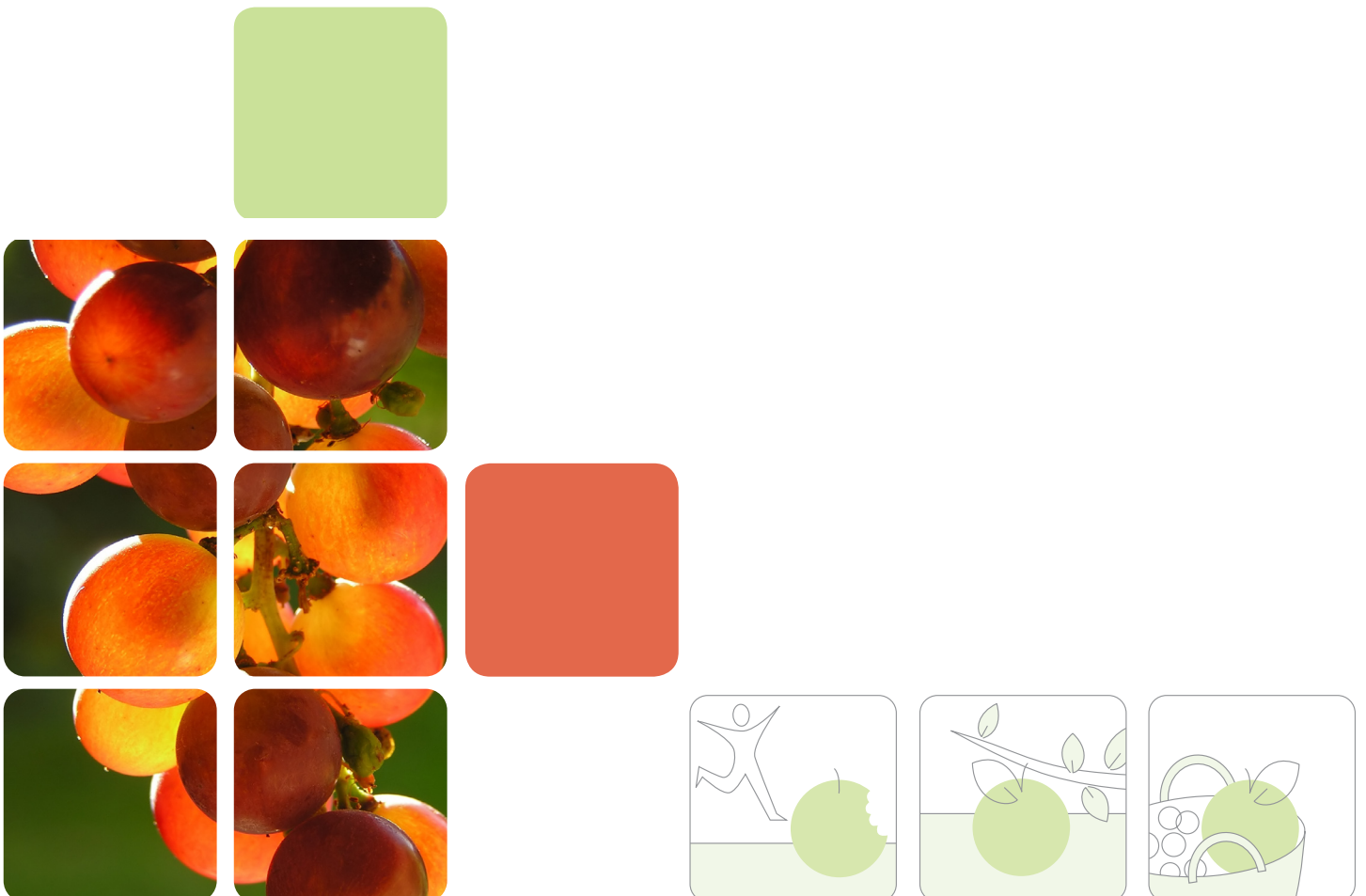


Alcohol in Europe

A public health perspective





EUROPEAN COMMISSION



Directorate C - Public Health & Risk Assessment
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Alcohol in Europe

A public health perspective

A report for the European Commission

Peter Anderson and Ben Baumberg
Institute of Alcohol Studies, UK
June 2006

This report has been written by Peter Anderson and Ben Baumberg on behalf of the Institute of Alcohol studies, England.

The report has been prepared under a contract with the European Commission [Contract SI2.378841 - Health, Social and Economic Impact of Alcohol]¹. As part of the contract, country based information on alcohol and alcohol policy was collected², and an analysis of stakeholders' views on alcohol policy undertaken³. In addition, during the preparation of the report, five hearings were convened: with stakeholders (that includes the beverage alcohol and related industries), 20 January 2005⁴, 30 August 2005⁵, and 26 September 2005⁶; with members of the Commission's Alcohol and Health Working Group, 8 March 2005⁷; and with non-governmental organizations, 19 May 2005⁸.

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¹ http://ec.europa.eu/health/ph_programme/howtoapply/call_096299_2003.htm.

² <http://www.eurocare.org/btg/countryreports/index.html>.

³ <http://www.ias.org.uk>.

⁴ http://ec.europa.eu/health/ph_determinants/life_style/alcohol/ev_20050120_en.htm.

⁵ http://ec.europa.eu/health/ph_information/dissemination/ev_20050830_en.htm.

⁶ http://ec.europa.eu/health/ph_determinants/life_style/alcohol/ev_20050926_en.htm.

⁷ http://ec.europa.eu/health/ph_determinants/life_style/alcohol/ev_20050307_en.htm.

⁸ <http://www.eurocare.org/btg/apn/minutes0505.html>.



The Health and Consumer Protection Directorate-General is pleased to present the Health-EU Portal (the official public health portal of the European Union) and the wide range of information and data on health-related issues and activities at both European and international level. The main objective of this thematic Portal is to provide European citizens with easy access to comprehensive information on Public Health initiatives and programmes at EU level. The portal is intended to help meet EU objectives in the Public Health field, it is an important instrument to positively influence behaviour and promote the steady improvement of public health in the 25 EU Member States.

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⁹ www.eurocare.org/btg.

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Preface

In June 2001, the Council of the European Union, in its Conclusions on a Community strategy to reduce alcohol-related harm, emphasized that a high level of human health protection should be ensured in the definition and implementation of all Community policies and activities, and recognized that alcohol is one of the key health determinants in the European Community.¹⁰

The Council stressed the desirability of developing a comprehensive Community strategy aimed at reducing alcohol-related harm comprising, in particular, an effective monitoring system on alcohol consumption, alcohol-related harm, and policy measures and their effects in the European Community; and a coordinated range of Community activities in fields such as research, consumer protection, transport, advertising, marketing, sponsoring, excise duties and other internal market issues, while fully respecting Member States' competencies. The Council invited the Commission to put forward proposals for a comprehensive Community strategy aimed at reducing alcohol-related harm, to complement national policies and with a timetable for action.

This public health report on alcohol, requested and financed by the European Commission, will describe the social, health and economic burden that alcohol brings to European citizens, families and to Europe as a whole; this is a burden that increases social marginalization and exclusion and places a strain on the viable, socially responsible and productive Europe, as envisaged by the Lisbon strategy.¹¹

Whilst noting that, in the European Union, alcoholic beverages are important economic commodities, the report will note that alcohol-attributable disease, injury and violence cost the health, welfare, employment and criminal justice sectors some €125bn a year. In particular, alcohol-related harm has a negative impact on the competitive position of European businesses, since it lowers productivity, and causes the loss of working life-years, with €59bn of the costs due to alcohol resulting from lost production. The report will also note that alcohol, as an important contributor to health inequalities between and within European Member States, risks damaging social cohesion throughout the Union.

The report will find that, although much has been on alcohol policy in the countries of Europe, much more can still be done to reduce alcohol's burden and to promote individual and European health. The report will note that alcohol policy is everybody's business; it is not only an issue for the health sector, but also for other sectors of public policy, including, amongst others, agriculture, business, criminal justice, education, finance, labour, municipalities, transport, and social welfare.

The report will find that alcohol policy, a global public good and an integral part of the health and well-being of the citizens of Europe, can enhance social cohesion and social capital and improve health and safety in the living environment, thereby contributing to higher productivity and a sustainable economic development in the European Union, in line with the objectives set out in the Lisbon Strategy.

¹⁰ http://ec.europa.eu/eur-lex/pri/en/oj/dat/2001/c_175/c_17520010620en00010002.pdf.

¹¹ Lisbon strategy: http://ec.europa.eu/comm/lisbon_strategy/index_en.html.

Summary

Background to the report

At the time that the European Commission has been preparing its own strategy on alcohol to cover the full range of activity that takes place at a European level, it called for an analysis of the health, social and economic impact of alcohol in Europe. This is the present report, which is an expert synthesis of published reviews, systematic reviews, meta-analyses and individual papers, as well as an analysis of data made available by the European Commission and the World Health Organization. The report views alcohol policy as “*servicing the interests of public health and social well-being through its impact on health and social determinants.*” This is embedded in a public health framework, a process to “*mobilize local, state, national and international resources to ensure the conditions in which people can be healthy.*” A standardized terminology has been proposed throughout the report based on that of the World Health Organization, the specialized United Nations agency on health matters.

Alcohol and Europe

Alcohol has been produced and drunk in Europe for thousands of years, usually made out of whatever materials were locally available. Alcoholic drinks were often also used as a medicine, a practice that continued until the early twentieth century and the advent of modern medicine. Laws on alcohol did exist, but normally for reasons of public order or to regulate the market rather than for public health. However, this picture changed with a series of developments in medieval and early modern Europe, including industrialization, improved communication links, and the discovery of stronger, distilled beverages. Large ‘temperance’ movements spread across much of Europe in the nineteenth and early twentieth centuries, driven by concerns over spirits before often moving on to an opposition to all alcoholic drinks. In most, but not all, countries the temperance movement has since faded, to a position of little significance by the end of the twentieth century.

The idea of ‘alcoholism’ as a disease also grew during the nineteenth century, with many European countries developing homes or asylums to treat ‘alcoholics’. In recent years, the ‘new public health movement’ has become the dominant paradigm for discussing alcohol-related problems, allowing a broader discussion than a focus on a small subset of ‘alcoholics’. Today’s Europe includes a wide range of uses and meanings of alcohol, ranging from an accompaniment to family meals to a major part of rites of passage. Drinking behaviour is often used to communicate the formality of an event or the division between work and leisure. Drunkenness is equally symbolic, with ‘drunken comportment’ – how people act under the influence of alcohol – varying across Europe.

Alcohol and the economy of Europe

Europe plays a central role in the global alcohol market, acting as the source of a quarter of the world’s alcohol and over half of the world’s wine production. Trade is even more centred on Europe, with 70% of alcohol exports and just under half of the

Summary

world's imports involving the European Union (EU). Although the majority of this trade is between EU countries, the trade in alcohol contributes around €9 billion to the goods account balance for the EU as a whole.

It is hard to place a value on the amount of **smuggling** in the EU, although the European High Level Group on Fraud estimated that €1.5bn was lost to alcohol fraud in 1996. Price differences play more of a role in the level of legitimate **cross-border shopping**, where individuals legally bring back alcohol with them from cheaper countries. At least 1 in 6 tourists returns from trips abroad with alcoholic drinks, carrying an average of over 2 litres of pure alcohol per person in several countries.

The **economic role of the alcoholic drinks industry** is considerable in many European countries. Alcohol excise duties in the EU15¹ countries amounted to €25 billion in 2001, excluding sales taxes and other taxes paid within the supply chain – although €1.5 billion is given back to the supply chain through the Common Agricultural Policy. Due to the relative inelasticity of the demand for alcohol, the average tax rates are a much better predictor of a government's tax revenue than the level of consumption in a country.

Alcohol is also associated with a **number of jobs**, including over three-quarters of a million in drinks production (mainly wine). Further jobs are also related to alcohol elsewhere in the supply chain, e.g. in pubs or shops. However, the size of the industry is not necessarily a good guide to the economic impact of alcohol policies – for example, trends in alcohol consumption show no crude correlation with trends in the number of jobs in associated areas such as hotels, restaurants, and bars, suggesting that the effect of changes in consumption may be relatively weak. A reduction in spending on alcohol would also be expected to free consumer funds to be spent on other areas, with the economic impact depending on the exact nature of the new expenditure. While further research needs to be done on this issue, current evidence from alcohol and other sectors suggests that declining consumption may not necessarily lead to job losses in the economy as a whole.

Based on a review of existing studies, the **total tangible cost of alcohol** to EU society in 2003 was estimated to be €125bn (€79bn-€220bn), equivalent to 1.3% GDP, which is roughly the same value as that found recently for tobacco. The **intangible costs** show the value people place on pain, suffering and lost life that occurs due to the criminal, social and health harms caused by alcohol. In 2003 these were estimated to be €270bn, with other ways of valuing the same harms producing estimates between €150bn and €760bn. While these estimates consider a number of different areas of human life where alcohol has an impact, there are several further areas where no estimate has been made as it was impossible to obtain data. Similarly, while the estimates take into account the benefits of alcohol to health systems and loss of life (valued intangibly), there is no research that would enable the other social benefits to be evaluated.

The use of alcohol in Europe

The EU is the **heaviest drinking region** of the world, although the 11 litres of pure alcohol drunk per adult each year is still a substantial fall from a recent peak of 15 litres in the mid-1970s. The last 40 years has also seen a harmonization in

¹ Austria, Belgium, Denmark, France, Finland, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

consumption levels in the EU15, with rises in central and northern Europe between 1960 and 1980, met by a consistent fall in southern Europe. Average consumption in the EU10² is also closer to the EU15 than ever before, although substantial variation remains within the EU10. Most Europeans drink alcohol, but 55 million adults (15%) abstain; taking this and unrecorded consumption into account, the consumption per drinker reaches 15 litres per year.

Just under half of this alcohol is consumed in the form of **beer** (44%), with the rest divided between **wine** (34%) and **spirits** (23%). Within the EU15, northern and central parts drink mainly beer, while those in southern Europe drink mainly wine (although Spain may be an exception). This is a relatively new phenomenon, with a harmonization visible over the past 40 years in the EU15. Around 40% of **drinking occasions** in most of the EU15 involve consuming alcohol with the afternoon/evening **meal**, although those in southern Europe are much more likely to drink with lunch than elsewhere. While the level of **daily drinking** also shows a north—south gradient, non-daily **frequent consumption** (i.e. drinking several times a week but not every day) seems to be more common in central Europe, and there is evidence for a recent harmonization within the EU15.

Drinking to drunkenness varies across Europe, with fewer southern Europeans than others reporting getting drunk each month. This pattern is attenuated when 'binge-drinking', a measure of drinking beyond a certain number of drinks in a single occasion, is instead investigated, suggesting that there are systematic differences in people's willingness to report being intoxicated or the length of a 'single occasion'. The studies of binge-drinking also show occasional exceptions to the north-south pattern, in particular suggesting that Sweden has one of the lowest rates of binge-drinking in the EU15. Summing up across the EU15, adults report getting drunk 5 times per year on average but binge-drink (5+ drinks on a single occasion)¹⁷ times. This is equivalent to 40m EU15 citizens 'drinking too much' monthly and 100m (1 in 3) binge-drinking at least once per month. Much fewer data are available for the EU10, but that which exists suggests that some of the wine-drinking is replaced by spirits, the frequency of drinking is lower, and the frequency of binge-drinking higher than in the EU15.

While 266 million adults drink alcohol up to 20g (women) or 40g (men) per day, over 58 million adults (15%) consume above this level, with 20 million of these (6%) drinking at over 40g (women) or 60g per day (men). Looking at addiction rather than drinking levels, we can also estimate that 23 million Europeans (5% of men, 1% of women) are **dependent on alcohol** in any one year.

In every culture ever studied, **men are more likely than women** to drink at all and to drink more when they do, with the gap greater for riskier behaviour. Although many women give up alcohol when pregnant, a significant number (25%-50%) continue to drink, and some continue to drink to harmful levels. Patterns in drinking behaviour can also be seen for **socio-economic status** (SES), where those with low SES are less likely to drink alcohol at all. Despite a complex picture for some aspects of drinking (with some measures showing opposite trends for men and women), getting drunk and becoming dependent on alcohol are both more likely among drinkers of lower SES.

² Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

Nearly all **15-16 year old students** (>90%) have drunk alcohol at some point in their life, on average beginning to drink at 12½ years of age, and getting drunk for the first time at 14 years. The average amount drunk on a single occasion by 15-16 year olds is over 60g of alcohol, and reaches nearly 40g in the south of Europe. Over 1 in 8 (13%) of 15-16 year olds have been drunk more than 20 times in their life, and more than 1 in 6 (18%) have 'binged' (5+ drinks on a single occasion) three or more times in the last month. Although two countries saw more drunkenness on some measures in girls than boys for the first time in 2003, boys continue to drink more and get drunk more often than girls, with little reduction in the absolute gap between them. Most countries show a rise in binge-drinking for boys from 1995/9 to 2003, and nearly all countries show this for girls (similar results are found for non-ESPAD countries using other data). Behind this overall trend we can see a rise in binge-drinking and drunkenness across most of the EU 1995-9, followed by a much more ambivalent trend since (1999-2003).

The impact of alcohol on individuals

Although the use of alcohol brings with it a number of pleasures, alcohol increases the risk of a wide range of **social harms**, generally in a dose dependent manner - i.e. the higher the alcohol consumption, the greater the risk. Harms done by **someone else's drinking** range from social nuisances such as being kept awake at night through more serious consequences such as marital harm, child abuse, crime, violence and homicide. Generally the higher the level of alcohol consumption, the more serious is the crime or injury. The volume of alcohol consumption, the frequency of drinking and the frequency and volume of episodic heavy drinking all independently increase the risk of violence, with often, but not always, episodic heavy drinking mediating the impact of volume of consumption on harm.

Apart from being a drug of dependence, alcohol is a cause of some 60 different types of diseases and conditions, including injuries, mental and behavioural disorders, gastrointestinal conditions, cancers, cardiovascular diseases, immunological disorders, lung diseases, skeletal and muscular diseases, reproductive disorders and pre-natal harm, including an increased risk of prematurity and low birth weight. For most conditions, alcohol increases the risk in a dose dependent manner, with the higher the alcohol consumption, the greater the risk. For some conditions, such as cardiomyopathy, acute respiratory distress syndrome and muscle damage, harm appears only to result from a sustained level of high alcohol consumption, but even at high levels, alcohol increases the risk and severity of these conditions in a dose dependent manner. The frequency and volume of episodic heavy drinking are of particular importance for increasing the risk of injuries and certain cardiovascular diseases (coronary heart disease and stroke).

A small dose of alcohol consumption reduces the risk of **coronary heart disease**, although the exact size of the reduction in risk and the level of alcohol consumption at which the greatest reduction occurs are still debated. Better quality studies that account for other influences find less of a reduced risk than poorer quality studies and find that the reduced risk occurs at a lower level of alcohol consumption. Most of the reduction in risk can be achieved by an average of 10g of alcohol (one drink) every other day. Beyond 20g of alcohol (two drinks) a day - the level of alcohol consumption with the lowest risk - the risk of coronary heart disease increases. In very old age, the reduction in risk is less. It is alcohol that mainly reduces the risk of heart disease rather than any specific beverage type. There is evidence that alcohol

in low doses might reduce the risk of vascular-caused dementia, gall stones and diabetes, although these findings are not consistent across all studies.

The **risk of death** from alcohol is a balance between the risk of diseases and injuries that alcohol increases and the risk of heart disease (which mostly occurs at older age) which, in small amounts, alcohol decreases. This balance shows that, at least in the United Kingdom, the level of alcohol consumption with the lowest risk of death is zero or near zero for women under the age of 65 years, and less than 5g of alcohol a day for women aged 65 years or older. For men, the level of alcohol consumption with the lowest risk of death is zero under 35 years of age, about 5g a day in middle age, and less than 10g a day when aged 65 years or older, (and probably returning towards zero in very old age).

There are health benefits to the heavier drinker from reducing or stopping alcohol consumption. Even for chronic diseases, such as liver cirrhosis and depression, reducing or stopping alcohol consumption is associated with rapid improvements in health.

The impact of alcohol on Europe

Alcohol places a significant burden on several aspects of human life in Europe, which can broadly be described as 'health harms' and 'social harms'. Seven million adults report being in **fights when drinking** over the past year and (based on a review of a small number of national costing studies) the economic cost of alcohol-attributable crime has been estimated to be €33bn in the EU for 2003. This cost is split between police, courts and prisons (€15bn), crime prevention expenditure and insurance administration (€12bn) and property damage (€6bn). Property damage due to drink-driving has also been estimated at €10bn, while the intangible cost of the physical and psychological effects of crime has been valued at €9bn-€37bn.

An estimated 23 million Europeans are dependent on alcohol in any one year, with the pain and suffering this causes for family members leading to an estimated intangible impact of €68bn. Estimates of the scale of harm in the workplace are more difficult, although nearly 5% of drinking men and 2% of drinking women in the EU15 report a negative impact of alcohol on their work or studies. Based on a review of national costing studies, lost productivity due to alcohol-attributable absenteeism and unemployment has been estimated to cost €9bn-€19bn and €6bn-€23bn respectively.

Looking from a **health perspective**, alcohol is responsible for about 195,000 deaths each year in the EU, although it is also estimated to delay 160,000 deaths in older people, mainly through its cardioprotective effect for women who die after the age of 70 years (although due to methodological problems, this is likely to be an over-estimate of the number of deaths delayed). A more accurate estimate is likely to be the 115,000 net deaths caused in people up to the age of 70, which avoids most of the likely overestimate of alcohol's preventive effect. These figures are also relative to a situation of no alcohol use, and the net effect would be much greater, looking at the lowest-risk level of drinking. Measuring the impact of alcohol through Disability-Adjusted Life Years (DALYs) lessens this problem, and shows that alcohol is responsible for 12% of male and 2% of female premature death and disability, after accounting for health benefits. This makes alcohol the third highest of twenty-six risk factors for ill-health in the EU, ahead of overweight/obesity and behind only tobacco and high blood pressure.

This health impact is seen across a wide range of conditions, including 17,000 deaths per year due to road traffic accidents (1 in 3 of all road traffic fatalities), 27,000 accidental deaths, 2,000 homicides (4 in 10 of all murders and manslaughters), 10,000 suicides (1 in 6 of all suicides), 45,000 deaths from liver cirrhosis, 50,000 cancer deaths, of which 11,000 are female breast cancer deaths, and 17,000 deaths due to neuropsychiatric conditions as well as 200,000 episodes of depression (which also account for 2.5 million DALYs). The cost of treating this ill-health is estimated to be €17bn, together with €5bn spent on treatment and prevention of harmful alcohol use and alcohol dependence. Lost life can either be valued as lost productive potential (€36bn excluding health benefits), or in terms of the intangible value of life itself (€145bn-€712bn after accounting for health benefits).

Young people shoulder a disproportionate amount of this burden, with over 10% of youth female mortality and around 25% of youth male mortality being due to alcohol. Little information exists on the extent of social harm in young people, although 6% of 15-16 year old students in the EU report fights and 4% report unprotected sex due to their own drinking.

Between countries, alcohol plays a considerable role in the lowered life expectancy in the EU10 compared to the EU15, with the alcohol-attributable gap in crude death rates estimated at 90 (men) and 60 (women) per 100,000 population. **Within countries**, many of the conditions underlying health inequalities are associated with alcohol, although the exact condition may vary (e.g. cirrhosis in France, violent deaths in Finland). Worse health in deprived areas also appears to be linked to alcohol, with research suggesting that directly alcohol-attributable mortality is higher in deprived areas beyond that which can be explained by individual-level inequalities.

Many of the harms caused by alcohol are borne by **people other than the drinker**. This includes 60,000 underweight births, as well as 16% of child abuse and neglect, and 5-9 million children in families adversely affected by alcohol. Alcohol also affects other adults, including an estimated 10,000 deaths in drink-driving accidents for people other than the drink-driver, with a substantial share of alcohol-attributable crime also likely to occur to others. Parts of the economic cost are also paid by other people or institutions, including much of the estimated €33bn due to crime, €17bn for healthcare systems, and €9bn-€19bn of absenteeism.

Natural experiments and time-series analyses both show that the health burden from alcohol is related to **changes in consumption**. These changes reflect the behaviour of the heaviest drinkers more than lighter drinkers (given that e.g. the top 10% of drinkers account for one-third to one-half of total consumption in most countries), but also tap into the wider tendency for populations to change their levels of consumption collectively. Across the whole population, the impact of a one-litre change in consumption on levels of harm is highest in the low-consuming countries of the EU15 (northern Europe), but still significant for cirrhosis, homicide (men only), accidents, and overall mortality (men only) in southern Europe. While some have argued that the greater change in northern Europe reflects the 'explosive' drinking culture there, this may also reflect the greater proportional size of a one-litre change in the low-consuming northern European countries. Overall, it has been estimated that a one litre decrease in consumption would decrease total mortality in men by 1% in southern and central Europe, and 3% in northern Europe.

Evaluating alcohol policy options

The **drinking-driving policies** that are highly effective include unrestricted (random) breath testing, lowered blood alcohol concentration (BAC) levels, license suspension, and lower BAC levels for young drivers. The limited evidence does not find an impact from designated driver and safe drive programmes. Alcohol locks can be effective as a preventive measure, but as a measure with drink driving offenders, only work as long as they are fitted to a vehicle. The World Health Organization has modelled the impact and cost of unrestricted breath testing compared with no testing; applying this to the Union finds an estimated 111,000 years of disability and premature death avoided at an estimated cost of €233 million each year.

The impact of policies that support **education, communication, training and public awareness** is low. Although the reach of school-based educational programs can be high because of the availability of captive audiences in schools, the population impact of these programs is small due to their current limited or lack of effectiveness. Recommendations exist as to how the effectiveness of school-based programmes might be improved. On the other hand, mass media programmes have a particular role to play in reinforcing community awareness of the problems created by alcohol use and to prepare the ground for specific interventions.

There is very strong evidence for the effectiveness of policies that **regulate the alcohol market** in reducing the harm done by alcohol. Alcohol taxes are particularly important in targeting young people and the harms done by alcohol in all countries. If alcohol taxes were used to raise the price of alcohol in the EU15 by 10%, over 9,000 deaths would be prevented during the following year and an estimate suggests that approximately €13bn of additional excise duty revenues would also be gained. The evidence shows that if opening hours for the sale of alcohol are extended, then more violent harm results. The World Health Organization has modelled the impact of alcohol being less available from retail outlets by a 24 hour period each week; applying this to the Union finds an estimated 123,000 years of disability and premature death avoided at an estimated implementation cost of €98 million each year.

Restricting the volume and content of **commercial communications** of alcohol products is likely to reduce harm. Advertisements have a particular impact in promoting a more positive attitude to drinking amongst young people. Self-regulation of commercial communications by the beverage alcohol industry does not have a good track record for being effective. The World Health Organization has modelled the impact of an advertising ban; applying this to the Union finds an estimated 202,000 years of disability and premature death avoided, at an estimated implementation cost of €95 million each year.

There is growing evidence for the impact of strategies that alter the **drinking context** in reducing the harm done by alcohol. However, these strategies are primarily applicable to drinking in bars and restaurants, and their effectiveness relies on adequate enforcement. Passing a minimum drinking age law, for instance, will have little effect if it is not backed up with a credible threat to remove the licenses of outlets that repeatedly sell to the under-aged. Such strategies are also more effective when backed up by community based prevention programmes.

There is extensive evidence for the impact of **brief advice**, particularly in primary care settings, in reducing harmful alcohol consumption. The World Health Organization has modelled the impact and cost of providing primary care-based brief

Summary

advice to 25% of the at-risk population; applying this to the Union finds an estimated 408,000 years of disability and premature death avoided at an estimated cost of €740 million each year.

Using the World Health Organization's models, and compared to no policies at all, a **comprehensive European Union wide package** of effective policies and programmes that included random breath testing, taxation, restricted access, an advertising ban and brief physician advice, is estimated to cost European governments €1.3 billion to implement. This is about 1% of the total tangible costs of alcohol to society and only about 10% of the estimated income gained from a 10% rise in the price of alcohol due to taxes in the EU15 countries. It is estimated that such a package can avoid 1.4 million years of disability and premature death a year, approximately 2% of all disability and premature death facing the European Union.

European and global alcohol policy

The most prominent **international legal obligations** that affect alcohol policy are the General Agreement on Tariffs and Trade (GATT) dealing with goods, and the General Agreement on Trade in Services (GATS). Past cases on these have shown that the World Trade Organization (WTO) will prioritize health over trade in some circumstances (for example, a ban on asbestos imports), although policies must pass a series of strict tests in order to be maintained.

However, by far the greater effect on alcohol policy in practice has come from the **trade law of the European Union** (EU). Most of the cases relating to alcohol stem from the 'national treatment' rule on taxation, which means that states are forbidden from discriminating – either directly or indirectly – in favour of domestic goods against those from elsewhere in the EU. No exceptions can be made to this on health grounds, with the result that countries face certain restrictions in the design of their tax policy. In contrast, the increasingly influential **European Court of Justice** (ECJ) has unambiguously supported advertising bans in Catalonia and France, accepting that "it is in fact undeniable that advertising acts as an encouragement to consumption".

Standardized excise duties are a longstanding goal of the EU in order to reduce market distortions, where large differences in tax rates between nearby countries lead to large amounts of shopping abroad. This leads to lost revenue for the high-tax government, as well as creating pressure to lower taxation rates, as has occurred in some of the Nordic countries. The production of alcoholic drinks in the form of wine receives €1.5 billion worth of support each year through the **Common Agricultural Policy** (CAP). The economic and political importance of these subsidies, and in particular, the problems of wine producers, makes it hard to progress from a public health perspective.

The international body most active on alcohol has been the **World Health Organization** (WHO), whose European office has undertaken several initiatives to reduce alcohol-related harm in its 52 Member States. These include the Framework for Alcohol Policy in the European Region, the European Charter on Alcohol and two ministerial conferences, which confirmed the need for alcohol policy (and public health policy more broadly) to be developed without any interference from commercial or economic interests.

Although the EU itself cannot pass laws simply to protect human health (Member States have not conferred this power on the European institutions), some policies dealing with the internal market can incorporate substantial health concerns, such as the alcohol advertising clause within the **Television Without Frontiers Directive**. Otherwise, the EU's action on alcohol has come through 'soft law', in the form of non-binding resolutions and recommendations urging Member States to act in a certain way.

Member State alcohol policy

Every country in the European Union (EU) has a number of laws and other policies that set alcohol apart from other goods traded in its territory, often for reasons of public health. Despite the ubiquity of alcohol policies, just under half the EU countries still do not have an **action plan or coordinating body for alcohol**. Even so, most countries have programmes for one aspect of alcohol policy, of which **school-based education** programmes are the most common throughout Europe. All countries also have some form of **drink-driving restrictions**, with everywhere except the UK, Ireland and Luxembourg having a maximum blood alcohol limit for drivers at the level recommended by the European Commission (0.5g/L). However, many European drivers believe that there is only a slim chance of being detected - a third overall believe they will never be breathalysed, although this is lower in countries with random breath testing.

Sales of alcohol are generally subject to restrictions in most EU countries, in a few cases through retail monopolies but more often through licences, while the places that alcohol can be sold are frequently restricted. Over one-third of countries (and some regions) also limit the **hours of sale**, while restrictions on the days of sale or the density of off-premise retailers exist in a small number of countries. All countries prohibit the **sale of alcohol to young people** beneath a certain age in bars and pubs, although four countries have no policy on the sale of alcohol to children in shops. The cut-off point for allowing sales to young people also varies across Europe, tending to be 18 years in northern Europe and 16 years in southern Europe.

Alcohol marketing is controlled to different degrees depending on the type of marketing activity. Television beer adverts are subject to legal restrictions (beyond content restrictions) in over half of Europe, including complete bans in five countries; this rises to 14 countries for bans on spirits adverts. Billboards and print media are subject to less regulation though, with one in three countries (mainly in the EU10) having no controls. **Sports sponsorship** is subject to the weakest restrictions, with only seven countries having any legal restrictions at all.

The **taxation** of alcoholic beverages is another consistent feature of European countries, although the rates themselves vary considerably between countries. This can be seen clearly for wine, where nearly half the countries have no tax at all, but one in five countries has a tax rate above €1,000, adjusted for purchasing power. In general, the average effective tax rate is highest in northern Europe, and weakest in southern and parts of central and eastern Europe. Four countries have also introduced a targeted **tax on alcopops** since 2004, which appears to have reduced alcopops consumption since.

When the different policy areas are combined into a **single scale**, the overall strictness of alcohol policy ranges from 5.5 (Greece) to 17.7 (Norway) out of a possible maximum of 20, with an average of 10.8. The least strict policies are in

southern and parts of central and eastern Europe, and the highest in northern Europe – but the scores do not all decrease from north to south, as seen in the high score in France. This picture of alcohol policy is very different from the one visible fifty years ago, with the overall levels of policy now much closer together, largely due to the increased level of policy in many countries, particular in the area of drink-driving where all countries have a legal limit. Marketing controls, minimum ages to buy alcohol, and public policy structures to deliver alcohol policy are also much more common in 2005 than in 1950.

CONCLUSIONS

Alcohol and the Economy of Europe

Conclusion 1

The trade in alcohol contributes around €9billion to the **goods account balance** for the European Union as a whole, with such trade not necessarily affected by European and domestic policy to reduce the harm done by alcohol.

Conclusion 2

Alcohol tax revenues, an important source of government revenue (€25bn in 2001 in the older EU15 countries), are more closely related to tax rates than to the overall level of alcohol consumption.

Conclusion 3

Declining consumption will not necessarily lead to **job losses** in the economy as a whole, and may not even lead to large changes in employment in some **sectors linked to alcohol** such as restaurants and bars.

The social costs of alcohol

Conclusion 4

The tangible **costs of alcohol** to the European Union were estimated to be €125bn in 2003, including €59bn worth of **lost productivity** through absenteeism, unemployment and lost working years through premature death.

Conclusion 5

The intangible **costs of alcohol** (which describe the value people place on suffering and lost life) to the European Union were estimated to be €270bn in 2003.

The use of alcohol in Europe

Conclusion 6

While **differences** between countries in the levels and patterns of drinking are still evident, they are smaller than they were 40 years ago, and many aspects of drinking are much more similar across Europe than commonly believed. **Adolescent binge drinking** has increased in most countries in the 1990s, followed by mixed trends in the past few years.

Conclusion 7

Drunkness is an important cause of **injuries** – including violent injuries – across all of Europe, including in southern Europe.

Conclusion 8

Where you live in Europe remains a major determinant of the harm done by alcohol.

Alcohol and Health

Conclusion 9

Alcohol is a health determinant, responsible for 7.4% of all disability and premature death in the European Union.

Conclusion 10

Alcohol is a cause of harm to **others than the drinker**, including some 60,000 underweight births, 5-9 million children living in families adversely affected by alcohol and 10,000 traffic

Conclusions

deaths to people other than the driver in the European Union each year.

Conclusion 11

Alcohol is a cause of **health inequalities** both between and within Member States, causing an estimated 90 extra deaths per 100,000 men and 60 extra deaths per 100,000 women in the newer EU10 countries, compared to the older EU15 countries.

Alcohol and government policy

Conclusion 12

Governments have a **responsibility** to intervene in the market, and **benefit** from doing so. For example, a 10% increase in the price of alcohol across the older EU15 Member States estimated to bring in approximately €13bn in extra alcohol taxes in the first year.

Conclusion 13

Educational interventions, which show little effectiveness in reducing the harm done by alcohol, are not an alternative to **measures that regulate the alcohol market**, which have the greatest impact in reducing harm, including amongst heavier and younger drinkers.

Alcohol and European policy

Conclusion 14

Continuing differences in alcohol policy across Europe, such as tax rates, impair the ability of countries to implement effective policies.

Conclusion 15

Different policies between Member States are sometimes ruled as legitimate to **protect public health**, such as the European Court's 2004 ruling in favour of the French advertising law.

RECOMMENDATIONS

I. Defining an alcoholic beverage

Defining an alcoholic beverage	Relevant actor
I.1. Public policies need to define alcoholic beverages in a uniform way across the European Union. A starting point could be the lowest definition for tax purposes (0.5% alcohol by volume).	(I) Eur. Inst. ³

II. Creating the evidence base

Recommendations for research	Relevant actor
II.1. European infrastructures should be established and financed to undertake collaborative cross country alcohol research.	(I) Eur. Inst. (II) MS/region ⁴
II.2. European infrastructures should be created and financed to review and disseminate all major research outcomes in alcohol policy through, for example, registries and databases; the evidence base should be translated into easily understood policies and practices through practical toolkits and guidelines.	(I) Eur. Inst. (II) MS/region
II.3. Long-term publicly funded alcohol research programmes should be established and financed.	(I) Eur. Inst. (II) MS/region
II.4. Research capacity in alcohol policy should be developed through professional development programmes.	(I) Eur. Inst. (II) MS/region
Recommendations for information	Relevant actor
II.5. A European Alcohol Monitoring Centre (EAMC), with country based counterparts, should be established and financed.	(I) Eur. Inst. (II) MS/region
II.6. The importance of including alcohol-related indicators dealing with consumption, harm and policy and programme responses within the European Community Health Indicators short-list should be stressed to the EU Working Party on Health Indicators.	(I) Eur. Inst.
II.7. Alcohol surveillance programmes should be established so that data are comparable and analysable across Europe.	(I) Eur. Inst. (II) MS/region
II.8. A European database of laws and regulations and of effective policies and programmes at European, Member State and municipal level should be established and maintained.	(I) Eur. Inst. (II) MS/region (III) Municipal ⁵

³ European Institutions.

⁴ Member States and regions within Member States.

⁵ Municipalities.

III. Preparing and implementing resourced strategies and plans

Recommendations for strategies and action plans	Relevant actor
III.1. A European mechanism and focal point for alcohol policy should be strengthened within the European Commission with adequate staff and financial resources to oversee the development of European alcohol policy and the implementation of the Commission's strategy on alcohol.	(I) Eur. Inst.
III.2. Co-ordinating mechanisms and focal points for alcohol policy should be established or reinforced at all levels of action and adequately financed.	(I) Eur. Inst. (II) MS/region (III) Municipal
III.3. Action plans on alcohol with clear objectives, strategies and targets should be formulated and implemented.	(I) Eur. Inst. (II) MS/region (III) Municipal
III.4. A predictable funding system should be set in place for organizations, programmes and human resources involved in reducing the harm done by alcohol. Analyses should be undertaken of the practicality and desirability of earmarking a proportion of alcohol taxes (hypothecated tax) to fund these.	(I) Eur. Inst. (II) MS/region (III) Municipal
III.5. Support for alcohol policy measures amongst civil and political society should be promoted through awareness-raising campaigns and initiatives.	(I) Eur. Inst. (II) MS/region (III) Municipal
III.6. Regular reports on alcohol should be prepared and made accessible to a wide public audience.	(I) Eur. Inst. (II) MS/region (III) Municipal

IV. Other policies and actions and cross border support

Recommendations for impact assessment and collective action	Relevant actor
IV.1. Health policy-makers and advisers should monitor the risks inherent in the process of trade liberalization and should ensure that health concerns are accounted for in trade negotiations at both the global and European levels.	(I) Eur. Inst. (II) MS/region
IV.2. Analytical and feasibility studies should be undertaken to determine when collective action on alcohol policy at both the European and global level is more appropriate and how comity of countries in relation to alcohol policy can be strengthened.	(I) Eur. Inst. (II) MS/region
IV.3. Increased resources should be provided to undertake thorough assessments of the impact of European community policies and activities (including agricultural policy) on the harms and costs associated with alcohol.	(I) Eur. Inst.

V. Reducing drinking and driving

Recommendations for drinking and driving	Relevant actor
V.1.A maximum blood alcohol concentration limit of 0.5 g/L should be introduced throughout Europe; countries with existing lower levels should not increase them.	(I) Eur. Inst. (II) MS/region
V.2.A lower limit of 0.2 g/L should be introduced for young drivers and drivers of public service and heavy goods vehicles; countries with existing lower levels should not increase them.	(I) Eur. Inst. (II) MS/region
V.3.Unrestricted powers to breath test, using breathalysers of equivalent and agreed standard, should be implemented throughout Europe.	(I) Eur. Inst. (II) MS/region
V.4.Common penalties with clarity and swiftness of punishment, with penalties graded depending at least on the BAC level, should be implemented throughout Europe.	(I) Eur. Inst. (II) MS/region
V.5.Driver education, rehabilitation and treatment schemes, linked to penalties, based on agreed evidence-based guidelines and protocols should be implemented throughout Europe.	(I) Eur. Inst. (II) MS/region
V.6.Action to reduce drinking and driving should be supported by a Europe wide campaign.	(I) Eur. Inst.
V.7.Existing designated driver campaigns should be evaluated for their impact in reducing drink driving accidents and fatalities before financing and implementing any new campaigns.	(I) Eur. Inst. (II) MS/region
V.8.Effective and appropriate training for the hospitality industry and servers of alcohol should be implemented to reduce the risk of drinking and driving.	(III) Municipal
V.9.Comprehensive community-based educational and mobilization programmes, including urban planning and public transport initiatives, should be implemented to reduce drinking and driving.	(III) Municipal

VI. Supporting education, communication, training and public awareness

Recommendations for education and public awareness	Relevant actor
VI.1. Educational programmes should not be implemented in isolation as an alcohol policy measure, or with the sole purpose of reducing the harm done by alcohol, but rather as a measure to reinforce awareness of the problems created by alcohol and to prepare the ground for specific interventions and policy changes.	(II) MS/region (III) Municipal
VI.2. Funding should be provided to evaluate the design and impact of individual-based programmes that may show some promise.	(II) MS/region (III) Municipal

Recommendations

VI.3. Broad educational programmes, beginning in early childhood, should be implemented to inform young people of the consequences of alcohol consumption on health, family and society and of the effective measures that can be taken to prevent or minimize harm.	(II) MS/region (III) Municipal
VI.4. Educational type programmes imported from another country or culture should first be evaluated in the new setting before being widely implemented.	(II) MS/region (III) Municipal
VI.5. Media campaigns should be used to inform and raise awareness among citizens on implementation of policy initiatives.	(I) Eur. Inst. (II) MS/region (III) Municipal

VII. Consumer labelling

Recommendations on labelling	Relevant actor
VII.1. Containers of alcoholic products should carry warnings determined by health bodies, describing the harmful effects of alcohol when driving or operating machinery, and during pregnancy, or other messages as appropriate.	(I) Eur. Inst. (II) MS/region
VII.2. Alcohol product packaging and labelling should not promote an alcoholic product by any means that are likely to create an erroneous impression about its characteristics or health effects, or that directly or indirectly appeals to minors.	(I) Eur. Inst. (II) MS/region

VIII. Policies that regulate the alcohol market

Recommendations for tax, cross border purchases and smuggling	Relevant actor
VIII.1. Minimum tax rates for all alcoholic beverages should be increased in line with inflation; should be at least proportional to the alcoholic content of all beverages that contain alcohol; and should at least cover the external costs of alcohol as determined by an agreed and standardized methodology.	(I) Eur. Inst. (II) MS/region
VIII.2. Member States should retain the flexibility to use taxes to deal with specific problems that may arise with specific alcoholic beverages, such as those that prove to be appealing to young people.	(II) MS/region
VIII.3. Alcoholic products should be marked to determine their origin and movement in trade, to enable estimates to be made of the value of the amount of alcohol smuggling into and within the EU.	(I) Eur. Inst. (II) MS/region
VIII.4. Member States should have the flexibility to limit individual cross-border purchases so as not to diminish the impact of their current tax policies.	(I) Eur. Inst. (II) MS/region

Recommendations for minimum purchase age and availability	Relevant actor
VIII.5. A minimum system of licensing for the sale of alcoholic products should be implemented throughout Europe, respecting existing licensing systems, where these are stronger.	(I) Eur. Inst. (II) MS/region (III) Municipal
VIII.6. The sales of alcoholic products to persons under the age set by domestic law, national law or eighteen years, whichever is the higher, should be prohibited and enforced.	(II) MS/region
VIII.7. Jurisdictions that manage outlets through number and density, location and hours and days of sale should consider not relaxing their regulations; jurisdictions without such regulations or with very limited regulations should analyze the impact of introducing or strengthening them.	(II) MS/region (III) Municipal
VIII.8. A range of increasingly severe penalties against sellers and distributors, such as withdrawal of license or temporary and permanent closures, should be implemented in order to ensure compliance with relevant measures.	(III) Municipal

Recommendations for commercial communications	Relevant actor
VIII.9. A level playing field for commercial communications should be implemented across Europe, building on existing regulations in Member States, with an incremental long-term development of no advertising on TV and cinema, no sponsorship, and limitation of messages and images only to those that refer to the quality of the product.	(I) Eur. Inst. (II) MS/region
VIII.10. Article 15 of the Television Without Frontiers Directive should be strengthened in terms of both content and volume, and an analysis of its adherence across MS should be commissioned.	(I) Eur. Inst. (II) MS/region
VIII.11. Where self-regulatory approaches adopted by the beverage alcohol industry or marketing industry are in place, they should be monitored and adjudicated by a body that is independent of the alcohol and marketing industries.	(I) Eur. Inst. (II) MS/region

IX Reducing harm in drinking and surrounding environments

Recommendations for drinking and surrounding environments	Relevant actor
IX.1. Urban planning, community strategies, licensing regulations and restrictions, transport policies and management of the drinking and surrounding environments should work to minimize the negative effects that result from alcohol intoxication, particularly for local residents.	(III) Municipal

Recommendations

IX.2. Effective and appropriate training should be implemented for the hospitality industry and servers of alcohol to reduce the harmful consequences of intoxication and harmful patterns of drinking.	(IV) Alcohol industry
IX.3. Adequate policing and enforcement of alcohol sales and licensing laws should be implemented, targeted at premises associated with a higher level of harm.	(III) Municipal
IX.4. Well-resourced community mobilization and intervention projects, involving different sectors and partners should be implemented to create safer drinking environments and to reduce the harm done by alcohol.	(III) Municipal

X. Advice for hazardous and harmful alcohol consumption and alcohol dependence

Recommendations for advice	Relevant actor
X.1. Integrated evidence-based guidelines for brief advice for hazardous and harmful alcohol consumption should be developed and implemented in different settings upwardly to harmonize the quality and accessibility of care.	(II) MS/region (III) Municipal
X.2. Training and support programmes to deliver brief advice for hazardous and harmful alcohol consumption should be developed and implemented in different settings upwardly to harmonize the skills of primary care providers.	(II) MS/region (III) Municipal
X.3. Resources should be made available to ensure the widespread availability and accessibility of identification and advice programmes for hazardous and harmful alcohol consumption and alcohol dependence.	(II) MS/region (III) Municipal

Chapter 1: Introduction

At the time that the European Commission has been preparing its own strategy on alcohol to cover the full range of activity that takes place at a European level, it has called for an analysis of the health, social and economic impact of alcohol in Europe. This is the present report, which is an expert synthesis of published reviews, systematic reviews, meta-analyses and individual papers, as well as an analysis of data made available by the European Commission and the World Health Organization. The report views alcohol policy as “serving the interests of public health and social well-being through its impact on health and social determinants.” This is embedded in a public health framework, a process to “mobilize local, state, national and international resources to ensure the conditions in which people can be healthy”. A standardized terminology has been proposed throughout the report based on that of the World Health Organization, the specialized United Nations agency on health matters. This has led to avoiding terms such as “alcohol misuse” and “alcohol abuse” which can be both ill-defined and misleading.

INTRODUCTION

Although alcohol consumption levels have been falling (see Chapter 4), the European Union remains the part of the world with the highest proportion of drinkers and with the highest levels of alcohol consumption per population (World Health Organization 2005a), Figure 1.1. Although parts of Europe are described as having drinking patterns that are less risky to health, alcohol remains one of the most important risk factors for ill-health and premature death (see Chapter 6). Alcohol is the third largest risk factor for ill-health (after smoking and raised blood pressure), being more important than high cholesterol levels and overweight (World Health Organization 2002).

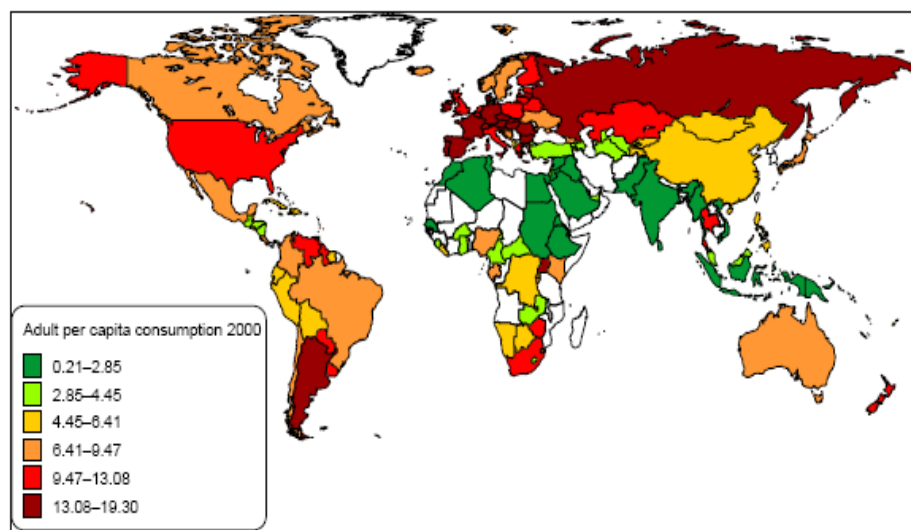


Figure 1.1 Adult per capita alcohol consumption in the world measured in pure alcohol per person per year (estimates include unrecorded consumption). Source: World Health Organization (2005a).

Since the 1970s and the growing process of European integration, there has been a rising and coordinated response to the problems caused by alcohol, at the level of science, policy and civil society:

1. At the scientific level, three major publications co-sponsored by the European Region of the World Health Organization (WHO) have presented the scientific foundation for alcohol policy (Bruun *et al.* 1975; Edwards *et al.* 1994; Babor *et al.* 2003), supplemented by a wide range of background technical documents. As described in detail in Chapter 8, the WHO has also contributed substantially to the political process through two ministerial conferences (Anderson 1996; World Health Organization 2001), the European Charter on Alcohol (World Health Organization 1995), two European Alcohol Action Plans (World Health Organization 1992a; 2000) and a new Framework for Alcohol Policy in the European Region (World Health Organization 2005b).
2. The civil society response in Europe to the harm done by alcohol was given a boost in 1990, with the creation of Eurocare,¹ a European non-governmental organization drawing together networks and organizations throughout Europe. Eurocare represents a diversity of views and cultural attitudes, and is dedicated to the prevention of the harm done by alcohol, focusing in particular on the impact of the European Union on alcohol policy in Member States.
3. The European Union itself has supported the process of alcohol policy through its Council Recommendation of 5 June 2001 on the drinking of alcohol by young people, in particular children and adolescents,² and its Council Conclusions of 5 June 2001 on a Community strategy to reduce alcohol-related harm (see also Chapter 8).³ During June 2004, the Council reiterated the importance of its 2001 Recommendation and Conclusions and recalled its invitation to the Commission to develop a strategy,⁴ which, as of the beginning of 2006, is under preparation.

In 2003, the European Commission called for a report and analysis of the health, social and economic impact of alcohol (SANCO/G/3/2003/06), in particular to summarize the available information on alcohol at the country and European levels (economic factors, health and social problems, health promotion, prevention and treatment, alcohol policies) and describe options for action at the country and European levels. The present report is the response to the European Commission's call.

This chapter will describe how the report has been prepared, will outline the public health basis of the report, will discuss issues of terminology, and will introduce the readers to the remaining chapters.

¹ <http://www.eurocare.org>.

² http://ec.europa.eu/eur-lex/pri/en/oj/dat/2001/l_161/l_16120010616en00380041.pdf .

³ http://ec.europa.eu/eur-lex/pri/en/oj/dat/2001/c_175/c_17520010620en00010002.pdf.

⁴ http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/lsa/80729.pdf.

METHODS, STRUCTURE AND TERMINOLOGY OF THIS REPORT**Method of preparing the report**

Source materials The report is not meant to be a series of new meta-analyses or systematic reviews, but rather an expert synthesis of published reviews, systematic reviews, meta-analyses and individual papers. It is this review of reviews, supplemented by information from additional individual papers that forms the primary evidence base for the report. Summaries of this evidence are presented in the report, citing some of the better known and more substantial work in the field, although readers should consult the literature reviews themselves if more detail is required.

To begin with, source materials were identified through the references of key texts (including Norström 2001; Heather, Peters, and Stockwell 2001; Babor *et al.* 2003; Rehm *et al.* 2004; Loxley *et al.* 2004), hand searches of the journals *Addiction*, *Drug and Alcohol Review*, *Alcohol Research and Health*, and *Nordic Studies on Alcohol and Drugs*, and the websites of the European Commission, the National Institute on Alcohol Abuse and Alcoholism, and the World Health Organization. From these initial source materials, topics were identified for inclusion, and additional source material to update the evidence base was identified through literature searches using PubMed,⁵ MEDLINE,⁶ and PsychINFO.⁷

The report has followed the definitions of evidence-based medicine modified for the purpose of alcohol policy. This can be defined as 'the conscientious, explicit and judicious use of current best evidence in informing decisions about alcohol policy' through an approach that 'promotes the collection, interpretation, and integration of valid, important and applicable research-derived evidence that can support alcohol policy' (adapted from Sackett *et al.* 2000). In adopting an evidence-based approach, it is relevant to note the importance of doing this pragmatically and realistically. As Gray (Gray 2001) states, '*The absence of excellent evidence does not make evidence-based decision making impossible; what is required is the best evidence available, not the best evidence possible*'. A substantial body of rigorous data was used in preparing the report, although there are many areas where additional research is required (see Chapter 10 for research recommendations).

Where possible, the report has drawn on publications and data available directly from the European Commission as well as European Commission (co-)financed projects, as well as publications produced, supported or co-sponsored by the World Health Organization, see Table 1.1. The report has further given preferential treatment to publications of official bodies or governmental organizations from both within and without Europe. For example, it has drawn heavily on the publications of the National Institute on Alcohol Abuse and Alcoholism of the United States, and the Interim Analysis produced for the national strategy on alcohol in England and Wales.

Data The literature review has been supplemented with data obtained from many different sources (referred to in the chapters). Key data sources include the alcohol policy summaries and the alcohol profiles of the World Health Organization (World

⁵ <http://www.pubmedcentral.nih.gov/>.

⁶ <http://medline.cos.com/>.

⁷ <http://www.psycinfo.com/>.

Health Organization 2004a; World Health Organization 2004b). These profiles were checked and updated by members of the Alcohol Policy Network, a network co-financed by the European Commission.⁸ Additional data were obtained from Eurostat,⁹ with the support of the Public Health and Risk Assessment's Health Information Unit of the General Directorate of Health and Consumer Protection (SANCO).¹⁰ A hierarchy of data sources has been adopted, such that data from Eurostat has been given preference to data from the Health for All database of the European Region of the World Health Organization,¹¹ which has been given preference to data from the WHO Global Alcohol Database.

New work Some additional work was undertaken specifically for this project in estimating the social cost of alcohol to Europe (Baumberg & Anderson, submitted).

Limits of the report While randomised controlled trials are considered to be the 'gold standard' of evidence, they are often neither feasible nor possible for many public health interventions, and there is currently no agreed grading for levels of evidence that are specific and appropriate to this area. Similarly, both logistical and ethical barriers often prevent the use of randomised controlled trials to assess alcohol toxicity. Valid conclusions on the consequences of alcohol consumption can nevertheless be drawn from well designed and conducted observational studies.

In addition, the conclusions of the report can be limited in the extent to which they can make allowances for individual country and cultural variation (as discussed in Chapters 2 and 3), and this needs to be considered in implementing alcohol policy. Finally, the report is based on the best evidence available at the time of writing. Its conclusions may be subject to different interpretation as the body of research builds in various areas.

The report is also dependent on the available published literature, which is not always representative of all countries, cultures and population groups. Although the literature base is growing throughout Europe (Sanchez-Carbonell *et al.* 2005), it is still heavily dominated by North American, and northern and central European literature, although with a growing literature from southern Europe. Where caution in interpreting the literature base is warranted, we have exercised this throughout the report. It should be emphasized, however, that large parts of the report (and in particular, much of Chapters 3, 4, 6, and 9) are based on data from all of the European Union Member States.

⁸ <http://www.eurocare.org/btg/countryreports/index.html>.

⁹ http://epp.eurostat.cec.eu.int/portal/Portal?_pageid=1090,30070682,1090_33076576&_dad=portal&_schema=PORTAL.

¹⁰ http://ec.europa.eu/comm/health/ph_information/information_en.htm.

¹¹ <http://www.who.dk/hfadb>.

Table 1.1 Key primary source materials in drawing up report

Source Body	Materials ¹	Chapters supported
European Commission	Updated country profiles provided by the members of the Alcohol Policy Network (APN), co-financed by the European Commission (www.eurocare.org/btg)	4,6,9
	Eurostat NewCRONOS database	3,4,6,9
	Eurobarometer surveys	4
Commission-funded projects	European Comparative Alcohol Study (ECAS) reports (2001-2)	All
World Health Organization (WHO)	Comparative Risk Assessment Study, carried out within the Global Burden of Disease (GBD) project	4,6
	CHOosing Interventions that are Cost-Effective project (CHOICE)	7
	Global Status Report on Alcohol	4,6
	Global Status Report on Alcohol Policies	9
	WHO-EURO Health for All Database	4,6
	WHO-EURO Alcohol Control Database	9
	WHO Global Alcohol Database	4
International comparative surveys	European Schools Project on Alcohol and Other Drugs (ESPAD; part-financed by Council of Europe)	4
	Health Behaviour in School-aged Children (HBSC; WHO-EURO)	4
Food and Agriculture Organization	Statistical division (FAOSTAT) database	3
OECD	OECD Statistics Portal	6
United Kingdom Government	<i>Prime Minister's Strategy Unit</i> . Alcohol Harm Reduction project: Interim Analytical Report	6,7
United States Government	<i>National Institute of Alcohol and Alcohol Abuse (NIAAA)</i> : 10 th Special report to the US Congress on Alcohol and Health	5
	<i>National Institute on Alcohol Abuse and Alcoholism (NIAAA)</i> : Alcohol Research & Health [Journal]	5,7
Australian Government	<i>Ministerial Council on Drug Strategy</i> : The prevention of substance use, risk and harm in Australia	5,7
Scientific texts	Alcohol: No Ordinary Commodity (2003), and the two preceding volumes Alcohol Policy and the Public Good (1994) and Alcohol Control Policies in Public Health Perspective (1975) (Co-sponsored by WHO-EURO)	4,7
	International Handbook of Alcohol Problems and Dependence	All

¹ For references, see individual chapters.

A public health approach to alcohol policy

The frame of reference for this report is public health, defined as “*the science and art of preventing disease, prolonging life and promoting health through the organized efforts of society*” (International Epidemiological Association, (Last 2001, derived from Acheson 1988), or similarly “*the process of mobilizing local, state, national and international resources to ensure the conditions in which people can be healthy*” (Oxford Textbook of Public Health (Detels *et al.* 2002)). These definitions are consistent with the 1998 World Health Declaration (World Health Organization 1988) which states that “*the enjoyment of the highest attainable standard of health (defined as a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity), is one of the fundamental rights of every human being.*”

From the perspective of the individual, health promotion can be seen as “*the process of enabling people to increase control over, and to improve, their health*” through building healthy public policy, creating supportive environments, strengthening community actions, developing personal skills, and reorienting health services (Ottawa Charter for Health Promotion; World Health Organization 1986). Similarly, the UK government’s basis for public health policy is that “*People need to be supported more actively to make better decisions about their own health and welfare because there are widespread, systematic failures that influence the decisions individuals currently make. These failures include a lack of full information, the difficulty individuals have in considering fully the wider social costs of particular behaviours, engrained social attitudes not conducive to individuals pursuing healthy lifestyles, and addictions. These failures can be tackled not only by individuals but by wide ranging action by health and care services, government – national and local, media, businesses, society at large, families and the voluntary and community sector. The main levers for Government Action include taxes, subsidies, service provision, regulation and information*” (Wanless 2004).

What do we mean by alcohol policy?

The third in the series of WHO co-sponsored publications on alcohol policy set out what is meant by alcohol policy (Babor *et al.* 2003). The authors noted that “*the first book in the series defined alcohol control policies as all relevant strategies employed by governments to influence alcohol availability, leaving health education, attitude change and informal social control as beyond the scope of a public health approach*” (Bruun *et al.* 1975), whereas the second book in the series “*provided a broader view of alcohol policy, considering it as a public health response dictated in part by national and historical concerns. Though there was not an explicit definition of the nature of alcohol policy, its meaning could be inferred from the wealth of policy responses that were considered: alcohol taxation, legislative controls on alcohol availability, age restrictions on alcohol purchasing, media information campaigns and school-based education, to name a few*” (Edwards *et al.* 1994). The third book expanded the concept in keeping with evolving views of public health both nationally and internationally. The authors described public policies as “*authoritative decisions that are made by governments through laws, rules and regulations* (Longest 1998). The word authoritative indicates that the decisions come from the legitimate purview of legislators and other public interest group officials, not from private industry or related advocacy groups”. Thus, they noted that “*when public policies pertain to the relation between alcohol, health, and social welfare, they are considered alcohol policies. Thus, drinking-driving laws designed to prevent alcohol-related accidents,*

rather than those merely intended to punish offenders, are considered alcohol policies.”

In the context of public health policy (above), this means that the central purpose of alcohol policies here *“is to serve the interests of public health and social well-being through their impact on health and social determinants, such as drinking patterns, the drinking environment, and the health services available to treat problem drinkers”* (Babor et al. 2003).

What do we mean by Europe?

Europe can mean different things to different people. In this report Europe means the 25 countries of the European Union (EU25), Figure 1.2. We sometimes break this down into the **EU15** (Austria, Belgium, Denmark, France, Finland, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom) and the **EU10**, the ten Member States which joined the Union in 2004 (Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia), simply to explain the differences (which can be quite substantial in the evolving Europe).

We also refer to three of the four candidate countries (Bulgaria, Romania and Turkey) (the fourth being Croatia) as well as three (Iceland, Norway and Switzerland) of the countries of the European Free Trade Association (EFTA)¹² (the other country being Liechtenstein). Norway and Iceland (along with Liechtenstein) are also members of the European Economic Area (EEA),¹³ allowing them to participate in the European Union’s (EU) Internal Market, while not assuming the full responsibilities of EU membership. The European Union is different from the European Region of the World Health Organization, which comprises 52 Member States.¹⁴

Throughout the report, we often describe the countries in various groupings, some more definitive than others. Three of these stem from the European Comparative Alcohol Study (ECAS) that divided the EU15 (plus Norway) into three groups:¹⁵

Central This refers to countries between north and south rather than between east and west, i.e. Austria, Belgium, Denmark, Germany, Ireland, the Netherlands and the UK. Unlike ECAS, ‘central Europe’ in this report also refers to Luxembourg and Switzerland (which were not included within the ECAS project).

Northern This refers to Finland, Norway, Sweden, and Iceland, i.e. all countries north of the Baltic Sea. This, therefore, does not include Denmark, which is classified here as a central European country (see also the term ‘Nordic countries’ below).

Southern This refers to France, Greece, Italy, Portugal, and Spain. Sometimes these are also described as the ‘**Mediterranean**’ countries. If this is used in contrast

¹² <http://www.efta.int/>.

¹³ http://ec.europa.eu/comm/external_relations/eea/.

¹⁴ <http://www.euro.who.int/AboutWHO/About/MH>.

¹⁵ Within the original ECAS project these were defined as ‘high-consuming, ‘medium-consuming’ and ‘low-consuming’ countries, but – as discussed in chapter 4 – these categorizations are becoming more problematic and hence the grouping has been re-titled.

to 'eastern Europe' then it will also include Cyprus and Malta (while this will not be true when opposed to 'the EU10').

Throughout the report these groupings are adapted to particular questions, and will often explicitly include or exclude nearby countries outside of these definitions (e.g. "central Europe, including the Czech Republic").

Three additional terms have also been used in the report:

Baltic This refers to Estonia, Latvia, and Lithuania. Some results refer to the 'Baltic region', which includes other countries bordering the Baltic (usually only Finland).

Eastern This is generally shorthand referring to the EU10 countries plus Bulgaria and Romania but minus Cyprus and Malta.

Nordic This refers to Denmark plus the northern European countries (Finland, Iceland, Norway, and Sweden).



Figure 1.2 Countries of the European Union (in yellow) as of 2005 (using country names in the original language, as provided by the European Commission). Source: http://ec.europa.eu/abc/maps/index_en.htm.

Some notes on terminology¹⁶

There are many different terms used when talking about alcohol, many lacking definition, some confusing, and some even pejorative. The World Health Organization (as the specialized United Nations agency on health matters) provides a standardized nomenclature through its ICD-10 classification of mental and behavioural disorders (World Health Organization 1992b) and its lexicon of alcohol and drug terms.¹⁷ We have adopted these terms throughout the report, including:

Alcohol Clearly, the report concerns *ethyl alcohol*, also known as *ethanol*, the type of alcohol found in drinks intended for human consumption.

Levels and categories of drinking Wherever possible, the report defines levels of drinking precisely, using grammes of alcohol, where, due to its specific gravity, one ml of alcohol contains 0.785g of alcohol. Where descriptive terms such as 'light' or 'heavy', are used, some quantitative descriptors are included where possible. The report has avoided the use of the term '*standard drink*', because these differ from country to country and change over time; they also vary considerably, depending on the amount of drink poured or served. It is nevertheless helpful to have some understanding of how much alcohol is in a drink:

- one pint (UK) of beer of average strength (around 5% alcohol concentration) contains about 23g of alcohol;
- assuming a 750ml bottle of wine serves six glasses of wine, then a glass of wine at 13% alcohol concentration contains about 13g of alcohol;
- a 50ml serving of vodka containing 40% alcohol concentration contains 16g of alcohol.

When describing the results of the epidemiological data, we have sometimes used **categories of drinking**, the preferred descriptive grouping of the World Health Organization (e.g., see Rehm *et al.* 2004).

Category	Definition (g alcohol/day)	
	<i>Men</i>	<i>Women</i>
Abstinent	0	0
Level I	>0-40g	>0-20g
Level II	>40-60g	>20-40g
Level III	>60g	>40g

Hazardous alcohol consumption Hazardous alcohol consumption has been defined as a level of consumption or pattern of drinking that is likely to result in harm

¹⁶ We have also provided a glossary of terms at the end of the report, derived from glossaries provided by the World Health Organization, the European Commission and the International Epidemiological Association.

¹⁷ http://www.who.int/substance_abuse/terminology/who_lexicon/en/.

should present drinking habits persist (Babor *et al.* 1994). There is no standardized agreement for the level of alcohol consumption that should be taken for hazardous drinking, and, as shown for many conditions in Chapter 5, any level of alcohol consumption can carry risk.

Harmful drinking Harmful drinking is defined as ‘a pattern of drinking that causes damage to health, either physical (such as liver cirrhosis) or mental (such as depression secondary to alcohol consumption)’ (World Health Organization 1992b).

Intoxication is a condition that follows the use of alcohol resulting in disturbances in level of consciousness, cognition, perception, affect or behaviour, or other psycho-physiological functions and responses (World Health Organization 1992b). The disturbances are directly related to the acute pharmacological effects of alcohol and are mostly dose-related, involving multiple body functions. Intoxication can lead to unintentional injuries and acute social consequences such as violence and crime, and can also lead to long term social consequences – for example when an intoxicated person causes an intentional injury to another person, leading to a prison sentence. Intoxication’s equivalent in everyday speech is ‘**drunkenness**’, which is manifested by such signs as facial flushing, slurred speech, unsteady gait, euphoria, increased activity, volubility, disorderly conduct, slowed reactions, impaired judgement and motor incoordination, insensibility, or stupefaction.

Episodic heavy drinking A drinking occasion that includes consumption of at least 60g of alcohol can be defined as episodic heavy drinking (World Health Organization 2004a), although other definitions (such as 5 or more ‘standard drinks’) have also been used (see Chapter 4). In common terms this is frequently called ‘**binge drinking**’,¹⁸ which is the term we have used in Chapter 4, when describing alcohol use and drinking patterns in Europe. In Chapter 5, we have used the term episodic heavy drinking, since this is now becoming a common term when describing the relationship between patterns of alcohol use and harm in epidemiological studies based on individuals.

Alcohol dependence The World Health Organization’s International Classification of Mental and Behavioural Disorders (1992b) (ICD-10) defines alcohol dependence as a cluster of physiological, behavioural, and cognitive phenomena in which the use of alcohol takes on a much higher priority for a given individual than other behaviours that once had greater value. A central characteristic is the desire (often strong, sometimes perceived as overpowering) to drink alcohol. Return to drinking after a period of abstinence is often associated with rapid reappearance of the features of the syndrome.

Ill-defined terms not recommended for use As the World Health Organization’s lexicon of alcohol and drug terms notes, there are a number of ill-defined terms that the report does not use, including:

- **moderate drinking** The report has avoided the use of the word ‘moderate’, since it is an inexact term for a pattern of drinking that is by implication contrasted with heavy drinking. Although it commonly denotes drinking that

¹⁸ Binge drinking is defined by the WHO as “A pattern of heavy drinking that occurs in an extended period set aside for the purpose. In population surveys, the period is usually defined as more than one day of drinking at a time. The terms “bout drinking” and “spree drinking” are also used for the activity, and “drinking bout” for the occasion. A binge drinker or bout drinker is one who drinks predominantly in this fashion, often with intervening periods of abstinence”. See http://www.who.int/substance_abuse/terminology/who_lexicon/en/.

does not cause problems (and thus is not drinking to 'excess'), it is difficult to define. A better description might be *lower-risk drinking*.

- **sensible drinking, responsible drinking and social drinking**, all of which are impossible to define and depend on social, cultural and ethical values which can differ widely from country to country, from culture to culture, and from time to time.
- **excessive drinking** is currently a non-preferred term for a pattern of drinking considered to exceed some standard of light drinking. *Hazardous use* is the preferred term in current use.
- **alcoholism** is a term of long-standing use and variable meaning, generally taken to refer to chronic continual drinking or periodic consumption of alcohol which is characterized by impaired control over drinking, frequent episodes of intoxication, and preoccupation with alcohol and the use of alcohol despite adverse consequences. The inexactness of the term led a WHO Expert Committee to disfavour it, preferring the narrower formulation of alcohol dependence syndrome as one among a wide range of alcohol-related problems (Edwards and Gross 1976; World Health Organization 1980), and it is not included as a diagnostic entity in ICD-10. The preferred term is *alcohol dependence*.
- **alcohol abuse** a term in wide use but of varying meaning. Although it is used in the DSM (Diagnostic and Statistical Manual of Mental Disorders) classification (American Psychiatric Association 1994), it should be regarded as a residual category, with dependence taking precedence when applicable. The term is sometimes used disapprovingly to refer to any use at all, particularly of illicit drugs. Because of its ambiguity, the term is not used in the ICD-10 classification. *Harmful use* and *hazardous use* are the equivalent terms;
- **alcohol misuse** is a term that describes the use of alcohol for a purpose not consistent with legal or medical guidelines, as in the non-medical use of prescription medications. Although misuse is preferred by some to abuse in the belief that it is less judgmental, it is also ambiguous. *Hazardous use* is the equivalent term.

The terms "misuse" and "abuse" are sometimes used to convey the idea that alcohol problems represent a marginal phenomenon, or that there is a straightforward dichotomy between "use" and "misuse". However, as will be apparent from the data presented throughout this report, the harm done by alcohol is not a marginal phenomenon, and the risk curves describing the relationship between alcohol use and harm do not find simple dichotomies between misuse and risk-free use (see also McNeill 2004). Thus, this report refers to "the harm done by alcohol use" rather than "misuse" or "abuse" (see World Health Organization 1992a).

The review process

The Public Health reports of the European Commission¹⁹ (in which the present report is framed) are not normally subject to a review process. However, we have subjected the report to an extensive review process. During the preparation of the report, drafts have been reviewed by the scientific advisers of the Institute of Alcohol Studies, and by three external reviewers. The report was also reviewed by four external reviewers chosen by the European Commission. (See acknowledgements for the names of the reviewers).

In addition, during the preparation of the document, five hearings were convened: with stakeholders (that includes the beverage alcohol and related industries), 20 January 2005,²⁰ 30 August 2005,²¹ and 26 September 2005;²² with members of the Commission's Alcohol and Health Working Group, 8 March 2005;²³ and with non-governmental organizations, 19 May 2005.²⁴

Database of country profiles

As part of the background to the report, a database of country profiles on alcohol and alcohol policy was prepared, with ongoing development.²⁵ The database comprises four elements: the alcohol profiles of the World Health Organization (2004a), checked and updated; the alcohol policy summaries of the World Health Organization (2004b), checked and updated; a revision (or preparation where not previously available) of the country reports of the ECAS project (Österberg and Karlsson 2002); and a list of infrastructures available for alcohol policy,²⁶ all of these undertaken by members of the Alcohol Policy Network of the Bridging the Gap project.²⁷ A key finding of this activity is that it is never easy to reach complete agreement at the country level on the data used, a problem complicated by the differing jurisdictional responsibilities (for example regions and municipalities) within countries. At the time of publication, there still remained differences between the data used by the World Health Organization, and that available within countries which could not be resolved.²⁸

¹⁹ http://ec.europa.eu/comm/health/ph_information/reporting/full_listing_reporting_en.htm.

²⁰ http://ec.europa.eu/comm/health/ph_determinants/life_style/alcohol/ev_20050120_en.htm.

²¹ http://ec.europa.eu/comm/health/ph_information/dissemination/ev_20050830_en.htm.

²² http://ec.europa.eu/comm/health/ph_determinants/life_style/alcohol/ev_20050926_en.htm.

²³ http://ec.europa.eu/comm/health/ph_determinants/life_style/alcohol/ev_20050307_en.htm

²⁴ <http://www.eurocare.org/btg/apn/minutes0505.html>.

²⁵ <http://www.eurocare.org/btg/countryreports/index.html>.

²⁶ <http://www.hp-source.net/dataoutput.html?module=btg>.

²⁷ <http://www.eurocare.org/btg>.

²⁸ For example, at the time of printing, the Estonian Institute of Economic Research provided data on recorded and unrecorded consumption, adjusted for tourism purchases, which differed from the Estonian data used in Figure 4.2 and for this report.

Stakeholders' views of alcohol policy

At the same time as the preparation of the report, a questionnaire survey was completed by stakeholders (country counterparts of the European Commission's Alcohol and Health Working Group (mostly government officials), country and European non-governmental organizations that have a remit on alcohol policy, and representative bodies of the beverage alcohol industry, who are stakeholders of the European Commission's Alcohol and Health Working group) (Anderson and Baumberg 2005). The questionnaire ascertained views of the impact and importance of a range of alcohol policy measures, implementation estimates of the WHO European Alcohol Action Plan (2000-2005) and of the 2001 Council Recommendation on the drinking of alcohol by young people, and perceived advances and barriers for alcohol policy at the country and European levels.

Representatives of the alcohol industry (AIs) tended to hold different views from representatives of governmental (GOs) and non-governmental organizations (NGOs), who were more similar in their views. The AIs viewed regulatory measures (such as tax and price measures, and restrictions on the availability and advertising of alcoholic beverages) as of low impact and policy importance, Table 1.2, whereas they were more favourable to educational measures. All three groups were similar and positive in their views of the impact and importance of implementation measures and of interventions for hazardous and harmful alcohol consumption.

In general, AIs were more positive in their views of successful implementation of both the WHO European Alcohol Action Plan and the Council Recommendation on the drinking of alcohol by young people (mean score 6.1 and 5.9 respectively on an 11 point scale from 0 (not at all) to 10 (fully)) than GOs (mean score 5.0 and 4.6 respectively) who were more favourable than NGOs (mean score 3.7 and 3.3 respectively), but this was largely due to the AIs giving very high implementation scores for items that were their responsibility.

Table 1.2 Results for three factors (mean (standard error of the mean)) for views of the policy impact and of the policy importance in reducing the harm done by alcohol on a scale ranging from 0 (no impact or not important at all) to 10 (very high impact and very important). *Main values refer to the mean; values in brackets show the standard error of the mean.*

	Policy impact				Policy importance			
	NGO ¹	GO ²	AI ³	Anova ⁴	NGO ¹	GO ²	AI ³	Anova ⁴
Factor 1 (regulations)	7.4 (0.31)	7.3 (0.30)	1.4 (0.31)	0.000	8.2 (0.93)	8.2 (0.72)	1.6 (1.0)	0.000
Factor 2 (education)	4.8 (0.31)	6.0 (0.48)	8.7 (0.23)	0.000	6.3 (0.28)	6.7 (0.46)	8.7 (0.23)	0.000
Factor 3 (implementation and interventions)	8.3 (0.28)	8.3 (0.21)	9.5 (0.21)	0.000	9.1 (0.18)	8.8 (0.18)	9.5 (0.20)	0.072

¹Non-governmental organization

²Governmental organization

³Alcohol industry

⁴Anova, p value.

The structure of the report

Chapter 2 of the report will provide a very brief history of alcohol in Europe, describing the long history (several thousands of years) of the use of alcohol in everyday life, the changes that occurred in mediæval Europe and during the industrial revolution, the rise of mass movements beginning particularly in the 19th century, and finishing with a discussion of the rise of the concept of addiction and the modern public health movement.

Chapter 3 will describe the economic impact of alcohol. It will describe the global and European production and trade in alcohol. It will briefly describe smuggling and lost taxes from alcohol due to cross border trade. It will summarize how much Europeans spend on alcohol and outline the relationship between alcohol consumption and both government revenue from alcohol taxes, and employment in the alcohol sector from production to retailing. It will provide estimates of the tangible and intangible costs of alcohol to European society and note opportunities and limitations of using such data as an aid to policy making.

Chapter 4 will describe the use of alcohol in Europe and how this has changed over time. It will describe population levels of drinking based on both recorded and unrecorded consumption, and will provide estimates of the numbers of abstainers, and the number of people with hazardous and harmful alcohol consumption and with alcohol dependence. It will describe ways and patterns of drinking, including drinks of choice, drinking context (for example drinking with meals and public drinking). It will provide estimates of drinking frequency, and intoxication and binge drinking, and describe different drinking patterns across Europe. It will discuss how drinking varies by gender and socio-economic grouping and will describe in detail the patterns, changes, and determinants of young people's drinking. Finally, it will stand back from the detail and consider the broad cultural and social influences on European drinking.

Chapter 5 will describe the impact of alcohol on individuals. It will begin with some general observations on the measurement of alcohol consumption, patterns of drinking and issues of causality and attribution. It will then describe alcohol's impact on social well-being, both positive and negative, and, in particular, consider alcohol's role in violence and crime. It will then discuss alcohol's role as a cause or contributor (both positive and negative) to a wide range of conditions, grouped under the headings of intentional and unintentional injuries, neuropsychiatric conditions, gastrointestinal conditions, endocrine and metabolic conditions, cancers, cardiovascular conditions, the immune system, lung diseases, post-operative complications, skeletal conditions, and reproductive and pre-natal conditions. It will discuss in some length the robustness of the data and some concerns about alcohol's role in reducing the risk of coronary heart disease. It will summarize the overall risk to individuals, discuss some of the determinants of risk, and conclude by describing the evidence of the relationship between reductions in harmful alcohol consumption and risk of harm.

Chapter 6 will describe alcohol's impact on European health, summarizing the numbers of people affected by different alcohol-related conditions. Referring back to the impact of alcohol on the individual discussed in Chapter 5, and the costs of alcohol presented in Chapter 3, it will describe alcohol's role in social harms at the European level, including social nuisances, crime and violence, and harm to the family and at work. It will then consider health harms, with overall estimates of the

numbers of deaths caused and delayed at the European level, and the overall contribution of alcohol to disability and premature death in the Union. It will outline some of the difficulties and cautions in these estimates, in particular, the possible overestimates of the numbers of deaths delayed. It will continue by providing estimates of the numbers of Europeans affected by the different disease headings presented in Chapter 5. It will describe the overall harms to young people, harms to people other than the drinker, and the socio-economic differences due to alcohol between and within countries. It will finish with an extensive discussion of how alcohol-related harms change when population levels of alcohol consumption change.

Chapter 7 will describe at some length what works in alcohol policy (and what does not work). Detailed evidence will be provided for the following policy options, (i) policies that reduce drinking and driving; (ii) policies that support education, communication, training and public awareness; (iii) policies that regulate the alcohol market (price and tax, availability and commercial communications); (iv) policies that support the reduction of harm in drinking and surrounding environments; and (v) policies that support advice and treatment for individuals.

Chapter 8 will describe how global and European factors impinge on alcohol policy. It will begin with a discussion of why trade law is relevant for alcohol policy, discussing both the General Agreement on Tariffs and Trade (GATT) and the General Agreement on Trade in Services (GATS). It will continue with a discussion of trade law in the European internal market and how this can affect Member State alcohol policy, in the areas of tax, monopolies and advertising, noting both positive and negative effects. It will discuss alcohol as an economic commodity and how this is influenced in more detail by European policy on taxes, labelling and packaging, other internal market legislation, and the Common Agricultural Policy. Finally it will describe the role of the World Health Organization and the European Commission in influencing alcohol policy.

Chapter 9 will summarize existing alcohol policy within the Member States, under the headings of drinking and driving, workplace, market restrictions, controlling sales to young people, and tax and price. It will compare European countries in relation to the rest of the world and over time.

Chapter 10, taking stock of all of the material presented so far, will bring the report together in some brief conclusions and recommendations as to what further could be done to improve the health of European citizens and of the European Union as a whole.

REFERENCES

Acheson, D. (1988). Public Health in England. The report of the Committee of Inquiry into the future development of the public health function. Cmnd 289. London: HMSO.

American Psychiatric Association (1994) Diagnostic and Statistical Manual of mental Disorders. 4th edn. Washington DC: American Psychiatric Association

Anderson, P. (1996) Alcohol - less is better. Report of the WHO European Conference, Health, society and alcohol, Paris 12-14 December 1995. WHO Regional Publications, European Series, No 70. Copenhagen, WHO Regional Office for Europe.

Anderson, P. & Baumberg, B. (2005) Stakeholders' views of alcohol policy. London: Institute of Alcohol Studies

Babor TF, Caetano R, Casswell S, Edwards G, Giesbrecht N, Graham K, Grube JW, Gruenewald PJ, Hill L, Holder HD, Homel R, Österberg E, Rehm J, Room R & Rossow I (2003). *Alcohol: No Ordinary Commodity. Research and Public Policy*. Oxford, Oxford Medical Publication, Oxford University Press.

Babor, T., Campbell, R., Room, R. & Saunders, J., (1994) *Lexicon of Alcohol and Drug Terms*, World Health Organization, Geneva.

Baumberg, B. & Anderson P. (2005). The social cost of alcohol to Europe. Submitted for publication.

Bruun, K., Edwards, G., Lumio, M., Mäkelä, K., Pan, L., Popham, R.E., Room, R., Schmidt, W., Skog, O-J., Sulkunen, P. & Österberg, E. (1975) *Alcohol Control Policies in Public Health Perspective*. Helsinki: Finnish Foundation for Alcohol Studies.

Department of Health (2004). *Choosing Health. Making healthy choices easier*. London: HMSO.

Detels, R., McEwen, J., Beaglehole, R. & Tanaka, H. Eds. (2002). *Oxford Textbook of Public Health*. Oxford: Oxford University Press.

Edwards G, Anderson P, Babor TF, Casswell S, Ferrence R, Giesbrecht N, Godfrey C, Holder HD, Lemmens PH, Mäkelä K, Midanik LT, Norström T, Österberg E, Romelsjö A, Room R, Simpura J & Skog O-J (1994). *Alcohol Policy and the Public Good*. New York, Oxford University Press.

Edwards, G. & Gross, M.M. (1976) Alcohol dependence: provisional description of a clinical syndrome. *British Medical Journal* 1, 1058-1061.

Gray, J.A.M. (2001). *Evidence-based Health Care*. London: Churchill Livingstone.

Heather, N., Peters, T.J. & Stockwell, T. (2001) (Eds.), *International Handbook of Alcohol Problems and Dependence*. West Sussex, U.K: John Wiley & Sons, Ltd.

Last, J. (2001). *A dictionary of epidemiology*. (Fourth edition ed.) Oxford: Oxford University Press.

Longest B.B. (1998) *Health policymaking in the United States*. Chicago, IL: Health Administration Press.

Loxley, W., Toumbourou, J.W., Stockwell, T., Haines, B., Scott, K., Godfrey, C., Waters, E., Patton, G., Fordham, R., Gray, D., Marshall, J., Ryder, D., Siggers, S., Sanci, L & Williams, J. (2004). *The prevention of substance use, risk and harm in Australia*. Canberra: National Drug Research Institute and Centre for Adolescent Health.

McNeill, A. (2004). *Alcohol Harm Reduction Strategy for England*. Response by the Institute of Alcohol Studies. http://www.ias.org.uk/iaspapers/ahrs_july04.pdf.

Norström, T. (2001) Ed. *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries*, Stockholm: National Institute of Public Health, European Commission.

Österberg, E. and Karlsson, T. 2002. *Alcohol Policies in EU Member States and Norway: a Collection of Country Reports*. Helsinki: STAKES.

Rehm J, Room R, Monteiro M, Gmel G, Graham K, Rehn T, Sempos CT, Frick U, Jernigan D. (2004). Alcohol. In: WHO (ed), *Comparative quantification of health risks: Global and regional burden of disease due to selected major risk factors*. Geneva: WHO.

Sanchez-Carbonell, X., Guardiola, E., Belles, A. & Beranuy, M. (2005). European Union scientific production on alcohol and drug misuse (1976-2000). *Addiction* 100 1166-1174.

Wanless, D (2004). *Securing Good Health for the Whole Population*. London: HMSO.

World Health Organization (1980) Problems related to alcohol consumption. Report of a WHO Expert Committee. Geneva. World Health Organization, 1980 (WHO Technical Report Series, No.650).

World Health Organization (1986). Ottawa Charter for Health promotion. Geneva, World Health Organization.

World Health Organization (1992a). European Alcohol Action Plan 1992-1999. Copenhagen: World Health Organization Regional Office for Europe.

World Health Organization (1992b) The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines. Geneva: World Health Organization.

World Health Organization (1995). European Charter on Alcohol. Copenhagen: World Health Organization Regional Office for Europe.

World Health Organization (1998). Health 21 – health for all in the 21st century. Copenhagen: World Health Organization Regional Office for Europe.

World Health Organization (2000). European Alcohol Action Plan 2000-2005. Copenhagen: World Health Organization Regional Office for Europe.

World Health Organization (2001). Stockholm Declaration on Alcohol and Young people Copenhagen: World Health Organization Regional Office for Europe.

World Health Organization (2002). The World Health Report 2002 - Reducing Risks, Promoting Healthy Life. Geneva, World Health Organization.

World Health Organization (2004a). Global Status Report on Alcohol 2004. Geneva, World Health Organization.

World Health Organization (2004b). Global Status Report on Alcohol Policy. Geneva, World Health Organization.

World Health Organization (2005a) Alcohol policy in the WHO European Region: current status and the way forward. Copenhagen, World Health Organization Regional Office for Europe.

World Health Organization (2005b). Framework for Alcohol Policy in the European Region. Copenhagen: World Health Organization Regional Office for Europe.

Chapter 2: A brief history of alcohol in Europe

Alcohol has been produced and drunk in Europe for thousands of years, usually made out of whatever materials were locally available. Fermented alcoholic drinks and (from the thirteenth century) spirits were often also used as a medicine, a practice that continued until the early twentieth century and the advent of modern medicine. Alcoholic drinks were commonly preferred as they were less likely to be damaging to health than (impure) water, and drunkenness was also common, although repeated drunkenness was sometimes condemned. Laws on alcohol did exist, but normally for reasons of public order or to regulate the market rather than for public health. However, this picture changed with a series of developments in mediæval and early modern Europe, including industrialization, improved communications links, and the discovery of stronger, distilled beverages. European elites were faced with a situation of urban squalor that included unprecedented public drunkenness in lower classes – and both they and (in some countries) emerging workers' movements attributed much of this to alcohol.

Large 'temperance' movements, therefore, spread across much of Europe in the nineteenth and early twentieth centuries, driven by concerns over spirits before often moving on to an opposition to all alcoholic drinks. In some cases this led to a complete ban on alcohol in a country or area, although elsewhere less drastic systems of alcohol control were adopted. In most, but not all, countries the temperance movement has since faded, to a position of little significance by the end of the twentieth century. The idea of 'alcoholism' as a disease also grew during the nineteenth century, with many European countries developing homes or asylums to treat 'alcoholics'. Although temporarily out of fashion at the height of the temperance period, the 'addiction concept' fitted the ideological climate of the mid-twentieth century and became popular once again. Yet in recent years, the 'new public health movement' has become the dominant paradigm for discussing alcohol-related problems, allowing a broader discussion than a focus on a small subset of 'alcoholics'.

Today's Europe includes a wide range of uses and meanings of alcohol, ranging from an accompaniment to family meals to a major part of rites of passage. Alcoholic drinks are full of meaning, with drinking behaviour able to communicate the formality of an event or the division between work and leisure. Drunkenness is equally symbolic, with 'drunken comportment' – how people act under the influence of alcohol – varying across Europe. Meanings and practices vary within as well as between countries, sometimes linked to the identities of different groups. This can occur through many alcohol-related channels, from the association of a particular drink with regional or national identity, to the meaningful non-use of alcohol in many European Muslim communities.

ALCOHOL IN EVERYDAY LIFE

The deliberate creation of drinkable alcohol is thought to date back roughly ten thousand years, and most of the ancient world was very familiar with alcoholic drinks (Austin 1985; Sournia 1990). Beer without hops and drinks made from honey ('mead') are likely to have been the first alcoholic beverages, but other drinks were quickly discovered and produced from whatever was locally available. Wine cultivation came later but still dates back at least 5000-6000 years (Burnett 1999), although wine was still a relatively scarce commodity in Ancient Greece and the early Roman Empire. Viticulture only became widespread in Italy from the 2nd century BC, but wine-making then spread quickly through the Roman conquests (Jellinek 1976).

The Roman Empire was also linked to the spread of Christianity in Europe, and given the crucial role of wine in Christian mass this may well have helped the spread of wine production. Several positive references to wine are contained in the bible, while many monasteries have produced alcoholic drinks, although the clergy have also issued condemnations of drunkenness which was seen as a form of gluttony (see e.g., Edwards 2000). Ambivalences can also be seen in European Judaism – the Torah discusses alcohol as a gift from God, and wine forms a part of most Jewish festivals include Shabbat (the Sabbath). However, the Torah also describes how alcohol can lead to violence and a loss of consciousness, and intoxication is generally stigmatized in the Jewish community (Sournia 1990).

Seemingly from the time of the very first alcoholic drinks, claims have been made that they can treat a huge array of illnesses. Cato the Elder (234-149BC), for example, defended the medicinal value of wine in moderation for treating snake bites (Sournia 1990), while even in the eighteenth-century English doctors were advocating the use of wine to treat gout and venereal infections (Porter 1985). Although known in Europe in the thirteenth century, distilled beverages – commonly called *aqua vitae*, the “water of life” – were almost solely used as medicines for several hundred years (Austin 1985). Even less than a hundred years ago, the Norwegian spirits prohibition was partly lifted to enable households to buy half a bottle of spirits as treatment against Spanish influenza (Hauge 1978). Ultimately it took increasing medical knowledge of the harmful effects of alcohol (Knapp 1998) and in particular the advent of effective modern medicines for alcohol to be removed from the doctor’s cabinet (Sournia 1990; Edwards 2000).

From antiquity to the early nineteenth century, water was often seen as unfit for human consumption, and there were benefits to be had from drinking beer given the purification methods unknowingly used in the brewing process (as well as from the calorific intake; Vallee 1993; Burnett 1999). ‘Weak beer’ and other weak drinks, therefore, seem to have been common even before the industrial revolution, although in some cases they were barely alcoholic (Wilson and Gourvish 1993:4). Drunkenness was generally accepted as part of human life but repeated drunkenness was sometimes seen negatively, and there are many cases of a ‘generalized disapproval’ of breaking legal or moral codes (Thom 2001). In some cases this disapproval has been heightened by the perception that alcohol could fuel challenges to the social order, leading to a long history of access to alcohol reflecting external power structures (Tannahill 1988). Slaves, for example, have nearly always been forced to be abstinent (Sournia 1990), while women’s drinking was disapproved of in, for example, Ancient Greece – in contrast to women’s close involvement in the production and sale of alcohol prior to the industrial revolution (Plant 1997).

It is, therefore, unsurprising that the first legal considerations of alcohol dealt with either public order or issues relating to the production of alcoholic drinks, such as forbidding their adulteration (the earliest globally being 4,000 years ago (Hammurabi (translated by King) 2000)). Other laws were motivated by the particular concerns of the specific time and place (such as grain shortages), but these again rarely included public health. Sometimes public drinking places were associated with public order disturbances and unrest, and English justices of the peace could suppress alehouses in the fifteenth century (Thom 2001). In the mid-nineteenth century in France they were even associated with rebellion, leading to attempts by Louis Napoleon to suppress French drinking establishments in 1848 (Barrows and Room 1991; Haine 2003). Rulers often also tried to gain economically from the production and distribution of alcohol, with alcohol duties forming a large part of government income in the early modern period before the introduction of income taxes (Moskalewicz and

Zielinski 1995; see also Chapter 3). Despite these concerns, alternate uses and power structures, all levels of society seem to have got drunk on certain occasions, with, if anything, the higher classes having had the greater access to alcohol (Porter 1985).

DRINKING THROUGH THE INDUSTRIAL REVOLUTION

Although a trade in alcohol had existed since Roman times, this was hampered by both the scale of production and the difficulties in getting perishable, bulky products across long distances. This all changed in Europe from the late middle ages, with stronger, less-perishable spirits and fortified wines becoming widely available by the end of the sixteenth century (Sournia 1990; Vallee 1993). Accompanying these stronger drinks were wider changes in the world around alcohol, including urbanization, improved transportation links and the wider consequences of the industrial revolution, itself encompassing a number of moves that evolved at different speeds and in different ways across Europe. These created previously unthinkable markets for commercial producers, with family businesses ever-more replaced by large breweries and distilleries, who were able to take advantage of later scientific advances to further improve the scale of production (Wilson and Gourvish 1993; Anderson 2003; Room 2006).

These developments meant that from an early stage of the industrial revolution, alcohol was more available, stronger and cheaper than ever before. Unsurprisingly, this led to sharp increases in the consumption of alcohol across Europe (Knapp 1998) – and in particular, in the consumption of the urban working classes. Drunkenness, therefore, became progressively more common, more public and more associated with poverty (Porter 1985; Barrows and Room 1991). The most commonly cited example of this can be found in the ‘gin mania’ in England from the late seventeenth to mid-eighteenth centuries, following abundant grain harvests and political moves to increase spirits production to undercut the burgeoning trade in imported French products. The number of gin shops exploded – one estimate suggests that one in four houses in the Westminster and City areas of London were dram-shops (Burnett 1999) – and the visible problems prompted a series of legislation in the first half of the eighteenth century (Warner 2002).

Other explosions of drunkenness can be seen elsewhere in Europe during the eighteenth and nineteenth centuries, sometimes similarly prompted by liberalising policy measures. For example, the 1816 Spirits Act in Norway allowing home distillation was followed by an estimated fivefold increase in spirits consumption, eventually drawing a response in more restrictive Acts in the 1840s (Hauge 1978). Concerns in France in the late nineteenth century, however, were triggered by non-government forces, primarily the phylloxera virus that devastated French vines and led to a growing taste for spirits. When the new grafted hybrid vines eventually produced new wine crops, the French added the spirits to their original wine consumption (Brennan 2003), resulting in substantially increased consumption and growing public concern (Barrows and Room 1991; Preswich 2003). Despite this, the changes of the early modern period were much less dramatic in parts of Europe where industrialization was slower or shallower, including many of the wine-producing regions (wine being relatively harder to mass produce than beer or spirits).

MASS MOVEMENTS AND ALCOHOL

The period of change from the late eighteenth and especially nineteenth centuries saw the rise of a 'temperance movement' across much of Europe, looking to respond to the increasingly visible problems from alcohol. The movement was not initially for prohibition but instead focused on members drinking in moderation in their own lives (as the word 'temperate' suggests), motivated by an opposition to the "evils of spirits". In several countries it became a broad working-class movement (Barrows and Room 1991), being both relevant to everyday concerns (Tyrell 1991) and providing an opportunity to participate in public life (Thom 2001). The temperance message, nevertheless, spread unevenly in Europe, tending to be stronger in Protestant countries than Catholic ones and amongst Protestants than Catholics (Barrows and Room 1991; Levine 1993) – although there were exceptions, such as the Catholic temperance movements in Ireland and Poland (Bretherton 1991; Swiatkiewicz and Moskalewicz 2003).

The movement was generally largest in English-speaking and Nordic countries, but there were also significant groups in some central and eastern European countries, with peak membership of 100,000 or more in Denmark, France, and Poland (Swiatkiewicz and Moskalewicz 2003; Preswich 2003; Eriksen 2003). There were, however, some countries where temperance was never adopted outside of small, usually religious elites, and these tended to be in southern Europe (e.g. Spain, Italy). The temperance movement also had some impact internationally, due to concerns that the trade in spirits (with some of the indigenous populations of colonial territories) was fuelling violence that in turn fed the slave trade (Fidler 2001; Willis 2003; Lewis 2003). Despite tentative agreements with other European colonial powers on restricting the spirits trade, the main result of this movement was the prohibition zones in British colonies in East and West Africa (Room 2005a).

Many of the countries where temperance was strongest adopted a prohibition of alcohol in the early years of the twentieth century (Finland, Iceland, the US, and Russia), while other countries either adopted partial prohibitions (Norway) or allowed individual areas to vote on prohibition (including Denmark, Poland and Norway), often known as the 'local option'. Where support was less strong, or after prohibition was seen to fail, political elites often adopted a compromise position of alcohol control; that is, a way of making alcohol available in a way to minimize the harms from drinking through such policies as state monopolies (Room 2004; Room 2005a). Many of the laws were explicitly targeted at the 'new problem' of spirits, including heavy taxes in Denmark (1917) and Germany (1887) that in both cases contributed to a move towards beer (Eriksen 2003; Spode 2003).

THE IDEA OF ADDICTION

Although habitual drunkenness was sometimes the subject of disapproval throughout European history, it was only in the late-eighteenth- and early nineteenth-centuries that the loss of self-control began to be seen as part of the explanation. The new paradigm of addiction is usually attributed to Thomas Trotter and particularly Benjamin Rush (physicians from Scotland and America respectively), who argued that these people suffered from a 'disease of the will' (Levine 1978; Thom 2001). Nevertheless, there were several less-developed precursors to this during the earlier part of the eighteenth-century (Porter 1985; Knapp 1998), and it is better to see these

ideas as the culmination of developments such as the increase in general medical understanding and the medicalization of new fields such as mental illness. Perhaps the most important of these contextual factors is the ideology of personal willpower (Levine 1978), which has been argued to explain the much greater concerns with drinking and drunkenness in the Protestant countries where self-control is culturally salient (Levine 1993; Engs 1995).

The first voluntary homes for inebriates were set up in the US, generally reflecting the ideologies and spirituality of the temperance groups that ran them (Baumohl and Room 1987). However, the medical recognition of alcohol addiction that took root during the nineteenth century led to the movement of treatment into the medical sphere with larger, compulsory asylums run on less spiritual lines (Porter 1985). Both the homes and then the asylums were copied by European countries, and by the year 1900 there were treatment facilities of some form in Austria, Finland, France, Germany, Ireland, the Netherlands, Norway, Switzerland and the UK (Baumohl and Room 1987). By the early twentieth century there were quite sophisticated structures in several of these countries, with several levels of remedy available to coordinated boards or committees including both social control (such as work camps) and rehabilitation. Nevertheless, problems of addiction were sometimes marginalised at the turn of the century given the temperance focus on broader political solutions.

Addiction concepts swung back into fashion in the post-prohibition era in the USA, reformulated to look more at the 'sick individual' than anything intrinsic to alcohol itself (Levine 1978; Roizen 1991). This spread to Europe after World War Two, helped by the expanding Alcoholics Anonymous movement, and also fitted the dominant ideologies of consumerism and personal freedom (Mann, Hermann, and Heinz 2000; Room 2004). Such an ideology was however invisible in countries such as East Germany and Poland within the Soviet sphere of influence, where 'alcoholism' was instead seen as a relic of capitalist society for many years. It was only in the 1970s that humanistic psychiatric approaches to treatment emerged in these countries (Swiatkiewicz and Moskalewicz 2003; Spode 2003).

Most recently of all, the 'new public health movement' (of which this report is a part) once again feels comfortable looking at the full scale of 'alcohol-related harm', rather than compartmentalising all alcohol-related problems with a small number of 'alcoholics' (Berridge 1989; Thom 2001).

ALCOHOL IN EUROPE: PAST AND PRESENT

In today's Europe, alcohol is a part of events as diverse as everyday meals, religious services and celebrations (e.g. Gamella 1995; Beccaria and Sande 2003). People drink for many more reasons than the single factors proposed by early anthropologists, reflecting the variety of meanings which alcohol possesses for different people at different times (Moore 2001; see also the discussion of young people in Chapter 4). Meaning is also evident in the *production* of alcohol in many parts of Europe, such as the importance of the home-made *Vin Santo* reported in Tuscany by Calabresi (Calabresi 1987; see also the discussion of production in Chapter 3). Despite this variety of meanings, drinking can generally be described as a social activity (at least for most drinkers), taking part within the context of drinkers' relationships with each other and with the world more generally (Hunt and Barker 2001).

It is therefore, unsurprising, that drinking is also a highly symbolic activity, with all aspects of drinking – type of drink, time and place of drinking, drinking companions and way of drinking – containing meanings for both the drinker and those around them. For example, alcoholic drinks in modern industrialised societies can serve as a marker of time and mood, dividing between alcohol-free work environments and leisure time in evenings and particularly weekends (Gusfield 1987). It can also be part of the definition of a particular social event, such as the separation between *sekt* (drunk on formal, fixed, traditional holidays) and *schnapps* (drunk to show intimacy at spontaneous moments) in the Viennese basin in Austria (Thornton 1987). Drunkenness itself is also subject to social expectations and interpretations, with ‘drunken comportment’ – how people act under the influence of alcohol – varying across countries (MacAndrew and Edgerton 1969; Room 2001). Evidently these expectations can also be different as times and contexts change, as is clear from a description of the Munich Oktoberfest as unusually “close to a visit to the wilderness” in some *Kniepe* (German pubs; Vogt 1995). Drunken comportment has significant implications for certain consequences of drinking, and is discussed in more detail in Chapters 5 and 6.

Given that this report focuses primarily on countries, it must be remembered that ‘one country’ does not equal ‘one culture’, with boundaries between ‘cultures’ reflecting more than mere political definitions (Wilson 2004). Cultures also include different groups and subcultures who vary in their drinking behaviour, some of which (age, gender, socioeconomic status) are looked at in the latter half of Chapter 4. Identity can be important in these patterned differences, as described for drunkenness in different youth networks within a single school in New Zealand (Abel and Plumridge 2004). Certain drinks and ways of using alcohol are felt to be linked to a regional or national identity, with the identity itself partially constructed through drinking behaviour (Moore 1990; Nahoum-Grappe 1995; Gamella 1995; Wilson 2004). *Non*-use of alcohol can equally be an important marker, such as by contemporary Muslims in European societies for whom abstinence is linked to religious belief, and in turn can become a mark of identity (Amundsen, Rossow, and Skurtveit 2005; Room 2005b).

Despite the variety of meanings of drinking in Europe, several overarching typologies of ‘drinking cultures’ have been attempted (see review in Room and Mäkelä 2000), sometimes arguing that these reflect the historical legacies described above dating back to Roman times (Engs 1995). These divide countries into such divisions as ‘wet’ versus ‘dry’ or ‘temperance’ versus ‘non-temperance’ cultures, often packaging the production, pattern, ‘drunken comportment’ and response to alcohol within these dichotomies.

However, to take but one example, the picture produced by the (albeit limited) studies of disapproval and peer/family influence do not bear out such simple divisions. One relatively small study found variations between cultures in levels of disapproval but this generally reflected patterns in disapproving of a whole range of conditions (ranging from pregnancy to obesity). For drunkenness, the UK and Spain showed similar levels of disapproval, and no systematic trend could be seen overall (Room *et al.* 2001).¹ Similarly, a single question in the ECAS surveys asking if people had attempted to influence anyone they know about their drinking found no

¹ Given the context of the research investigation (universalism and diversity in views on disability), it is possible that the results are reactions to alcohol dependence rather than simply intoxication. Furthermore, comparative surveys are subject to multiple possible biases (see chapter 4), and this survey had a very small sample size. Nevertheless, the indicative results from the study are of interest here, particularly in the context of results discussed later in the report.

clear pattern. For example, those in Italy were more likely to say anything than those in Finland or Sweden, who in turn were more likely to say something than those in France (Hemström, Leifman, and Ramstedt 2001; Hemström 2002b). Further examples of related generalisations, exceptions and complications are discussed throughout this report, particularly in Chapters 4 and 6.

Irrespective of these debates, the essence of this section is to show that alcohol has both meaning and history within Europe – or more properly, meanings and histories that vary within and between countries. The world that the coming chapters investigate – covering the production, use, consequences of and responses to alcohol – is, therefore, one that is meaningful for drinkers and non-drinkers alike. The present situation of alcohol in Europe does not come from a blank slate, but instead comes from a long history of practices and meanings, that are themselves changing, as will be outlined in this report.

REFERENCES

Abel, G. M. and Plumridge, E. W. (2004). "Network "Norms" or "Styles" of "Drunken Comportment"?" *Health Education Research*, 19: 492-500.

Amundsen, E. J., Rossow, I., and Skurtveit, S. (2005). "Drinking Pattern Among Adolescents With Immigrant and Norwegian Backgrounds: A Two-Way Influence?" *Addiction*, 100(10): 1453-63.

Anderson, R. (2003). "Beer." *Alcohol and Temperance in Modern History*, Edited by J. S. Blocker, D. M. Fahey, and I. R. Tyrrell. Oxford, England: ABC Clio.

Austin, G. A. (1985). *Alcohol in Western Society From Antiquity to 1800*, Santa Barbara, California: ABC - Clio Information Services.

Barrows, S. and Room, R. (1991). *Drinking: Behavior and Belief in Modern History*, Berkeley: University of California Press.

Baumohl, J. and R. Room (1987). "Inebriety, Doctors, and the State: Alcoholism Treatment Institutions Before 1940." Pp.135-74 in *Recent Developments in Alcoholism, vol 5.*, Edited by M. Galanter.

Beccaria, F. and Sande, A. (2003). "Drinking Games and Rite of Life Projects: a Social Comparison of the Meaning and Functions of Young People's Use of Alcohol During the Rite of Passage to Adulthood in Italy and Norway." *Young: the Nordic Journal of Youth Research*, 11(2): 99-119.

Berridge, V. (1989). "History and Addiction Control: the Case of Alcohol." Pp.24-42 in *Controlling legal addictions*, Edited by D. Robinson, A. Maynard, and R. Chester. Basingstoke: Macmillan.

Brennan, T. (2003). "France, Production and Consumption of Alcohol in." *Alcohol and Temperance in Modern History*, Edited by J. S. Blocker, D. M. Fahey, and I. R. Tyrrell. Oxford, England: ABC Clio.

Bretherton, G. (1991). "Against the Flowing Tide: Whisky and Temperance in the Making of Modern Ireland." *Drinking behavior and belief in modern history*, Edited by S. Barrows and R. Room. Berkeley, CA: University of California Press.

Burnett, J. 1999. *Liquid Pleasures: A Social History of Drinks in Modern Britain*, Routledge.

Calabresi, A. T. (1987). "Vin Santo and Wine in a Tuscan Farmhouse." Pp.122-34 in *Constructive drinking: perspectives on drink from anthropology*, Edited by M. Douglas.

Edwards, G. (2000). *Alcohol: the Ambiguous Molecule*, London, UK: Penguin Books Ltd.

Engs, R. C. (1995). "Do Traditional Western European Drinking Practices Have Origins In Antiquity?" *Addiction Research*, 2(3): 227-39. <http://www.indiana.edu/~engs/articles/ar1096.htm>

Eriksen, S. (2003). "Denmark." *Alcohol and Temperance in Modern History*, Edited by J. S. Blocker, D. M. Fahey, and I. R. Tyrrell. Oxford, England: ABC Clío.

Fidler, D. P. (2001). "The Globalization of Public Health: the First 100 Years of International Health Diplomacy." *Bulletin of the World Health Organization*, 79(9): 842-49.

Gamella, J. F. (1995). "Spain." Pp.254-69 in *International handbook on alcohol and culture*, Edited by D. B. Heath. Westport, Connecticut and London: Greenwood Press.

Gusfield, J. R. (1987). "Passage to Play: Rituals of Drinking Time in American Society." Pp.73-90 in *Constructive drinking: perspectives on drink from anthropology*, Edited by M. Douglas.

Haine, W. S. (2003). "Drinking Establishments (France)." *Alcohol and Temperance in Modern History*, Edited by J. S. Blocker, D. M. Fahey, and I. R. Tyrrell. Oxford, England: ABC Clío.

Hammurabi (translated by L.W.King) (2000). *Code of Hammurabi*.
<http://www.fordham.edu/halsall/ancient/hamcode.html>

Hauge, R. (1978). "Alcohol Policy in Norway: a Historical Outline." *Prepared for International Institute on the Prevention and Treatment of Alcoholism in Zürich, June 25 - July 1 1978 [conference proceeding]*: Oslo: National Institute for Alcohol Research.

Hemström, Ö., H. Leifman, and M. Ramstedt (2001). "The ECAS-Survey on Drinking Patterns and Alcohol-Related Problems." *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries*, Edited by T. Norström. Stockholm: National Institute of Public Health, European Commission.

Hunt, G. and Barker, J. (2001). "Socio-Cultural Anthropology and Alcohol and Drug Research: Towards a Unified Theory." *Social Science and Medicine*, 53: 165-88.

Jellinek, E. M. (1976). "Drinkers and Alcoholics in Ancient Rome." *Journal of Studies on Alcohol*, 37: 1721-43.

Knapp, V. J. (1998). "The Medical Response to Rising Alcohol Consumption in 18th- and 19th-Century Europe." *Nutrition and Health*, 12: 163-79.

Levine, H. G. (1978). "The Discovery of Addiction: Changing Conceptions of Habitual Drunkenness in America." *Journal of Studies on Alcohol*, 38: 1347-70.
<http://www.soc.qc.edu/Staff/levine/doa.htm>

Levine, H. G. (1993). "Temperance Cultures: Alcohol As a Problem in Nordic and English-Speaking Cultures." Pp.16-36 in *The Nature of Alcohol and Drug-Related Problems*, Edited by M. Lader, G. Edwards, and C. Drummond. New York: Oxford University Press.

Lewis, M. J. (2003). "Indigenous Peoples and the Liquor Traffic Controversy." *Alcohol and Temperance in Modern History*, Edited by J. S. Blocker, D. M. Fahey, and I. R. Tyrrell. Oxford, England: ABC Clío.

MacAndrew, C. and Edgerton, R. (1969). *Drunken Comportment*, Chicago: Aldine Pub. Co.

Mann, K., Hermann, D., and Heinz, A. (2000). "One Hundred Years of Alcoholism: the Twentieth Century." *Alcohol and Alcoholism*, 35(1): 10-15.
<http://alcalc.oxfordjournals.org/cgi/content/full/35/1/10>

Moore, D. (1990). "Drinking, the Construction of Ethnic Identity and Social Process in a Western Australian Youth Subculture." *British Journal of Addiction*, 85(10): 1265-78.

Moore, D. (2001). "The Anthropology of Drinking." *International handbook of alcohol dependence and problems*, Edited by N. Heather, T. J. Peters, and T. Stockwell.

- Moskalewicz, J. and A. Zielinski (1995). "Poland." Pp.224-36 in *International handbook on alcohol and culture*, Edited by D. B. Heath. Westport, Connecticut and London: Greenwood Press.
- Nahoum-Grappe, V. (1995). "France." Pp.75-87 in *International handbook on alcohol and culture*, Edited by D. B. Heath. Westport, Connecticut and London: Greenwood Press.
- Plant, M. (1997). *Women and Alcohol: Contemporary and Historical Perspectives*, London: Free Association Books.
- Porter, R. (1985). "The Drinking Man's Disease: the 'Pre-History' of Alcoholism in Georgian Britain." *British Journal of Addiction*, 80(4): 385-96.
- Preswich, P. E. (2003). "France, Temperance In." *Alcohol and Temperance in Modern History*, Edited by J. S. Blocker, D. M. Fahey, and I. R. Tyrrell. Oxford, England: ABC Clío.
- Roizen, R. (1991). (*The American Discovery of Alcoholism, 1933-1939*). PhD dissertation, Sociology. University of California, Berkeley. <http://www.roizen.com/ron/disshome.htm>
- Room, R. (2001). "Intoxication and Bad Behaviour: Understanding Cultural Differences in the Link." *Social Science and Medicine*, 53: 189-98.
- Room, R. (2004). "Alcohol and Harm Reduction, Then and Now." *Critical Public Health*, 14(4): 329-44.
- Room, R. (2005a). "Alcohol Policy: Issues and Challenges for the WHO European Region." *10th meeting of national counterparts for alcohol policy in the WHO European Region, Stockholm 13-15 April 2005 [conference proceeding]*
- Room, R. (2006). "International control of alcohol: Alternative paths forward". *Drug and Alcohol Review*. In press.
- Room, R. (2005b). "Multicultural Contexts and Alcohol and Drug Use As Symbolic Behaviour." *Addiction Research and Theory*, 13(4): 321-31.
- Room, R. and Mäkelä, K. (2000). "Typologies of the Cultural Position of Drinking." *Journal of Studies on Alcohol*, 61(3): 475-83.
- Room, R., J. Rehm, R. T. Trotter, A. Paglia, and T. B. Ustün (2001). "Cross-Cultural Views on Stigma, Valuation, Parity and Societal Attitudes Towards Disability." Pp.247-91 in *Disability and Culture: Universalism and Diversity*, Edited by T. B. Ustün. Seattle: Hofgrebe & Huber.
- Sournia, J-C. (1990). *A History of Alcoholism*, Oxford: Basil Blackwell.
- Spode, H. (2003). "Germany [Translated by Giles,G.]." *Alcohol and Temperance in Modern History*, Edited by J. S. Blocker, D. M. Fahey, and I. R. Tyrrell. Oxford, England: ABC Clío.
- Swiatkiewicz, G. and J. Moskalewicz (2003). "Poland." *Alcohol and Temperance in Modern History*, Edited by J. S. Blocker, D. M. Fahey, and I. R. Tyrrell. Oxford, England: ABC Clío.
- Tannahill, R. (1988). *Food in History*. 2nd, London: Penguin.
- Thom, B. (2001). "A Social and Political History of Alcohol." *International handbook of alcohol dependence and problems*, Edited by N. Heather, T. J. Peters, and T. Stockwell. Chichester: John Wiley & Sons, Ltd.
- Thornton, M. A. (1987). "Sekt Versus Schnapps in an Austrian Village." Pp.102-12 in *Constructive drinking: perspectives on drink from anthropology*, Edited by M. Douglas.
- Tyrell, I. (1991). "Women and Temperance in International Perspective: the World's WCTU 1880s-1920s." Pp.217-40 in *Drinking behaviour and belief in modern history*, Edited by S. Barrows and R. Room. Berkeley, CA: University of California Press.

Vallee, B. L. (1993). "Alcohol in Human History." *Symposium on Toward a Molecular Basis of Alcohol Use and Abuse*, Edited by B. Jansson, H. Jörnvall, U. Rydberg, L. Terenius, and B. L. Vallee. Birkhäuser Verlag.

Vogt, I. (1995). "Germany." Pp.88-98 in *International handbook on alcohol and culture*, Edited by D. B. Heath. Westport, Connecticut and London: Greenwood Press.

Warner, J. (2002). *Craze: Gin and Debauchery in an Age of Reason*, London: Profile Books.

Willis, J. (2003). "Brussels Act and Conventions, 1890-1912." *Alcohol and Temperance in Modern History*, Edited by J. S. Blocker, D. M. Fahey, and I. R. Tyrrell. Oxford, England: ABC Clío.

Wilson, R. G. and Gourvish, T. (1993). *The production and consumption of alcoholic beverages in Western Europe*. London: Amsterdam Group.

Wilson, T. (2004). "Globalization, Differentiation and Drinking Cultures, an Anthropological Perspective." *Anthropology of Food*, 3. <http://www.aofood.org/JournalIssues/03/wilson.pdf>.

Chapter 3: The economic impact of alcohol

Europe plays a central role in the global alcohol market, acting as the source of quarter of the world's alcohol and over half of the world's wine production. Even for spirits, where production is least concentrated in Europe, some European countries (e.g. the UK, France) are among the world's leading producers. The production of many types of beverages is also felt by some countries and regions to be a part of national identity. Trade is even more centred on Europe, with 70% of alcohol exports and just under half of the world's imports involving the EU. Although the majority of this trade is between EU countries, the trade in alcohol contributes around €9billion to the goods account balance.

It is hard to place a value on the amount of smuggling in the EU, although the European High Level Group on Fraud has estimated that €1.5bn was lost to alcohol fraud in 1996. Any highly-taxed good like alcohol is susceptible to smuggling, but price differences in Europe play little part as much organized smuggling activity involves the system of 'duty suspension'.

Price differences play more of a role in the level of legitimate cross-border shopping, where individuals legally bring back alcohol with them from cheaper countries. At least 1 in 6 tourists returns from trips abroad with alcoholic drinks, carrying an average of over 2 litres of pure alcohol per person in several countries. This seems to represent an increase from past levels, due to increased intra-EU travel, relaxations in travellers' allowances and, more recently, the accession of several new, lower cost countries into the EU.

The economic role of the alcoholic drinks industry is considerable in many European countries. Alcohol excise duties amounted to €25 billion in 2001, excluding sales taxes and other taxes paid within the supply chain – although €1.5 billion is given back to the supply chain through the Common Agricultural Policy (see Chapter 8). Due to the relative inelasticity of the demand for alcohol (see Chapter 7), the average tax rates are a much better predictor of a government's tax revenue than the level of consumption in a country.

Alcohol is also associated with a number of jobs, including over three-quarters of a million in drinks production (mainly wine). Further jobs will also be related to alcohol elsewhere in the supply chain, e.g. in pubs or shops. However, the size of the industry is not necessarily a good guide to the economic impact of alcohol policies – for example, trends in alcohol consumption show no crude correlation with trends in the number of jobs in associated areas such as hotels, restaurants, and bars, suggesting that the effect of changes in consumption may be relatively weak. A reduction in spending on alcohol would also be expected to free consumer funds to be spent on other areas, with the economic impact depending on the exact nature of the new expenditure. While further research needs to be done on this issue, current evidence from alcohol and other sectors suggests that declining consumption may not necessarily lead to job losses in the economy as a whole.

Based on a review of existing studies, the total tangible cost of alcohol to EU society in 2003 was estimated to be €125bn (€79bn-€220bn), equivalent to 1.3% GDP, which is roughly the same value as that found recently for tobacco. The intangible costs show the value people place on pain, suffering and lost life that occurs due to the criminal, social and health harms caused by alcohol. In 2003 these were estimated to be €270bn, with other ways of valuing the same harms producing estimates between €150bn and €760bn. Although these estimates are subject to a wide margin of error, they are likely to be an underestimate of the

true gross social cost of alcohol (excluding benefits), given the number of areas where it has been impossible to obtain data. Similarly, while the estimates take into account the benefits of alcohol to health systems and loss of life (valued intangibly), there is no research that would enable the other social benefits to be evaluated. This should be only the start of economic contributions to policymaking, with further research quantifying the share of costs that can be avoided, and, in particular, investigating the most cost-effective policies to do this.

THE ALCOHOL ECONOMY

Alcohol is a major economic commodity that is associated with substantial governmental tax receipts and considerable consumer expenditure. Indeed, Europe can be considered the centre of the global alcohol industry, acting as both the largest market and the major producer of alcoholic drinks.

As for many other consumer industries in the 'globalized era', however, the production of alcoholic drinks has increasingly become an international arena dominated by drinks brands owned by multinational companies (MNCs). In contrast, the scope of this report is European, while the following chapters primarily look at patterns and trends at the country level. Although the following section fits with the general (country/regional) structure of the report, it must nevertheless be read with the caveat that a full understanding of the contemporary alcoholic beverages industry requires an international focus and a consideration of the corporate governance of MNCs (see Jernigan 1997; Euromonitor and just-drinks.com 2005).

This chapter, therefore, looks first at the production of alcoholic drinks in the countries of Europe, before moving on to international alcohol trade, alcohol-related tax receipts, and employment in alcohol-associated industries.

Production

Wine

The ability to grow vines to make wine has historically been restricted, for reasons of climate, to certain countries, although there have been some tentative suggestions that this might change due to global warming.¹ According to the Commission's inventory at the turn of the millennium, wine is grown in 150 different regions within the EU15 as well as in several of the countries in the EU10 (Czech Republic, Cyprus, Hungary, Malta, Slovenia and Slovakia).² The largest single regions in terms of cultivated area are in Spain (Castilla La-Mancha and Extremadura), Italy (Sicilia and Puglia) and France (Gironde and Herault), each of which have over 100,000 hectares of land producing wine (although this partially depends on whether clusters of regional producers are treated as a single or multiple regions). The same three countries also have the highest number of individual wine-producing regions (75 in France, 21 in Italy, 17 in Spain) and the greatest total wine-producing area (over $\frac{3}{4}$

¹ Examples of speculations on climate change and viticulture can be found from the Geological Society of America (<http://www.geosociety.org/news/pr/03-35.htm>) and BBC News (<http://news.bbc.co.uk/1/low/world/europe/3288129.stm>).

² Data on EU15 wine-producing regions comes from the Commission's official statistics, available at http://ec.europa.eu/comm/agriculture/markets/wine/prod/index_en.htm. Figures presented are the inventory of wine-growing areas conducted 1998-2000, and exclude potential planting rights.

million hectares each, compared to less than ½ million hectares in the other EU15 countries combined).

Unsurprisingly, given these figures, world wine production is particularly dominated by Europe and is concentrated in the trinity of France, Italy and Spain, with around half of world wine production coming from these three countries alone, Figure 3.1. Of the study countries outside the EU, Romania is by far the largest producer, especially for wine – in fact, the combined wine production of Romania and Bulgaria is roughly equal to that of Portugal.

However, global wine surpluses have existed since the 1970s, and have coexisted with a challenge to the European producers from the ‘New World’ countries of the US, Canada, South America, Australia and New Zealand (Spitzer 2002; Furlani *et al.* 2003). These countries now produce a considerable amount of (often branded) wine to compete with European producers – and this has been able to enter the EU more easily due to the outcomes of trade negotiations, with current negotiations threatening further tariff reductions (see Chapter 8). The problems and their response within the Common Agricultural Policy (CAP; also see Chapter 8) have contributed to decreased levels of production in recent years, such that 2002/3 production was 25% down on the average mid-1980s amount. To aid the sector the CAP has tried to induce more expensive quality wine production in place of table wine. Despite a substantial fall in table wine production and a concomitant rise in quality wine though, there is still slightly more table wine produced than quality wine, especially in Italy.

Beer

Europe is also important for world beer production, although to a far lesser extent than for wine. Germany alone produces 7.5% of the global total, a figure behind only China and the US, with (in descending order) the UK, Poland, Spain, the Netherlands, Czech Republic, France and Belgium all producing 1-4% of the world’s beer. Although dominated by large brewing multinational companies, there are still a number of local microbreweries using their own production methods and continuing to make up a very small share of the beer market (Euromonitor and just-drinks.com 2005). Most European beers today are types of lager; even the UK, which was for many years an exceptional case preferring ale, has lager making up 70% of its beer market (Tighe and Bussett 2004).

Spirits

Perhaps more than the other two main types of alcoholic drinks, ‘spirits’ is a broad term including a number of drinks that have strong identities in themselves. While some aspects of the production process (i.e. distillation) and the strength of the beverages are relatively similar and give the category some coherence, it is the particular ingredients that give distilled spirit its flavour that sets it apart. Some countries associate a particular spirit with national culture and identity, which has led to fierce efforts to protect the rights to produce these beverages. This can be seen in disputes over Greek aniseed-flavoured spirits (ouzo; Taylor 2004) and Polish bison-grass-flavoured vodka (Zubrowka; Koizol 2003) to name but two.

Unsurprisingly then, some European countries focus ‘spirits production’ primarily on a single type of distilled spirit, although due to partial data coverage it is difficult to investigate this in much detail. Tentatively looking at the EU countries with available data, the UK produces the most whisky and gin (although there is no data for Ireland), while France produces the most liqueurs, and Poland produces the most

vodka.³ Better data are available looking globally across all spirits drinks, and this shows that production is even less focused on the EU than for beer - over 6 in 7 bottles globally are produced outside the EU. Nevertheless, the UK, France and Germany are among the 10 highest-producing countries for spirits in the world, with Italy, Poland and Spain not far behind.

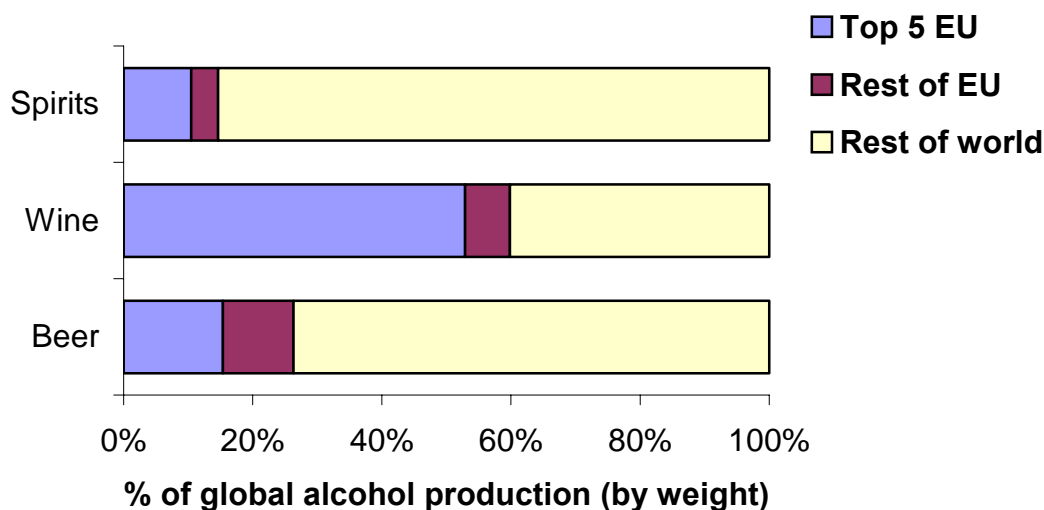


Figure 3.1 Global alcoholic beverages production by weight, 2002 (FAOSTAT)⁴

Total

Across all these beverages, the EU is the world's major source of alcohol, responsible for a quarter of the world's total, equivalent to over 50% more than either China or the US.⁴ The EU10 contributes around 3.5% of the global total, mainly through beer but also contributing just under 2% of the world's total wine and spirits production. Despite this considerable role, the current position still represents a decline in global importance given that 5 EU countries alone accounted for a third of the world's alcohol production in 1961 (Germany, France, Italy, Spain and the UK). The change has not come about through a drop in production levels, however; instead, EU production in the past 40 years has risen by 150% (despite the more recent drop in wine production), but this is overtaken by the 250% rise in the rest of the world's recorded production (possibly partly due to increased industrial production and reduced unrecorded home production).

³ Spirits production analysis uses Eurostat production data on particular spirits types (available from <http://fd.comext.eurostat.ec.eu.int/xtweb/mainxtnet.do>).

⁴ Production analysis is authors' calculations using data from the UN Food and Agriculture Organisation's Statistical division (FAOSTAT) database (<http://apps.fao.org/faostat/>). FAOSTAT production data is only available by weight. Wine production analysis also uses CAP data, which is available by volume only.

Trade

Europe is even more central to the global alcohol economy when it comes to trade, with more than 70% of all alcohol exports in the world coming from European countries⁵ (see Table 3.1). The six countries worldwide exporting the most alcohol are also all European – when combined, the exports from France, the UK, Italy, Spain, the Netherlands and Germany (in order) alone make up over 60% of the world's total. More beer is exported from the Netherlands than any other country in the world, although exports are marginally less concentrated for beer than for other drinks types. For both wine and spirits, the single leading exporter (France for wine, the UK for spirits) and three-quarters of the world's exports are European although the 'New World countries' (see above) have become more important wine exporters in recent years (Furlani *et al.* 2003). Most exports come from the EU15, but several EU10 and accession countries are also important alcohol exporters, including the Czech Republic and Slovenia (both for beer), Bulgaria and Hungary (for wine), and Latvia and Poland (for spirits).

Table 3.1 World alcohol exports by value, 2003

	Beer	Wine	Spirits	TOTAL
Major exporter (>2% world share)	Netherlands (22% of world beer exports)	France (37% of world wine exports)	UK (34% of world spirits exports)	France (24% of world alcohol exports)
	Germany (13%)	Italy (18%)	France (17%)	UK (14%)
	Belgium (7%)	Spain (9%)	Ireland (5%)	Italy (10%)
	UK (5%)	Portugal (3%)	Netherlands (4%)	Spain (5%)
	Ireland (4%)	Germany (3%)	Sweden (4%)	Netherlands (5%)
	Denmark (4%)		Germany (4%)	Germany (5%)
	France (3%)		Italy (3%)	Ireland (3%)
Medium exporter (0.5% – 2% world share)	Czech Republic	Belgium	Belgium	Belgium
	Italy	Netherlands	Denmark	Denmark
	Portugal	UK		Portugal
	Slovenia			Sweden
	Spain			

Source: authors' analysis of data from the FAOSTAT database.

This alone gives a slightly misleading impression of Europe taken as a whole, as just over half of the exports go elsewhere within the EU rather than the rest of the world (see Figure 3.2). This figure is even higher for the EU10, who export twice as much alcohol to EU15 countries than to other EU10 countries. Indeed, only spirits are more likely to go outside the EU than within it. Nevertheless, €12bn of alcohol was exported from the EU as a whole to the rest of the world in 2002, principally made up of wine (€4.4bn) and spirits (€5.4bn).

⁵ Trade analysis is done by value rather than by weight, as it was felt to be a more important measure for investigating trade. This biases the results in favour of high-price exporters (e.g. France, the UK) and underplays the total alcohol exported by the EU10 and accession countries (e.g. Bulgaria, Poland). However, even when looked at by weight, $\frac{2}{3}$ of the world's alcohol exports by weight originate from the EU. All data is from Eurostat's NewCRONOS and XTNET databases. Note, also, that (as with most trade sources) there are slight divergences in the levels recorded under, for example, 'exports from e.g. UK to France' and 'imports in France from the UK'.

Looking in the reverse direction, just under half the world's alcohol trade goes to EU countries, with $\frac{1}{5}$ of these starting outside Europe and the rest coming from other EU countries. Wine imports are more concentrated on the EU than other beverages (the UK taking 20%, the most out of any country worldwide), but even so around a third of world beer and spirits imports go to the EU (the US being higher than the EU for spirits but not beer imports). Given the EU15's dominance as an exporter it is unsurprising that most of the alcohol going in to the EU15 comes from other EU15 countries, although EU10 countries are also more likely to import from other EU10 countries (around 20% of their imports). More wine is imported from outside the EU than any other drink, with only a negligible amount of beer coming from outside the EU (€2.3bn for wine, €0.1bn for beer).

Taking the European Union as a whole, the trade in alcohol accounts for 1.3% of all exports and 0.3% of all imports, thereby contributing €8.9bn to the goods account balance, with such trade not necessarily affected by European and domestic policy to reduce the harm done by alcohol. Exports are concentrated in the EU15 to a greater extent than imports, which explains the slight trade deficit for alcohol in the EU10.

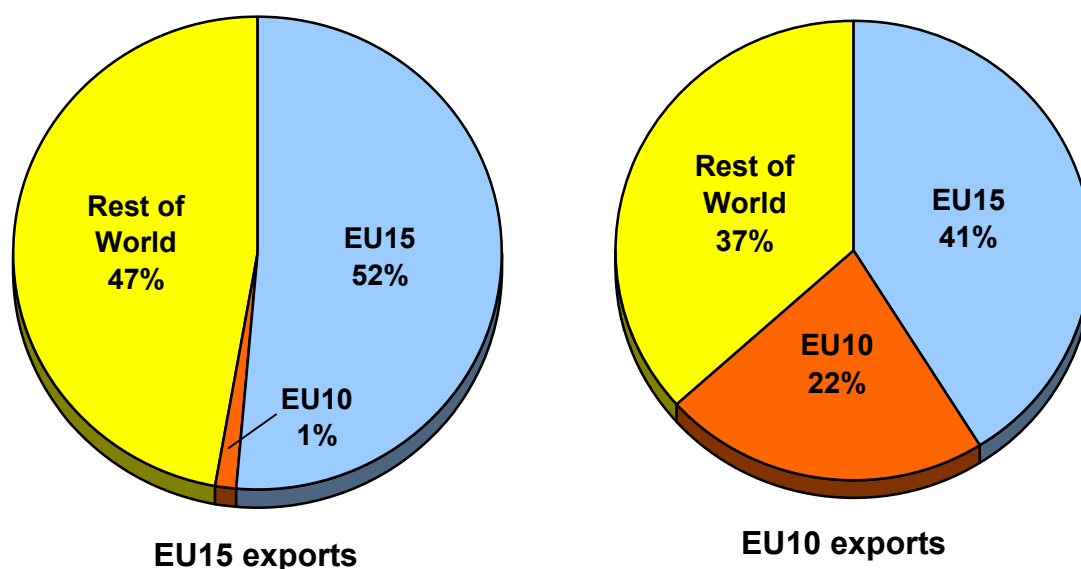


Figure 3.2 Destinations of EU alcohol exports (by value) **Source:** authors' analysis of data from the Eurostat XNET database.

Smuggling

Beneath the level of official records, there is also an illegal trade in alcohol in Europe (see also Chapter 4), often by diverting goods that are held in 'duty suspension'.⁶ By its nature, it is obviously difficult to obtain reliable statistics on illicit trade, which

⁶ Within the EC, alcoholic beverages move in 'duty suspension' where the tax is only paid when and where the goods are released for consumption. Smuggling and tax fraud sometimes take place when the goods are illegally diverted from their (low-tax) claimed destination to a new (high-tax) one. Some Member States believe that most of the illicit trade in alcohol occurs in this way (Wells, Gerrard, and Hubbard 2005), although others believe that cross-border smuggling is also a major problem (see COM (2004) 223).

makes estimating the scale of smuggling in Europe difficult. The only existing estimate for the EU15 comes from the European High Level Group on Fraud, which estimated that €1.5bn was lost due to fraud in 1996, equivalent to around 8% of the total alcohol excise duty at the time (High Level Group on Fraud in the Tobacco and Alcohol Sectors 1998). However, it is unclear how this estimate was derived, and there have been no estimates either for more recent years or including the EU10. Even country-level estimates suffer from considerable problems, with the UK estimate of total duty losses for spirits best expressed as a range going from £650m to zero – a position that the national statistics office is currently trying to rectify (HM Customs and Excise 2004).

Given the difficulties of evaluating the extent of smuggling, it is difficult to monitor any trends in the illegal trade. Although the single market and increased passenger movement may be expected to increase the possibilities for fraud, the indications are that there are different trends in Europe – for example, Ireland, the UK and France believe they have experienced increased diversion fraud, while Portugal has seen more duty evasion (COM (2004) 223).

Although any heavily taxed product will be susceptible to fraudulent activity, this does not mean that reduced, uniform tax rates will reduce the level of smuggling (UK Treasury Select Committee 2000; Wells, Gerrard, and Hubbard 2005). In fact, smuggling of tobacco (which has been analysed in more detail) was more likely to

Box 3.1 – ALCOHOL SMUGGLING

- It is – by its nature – hard to place a value on the amount of smuggling in the EU
- However, the European High Level Group on Fraud has estimated that €1.5bn was lost to alcohol fraud in 1996
- Any highly-taxed good like alcohol is susceptible to smuggling, but price differences in Europe play little part

occur from the expensive north of Europe to the cheaper south (Joossens and Raw 2000), probably related to less 'transparent' governments in Southern Europe (Merriman, Yurekli, and Chaloupka 2000). Price differentials do increase the incentive to smuggle goods (especially for small-scale smuggling by individuals in single vehicles), but any highly-taxed good like alcohol is susceptible to smuggling – which makes the

chances of being caught of key importance for the large-scale, organised smuggling operations that make up the bulk of the problem for alcohol. Improved enforcement is, therefore, an effective tool against smuggling, as seen in the UK (UK Treasury Select Committee 2005) and Spain (Joossens and Raw 2000) and also reflected in several measures within the Council Regulation on administrative cooperation in the field of excise duties (16 Nov 2004; Regulation 2073/2004).

Tax losses and the European internal market

Alongside tax losses through illegal actions, domestic taxes can be legally avoided if drinks are bought abroad and transported back to their home country by travelling individuals themselves. This is particularly important in areas of Europe where there are large price differentials across small distances, such as in the Öresund region (where beer in Denmark costs 40% of the price in Sweden) and Helsinki-Talinn (where spirits in Estonia cost 25% of the price in Finland) (Karlsson and Tigerstedt 2005). Cross-border shopping is a sizeable component of consumption in several countries – for example, cross-border purchases in Denmark and Sweden accounted

for over 15% of all alcohol consumed in 2000 (Elinder *et al.* 2003; COM (2004) 223), a figure that has risen to over 25% in Sweden in 2004 (SoRAD 2005). The only comparative data comes from the ECAS survey, which found that at least 1 in 6 tourists in each country returned with alcohol purchased abroad – rising to over half of tourists in the higher-tax countries such as the UK, Finland and Sweden. The amount purchased in these countries (in the survey, Finland, Sweden and the UK) as well as Germany was also much greater than elsewhere (France and Italy), averaging two litres or more of pure alcohol per importer (see Table 3.2).

Table 3.2 Legal imports of alcohol by European tourists aged 18-64, in litres of pure alcohol per tourist (excluding alcohol over the indicative travellers allowances).

	Finland	France	Germany	Italy	Sweden	UK
<i>Beer</i>	0.3	0.0	0.0	0.0	0.2	0.1
<i>Wine</i>	0.4	0.1	0.1	0.0	0.3	0.4
<i>Spirits</i>	0.2	0.0	0.3	0.0	0.2	0.6
TOTAL *	1.1	0.1	0.5	0.04	0.9	1.4
TOTAL per importer *	2.5	1.4	2.9	0.8	2.3	5.0

* Adjusted upwards by 1.25 to correct for under-reporting of numbers of trips (based on data from Sweden)

Source: ECAS study (Leifman 2001)

The current level represents an increase from past purchasing patterns, according to a number of countries' reports of trends in legitimate cross-border shopping. This is likely to be a result of the relaxation of travellers' allowances for intra-EU purchases in recent years, as well as increased intra-EU travel and 'globalization' more generally (see Chapter 4). For example, the UK estimates that losses have increased fourfold 1992-9 (COM (2004) 223), while Finland's EC membership in 1995 was estimated to increase private imports by 3-10 times (Österberg 1996, cited in Vingilis, Lote, and Seeley 1998). The accession of 10 new states to the European Union also introduced new nearby areas of price differentials (such as the Helsinki-Tallinn area mentioned above), with tourist sales reported to have more than doubled in Estonia, and the average purchase of vodka per buyer increasing from around 1L to 3L (Ahermaa and Josing 2005). Following this rise in consumption and the lowered taxes in Finland to reduce this incentive (see Chapter 8), the Finnish government saw a sharp fall in tax revenue in 2004 while the Estonian government saw an equally sharp increase (Österberg 2005). The current levels of cross-border shopping may increase yet further if proposals for new European legislation are agreed by Member States; this is discussed further under 'European alcohol taxes' in Chapter 8.

National economies

Alcohol-specific taxes, aside from being an effective policy for reducing harm (see Chapter 6), are an important source of revenue for many national Governments. Official figures show that alcohol excise duties make up between 0.5% and 3% of total tax income in EU15 Member States, giving a total of €25bn in 2001 (COM (2004) 223). This is, however, far less than was gained previously when, in the absence of well-developed commercial and income taxes, taxes on specific goods were a key part of a government's income. For example, alcohol excise duties in late

nineteenth-century Britain made up over 40% of British exchequer income (Harrison 1971), while even since 1965, the importance of all taxes on specific goods and services in OECD countries has halved (measured as a % of total taxation; OECD 2001).

Aside from taxes targeted on alcohol, there are also a number of general taxes on alcoholic products, including an estimated €34bn in 1998 from general sales taxes (VAT; Naert, Naert, and Maex 2001). Other taxes that apply to various businesses in the alcohol supply chain can include income tax and national insurance contributions for employees, corporation taxes, and business rates (Thurman 2000). It should also be noted that €1.5 billion of this tax revenue is given back to parts of the alcoholic drinks supply chain, in the form of support for wine production in the EU's Common Agricultural Policy (see Chapter 8).

While it may be predicted that the tax from alcohol depends on the total amount of alcohol drunk in a country, the evidence suggests that this is not the case – for example, the Nordic countries consume considerably less than Italy and Switzerland while collecting higher tax receipts. Looking across Europe more thoroughly (Figure 3.3), there is no apparent correlation between the revenue from alcohol-specific taxes (as a % of government revenue or % of GDP) and per capita consumption. The best predictors of the importance of alcohol-specific taxes are unsurprisingly the average alcohol tax rates (see Chapter 9), which relate very closely to the income from alcohol taxes.⁷ Conversely, this also demonstrates the relative price inelasticity of alcoholic beverages, although the price elasticities are nevertheless of a size that shows a noticeable effect on alcohol consumption (the effectiveness of taxes from an alcohol policy perspective is discussed in Chapter 7).

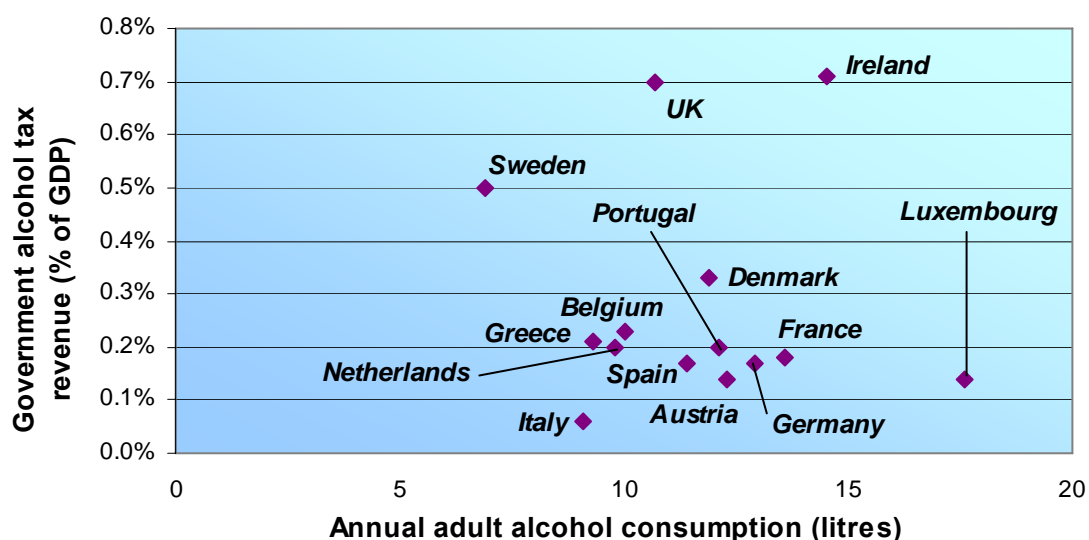


Figure 3.3 Alcohol consumption and alcohol tax revenue in the EU15. **Source:** Eurostat, cited by COM (2004) 223.

⁷ The level of household expenditure on alcoholic drinks and the price of alcohol also relate to the tax take, presumably through the impact of taxation on price and the impact of price on household expenditure. Consumption data in 2001 taken from the WHO Health For All database; household expenditure data taken from the Eurostat Household Expenditure Survey (HES) in the most recent year (1999); price data taken from Eurostat Price Level Indices for alcoholic drinks in 2001; analysis conducted by the authors.

By far the greatest proportion and level of expenditure on alcohol in Europe is found in Ireland, with each household spending nearly €PPP1700⁸ on alcohol each year.⁹ This is three times the level of any other country, and over ten times as much as Greece (see Figure 3.4). More generally, expenditure is much lower in the wine-producing countries than in the rest of the EU15, reflecting the relatively low price of alcohol in Southern Europe (see Chapter 9). The proportion of expenditure on different types of drink tends to follow the same pattern as consumption in general (see Chapter 4), although with certain exceptions such as Greece spending proportionally more than Finland on spirits, and Belgium spending more of its alcohol expenditure on wine than Spain. The total spend on alcohol has increased in most of Europe since data were first collected systematically in 1988 (with the increase happening primarily in the early 1990s), yet increasing wealth in the EU15 also means that proportionally less of disposable income is spent on alcohol in most countries (see Figure 3.4).

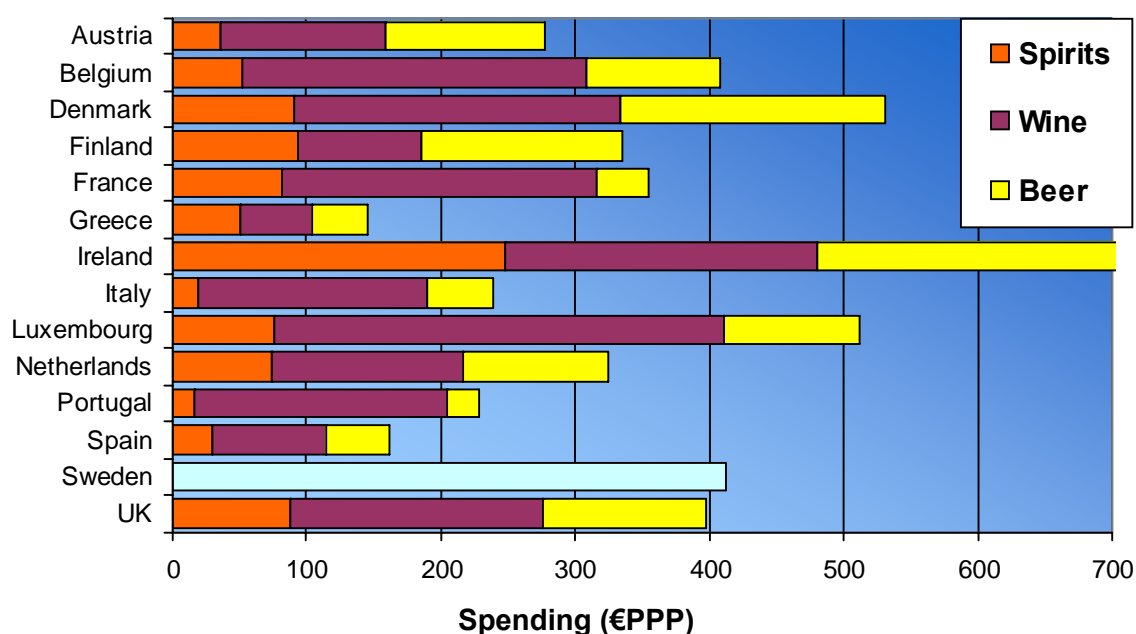


Figure 3.4 Household expenditure on alcohol in the EU15 in 1999.

Notes: The scale ignores Irish beer expenditure of €PPP1200 as this would distort the scale. Sweden has no beverage-specific data available. **Source:** Household Budget Survey 1999, Eurostat.

⁸ Purchasing power parity (PPP) allows costs to be scaled by the relative prices in different countries, so that the figures would buy the same amount of goods in each country. The resulting values are therefore in purchasing-power adjusted euros, or '€PPP'.

⁹ Authors' own analysis of data from the HES which took place in 1988, 1994 and 1999; data available from Eurostat and the Commission report on health surveys in Europe 1997-2000 (European Commission 2003).

Employment

Another way of approaching the alcohol economy is to look at the numbers of people whose working lives are linked to alcohol. Estimates from the 1990s suggest that nearly 850,000 people in the EU15 work in *producing* alcoholic drinks, mainly wine (Naert, Naert, and Maex 2001). However, it is harder to estimate the numbers of employees whose jobs are *indirectly* dependent on alcohol, such as in marketing, retailing, wholesaling and packing. In the EU15, the industry-funded Amsterdam Group (TAG) has estimated this as 2½ million jobs (Naert, Naert, and Maex 2001), but neither TAG nor the study authors have been able to provide any details as to how this figure was calculated.

Even in the major wine-producing countries, the majority of the alcohol-related employment is estimated to be in the Hotels, Restaurants and Catering sector (HoReCa), which also includes jobs in pubs and bars. This sector is the worst paid in Europe, in contrast to brewing which is better paid than the manufacturing sector as a whole (Room and Jernigan 2000).¹⁰ It also contains more part-time workers than most service sectors in the EU15, although it is unclear whether the TAG employment estimate above is for all employees or full-time equivalent workers.

When interpreting these figures, it is important to remember that the strength of the direct relationship between alcohol consumption and employment in alcohol-related industries is unclear (see right). Despite the simplicity of the implicit model sometimes suggested in debates (reduced consumption leads to reduced output leads to job losses leads to higher unemployment), most of these connections in practice require assumptions that rarely hold fully (Godfrey and Hartley 1990). Even for production, stable consumption levels of a particular beverage can happen at the

BOX 3.2: WHAT AFFECTS ALCOHOL-RELATED EMPLOYMENT?

In theory: employment depends on much more than just the amount drunk (Godfrey and Hartley 1990):

- **Consumer preferences (1)** – a shift towards drinks produced abroad can reduce the number of jobs in domestic production, without any effect on consumption levels.
- **Consumer preferences (2)** – the number of jobs in associated industries (esp. in HoReCaⁱ) will depend on when and how people choose to drink, e.g. whether people drink alcohol in pubs/bars or at home.
- **Labour process** – this is particularly important for jobs in production. For example, output per employee in European distilleries rose by over 50% between 1983 and 1989 (Molyneux *et al.* 1993).
- **Other** – wage rates, the cost of capital, and a myriad of other economic factors will also influence employment levels.

In practice: a crude analysis of Eurostat data shows that there is no relationship between trends in HoReCaⁱ employment and alcohol consumption. In several countries employment and consumption levels even go in opposite directions (e.g. Italy; see Figure 3.5).

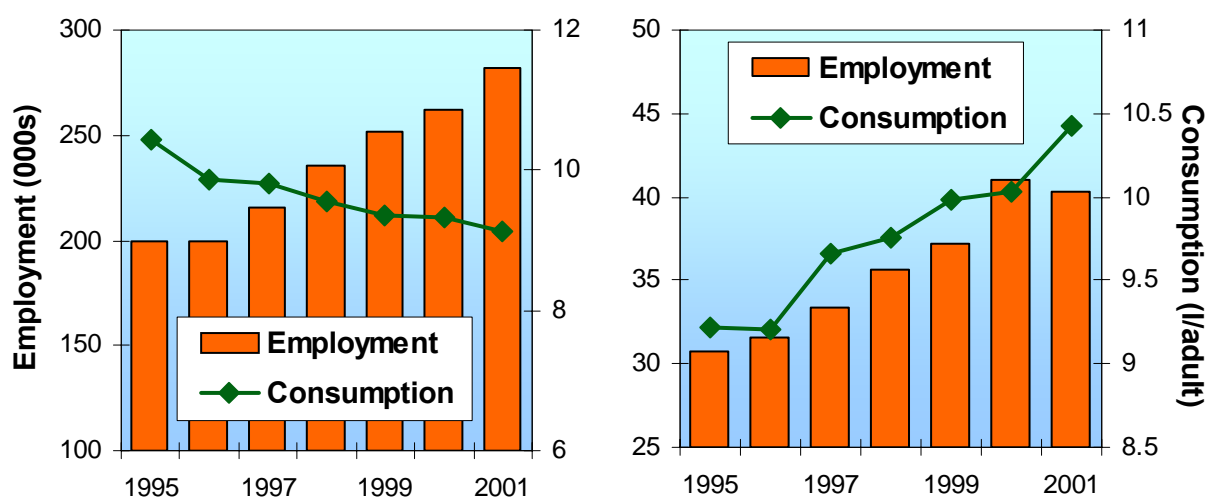
This suggests that the effect of drinking levels on employment levels in industries linked to alcohol may be relatively weak.

ⁱ HoReCa = HOtels, REstaurants and CAtering (and also includes bars).

¹⁰ Data on part-time work and levels of pay from the Commission analysis of the Structural Business Statistics and authors' analysis of the Labour Force Survey, available from Eurostat.

same time as falls in employment, such as the 50% fall in European brewery employment at the same time as a much slighter fall in beer consumption (Molyneux *et al.* 1993).¹¹

The detached nature of many of the jobs from consumption becomes particularly clear when looking at the HoReCa¹² sector, which (as mentioned above) constitutes the bulk of the employment that has been claimed by The Amsterdam Group to relate indirectly to alcohol. A crude examination of Eurostat data in 24 EU countries and 3 other study countries show an average relationship of trends in HoReCa employment and alcohol consumption that is indistinguishable from zero.¹³ Fewer data are available for the numbers of jobs in bars, but where data exists the same possibilities appear to hold (the lack of a definite relationship is illustrated by Figures 3.5 and 3.6). Insufficient data exist to test whether similar results would be found where bars are almost exclusively based around alcohol (rather than including coffee, food etc.). These figures tentatively suggest that the direct effect of levels of consumption on employment levels in HoReCa may be relatively weak – although more robust and sensitive research is clearly needed to investigate this further.



Figures 3.5 (Employment in bars in Italy; left) and 3.6 (Employment in hotels, restaurants and bars in Finland; right), demonstrating the heterogeneity of links of consumption to jobs

More consequentially, a reduction in the consumption of alcohol would also free up money for consumers to spend on other products or services, which could lead to either an *increase* or a *decrease* in total employment in the economy depending on the structure of the industry following the new consumption (Godfrey and Hartley 1990). Although no specific research exists to suggest what would happen for reduced drinking, there have been a number of studies that have looked at the case of tobacco. The situation here is unlikely to be identical to that for alcohol (given e.g. the different importance of the HoReCa sector), but it offers an insight into how health-motivated consumption changes can impact upon employment as a whole. In a situation of a dramatic reduction or complete cessation of smoking, most of the studies reviewed within a World Bank/WHO project estimated that there would be a

¹¹ Authors' own calculation from employment data taken from TAG (Molyneux *et al.* 1993) and The Brewers of Europe (http://stats.brewersofeurope.org/stats_pages/employees.asp).

¹² HoReCa = HOtels, REstaurants and CAtering (and also includes bars).

¹³ Authors' own calculation from Eurostat data. Note that these are based on simple bivariate correlations on a limited number of data points (years) and, as such, are both crude and relatively insensitive to weak trends – hence the recommendations for further research (see chapter 10).

net employment *gain* in all of the non-tobacco producing countries (Jacobs *et al.* 2000). In the case of the US, where tobacco-production is concentrated in certain areas, it has been estimated that the gain in jobs in non-producing regions even outweighs the loss of jobs in tobacco-producing regions. While this still offers no clue as to the direction of the net result for alcohol, this demonstrates the fallacy in simply using the number of jobs associated with alcohol as an indicator of the cost of reduced consumption.

It should be stressed here that this is not to deny the size of alcohol-related industries within Europe; as mentioned above, there are a considerable number of jobs across Europe that are due to alcohol, and the production of alcoholic beverages is an important economic activity in Europe. Perhaps most importantly, further research is clearly needed – not only to determine the practical effect of alcohol control policies on economic outcomes, but also to estimate transparently the number of jobs linked to alcohol and the factors determining changes in their levels (see Recommendations in Chapter 10). From a policymaking perspective however, the current, but limited, evidence suggests that changing consumption will not necessarily lead to job gains/losses in the economy as a whole, and may not even lead to large changes in employment in sectors relatively closely linked to alcohol such as restaurants and bars.

THE SOCIAL COST OF ALCOHOL IN EUROPE

Increasingly at the European level, major health and social problems are being expressed as a single monetary value in what is termed a ‘social cost’ or ‘cost-of-illness’ study (The ASPECT Consortium 2004; Peterson *et al.* 2005). In similar fashion, the original specification for this report included the need for an estimate of the social cost of alcohol in Europe, and this chapter discusses a new estimate undertaken for this report. Given constraints of time and money, this estimate has been based on the most thorough review yet conducted of existing national-level studies. Summaries of the results are presented here and in Chapter 6, and a detailed discussion of the methodology and results are published in Baumberg & Anderson (submitted).

From the outset, it should be borne in mind that a social cost study does not provide any information as to which policies (if any) are cost-effective. Social cost estimates are a starting point for economic contributions to research rather than the end-point, and the importance of further analyses such as cost-benefit analyses is discussed at the end of this chapter. Furthermore, the figures are often misunderstood or misused – for this reason, any reader who wishes to use these figures is advised to consult Box 3.3 to ensure that the results are used accurately. Although this study is a marked improvement on previous estimates of the social cost of alcohol in Europe, many methodological concerns remain and these are both discussed below and also inform the recommendations made in Chapter 10. Nevertheless, the results below are the best estimate of the full scale of alcohol-attributable harm in contemporary Europe, and it is hoped that aside from their intrinsic interest they can provide an academic and political spur to further action and research.

Method

A long-standing problem with social cost studies has been the eclectic methodologies used by different studies. To get around this, the present review split each study into

its component costs (e.g. health, crime), and investigated the methodology underlying each component. Those that met a given methodological standard were then scaled according to an appropriate indicator (e.g. total health expenditure), with the final estimates reflecting the range of studies that met the standard. The exact methodological standards are detailed in Baumberg & Anderson (submitted), but in general are based as far as possible upon the WHO Guidelines on Estimating the Costs of Substance Abuse (Single *et al.* 2003).

The review ultimately included 21 European studies (with a further 9 international studies used for sensitivity analyses), although for several cost components only a small number of studies passed the methodological standards, Table 3.3.

Box 3.3 – FOUR WAYS TO AVOID MISINTERPRETING A SOCIAL COST STUDY

1. What is a 'social cost of alcohol'? The social cost of alcohol is the cost to society of everything that happens in Europe in 2003 which would not happen in a world without alcohol. It does not show how much could be saved by any particular policy measure (see chapter 6), nor does it show how much could be saved if alcohol suddenly vanished (some of the costs are unavoidable consequences of previous alcohol consumption).
2. Are *intangible* costs real money? Intangible costs are a way of turning non-monetary harms – such as pain or loss of life – into a monetary figure. This means they do not exist as money in the real world, and cannot be compared to economic costs such as GDP, or the cost of a hospital. However, they not only present a fuller picture of the scale of alcohol-related harm but also avoid treating some people's deaths as a 'benefit' to society.
3. Who pays these costs? These are the costs of alcohol for the whole of society and not just costs to governments (in France and Australia, the government has been estimated to pay about 15%-25% of the tangible costs). Although some of the cost is paid by the drinker, large amounts are also paid by other people and count as 'externalities' (see discussion in text). Most of the intangible costs are the value of lost life, which mainly but not exclusively lie with the drinker, although the intangible cost of alcohol dependence (to family members) and crime are over 25% of the total.
4. How much are the social benefits of alcohol worth? Very few social benefits of alcohol have been evaluated, although health benefits are taken into account for health costs and the intangible cost of lost life. It should also be remembered that the economic side of alcohol – i.e. jobs and economic value-added – cannot simply be treated as social benefits (see discussion in text). Taxes are also not a 'social benefit' as they simply transfer money between different groups in society, although they would clearly be relevant for investigating the cost to governments. Future research should attempt to quantify a greater number of the social benefits of alcohol, although it is recognised that this is methodologically problematic.

Table 3.3 – the social cost of alcohol in different studies ^A

Country	Year of Cost	Total tangible costs	Total cost per capita (inc. intangible costs)	Health			Prevention			Crime	% (per thousand) of GDP				
				% of health spend	Treatment	Prevention	% of POS ^c	Criminal damage	Traffic accident damage		Lost productivity from lost life	Absenteeism	Unemployment		
Belgium (Industry-funded) [1]	1999	2.4	586	2.6	<0.1		1.4 ^d		6.2	4.7	<0.1	2.3			
Denmark [2]	1996	0.9	218	3.4			10.5		1.2	1.7	0.4-0.5				
Finland [3]	1990	1.3-1.8	482-823	0.9-1.4	1.2	0.5-0.6	12.7-13.9	0.6		6.5-10.3	0.5-0.6				
France [4,5]	1997	1.2-1.4	256-300	2.4		<0.1			2.7-2.8	4.4-6.5	0.4-0.5				
France [6]	1996	-	-	0.2-0.3			-	-	-	-	-				
Germany [7]	1995	1.1	253	2.3	0.2	<0.1			0.4	3.7	0.8				
Ireland [8]	2003	1.6	447	4.4			7.8				7.8				
Italy [9]	1994	0.7-0.8	134-153	1.7-1.9	0.2					1.3-1.6	1.7-1.8				
Latvia [10]	1999	1.8	113	n/c	0.5				1.7						
Netherlands [11]	2000	0.7	171	0.3	0.2		1.4 ^d	0.7				2.4			
Netherlands (Industry-funded) [12] ^e	1996	0.3	78	0.7	0.2		3.7	0.7			<0.1				
Norway [13]	2001	1.2-2.1	447-729	0.7-1.3	1.0-1.6		1.9		<0.1	1.6-9.3	1.0-1.1	0.6			
Portugal [14]	1995	0.5	73	0.5	<0.1				0.7	0.9	<0.1				
Scotland [15]	2001-2	0.7	296-360	1.4	<0.1	<0.1	14.4				0.9	1.3			
Slovak Republic [16]	1994	3.1	292	4.9			16.9			5.4	6.6	12.1			
Slovenia [17]	2002	0.3	50	0.5						2.6	0.1				
Spain [18]	1998	0.7	129	2.4	0.3	<0.1	2.6				1.4				
Sweden [19]	1998	5.5	1,194	5.5		2.4	3.6	1.0		9.6	7.1				

Country	Year of Cost	Total tangible costs	Total cost per capita (inc. intangible costs)	Health			Prevention	Crime	Criminal damage	Traffic accident damage	Mortality - tangible	Absenteeism	Unemployment
				% GDP	PP € 2003 ^B	% of health spend							
Switzerland [20]	1998	0.5-0.7	435-482	1.4	0.1				0.3		1.4-2.6		0.6
England & Wales [21]	2001	1.5-1.7	456-497	2.8-3.3	0.1		10.6	1.6			2.6	2.0	2.4
EU mean				2.3	0.5	0.2^F	12.4	0.9	1.7^D		3.9	1.6	1.5
EU minimum				1.4	0.1	<0.1	10.6	0.6	^D		2.6	1.0	0.6
EU maximum				3.3	1.6	2.4	13.9	1.6	^D		6.5	2.0	2.4
Australia [22,23]	1998/9	0.9-1.0	286-315	n/c			8.4-15.9 ^G		1.2		n/c	0.1	
Canada [24]	1992	0.9-1.3	195-265	1.3-1.6	0.4	0.2	12.3		0.7		2.5-5.4		
Japan [25]	1993	1.9	381	4.9					<0.1		2.6	0.1	
New Zealand [26]	1990	4.7	4289	n/c							8.2	0.2	
New Zealand [27]	1991	1.4-2.4	234-386	1.3			25.0-51.6				0.3-0.6		3.8-11.3
New Zealand [28]	1996	-	-	-			-	-	1.7		-	-	
USA [29,30]	1992	2.3	666-731	1.5	0.5		6.4 ^G	<0.1	1.2		4.2		
USA [31]	1985	1.7	447	1.1			9.2 ^G	<0.1	0.6		5.7		
USA [32]	1995	-	-	-			-	-	1.0		-	-	

SHADED FIGURES ARE THOSE THAT MET THE METHODOLOGICAL CRITERIA FOR THAT COST COMPONENT, AND WERE THEREFORE INCLUDED IN THE MEAN/MINIMUM/MAXIMUM SUMMARY VALUES.

Notes: n/c means that the methodology used was *not comparable* with other studies. (A) Types of cost that were only investigated in a single study are not shown here. Figures may differ from reported figures in study summaries as they are taken from the range of values reported in the detail of the original study, and also remove costs excluded on theoretical grounds from the current study (mainly transfer payments). (B) Total cost is inflated to 2003 prices and adjusted for purchasing power. (C) POS = Public order spend. (D) See discussion in Methods and Results in Baumberg and Anderson (submitted). (E) Costs to government only. (F) Prevention mean excludes Sweden as an outlier. (G) Study includes a downward adjustment for the causal role of alcohol.

- (1) Pacolet, J., Degreef, T., and Bouten, R. (2004). Analyse des coûts sociaux et bénéfices en matière de consommation et d'abus d'alcool en Belgique: synthèse [Analysis of the social costs and benefits due to the consumption and abuse of alcohol in Belgium: executive summary]. *Sundhedsministeriet [Ministry of Health]* (1999). "De samfundsoekonomiske konsekvenser af alkoholforbrug." [The Economic consequences of alcohol consumption" in Denmark]. 2nd edition. Copenhagen, Denmark: Ministry of Health. <http://www.im.dk/publikationer/alkoholrapport/index.htm>
- (2) Salomaa, J. (1995). "The Costs of the Detrimental Effects of Alcohol Abuse Have Grown Faster Than Alcohol Consumption in Finland." *Addiction*, 90(4): 525-37.
- (3) Kopp, P. and Fenoglio, P. (2000). Le coût social des drogues licites (alcool et tabac) et illicites en France [The social costs of licit (alcohol and tobacco) and illicit drugs in France]. *Étude n° 22*. Paris, France: Observatoire français des drogues et des toxicomanies.
- (4) Fenoglio, P., Parel, V., and Kopp, P. (2003). "The Social Cost of Alcohol, Tobacco and Illicit Drugs in France, 1997." *European Addiction Research*, 9(1): 18-28.
- (5) Reynaud, M., Gaudin-Colombel, A. F., and Le Pen, C. (2001). "Two Methods of Estimating Health Costs Linked to Alcoholism in France (With a Note on Social Costs)." *Alcohol and Alcoholism*, 36(1): 89-95.
- (6) Bergmann, E. and Horch, K. (2002). Kosten alkoholassoziierter Krankheiten: Schätzung für Deutschland [The cost of alcohol-related illness: estimates for Germany]. Berlin, Germany: Robert Koch-Institut.
- (7) Byrne, S. (2000). The cost of alcohol-related problems in Ireland. Dublin Institute of Technology.
- (8) Collicelli, C. (1996). "Income From Alcohol and the Costs of Alcoholism: an Italian Experience." *Alcologia*, 8(2): 135-43.
- (9) Baltic Data House (2001). Economic research about the influence of taxes imposed on alcohol and influence of price policy on alcohol consumption; research about accidents caused by alcohol intoxication. Riga, LV: Market and Social Research Group. Baltic Data House. Baltic Institute of Social Sciences.
- (10) KPMG. (2001). Excessive alcohol consumption in the Netherlands: trends and social costs. Hoofddorp: KPMG Economic Consulting.
- (11) Muizer, A. P., Reinhard, O. P. M., and Rood-Bakker, D. S. (1996). Externaliteiten van alcohol gebruik: naar een doeltreffend alcoholbeleid [Social costs: externalities of alcohol consumption, costs and benefits for third parties]. Rotterdam: Netherlands Economics Institute (NEI) on behalf of the Dutch Foundation for the Responsible Use of Alcohol (STIVA).
- (12) Gjelsvik, R. (2004). Counting the economic costs caused by alcohol. Norway: Directorate for Health and Social Affairs, the Rokkan Centre, and the Norwegian Institute for Alcohol and Drug Research (SIRUS).
- (13) Lima, E. and Esquerdo, T. (2003). The economic costs of alcohol misuse in Portugal. Working Paper Series No. 24. Núcleo de Investigação em Microeconomia Aplicada, Universidade do Minho.
- (14) Guest, J. and Varney, S. (2001). Alcohol misuse in Scotland: trends and costs. Scottish Executive.
- (15) Koziková, I. E. (1995). Estimation of the social costs caused by alcoholism: draft material of the former Socioeconomic Analyses Department of the National Centre for Health Promotion (Social Programs Division). Selection and translation by Nočiar A., General Secretariat of the Ministerial Board for the Drug Dependencies and Drug Control.
- (16) Sesok, J. (2003). Indicators of harmful alcohol drinking in Slovenia in the year 2002 [in Slovenian]. Ljubljana: Institute of Public Health of the Republic of Slovenia.
- (17) Garcia-Sempere, A. and Portella, E. (2002). "Los Estudios Del Coste Del Alcoholismo: Mirco Conceptual, Limitaciones y Resultados En España [Studies of the Cost of Alcoholism: Concepts, Limitations and Results From Spain]." *Addicciones*, 14(Suplemento 1): 141-53.
- (18) Johnson, A. (2000). Hur mycket kostar supen? [How much for the booze?]. Stockholm: Sober.
- (19) Jeanrenaud, C., Priez, F., Pellegrini, S., Chevrou-Severac, H., and Vitale, S. (2003). Le coût social de l'abus d'alcool en Suisse [The social costs of alcohol in Switzerland]. Neuchâtel, Switzerland: Institut de recherches économiques et régionales, Université de Neuchâtel.
- (20) Leontaridi, R. (2003). Alcohol misuse: How much does it cost? London: Cabinet Office.
- (21) Collins, D. and Lapsley, H. (2002). Counting the cost: estimates of the social costs of drug abuse in Australia in 1998-9. Canberra: Australian Government Printing Service.
- (22) Collins, D. and Lapsley, H. (1996). The social costs of drug abuse in Australia in 1988 and 1992. Canberra: Australian Government Printing Service.
- (23) Single, E., Robson, L., and Xie, X. (1996). The costs of substance abuse in Canada: a cost estimation study. Ottawa, ON: Canadian Centre on Substance Abuse.
- (24) Nakamura K., Tanaka A., and Takano T. (1993). "The social cost of alcohol abuse in Japan." *Journal of Studies on Alcohol*, 54(5):618-25.
- (25) Easton, B. (1997). The social costs of tobacco use and alcohol misuse. Wellington, New Zealand: Department of Public Health, Wellington School of Medicine.
- (26) Devlin, N. J., Scuffman, P. A., and Bunt, L. J. (1997). "The Social Cost of Alcohol Abuse in New Zealand." *Addiction*, 92: 1491-505.
- (27) Miller, T. R. and Blewden, M. (2001). "Costs of Alcohol-Related Crashes: New Zealand Estimates and Suggested Measures for Use Internationally." *Accident Analysis and Prevention*, 33: 783-91.
- (28) Harwood, H., Fountain, D., and Livermore, G. (1998). The economic costs of alcohol and drug abuse in the United States – 1992. Report prepared for the National Institute on Drug Abuse (NIDA) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA), National Institutes of Health, Department of Health and Human Services (NIH Publication No. 98-4327). Washington ed. Rockville, MD: National Institutes of Health.
- (29) Harwood, H., Fountain, D., and Livermore, G. (1999). "Cost Estimates for Alcohol and Drug Abuse." *Addiction*, 94(5): 631-34.
- (30) Rice, D. P., Kellman, S., Miller, L. S., and Dunmeyer, S. (1990). The Economic Cost of Alcohol and Drug Abuse and Mental Illness 1985. Report submitted to the Office of Financing and Coverage Policy of the Alcohol, Drug Abuse, and Mental Health Administration. San Francisco: Institute for Health and Aging, University of California. DHHS Publication No. (ADM) 90-1694.
- (31) Miller, T. R., Lestina, D. C., and Spicer, R. S. (1998). "Crash Costs in the United States by Age, Blood Alcohol Level, Victim Age, and Restraint Use." *Accident Analysis and Prevention*, 30(2): 137-50.

The final estimates present the cost to all of European Union society in 2003 of all past and current alcohol consumption, compared to a society without alcohol (with the exception of health costs; see the discussion of 'social benefits' below). While an alcohol-free society is not necessarily the most useful comparison, it does provide an estimate of the full range of alcohol-related consequences and was by far the most common method found in the reviewed studies (both the implications of this and further research recommendations are discussed below). It is also important to note that the estimate does not include 'transfer costs' – that is, the large sums of money that one group in society gives to another group due to alcohol-related effects, such as disability benefits. While these costs are not relevant for the 'social cost' perspective taken by most of the studies reviewed, they are clearly of large importance for the 'external costs' often considered in policymaking, and this is considered in more detail at the end of this chapter.

Main results

The total tangible cost of alcohol to the European Union is €125bn (€79bn-€220bn) in 2003, equivalent to 1.3% of GDP (0.9%-2.4%) and shown in Table 3.4. Actual spending on alcohol-related problems accounts for €66bn of this, while potential production not realised due to absenteeism, unemployment and premature mortality accounts for a further €59bn. The total tangible cost broken down into the cost components is shown in Figure 3.7, and illustrates the spread of costs across different domains of human life (the components are also discussed in Chapter 6).

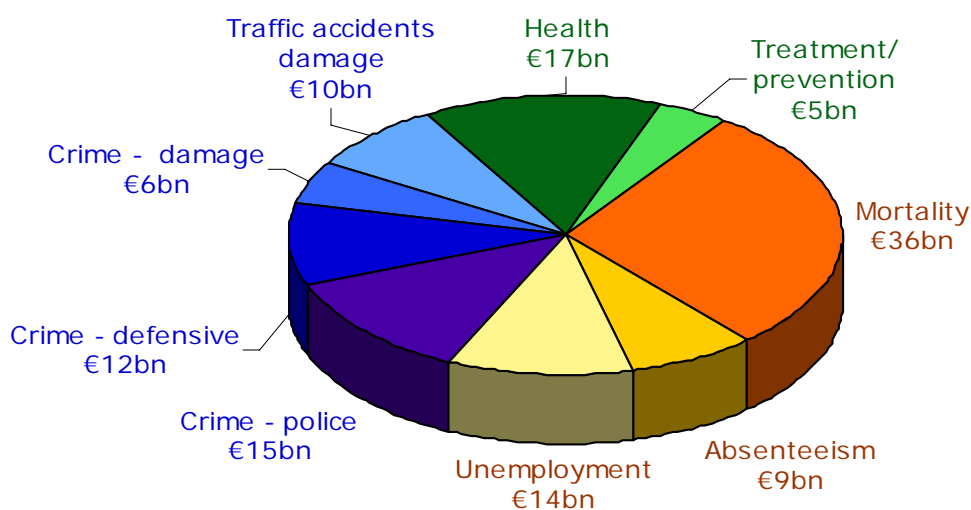


Figure 3.7 The tangible cost of alcohol in Europe 2003, by cost component

This figure uses the conventional method for valuing health and mortality costs in social cost studies, and despite some methodological differences can, therefore, be compared to a recent estimate for the cost of tobacco in Europe of €98bn-€130bn in 2000 (The ASPECT Consortium 2004). Two other studies in the past few years have also made tentative estimates of the social cost of alcohol in Europe. The first was within a WHO-EURO project and used five studies to estimate crudely that the social costs of alcohol were 1-3% of GDP, equivalent to €100bn-300bn in 2001 (Gutjahr and Gmel 2001). More recently, a wider project on the cost of brain disorders within Europe estimated the total cost of addictive disorders (alcohol and drugs) to be over

€55bn in 2004, with a further €50bn due to alcohol- and drug-related crime (Andlin-Sobocki and Rehm 2005). Unusually, this was based on the cost per person dependent on alcohol, despite under one-fifth of premature mortality costs in Germany coming from people with alcohol use disorders (Bergmann and Horch 2002). The results presented above use a much more detailed methodology than either of these studies, and can, therefore, be expected to provide a more accurate result.

Table 3.4 The social cost of alcohol in Europe, 2003

	Cost (€ billion)	Minimum (€ billion)	Maximum (€ billion)
Tangible costs – direct			
Healthcare	17	11	28 ^A
Treatment & prevention ^C	5	1	18
Crime – police, courts, prisons	15	13	24 ^B
Crime – defensive and insurance ^D	12	7	17 ^B
Crime – property damage	6	3	16 ^B
Traffic accidents – damage	10	6	16
SUBTOTAL	66	40	118¹
Tangible costs – productivity losses			
Absenteeism ^C	9	9	19
Unemployment ^C	14	6	23
Premature mortality	36	24	60
SUBTOTAL	59	39	102
TOTAL TANGIBLE COSTS			
	125	79	220¹
Intangible costs			
Psychosocial & behavioural effects ^D	68	37	68
Crime – victims' suffering ^D	12 ^F	9 ^F	52 ^{B, F}
Loss of healthy life ^E	258 ^F	145 ^F	712 ^F
TOTAL INTANGIBLE COSTS^F			
	270^G	154^G	764^G

¹Totals do not add due to rounding. **Notes:** (A) This excludes health benefits, while minimum and headline figures are for the net effect compared to the lowest-risk level of drinking; (B) Cost of crime *related to* rather than *caused by* alcohol, and is therefore a maximum figure for the cost of alcohol; (C) Cost areas with higher levels of uncertainty; (D) Costs based on a single study; (E) Excludes loss of life due to homicide to avoid potential double-counting with intangible costs of crime; (F) The main estimate is based on a QALY valuation of 3-times each country's GDP per capita (EU25 average of €64,000); the minimum value is based on €32,000 per QALY; and the maximum value is based on €158,000 per QALY [the rationales behind these figures are detailed in Baumberg and Anderson (submitted), and can also be obtained from the authors]; (G) Psychosocial & behavioural effects excluded from the intangible subtotal to avoid potential double-counting with loss of healthy life.

Aside from the tangible monetary costs, alcohol causes an intangible cost of €152bn-€764bn, which incorporates the value people place on pain, suffering and life itself due to crime and lost healthy life due to alcohol. As explained Box 3.3, this intangible cost is not an 'economic loss' in the normal sense of the term and cannot be compared to e.g. GDP (nor can it be simply added to the tangible cost, given that they both include estimated values for lost life but the estimates are done in different ways). However, this cost offers a more accurate estimate of the full economic and human cost of alcohol to the EU, as well as avoiding several problems within the tangible way of valuing human life (see below).

Methodological issues

Although the present study avoids some pitfalls of previous studies, there are a number of remaining methodological issues that should be noted. First, the estimates are subject to a wide margin of error, as found for all cost-of-illness studies (Single and Easton 2001). Combined with data limitations and a lack of good studies from the EU10, this has made it impossible to adjust the costs for any measure of harm in individual countries. Given evidence that the costs are likely to vary considerably between countries (see Chapters 4-6), the cost estimates are only presented for the EU as a whole. Recommendations for overcoming these limitations are mentioned briefly in the research recommendations within Chapter 10.

A second problem relates to the assumptions that are made in social cost studies (Single *et al.* 2003), including the different rates used for reducing future costs to present-day values. Most studies also treat the lost production due to alcohol-attributable unemployment as irreplaceable by other people without jobs, which is of debatable validity (Maynard, Godfrey, and Hardman 1994). A Danish study that instead assumed that these people are replaced after a period of 3 months produced a figure for this cost component that was 100 times lower, although the authors of the Danish study argue that the original assumption is more accurate in the current economic situation (Sundhedsministeriet [Ministry of Health] 1999).

A further problem results from applying the same logic as in the discussion on alcohol and employment above: in the absence of alcohol, the same money would be spent on another consumer good or service. However, it is clearly possible that spending on alcohol would be replaced by another good with a non-zero social cost. It is, therefore, recommended (cf. Chapter 10) that the same research that investigates the economic impact of changing alcohol consumption on the wider economy should examine the potential costs in consumer choices that replace alcohol.

Despite these continuing concerns, the number of potential harms that were not valued suggest that the figure is likely to be an underestimate of the true gross social cost of alcohol (although it is impossible to say whether the net cost figure is an under- or over-estimate given the omission of the social benefits below). The non-valued harms include impaired on-the-job productivity (Gjelsvik 2004), (although see tentative attempts in Single, Robson, and Xie 1996; Harwood, Fountain, and Livermore 1998; García-Sempere and Portella 2002; Jeanrenaud *et al.* 2003) a share of the crimes committed by people using *both* alcohol and drugs (Collins and Lapsley 2002; Pernanen *et al.* 2002), property damage from workplace accidents (Bergmann and Horch 2002; Eurostat 2004), employer costs and travel delays due to drink-

driving accidents (Miller, Lestina, and Spicer 1998; Miller and Blewden 2001), insurance administration costs (Collicelli 1996), social welfare payment administration (Harwood 2000; Harwood, Fountain, and Livermore 1998) (Salomaa 1995; Single, Robson, and Xie 1996) and lost productivity for several groups including prisoners, crime victims and carers (Salomaa 1995; Collicelli 1996; Brecht, Poldrugo, and Schädlich 1996; Harwood, Fountain, and Livermore 1998; Bergmann and Horch 2002).

Social benefits

Although only a small number of the reviewed studies consider any of the social benefits of alcohol consumption (see also Box 3.3), the estimates above account for the health benefits of alcohol for two cost components. First, the intangible costs of lost life are based on Disability-Adjusted Life Years after accounting for the current health benefits of alcohol relative to a situation of no drinking, based on the Global Burden of Disease study (GBD; see Chapter 6). Second, the health costs use an adjustment based on a Swiss costing (Jeanrenaud *et al.* 2003) that calculated the current health benefits of alcohol consumption relative to a situation of light drinking.¹⁴

There are also several benefits that are not included in this study for methodological reasons:

1. **There may be ‘cost savings’ that arise from non-working people who die prematurely, so that they do not consume resources.** The implications of this have proved to be problematic if misinterpreted, as it could be taken to mean that the lives of people over around age 55 years are a net cost to society (Meltzer 1997).¹⁵ This can be avoided by valuing life through people’s willingness to pay to change health risks (the intangible approach presented above) rather than simply by their contribution to the economy (the tangible approach).
2. **There may also be ‘cost savings’ in healthcare as people’s early deaths prevent them from getting a disease that is more costly to treat.** These ‘cost savings’ are particularly likely for preventing fatal diseases (Bonneux *et al.* 1998). One study has estimated that *eliminating* alcohol-attributable health harms would produce additional costs in nursing homes, although there would be savings overall in the health system (the savings being further increased due to the ‘cost’ of the health benefits of alcohol; Collins and Lapsley 2002). However, this method has only been used outside of Europe, is not compatible with the methods of the European studies reviewed, and is incompatible with other European level estimates such as for heart disease (Peterson *et al.* 2005) and tobacco (The ASPECT Consortium 2004).

¹⁴ The ideal comparison for examining the health benefits would be the lowest-risk level of alcohol consumption (i.e. the ‘nadir’, which is equivalent to ‘light drinking’ at some ages; see chapter 5). However, the closest potential adjustment to the cost estimates was to use the situation of light drinking in the Swiss study; furthermore, it was not possible to recalculate the GBD figures for this situation. Nevertheless, and as discussed in chapter 6, the difference between these alternative situations is much less for years of life lost than for numbers of deaths – this suggests that the effect of this discrepancy is likely to be relatively minor.

¹⁵ Evidently most people over age 55 years are still in the workforce, but age 55 years is the point that – at least in the US – the expected *lifetime* resource use outweighs the expected *lifetime* production of an individual.

3. **Probably the main benefit of alcohol derives from the pleasure that people get from drinking it (see Chapter 4 and Leontaridi 2003).** While economists have devised theoretical methods for valuing this (Leontaridi 2003), there are some problematic assumptions relating to the nature of addiction (Easton 1997; Aslam *et al.* 2003) as well as substantial methodological difficulties in performing this calculation for alcohol (such that no European study that was reviewed has attempted it) (Collins and Lapsley 2002).
4. **There may be further external benefits of alcohol in terms of its ability to 'catalyse' social interactions and to help in the creation of social networks or social capital.** However, such benefits are generally anecdotal rather than supported by research; no study has attempted to attach a value to these, and it is unclear what methodological basis could underpin any such valuation (Leontaridi 2003).

Economic analyses and policymaking

As implied by the previous discussion in this chapter, it must be remembered here that the social cost of alcohol should not simply be set alongside the economic role of alcoholic beverages (Lehto 1995; Leontaridi 2003). Even in the hypothetical situation examined by the costing studies (that alcohol disappeared overnight), the likely outcome depends on the size of the industry in question (Single *et al.* 2003). For small-scale production, it is reasonable to assume that resources will be re-used to a similar level in the medium- to long-term. For larger industries, there may be a noticeable detrimental impact on the national economy depending on whether the industry was a major exporter, whether consumption expenditure moves to a domestically produced replacement or not, and whether the substantial funds that are ploughed into wine production through the CAP were put to a labour-intensive use such as public services.

The social cost estimates above do however need to be considered alongside other economic analyses. As mentioned in Box 3.3, the social cost is not the same as the external cost – that is, the cost of someone's drinking to other people in society. This is based on a view taken from economic theory that governments should set a level of alcohol taxation so that the full costs of the decision to drink are accounted for in the price (Godfrey 2004). No European studies have calculated a cost on this basis, but studies do exist for other developed economies such as the US (Manning *et al.* 1989; Heien and Pittman 1993) and New Zealand (Barker 2002). It is difficult to explore the implications of these studies for the European situation, however, as the definition of what is an 'external' cost varies enormously, and also because drinkers' health costs are often a private cost in the US, while are predominantly publicly borne in Europe. One European study, from France (Fenoglio, Parel, and Kopp 2003), did, however, divide the total cost between different sectors of society, and found that the greatest costs were borne by private companies (48%), while drinkers and other households bore 38% and governments only 14%.

While externality studies are another useful tool for policymaking, they evidently omit any consideration of the broad range of costs borne by the individual drinker, and are most useful when conducted alongside rather than in place of the more common social cost studies. This is particularly true given two contentious results of the assumptions in many externality studies – first, that any harm within the household (such as to the drinker's partner, or children) is counted as a private cost; and second, that drinkers are both fully rational and fully informed of the risks when they

decide to drink (Collins and Lapsley 2002; Single *et al.* 2003). This does not necessarily mean that external costings will be lower than social costings however, as there are substantial costs that are *not* considered in a social cost study that should be calculated within an externalities study – in particular, the general class of ‘transfers’ of money that includes government social welfare expenditure.

Health and economic success

Although cost-of-illness studies are a “*useful first step*” (Suhrcke *et al.* 2005) in demonstrating the size of the harms that are linked to a particular condition or risk factor, they suffer from a number of drawbacks in addition to their methodological weaknesses. These relate in particular to what they *do not show*, which as Box 3.3 suggests, covers a range of highly policy-relevant questions. Most of all, their counterfactual scenario of an alcohol-free world means that they say nothing about whether a given policy option will produce a social benefit or not.

Following on from this, it is important to treat an estimate of the social or external cost of alcohol as the start rather than the end of economic contributions to policymaking. As Collins and Lapsley (2000) have noted, further research should:

1. quantify the share of costs that can be avoided;
2. evaluate the policy investments that should be made to avoid them; and
3. monitor how effective the resulting policies have been in reducing costs.

Similarly, a recent report funded by the European Commission has noted that “*since human capital matters for economic outcomes and since health is an important component of human capital, health matters for economic outcomes*” (Suhrcke *et al.* 2005:9). This leads them to the similar conclusion that cost-benefit analyses of public health interventions “*would represent the ultimate and necessary step in order to enable a direct comparison of the returns to health investment with alternative uses of money*” (Suhrcke *et al.* 2005:14). In this context, the WHO programme on Choosing Interventions that are Cost-Effective (CHOICE) is one promising step in such a direction, and this is discussed at the end of Chapter 7.

CONCLUSION

Alcohol is a major part of the social, cultural and economic life of European citizens, with the countries of Europe dominating the global alcohol market. Europeans are employed in the production, sale, and advertising of alcoholic drinks, and many European governments collect above 1% of their tax income from excise duties on alcohol. However, due to the relative inelasticity of alcohol consumption, the government’s alcohol tax revenue depends primarily on the level of taxation rather than the level of consumption (the effects of taxes being discussed further in Chapter 7). Furthermore, a crude analysis shows no strong effect of changes in consumption on the number of jobs in industries linked to alcohol (suggesting the effect may be relatively weak), while analyses from other fields suggest that the economic impact of changes in one consumer good depend on how consumers change their spending patterns. While further research is needed on this issue, it appears that changes in the consumption of alcoholic beverages will not necessarily have effects in the same direction on the economy as a whole, despite the size of the alcoholic beverages industry in many European countries.

There is a social cost attached to alcohol, with the tangible cost estimated at €125bn (€79bn-€220bn) in 2003, for the European Union as a whole. This is very similar to the social cost of tobacco in Europe (€98bn-€130bn in 2000). This does not take into account a value that people place on pain, suffering and life itself due to crime and lost healthy life due to alcohol, which has been estimated at €270bn (although different valuations of these intangibles produce a range of €150-760bn). Although these costs take into account the health benefits (largely from heart disease), they do not account for the social benefits of alcohol. Having considered the economic impact of alcohol, the next two chapters discuss the health impact of alcohol on individuals and on Europe as a whole.

References

Ahermaa, E. and Josing, M. (2005). "Estonian Alcohol Market." *Presentation at Alcohol - use, harms and policy. A research-based Nordic-Baltic seminar, Riga, October 3, 2005 [conference proceeding]*

Andlin-Sobocki, P. and Rehm, J. (2005). "Cost of Addiction in Europe." *European Journal of Neurology*, 12(S1): 28-33.

Aslam, S., Barham, L., Bramley-Harker, E., Dodgson, J., and Spackman, M. (2003). *Alcohol in London: a cost-benefit analysis*. London, UK: A Final Report for the Greater London Authority Prepared by NERA.
http://www.london.gov.uk/mayor/health/drugs_and_alcohol/docs/cost_benefit_alcohol.pdf

Baumberg, B. and Anderson, P. (submitted). "How much does alcohol cost Europe? A review and estimate of the social cost in 2003."

Barker, F. (2002). *Consumption externalities and the role of Government: the case of alcohol*. Working Paper 02/25. New Zealand Treasury.
<http://www.treasury.govt.nz/workingpapers/2002/02-25.asp>

Bergmann, E. and Horch, K. (2002). *Kosten alkoholassoziierter Krankheiten: Schätzung für Deutschland [The cost of alcohol-related illness: estimates for Germany]*. Berlin, Germany: Robert Koch-Institute. <http://www.rki.de/FORSCH/FOR2/FORGBE/AN33.PDF>

Bonneux, L., Barendregt, J. J., Nusselder, W. J., and Van der Maas, P. J. (1998). "Preventing Fatal Diseases Increases Healthcare Costs: Cause Elimination Life Table Approach." *British Medical Journal*, 316: 26-29. <http://bmj.com/cgi/content/full/316/7124/26>

Brecht, J. G., Poldrugo, F., and Schädlich, P. K. (1996). "Alcoholism: The Cost of Illness in the Federal Republic of Germany." *PharmacoEconomics*, 10(5): 484-93.

Collicelli, C. (1996). "Income From Alcohol and the Costs of Alcoholism: an Italian Experience." *Alcologia*, 8(2): 135-43.

Collins, D. and Lapsley, H. (2000). Economic evaluation of policies and programmes: further uses of estimates of the social costs of substance abuse. *Bulletin on Narcotics*. Vienna: United Nations International Drug Control Programme

Collins, D. and Lapsley, H. (2002). Counting the cost: estimates of the social costs of drug abuse in Australia in 1998-9. Canberra: Australian Government Printing Service.
[http://www.health.gov.au/internet/wcms/publishing.nsf/Content/health-publth-publicat-mono.htm/\\$FILE/mono49.pdf](http://www.health.gov.au/internet/wcms/publishing.nsf/Content/health-publth-publicat-mono.htm/$FILE/mono49.pdf)

Easton, B. (1997). *The social costs of tobacco use and alcohol misuse*. Public Health Monograph. 2 ed. Wellington, New Zealand: Department of Public Health, Wellington School of Medicine.

Elinder, L. S., Joossens, L., Raw, M., Andréasson, S., and Lang, T. (2003). *Public health aspects of the EU Common Agricultural Policy: developments and recommendations for change in four sectors (fruit and vegetables, dairy, wine and tobacco)*. Sweden: National Institute for Public Health. http://www.fhi.se/upload/PDF/2004/English/eu_inlaga.pdf

Euromonitor and just-drinks.com (2005). *The just-drinks/Euromonitor International industry review 2004-2010*. Bromsgrove, UK: Aroq Ltd.

European Commission (2003). *Health in Europe: results from 1997-2000 surveys*. http://epp.eurostat.cec.eu.int/cache/ITY_OFFPUB/KS-57-03-184/EN/KS-57-03-184-EN.PDF

Eurostat (2004). *Statistical analysis of socio-economic costs of accidents at work in the European Union*. Luxembourg: Office for Official Publications of the European Communities, 2004. http://epp.eurostat.cec.eu.int/cache/ITY_OFFPUB/KS-CC-04-006/EN/KS-CC-04-006-EN.PDF

Fenoglio, P., Parel, V., and Kopp, P. (2003). "The Social Cost of Alcohol, Tobacco and Illicit Drugs in France, 1997." *European Addiction Research*, 9(1): 18-28.

Furlani, A. and colleagues (2003). *Ex-post evaluation of the Common Market Organisation for wine*. Tender AGRI / EVALUATION / 2002 / 6. Prepared for European Commission - DG Agriculture. http://ec.europa.eu/comm/agriculture/eval/reports/wine/index_en.htm

García-Sempere, A. and Portella, E. (2002). "Los Estudios Del Coste Del Alcoholismo: Marco Conceptual, Limitaciones y Resultados En España [Studies of the Cost of Alcoholism: Concepts, Limitations and Results From Spain]." *Addicciones*, 14(Suplemento 1): 141-53. <http://www.irefrea.org/Publications/Spanish/Spanish.htm>

Gjelsvik, R. (2004). *Utredning av de samfunnsmessige kostnadene relatert til alkohol [Counting the economic costs caused by alcohol]*. Norway: Directorate for Health and Social Affairs, the Rokkan Centre, and the Norwegian Institute for Alcohol and Drug Research (SIRUS).

Godfrey, C. (2004). "The Financial Costs and Benefits of Alcohol." *Paper presented to the European Alcohol Policy Conference: Briding the Gap, Warsaw, 16-19 June 2004 [conference proceeding]* <http://www.eurocare.org/btg/conf0604/papers/godfrey.pdf>

Godfrey, C. and K. Hartley (1990). "Employment." Pp.204-25 in *Preventing alcohol and tobacco problems volume 1: the addiction market*, Edited by A. Maynard and P. Tether. Aldershot, UK: Avebury.

Gutjahr, E. and G. Gmel (2001). "The Social Costs of Alcohol Consumption." Pp.133-44 in *Mapping the Social Consequences of Alcohol Consumption*, Edited by H. Klingemann and G. Gmel. Dordrecht, the Netherlands: Kluwer Academic Publishers on behalf of WHO-EURO.

Harrison, B. (1971). *Drink and the Victorians: the Temperance Question in England: 1815-72*, London: Faber.

Harwood, H. (2000). *Updating estimates of the economic costs of alcohol abuse in the United States: estimates, update methods and data*. Report prepared by The Lewin Group for the National Institute on Alcohol Abuse and Alcoholism (NIAAA). <http://pubs.niaaa.nih.gov/publications/economic-2000/>

Harwood, H., Fountain, D., and Livermore, G. (1998). *The economic costs of alcohol and drug abuse in the United States – 1992*. Report prepared for the National Institute on Drug Abuse (NIDA) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA), National Institutes of Health, Department of Health and Human Services (NIH Publication No. 98-4327). Washington ed. Rockville, MD: National Institutes of Health. <http://www.nida.nih.gov/EconomicCosts/Index.html>

Heien, D. M. and Pittman, D. J. (1993). "The External Costs of Alcohol Abuse." *Journal of Studies on Alcohol*, 54: 302-7.

High Level Group on Fraud in the Tobacco and Alcohol Sectors (1998). *Report to Directors General for Customs and Indirect Taxation*.

http://ec.europa.eu/comm/taxation_customs/taxation/excise_duties/circulation_control/studies_reports/index_en.htm

HM Customs and Excise (2004). *Measuring and tackling indirect tax losses - 2004*. HMSO. customs.hmrc.gov.uk/channelsPortalWebApp/downloadFile?contentID=HMCE_PROD_011582

Jacobs, R., H. F. Gale, T. C. Capehart, P. Zhang, and P. Jha (2000). "The Supply-Side Effects of Tobacco-Control Policies." Pp.311 in *Tobacco Control in Developing Countries*, Edited by P. Jha and F. J. Chaloupka. Oxford University Press for the World Bank and World Health Organization.

Jeanrenaud, C., Priez, F., Pellegrini, S., Chevrou-Severac, H., and Vitale, S. (2003). *Le coût social de l'abus d'alcool en Suisse [The social costs of alcohol in Switzerland]*. Neuchâtel, Switzerland: Institut de recherches économiques et régionales, Université de Neuchâtel.

Jernigan, D. (1997). *Thirsting for markets: the global impact of corporate alcohol*. The Marin Institute.

Joossens, L. and Raw, M. (2000). "How Can Cigarette Smuggling Be Reduced?" *British Medical Journal*, 321: 947-50. <http://bmj.bmjournals.com/cgi/content/full/321/7266/947>

Karlsson, T. and Tigerstedt, C. (2005). "Alcohol Policy: Changing Climate and Changing Structures in the Nordic Countries." *Presentation at Alcohol - use, harms and policy. A research-based Nordic-Baltic seminar, Riga, October 3, 2005 [conference proceeding]*

Koizol, M. (2003). Zubrowka: Polish vodka and cultural geographic indicators. *Trade and Environment Database Case Studies*. <http://www.american.edu/ted/polish-vodka.htm>

Lehto, J. (1995). *The economics of alcohol policy*. WHO-EURO.

Leifman, H. (2001). "Estimations of Unrecorded Alcohol Consumption Levels and Trends in 14 European Countries." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 18(English Supplement): 54-70.

Leontaridi, R. (2003). *Alcohol misuse: How much does it cost?* London: Cabinet Office. <http://www.number10.gov.uk/files/pdf/econ.pdf>

Manning, W. G., Keeler, E. B., Newhouse, J. P., Sloss, E. M., and Wasserman, J. (1989). "The Taxes of Sin: Do Smokers and Drinkers Pay Their Way?" *Journal of the American Medical Association*, 261: 1604-9.

Maynard, A., Godfrey, C., and Hardman, G. (1994). "Conceptual Issues in Estimating the Social Costs of Alcohol." *International Symposium on the Economic Costs of Substance Abuse, Banff, Canada; May 11-13th 1994. [conference proceeding]* <http://www.ccsa.ca/pdf/ccsa-005409-1994.pdf>

Meltzer, D. (1997). "Accounting for Future Costs in Medical Cost-Effectiveness Analysis." *Journal of Health Economics*, 16: 33-64.

Merriman, D., A. Yurekli, and F. J. Chaloupka (2000). "How Big Is the Worldwide Cigarette Smuggling Problem?" *Tobacco control in developing countries*, Edited by P. Jha and F. J. Chaloupka. OUP for the World Bank and World Health Organization.

Miller, T. R. and Blewden, M. (2001). "Costs of Alcohol-Related Crashes: New Zealand Estimates and Suggested Measures for Use Internationally." *Accident Analysis and Prevention*, 33: 783-91.

Miller, T. R., Lestina, D. C., and Spicer, R. S. (1998). "Crash Costs in the United States by Age, Blood Alcohol Level, Victim Age, and Restraint Use." *Accident Analysis and Prevention*, 30(2): 137-50.

Molyneux, R., G. de Ryck, B. Kegels, and P. Naert (1993). "The Socio-Economic Impact of the European Alcoholic Drinks Industry." *Alcohol beverages and European society: a report by the Amsterdam Group*.

Naert, P., S. Naert, and D. Maex (2001). "The Socio-Economic Impact of the European Alcoholic Beverages Industry." Pp.32-39 in *The Amsterdam Group Report 2001*, TAG.

OECD (2001). *Consumption tax trends: VAT/GST, excise and environmental taxes*. Paris: Organisation for Economic Cooperation and Development (OECD) Publications. <http://www1.oecd.org/publications/e-book/2301111e.pdf>

Österberg, E. (2005). "Taxes and Border Trade." *Presentation at Alcohol - use, harms and policy. A research-based Nordic-Baltic seminar, Riga, October 3, 2005 [conference proceeding]*

Pernanen, K., Cousineau, M-M., Brochu, S., and Sun, F. (2002). *Proportion of crimes associated with alcohol and other drugs in Canada*. Canadian Centre for Substance Abuse.

Peterson, S., Peto, V., Rayner, M., Leal, J., Luengo-Gernandez, R., and Gray, A. (2005). *European cardiovascular disease statistics (2005 edition)*. British Heart Foundation Health Promotion Research Group and Health Economics Research Centre, Department of Public Health, University of Oxford. <http://www.heartstats.org/topic.asp?id=4540>

Room, R. and Jernigan, D. (2000). "The Ambiguous Role of Alcohol in Economic and Social Development." *Addiction*, 95(Supplement 4): 523-35.

Salomaa, J. (1995). "The Costs of the Detrimental Effects of Alcohol Abuse Have Grown Faster Than Alcohol Consumption in Finland." *Addiction*, 90(4): 525-37.

Single, E., Collins, D., Easton, B., Harwood, H., Lapsley, H., Kopp, P., and Wilson, E. (2003). *International Guidelines for Estimating the Costs of Substance Abuse*. 2, World Health Organization.

Single, E. and Easton, B. (2001). "Estimating the Economic Costs of Alcohol Misuse: Why We Should Do It Even Though We Shouldn't Pay Too Much Attention to the Bottom-Line Results." *Kettil Bruun Society for Social and Epidemiological Research on Alcohol meeting in Toronto [conference proceeding]* <http://www.eastonbh.ac.nz/article107.html>

Single, E., Robson, L., and Xie, X. (1996). *The costs of substance abuse in Canada : a cost estimation study [Full report]*. Ottawa, ON: Canadian Centre on Substance Abuse.

SoRAD (2005). *Konsumtionsutvecklingen månad för månad och i rullande 12-månadersperioder från juni år 2000 och framåt, uppdaterad t.o.m. mars 2005 [The month-for-month and rolling 12-month developments in alcohol consumption since June 2000, updated March 2005]* SoRAD, Centrum för socialvetenskaplig alkohol- och drogsforskning, Stockholms universitet. http://www.sorad.su.se/doc/uploads/alcohol_statistics/konsumtion.pdf

Spitzer, A. A. (2002). The wine pact: 'New World' wines change the industry. *Trade and Environment Database Case Studies*. <http://www.american.edu/TED/wine-pact.htm>

Suhrcke, M., McKee, M., Sauto Arce, R., Tsoлова, S., and Mortensen, J. (2005). *The contribution of health to the economy in the European Union*. European Communities. http://ec.europa.eu/comm/health/horiz_publications_en.htm

Sundhedsministeriet [Ministry of Health] (1999). *"De samfundsøkonomiske konsekvenser af alkoholforbrug" [The Economic consequences of alcohol consumption] in Denmark*. 2nd edition. Copenhagen, Denmark: Ministry of Health. <http://www.im.dk/publikationer/alkoholrapport/index.htm>

Taylor, L. (2004). Ouzo, Trade and Culture. *Trade and Environment Database Case Studies*. <http://www.american.edu/TED/ouzo.htm>

The ASPECT Consortium (2004). *Tobacco or health in the European Union: past, present and future*. European Commission.

Thurman, C. (2000). "Alcohol Drinks: Demand and Supply." Pp.79-123 in *The Alcohol Report*, Edited by Martin Plant and D. Cameron. London: Free Association Books.

Tighe, A. and Bussett, A. 2004. *British Beer and Pub Association Statistical Handbook 2004*, London: Brewing Publications Limited.

UK Treasury Select Committee (2000). *HM Customs and Excise: Second Report of the Session 1999-2000*. HMSO.
<http://www.parliament.the-stationery-office.co.uk/pa/cm199900/cmselect/cmtreasy/cmtreasy.htm>

UK Treasury Select Committee (2005). *Excise duty fraud*. London: The Stationery Office Limited.
<http://www.publications.parliament.uk/pa/cm200405/cmselect/cmtreasy/126/12602.htm>

Vingilis, E., Lote, R., and Seeley, J. (1998). "Are Trade Agreements and Economic Cooperatives Compatible With Alcohol Control Policies and Injury Prevention?" *Contemporary Drug Problems*, 25(Fall): 579-620.

Wells, M., P. Gerrard, and D. Hubbard (2005). "Oral Evidence to the Treasury (Sub-)Committee on Excise Duty Fraud, 17 Nov 2004." Pp.Ev1-Ev12 in *Excise Duty Fraud: fourth report of session 2004-05*, Edited by House of Commons Treasury Committee. London: The Stationery Office Ltd.

Chapter 4: The use of alcohol in Europe

The EU is the heaviest drinking region of the world, although the 11 litres of pure alcohol drunk per adult each year is still a substantial fall from a recent peak of 15 litres in the mid-1970s. The last 40 years have also seen a harmonization in consumption levels in the EU15, where rises in central and northern Europe between 1960 and 1980, were met by a consistent fall in southern Europe. Average consumption in the EU10 is also closer to the EU15 than ever before, although substantial variation remains within the EU10. Most Europeans drink alcohol, but 55 million adults (15%) abstain; taking this and unrecorded consumption into account, the consumption per drinker reaches 15 litres per year. Abstinence appears to have decreased in northern Europe and stayed constant elsewhere, suggesting that abstinence and consumption levels move relatively independently.

Just under half of this alcohol is consumed in the form of beer (44%), with the rest divided between wine (34%) and spirits (23%). Within the EU15, northern and central parts drink mainly beer, while those in southern Europe drink mainly wine (although Spain may be an exception). This is a relatively new phenomenon, with a harmonization visible over the past 40 years in the EU15. Around 40% of drinking occasions in most of the EU15 are consumed with the afternoon/evening meal, although those in southern Europe are much more likely to drink with lunch than elsewhere. While the level of daily drinking also shows a north–south gradient, non-daily frequent consumption seems to be more common in central Europe, and there is evidence for a recent harmonization within the EU15.

Drinking to drunkenness varies across Europe, with fewer southern Europeans than others reporting getting drunk each month. This pattern is attenuated when 'binge-drinking', a measure of drinking beyond a certain number of drinks in a single occasion, is instead investigated, suggesting that there are systematic differences in either or both of people's willingness to report being intoxicated or the length of a 'single occasion'. The studies of binge-drinking also show occasional exceptions to the north-south pattern, in particular suggesting that Sweden has one of the lowest rates of binge-drinking in the EU15. Summing up across the EU15, adults report getting drunk 5 times per year on average but binge-drink 17 times. This is equivalent to 40m EU15 citizens 'drinking too much' monthly and 100m (1 in 3) binge-drinking at least once per month. Much fewer data are available for the EU10, but that which exists suggests that some of the wine-drinking is replaced by spirits, the frequency of drinking is lower, and the frequency of binge-drinking higher than in the EU15.

While 266 million adults drink alcohol up to 20g (women) or 40g (men) per day, over 58 million adults (15%) consume above this level, with 20 million of these (6%) drinking at over 40g (women) or 60g per day (men). Looking at addiction rather than drinking levels, we can also estimate that 23 million Europeans (5% of men, 1% of women) are dependent on alcohol in any one year.

In every culture ever studied, men are more likely than women to drink at all and to drink more when they do, with the gap greater for riskier behaviour. It is hard to find evidence that this gender gap has decreased for most aspects of drinking, although the gender gap in drunkenness is lowest in young adults. Although many women give up alcohol when pregnant, a significant number (25%-50%) continue to drink, and some continue to drink to harmful levels. Patterns in drinking behaviour can also be seen for socio-economic status (SES), where those with lower SES are less likely to drink alcohol at all. Despite a complex

picture for some aspects of drinking (with some measures showing opposite trends for men and women), getting drunk and becoming dependent on alcohol are both more likely among drinkers of lower SES.

Nearly all 15-16 year old students (>90%) have drunk alcohol at some point in their life, on average beginning to drink at 12½ years of age, and getting drunk for the first time at 14 years. The most common place for them to have drunk alcohol is at their own or someone else's home, although sizeable numbers also drink in outdoor public spaces and bars. The average amount drunk on a single occasion by 15-16 year olds is over 60g of alcohol, and reaches nearly 40g even in the lower-consuming (for 15-16 year olds) south of Europe. Over 1 in 8 (13%) of 15-16 year olds have been drunk more than 20 times in their life, and more than 1 in 6 (18%) have 'binged' (5+ drinks on a single occasion) three or more times in the last month. Although two countries saw more drunkenness on some measures in girls than boys for the first time in 2003, boys continue to drink more and get drunk more often than girls, with little reduction in the absolute gap between them overall.

Most countries show a rise in binge-drinking for boys from 1995/9 to 2003, and nearly all countries show this for girls (similar results are found for non-ESPAD countries using other data). This is due to a rise in binge-drinking and drunkenness across most of the EU 1995-9, followed by a much more ambivalent trend since (1999-2003). A narrowed gap between the EU10 and EU15 is also visible for binge-drinking and drunkenness, due to both the size of the changes and a continued rise in parts of the EU10, particularly for girls, and accompanied by rises in other aspects of consumption (e.g. last occasion consumption). Trends are more ambivalent for many other aspects of drinking, however, such as frequency of drinking and estimated total consumption. While there is, therefore, no evidence that young people's use of alcohol has increased in the last decade, it does appear that there is a trend towards increased risky use, particularly in the EU10.

THE POPULATION LEVEL OF DRINKING

The European Union is the heaviest drinking region of the world, with each adult drinking 11 litres of pure alcohol each year – a level over two-and-a-half times the rest of the world's average (WHO 2004).¹ This high level is in fact a considerable fall from the highest point of over 15 litres in the mid-1970s, a peak which followed a period of rising consumption levels across most of Europe. Since then there has been a general plateau across Europe, with the exception of a substantial fall in the wine-producing countries of southern Europe, and a continuing rise in alcohol consumption in Ireland. This contrasts with persistently rising alcohol consumption in south-east Asia and the western Pacific (see Figure 4.1), although drinking in the Americas (at just under 7 litres), the next highest-consuming world region, follows a similar trend to Europe.

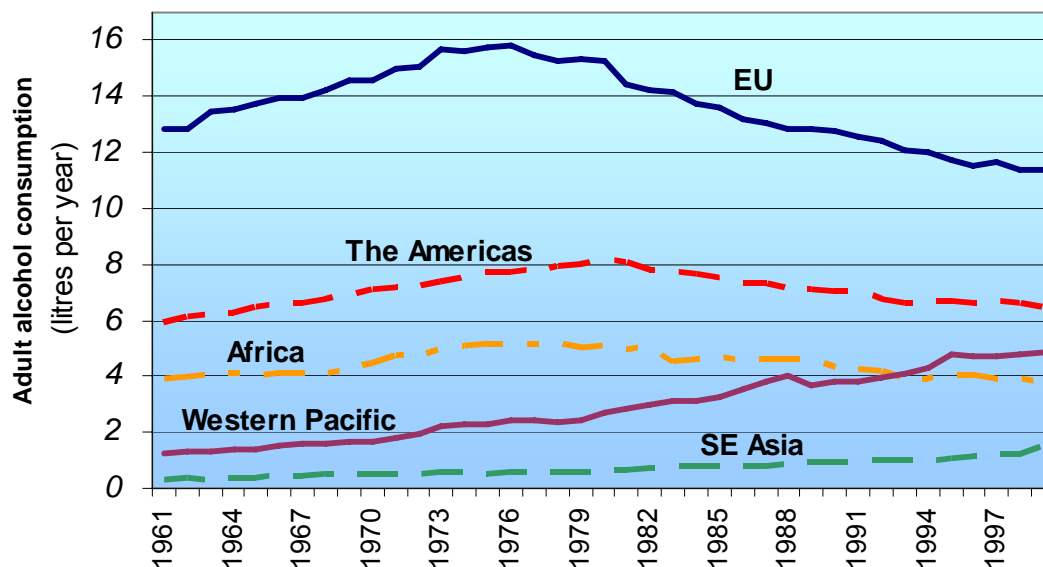


Figure 4.1 Europe and the world's drinking Sources: *Global Status Report on Alcohol (WHO 2004)*; EU figures are taken from *WHO Health for All Database* and *WHO Global Alcohol Database* (as below). Averages are population-weighted.

Within the EU there is a considerable variation in levels of recorded consumption, with Luxembourg drinking two-and-a-half times as much per adult as Malta, and even lower levels visible in non-EU European countries such as Iceland, Norway and Turkey. Recorded alcohol consumption is slightly lower in the EU10 (10½ litres) than the EU15 (11½), and is noticeably lower in three of the Nordic countries (Iceland, Norway and Sweden) than the rest of the EU15.

¹ Values are all per adult (defined as at least 15 years old) to compensate for greater numbers of pre-drinkers in some countries. Global comparisons are taken from the *Global Status Report on Alcohol (WHO 2004)*. All trend data is from the WHO's *Global Alcohol Database (1961-99)*, supplemented by all recent (2002) European data from the WHO's *Health For All Database (HFA)*. It should be noted that the two trend sources sometimes diverge, in particular with the HFA showing spirits consumption in Portugal as around 2 litres lower over 1970-99. Portugal's result should therefore be treated with some caution; for related reasons, the same cautions also apply to Cyprus and Malta (see also Gual and Colom 1997:S22-4).

However, these figures miss out any alcohol that comes from smuggling, home production and cross-border shopping as well as failing to adjust for drinks bought by tourists rather than residents (Trolldall 2001; Leifman 2001a). Although unrecorded consumption is by its nature difficult to measure, illicit and cross-border consumption seem to be highest in eastern Europe (particularly the Baltic countries, Bulgaria, Poland, and Slovenia), where it is estimated to reach 5 litres per adult per year.

Considering all forms of consumption then, the average EU adult drinks 13 litres of alcohol per year – with EU10 adults drinking two litres more than those in the EU15 (see Figure 4.2).²

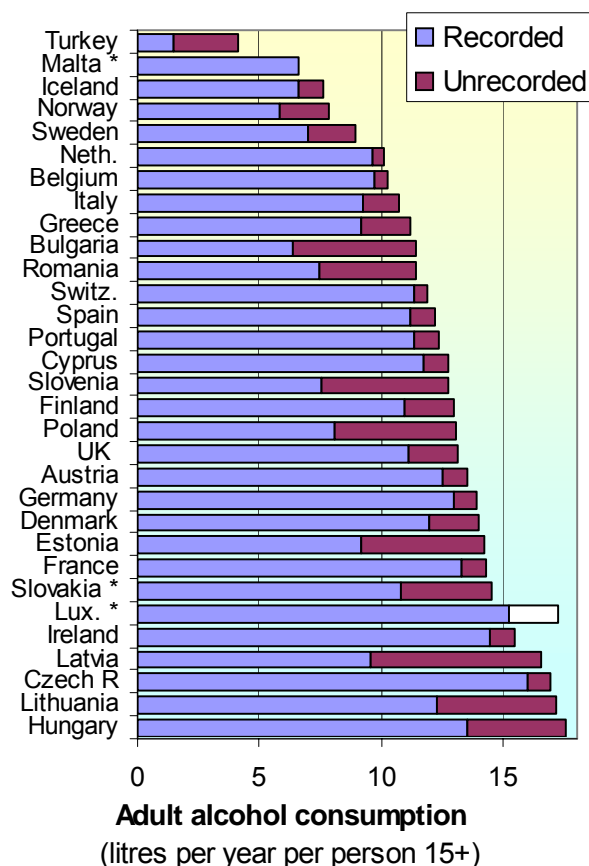


Figure 4.2 Alcohol consumption in Europe, 2002

Sources: WHO Health for All database and WHO GBD study (Rehm et al 2004).

* No estimate available for unrecorded consumption in Malta; APN update of WHO figures used for Slovakia; unrecorded consumption in Lux. is minus 2 litres due to tourist consumption.

Abstinence and consumption per drinker

As well as comparing the average amount drunk per European adult, it is also important to discount the people who abstain from alcohol and consider how much the average drinker consumes. The broad category of 'non-drinkers' includes a number of different drinking histories, including people who have never drunk alcohol in their life and people who were once heavy drinkers but who gave up alcohol for health reasons, as well as other more complex histories. A problem arises in defining people who only drink very occasionally (e.g. champagne on special events), who may say they do not drink in one culture (e.g. Spain) but will consider themselves occasional drinkers in another (e.g. Norway; see Allamani 2001). Conversely, data from the 1970s suggests that a small but still significant number (10%-15%) of those in temperance cultures who define themselves politically as abstainers will nevertheless report drinking at least once in the past year (Lindgren 1973).

² At the time of printing, the Estonian Institute of Economic Research provided data on recorded and unrecorded consumption, adjusted for tourism purchases, which differed from the Estonian data used in Figure 4.2 and for this report.

Box 4.1 – SOURCES ON ALCOHOL CONSUMPTION IN EUROPE

Making alcohol policy in Europe requires comparative data across the countries (and regions) of Europe, which this chapter reviews and summarises. However, it should be noted that there are substantial difficulties in making comparisons across different cultural contexts using studies conducted in different languages:

- **Interpretation:** questions may be interpreted differently depending on the prevailing language and culture. For example, there are numerous words or expressions referring to intoxication, with varied meanings (Cameron 2000). The EuroHIS project (Raitasalo 2004) also found that countries where alcohol is more related to the rhythms of everyday life can use routines to help answer questions (although they may also need help in understanding terms) – for example, respondents in the UK had greater difficulty answering questions than those in France or Germany (Simpura 2002).
- **Underreporting:** all surveys of drinking find that the reported total alcohol consumed is less than sales records show (typically in the range 40%-60%; Bloomfield et al. 2003). A necessary assumption for making international comparisons is that the level of under-reporting is constant, but this is unlikely to be strictly true (see also for ECAS).
- **Methodology (other):** more generally, comparative surveys in all fields must contend with variations in sampling practices, response rates, and the way fieldwork is conducted across varying cultural contexts (Simpura, Karlsson and Leppanen 2001; Leifman 2002b; Hibell et al. 2004).

The sources used also differ in the robustness of the results. Key comparative sources are therefore discussed briefly in turn:

- **WHO-EURO Health for All database:**

Information on recorded consumption is taken from several sources (including the market research organization WARC), with WHO-EURO staff deciding on the most robust data. Nevertheless, unexplained differences remain between this and the WHO central office's Global Alcohol Database for some countries (e.g. Portugal).

- **WHO Global Status Report on Alcohol:**

The Global Status Report (GSR) presents a variety of data for each European country, together with information (where available) on sample sizes and the target population. However, the reported figures are rarely the result of studies that were designed for international comparison, and there are likely to be many methodological differences. Wherever possible, data have been checked against other studies and profiles provided by members of the Alcohol Policy Network (see Chapter 1) by the present authors, but differences of data within countries may remain.

- **WHO Global Burden of Disease study:**

The Comparative Risk Assessment within the WHO's Global Burden of Disease study (GBD) was designed to estimate the burden of ill-health due to different risk factors in the WHO sub-regions. As part of this, estimates of drinking variables were made which have been used here where no other data are available (including unrecorded consumption and drinking levels). However, the estimates are of sometimes questionable validity due to lack of data and (in the case of drinking levels) are only available for the sub-region as a whole, with the results subsequently scaled on a population-basis to the EU.

Box 4.1 – SOURCES ON ALCOHOL CONSUMPTION IN EUROPE (CONTINUED)

- **ESPAD** *n=2000-5,000 per country among people aged 15-16 years*
- **HBSC** *n=800-3,000 per age-group per country at ages 11,13 and 15 years*
These two surveys among young people have been repeated and use international centres to standardize the data (ESPAD funded by the Pompidou Group (within the Council of Europe) and the Swedish governmental organization CAN; HBSC from the WHO). It should be borne in mind that these surveys represent only school students rather than the full population of young people. In the ESPAD countries of Bulgaria, Estonia, Portugal and Turkey, for example, there are less than 85% of the age group in schooling, but in all other countries the figure was 85%-100%.
- **Eurobarometer** *n =1000 per country among adults aged 15 or above*
This is primarily a public opinion survey conducted regularly for the European Commission by market research agencies. It has included modules on alcohol consumption on several occasions (1988, 1990, 1992 and 2003), but there are some concerns relating to the lack of a dedicated focus on alcohol or health.
- **ECAS** *n =1,000 per country among adults aged 18-64*
Although conducted within the framework of a comparative project with much expertise in the area of alcohol surveys, there are a large number of methodological concerns with the European Comparative Alcohol Study (ECAS) survey. These include large variations in response rates and underreporting (the latter from 30%-90%) as well as sampling variations between countries. Comparisons of ratios among sub-groups are preferable; comparisons between countries (shown where necessary due to lack of data) must therefore be done with considerable reservations.
- **GENACIS** *n = 1,300-10,000 per country among adults aged 20-64*

Note: The recently published GENACIS final report was unpublished at the time that this chapter was principally written. While draft versions of several GENACIS papers were used for this report (and have since been checked against the final version), this has meant that none of the figures in this report use GENACIS data. Comparability: While the majority of questions in GENACIS were designed to be comparable across Europe, response categories were often differently constructed across countries (e.g. offering different time periods in response to the same question). The survey years and modes vary (e.g. 1997-2002, plus Austria in 1993), and three samples are regional rather than national (Netherlands, Italy, Spain). As in ECAS, there are large variations in underreporting (18% in Hungary to 69% in Italy after accounting for unrecorded consumption).
- **EPIC** *n = 100-2,000 per region; convenience sample of adults aged 35-74*
A sub-sample of the European Prospective Investigation into Cancer and Nutrition (EPIC) investigated alcohol consumption through 24-hour dietary recall between 1995-8 (1999-2000 in Norway). However, due to severe methodological concerns (e.g. the use of largely regional samples and convenience sampling methods) and the unusual age-range (35-74), this source has not been used within this chapter; interested readers should instead refer to Klipstein-Grobusch et al (2002) and Sieri et al (2002).

While these data are necessarily used to create a comparative picture within Europe, it should be realised that all of the adult surveys have substantial limitations. Results from a single survey should therefore be treated highly cautiously without other supporting data.

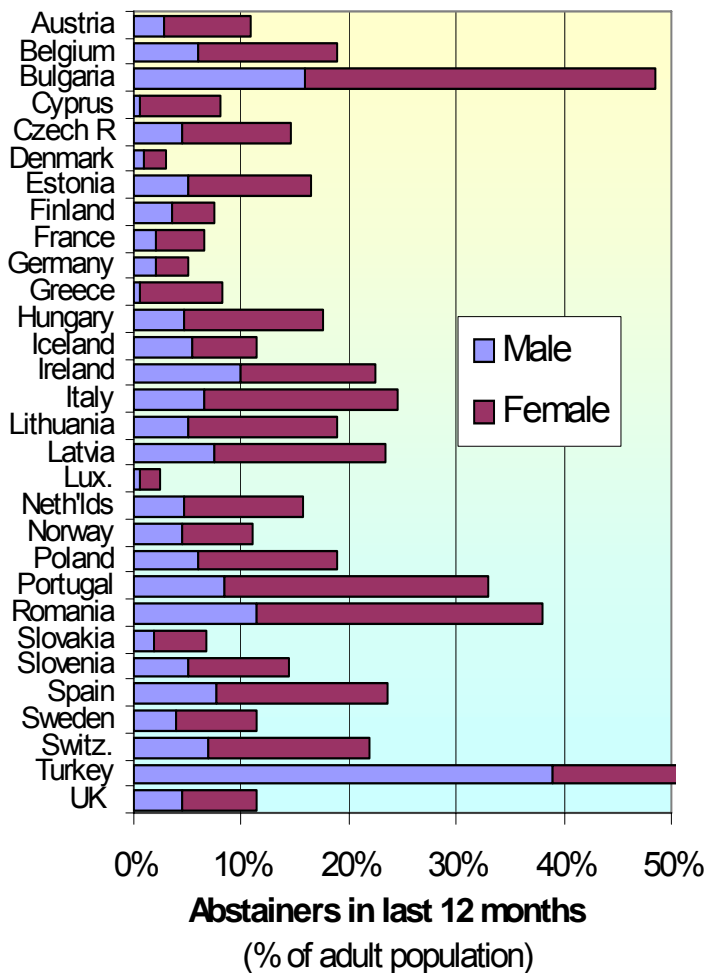


Figure 4.3 Abstention rates in Europe ²

The shading within each bar shows the relative proportions of male and female abstainers. E.g. in Austria 11% are abstainers, of which ³/₄ are women

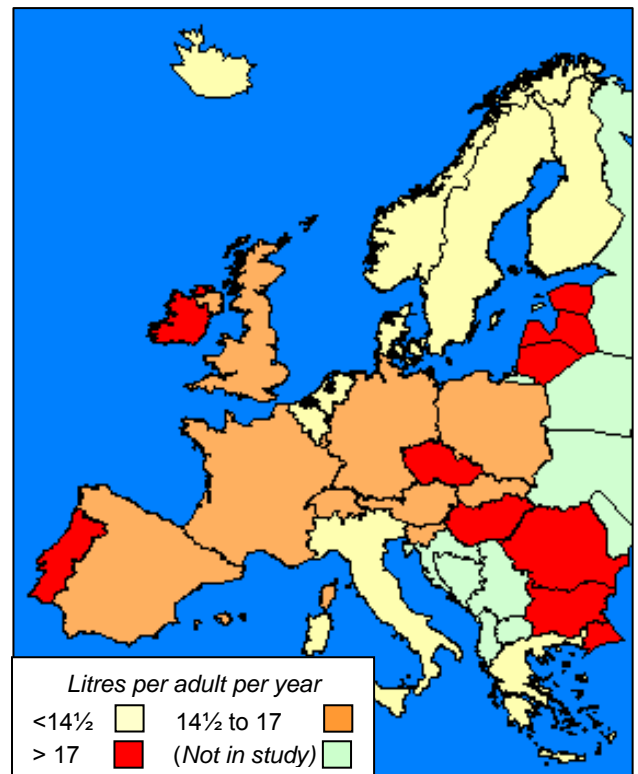


Figure 4.4 Total alcohol consumption per drinker in Europe in 2002

[Sources: primarily from WHO data (Global Status Report on Alcohol 2004, HFA Database and GBD project); see above for detail]

This can make it difficult to compare numbers of abstainers across countries, although a combination of awareness and transparent, comparative studies means that the results have a reasonable degree of robustness in most cases.³ Proceeding with caveats about interpretation in mind, 53 million adults across the EU – or 15% of the adult population – abstain from alcohol. In most European countries, this means that at least 7 in 8 men and 3 in 4 women have drunk at least once in the past year (see Figure 4.3). In general the highest abstention rates are found in parts of eastern and southern Europe, but even within these regions there are countries where nearly everyone drinks, such as Slovakia and Greece.⁴

³ Abstention data is taken from the WHO Global Status Report on Alcohol 2004, updates from the Alcohol Policy Network of the Bridging the Gap project (see Chapter 1), a European report on national health surveys (European Commission 2003a), the ECAS comparative survey (Ramstedt and Hope 2003), estimates from the Global Burden of Disease project (Rehm *et al.* 2003) and also (where data conflicts) supplemented by national-level reports. As a cautionary note, it is important to remember that surveys may not be comparable due to (a) how long without a drink counts as abstinence, (b) the wording of the questions, (c) the cultural definition of abstaining, and (d) the population sampled (e.g. 16-64 years, or 18 years and older).

⁴ There is substantial disagreement among sources as to the degree of abstinence in France. This may be due to difficulties understanding the concept of abstinence in French culture.

Using these results, we find the total alcohol consumption *per drinker* in the EU is 15 litres per year. This is about 20% higher in the EU10 than the EU15, although there is no simple divide (see Figure 4.4). Only two countries (Norway and Iceland) have a consumption-per-drinker of less than 10 litres of alcohol per year, while at the other extreme there are five countries with an average of over 20 litres (Bulgaria, Hungary, Latvia, Lithuania, and Turkey). Nevertheless, the variation between countries for consumption per-drinker is less than for the per-capita level (as is found for global comparisons; see Babor *et al.* 2003).

Levels of drinking

A parallel way of looking at the amount drunk by individuals is to look at the rates of different levels of drinking, although studies are sometimes not comparable given different cut-off points for the levels. In the small number of countries where comparable data does exist (WHO 2004), male rates of drinking above 60g vary from 3%-23% and female rates of drinking above 40g range from 1% to 11%. Although no strong patterns are apparent, it appears that central European countries (in both the east and west of Europe) have higher levels than further north or south.

The above definition was also used within the WHO's Global Burden of Disease (GBD) study,⁵ and was the highest of three drinking levels considered (level III) for drinkers. The two lower levels of drinking were more than zero, but <40g men or <20g women (level I), and a category in-between the other two levels (level II, +40g-60g men, +20g-40g women). Based on these estimates, we can say that 263 million adults drink at Level I, Table 4.1. This leaves roughly 58 million adult Europeans – 15% of the adult population – drinking at level II or above. The higher level III drinkers account for over 22 million of these, representing 6% of the adult population of the EU.

Table 4.1 The numbers of adult Europeans (16+ years) at different drinking levels; estimates for 2001.

	Definition (g/day)		Adults
	Men	Women	EU25 (m)
Abstinent	0	0	53
Level I	>0-40g	>0-20g	263
Level II	>40-60g	>20-40g	36
Level III	>60g	>40g	22

Source: Global Burden of Disease Project (Rehm *et al.* 2004), amended by present authors⁵.

Alcohol dependency

While often associated with heavy consumption (see Chapter 5), definitions of alcohol dependence go beyond measures of the amount consumed to a psychiatric definition encompassing compulsion and a lack of self-control (Epstein 2001). One

⁵ The GBD study and its adaptation for this report are discussed in more detail in chapter 6. Data for abstainers in Europe presented above are more accurate than presented in the GBD study (and produce a lower number); these results have been scaled so that the numbers add up to the total adult European population.

problem that results from this is that representative studies from the same population in similar periods – and even using similar instruments – can show very different prevalence figures (Rehm *et al.*, in press). As with respondents' views on social harms that result from drinking (see Chapter 6), it may be the case that apparent differences in prevalence rates may be due to a changing awareness of alcohol-related problems rather than objective changes in alcohol-related harm (Midanik and Clark 1995; Grant *et al.* 2004:232).

Combined with a lack of comparative studies within Europe, this makes it difficult to look at patterns of alcohol dependence in Europe.⁶ Nevertheless, a review conducted for the World Health Organization has used existing studies to estimate the number of people who are alcohol dependent within one year (Rehm *et al.* 2004; Rehm *et al.*, in press). Adjusting the main estimates that were presented in the GBD study (as above), we find that 5% of adult men and 1% of adult women are alcohol dependent – that is, 23 million people are addicted to alcohol in any one year. However, this contains a considerable variability across countries, largely due to different methodologies (see also Rehn, Room, and Edwards 2001; WHO 2004). Alcohol dependence often leads to a wide variety of severe negative consequences both for the dependent individual and for others around them such as their family; this toll is discussed in Chapter 6.

Long-term trends in population drinking

Since the second world war, there has been a harmonization in the levels of recorded consumption in the countries of western Europe (Simpura and Karlsson 2001; Leifman 2001b). Declining drinking levels in the high-drinking southern European countries came at the same times as increased levels in northern and central Europe during the 1960s and 1970s, leading to considerably less variation at the end of the 20th century than halfway through it. A similar (if smaller) trend may also be true for unrecorded consumption, with a suggestive method based on mortality figures showing that unrecorded consumption since the mid-1970s increased in the Nordic countries and UK while being stable elsewhere in the EU15 (Leifman 2001a). However, this method allows only a tentative estimate of trends in unrecorded consumption, and must, therefore, be regarded cautiously.

If this analysis is extended to the EU25 and accession countries, we similarly find that recorded consumption is much closer together than it was previously – across the 20 countries with data going back to the 1960s, the amount of variation has more than halved. Alcohol consumption in the EU10 is closer to that of the EU15 than ever before, with Figure 4.5 showing that this is due to a faster rise over the years 1960-80 in the EU10 and a slower decline compared to the EU15 since then. Nevertheless, there is little sign of the EU10 countries moving closer to one another, with the amount of variation staying effectively static since the mid-1960s except for fluctuations in Latvia, Lithuania and Slovenia in the late 1980s (see Figure 4.6). There is no available information on trends in unrecorded consumption in the EU10 though, which is unfortunate given the combination of significant political changes and the high current level of unrecorded consumption.

⁶ Although the ESEMeD study investigated “alcohol abuse” and alcohol dependence in 6 European countries (Alonso *et al.* 2004), we felt (following consultation with the study authors and the European Commission) that, due to certain methodological issues, the results of the study should not be presented here.

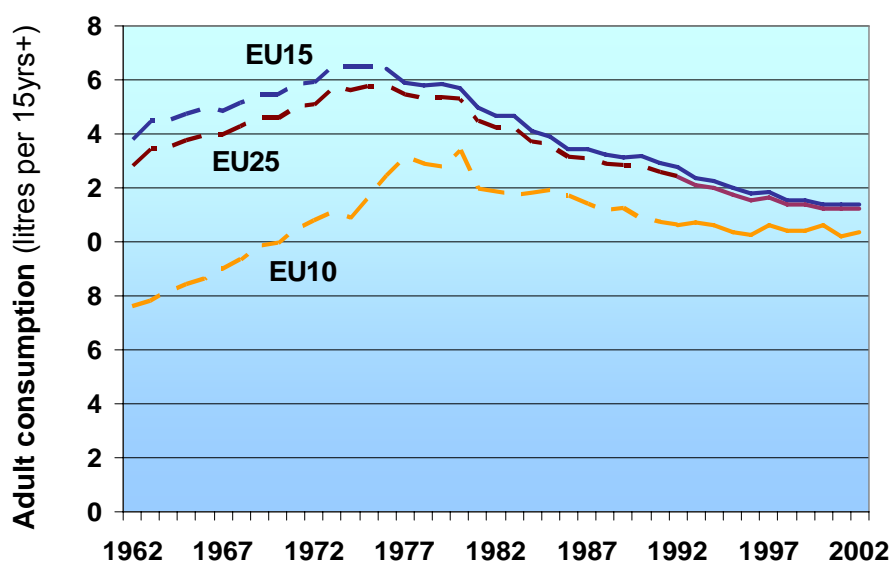


Figure 4.5 Trends in European recorded alcohol consumption

Data were not available for all countries for the full 40-year period – dashed lines have been used to indicate the trend in the smaller number of countries with data.⁷ **Source:** WHO Health for All Database (1961-9 trend from WHO Global Alcohol Database).

While these trends are sometimes the accumulation of many years of gradual movement, it is also possible for large changes to occur in a short time period. For example, consumption rose by nearly 25% in Ireland between 1995 and 2000 and doubled in Finland between 1967 and 1974, while it dropped by five litres per person in Italy between 1974 and 1981.

Abstinence trends are harder to decipher, given a paucity of data in many countries. The little long-term data that are available suggest that abstinence rates went down in northern European countries in the 1960s, but have remained relatively unchanged in Italy, the Netherlands and the UK (Simpura, Karlsson, and Leppänen 2001; Simpura and Karlsson 2001). More recently, a varied mix of data suggests that there were more drinkers in several European countries by the mid-to-late 1990s than in the late 1980s/early 1990s, with only three countries (Poland, Sweden and Switzerland) going in the reverse direction (Rehn, Room, and Edwards 2001).

⁷The different country coverage was: (i) EU10 – Estonia (1992-), Malta (1988-), Lithuania (1984-), Latvia & Slovenia (1980-); and (ii) EU15 – Greece (1976-). Imputed values were calculated using the trend in the countries with data, adapted to the original value of the full group of countries.

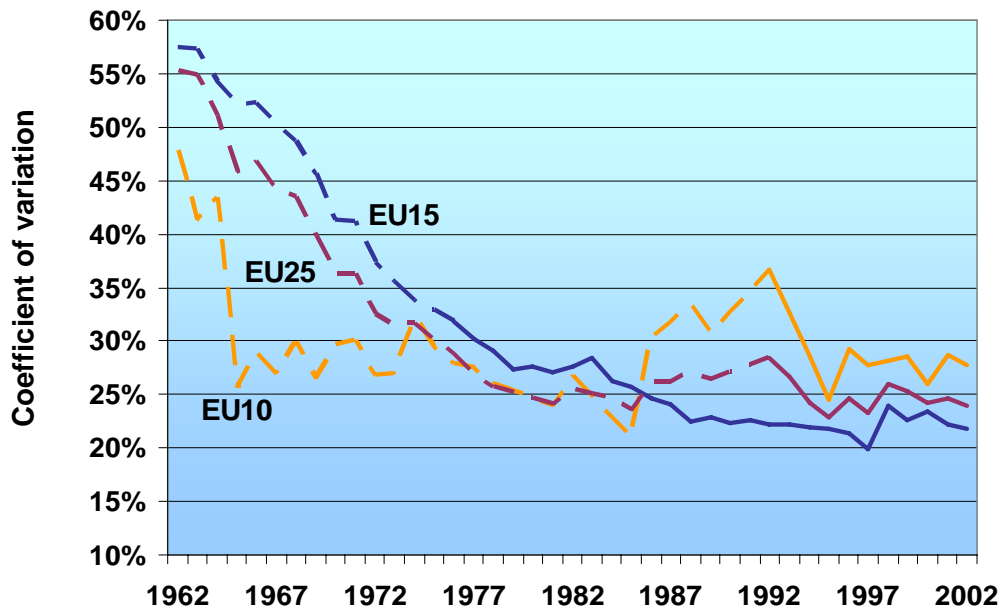


Figure 4.6 Harmonization in European recorded alcohol consumption⁸
 Data were not available for all countries for the full 40-year period – dashed lines have been used to indicate the trend in the smaller number of countries with data⁹ **Source:** WHO Health for All Database (1961-9 trend from WHO Global Alcohol Database).

This might seem surprising, in that (all things being equal) the total amount drunk will increase if abstainers start to drink. However, research from regions within the UK shows that there is no correlation between total consumption and abstinence rates (Colhoun *et al.* 1997). Furthermore, the UK as a whole has seen a marked rise in consumption in the last 20 years at the same time as abstinence rates have increased (see Figure 4.7). The reverse effect can also be seen in Italy, where a 5% drop in total consumption between 1997 and 2000 came at the same time as a 3% increase in the number of drinkers (Osservatorio Permanente Giovani ed Alcool 2001). Looking across cultures rather than time, the same effect is visible; for example, the regions of the US with the highest proportions of abstainers were the ones with the highest consumption per-drinker (cited in Lemmens 1995). It, therefore, seems as though abstinence rates and recorded consumption are relatively independent, and should not be expected to move in tandem.

⁸ This is based on the authors' analysis of the Coefficient of Variation (CV), a measure of relative dispersion calculated as the absolute dispersion (Standard Deviation) of the country values divided by their mean (i.e. a 50% CV is where the standard deviation of the EU country values is half the value of the mean). This is identical to the ECAS study (Leifman 2001b), except that the trends in Figure 4.5 use population-weighted values.

⁹ The different country coverage was: (i) EU10 – Estonia (1992-), Malta (1988-), Lithuania (1984-), Latvia & Slovenia (1980-); and (ii) EU15 – Greece (1976-). Imputed values were calculated using the trend in the countries with data, adapted to the original value of the full group of countries.

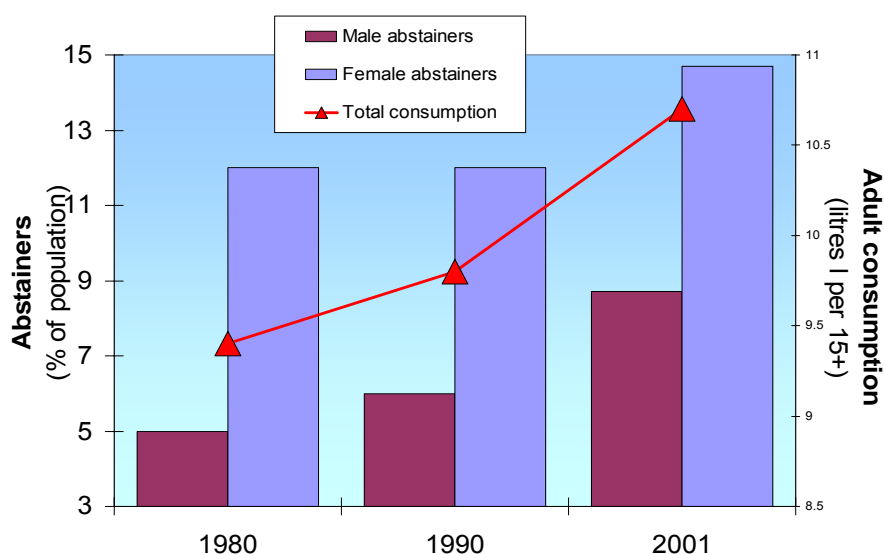


Figure 4.7 Consumption and abstinence trends in the UK

Source: Abstinance estimates from General Household Survey and Health Survey for England (cited by Academy of Medical Sciences 2004)

WAYS OF DRINKING

There are many ways of looking at the drinking patterns across Europe, from the place that alcohol is drunk (e.g., at home, in a bar) to the time (e.g., Saturday nights, Wednesday lunchtimes) and context (e.g., with meals, special events). While 'drinking patterns' as a concept has been used to denote varying aspects of alcohol consumption (Simpura, Karlsson, and Leppänen 2001), this section opts for an all-encompassing approach that looks at any aspect of drinking not covered by the consumption levels above or the sub-group discussions below. In particular, four key aspects are covered here – the type of alcoholic drink preferred, the drinking context (primarily the place and relation to meals), frequency of drinking, and how often drinks are used for drunkenness (sometimes referred to as 'binge-drinking'). This is nevertheless an incomplete list, with areas such as party and celebratory drinking not covered due to constraints of space. While the type of beverage makes little difference to the level of alcohol-related harm, drinking context, frequency and particularly drunkenness are of importance from a public health perspective (this evidence is reviewed in Chapter 5).

Drinks of choice

A huge variety of local specialities and regional preferences influence the preferred form of alcohol across Europe, but for analytic purposes the drinks are broadly categorised here as beer, wine and spirits (see also Chapter 3).¹⁰ At a general level across all 25 EU member states, around 44% of the alcohol comes from beer, with about a third from wine (34%) and just under a quarter from spirits (23%), Figure 4.8.

¹⁰ This typology of beer-wine-spirits is becoming increasingly problematic with the diversification of the alcoholic drinks market and the popularity of 'new' drinks types (such as alcopops) for young people (see below).

In over half the countries, beer is the preferred drink, with the bulk of the rest preferring wine. These choices are also more than just marginal matters in most cases; 6 of every 10 countries drink over half their alcohol in one type of drink, with Italy and Latvia taking more than 70% of their total in one type (wine and spirits respectively).

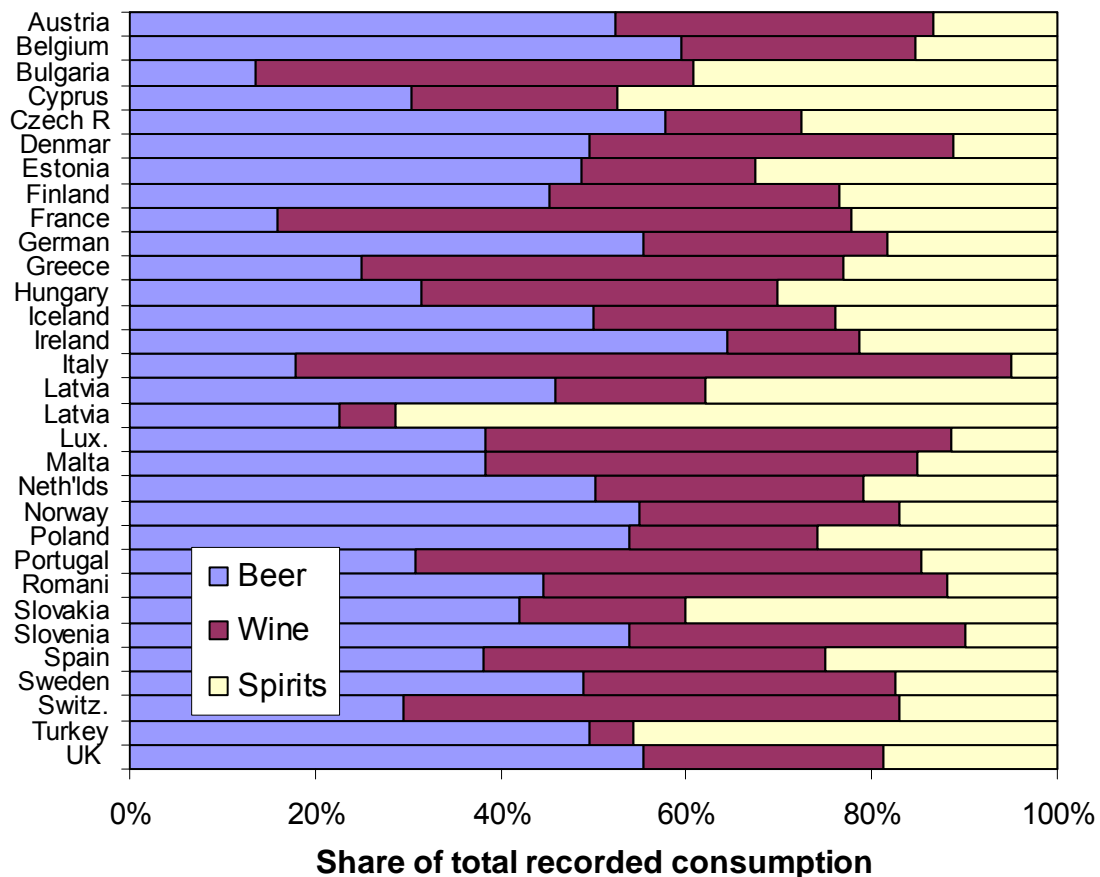


Figure 4.8 Preferences for alcoholic drinks in Europe, 2002. **Source:** WHO Health for All Database

The EU15 plus Norway splits into two groups when it comes to beverage choices, with beer the preferred drink in central and northern Europe and wine preferred in southern Europe. In none of these countries did spirits account for even one-third of consumption, with even the former spirits-dominated northern European countries now overwhelmingly preferring beer. Nevertheless, this picture belies several interesting results, in particular for Spain which some recent data suggest now drinks more beer than wine. It is also interesting to observe that Greece and Spain drink more of their alcohol in spirits than Sweden and Norway.

The two-fold split in the EU15 is a relatively recent phenomenon, with the Nordic countries drinking gradually less spirits since the 1960s, when it formed most of their alcohol intake. More generally, countries in northern and central Europe have opened up to wine, mirroring the trend in the wine-producing countries to open up to other beverage types, particularly beer. These trends combine into a harmonization

of beverage preferences within the EU15, with the relative dispersion reduced to about a half of its previous level.¹¹

Compared to the EU15, EU10 countries have wine rather than spirits as their second-most preferred type of drink, but beer is similarly the most popular. Only one country drinks more spirits than anything else (Latvia, although sources disagree over Poland), with five of the six other EU10 countries with reliable data mainly drinking beer and only one (Hungary) mainly wine. Discerning a single trend over the past 40 years is nearly impossible, however, as countries have moved in completely different directions. The new Member States also show no sign of moving collectively towards the beverage preferences of the EU15, and even moved away in the 1960s and 1970s as spirits grew in popularity.

The drinking context

There is a conventional stereotype of drinking contexts in southern Europe (see also below), which suggests that drinking there revolves around mealtimes much more there than elsewhere in Europe. When the data are closely examined, it seems that this stereotype has some validity – but only up to a point. This is most clearly demonstrated by Eurobarometer data, which asked people how much of their drinking was with meals. As Figure 4.9 shows, there is certainly a trend that those in southern Europe did more of their drinking with meals than elsewhere, with Italy, Portugal and France having the greatest number of people who reported only drinking when eating. However, there are also some notable exceptions to this north-south pattern, with Sweden in particular having more people ‘only drinking when eating’ than Spain. Denmark also shows more people ‘mainly or only drinking when eating’ than either Spain or Greece. There is, therefore, evidence that while a strong trend underlies the stereotype, in its simplest form it does not capture the reality of European drinking.

Other comparative data confirm that these results are not just a statistical anomaly, despite this being a contradiction of more anecdotal information (Allamani *et al.* 2000). For example, earlier Eurobarometer results showed that beer in Denmark was more commonly drunk with meals than in any other situation (Hupkens, Knibbe, and Drop 1993). Aside from Eurobarometer surveys, the results from GENACIS also show that the relative frequency of drinking with meals compared to drinking in a bar is far greater in Sweden than elsewhere (including Spain) for both men and women (Ahlström *et al.* 2005).¹² This should be connected to the results on overall drinking frequencies (below), as those in Spain were much more likely to drink with any given meal – the results for relative preferences, therefore, partly reflecting the much greater overall frequency of drinking in Spain.

¹¹ Relative dispersion is calculated as the Coefficient of Variation (CV), described in footnote 8 above.

¹² It is also possible to compare the frequencies of drinking in different contexts to the total frequency of consumption from a separate GENACIS paper (Mäkelä *et al.* 2005). However, this produces some results that are clearly implausible (i.e. greater than 100% of drinking occasions occurring with meals), and is not undertaken by the study authors, hence the results are not presented here. This may be due to either response errors or the existence of multiple contexts on a single ‘occasion’.

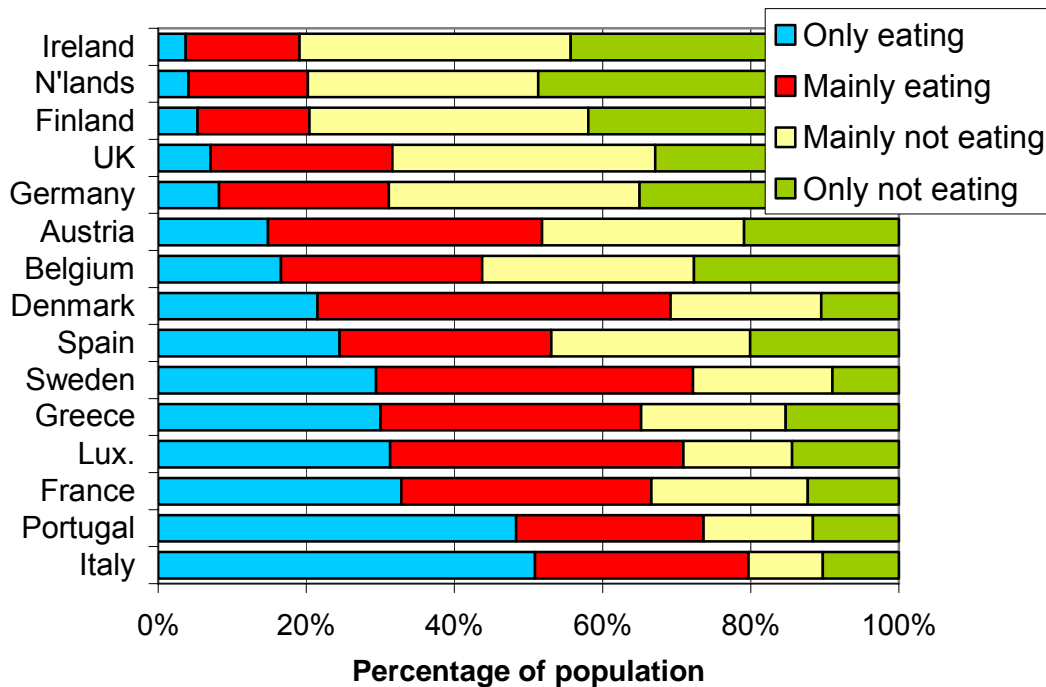


Figure 4.9 Drinking with meals in the EU15. **Source:** Eurobarometer data (Eurobarometer 2003)

A deeper understanding can be gained from the more detailed ECAS results, showing the distribution of drinking occasions through different contexts (Leifman 2002). The most striking finding is that the percentage of drinking occasions that occur with the afternoon or evening meal is virtually constant across countries at around 40%. Only two exceptions exist to this, one in either direction: Finland is lower (around 20% of drinking occasions being with this meal), while women in Sweden are higher (at 60% of all drinking occasions). The other three contexts investigated all show considerable variations, however, in particular drinking with lunch (30%-50% in southern Europe, 15% or less elsewhere) and drinking at home outside meals (over 40% in Finland compared to 5% or less in Italy and for French women). Although covered in the discussion on young people below, it is also worth noting here that the 'stereotype' of southern European drinking with meals is least applicable to the youngest age group. For example, young people in the UK drink more often with meals – even in absolute terms – than in France, and are on a par with the level in Italy.

Public drinking is also of interest from both a cultural and public health perspective, although cultural definitions of public drinking places are even more complex than definitions of eating occasions (see Chapter 4 and also Single *et al.* 1997; Rehm *et al.* 2004). Looking at drinking in 'bars, pubs and discos', the GENACIS results show that the greatest frequency occurs in Spain (89 times per year for men, 38 for women), the UK (57 and 25) and Hungary (43 for men but much lower for women), with the Nordic countries all under 20 times per year for men and 10 for women (Ahlström *et al.* 2005). Similarly, the ECAS survey showed that drinking in restaurants and bars was most frequent in the UK (and to a lesser extent France and Italy), with the lowest frequency occurring in Sweden (Leifman 2002).

Explaining this is unfortunately less simple due to contradictory results from the two surveys. While it could be primarily due to the much lower frequency of drinking in the Nordic countries, other GENACIS results suggest that the share of drinking occasions that occur in pubs is also lower in the Nordic countries (Ahlström *et al.*

2005).¹³ In contrast, drinking in restaurants and pubs was found to be under 20% of all drinking occasions in France and Italy (as well as German men and Swedish women) in ECAS, with the other gender-country combinations all having levels of 20%-27% (Leifman 2002). More consistent is the finding that young people (and particularly young women) are the most likely age group to drink in public places in all countries, showing a reverse tendency to drinking with meals above (see also the discussion of young people below).

Drinking frequency

While the per-capita consumption data are of considerable use from a public health perspective (see also Chapter 6), they say nothing about whether the alcohol is drunk in relatively small quantities across a large number of drinking occasions, or whether a month's alcohol is all drunk in one session (this also relates to measures of binge-drinking, see below). It is, therefore, useful to look at how often people drink in different countries – although for a simple concept, there are a surprising number of complications in agreeing on a way of measuring this. First many alcohol surveys ask about the frequency of drinking different beverage types individually, but this leaves the question of how to combine the frequencies for different beverage types into a single frequency for alcoholic drinks.¹⁴ Secondly, there is an implicit assumption in most surveys that there can be only one drinking occasion in any given day.¹⁵ Nevertheless, by putting together the picture from a variety of measures we can obtain a rough picture as to how drinking frequency varies across Europe.

In general, drinking occurs more often in the south of the EU15 than in the north – for example, the ECAS survey showed that daily drinking was most common in Italy (40% for men, 20% for women) and then France (about half the Italian level). Daily drinking was much less common elsewhere, and the lowest values came from Finland and Sweden (Hemström, Leifman, and Ramstedt 2001).¹⁶ Similarly, Eurobarometer data showed that the average number of drinking days was highest in Portugal, Italy and Spain (19 or more days per month), while the lowest frequencies of less than 10 days were found in Finland and Sweden (Eurobarometer 2003).¹⁷

Despite this general trend, it is (once again) untrue to represent the pattern in Europe as a simple north-south gradient. For example, the Eurobarometer data show that the frequency of drinking in Greece is lower than nearly all of the EU15, including Denmark and the east of Germany (Eurobarometer 2003). The GENACIS data (mainly using a more accurate method)¹⁸ show a more complex picture, with the

¹³ As described in the previous footnote (number 12), this suffers from certain methodological problems and is therefore indicative only.

¹⁴ Ideally a question asking about the overall frequency of drinking is asked separately (e.g. Mäkelä *et al.* 2005), but if not then a rough method must be applied of either (a) the frequency of drinking the most commonly consumed beverage type; or (b) the sum of the frequencies of all the beverage types (such as with the Eurobarometer data). While both are used below, it should be remembered that the former will underestimate the frequency in countries where only one type of drink is drunk on a given occasion, while the latter will overestimate the frequency in countries where most drinking occasions involve multiple beverage types.

¹⁵ However, this may not always be true (drinking with lunch and also in bar in the evening, for example), particularly on non-working days, and the difference between speaking about drinking occasions and drinking days should be borne in mind (Leifman 2002).

¹⁶ Drinking frequency based on the most frequently-consumed beverage.

¹⁷ Drinking frequency calculated from the sum of the frequencies of beer, wine, spirits and other drinks.

¹⁸ In most of the GENACIS surveys (with the exceptions of France and Norway) the frequency data are based on a specific question asking about the consumption of all beverages.

annual number of drinking occasions in men in Austria (175) above the levels in Spain, and high frequencies also found in Germany and Switzerland (Mäkelä *et al.* 2005). This is even more striking for women, where the frequency of drinking in Spain is around the European average, while the Netherlands and UK are among the most frequent-drinking countries. As before though, the lowest frequencies were found in some of the Nordic countries and also in Hungary (see below).

One interesting aspect of this is that there is a different pattern for daily drinking than there is for frequent-but-less-than-daily drinking. As Figure 4.10 shows, there is a clear north-south gradient for daily drinking with no exceptions (Hemström, Leifman, and Ramstedt 2001). However, drinking 4-5 times a week is far more common in the UK than elsewhere, with the result that the UK has a greater proportion drinking 4-5 times a week *or more* than Germany and is on a par with France. When drinking *at least* 2-3 times a week is further examined, the UK now has greater numbers than France or Germany (which are similar) and is not far off the level of Italy. Given a similarly striking result for Ireland (Ramstedt and Hope 2003), it is clear that a strong north-south gradient for one measure can belie a more subtle picture when more detail is included.

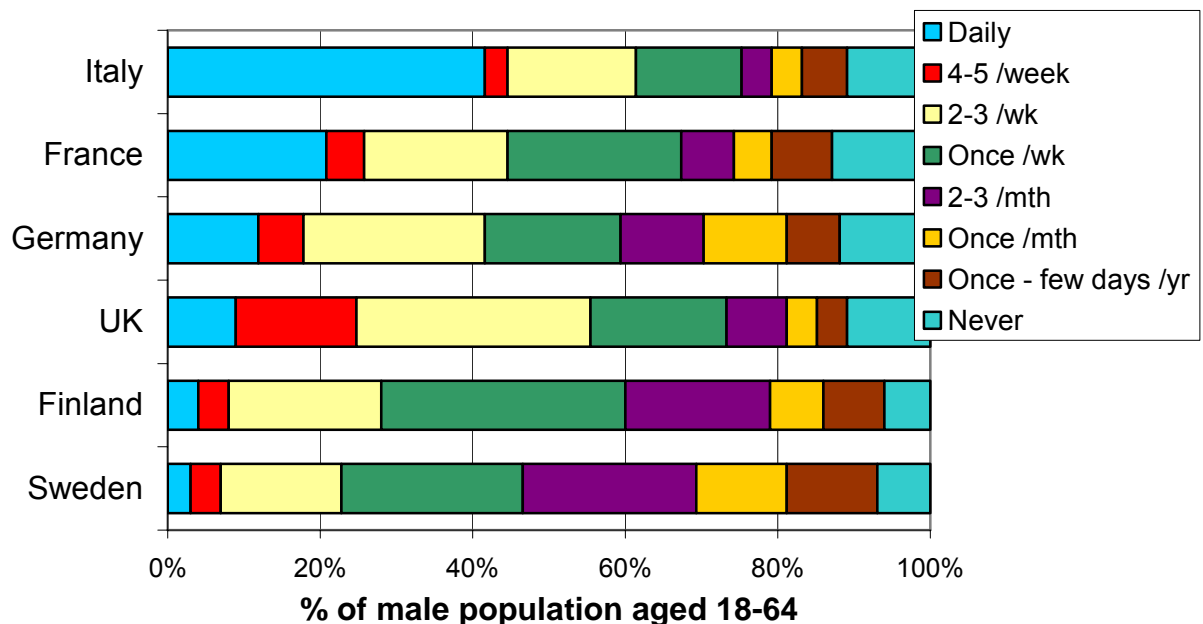


Figure 4.10 Drinking frequencies for men in six EU countries. Based on the most commonly consumed beverage type. **Source:** ECAS (Hemström, Leifman, and Ramstedt 2001)

Fewer data are available in the EU10 but there are some indications that the frequency of drinking tends to be lower in many EU10 countries than in most of the EU15. For example, a recent comparison in the Baltic countries and Finland (Helasoja *et al.* 2005) found that frequent drinking was less common in Estonia and particularly Latvia and Lithuania than in Finland (itself with one of the lower levels in Europe).¹⁹ Looking at the full range of frequencies, relatively frequent drinking has been found among Estonian men and Latvian women, but low frequencies were found among all other country/gender combinations in the Baltic states (McKee *et al.* 2000; low frequencies being roughly the same level as found for 45-64 year olds in

¹⁹ Frequent drinking defined as 15+ drinks per week for men, and 5+ for women.

Poland in Bobak *et al.* 2004). The GENACIS data shows that the drinking frequency in Hungary was also amongst the lowest in Europe for men and the lowest for women (Mäkelä *et al.* 2005). However, the frequency of drinking in the Czech Republic seems to at least at the level of the EU average (Kubicka *et al.* 1998; Mäkelä *et al.* 2005). Separate research has also suggested that the frequency of drinking is substantially lower in Poland than in the Czech Republic, although this study looked only at those aged 45-64 which may show a different pattern to that of the full population (Bobak *et al.* 2004). Nevertheless, we can tentatively suggest that a minimum of 5 of the 10 new Member States have frequencies of drinking that are at the lower end of the EU15 range.

As for most aspects of drinking patterns, it is difficult to definitively say anything about trends in the frequency of drinking due to the lack of long-running comparable datasets (Simpura and Karlsson 2001). One tentative analysis has nevertheless compared Eurobarometer data from 1988 with the results of the ECAS survey using similar methodologies (Leifman 2002).²⁰ This found that there has been a harmonization in drinking frequency in the ECAS countries, with a decreasing frequency in Germany, France and especially Italy, and stability elsewhere (or in the case of men in Finland and Sweden, an increase). This may be linked to the much stronger north-south gradient visible in the oldest age group (45-59) than the middle-age group (30-44) and particularly the youngest (15-29) in the same study (and see also Mäkelä *et al.* 2005) – for example, young males in the UK are more frequent drinkers than those in France, while young males in Finland, Germany and Sweden have similar frequencies (see also discussion of young people below).²¹ The conventional north-south view applies least of all to young women, where the UK and Italy (at a high level) and Finland and France (at a lower level) show the same frequencies (Leifman 2002).

While it may, therefore, have been relatively accurate to represent drinking frequencies as a simple north-south gradient in the 1980s, the complexities discussed above suggest that it must be more cautiously applied today.

Intoxication and binge-drinking

Binge-drinking has formed the focus of much media debate across Europe in recent years, but the concept itself is often misunderstood. The idea of looking at binge-drinking is to investigate drinking occasions leading to drunkenness or *intoxication*. This is defined in the next chapter as a state of functional impairment due to drinking, and is particularly important given its link to a number of health and social problems (Kuntsche, Rehm, and Gmel 2004; see also Chapter 5). In order to measure this in an 'objective' way and to avoid certain biases, it is often measured as single drinking occasions involving more than a certain number of drinks (usually 5-6). However, for different people on different 'single drinking occasions', there can be a wide variation in how drunk people become from a given alcohol intake (see e.g. Beirness, Foss, and Vogel-Sprott 2004).

²⁰ Frequency of drinking is based on the sum of beverage-specific frequencies for beer, wine and spirits, excluding abstainers.

²¹ These country/age-group comparisons are based on all three measures used in the ECAS survey (beverage-specific drinking frequencies; sum of drinking frequencies for beer, wine and spirits; and the sum of all 'drinking occasions' (with lunch, with dinner, at home without meal, away from home without meal) in the past 7 days). These all show consistent patterns for the trends mentioned in the text.

To avoid confusion, this chapter uses the term 'binge-drinking' *only* when looking at reported drinking occasions above a given cut-off level of drinking, while 'intoxication' and 'drunkenness' are used to refer to self-reports about how the individual perceived their state after drinking (see also Chapter 1).²²

Even when looking solely at measures of binge-drinking, a further problem is that many studies are not comparable due to different measurement techniques. Using the most common definition,²³ we can only tell that 11% of male drinkers in Spain were weekly binge-drinkers compared to 20%-30% in the EU10, with similar patterns for women in the range of 3%-6%. Better information is available from a comparative survey conducted in the Baltic region, which found that 40%-50% of men reported binge-drinking at least monthly in Estonia, Finland, Latvia, and Lithuania.²⁴ Here Estonia reported a prevalence of less than 10% for monthly binge-drinking in women, but the other countries were all higher at 10%-20% (Helasoja *et al.* 2005). A separate comparative survey with yet another definition has also found the rate of monthly binge-drinking in 45-64 year olds to be 12% and 2% for men and women in Poland, compared to 17% and 4% in the Czech Republic (Bobak *et al.* 2004).²⁵ However, it is difficult to put all of these together into a coherent picture of binge-drinking in Europe.

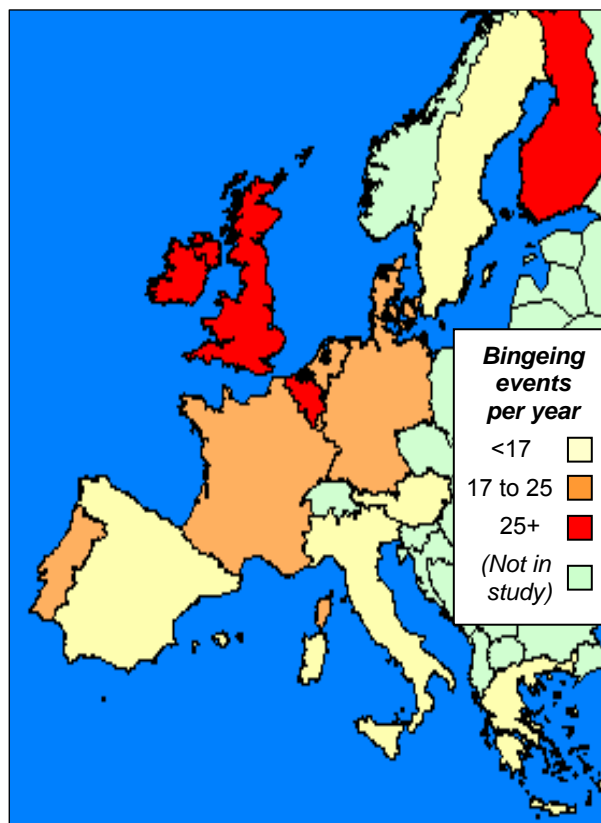


Figure 4.11 Binge-drinking in the adult population

5 pints of beer, 1 bottle of wine or 5 shots of spirits on a single occasion. Source: Eurobarometer 2003

The best information for EU15 countries comes from two explicitly comparative surveys conducted in the past few years each covering several EU countries. The first of these is the Eurobarometer survey,²⁶ which found that the southern European countries as a whole had significantly less people reporting monthly binge-drinking than elsewhere (24% compared to 40%), with Finland and Ireland reaching three times the level of Italy. While the pattern shown in Figure 4.11 strongly suggests a north-south

²² The term 'binge-drinking' has also been criticized for being stigmatizing (among other difficulties), which has led some to adopt the terms 'heavy episodic drinking' instead (Carey 2001) (which should really be called 'episodic heavy drinking'). However, this is a relatively cumbersome phrase that is not well-recognized by policymakers, the media or the public. Given the function of this report the term 'binge-drinking' has been used throughout this chapter (although see Chapter 1 for definitions).

²³ Data on 5 or more "standard drinks" on a single occasion (WHO 2004).

²⁴ Binge-drinking defined as 6 or more 'regular restaurant' portions on a single occasion.

²⁵ Binge-drinking defined as 80g or more of alcohol on a single occasion during the past month.

²⁶ Drinking to intoxication defined as 2.8 litres (5 pints) of beer, 1 bottle of wine or 5 shots of spirits on a single occasion; percentage shows the numbers reporting doing this monthly (Eurobarometer 2003). These figures are likely to underestimate the relative amount of binge-drinking in countries that drink more beer, as the definition of binge-drinking for beer includes a greater amount of alcohol than that for other beverages.

gradient, it is worth noting that Sweden was an exception from this – the level there was lower than any other country except Italy, and was less than two-thirds the level of Portugal.

A similar overall north-south gradient with exceptions is found in the ECAS study,²⁷ where binge-drinking as a proportion of all drinking occasions is highest in Ireland and the UK, but much lower in France and Italy. For the numbers of weekly binge-drinkers, Sweden was again an exception to the expected north-south gradient, with a lower frequency than every country except France. More surprisingly, and in contrast to the Eurobarometer results, the average number of binge-drinking episodes for Italy was also more than that for Finland. When examined in detail, it is apparent that the particular measure used for the comparison is crucial given the very varied distribution of binge-drinkers in different countries. At the lower end of the spectrum,²⁸ there were a greater number of people who binge-drank very rarely/never in Germany, France and Italy than elsewhere. At the top end, however,²⁹ the share of frequent binge-drinkers in Italy was relatively high, being greater than Sweden and Germany for both genders (a finding that should be interpreted alongside the findings on drinking frequency above).

No other European comparative studies exist to investigate this further, as relevant surveys either have no relevant data for southern Europe (GENACIS) or look solely at smaller country groups (the Nordic comparative surveys). Even for the case of Sweden, the GENACIS surveys confirm the low Swedish figures (Mäkelä *et al.* 2005) but the Nordic surveys show no sign that Sweden has a lower rate of binge-drinking than Finland or Norway (although note problems of comparability; see Mäkelä *et al.* 1999:5,40,51).

Other research has used the alternative measure of people's own reports of intoxication, but this may be affected by people's interpretation of drunkenness. For example, Danes report more binge-drinking (defined as 6 drinks) than intoxication, while Finns state the opposite (Mäkelä *et al.* 2001). This is a particular problem in southern European countries where drunkenness is relatively stigmatised (Pyörälä 1995), which may mean that respondents insist they were not drunk even when the amount consumed indicates they must have been (see also under young people below). Self-reported intoxication does, however, have some advantages in better capturing both individual differences and differences in the drinking situation (see above), although few data have investigated how *length* of drinking occasions vary across Europe (although note mentions in Pyörälä (1995)). Self-reported 'drinking too much' in the Eurobarometer survey, therefore, follows the same pattern as binge-drinking (Italians reporting this least and those from Finland, the UK and Ireland the most), but shows a much greater variation. Very little data has been able to track this over time, but long-term records in Finland imply that any change is very slow (Simpura, Karlsson, and Leppänen 2001).

Summing up across the EU15, the average frequency of people reporting that they 'drink too much' is about five times per year, while the average frequency of binge-drinking is about 17 times per year (representing 10%-60% of drinking occasions for

²⁷ Drinking to intoxication defined as 2.3 litres (4 pints) of beer, 1 bottle of wine or 25cl of spirits on a single occasion (Hemström, Leifman, and Ramstedt 2001). As with the Eurobarometer definition, the definitions of binge-drinking for different beverage types do not include the same level of alcohol, hence the results should be interpreted cautiously. (Leifman 2002; Ramstedt and Hope 2003).

²⁸ The percentage of drinkers who binge-drink a few days per year or less.

²⁹ The percentage of drinkers who binge-drink every week or more.

men and about half the proportion of occasions for women).³⁰ This is equivalent to 40m EU15 citizens 'drinking too much' at least once a month – over 1 in 8 people – or 100m EU15 citizens binge-drinking at least once a month, representing just under 1 in 3 of the adult population.³¹

Drinking patterns in a European and global context

Given the difficulties involved in obtaining comparative data in a European context, it is unsurprising that it is difficult to consider European drinking as opposed to the 'rest of the world'. Nevertheless, one crude measure has been calculated for a range of countries based on key informant reports and expert evaluation of the limited available evidence (Rehm *et al.* 2001; Rehm *et al.* 2003). This 'pattern value' was a first attempt to take account of the effect of drinking patterns within the WHO's Global Burden of Disease study (see Chapter 6), and looked into a number of areas of drinking patterns that are likely to link to health outcomes.³² The results of the expert evaluation and key informant surveys were then analysed through optimal scaling analysis before being combined into a single summary measure, shown in Figure 4.12.

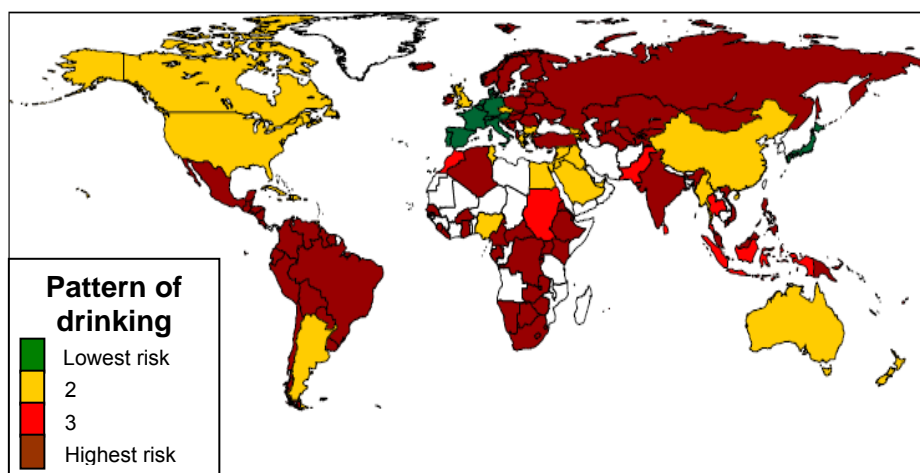


Figure 4.12 The global distribution of patterns of drinking
Source: World Health Organization 2005.

When interpreting the map, it should be remembered that this is an estimate of the effect of the pattern of drinking considered independently from the level of

³⁰ Average European frequency and numbers of Europeans getting drunk monthly taken from Eurobarometer data on intake in a single occasion; percentage of drinking occasions taken from ECAS.

³¹ As a sensitivity analysis, the average number of binges per year was also calculated based on the ECAS data (extrapolating the survey data within each of the three country groups). This produced a very similar result of 15-16 binges per year (depending on whether the later Ireland data is also included). A separate estimate for the number of weekly (rather than monthly) binge-drinkers from ECAS produced an estimate of 35m adult citizens of the EU15 (11% of the total adult population).

³² The full list of pattern variables was (i) daily drinking (inverse scoring); (ii) frequency of getting drunk; (iii) usual quantity per drinking session; (iv) fiesta binge drinking; (v) drinking with meals; and (vi) drinking in public places. For a full description of how responses to this were scored, see the description and appendices in Rehm *et al.* (2003).

consumption (in fact, the two variables are neither positively nor statistically significantly related). As can be seen from Figure 4.12, European drinking patterns are amongst the least damaging in the world, although relatively detrimental patterns can still be found, particularly in northern and eastern parts. The levels of harm in different countries will be a reflection of *both* patterns and consumption, and – given that we know Europe has the highest levels of consumption in the world – these relatively less detrimental patterns still coexist with significant levels of harm in Europe (see Chapter 6).

Despite the innovative nature of much of this analysis, there are a number of significant problems that caution against using the pattern value to compare European countries against each other. First, the justification for both the selection and weighting of the drinking patterns data in the creation of the pattern variable is unclear, often going far beyond the available epidemiological data on the basis of working hypotheses. Secondly, the data itself is lacking in many areas, relying on expert evaluations of e.g. whether drinking in public places is ‘common and everyday’ or not. Such evaluations may be based on local researchers’ best guesses, which (while better than nothing) have often been found to be contradicted by later research (for example, the expert views on drinking with meals in Allamani *et al.* 2000 differ substantially from the later evidence presented above). Nevertheless, these pattern values were found to mediate the effect of level of consumption on certain health outcomes linked to intoxication, and this is discussed in Chapter 6.

Summarising European drinking patterns

While this section has considered different aspects of drinking patterns separately, these findings must be recombined to produce a rounded picture of drinking behaviour. The overriding finding in many areas has been that there is a north-south gradient within the EU15, but that this is never simple and absolute.³³ In each case there are complications that ensure that European drinking patterns can only be understood by considering a general trend alongside the exceptions that go against it:

1. **Beverage choices:** southern European countries prefer wine while central and northern European countries prefer beer. *However, recent data suggests Spain drinks more beer than wine, while Greece and Spain both drink more of their alcohol in spirits than the ‘former-spirits countries’ of Sweden and Norway.*
2. **Drinking with meals:** southern European countries do more of their drinking with meals than other EU15 countries, particularly at lunchtime. *However, Denmark and particularly Sweden do more of their drinking with meals than some southern European countries, particularly Spain. Overall, the share of total drinking occasions that occur with the afternoon/evening meal is similar in most EU15 countries – but as southern European countries drink much more often in total, they are more likely to drink with any given meal.*

³³ This is relevant to the discussion on the typologies of drinking cultures that have been discussed in detail elsewhere (Room and Mäkelä 2000), although the discussion is not repeated here. For the purposes of this report, it is sufficient to note that Room and Mäkelä found that the concepts of ‘wet’ and ‘dry’ drinking cultures were increasingly problematic. The results here similarly suggest here that while the division may capture some aspects of drinking patterns, it serves to obscure others and can therefore be unhelpful.

3. **Frequency of drinking:** people in southern European countries drink alcohol more often than those in northern Europe, and are much more likely to be daily drinkers. *However, there is little evidence for an overall gradient in drinking frequency, with various central European countries showing the highest numbers of drinking days or occasions (particularly for women).*
4. **Drunkenness and binge-drinking:** there is a gradient in binge-drinking and drunkenness so that they are much more common in northern European countries than in the south. *However, the frequency of binge-drinking appears to be lower in Sweden than in many southern European countries. There are also more very frequent binge-drinkers in southern Europe than elsewhere in the EU15.*

It is also clear that many aspects of even this 'north-south gradient with exceptions' are much weaker in the younger generations (see also the section on young people, below). Young southern Europeans are more likely to drink beer and to drink in public places than older generations, and less likely to drink as much wine with meals. There has already been a partial harmonization of beverage preferences and (from the limited evidence) probably also of drinking frequency; if the patterns in young people represent a cohort rather than age effect, then further harmonization of drinking patterns in Europe is likely.

Characterising wider regularities in the EU10 is even more complicated, as the very limited evidence suggests these countries share little in terms of patterns of drinking. Nevertheless, there are some suggestions that the EU10 differs from the EU15 in that:

1. **Beverage choices:** many of these countries drink more spirits than in the EU15 (including Latvia, which drinks more spirits than any other drink);
2. **Drinking frequency:** people drink alcohol less often in the EU10 compared to the EU15; and
3. **Binge-drinking:** it appears that binge-drinking may be as common in parts of the EU10 as the highest levels in the EU15, although the limited data make this slightly speculative.

Perhaps the strongest conclusion from looking at drinking patterns in the EU10 is that there is an urgent need from a European perspective for more comparative data.

ALCOHOL AND POPULATION SUB-GROUPS – CLASS, GENDER AND AGE

The gender gap in drinking

In nearly every culture ever studied, irrespective of that culture's level or pattern of drinking, adult men are more likely to drink than adult women, and drink more when they do (Fillmore *et al.* 1991; Wilsnack, Vogeltanz, and Wilsnack 2000). These gaps are greater for riskier behaviour – for example, men's share of total consumption in Europe is around two to three times that of women's (Leifman 2002; Mäkelä *et al.* 2005), but men tend to report three to six times as much binge-drinking (Bloomfield *et al.* 1999; Ramstedt and Hope 2003). A much larger number of women than men have similarly never drunk alcohol in their life, although in contrast, there is only a

small tendency for more women to have not drunk alcohol in the past 12 months (Wilsnack, Vogeltanz, and Wilsnack 2000). Women also tend to prefer different beverages to men, drinking more wine and less beer, although this is less noticeable in the generally wine-drinking south of Europe (Hemström, Leifman, and Ramstedt 2001). Even after accounting for these the context of drinking varies by gender, with women drinking relatively more often with meals than men and relatively less in public drinking places – to a small extent in many countries, but occasionally noticeably such as in the UK and Hungary (Leifman 2002; Ahlström *et al.* 2005).

Countries differ in the size of the gender gap but not according to a consistent geographical pattern across Europe, although a recent comparative study within Europe noted that there were three types of different European societies where 'egalitarian drinking patterns' could be found (Ahlström, Bloomfield, and Knibbe 2001). These were countries where drinking was well-integrated into everyday life (Italy), where both this and a low employment status for women was visible (Switzerland), or where these two factors only result in an egalitarian pattern for those with a low employment status (Netherlands, Germany). While this suggests that egalitarian patterns are linked to both the presence of alcohol in the private sphere and the absence of women in high-status employment, a more detailed analysis of women's roles within the same project found a complicated picture that cannot be reduced to cross-cultural generalizations (Gmel *et al.* 2000). However, the divergence between men and women for the frequency of both drinking and drunkenness does appear to be lowest in the Nordic countries and the UK, and is also consistently lower in young adults in Europe, where drunkenness is most common (Mäkelä *et al.* 2005). This is also true for adolescents, as discussed separately below.

In line with wider social changes, it has been suggested that there has been a convergence in drinking behaviour between genders over the past few decades. Recent trends in the UK fit this view, with average consumption for young women nearly doubling over four years together with a rise in drinking to intoxication between 1992 and 2002, while young men's drinking has been relatively stable (Rickards *et al.* 2004). Some of the GENACIS results are also suggestive of a recent change in the EU10, with gender gaps in younger drinkers being much lower in the Czech Republic and Hungary compared to older drinkers (Mäkelä *et al.* 2005). Such trends cannot be seen in other European countries in the GENACIS project, however, nor can they be seen in the limited available longitudinal data that shows only a slight convergence visible in the latter part of a 30 year analysis in the Netherlands, and decreases in women's abstinence being partially reversed by a counter-trend in Finland in the late 1970s (Sulkunen 1987; Neve *et al.* 1996; and more recently Poelen *et al.* 2005). Looking across Finland, Germany, the Netherlands and Switzerland, Bloomfield and colleagues found only limited evidence of convergence in levels of consumption and hazardous drinking in the 1980s (Bloomfield *et al.* 2001).

The only small trend towards a smaller gender divide seems to be for changes in drinking at all in the past year, which currently shows a less than 25% gap in many countries (Wilsnack, Vogeltanz, and Wilsnack 2000). This is the case for the Nordic countries in particular, and has been put down to a mixture of gender equality and more general liberal attitudes to alcohol (Simpura, Karlsson, and Leppänen 2001; Bloomfield *et al.* 2001). Despite the lack of demonstrable convergence – which may in part be due to a lack of data covering a long enough period – there is still an expectation that women’s drinking will move closer to that of men’s in future. For example, market research agencies have already noted that *“the growing independence of women, as well as the trend towards starting a family later in life, makes women a key demographic for alcoholic drinks”* (Euromonitor and just-drinks.com 2005:17).

BOX 4.2 – WOMEN AND ALCOHOL

- In every culture ever studied, men drink more than women. The gender gap is largest for riskier drinking, such as very heavy drinking or intoxication.
- Drinking any alcohol in the past year may be more equal between the sexes than in the past. However, it is hard to find evidence that this gap has narrowed across Europe for other aspects of adult drinking.
- Although many women give up alcohol when pregnant, a significant number do drink, and some continue to drink to harmful levels.

Aside from gender differences in drinking, it is also important to consider women’s consumption during pregnancy, given the growing evidence on the harm that alcohol can do to the developing foetus (see Chapter 5). Although many women give up alcohol when pregnant, there are a substantial number of women in all countries who continue to drink – ranging from 25% in Spain³⁴ to 35%-50% in the Netherlands and even higher rates in the UK. Furthermore, a smaller but still not insignificant proportion continue to drink at high levels when pregnant, although few data here are comparable (Hamlyn *et al.* 2002; Göransson *et al.* 2003; Health Council of the Netherlands 2004; Grundberg 2004).

Social inequalities in alcohol use

It should come as no surprise that different socioeconomic groups vary in their use of alcohol given the powerful cultural associations of drinking that were discussed in Chapter 3. The most consistent of these patterns is that ‘lower socioeconomic groups’ – those with less education, a lower occupational level or less income, as well as the unemployed – are more likely to abstain from alcohol, a finding that holds for nearly all of the EU25 (Hupkens, Knibbe, and Drop 1993; Marmot 1997; Simpura *et al.* 1999). This is true for both sexes, although the consistently higher level of abstinence in women compared to men (see above) seems to be lowest in those with more education (Knupfer 1989; Bongers *et al.* 1998).

At first sight there appears to be few trends for the total amount drunk, with studies from some countries showing manual workers having heavier consumption while others show the exact opposite (Péquignot *et al.* 1988; Marmot 1997; Bongers *et al.* 1998; Hemmingsson, Lundberg, and Diderichsen 1999). The lack of a fixed relationship is particularly obvious from a historical study from Sweden (Romelsjö

³⁴ Drinking monthly; other figures are for those who drink at all during pregnancy, suggesting that the situation in Spain may be closer to the other countries if identical questions were asked.

and Lundberg 1996; Norström and Romelsjö 1998), where managerial non-manual workers were replaced over the period from 1970 to 1994 by manual workers as the heaviest drinking group. Other patterns are further complicated by age effects, in that young unemployed people in some countries drink more than their employed counterparts, but this is reversed from age mid-20s onwards (Temple *et al.* 1991; Casswell, Pledger, and Hooper 2003).

The clearest results can be seen for men with a low level of education, who are likely to drink more than other men, although it should be remembered that alcohol use can also negatively affect educational outcomes (Bongers *et al.* 1998; Casswell, Pledger, and Hooper 2003; Schnohr *et al.* 2004; Bloomfield *et al.* 2005) (although see European Commission 2003b). It has been suggested that this is in fact due to two separate trends, where those with more education drink less on each occasion, but drink more often. This has received partial support (e.g. Knupfer 1989), but other studies have not found a clear link of education to drinking frequency (Eurobarometer 2003; Helasoja *et al.* 2005), instead finding that only income predicts a more frequent use of alcohol, and this is not found in all populations (McKee *et al.* 2000; Casswell, Pledger, and Hooper 2003). What seems to be more consistent is that adult men in lower occupational or educational groups in most of Europe are more likely to drink to intoxication or drink very heavily, and are least likely to drink smaller amounts (Ahlström 1987; Knupfer 1989; Jacobsen 1989; Norström and Romelsjö 1998; Bongers *et al.* 1998; Mackenbach *et al.* 2000; Eurobarometer 2003; Kuntsche, Rehm, and Gmel 2004; Estonia and Latvia in Helasoja *et al.* 2005). Even here, however, there are some countries where there is no real class gradient in drinking to intoxication (UK, Ireland, Finland) – although given these are the countries where men in higher occupational groups drink more often and more in total, this means that lower SES men are still much likely on a given drinking occasion to get drunk (Kelleher *et al.* 2003; Rickards *et al.* 2004; Yarnell *et al.* 2005) with heavy drinking also concentrated in deprived areas (Law and Whincup 1998; Yarnell *et al.* 2005).

Box 4.3 – SOCIAL INEQUALITIES IN ALCOHOL

- It has been consistently found that those with lower socio-economic status (SES) are more likely to abstain from alcohol.
- Several studies show that some measures of higher SES relate to more frequent consumption, particularly for women.
- Men with more education are less likely to be heavy drinkers, in contrast to a reverse effect found in women.
- Getting drunk and becoming dependent on alcohol are both clearly more likely in those with lower SES for both genders.

This picture changes for women, probably due to the link of gender inequalities to both drinking practices and socioeconomic status – for example, it has been suggested that the self-maintenance, productivity and opportunities for leisure that accompany professional occupations and high income may link to higher levels of consumption for women (Thundal and Allebeck 1998). One consequence of this complexity is that different countries exhibit different trends – for example, a number of studies show that women with more education drink more than other women, although the reverse has also been shown in other times and countries (Bongers *et al.* 1998; Ahlström, Bloomfield, and Knibbe 2001; Helasoja *et al.* 2005). In general, it appears as though women in higher socioeconomic groups drink more often than other women to an even greater degree than in men, meaning that the gender gap in frequency of drinking is smaller in those with more income or education than in those with less (Ahlström 1987; McKee *et al.* 2000; Casswell, Pledger, and Hooper 2003; Helasoja *et al.* 2005). In many countries it is also true that women with more education are more likely to be heavy drinkers, although drinking to intoxication may

be more commonly associated with lower educational groups (Ahlström 1987; Kuntsche, Rehm, and Gmel 2004; Bloomfield *et al.* 2005; Helasoja *et al.* 2005).

Taken together, it is clear that the effect of socioeconomic status on drinking practices can vary both over time and between population groups such as men and women (for other groups, see e.g. Knupfer 1989; Neumark, Rahav, and Jaffe 2003). Men with lower educational status are more likely to drink heavily, while conversely a greater level of consumption is found in better-educated women in some countries. Certain trends nevertheless seem to hold constant for both genders in Europe, not least the greater likelihood of drinking to intoxication in the lowest socioeconomic groups, as well as a greater probability of being dependent on alcohol (Thundal and Allebeck 1998; Bongers *et al.* 1998; Hemmingsson, Lundberg, and Diderichsen 1999; Droomers, Schrijvers, and Mackenbach 2004). This inequality in risky patterns of drinking – particularly for men – is mirrored by inequalities in levels of alcohol-related mortality, and is discussed further in Chapters 5 and 6.

Young people and adolescents

The political interest in young people's drinking has been an important driver of policy both within countries and at an EU-level in recent years (see Chapter 8). This has not only made it important to be aware of the evidence on young people's drinking patterns and trends, but it has also led to robust comparative data that have been available since the mid-1990s.³⁵ Nevertheless, these surveys only consider particular ages of adolescents (11, 13, and 15 years in the case of HBSC; 15-16 years in ESPAD), in contrast to the general definition of young people as either 15-24 years (for example, by the UN organizations) or 15-29 years old (as a broad category within much alcohol research). The Council Recommendation of 2001 that provides the context behind this report (see Chapter 8) is interesting here, as – while not explicitly defining the age range concerned – it refers to 'young people, in particular children and adolescents'.

As implied by this terminology, this section, therefore, focuses primarily on the age ranges covered in the international surveys (11-16 years) but also includes a discussion of older young people ('young adults'). These ages cover a time of substantial change, where particularly adolescents are defining themselves in terms of their work, friendships and relationships (Room 2004). Although these changes can be very different in different societies, their nature is itself tending to change in a common direction, with their duration lengthening and their demands increasing (Larson, Wilson, and Mortimer 2002). When this is combined with the potent symbolic content of alcohol (see also Chapter 2), it is likely that some drinking practices at this age can be understood as symbolic behaviour, such as rebellion against older generations (Room 2005). Throughout this section, however, it should equally be remembered that drinking can be an expression of *sub*-cultural identity (Abel and Plumridge 2004), meaning that there will be particular variation *within* as well as between European countries (see also the discussion of motivations below).

Starting to drink

Nearly all (over 9 in 10) 15-16 year-old students have drunk alcohol at some point in their life (Currie *et al.* 2000), starting on average just after 12½ years of age. Although young drinkers start much earlier in some countries than others, this does

³⁵ Most results presented in this chapter are from ESPAD, with the exception of (a) age of first drink or drunkenness; and (b) any results for those aged 11 or 13 years, which are taken from HBSC.

not follow patterns for the adult abstention rates, with students from northern and southern Europe trying alcohol later than those from eastern and particularly central Europe. Although the question explicitly avoids asking about drinking 'only a small amount', it does show that the first perceived drink does not occur earlier in southern Europe than elsewhere, suggesting that adolescents may not consider early family experiences as a first 'real' drinking experience (see also Milgram 2001:93; Room 2005).

Similarly, nearly three-quarters or more of those from the Baltic countries or a broadly defined central Europe (as opposed to north and south, including both Ireland and the Czech Republic) report having been drunk by the age of 15 years, compared to less than half of equivalent southern Europeans; although, as we shall see, the difference is less in reported binge-drinking. The average age of first intoxication for those that had been drunk was nearly 14 years, suggesting an average delay of about a year between experimenting with drinking and the first experience of drunkenness. However, given that this average age is relatively close to the age of the respondents, and that a sizeable number of respondents report never having been drunk so far in their life, it is likely that the average age of first drunkenness in the whole population is higher than that reported here (Room 2005).

Where do young people drink?

The two most common places for 15-16 year olds to drink are their own home or someone else's home, with these accounting for nearly half of all mentions of drinking places by students who drink.³⁶ There is no definitive geographical pattern to this, with lower average rates in southern and central Europe visible alongside high rates in France and the UK. In contrast, no more than a third of students in any country reporting drinking in outdoor public spaces (parks, streets or beaches) on the last occasion, and most countries reporting considerably less than this (closer to 10% and substantially under this in Greece). While the EU10 countries were generally similar to the EU15, noticeably higher values were found in some countries including Latvia (32%) and Poland (27%). Research within the UK suggests that drinking in outdoor locations is most common at earlier ages, becoming less frequent as young people reach the legal drinking age (Coleman and Cater 2005).

Rates of drinking in public drinking places were lowest (less than 5%) in the Nordic countries, where drinking at home was most common. They also tended to be highest in southern and some parts of central Europe (e.g. over 30% drinking in a bar on their last drinking occasion in Portugal). Within the EU10, the highest levels are found closer to central Europe (the Czech Republic, Hungary, Slovakia) and the lowest levels closer to northern Europe (the Baltic countries, Poland). No comparative information on enforcement of the legal purchase age in *bars* is available, but own-purchases of alcohol in a *shop* from ESPAD³⁷ shows that the greatest number of purchasers was found in central Europe (especially Denmark) and the EU10 (Malta, Poland, the Baltic countries), while the lowest rates were found in northern Europe. Boys were more likely to have bought drinks for themselves than girls, particularly for beer which was the most commonly purchased type of drink for both genders.

³⁶ From data on place of drinking on last consumption occasion in ESPAD 2003. Reported figures have been adjusted to show the drinking place as a percentage of all students who had been drinking.

³⁷ Analysis here uses highest value for any drink type.

What do adolescents drink?

As has been noted above, the division of all alcoholic drinks into the three categories of 'beer', 'wine' and 'spirits' represents a simplification of the spectrum of drinks available in Europe. This is particularly so for youth drinking, where a large amount of recent policy has been driven by concerns over a new, 'fourth' category of drinks that appealed to young people (see Mosher and Johnsson 2005 for a more detailed history). These sweetened, brightly-coloured drinks of around 5% alcohol concentration have been given several names – including 'wine coolers', 'Flavoured Alcoholic Beverages' (FABs) and 'Ready-To-Drink' beverages (RTDs) – but throughout this report are usually described as 'alcopops', following the European Working Group on Alcopops set up in the 1990s.

Despite these recent developments, beer and spirits are still the most popular drinks for young people overall, with beer accounting for over half of the total in 11 countries (5 in the non-EU study countries and 6 in the EU25) (see also Hupkens, Knibbe, and Drop 1993). Spirits are slightly more popular than beer in only three countries (Norway, Italy and Portugal), while alcopops are not the most popular drink in any country (Hemström, Leifman, and Ramstedt 2001).³⁸ Other drinks have a range of popularity in different parts of Europe – three times as many alcopops are drunk in the EU15 as in the EU10, but more wine is drunk by boys in the EU10 than in the EU15 (see Figure 4.13). Within the EU15, levels of spirits and wine consumption on the last occasion are similar, although beer and alcopops are over twice as popular in central compared to southern Europe.

When the amounts of each drink are added together, we find that the average amount of alcohol drunk on the last drinking occasion is 60g of alcohol. No EU15 country outside of southern Europe has an average level below 56g, while in the UK and Ireland the amount drunk on the last occasion even reaches over 80g of pure alcohol. Last occasion drinking levels are slightly lower in the EU10 (see Figure 4.13) and significantly lower in southern Europe, which averaged 38g of pure alcohol.

Drinking frequency and total consumption

On the other hand, a different picture emerges if amount drunk per occasion is combined with drinking frequency to produce an estimate of total annual consumption (bearing in mind that this assumes a consistent level of under-reporting). The frequency of 15-16 year old drinking is highest in central Europe (5-9 times per month) and lowest in northern Europe (around twice per month). The southern and eastern European countries are generally in-between at 3-5 times per month, although a particularly high value is found in Malta (7 times per month). As for other variables (see below), the frequency of drinking was generally higher for boys than for girls, with small gaps only found in the Nordic countries, Ireland and the UK.

For total consumption, this, therefore, means that boys from northern Europe appear to have the lowest levels of consumption (2-3 litres per year) with those in southern and eastern Europe generally drinking more (2-6 litres) and those in central Europe and Malta drinking much more (8-10 litres, and an exceptional 14 litres in the Netherlands – although the robustness of individual values is limited given the concerns in Box 4.1). For girls, those from central Europe and Malta also drink much more than those from anywhere else (4-7 litres compared to 3 litres in the Czech

³⁸ Wine is the most popular beverage in Slovenia, but given the marginal nature of the difference it may be more suitable to see Slovenia as equally split between beer, wine and spirits.

Republic and 1-2 litres elsewhere). Extending this to estimate the proportion of total consumption that is drunk by adolescents in the ECAS countries requires several crude assumptions, but tentatively suggests that the 4%-5% of the total population aged 15-17 years will drink 2%-3% of the total consumption.³⁹

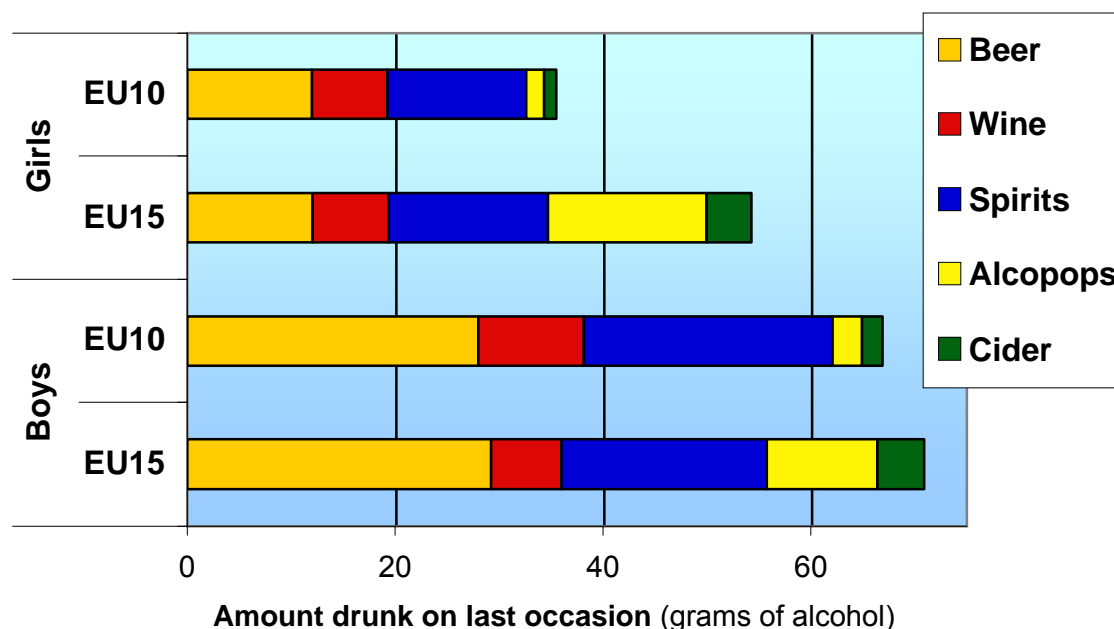


Figure 4.13 A picture of 15-16 year students' last drinking occasion (amount drunk on the last drinking occasion) *It has been assumed that there was no consumption of alcopops/cider where the questions were not asked (two countries from each of the EU10 and EU15). As such, these figures may be an underestimate. Source: ESPAD 2003 (Hibell et al. 2004).*

Binge-drinking and drunkenness in adolescents

As shown in Figure 4.14, the highest levels of both binge-drinking and drunkenness are found in the Nordic countries, UK, Ireland, Slovenia and Latvia.⁴⁰ This contrasts with the low levels found in France, Italy, Lithuania, Poland and Romania – for example, binge-drinking 3+ times in the last month was reported by 31% of boys and 33% of girls in Ireland, but only 12%-13% of boys and 5%-7% of girls in France and Hungary. Perhaps surprisingly, the differences between regions of Europe in Figure 4.14 are not visible at earlier ages, with the variation mainly occurring between the ages of 13 and 15 years. Across the whole EU though, over 1 in 8 (13%) of 15-16 year old students have been drunk more than 20 times in their life, and over 1 in 6

³⁹ This assumes that the ESPAD and ECAS survey coverage rates are similar, that consumption for those aged 15-17 years in ECAS is the same as for those aged 15-16 years in ESPAD, and that drinking by those aged 65 years plus is equal to drinking by those aged 50-65 years. These are all very rough approximations, but provide an indicative figure.

⁴⁰ Although a detailed comparison of the 1998 and 1999 surveys found that ESPAD estimates are higher than those from HBSC (Schmid *et al.* 2003), the variables used here showed a very high correlation ($r > 0.85$; present authors' own calculation) suggesting that the patterns across countries are similar. As such, lifetime drunkenness more than 20 times (from ESPAD) is used unless otherwise specified. Binge-drinking is highly correlated with similarly worded questions on intoxication ($r > 0.7$; present authors own calculation) but differs sufficiently to be reported separately.

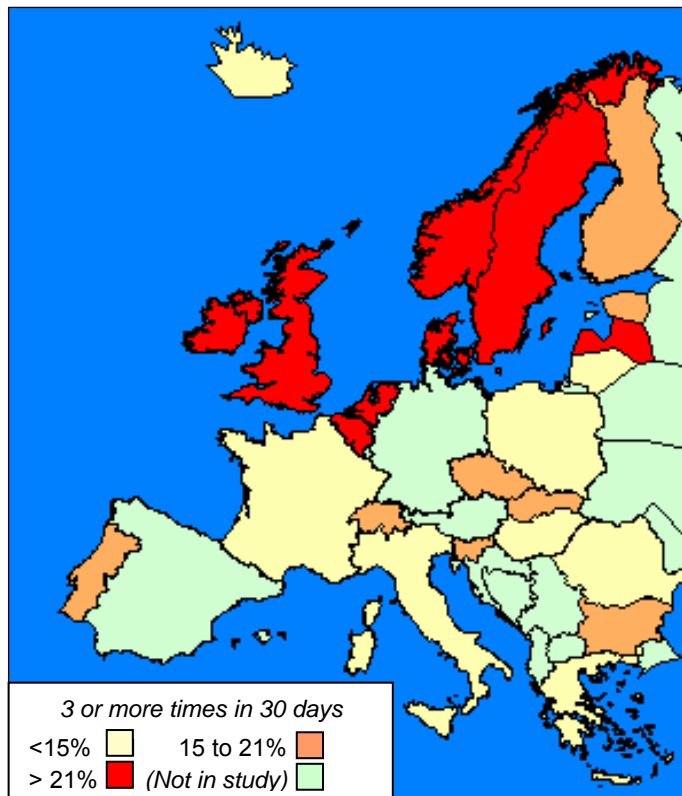


Figure 4.14 Binge-drinking in 15-16 year old students in Europe Defined as 5+ drinks on a single occasion

Source: ESPAD 2003 (Hibell et al 2004)

(18%) have binged (5+ drinks on a single occasion) three times or more in the last month.

To some degree this picture is sensitive to the particular variable used, with the numbers of those binge-drinking *at all* in the last 30 days (taken from the same dataset) showing no difference between differently conceptualised groups of 'wine' and 'spirits' countries (Room 2005). Similarly, students from southern Europe are about five times less likely than those from elsewhere in the EU15 to report being drunk more than 20 times in their life (as in Schmid *et al.* 2003), although they are only half as likely to report drinking 5+ drinks on a single occasion more than 3 times in 30 days. Other individual countries also show large discrepancies between the two measures (e.g. Malta

and Cyprus reporting five times as much binge-drinking as self-reported drunkenness, in contrast to Denmark that saw more drunkenness).

As discussed for adults above, this suggests that self-reports of intoxication may suffer from cultural biases, although there are also problems with binge-drinking as a measure (subjectively felt intoxication may also be of considerable importance for some harms due to 'drunken comportment', see Chapter 5). Qualitative data comparing Nordic and Mediterranean countries confirms that social heavy drinking and intoxication games are found in young people across Europe, but that the lack of self-control associated with visible drunkenness is suppressed in southern European youth culture despite heavy consumption within drinking rituals (Pyörälä 1995; Beccaria and Sande 2003). Further support for this comes from a study on expectations of the effect on alcohol, where those in Malta (culturally similar to other 'wine countries') were relatively surprised to find they were intoxicated, while those in other countries were more likely to expect to feel drunk (cited by Room 2005).

Risk factors in young people's drinking⁴¹

An enormous amount of research has been conducted into the risk and protective factors linked to young people's drinking, although these often work in different directions in different countries and present associational rather than causal evidence. It is beyond the scope of this report to comprehensively review this

⁴¹ Information for families' economic status (students' self-report) is from ESPAD 2003; other information is from HBSC 1998 and 2002.

literature, especially given a much lower level of comparative research on how these risk factors vary within different European environments. This section, therefore, outlines existing pan-European studies and provides brief summaries of recent research in several areas in order to flag important risk factors to the interested reader.

One of the strongest associations with alcohol use is for smoking – across Europe for both genders aged 11-15 years, never smoking is strongly associated with never drinking, frequent smoking is associated with frequent drinking (particularly frequent beer-drinking), and both ever-smoking and frequent smoking are strongly associated with frequent drunkenness (Currie *et al.* 2000; Currie *et al.* 2004; Duarte and Molina 2004). This may partly be a result of the personality trait of 'sensation seeking', which (together with binge-drinking) has been found to independently predict risky alcohol-related behaviours (e.g. drink-driving, fewer 'positive celebratory behaviours') in year 10/11 Australian students (van Beurden *et al.* 2005). Alternatively it may relate to antisocial behaviour, which has been shown (alongside frequent drinking) to predict later alcohol dependence (Bonomo *et al.* 2004). Another strong correlate of drunkenness is educational problems (Currie *et al.* 2000; Duarte and Molina 2004), although evidently this is a bi-directional relationship (cf. Chapters 5 and 6).

Much research has focused on the family of the young person, with a positive family environment being associated with a lowered probability of (risky) substance use (Beinart *et al.* 2002), including high levels of 'parental communication' (Currie *et al.* 2000) and 'parental awareness' (Hibell *et al.* 2004). While some family variables have a varying effect in different countries, a comparison of France and Britain found parental awareness was significantly related to drunkenness in both countries (Ledoux *et al.* 2002). In this context it is interesting to note that parents are more likely to always know where their child is on a Saturday night in southern and central Europe (up to two-thirds always knowing), and least likely to know in the Nordic countries (except Denmark) and the Baltic countries (Hibell *et al.* 2000). Parents can also impact on their (underage) children's drinking by supplying them with alcohol, with Swedish research suggesting this is associated with heavier, more frequent consumption and increased drunkenness (Lundborg 2002). Finally, living with a single parent or step-parent is also associated with an increased frequency of use of alcohol and of heavy drinking across Europe (Bjarnason *et al.* 2003). When both family dynamics and family structure are considered simultaneously, it appears that family dynamics are one pathway through which family structure affects substance use (Ledoux *et al.* 2002; Hibell *et al.* 2004).

The influence of peers has also been extensively researched, with (for example) self-reported drunkenness across Europe associated with spending time with friends (Currie *et al.* 2000). Any effect of peers is unlikely to be entirely independent of the family, however, with one theory suggesting that peers mediate the protective effect of the family (Gerrard *et al.* 1999). In contrast, a separate developmental model attributes adolescent involvement with 'deviant peers' to poor parenting practices (Nash, McQueen, and Bray 2005). Nash's own research suggests that a supportive family environment – moderated by parental disapproval of substance use – can predict later self-efficacy and peer substance use, which in turn affects later alcohol behaviours.

Across Europe (Hibell *et al.* 2004), perceptions of peer drinking generally mirror the actual patterns of alcohol use above, with the highest values *primarily* in central Europe (e.g. 75% in Germany and 80% in Ireland believing that their friends drank alcohol regularly). The lowest perceptions of peer drinkers were scattered around to a greater degree, with low values found in parts of eastern Europe (e.g. Slovakia

44%) but strong increases visible elsewhere 1995-2003 (e.g. from 50% to 70% in the Czech Republic and Estonia). Perceived peer drunkenness is similarly linked to actual patterns of intoxication, with the highest values in Denmark, Ireland, and the UK (27%-36% believing their friends get drunk every week) and the lowest values in central and southern Europe (8% in Poland, 5% in Portugal). Again, a substantial rise can be seen in most EU10 countries including Estonia (9% to 27%) and Slovakia (4% to 17%).

Even more complex is the link of socioeconomic status (SES) to drinking behaviour across Europe, which shows different relationships in different countries (Hibell *et al.* 2004). The absence of any consistent social gradient, and some suggestions of earlier, heavier use in higher-SES young people (Eurobarometer 2003; Bjarnason 2003), is likely to be because of the limited income young people have available to spend on goods like alcohol (UN Department of Social Affairs 2005:138). This is supported by research showing that alcohol was the greatest expense for young (legal age) males in the Netherlands (Poelen *et al.* 2005), and that young people's income predicts consumption and drunkenness in Spain and the Netherlands (Duarte and Molina 2004; Poelen *et al.* 2005).

This is only a fraction of the full list of risk and protective factors linked to alcohol, including genetic vulnerability, other psychosocial characteristics, social norms (perceived use and approval among peers), elements of the neighbourhood (a deprived neighbourhood being a risk, but opportunities for involvement being a protective factor) and positive behaviour by friends and teachers (standards and praise for positive behaviour being protective factors) (Beinart *et al.* 2002; Olds, Thombs, and Tomasek 2005). However, it would seem unlikely that the variations in the levels of adolescent drinking and drunkenness across Europe described above can be attributed fully to these individual- and area-level factors – a suggestion supported by an analysis of ESPAD data that found an effect of per capita beer sales and particular 'adolescent drinking culture' on individuals' drinking (Bjarnason *et al.* 2003). As should be clear from the brief discussion, these risk factors do not act independently but instead can be thought of as probability models working through multiple pathways to come together in an individual's substance use.

Expectations and perceptions of alcohol

Adolescents' expectations of the consequences of drinking have also been related to the likelihood of binge-drinking at the individual level (Kuntsche, Rehm, and Gmel 2004). Unsurprisingly given the increasing drinking with age reported above, expectations of drinking are more negative at younger ages and become more positive with time (in the UK, starting to become more positive from about 10 years; Wright 1999). Across Europe, about 25% more 15-16 year old students think that positive consequences (e.g. feel happy) are likely or very likely than negative consequences (e.g. do something I regret), which may be either a prior expectancy (leading to consumption) or a post-hoc justification for drinking (Hibell *et al.* 2004). Given that the structure of these responses is relatively stable (countries will tend to be high or low on all positive consequences rather than just 'feel happy'), this can be seen as a 'net rating' of the consequences of alcohol of 25% (positive).

Looking at this by country, the most positive of these overall views comes from central Europe (40% in Denmark and Ireland, i.e. 40% more students saying positive consequences are likely compared to the numbers saying negative consequences are likely). Less positive views are found in northern Europe and especially eastern Europe, while the most negative picture comes from southern Europe (where France and Italy, as well as Romania and Turkey, had ratings of 10% or less).

Adolescents' perceptions of the risk of binge-drinking (asked as the risk of drinking 5 or more drinks on a single occasion) shows a quite similar pattern (Hibell *et al.* 2004). None of the southern EU15 countries had fewer than 40% of 15-16 year olds saying that there was a great risk (values above 50% were also found in Cyprus and Turkey). Perception of risk was lowest where binge-drinking itself was high, including Norway (19%), the Netherlands (19%) and the UK (21%). While the perception of risk has not moved in a consistent direction since 1995, the expected consequences have become significantly more positive between 1995 and 2003, particularly in the EU10, in parallel to a decline in the perceived disapproval of getting drunk every week (data only available 1995-9). In other words, increased binge-drinking in young people in many countries seems to have coexisted with more positive views of alcohol and reduced disapproval of drunkenness, but with no change in how risky young people feel binge-drinking is.

Why do young people drink?

Young people are bound together by the way society thinks of youth, which, in the EU, means new-found independence as well as a pressure to form an individual identity. One form of this is for young people to see drinking as a symbol of adult identity as opposed to the world of childhood (Wright 1999) – but the symbolic potential of alcohol clearly goes beyond statements of age (see also Chapter 2). Drinking may also be motivated by fulfilling different needs that particularly relate to young people's life situation – for example, the latest World Youth Report suggests that alcohol and other drug use “*may become a means of escaping from situations that youth feel powerless to control*” (UN Department of Social Affairs 2005:149). In other cultural contexts, the reverse can equally be true – in Latvia, for example, young people (aged 11-20 years) drink mainly to relax or feel better, while adults mainly drink to forget about their problems (Koroleva 2005).

Many other reasons have been suggested by different groups of young people, including boredom, psychological distress and sociability (Milgram 2001). In the context of pressures on group membership and identity (which also relates to the 'peer pressure' discussed under 'risk factors' above), it is perhaps unsurprising that young people frequently cite the disinhibitory effects of alcohol (e.g. for sociability, or sexual relations) as a key motivation to drink (Kloep *et al.* 2001; Abel and Plumridge 2004). A UK study has divided motivations in 12-17 year olds into three categories: 'individually-based reasons' (relaxation and coping with stressful events), 'socially-based reasons' (linked to relationships with others) and 'peer influence' (Honest, Seymour, and Webster 2000). These are not only similar to the reported motivations of young 'risky' drinkers in a separate UK study (Coleman and Cater 2005), but are also similar to the motivations given by adult drinkers, with the exception of peer influence motivations (Crawford 1987).

While it is likely that motivations vary cross-culturally, it is also important to realise that motivations change considerably with age even within a single country. For example, the 12-13 year olds in the UK study wanted to experiment with alcohol to signal the change from child status, while 14-15 year olds' secretive drunkenness serves both to test limits and to be sociable (Honest, Seymour, and Webster 2000; Newburn and Shiner 2001). It is also likely that different motivations are associated with different patterns of drinking within any particular group (Room 2005); one study found that those seeking a 'buzz' (i.e. intoxicating effect) were more likely to report harmful outcomes than those looking for social facilitation (Coleman and Cater 2005). Although multiple drinking patterns can be associated with any given motivation (Crawford 1987:292), it would be interesting to see if further research across Europe showed any cultural regularities in how motivations relate to drinking patterns and consequences.

Trends in young people's drinking

In line with the attention in young people's risky drinking, it is clear that binge-drinking in young people has increased across much of Europe in the last 10 years, although other aspects of drinking are more ambiguous. Most countries are above the dashed line in Figures 4.15 and 4.16, showing that the numbers binge-drinking regularly has increased since 1995 (or where 1995 data is not available, since 1999). For the vast majority of these countries (coloured in red), the change has been a noticeable size of more than 2%.⁴² However, this rise was not seen everywhere in Europe, with a small number of countries even showing a fall in this period (coloured in blue).

These changes go in the reverse direction to the frequency of drinking in the past 30 days, which decreased considerably across the EU, particularly during the 1995-9 period.

Similar trends in binge-drinking are also visible in EU countries not covered by the ESPAD report, with noticeable rises in reports of being 'really drunk' at least twice in Austria (girls only), Belgium, Spain (mainly girls) and Switzerland (data from HBSC). Other data from Spain for 14-18 year olds also show a jump between 2002 and 2004 in last-month drunkenness (from 24% to 35%), following relative stability in the 1990s (Ministerio de Sanidad y Consumo 2005; Oservatorio 2005). Looking at all the EU countries in the HBSC study, we find that the numbers of both 15-year old boys and girls who report being 'really drunk' more than once has increased in the majority of countries 1994-2002 (for boys, only Austria and Wales were exceptions; there were no noticeable decreases for girls). A smaller but still noticeable increase is also visible for drunkenness in girls at 13 years, although 11-year olds appear to be young enough to miss the new trends.

Looking more closely at the ESPAD results (see Tables 4.2 to 4.4), we find that this increase is not a simple linear trend applying equally to the whole of Europe. For the first data period (1995-9 or 1993/4-97/8), we can see a very strong trend for binge-drinking and drunkenness to increase – indeed, none of the three displayed variables for boys show a noticeable *decrease*, while *rises* in at least one variable were seen in 18 of the 22 countries with data. In contrast, trends in the second period (1999-2003 or 1997/8 to 2001/2) are much less clear, with boys showing no discernible trend and girls showing an inconsistent rising trend. Eastern Europe also appears to differ from the rest of Europe in the second period, with more countries showing rising rather than falling binge-drinking and drunkenness (particularly for girls), as well as rises in other measures (including the numbers of 13- and 15-year olds who have ever been drunk and the level of last occasion consumption).

The combination of these trends explains why there is much less systematic difference between the EU10 and EU15 in youth drinking behaviour than there was 10 years ago, as can be shown in the falls in relative dispersion for binge-drinking (15%) and intoxication (28%).⁴³ However, in other aspects of drinking there has been little or no change in recent years. Overall consumption rose in eastern Europe for both boys and girls 1999-2003, but showed no strong changes in the EU15.

⁴² This is not the same as being statistically significant (a real change rather than sampling error), as this is not reported in the ESPAD study.

⁴³ Relative dispersion is calculated as the Coefficient of Variation (CV), described in footnote 8 above.

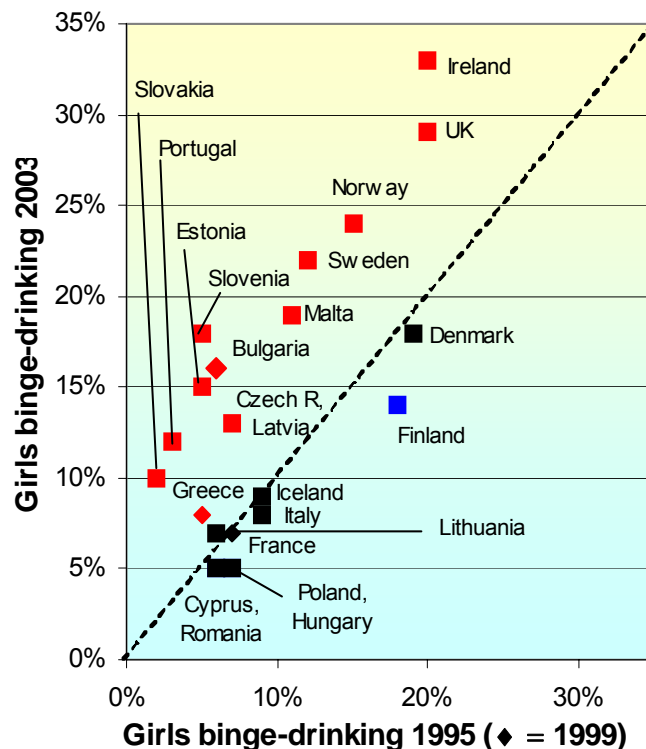


Figure 4.15 Trends in binge-drinking in 15-16 year old **female** students, 1995-2003

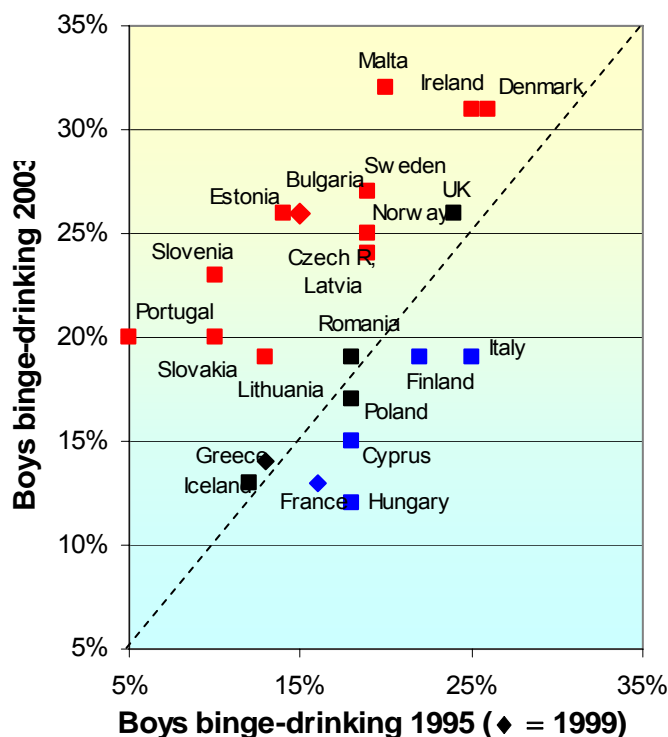


Figure 4.16 Trends in binge-drinking in 15-16 year old **male** students, 1995-2003
 5+ drinks on a single occasion 3+ times in last 30 days. Source: *ESPAD surveys (Hibell et al. 1996; 2000; 2004)* A point above the dashed line means that binge-drinking has increased. Countries in red have seen more than a 2% increase; countries in blue have seen more than a 2% decrease. Countries in black have seen less than a 2% change.

Gender and young people's drinking

Despite the media attention on girls' drinking in parts of Europe, it is still the case that boys are more likely than girls to have tried alcohol by age 11 years, be drunk by 13 years, to binge-drink, to be drunk, and to drink more on each drinking occasion (as occurs in the rest of the world, cf. Jernigan 2001). The size of the gender gap varies for different behaviours, and in general is stronger for more unusual behaviour, e.g. boys are more likely than girls to have drunk alcohol by age 11 years, but by 15 years the differences are almost non-existent.

The inequality between genders also changes size in different parts of Europe, where the difference in 'ever having been drunk' is larger in the EU10 than the EU15 (due to a greater frequency in boys but not girls). For many aspects of drinking (e.g. age of first drink, last occasion consumption, binge-drinking) the gap is also noticeably larger in southern Europe than elsewhere, although once more this may be biased by cultural desirability. For the first time in 2003, it is also true that binge-drinking in some countries (the UK and Ireland) and reported drunkenness in others (Finland, Iceland for some measures, and the UK) is more common for girls than boys. It has been suggested that this relative gender equality is linked to the wider position of women in the UK, Ireland, and the Nordic countries, although the complexity of the adult situation (see above) should warn against overly simplistic interpretations here (see also Room 2005).

Comparing the trends in drunkenness by gender (see Figures 3.14 and 3.15), it is clear that there were a few exceptions to the rise in drunkenness for boys, whereas it was a very consistent rise for girls. This trend is strongest in the EU15, where 7 of the 10 countries showed a proportional increase in girls' drunkenness that was greater than the change for boys (exceptions were Finland, the only country where drunkenness decreased overall, and Denmark, which had the highest levels in 1995; similar if less pronounced results are also found from HBSC). In some parts of the EU10 (Estonia, Latvia, Slovak Republic and Slovenia), the proportional increase was also much greater in girls than boys, although this trend was not visible everywhere (e.g. Poland, Lithuania). However, these figures can overstate how much the *absolute* gap between girls and boys has gone down – for example, the proportion of Estonian girls getting drunk 3 or more times a month trebled from 5% to 15%, but this is still less in absolute terms than the proportionally smaller 12% rise for Estonian boys. This means that the difference in the numbers of boys and girls getting drunk 3 or more times a month has increased in as many countries as it has decreased in recent years.

In conclusion, there are some signs of a narrowed gap between the genders, but this is happening for some aspects of drinking in some countries rather than being universal. Instead, the main trends in young people's drinking are occurring in parallel for both genders.

Table 4.2 Young people's trends in different measures of binge-drinking and drunkenness by country, here showing *binge-drinking three or more times in the past 30 days*.

Red ▲ show a greater than 2% rise; blue ▼ show a greater than 2% fall;
grey — show a trend of less than 2%.

	BOYS		GIRLS	
	1995 – 1999 ¹	1999 – 2003 ¹	1995 – 1999 ¹	1999 – 2003 ¹
Bulgaria		▲		▲
Cyprus		▼		—
Czech R.	▲	—	▲	—
Denmark	▲	▼	▲	▼
Estonia	▲	▲	▲	▲
Finland	—	—	▼	—
France		▼		—
Greece		—		▲
Hungary	—	▼	—	▼
Iceland	▲	▼	▲	▼
Ireland	▲	—	▲	—
Latvia		▲		▲
Lithuania	—	▲	—	—
Malta	▲	▲	▲	—
Norway	▲	—	▲	—
Poland	▲	▼	▲	▼
Portugal	▲	▲	—	▲
Romania		—		—
Slovak R.	—	▲	▲	▲
Slovenia ⁴	▲	▼	▲	—
Sweden	▲	▲	—	▲
UK	▲	▼	▲	—

Notes: No results have been displayed for Italy as data were only available for 1995 and 2003; this longer time period showed a fall for boys and no change for girls.

Sources: ESPAD (Hibell *et al.* 1997; Hibell *et al.* 2000; Hibell *et al.* 2004).

Table 4.3 Young people's trends in different measures of binge-drinking and drunkenness by country, here showing *binge-drinking ten or more times per year*

Red ▲ show a greater than 2% rise; blue ▼ show a greater than 2% fall;
grey — show a trend of less than 2%.

Years	BOYS		GIRLS	
	1995 – 1999 ¹	1999 – 2003 ¹	1995 – 1999 ¹	1999 – 2003 ¹
Bulgaria		▲		—
Cyprus	—	—	—	—
Czech R.	▲	—	—	▲
Denmark	▲	▼	▲	▼
Estonia	▲	▲	▲	▲
Finland	▲	▼	▼	▼
France		—		—
Greece		—		—
Hungary	—	▲	—	▲
Iceland	—	▼	▼	▼
Ireland	▲	—	▲	▲
Italy	—	▲	—	—
Latvia		—		—
Lithuania	▲	▲	—	▲
Malta	—	—	—	—
Norway	▲	▼	▲	—
Poland	▲	—	—	—
Portugal	▲	▼	—	—
Romania		—		—
Slovak R.	—	▲	▲	—
Slovenia	▲	—	▲	—
Sweden	▲	▼	—	▼
UK	▲	▼	—	—

Sources: ESPAD (Hibell *et al.* 1997; Hibell *et al.* 2000; Hibell *et al.* 2004).

Table 4.4 Young people's trends in different measures of binge-drinking and drunkenness by country, showing *lifetime drunkenness two or more times*

Red ▲ show a greater than 2% rise; blue ▼ show a greater than 2% fall; grey — show a trend of less than 2%.

Years	BOYS		GIRLS	
	1993/4	1997/8	1993/4	1997/8
	—	—	—	—
	1997/8	2001/2	1997/8	2001/2
Austria	▲	▼	▲	—
Belgium ¹	—	▲	▲	▲
Czech R.	—	—	▲	▲
Denmark	▲	▼	▼	—
Estonia	▲	▲	▲	▲
Finland	—	—	▲	—
Greece		—		▼
Hungary	▲	▲	—	▲
Ireland		▼		▲
Latvia	▲	▼	—	—
Lithuania	▲	▲	▲	▲
Norway	▲	—	▲	—
Poland	▲	—	▲	—
Portugal		▼		▲
Sweden	▲	—	▲	—
Switzerland	▲	▲	▲	▲
UK ²		▲		▲

Notes: ¹ French area of Belgium only; ² UK data refers to England only; other regions in the same period show different trends (Scotland showing no change for boys, and a rise and then fall for girls; Wales showing a rise 1993/4-1997/8 and a fall 1997/8-2001/2 for both genders).

No results have been displayed for Slovenia as data were only available for 1993/4 and 2001/2; this longer time period showed no change for boys and a rise for girls.

Sources: HBSC (King and colleagues 1996; Currie *et al.* 2000; Currie *et al.* 2004) reports.

Drinking and dependence in young adults

If we look instead at young adults,⁴⁴ we find that younger age groups have the highest level of consumption compared to older ages in some countries and a lower amount elsewhere (Mäkelä *et al.* 2001; Hemström, Leifman, and Ramstedt 2001; Mäkelä *et al.* 2005).⁴⁵ This means that people aged 19-29 years account for an estimated 20%-45% of all consumption in both males and females aged 19-65 years, with the exact value depending on the country (authors' calculation from Hemström, Leifman, and Ramstedt 2001; Ramstedt and Hope 2003). This compares 19-29 year olds accounting for 25%-30% of the population in most countries and 38% in Ireland. Similarly, although young adults generally drink less often than their elders (Eurobarometer 2003), this effect is strongest in southern Europe and Germany (Leifman 2002; Mäkelä *et al.* 2005). This effect is still visible in the Nordic countries and the UK, but is much less strong (particularly for women) and can even disappear depending on the variable used (Leifman 2002).⁴⁶

One major factor behind this seems to be young people's relatively stable preference for drinking in public drinking places such as bars rather than drinking with meals. This is particularly strong in southern Europe (and to a lesser extent, Germany) where young people are considerably less likely to drink with either lunch or the afternoon/evening meal than older groups, yet are more likely to drink at a restaurant or bar (the absolute size of the latter being insufficient to outweigh the former). Young people in northern Europe show a similar level of increased frequency of public drinking, but the frequency of drinking with meals is much less pronounced – and exceptionally in the UK, drinking with meals is even more common in young people than others (Leifman 2002). As a result of the different sizes of these age patterns, the contexts of drinking for young people in Europe look different than for older adults (described above); in particular, the UK has a frequency of drinking with afternoon/evening meals that matches that of Italy and is greater than that of France.

As found for public drinking, the frequency of drinking to intoxication is highest in young people compared with older groups in most but not all studies (although exceptions are found in Eurobarometer 2003), and the difference is much stronger in parts of northern Europe, the UK and Ireland than elsewhere (Leifman 2002; Kuntsche, Rehm, and Gmel 2004). In the Baltic region, the pattern seems to divide by gender, with higher rates of binge-drinking compared to older adults found in women but not men in Estonia, Latvia, Lithuania and Finland (Helasoja *et al.* 2005).⁴⁷ The link of youth and beer-drinking across Europe is one of the most consistent patterns – in nearly all countries (except Germany), younger age groups were more likely to choose beer than older groups (Hupkens, Knibbe, and Drop 1993; Hemström, Leifman, and Ramstedt 2001; Leifman 2002).

Although few data are available for looking at trends in young adults' drinking, research in Italy suggests that young people drink relatively less than older age

⁴⁴ 'Young adults' in this context only refers to either the 18-29 years (in ECAS) or 20-34 years (GENACIS surveys of Mäkelä *et al.* 2004) age group, and therefore excludes children and adolescents.

⁴⁵ Young adults have the highest level of alcohol consumption in northern Europe, Ireland and the UK, but drink less than older groups in central European EU10 countries.

⁴⁶ The effect is visible when drinking frequency is calculated as either the highest beverage-specific drinking frequency or the sum of drinking frequencies for different beverages, but disappears when the number of weekly 'drinking occasions' (with lunch, with dinner, at home without a meal, away from home without a meal) is considered. See also the discussion on measuring frequency of drinking above.

⁴⁷ Youngest age group was aged 20-34 years; 'middle-age' refers to the 35-49 years age group. Binge-drinking defined as six ('regular restaurant') portions on a single occasion.

groups in the 1990s when compared with the 1950s (Leppänen, Sullström, and Suoniemi 2001) but are more likely to drink outside meals (Ministero della Salute 2003). To the extent that the declining per capita consumption in Italy is explicable by declining consumption with meals (see discussion below), these findings may in fact be mutually supporting rather than contradictory. In other cases though, it is difficult to divide between trends over time in a population's drinking that occur first in young people (cohort effects) or simple age effects that will not lead to any change at the population level. Only time will tell if the much reduced differences between young adults' drinking in different EU countries (as shown in drinking frequency, beverage preferences and drinking with meals) represent a further harmonization in Europe.

WHAT EXPLAINS EUROPEAN DRINKING TRENDS?

Throughout this chapter we have seen evidence for harmonization of some aspects of alcohol use in some parts of Europe, while other aspects and regions have seen continued differences. In particular, EU countries have come closer together in (i) recorded consumption, (ii) beverage preferences, and (iii) youth drunkenness – in the latter case, a change we can see just from the last 10 years. For recorded consumption levels the harmonization has occurred in most of the EU, but in other areas the convergence is only within the EU15 (for beverage preferences) or between the EU10 and EU15 (for youth drinking). Unfortunately, we do not have the data to see how this relates to trends in risky patterns of drinking for adults, which, given the public health importance of the issue, is a gap that should be closed as a priority.

While these results provide a broad picture of recent drinking trends, they in turn demand an explanation: why has this partial harmonization taken place?

One possibility is that wider changes in living conditions within the EU are responsible, such as changing patterns of time use, urbanization, and a move from agricultural to industrial/service sectors in the Mediterranean areas (Allamani 2001). However, declining numbers of heavy-drinking agricultural workers in France were responsible for only one-fortieth of the total decline in consumption between 1965 and 1979 (Sulkunen 1989). Indeed, changes in consumption and beverage preferences in France in this period can be observed in all occupational groups (including agricultural workers), as well as in both rural and urban environments. More recently, European studies have shown no systematic differences between rural and urban areas in the EU15 in either the share of their income spent on alcohol or in the level of consumption (Eurobarometer 2003; European Commission 2003b). And on a general level, it is difficult to reconcile a simple single-factor explanation with the different outcomes of similar changes in northern Europe and southern Europe (Simpura 1998). One reason for this may be that the relationship between urbanization and alcohol use is complex and pulls in multiple directions, with some sociologists predicting that alcohol's role as a social lubricant will become more, rather than less, important in the anonymous world of the city (Sulkunen 1989; Simpura 1996).

Economic factors, such as increases in disposable income (especially for young people) and changes in the price of alcohol, have also been considered as a contributory factor in the partial harmonization. For example, it has been found that GDP is an important factor affecting consumption levels in the EU15 (Customs Associates Ltd 2001), while market research firms have predicted rises in

consumption due to rising GDP (cited in Anderson 2006). More generally, alcohol consumption levels have been found on many occasions to be responsive to tax and price (see Chapter 7). However, the most comprehensive econometric analysis finds that price and expenditure on their own cannot predict harmonization in consumption levels in the EU15, even though they can explain a part of the variation (Leppänen, Sullström, and Suoniemi 2001; Leifman 2001b). The decline in wine consumption in southern Europe is also clearly problematic from this perspective, given that real prices were stable or declining at the same time as consumption showed a stable decrease (Allamani 2001). Nevertheless, the recession in the mid-1980s has been put forward as a contributory factor in the decline of consumption in southern Europe, while the relative increase in wine prices compared to beer has also been linked to changing beverage choices in Spain (Gual and Colom 1997). This suggests that economic factors may play some part even where alcohol is relatively cheap (see Chapter 9 for a comparison of the price of alcohol in Europe).

A third potential driver of these process is 'globalization' in its many forms, and in particular the business practices of increasingly multinational drinks operators in the EU15 and more recently also within the EU10 (Simpura 1997; Leifman 2001b), as described in more detail in the discussion of marketing in Chapter 7. One aspect of this is the dominance of beer and spirits advertising over wine in southern Europe (Gual and Colom 1997), while another is the deeper ties and market access within the various forms of the EU (see Chapter 8). Perhaps more importantly, this would also seem to suggest that countries are increasingly drinking 'international alcoholic drinks' rather than simply the drinks that have tended to be produced within their own countries. Partially in support of this, the share of imports within all alcohol on the market in Greece, Italy, Portugal and Spain has dramatically increased from 1% or less in 1970 to between 9% and 18% today.⁴⁸ Yet this means the bulk of alcohol drinks are still domestically produced, and even for beer – the 'new beverage'⁴⁹ – only Italy gets less than 90% from domestic sources (see also Pyörälä 1989). Furthermore, the power of advertising in precipitating cultural change can be overstated, and it is likely that advertising has prompted or accelerated cultural change rather than being solely responsible for it.

Perhaps the most interesting explanation comes from an analysis of cultural competition between social groups (Sulkunen 1989; Hupkens, Knibbe, and Drop 1993; Knibbe, Drop, and Hupkens 1996). Using the social theory of Pierre Bourdieu (Bourdieu 1984; see also Bourdieu 1990), it has been argued that those people with 'cultural capital' use their judgements of taste to cement their high position in society (though this is often unconscious and 'natural' rather than made explicit). This judgement of taste diffuses throughout European society based not only on people's own desire to maximise cultural capital, but also due to their recognition that there is a hierarchy of taste – or in Bourdieu's famous phrase, because they know that "*taste classifies, and it classifies the classifier*" (Bourdieu 1984:6). Those with less cultural capital adopt the patterns of this elite to show their cultural competence, and in this way it is argued that the behaviour of those with higher status is gradually diffusing through European society. In France, and possibly in the other wine-producing countries such as Italy and Spain, the traditional substantial consumption of wine with meals seems to be seen more and more associated with old-fashioned habits, to be

⁴⁸ Alcohol availability calculated as "production + imports – exports"; all data (by weight) from the UN Food and Agriculture Organization's Statistical Division (FAOSTAT), publicly available from <http://faostat.fao.org/>.

⁴⁹ Beer is not wholly 'new' to southern Europe, its existence having been known for several thousand years. However, both beer in southern Europe and wine in northern Europe are sometimes described as 'new beverages' given their absence from frequent mainstream use in recent history.

replaced by more stylish drinking behaviour such as abstinence or drinking outside meals (Sulkunen 1989; Simpura 1998). Certainly some of the previous uses of wine have been replaced by consumption of cola, fruit juice and mineral water, drinks that were previously rarely drunk in this region (Gual and Colom 1997).

A strength of this approach is that it seems to be equally true in the rest of the EU15, where non-traditional drinks are also a way of showing fashionable tastes. In northern Europe this translates to the increasing popularity of wine with meals, a trend that (as would be predicted) appears to be strongest in the higher socioeconomic groups (Hupkens, Knibbe, and Drop 1993). Regional data also seems to support this, despite being blurred by the lack of controls for the drinking patterns of different educational groups.

Nevertheless, the relative preference for one beverage over another shows the predicted pattern for the educational level of regions, i.e. less educated regions in the Mediterranean show a stronger tendency to drink wine more often than beer, but those in northern European show the inverse.⁵⁰ It is important not to overstate the explanatory power of this – wine is still the preferred beverage in France, for example, particularly in certain regions – but it points to a possible common cause underneath some of the otherwise diverse trends in Europe.

A final factor to be considered is the impact of public health policy, where there has also been a harmonization since the Second World War (see Chapter 9). The change in policy measures has been most noticeable where there were few policies before – including southern European countries – and it has been noted that the decrease in consumption in these countries started at around the same point that these policies were starting to be adopted (Gual and Colom 1997). Gual and Colom further note that a public policy aim of curbing the use of spirits may have contributed to a growth in beer drinking. There may also be an effect of public health policy on young people's drinking, given that the rise in binge-drinking in the EU15 in the mid-to-late 1990s was followed by increased awareness and action on a national and European level (see Chapter 8)

A major difficulty here is in separating out the causes and effects of policy: an increase in awareness of alcohol-related harm may both reduce risky drinking and increase the chances of alcohol policies being adopted (Allamani 2001). For example, respondents to surveys in France in the early 1980s often said that health concerns were behind their reduced drinking (cited in Sulkunen 1989), which in turn can be linked to the changing French policies on alcohol. While it, therefore, seems unlikely that stringent public health policies can fully explain a large cultural shift, increasing levels of alcohol policy are frequently cited by market research organisations as factors explaining reduced consumption in countries such as France (for an example on underage drinking enforcement and drink-driving, see Euromonitor and just-drinks.com 2005:11, 23).

Cultural complexity and youth trends

These economic and cultural forces should not be seen as artificially distinct processes; instead, they are ways to understand a complex interplay of factors that are undoubtedly at work in what some have termed the 'modernization' of drinking

⁵⁰ Present authors' re-interpretation of data presented by Knibbe *et al.* (Knibbe, Drop, and Hupkens 1996). The original study saw no support for this trend for beer, but took no account of the *relative* preference for one beverage over another. Instead, the absolute correlations of the frequency of drinking beer/wine with the regional educational level were used, which seemed to create a distortion in the results.

preferences in Europe (see also below). For example, increasing health awareness may partly explain why wine is viewed as less stylish than it was before in France (Sulkunen 1989), while the 20th century explosion of car use has helped convince many in southern Europe that alcohol is a health risk (Gual and Colom 1997; Simpura 1998). More importantly, the globalization of cultural forms alongside the globalization of commerce (Simpura 1997) may have important implications for the style and taste associated with particular drinking practices, potentially leading to increasing harmonization. This can be seen in the increased movement of both people and cultural artefacts (e.g., TV programmes, films, music, and books) between regions and countries, giving people the opportunity to view alternate ways of life (and on a narrower level, alternate ways of drinking). Even if naïve models of cultural homogenization have now been generally dismissed, the increased exposure and use of previously 'foreign' cultural forms – particularly among young people – may lead to trends and fashions occurring across several geographical areas in parallel in a way that was much rarer in a less globalized world.

This may partially explain the harmonization in drunkenness between the EU10 and EU15 over the past decade, and the increasing reports of risky alcohol use in young people in countries not used to these problems. This includes rising binge-drinking in Portugal (Hibell *et al.* 2004), increased drinking outside meals in Italy (Ministero della Salute 2003), and the phenomenon of large numbers of young people drinking and listening to music until the early hours of the morning in Spanish towns known as 'el botellón' (Baigorri, Fernández, and GIESYT 2004). This has occurred within a context of increasing use of illicit drugs in the 1990s (Hibell *et al.* 2000), often by young people as part of an occasional leisure activity (Allaste and Lagerspetz 2002), and leading to what some have called the 'recreational drug wars' between legal and illegal drugs (Brain 2000). This suggests that alcohol and other drugs have to compete for their youth market by offering increasing 'highs' in the pursuit of pleasure, both in terms of the alcoholic product and the environment in which it is consumed (Measham 2004).

Although much of this analysis has been for the UK, a similar context has been observed throughout the EU. For example, drug use "is becoming more and more a consumption phenomenon rather than a deviant phenomenon" in Italy (Beccaria and Sande 2003:104), while there was a doubling of cannabis use and a quadrupling of cocaine use in Spain 1994-2002, followed by a sharp rise in binge-drinking 2002-4 (Ministerio de Sanidad y Consumo 2005). Based on the experience of the Estonian capital Tallinn, it has been suggested that recreational drug use among young people depends upon both a free media and the breakthrough of 'youth culture', itself a product of cultural change, economic growth and globalization in the post-World-War-II period (Allaste and Lagerspetz 2002). While other diverse causes may underpin these trends, it has been argued that the common experience of consumerism and individualism – creating a world of unmet expectations and isolation that people attempt to consume their way out of – may further be partially responsible (Eckersley 2005). Further analyses of both the extent and causes of these trends from a European perspective would be valuable in extending these conjectures, helping to explain the patterns clearly visible in young European citizens.

Yet despite these many forces at work, it is also important to remember that ways of drinking are deeply embedded in European cultures, and have their own inertia that makes the pace of change often very slow (Simpura, Karlsson, and Leppänen 2001). Indeed, this inertia may be linked to the internal rhythms of alcohol consumption in 'long waves' (see e.g. Simpura 1995). Recent changes in youth drinking culture may suggest that young people are more open to change than adults, which has an intuitive appeal. Nevertheless, the proportion of young people in a region did not

correlate with the adoption of the 'new beverage' in any part of Europe (Knibbe, Drop, and Hupkens 1996), while adult drinking cultures are still an important factor in patterns of youth drinking (Bjarnason *et al.* 2003). Most clearly of all, the evidence presented in this chapter shows that many of the patterns in adult drinking are replicated in their younger counterparts, despite the differences within each country between generations.

CONCLUSION

This chapter has sketched out the current picture of drinking habits in the EU, the highest-drinking region in the world. It has shown how population consumption levels are likely to move in tandem with the numbers of heavy drinkers, while trends in non-drinkers move relatively independently. Within this broad view, there are some clear differences – both between population subgroups (defined by socioeconomic status, gender or age) and between the countries of Europe. Yet the most striking feature from a long-term perspective is the partial harmonization that has taken place, sometimes within the whole EU (for consumption levels) and sometimes only within certain parts of the EU (between the EU10 and EU15 for youth drunkenness, within the EU15 for beverage preferences). There also appears to be a trend for new, riskier patterns of alcohol use in young people across many parts of Europe, although the general increase does not mean that young people are entirely disconnected from the drinking culture of their home country.

While trying to summarize the European situation is not always easy, trying to explain the reasons behind it are undoubtedly more difficult. A simple term such as 'modernization' can incorporate a number of different explanations, all of which interact in complex ways and often differently in different contexts. That said, the five broad perspectives considered above – living conditions, economic changes, globalization, cultural competition and public health policy – together offer a way of trying to grapple with these changes, and potentially guide predictions as to the future. Changing time use and urbanization may well have played some part in converging consumption levels, as may be true for rising prosperity, although in neither case do they explain as much as is sometimes thought. Globalization, by which we particularly mean the internationalization of the alcoholic drinks industry, has increased the availability of 'foreign' drinks types and also gradually standardized marketing practices (if not content). This may well connect to the symbolic competition going on within everyday choices, and partially explain why 'new drinks' have become more desirable across the EU15. Finally, while it is hard to fully separate out the policy effect from other factors, it is widely accepted – from both a public health and industry standpoint – that the converging and generally increased public health policies on alcohol (see Chapter 9) have contributed in some way to the observed harmonization in drinking levels.

From a public health policy-making perspective, these changes in drinking behaviour need to be further understood within the context of drinking-related harm. It is to these risks and outcomes that the following two chapters now turn.

REFERENCES

Abel, G. M. and Plumridge, E. W. (2004). "Network "Norms" or "Styles" of "Drunken Comportment"?" *Health Education Research*, 19: 492-500.

Academy of Medical Sciences (2004). *Calling time: the nation's health as a public health issue*. http://www.acmedsci.ac.uk/p_callingtime.pdf

Ahlström, S. (1987). "Women's Use of Alcohol." *Finnish drinking habits: results from interview surveys held in 1968, 1976 and 1984*, Edited by J. Simpura. Helsinki, Finland: The Finnish Foundation for Alcohol Studies.

Ahlström, S., Bloomfield, K., and Knibbe, R. (2001). "Gender Differences in Drinking Patterns in Nine European Countries: Descriptive Findings." *Substance Abuse*, 22(1): 69-85.

Ahlström, S., G. Gmel, Pia. Mäkelä, and J. Näsänen (2005). "Drinking Contexts in European Countries." Pp.73-86 in *Gender, Culture and Alcohol Problems: A Multi-national Study. Project Final Report*, Edited by K. Bloomfield, S. Ahlström, A. Allamani, F. Beck, K. Helmersson Bergmark, L. Csemy, I. Eisenbach-Stangl, Z. Elekes, G. Gmel, F. Kerr-Correa, R. Knibbe, Pia. Mäkelä, M. Monteiro, M. Medina Mora, S. Nordlund, I. Obot, M. Plant, G. Rahav, and R. Mendoza. Berlin: Charite Campus Benjamin Franklin.

Allamani, A. (2001). "Policy Implications of the ECAS Results: a Southern European Perspective." Pp.195-205 in *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries*, Edited by T. Norström. Stockholm: National Institute of Public Health, European Commission.

Allamani, A., Voller, F., Kubicka, L., and Bloomfield, K. (2000). "Drinking Cultures and the Position of Women in Nine European Countries." *Substance Abuse*, 21(4): 231-37.

Allaste, A-A. and Lagerspetz, M. (2002). "Recreational Drug Use in Estonia: the Context of Club Culture." *Contemporary Drug Problems*, 29: 183-200.

Alonso, J., Angermeyer, M. C., Bernert, S., Bruffaerts, R., Brugha, T. S., Bryson, H., Girolamo, G., Graaf, R., Demeyttenaere, K., Gasquet, I., Haro, J. M., Katz, S. J., and colleagues (2004). "Prevalence of Mental Disorders in Europe: Results From the European Study of the Epidemiology of Mental Disorders (ESEMeD) Project." *Acta Psychiatrica Scandinavica*, 109(s420): 22-27.

Anderson, P. (2006). "Addiction and Alcohol Use Disorders." In Martin Knapp, David McDaid, Elias Mossialos and Graham Thornicroft (Eds) *Mental Health Policy and practice across Europe*. Milton Keynes: Open University press.

Babor, T. F., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., Grube, J., Gruenewald, P., Hill, L., Holder, H. D., Homel, R., Österberg, E., Rehm, J., and Rossow, I. (2003). *Alcohol: No Ordinary Commodity*, Oxford: Oxford UP.

Baigorri, A., Fernández, R., and GIESYT. (2004). *Botellón: Un Conflicto Postmoderno [Botellón: a Postmodern Conflict]*, Barcelona: Icaria.

Beccaria, F. and Sande, A. (2003). "Drinking Games and Rite of Life Projects: a Social Comparison of the Meaning and Functions of Young People's Use of Alcohol During the Rite of Passage to Adulthood in Italy and Norway." *Young: the Nordic Journal of Youth Research*, 11(2): 99-119.

Beinart, S., Anderson, B., Lee, S., and Utting, D. (2002). *Youth at risk: a national survey of risk factors, protective factors and problem behaviour among young people in England, Scotland and Wales*. London: Communities that Care.

Beirness, B. J., Foss, R. D., and Vogel-Sprott, M. (2004). "Drinking on Campus: Self-Reports and Breath Tests." *Journal of Studies on Alcohol*, 65: 600-604.

Bjarnason, T., Andersson, B., Choquet, M., Elekes, Z., Morgan, M., and Rapinett, G. (2003). "Alcohol Culture, Family Structure and Adolescent Alcohol Use: Multilevel Modeling of Frequency

of Heavy Drinking Among 15-16 Year Old Students in 11 European Countries." *Journal of Studies on Alcohol*, 64(2): 200-208.

Bloomfield, K., Ahlström, S., Allamani, A., Choquet, M., Cipriani, F., Gmel, G., Jacquat, B. J., Knibbe, R., Kubicka, L., Lecomte, T., Miller, P., Plant, Moira, and Spak, F. (1999). *Alcohol consumption and alcohol problems among women in European countries*. Berlin: Free University of Berlin (Institute of Medical Informatics, Biostatistics and Epidemiology). <http://www.medizin.fu-berlin.de/statistik/Gender&Alcohol/>

Bloomfield, K., G. Gmel, U. Grittner, S. Kramer, and J. Eckloff (2005). "Social Inequalities in Alcohol Consumption and Alcohol-Related Problems in the Study Countries of the EU Concerted Action "Gender, Culture and Alcohol Problems: a Multi-National Study"." Pp.117-35 in *Gender, Culture and Alcohol Problems: A Multi-national Study. Project Final Report*, Edited by K. Bloomfield, S. Ahlström, A. Allamani, F. Beck, K. Helmersson Bergmark, L. Csemy, I. Eisenbach-Stangl, Z. Elekes, G. Gmel, F. Kerr-Correa, R. Knibbe, Pia. Mäkelä, M. Monteiro, M. Medina Mora, S. Nordlund, I. Obot, M. Plant, G. Rahav, and R. Mendoza. Berlin: Charite Campus Benjamin Franklin.

Bloomfield, K., Gmel, G., Neve, R., and Mustonen, H. (2001). "Investigating Gender Convergence in Alcohol Consumption in Finland, Germany, the Netherlands and Switzerland: a Repeated Survey Analysis." *Substance Abuse*, 22(1): 39-53.

Bobak, M., Room, R., Pikhart, H., Kubinova, R., Malyutina, S., Pajak, A., Kurilovitch, S., Topor, R., Nikitin, Y., and Marmot, M. (2004). "Contributions of Drinking Patterns to Differences in Rates of Alcohol Related Problems Between Three Urban Populations." *Journal Of Epidemiology and Community Health*, 58: 238-42. <http://jech.bmjournals.com/cgi/content/full/58/3/238>

Bongers, I. M. B., van de Goor, L. A. M., van Oers, J. A. M., and Garretsen, H. F. L. (1998). "Gender Differences in Alcohol-Related Problems: Controlling for Drinking Behaviour." *Addiction*, 93(3): 411-21.

Bonomo, Y. A., Bowes, G., Coffey, C., Carlin, J. B., and Patton, G. C. (2004). "Teenage Drinking and the Onset of Alcohol Dependence: a Cohort Study Over Seven Years." *Addiction*, 99(12): 1520-1528.

Bourdieu, P. 1984. *Distinction: a Social Critique of the Judgement of Taste [Translated by Richard Nice]*. Originally published as *La distinction* (1979), London: Routledge & Kegan Paul.

Bourdieu, P. (1990). *The Logic of Practice [Translated by Richard Nice]*. Originally published as *Le sens pratique*, Cambridge: Polity.

Brain, K. (2000). *Youth, alcohol, and the emergence of the post-modern alcohol order*. Institute of Alcohol Studies. <http://www.ias.org.uk/iaspapers/brainpaper.pdf>

Carey, K. B. (2001). "Understanding Binge Drinking: Introduction to the Special Issue." *Psychology of Addictive Behaviors*, 15(4): 283-86.

Casswell, S., Pledger, M., and Hooper, R. (2003). "Socioeconomic Status and Drinking Patterns in Young Adults." *Addiction*, 98(5): 601-10.

Coleman, L. and Cater, S. (2005). *Underage 'risky' drinking*. York, UK: Joseph Rowntree Foundation.

Colhoun, H., Ben-Shlomo, Y., Dong, W., Bost, L., and Marmot, M. (1997). "Ecological Analysis of Collectivity of Alcohol Consumption in England: Importance of Average Drinker ." *British Medical Journal*, 314: 1164. <http://bmj.bmjournals.com/cgi/content/full/314/7088/1164>

Crawford, A. (1987). "Attitudes About Alcohol: a General Review." *Drug and Alcohol Dependence*, 19: 279-311.

Currie, C., Hurrelman, K., Settertobulte, W., Smith, Rebecca, and Todd, Joanna (2000). *Health and Health Behaviour among Young People: a WHO Cross-National Study (HBSC) International Report*. WHO.

Currie, C., Roberts, Chris, Morgan, A., Smith, Rebecca, Settertobulte, W., Samdal, O., and Rasmussen, V. B. (2004). *Health Behaviour in School-aged Children (HBSC) study: international report from the 2001/2002 survey*. Copenhagen, Denmark: WHO.

Customs Associates Ltd (2001). *Study on the competition between alcoholic drinks*. http://ec.europa.eu/comm/taxation_customs/publications/reports_studies/taxation/study_al_drinks/al_drinks.htm

Droomers, M., Schrijvers, C. T. M., and Mackenbach, J. P. (2004). "Educational Differences in Starting Excessive Alcohol Consumption: Explanations From the Longitudinal GLOBE Study." *Social Science and Medicine*, 58(4): 2023-33.

Duarte, R. and Molina, J. A. (2004). "Alcohol Abuse Among Adolescents: Regional Evidence From Spain." *International Journal of Consumer Studies*, 28(1): 18-27. e-version in *YP/Europe*

Eckersley, R. M. (2005). "Cultural Fraud': the Role of Culture in Drug Abuse." *Drug and Alcohol Review*, 24: 157-63.

Epstein, E. E. (2001). "Classification of Alcohol-Related Problems and Dependence." Pp.47-70 in *International handbook of alcohol dependence and problems*, Edited by N. Heather, T. J. Peters, and T. Stockwell. Chichester: John Wiley & Sons, Ltd.

Eurobarometer (2003). *Health, food and alcohol safety*. Special Eurobarometer 186. http://ec.europa.eu/comm/public_opinion/index_en.htm

Euromonitor and just-drinks.com (2005). *The just-drinks/Euromonitor International industry review 2004-2010*. Bromsgrove, UK: Aroq Ltd.

European Commission (2003a). *Health in Europe: results from 1997-2000 surveys*. http://epp.eurostat.cec.eu.int/cache/ITY_OFFPUB/KS-57-03-184/EN/KS-57-03-184-EN.PDF

European Commission (2003b). *Health statistics: key data on health 2002*. Luxembourg: Office for Official Publications of the European Communities.

Fillmore, K. M., Hartka, E., Johnstone, B. M., Leino, E. V., Motoyoshi, M., and Temple, M. T. (1991). "A Meta-Analysis of Life Course Variation in Drinking." *British Journal of Addiction*, 86(10): 1221-68.

Gerrard, M., Gibbons, F. X., Zhao, L., and colleagues (1999). "The Effect of Peers' Alcohol Consumption on Parental Influence: A Cognitive Mediation Model." *Journal of Studies on Alcohol*, 13(Suppl.): 32-44.

Gmel, G., Bloomfield, K., Ahlström, S., Choquet, M., and Lecomte, T. (2000). "Women's Roles and Women's Drinking: a Comparative Study in Four European Countries." *Substance Abuse*, 21(4): 249-64.

Göransson, M., Magnusson, A., Bergman, H., Rydberg, U., and Heilig, M. (2003). "Fetus at Risk: Prevalence of Alcohol Consumption During Pregnancy Estimated With a Simple Screening Method in Swedish Antenatal Clinics." *Addiction*, 98(11): 1513-20.

Grant, B. F., Dawson, D., Stinson, F. S., Chou, S. P., Dufour, M. C., and Pickering, R. P. (2004). "The 12-Month Prevalence and Trends in DSM-IV Alcohol Abuse and Dependence: United States, 1991-1992 and 2001-2002." *Drug and Alcohol Dependence*, 74(3): 223-34.

Grundberg, G. (2004). "Consumption of Alcohol During Pregnancy: an Investigation of 1000 Spanish Women." *The 'Coping with Parental Drinking' Symposium, Cologne 14th & 15th May 2004 [conference proceeding]* <http://www.encare.info/content/resources/symposium2004.htm>

Gual, A. and Colom, J. (1997). "Why Has Alcohol Consumption Declined in Countries of Southern Europe?" *Addiction*, 92: S21-S31.

Hamlyn, B., Brooker, S., Oleinikova, K., and Wands, S. (2002). *Infant feeding 2000*. TSO.

Health Council of the Netherlands (2004). *Risks of alcohol consumption related to conception, pregnancy and breastfeeding: executive summary*. 2004/22. The Hague: Health Council of the Netherlands.

Helasoja, V., Lahelma, E., Prättälä, R., Petkeviciene, J., Pudule, I., and Tekkel, M. (2005). "Population Group Differences in Binge Drinking in Estonia, Latvia, Lithuania and Finland." *Presentation at Alcohol - use, harms and policy. A research-based Nordic-Baltic seminar, Riga, October 3, 2005 [conference proceeding]*

Hemmingsson, T., Lundberg, I., and Diderichsen, F. (1999). "The Roles of Social Class of Origin, Achieved Social Class and Intergenerational Social Mobility in Explaining Social-Class Inequalities in Alcoholism Among Young Men." *Social Science and Medicine*, 49(8): 1051-59.

Hemström, Ö., H. Leifman, and M. Ramstedt (2001). "The ECAS-Survey on Drinking Patterns and Alcohol-Related Problems." *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries*, Edited by T. Norström. Stockholm: National Institute of Public Health, European Commission.

Hibell, B., Andersson, B., Ahlström, S., Balakireva, O., Bjarnason, T., Kokkevi, A., and Morgan, M. (2000). *The 1999 ESPAD Report: alcohol and other drug use among students in 30 European countries*. Stockholm, Sweden: The Swedish Council for Information on Alcohol and Other Drugs (CAN) and The Pompidou Group at the Council of Europe.

Hibell, B., Andersson, B., Bjarnason, T., Ahlström, S., Balakireva, O., Kokkevi, A., and Morgan, M. (2004). *The ESPAD Report 2003: alcohol and other drug use among students in 35 European countries*. Stockholm, Sweden: The Swedish Council for Information on Alcohol and Other Drugs (CAN) and The Pompidou Group at the Council of Europe. www.espad.org

Hibell, B., Andersson, B., Bjarnason, T., Kokkevi, A., Morgan, M., and Narusk, A. (1997). *The 1995 ESPAD report: alcohol and other drug use among students in 26 European countries*. Stockholm, Sweden: The Swedish Council for Information on Alcohol and Other Drugs (CAN) and The Pompidou Group at the Council of Europe.

Honess, T., Seymour, L., and Webster, R. (2000). *The social contexts of underage drinking*. London: The Research Development and Statistics Directorate, the Home Office. <http://www.homeoffice.gov.uk/rds/pdfs/occ-drink.pdf>

Hupkens, C. L. H., Knibbe, R., and Drop, M. J. (1993). "Alcohol Consumption in the European Community: Uniformity and Diversity in Drinking Patterns." *Addiction*, 88(10): 1391-404.

Jacobsen, B. K. (1989). "Frequency of Alcohol Use and the Level of Education." *Journal of Internal Medicine*, 225: 417-242.

Jernigan, D. (2001). *Global status report: alcohol and young people*. Geneva: WHO.

Kelleher, C., Gabhainn, S. N., Friel, S., Corrigan, H., Nolan, G., Sixsmith, J., Walsh, O., and Cooke, M. (2003). *The national health & lifestyle surveys*. Galway, Ireland: Centre for Health Promotion Studies, National University of Ireland.

King, A. and colleagues (1996). *The health of youth: a cross-national survey*. 69. Copenhagen: WHO-EURO.

Klipstein-Grobusch, K., Slimani, N., Krogh, V., Keil, U., Boeing, H., Overvad, K., Tjønneland, A., Chavel-Chapelon, F., Thiébout, A., Linseisen, J., Schulze, M. B., Lagiùo, P., Kumle, M., Brustad, M., Martínez García, C., Barricarte, A., Berglund, G., Weinehall, L., Mulligan, A., Allen, N., Ferrari, P., and Riboli, E. (2002). "Trends in Self-Reported Past Alcoholic Beverage Consumption and Ethanol Intake From 1950 to 1995 Observed in Eight European Countries Participating in the European Investigation into Cancer and Nutrition (EPIC)." *Public Health Nutrition*, 5(6B): 1297-310.

Kloep, M., Hendry, L. B., Ingebrigtsen, J. E., Glendinning, A., and Espnes, G. A. (2001). "Young People in 'Drinking' Societies? Norwegian, Scottish and Swedish Adolescents' Perceptions of Alcohol Use." *Health Education Research*, 16(3): 279-91.

- Knibbe, R., Drop, M. J., and Hupkens, C. L. H. (1996). "Modernisation and Geographical Diffusion and Explanation for Regional Differences in the Consumption of Wine and Beer in the EC." *Substance Use and Misuse*, 31(11&12): 1639-55.
- Knupfer, G. (1989). "The Prevalence in Various Social Groups of Eight Different Drinking Patterns, From Abstaining to Frequent Drunkenness: Analysis of 10 US Surveys Combined." *British Journal of Addiction*, 84(11): 1305-18.
- Koroleva, I. (2005). "Alcohol Consumption and Problems in Latvia: Survey Results on Alcohol Use." *Presentation at Alcohol - use, harms and policy. A research-based Nordic-Baltic seminar, Riga, October 3, 2005 [conference proceeding]*
- Kubicka, L., Csemy, L., Duplinsky, J., and Kozeny, J. (1998). "Czech Men's Drinking in Changing Political Climates 1983-93: a Three-Wave Longitudinal Study." *Addiction*, 93: 1219-30.
- Kuntsche, S., Rehm, J., and Gmel, G. (2004). "Characteristics of Binge Drinkers in Europe." *Social Science and Medicine*, 59: 113-27.
- Larson, R. W., Wilson, S., and Mortimer, J. T. (2002). "Conclusions: Adolescents' Preparation for the Future." *Journal of Research on Adolescence*, 12(1): 159-66.
- Law, M. R. and Whincup, P. H. (1998). "Why Is Mortality Higher in Poorer Areas and in More Northern Areas of England and Wales?" *Journal Of Epidemiology and Community Health*, 52: 344-52.
- Ledoux, S., Miller, P., Choquet, M., and Plant, Martin (2002). "Family Structure, Parent-Child Relationships, and Alcohol and Other Drug Use Among Teenagers in France and the United Kingdom." *Alcohol and Alcoholism*, 37(1): 52-60.
- Leifman, H. (2001a). "Estimations of Unrecorded Alcohol Consumption Levels and Trends in 14 European Countries." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 18(English Supplement): 54-70.
- Leifman, H. (2001b). "Homogenisation in Alcohol Consumption in the European Union." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 18(English Supplement): 15.
- Leifman, H. (2002). "A Comparative Analysis of Drinking Patterns in 6 EU Countries in the Year 2000." *Contemporary Drug Problems*, 29: 501-48.
- Lemmens, P. (1995). "Individual Risk and Population Distribution of Consumption." Pp.38-61 in *Alcohol and public policy: evidence and issues*, Edited by H. D. Holder and G. Edwards. Oxford: Oxford University Press.
- Leppänen, K., Sullström, R., and Suoniemi, I. (2001). "Effects of Economic Factors on Alcohol Consumption in 14 European Countries." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 18(English Supplement): 100.
- Lindgren, A. (1973). "Some Results From an International Series of Drinking Surveys." *The Drinking and Drug Practices Surveyor*, 8: 34-47.
- Lundborg, P. (2002). "Young People and Alcohol: an Econometric Analysis." *Addiction*, 97: 1573-82.
- Mackenbach, J. P., Cavelaars, A. E. J. M., Kunst, A. E., Groenhouf, F., and EU Working Group on Socioeconomic Inequalities in Health (2000). "Socioeconomic Inequalities in Cardiovascular Disease Mortality: An International Study." *European Heart Journal*, 21: 1141-51.
- Marmot, M. (1997). "Inequality, Deprivation and Alcohol Use." *Addiction*, 92(Supplement 1): S13-S20.
- Mäkelä, Pia., Fonager, K., Hibell, B., Nordlund, S., Sabroe, S., and Simpura, J. (1999). *Drinking habits in the Nordic countries*. Oslo: National Institute for Alcohol and Drug Research.

Mäkelä, Pia., Fonager, K., Hibell, B., Nordlund, S., Sabroe, S., and Simpura, J. (2001). "Episodic Heavy Drinking in Four Nordic Countries: a Comparative Survey Study." *Addiction*, 96: 1575-89.

Mäkelä, Pia., G. Gmel, U. Grittner, H. Kuendig, S. Kuntsche, K. Bloomfield, and R. Room (2005). "Drinking and Gender Differences in Drinking in Europe: a Comparison of Drinking Patterns in European Countries." Pp.49-72 in *Gender, Culture and Alcohol Problems: A Multi-national Study. Project Final Report*, Edited by K. Bloomfield, S. Ahlström, A. Allamani, F. Beck, K. Helmersson Bergmark, L. Csemy, I. Eisenbach-Stangl, Z. Elekes, G. Gmel, F. Kerr-Correa, R. Knibbe, Pia. Mäkelä, M. Monteiro, M. Medina Mora, S. Nordlund, I. Obot, M. Plant, G. Rahav, and R. Mendoza. Berlin: Charite Campus Benjamin Franklin.

McKee, M., Pomerleau, J., Robertson, A., Pudule, I., Grinberga, D., Kadziauskiene, K., Abaravicius, A., and Vaask, S. (2000). "Alcohol Consumption in the Baltic Republics." *Journal Of Epidemiology and Community Health*, 54(5): 361-66.
http://jech.bmjournals.com/cgi/content/abstract/54/5/361?ijkey=2a1a904d4edcea59c1db69c40ca91ccee3012533&keytype=tf_ipsecsha

Measham, F. (2004). "The Decline of Ecstasy, the Rise of 'Binge' Drinking and the Persistence of Pleasure." *Probation Journal*, 51(4): 309-26.

Midanik, L. T. and Clark, W. C. (1995). "Drinking-Related Problems in the United States: Description and Trends, 1984-1990." *Journal of Studies on Alcohol*, 56(4): 395-402.

Milgram, G. G. (2001). "Alcohol Influences: the Role of Family and Peers." Pp.85-108 in *Learning about drinking*, Edited by E. Houghton and A. M. Roche. Philadelphia, PA: Taylor and Francis.

Ministerio de Sanidad y Consumo (2005). *Encuesta estatal sobre uso de drogas en enseñanzas secundarias 2004 [National survey on drug use in secondary schools in 2004]*.
<http://www.msc.es/pnd/observa/pdf/escolar2004.pdf>

Ministero della Salute (2003). Relazione del ministro della salute al parlamento sugli interventi realizzati ai sensi della legge 30.3.2001 N125: "Legge quadro in materia di alcol e problemi alcoholcorrelati" [Report of the Minister of Health to Parliament on the effect of the law of 30.3.2001 N125: "Law on alcohol and alcohol-related problems"].
<http://progetti.iss.it/binary/ofad/cont/0011.1103623005.pdf>

Mosher, J. F. and Johnsson, D. (2005). "Flavored Alcoholic Beverages: An International Marketing Campaign That Targets Youth." *Journal of Public Health Policy*, 26: 326-42. <http://www.palgrave-journals.com/jphp/journal/v26/n3/index.html>

Nash, S. D., McQueen, A., and Bray, J. H. (2005). "Pathways to Adolescent Alcohol Use: Family Environment, Peer Influence, and Parental Expectations." *Journal of Adolescent Health*, 37: 19-28.

Neumark, Y. D., Rahav, G., and Jaffe, D. H. (2003). "Socio-Economic Status and Binge Drinking in Israel." *Drug and Alcohol Dependence*, 69(1): 15-21.

Neve, R., Drop, M. J., Lemmens, P., and Swinkels, H. (1996). "Gender Differences in Drinking Behaviour in the Netherlands: Convergence or Stability?" *Addiction*, 91(3): 357-73.

Newburn, T. and Shiner, M. (2001). *Teenage Kicks? Young People and Alcohol: a review of the literature*. York: Joseph Rowntree Foundation.

Norström, T. and Romelsjö, A. (1998). "Social Class, Drinking and Alcohol-Related Mortality." *Journal of Substance Abuse*, 10(4): 385-95.

Olds, R. S., Thombs, D. L., and Tomasek, J. R. (2005). "Relations Between Normative Beliefs and Initiation Intentions Toward Cigarette, Alcohol and Marijuana." *Journal of Adolescent Health*, 37: 75.e7-75.e13.

Osservatorio Permanente Giovani ed Alcool (2001). *Italians and alcohol: consumption, trend and attitudes in Italy and in the regions (IV National DOXA National Survey)*.

http://ec.europa.eu/comm/health/ph_determinants/life_style/alcohol/documents/ev_20050120_co021_en.pdf

Péquignot, G., Crosignani, P., Terracini, B., Asunce, N., Zubiri, A., Raymond, L., Estève, J., and Tuyns, A. J. (1988). "A Comparative Study of Smoking, Drinking and Dietary Habits in Population Samples in France, Italy, Spain and Switzerland: III. Consumption of Alcohol." *Revue D'Epidémiologie Et De Santé Publique*, 36: 177-85.

Poelen, E. A. P., Scholte, R. H. J., Engels, R. C. M. E., Boomsma, D. I., and Willemsen, G. (2005). "Prevalence and Trends of Alcohol Use and Misuse Among Adolescents and Young Adults in the Netherlands From 1993 to 2000." *Drug and Alcohol Dependence*, 79: 413-21.

Pyörälä (1989). "Trends in Alcohol Consumption in Spain, Portugal, France and Italy From the 1950s Until the 1980s." *British Journal of Addiction*, 85(4): 469-77.

Pyörälä, E. (1995). "Comparing Drinking Cultures: Finnish and Spanish Drinking Stories in Interviews With Young Adults." *Acta Sociologica*, 38: 217-29.

Ramstedt, M. and Hope, A. (2003). *The Irish drinking habits of 2002: Drinking and drinking-related harm, a European comparison*. Dublin: Department of Health and Children.

Rehm, J., Monteiro, M., Room, R., Gmel, G., Jernigan, D., Frick, U., and Graham, K. (2001). "Steps Towards Constructing a Global Comparative Risk Analysis for Alcohol Consumption: Determining Indicators and Empirical Weights for Patterns of Drinking, Deciding About Theoretical Minimum, and Dealing With Different Consequences." *European Addiction Research*, 7(3): 138-47. <http://content.karger.com/ProdukteDB/produkte.asp?Aktion=ShowPDF&ProduktNr=224233&Ausgabe=227135&ArtikelNr=50734&filename=50734.pdf>

Rehm, J., Rehn, N., Room, R., Monteiro, M., Gmel, G., Jernigan, D., and Frick, U. (2003). "Global Distribution of Average Volume of Alcohol Consumption and Patterns of Drinking." *European Addiction Research*, 9(4): 147-56.

Rehm, J., Room, R., Monteiro, M., Gmel, G., Graham, N., Rehn, C. T., Sempos, U., Frick, U., and Jernigan, D. (2004). "Alcohol." *Comparative quantification of health risks: Global and regional burden of disease due to selected major risk factors*, Edited by M. Ezzati, A. D. Lopez, A. Rodgers, and C. J. L. Murray. Geneva: WHO.

Rehm, J., Room, R., van den Brink, W., and Jacobi, F. (In press). "Alcohol use disorders in EU countries and Norway: an overview of the epidemiology". *European Neuropsychopharmacology*.

Rehn, N., Room, R., and Edwards, G. 2001. *Alcohol in the European Region - Consumption, Harm and Policies*, Copenhagen: WHO Europe.

Rickards, L., Fox, K., Roberts, C., Fletcher, L., and Goddard, E. (2004). *Living in Britain: results from the 2002 General Household Survey*. 31. London: The Stationery Office. <http://www.statistics.gov.uk/lib2002/downloads/drinking.pdf>

Romelsjö, A. and Lundberg, M. (1996). "The Changes in the Social Class Distribution of Moderate and High Alcohol Consumption and of Alcohol-Related Disabilities Over Time in Stockholm County and in Sweden." *Addiction*, 91(9): 1307-23.

Room, R. (2004). "Drinking and Coming of Age in a Cross-Cultural Perspective." *Reducing underage drinking: a collective responsibility*, Edited by R. J. Bonnie and M. E. O'Connell. Washington D.C.: National Academies Press [Committee on Developing a Strategy to Reduce and Prevent Underage Drinking, Board on Children, Youth, and Families, National Research Council, Institute of Medicine of the National Academies].

Room, R. (2005). "Understanding Cultural Differences in Young People's Drinking." *Prepared for presentation at a conference, "Wet youth cultures", Copenhagen, 29-30 August, 2005 [conference proceeding]*

Room, R. and Mäkelä, Klaus (2000). "Typologies of the Cultural Position of Drinking." *Journal of Studies on Alcohol*, 61(3): 475-83.

Schmid, H., ter Bogt, T., Godeau, E., Hublet, A., Dias, S. F., and Fotiou, A. (2003). "Drunkness Among Young People: a Cross-National Comparison." *Journal of Studies on Alcohol*, 64(5): 650-661.

Schnohr, C., Højbjerg, L., Riegels, M., Ledet, L., Larsen, T., Schultz-Larsen, K., Petersen, L., Prescott, E., and Grønbaek, M. (2004). "Does Educational Level Influence the Effects of Smoking, Alcohol, Physical Activity, and Obesity on Mortality? A Prospective Population Study." *Scandinavian Journal of Public Health*, 32(4): 250-256.
<http://www.ingentaconnect.com/content/tandf/spub/2004/00000032/00000004/art00003>

Sieri, S., Agudo, A., Kesse, E., Klipstein-Grobusch, K., San-Jose, B., Welch, A. A., Krogh, V., Luben, R., Allen, N., Overvad, K., Tjønneland, A., Clavel-Chapelon, F., Thiebaut, A., Miller, A. B., Boeing, H., Kolyva, M., Saieva, C., Celentano, E., Ocke, M. C., Peeters, P. H., Brustad, M., Kumle, M., Dorransoro, M., Fernandez Feito, A., Mattisson, I., Weinehall, L., Riboli, E., and Slimani, N. (2002). "Patterns of Alcohol Consumption in 10 European Countries Participating in the European Prospective Investigation into Cancer and Nutrition (EPIC) Project." *Public Health Nutrition*, 5(6B): 1287-96.

Simpura, J. (1995). "Trends in Alcohol Consumption and Drinking Patterns: Lessons From World-Wide Development." Pp.8-37 in *Alcohol and public policy: evidence and issues*, Edited by H. D. Holder and G. Edwards. Oxford: Oxford University Press.

Simpura, J. (1996). "Trends in Alcohol Consumption in the EU Countries." *Alcohol misuse: a European perspective*, Edited by T. J. Peters. Harwood Academic Publisher.

Simpura, J. (1997). "Alcohol and European Transformation." *Addiction*, 92(S1): S33-S41.

Simpura, J. (1998). "Mediterranean Mysteries: Mechanisms of Declining Alcohol Consumption [Editorial]." *Addiction*, 93(9): 1301-4.

Simpura, J. and Karlsson, T. (2001). "Trends in Drinking Patterns Among Adult Population in 15 European Countries, 1950 to 2000: a Review." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 18(English Supplement): 31.

Simpura, J., T. Karlsson, and K. Leppänen (2001). "European Trends in Drinking Patterns and Their Socioeconomic Background." *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries*, Edited by T. Norström. Stockholm: National Institute of Public Health, European Commission.

Simpura, J., Tigerstedt, C., Hanhinen, S., Lagerspetz, M., Leifman, H., Moskalewicz, J., and Torronen, J. (1999). "Alcohol Misuse As a Health and Social Issue in the Baltic Sea Region: A Summary of Findings From the Baltica Study." *Alcohol and Alcoholism*, 34(6): 805-23.

Single, E., Beaubrun, M., Mauffret, M., Minoletti, A., Moskalewicz, J., Moukolo, A., Plange, N. K., Saxena, S., Stockwell, T., Sulkunen, P., Suwaki, H., Hoshigoe, K., and Weiss, S. (1997). "Public Drinking, Problems and Prevention Measures in Twelve Countries: Results of the WHO Project on Public Drinking." *Contemporary Drug Problems*, 24: 425-48.

Sulkunen, P. (1987). "Abstinence." *Finnish drinking habits: results from interview surveys held in 1968, 1976 and 1984*, Edited by J. Simpura. Helsinki, Finland: The Finnish Foundation for Alcohol Studies.

Sulkunen, P. (1989). "Drinking in France 1965-1979. An Analysis of Household Consumption Data." *British Journal of Addiction*, 84(1): 61-72.

Temple, M. T., Fillmore, K. M., Hartka, E., Johnstone, B. M., Leino, E. V., and Motoyoshi, M. (1991). "A Meta-Analysis of Change in Marital and Employment Status As Predictors of Alcohol Consumption on a Typical Occasion." *British Journal of Addiction*, 86(10): 1269-81.

Thundal, K-L. and Allebeck, P. (1998). "Abuse of and Dependence on Alcohol in Swedish Women: Role of Education, Occupation and Family Structure." *Social Psychiatry and Psychiatric Epidemiology*, 33: 445-50.

Trolldall, B. (2001). "Alcohol Sales Figures in 15 European Countries: Corrected for Consumption Abroad and Tax-Free Purchases." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 18(English Supplement): 71-81.

UN Department of Social Affairs (2005). *World Youth Report 2005: Today and in 2015. Heavy episodic drinking and sensation seeking in adolescents as predictors of harmful driving and celebrating behaviors: implications for prevention.*

van Beurden, E., Zask, A., Brooks, L., and Dight, R. (2005). "Heavy Episodic Drinking and Sensation Seeking in Adolescents As Predictors of Harmful Driving and Celebrating Behaviors: Implications for Prevention." *Journal of Adolescent Health*, 37: 37-42.

WHO (2004). *Global status report on alcohol 2004*. Geneva: Department of Mental Health and Substance Abuse, World Health Organization.

Wilsnack, R. W., Vogeltanz, N. D., and Wilsnack, S. C. (2000). "Gender Differences in Alcohol Consumption and Adverse Drinking Consequences: Cross-Cultural Patterns." *Addiction*, 95(2): 251-65.

Wright, L. (1999). *Young people and alcohol: what 11- to 24-year-olds know, think and do*. London: Health Education Authority.

Yarnell, J., Yu, S., Arveiler, D., Haas, B., Dallongeville, J., Montaye, M., Amouyel, P., Ferrières, J., Ruidavets, J-B., Evans, A., Bingham, A., and Ducimetière, P. (2005). "Education, Socioeconomic and Lifestyle Factors, and Risk of Coronary Heart Disease: the PRIME Study." *International Journal of Epidemiology*, 34(2): 268-75.

Chapter 5 Alcohol and individuals

Although the use of alcohol brings with it a number of pleasures, with most people expecting more positive than negative outcomes from drinking when asked, alcohol increases the risk of a wide range of social harms, generally in a dose dependent manner - i.e. the higher the alcohol consumption, the greater the risk. Harms done by someone else's drinking range from social nuisances such as being kept awake at night through to more serious consequences such as marital harm, child abuse, crime, violence and homicide. Generally the higher the level of alcohol consumption, the more serious is the crime or injury. The volume of alcohol consumption, the frequency of drinking and the frequency and volume of episodic heavy drinking all independently increase the risk of violence, with often, but not always, episodic heavy drinking mediating the impact of volume of consumption on harm.

Apart from being a drug of dependence, alcohol is a cause of some 60 different types of diseases and conditions, including injuries, mental and behavioural disorders, gastrointestinal conditions, cancers, cardiovascular diseases, immunological disorders, lung diseases, skeletal and muscular diseases, reproductive disorders and pre-natal harm, including an increased risk of prematurity and low birth weight. For most conditions, alcohol increases the risk in a dose dependent manner, with the higher the alcohol consumption, the greater the risk. For some conditions, such as cardiomyopathy, acute respiratory distress syndrome and muscle damage, harm appears only to result from a sustained level of high alcohol consumption, but even at high levels, alcohol increases the risk and severity of these conditions in a dose dependent manner. The frequency and volume of episodic heavy drinking are of particular importance for increasing the risk of injuries and certain cardiovascular diseases (coronary heart disease and stroke).

A small dose of alcohol consumption reduces the risk of heart disease, although the exact size of the reduction in risk and the level of alcohol consumption at which the greatest reduction occurs are still debated. Better quality studies that account for other influences find less of a risk and find that the reduced risk occurs at a lower level of alcohol consumption. Most of the reduction in risk can be achieved by an average of 10g of alcohol (one drink) every other day. Beyond 20g of alcohol (two drinks) a day - the level of alcohol consumption with the lowest risk - the risk of coronary heart disease increases. In very old age, it seems that the reduction in risk is less. It is alcohol that mainly reduces the risk of heart disease rather than any specific beverage type. There is evidence that alcohol in low doses might reduce the risk of vascular-caused dementia, gallstones and diabetes, although these findings are not consistent across all studies.

The risk of death from alcohol is a balance between the risk of diseases and injuries that alcohol increases and the risk of heart disease (which mostly occurs at older age) that, in small amounts, alcohol decreases. This balance shows that, at least in the United Kingdom, the level of alcohol consumption with the lowest risk of death is zero or near zero for women under the age of 65 years, and less than 5g of alcohol a day for women aged 65 years or older. For men, the level of alcohol consumption with the lowest risk of death is zero under 35 years of age, about 5g a day in middle age, and less than 10g a day when aged 65 years or older (and probably returning towards zero in very old age).

There are health benefits to the heavier drinker from reducing or stopping alcohol consumption. Even for chronic diseases, such as liver cirrhosis and depression, reducing or stopping alcohol consumption is associated with rapid improvements in health.

INTRODUCTION

The World Health Organization's comparative risk assessment study describes the relationship between alcohol consumption and health and social outcomes as complex and multidimensional, Figure 5.1 (Rehm *et al.* 2004). Alcohol can impact on health through three intermediate and linked variables, direct biochemical effects, intoxication and episodic heavy drinking, and dependence.

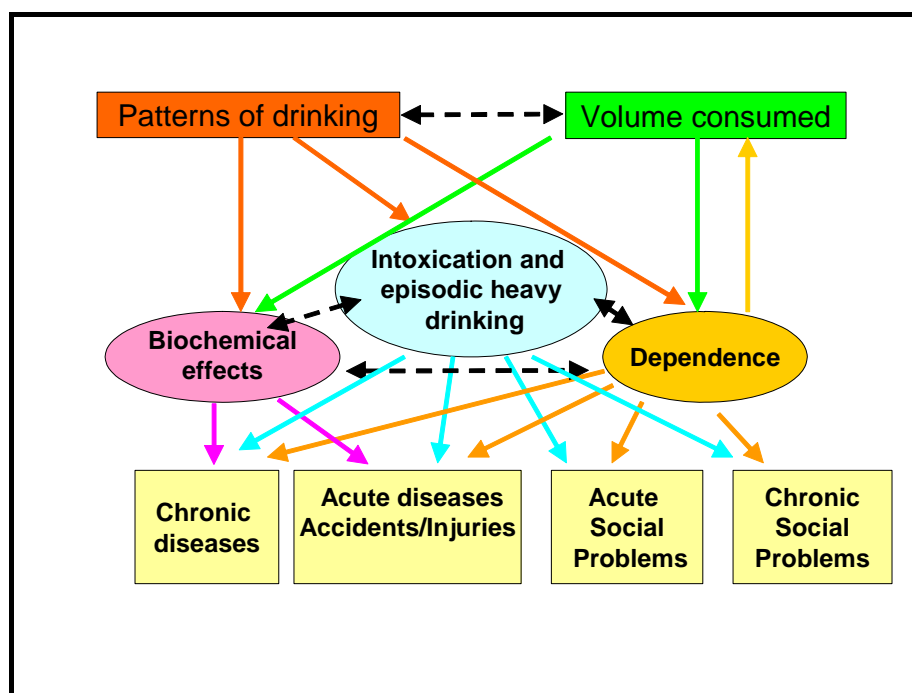


Figure 5.1. The relationship between alcohol consumption, intermediate variables and alcohol related outcomes. Source (modified): Rehm *et al.* 2004.

The direct **biochemical effects** of alcohol can influence a number of diseases of both short and long term duration, and with both positive and negative consequences. Beneficial effects include a reduced risk of coronary heart disease by, for example, alcohol's effect in raising levels of high density lipoprotein cholesterol (Klatsky 1999). Harmful effects include an increased risk of liver cirrhosis by, amongst other means, alcohol's effect when metabolized in producing carbon centred free radicals (Albano and Clot 1996).

Intoxication is a state of functional impairment in psychological and psychomotor performance induced by the presence of alcohol in the body (World Health Organization 1992) that is mostly dose-related (Eckardt *et al.* 1998) and involves multiple body functions. It can lead to unintentional injuries and short term social consequences such as violence and crime, and can also lead to long term social consequences – for example when an intoxicated person causes an intentional injury to another person, leading to a prison sentence. Episodic heavy drinking can be a cause of many major conditions with short and long term chronic consequences, including cardiac arrhythmias and strokes.

Alcohol dependence, a condition in its own right, is defined as a cluster of physiological, behavioural, and cognitive phenomena in which the use of alcohol takes on a much higher priority for a given individual than other behaviours that once had greater value (World Health Organization 1992). Alcohol dependence is thus a powerful mechanism sustaining alcohol consumption and mediating its impact on both short and long term diseases and social harms.

The measurement of alcohol consumption and the epidemiology of risk

In most studies relating alcohol consumption to risk, the measurement of alcohol consumption typically depends on self-report. This can bring a number of problems, since self-reported alcohol consumption is affected by mis-classification in both random and non-random ways (Duffy 1992). It is possible that, due to underreporting of alcohol consumption, the level of risk associated with a particular amount of alcohol consumption will correspond to a greater amount of alcohol consumption and the plotted risk curves are too steep. However, this might be balanced by the fact that it is uncommon for studies to measure consumption at more than one point in the lifetime (Grønbaek *et al.* 2004). Alcohol consumption usually decreases with age – this means the level of risk will correspond to a lower amount of alcohol consumption, and the risk curves will be too shallow. This has been shown in regular heavy drinkers for several outcomes (having coronary heart disease, a stroke, or dying), with a much higher risk when it is based on average alcohol intake over a twenty year period compared to measuring only the level of consumption at the beginning of the period (Embersson *et al.* 2005) (see Figure 5.8 below.) Unfortunately, current biomarkers of alcohol use presently available are not yet sufficiently reliable to account for lifetime consumption (Swift 2003). The length of follow-up also needs to be considered in estimating the true risk. The Copenhagen City Heart Study found that the apparent protective effect of low alcohol consumption on coronary heart disease became less during prolonged follow-up, whereas high alcohol consumption became associated with higher risk of death from cancer with longer follow-up (Nielsen *et al.* 2005).

Patterns of drinking

Increasingly epidemiological studies have taken into account drinking patterns, which include all aspects of alcohol use that are not covered by the term 'volume of drinking' (Rehm *et al.* 1996). Such aspects include temporal variations in drinking, heavy drinking occasions, settings, activities or circumstances associated with drinking and types of beverage consumed (see also Chapter 4). The volume of alcohol consumption has been the usual measure linking alcohol to disease, working mainly through direct biochemical effects or through alcohol dependence to produce long-term consequences. However, the same overall average volume of alcohol can be consumed in small quantities regularly or in large quantities on few occasions, and both volume and patterns appear to work as independent risks for certain conditions, with patterns also sometimes mediating the effect of volume on harm. As will be shown throughout this chapter, patterns of drinking are not only important for some acute health outcomes such as injuries (Greenfield 2001; Rossow *et al.* 2001), but also for some chronic diseases such as coronary heart disease (Britton and McKee 2000; Chadwick and Goode 1998; Puddey *et al.* 1999; Trevisan *et al.* 2001a 2001b).

This does not mean that the volume of drinking is no longer important when episodic

heavy drinking has been taken into account (Rehm *et al.* 2003). Rather, it seems that drinking patterns, including episodic heavy drinking, modify rather than explain the health effects of alcohol. This is well illustrated in a study of alcohol-related aggression in young American men and women (aged between 17 and 21 years), who were asked how often they had 'gotten into an argument or fight' during or after drinking in the previous 12 months, and who were asked about their drinking frequency, their drinking volume and their episodic heavy drinking, defined as the number of days in which five or more drinks had been consumed on the same occasion during the past 30 days (Wells *et al.* 2005). It is clear that drinking frequency, drinking volume and episodic heavy drinking are all related. The more there is episodic heavy drinking, the greater the frequency of drinking and the greater the overall volume of alcohol consumed. The study found that drinking frequency, drinking volume and episodic heavy drinking were all independently associated with an increased risk of fights after drinking. When these three drinking variables were analyzed together, looking at the interactions between them to see which was most important, drinking frequency and drinking volume confounded the relationship between episodic heavy drinking and aggression (in other words, a considerable proportion of the independent relationship between episodic heavy drinking and aggression was due to the frequency and volume of drinking). When all three drinking variables were considered together, only the frequency of drinking remained statistically significant in its relationship with aggression. Thus, whilst both volume of drinking and drinking patterns are important (Room 2005), there is not always a simple relationship between a pattern of episodic heavy drinking and harm.

Causality and attribution

The World Health Organization's Comparative Risk Assessment emphasized that in determining causality and attribution, both reliable outcome measurements and causal pathways are needed (Rehm *et al.* 2004). Sufficient evidence of causality includes outcomes for which the evidence indicates that an association (positive or negative) exists between alcohol consumption and the disease or injury and that chance, confounding variables and other bias can with reasonable confidence be ruled out as factors in this association. Using criteria for establishing causality in epidemiology (Hill 1965; Rothman and Greenland 1998), most weight is usually placed on the following four criteria:

1. consistency across several studies;
2. established experimental biochemical evidence of mediating processes, or at least physiological plausibility;
3. strength of the association (effect size); and
4. temporality (i.e. cause before effect).

"*Alcohol: no ordinary commodity*" stressed that to varying degrees, different health and social outcomes have both an objective element and an element that is a matter of social definition (Babor *et al.* 2003). Even at the one end of the continuum, where the fact of death can be measured objectively and reliably, national recording and coding practices often vary from one country to another (Ramstedt 2002). Further, alcohol's involvement in a death may be missed by those certifying the death, or may be deliberately not mentioned to protect the reputation of the deceased. A study of death recording in 12 cities in 10 countries found that, after supplementing data from the death certificate with data from hospital records and interviews with attending physicians and family members, the net number of deaths assigned to the disease category "liver cirrhosis with mention of alcoholism" rose by 135%, with the majority

of the new cases being recoded from categories of cirrhosis without mention of alcohol (Puffer and Griffith 1967). Similarly, in Canada, it has been estimated that 65% of recorded deaths from non-alcoholic cirrhosis of the liver are in fact due to alcohol (Ramstedt 2003).

For health problems that do not result in death, social definition plays an even larger part (Room *et al.* 2001). While internationally comparable statistics by causes of death have long been available (World Health Organization 1992), there are no cross-nationally comparable data on disabilities (Goerdt *et al.* 1996; Rehm and Gmel 2000; World Health Organization 2001), which can lead to difficulties in overall attribution, since alcohol is more related to disability than to mortality (Murray and Lopez 1996). For social problems, as the term itself implies, the element of social definition becomes more prominent and the way social matters are thought about in a given society changes over time. For this reason the role of alcohol as a causal factor in disease is presently more clearly understood scientifically than the role of alcohol in the causation of social harm.

Alcohol's causal role in social and health problems is usually contributory, being only one of several factors responsible for the problem. For health outcomes, epidemiological definitions stress not only consistent relations but also biological pathways (Rothman and Greenland 1998). Thus, the consistent relationship between alcohol and lung cancer found in many epidemiological studies, even after adjustment for smoking (English *et al.* 1995; Prescott *et al.* 1999; Freudenheim *et al.* 2005), is not usually included as an alcohol-attributable disease because no biological pathway has yet been identified, and because the higher incidence of lung cancer in drinkers may be due to smoking (Bandera *et al.* 2001).

While the causal status of the relationship between alcohol and health outcomes often depends on the plausibility of potential biological pathways, the causal status of the relationships between alcohol and social harm cannot usually be determined this way. An exception is aggressive behaviour, where biological pathways have been identified alongside non-biological mediating factors that determine whether violence occurs on a given drinking occasion (see below). A causal link between alcohol intoxication and aggression is supported by epidemiological (Collins and Schlenger 1988; Wiley and Weisner 1995) and experimental research (Bushman and Cooper 1990; Bushman 1997), as well as by research indicating specific biological mechanisms linking alcohol to aggressive behaviour (Peterson *et al.* 1990; Pihl *et al.* 1993; Sayette *et al.* 1993).

ALCOHOL AND SOCIAL WELL-BEING

Alcohol and social pleasure

The use of alcohol brings with it a number of pleasures (Peele and Grant 1999; Peele and Brodsky 2000). The notion that a low consumption of alcohol is good for health is possibly as old as the history of alcohol itself (Thom 2001) and is embedded in folk wisdom (Cherrington 1925), as discussed in Chapter 2. When respondents in general populations are asked their expectations about the effects of alcohol, more positive than negative sensations and experiences are usually mentioned. (e.g., taste, relaxation, sociability, and subjective health) (Grønbaek *et al.* 1999; Poikolainen and Vartiainen 1999; Heath 2000; Guallar-Castillon *et al.* 2001), with little mention of harm (Mäkelä and Mustonen 1988; Mäkelä and Simpura 1985; Nyström 1992).

Alcohol plays a role in everyday social life, marking such events as births, weddings and deaths, as well as marking the transition from work to play and easing social intercourse (see Chapter 2). Throughout history and in many different cultures, alcohol is a common means for friends and companions to enhance the enjoyment of each other's company and generally have fun (Heath 1995).

The benefits to those who drink during social occasions are greatly influenced by culture, the setting in which drinking occurs, and people's expectations about alcohol's effects. So strong are these beliefs about alcohol that people become observably more sociable when they think that they have consumed alcohol but actually have not (Darkes and Goldman 1993). That alcohol improves the drinker's mood in the short term is an important reason why many people drink (Hull and Stone 2004). There is, indeed, a large amount of evidence that the immediate effects of alcohol include increased enjoyment, euphoria, happiness and the general expression of positive moods, feelings that are experienced more strongly in groups than when drinking alone (Pliner and Cappell 1974), and very much influenced by expectations (Brown *et al.* 1980; Hull *et al.* 1983). In the few studies available of people who reported receiving psychological benefits from alcohol use, the number of benefits reported correlated with how much alcohol they drank as well as with how often they drank heavily (Mäkelä and Mustonen 1988). Of course, the heavier drinkers in the study were also more likely to report problems from use, and the ratio of benefits to problems tended to decline for the heaviest drinkers. Further, drinkers' expectancies of positive outcomes from drinking are associated with increased drinking levels (Bot *et al.* 2005).

Although stress reduction, mood elevation, increased sociability, and relaxation are the most commonly reported psychosocial benefits of drinking alcohol (Hull and Bond 1986; Baum-Baicker 1987), the effectiveness of alcohol use relative to other means for reducing stress-related diseases has not been studied. However, there is extensive evidence indicating that individuals who suffer psychological distress and rely on alcohol to relieve their stress are more likely to become dependent on alcohol (Kessler *et al.* 1996 1997; Book and Randall 2002). In any one year, over one in eight individuals with an anxiety disorder also suffer from an alcohol use disorder (Grant *et al.* 2004). Alcohol is also commonly seen as aiding sleep – but while it may induce sleep, it also leads to increased wakefulness and arousal several hours later, and aggravates sleep disorders (Castaneda *et al.* 1998).

Alcohol and its negative social consequences

The risk of the most commonly experienced negative social consequences of alcohol – such as getting into a fight, harming home life, marriage, work, studies, friendships or social life –

increases proportionally to the amount of alcohol consumed, with the slope of the curve varying across countries, Figure 5.2. An eight year follow up study from Switzerland found that both a daily consumption of more than 40g of alcohol and weekly heavy drinking occasions (50g of alcohol or more per occasion) were associated with at least one of six negative social consequences (Rehm and Gmel

Alcohol and social harms

Social harms from other people's drinking are common, and include being kept awake at night by drunk people, being harassed in public places and in private parties, being afraid of drunk people in public areas, and being physically hurt or having property damaged, child neglect and failure of others to fulfil social roles.

1999). In this study, episodic heavy drinking appeared to increase the risk of social consequences, independent of the overall volume of consumption.

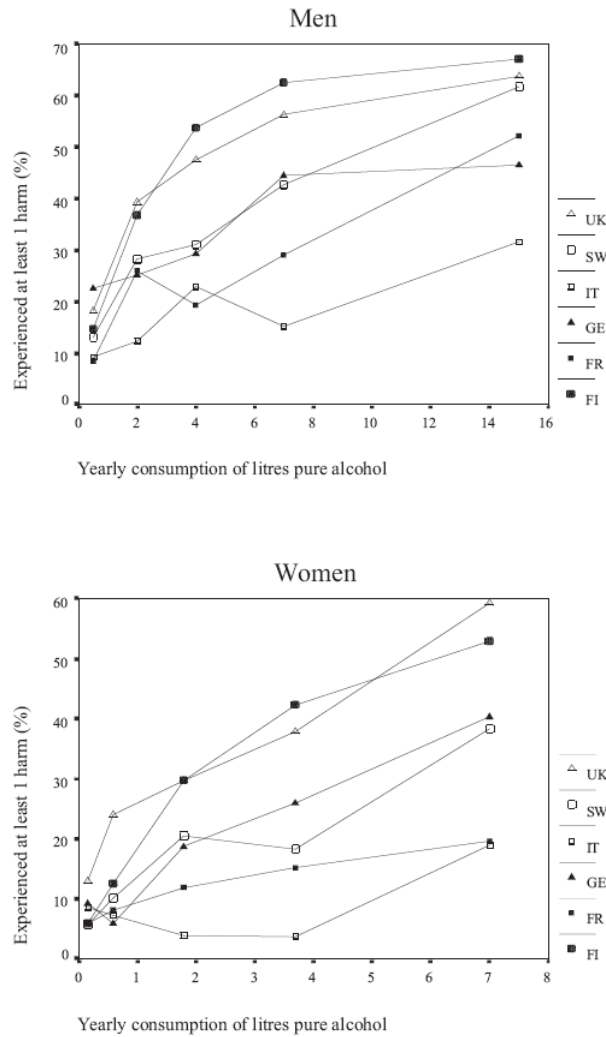


Figure 5.2 Increasing the risk of at least one negative social consequence (getting into a fight, harming home life, marriage, work, studies, friendships or social life) by yearly alcohol consumption for selected European countries. UK United Kingdom, SW Sweden, IT Italy, GE Germany, FR France, FI Finland. Source: Norström (2001).

Social harms from other people’s drinking are also common, being more common for less severe consequences (such as being kept awake at night by drunk people) than for being harassed in public places, being harassed in private parties, being insulted and being afraid of drunk people in public areas, as well as more severe types of consequences (such as being physically hurt or property damage) (Rossow and Hauge 2004). Studies show that a small proportion of the population are harmed repeatedly and in various ways, with younger people, women, those who report a higher annual alcohol intake, more frequent episodes of intoxication and more frequent visits to public drinking places being more likely to have received harm from someone else’s drinking (Rossow 1996; Mäkelä *et al.* 1999). The drinking behaviour of the typical victim of social harms from others’ drinking very much resembles the drinking behaviour of those who experience various kinds of alcohol-related social harms from their own drinking (Hauge and Irgens-Jensen 1986; Room *et al.* 1995; Midanik 1999; Mustonen and Mäkelä 1999; Rehm and Gmel 1999). The harm done

by alcohol to people other than the drinker (which could be termed environmental alcohol damage) is summarized in Box 5.1.

Box 5.1 The harm done by alcohol to people other than the drinker	
CONDITION	SUMMARY OF FINDINGS
Negative social consequences	Social harms from other people's drinking are more common for less severe consequences (such as being kept awake at night by drunk people) than for more severe ones (such as being afraid of drunk people in public areas). Negative social consequences to others have higher rates in the population than social consequences to the drinker.
Violence and crime	There is a relationship between alcohol consumption and the risk of involvement in violence (including homicide), which is stronger for episodic heavy drinking than for overall consumption. There are also relationships between greater alcohol use and sexual violence (particularly violence against strangers) and domestic violence (although this is attenuated when other factors are taken into account). Generally the higher the level of alcohol consumption, the more serious the violence.
Marital harm	Beyond a strong association between heavy drinking and marital breakdown, a few well-designed studies have demonstrated a significantly increased risk of separation or divorce among married heavy drinkers.
Child abuse	A large number of studies, not always of good methodology, have reported a variety of childhood adversities to be more prevalent among children of heavy drinkers than others.
Work related harm	When compared to lighter drinking, higher alcohol use results in lowered productivity and increased injury to others.
Drinking and driving	The risk of crashes and injuries to others from drinking increases with both the volume of alcohol consumption and the number of heavy drinking occasions.
Pre-natal conditions	Alcohol shows reproductive toxicity. Prenatal exposure to alcohol can be associated with a distinctive pattern of intellectual deficits that become apparent later in childhood. Even though the volume of drinking may be low, drinking several drinks at a time during pregnancy can increase the risk of spontaneous abortion, low birth weight, prematurity and intra-uterine growth retardation and may reduce milk production in breastfeeding mothers.

Violence A substantial proportion of incidents of aggression and violent crime involves one or more participants who have been drinking (Murdoch, Pihl and Ross 1990; Budd 2003; Pernanen 1991; Collins 1993; Wells, Graham and West 2000; Pernanen *et al.* 2002; Allen *et al.* 2003), with 25%-85% of violent crimes relating to alcohol, the proportion varying across countries and cultures (see Chapter 6). There is a relationship between alcohol consumption and the risk of involvement in violence, including homicide, which is stronger for intoxication than for overall consumption (Rossow 2000; Wells *et al.* 2000). A large number of studies have demonstrated a significantly increased risk of involvement in violence among heavy drinkers, who are also more likely to be the recipients of violence (Rossow *et al.* 2001; Greenfield and Henneberg 2001).

Alcohol and violence

There is a relationship between alcohol consumption and the risk of involvement in violence, which is stronger for intoxication than for overall consumption. Generally the higher the level of alcohol consumption, the more serious is the violence. Caution should be used in extrapolating these findings across all cultures, since many of the studies originate from a restricted range of cultures.

Episodic heavy drinking, frequency of drinking and drinking volume are all independently associated with the risk of aggression (Wechsler *et al.* 1994; Wechsler *et al.* 1995; Wechsler *et al.* 1998; Komro *et al.* 1999; Bonomo *et al.* 2001; Swahn 2001; Richardson and Budd 2003; Swahn and Donovan 2004; Wells *et al.* 2005), with frequency of drinking appearing to be the most

important (Wells *et al.* 2005). Drinking volume was associated with alcohol-related aggression in a general population sample, without any evidence of a threshold effect, even when high-quantity drinking was controlled (Room, Bondy and Ferris 1995).

Alcohol is related to aggression in both men and women, with some evidence that alcohol has a greater effect on male aggression than on female aggression (Giancola *et al.* 2002), although one study found similar or slightly increased risks of aggression for women compared with men at the same level of alcohol consumption variables (Wells *et al.* 2005). In this study, aggression was more related to drinking in public places for women, but not for men, when controlling for the drinking variables.

There is an overall relationship between greater alcohol use and criminal and domestic violence, with particularly strong evidence from studies of domestic and sexual violence (Mirrlees-Black 1999; Abbey *et al.* 2001; Caetano *et al.* 2001; Brecklin and Ullman 2002; White and Chen 2002; Lipsey *et al.* 1997; Greenfeld 1998). The relationship is attenuated when other characteristics, such as culture, gender, age, social class, criminal status, childhood abuse, and use of other drugs in addition to alcohol are taken into account. Generally the higher the level of alcohol consumption, the more serious is the violence (Gerson and Preston 1979; Martin and Bachman 1997; Sharps *et al.* 2001). Studies from the United Kingdom (Mirrlees-Black 1999) and Ireland (Watson and Parsons 2005) indicate that one third of intimate partner violence occurs when the perpetrator is under the influence of alcohol. Violence against strangers is more likely to involve alcohol than is violence against intimate partners (Abbey *et al.* 2001; Testa and Parks 1996).

High blood alcohol levels or high levels of consumption are commonly reported not only in the perpetrators of violence, but also in the recipients (Makkai 1997; Mirrlees-Black 1999; Brecklin and Ullman 2002). Alcohol-related sexual assaults by strangers seem to be more likely to occur the greater the alcohol consumption of the recipient, whereas the risk of alcohol-related sexual assaults by partners or spouses seems to be independent of the alcohol consumption of the recipient (Kaufman Kantor and Asdigian 1997; Chermack *et al.* 2001). Many recipients develop drinking problems as a response to sexual violence (Darves-Bornoz *et al.* 1998).

Alcohol as a cause of violence Aside from epidemiological and experimental research relating intoxication and violence (Graham and West 2001; Haines and Graham 2005), there is also research indicating specific biological mechanisms that link alcohol to aggressive behaviour (Bushman 1997; Lipsey *et al.* 1997; Leonard 2005), which are moderated by situational and cultural factors (Wells and Graham

2003). The pharmacological effects of alcohol include increased emotional lability and focus on the present (Graham, West and Wells 2000), decreased awareness of internal cues or less self-awareness (Hull 1981), decreased ability to consider consequences (Hull and Bond 1986; Pihl, Peterson and Lau 1993; Ito, Miller and Pollock 1996) or reduced ability to solve problems (Sayette, Wilson and Elias 1993), and impaired self-regulation and self-control (Hull and Stone 2004). However, these biological pathways are mediated by people's expectations about how people act after drinking (including how acceptable it is to act drunkenly and how accepted certain behaviours are when drunk), in what has been termed 'drunken comportment' (see Chapter 2). How this affects the role of alcohol as a cause of crime across Europe is discussed in Chapter 6.

Alcohol also appears to interact with personality characteristics and other factors related to a personal propensity for violence, such as impulsivity (Zhang *et al.* 1997, Lang and Martin 1993). Injuries from violence may also be more closely linked to alcohol dependence than other types of alcohol-related injury (Cherpitel 1997). In addition to alcohol consumption and drinking pattern, the social context of drinking is also important for alcohol related aggression (Eckardt *et al.* 1998; Fagan 1990; Martin 1992; Collins and Messerschmidt 1993; Graham *et al.* 1998; Parker and Auerhahn 1998), especially for young people whose drinking behaviour is influenced strongly by peers (Hansen 1997). A meta-analysis found that the effects of alcohol were greater in situations characterized by greater anxiety, inhibition conflict and frustration, while differences between sober and intoxicated persons were smaller in situations involving high provocation or self-focused attention (Ito *et al.* 1996). Further, given sufficient disincentives for aggression the effects of alcohol on aggression can be reduced or even eliminated altogether (Hoaken *et al.* 1998; Jeavons and Taylor 1985).

Public drinking establishments are high-risk locations for alcohol-related aggression (Pernanen 1991; Stockwell *et al.* 1993; Archer, Holloway and McLoughlin 1995; Rossow 1996; Leonard, Quigley and Collins 2002). However, drinking contexts by themselves do not explain the relationship between alcohol and aggression, since the impact of alcohol also acts independently of the context or setting in which drinking is taking place (Wells *et al.* 2005). The environment for alcohol-related aggression is also not independent of drinking. Although a few incidents that occur in bars involve interpersonal conflict between friends or couples that might have occurred in another setting, almost all incidents of aggression that occur in bars are unplanned, emerge from the social interaction in the bar (Graham and Wells 2001) and often involve strangers. The Comparative Risk Assessment study of the World Health Organization concluded that it seems reasonable to assume that almost all incidents of violence occurring in bars and other environments where drinking is the main activity should be considered attributable to alcohol, either directly through the pharmacological effects of alcohol or indirectly through the social norms related to drinking (Rehm *et al.* 2004).

Marital harm and violence A large number of cross-sectional studies have demonstrated a significant positive association between heavy drinking and the risk of marital breakdown (Leonard and Rothbard 1999), but only a few well-designed studies have demonstrated a significantly increased risk of separation or divorce among married heavy drinkers as compared to others (Fu and Goodman 2000). A large number of cross-sectional studies (Lipsev *et al.* 1997; Leonard 2005) and a few longitudinal studies on alcohol consumption and marital aggression have shown that husbands' heavy drinking increases the risk of marital violence (Quigley and Leonard 1999), in a dose dependent manner (Kaufman Kantor and Straus 1987). Testa *et al.* (2003) reported that episodes of violence in which the husband was drinking involved

more acts of violence and were more likely to involve severe violence compared to sober violence episodes. It also seems that treatment for alcohol dependence reduces intimate partner violence (O'Farrell and Choquette 1991; O'Farrell *et al.* 1999; O'Farrell *et al.* 2000; O'Farrell *et al.* 2003; Stuart *et al.* 2003). Thus, it seems reasonable to conclude that alcohol can be a contributing cause of violence (Leonard 2005). Women with alcohol-related problems often have marital problems (Blankfield and Maritz 1990), and are less confident about resolving marital disagreement (Kelly *et al.* 2000). Women who are alcohol-dependent report high rates of aggression in their spouses (Miller *et al.* 1989, Miller and Downs 1993) and women who are in receipt of alcohol related violence tend to drink more (Olenick and Chalmers 1991).

Child abuse Parental drinking can affect the environment in which a child grows up through financial strain, poor parenting, marital conflicts and negative role models (Gmel and Rehm 2003). A large number of studies have reported a variety of childhood mental and behavioural disorders to be more prevalent among children of heavy drinkers than others, although many of these studies have been criticized for inadequate methodology (Miller *et al.* 1997; Rossow 2000; Widom and Hiller-Sturmhofel 2001). A few recent reports from well-designed studies have shown a higher risk of child abuse in families with heavy drinking parents (Rossow 2000). Systematic reviews have suggested that alcohol is a cause of child abuse in 16% of cases (English *et al.* 1995; Ridolof and Stevenson 2001).

Reduced work performance Studies analyzing absenteeism rates of people at all levels of alcohol consumption have yielded mixed results (Gmel and Rehm 2003). Some have found no association between absenteeism and drinking. For example, Ames *et al.* (1997) found no significant association between absenteeism and the drinker's usual volume of consumption or frequency of heavy drinking occasions (which they defined as occasions during the past year when a person had 10 or more drinks). Moreover, though drinking at the workplace and hangovers at work were related to other negative consequences, such as workplace injuries, they were not related to absenteeism. A longitudinal study in the UK found that male abstainers had an increased risk of sickness absence compared with lighter drinkers (Marmot *et al.* 1993). A J-shaped relationship has been found in other studies for sickness absence (Vahtera *et al.* 2002), as well as for unemployment (Mullahy and Sindelar 1996) and earnings (Hamilton and Hamilton 1997), although it is not clear in all these studies the extent to which characteristics of the non-drinkers explain the findings, or the extent to which the absenteeism simply reflects a higher extent of health problems in the abstainers as opposed to the light drinkers.

On the other hand, harmful alcohol use and episodic heavy drinking increase the risk of arriving to work late and leaving work early or disciplinary suspension, resulting in loss of productivity; turnover due to premature death; disciplinary problems or low productivity from the use of alcohol; inappropriate behaviour (such as behaviour resulting in disciplinary procedures); theft and other crime; and poor co-worker relations and low company morale (Marmot *et al.* 1993; Rehm and Rossow 2001; Gmel and Rehm 2003). One study conducted at 114 work sites (Mangione *et al.* 1999) showed an almost linear relationship between increasing average consumption and a summary measure of job performance, finding the strongest associations between consumption and getting to work late, leaving early, and doing less work, and only a weak association with missing days of work. Thus, alcohol consumption may have more effect on productivity on the job than on the number of workdays missed.

ALCOHOL AND THE RISK OF ILL-HEALTH

Alcohol is a toxic substance related to more than 60 different disorders with short and long term consequences (Gutjahr *et al.* 2001; English *et al.* 1995; Ridolfo and Stevenson 2001; Room *et al.* 2005). Table 5.1, which is reproduced from the Comparative Risk Assessment, summarizes the relationship between alcohol consumption and risk of ill-health for some more important conditions. For many conditions there is an increasing risk with increasing levels of alcohol consumption, with no evidence of a threshold effect (Anderson *et al.* 1993; Anderson 1995; Anderson 2003; Rehm *et al.* 2003), and with the slopes of the risks varying by gender (Corrao *et al.* 1999; Corrao *et al.* 2004). Box 5.2 summarizes the harms done by alcohol to the individual drinker.

Table 5.1. Relative risks for selected conditions (taken from Comparative Risk Assessment)

	Women			Men		
	Alcohol consumption, g/day					
	0-19	20-39	40+	0-39	40-59	60+
Neuro-psychiatric conditions						
Epilepsy	1.3	7.2	7.5	1.2	7.5	6.8
Gastrointestinal conditions						
Cirrhosis of the liver	1.3	9.5	13.0	1.3	9.1	13.0
Oesophageal varices ¹	1.3	9.5	9.5	1.3	9.5	9.5
Acute and chronic pancreatitis	1.3	1.8	1.8	1.3	1.8	3.2
Metabolic and endocrine conditions						
Diabetes mellitus	0.9	0.9	1.1	1.0	0.6	0.7
Malignant neoplasms						
Mouth and oropharynx cancers	1.5	2.0	5.4	1.5	1.9	5.4
Oesophageal cancer	1.8	2.4	4.4	1.8	2.4	4.4
Laryngeal cancer	1.8	3.9	4.9	1.8	3.9	4.9
Liver cancer	1.5	3.0	3.6	1.5	3.0	3.6
Breast cancer	1.1	1.4	1.6			
Other neoplasms	1.1	1.3	1.7	1.1	1.3	1.7
Cardiovascular (CVD) diseases						
Hypertensive disease	1.4	2.0	2.0	1.4	2.0	4.1
Coronary heart disease	0.8	0.8	1.1	0.8	0.8	1.0
Ischaemic stroke	0.5	0.6	1.1	0.9	1.3	1.7
Haemorrhagic stroke	0.6	0.7	8.0	1.3	2.2	2.4
Cardiac arrhythmias	1.5	2.2	2.2	1.5	2.2	2.2
Conditions arising during the perinatal period						
Spontaneous abortion	1.2	1.8	1.8			
Low birth weight ²	1.0	1.4	1.4	1.0	1.4	1.4
Prematurity ²	0.9	1.4	1.4	0.9	1.4	1.4
Intrauterine growth retardation ²	1.0	1.7	1.7	1.0	1.7	1.7

¹Alcohol-related oesophageal varices only occur in the presence of liver cirrhosis

²Relative risk refers to drinking of mother

Source: Rehm *et al.* (2004)

Box 5.2 The harm done by alcohol to the individual drinker		
	Condition	Summary of findings
Social well being	Negative social consequences	For getting into a fight, harming home life, marriage, work, studies, friendships or social life, the risk of harm increases proportional to the amount of alcohol consumed.
	Reduced work performance	Higher alcohol use results in reduced employment and increased unemployment and reduced productivity.
Intentional and unintentional injuries	Violence	There is a relationship between alcohol consumption and the risk of involvement in violence, which is stronger for episodic heavy drinking than for overall consumption. The higher the alcohol consumption, the more severe the violence.
	Drinking and driving	The risk of drinking and driving increases with both the amount of alcohol consumed and the frequency of high volume drinking occasions. There is a 38% increased risk of accidents at a blood alcohol concentration level of 0.5g/L.
	Injuries	There is a relationship between the use of alcohol and the risk of fatal and non-fatal accidents and injuries. People who usually drink alcohol at lower levels, but who engage periodically in drinking large quantities of alcohol, are at particular risk. Alcohol increases the risk of attendance at hospital emergency rooms in a dose dependent manner.
	Suicide	There is a direct relationship between alcohol consumption and the risk of suicide and attempted suicide, which is stronger for episodic heavy drinking than for overall consumption.
Neuropsychiatric conditions	Anxiety and sleep disorders	Over one in eight of individuals with an anxiety disorder also suffer from an alcohol use disorder. Alcohol aggravates sleep disorders.
	Depression	Alcohol use disorders are a risk factor for depressive disorders in a dose dependent manner, often preceding the depressive disorder, and with improvement of the depressive disorder following abstinence from alcohol.
	Alcohol dependence	The risk of alcohol dependence begins at low levels of drinking and increases directly with both the volume of alcohol consumed and a pattern of drinking larger amounts on an occasion. Young adults are particularly at risk.
	Nerve damage	Clinical studies find that between one quarter and one third of alcohol dependent patients have damage to the peripheral nerves of the body, with the risk and severity of damage increasing with

		lifetime use of alcohol.
	Brain damage	Heavy alcohol consumption accelerates shrinkage of the brain, which in turn leads to cognitive decline. There appears to be a continuum of brain damage in individuals with long-term alcohol dependence.
	Cognitive impairment and dementia	Heavy alcohol consumption increases the risk of cognitive impairment in a dose dependent manner.
Gastrointestinal, metabolic and endocrine conditions	Liver cirrhosis	Alcohol increases the risk of liver cirrhosis in a dose dependent manner. At any given level of alcohol consumption, women have a higher likelihood of developing liver cirrhosis than men.
	Pancreatitis	Alcohol increases the risk of acute and chronic pancreatitis in a dose dependent manner.
	Type II diabetes	Although low doses decrease the risk compared with abstainers (see Box 5.3), higher doses increase the risk.
	Overweight	Alcohol contains 7.1 kcal/g and is a risk factor for weight gain. In very heavy drinkers alcohol can replace calories due to meal skipping and lead to malnutrition.
	Gout	Alcohol increases the risk of high blood levels of uric acid and gout in a dose dependent manner.
Cancers	Gastrointestinal tract	Alcohol increases the risk of cancers of the mouth, oesophagus (gullet) and larynx (upper airway), and to a lesser extent, cancers of the stomach, colon and rectum in a linear relationship.
	Liver	Alcohol increases the risk of cancer of the liver in an exponential relationship.
	Breast	Alcohol increases the risk of female breast cancer in a dose dependent manner.
Cardiovascular diseases	Hypertension	Alcohol raises blood pressure and increases the risk of hypertension, in a dose dependent manner.
	Stroke	Alcohol increases the risk of haemorrhagic stroke with a dose-response relationship. The relationship with ischaemic stroke is J-shaped, with low doses reducing the risk (see Box 5.3) and higher doses increasing the risk. Episodic heavy drinking is an important risk factor for both ischaemic and haemorrhagic stroke, and is particularly important as a cause of stroke in adolescents and young people.
	Irregularities in heart rhythms	Episodic heavy drinking increases the risk of heart arrhythmias and sudden coronary death, even in people without any evidence of pre-existing heart disease

	Coronary heart disease (CHD)	Although light drinking reduces the risk of CHD, beyond 20g a day (the level of alcohol consumption with the lowest risk, see Box 5.3), the risk of heart disease increases, being more than the risk of an abstainer after 80g a day. The reduced risk is much less in very old age, where over-reporting of CHD on death certificates also occurs.
	Cardiomyopathy	Over a sustained period of time, a high level of alcohol consumption, in a dose dependent manner, increases the risk of damage to the heart muscles (cardiomyopathy).
Immune system		Alcohol can interfere with the normal functions of the immune system, causing increased susceptibility to certain infectious diseases, including pneumonia, tuberculosis and possibly HIV.
Lung diseases		People with alcohol dependence have a two- to four- fold increased risk of acute respiratory distress syndrome (ARDS) in the presence of sepsis or trauma.
Post-operative complications		Alcohol increases the risk of post-operative complications and risk of admittance to intensive care in a dose dependent manner.
Skeletal conditions		There appears to be a dose-dependent relationship between alcohol consumption and risk of fracture in both men and women that is stronger for men than for women. (See also Box 5.3). In high doses, although in a dose dependent manner, alcohol is a cause of muscle disease.
Reproductive conditions		Alcohol can impair fertility in both men and women.
Total mortality		It has been estimated, at least in the UK, that in younger people (women under the age of 45 years and men under the age of 35 years), any level of alcohol consumption increases the overall risk of death in a dose dependent manner.

Alcohol increases the risk of disorders through both short term, and often brief and intense exposure such as episodic heavy drinking (or binge drinking), described as the *acute effects* of alcohol, and through prolonged or long term exposure, described as the *chronic effects* of alcohol (Last 2001). The disorders include those of sudden onset, whose duration is often brief, described as *acute consequences*, and those which last a long time, described as *chronic consequences* (Last 2001). Intentional and unintentional injuries largely result from acute exposure, as do certain other conditions with long term consequences, such as cardiac arrhythmias and ischaemic stroke. Other conditions, such as cirrhosis of the liver and cancers, result from long term exposure. It is important to note that there can be considerable overlap between acute and chronic exposure and between acute and chronic outcomes for individuals and for certain conditions. Thus an individual with alcohol-related osteoporosis (weakening of the bones) and muscle disease with decreased muscle strength, both

of which result from long term exposure, can be at increased risk of a bone fracture following an alcohol-caused fall. Further a fracture can have both short term consequences (completely and normally heals) and long term consequences, such as bone infection or disability resulting from the fracture. In this section, we have described the conditions in order of the importance of their contribution to alcohol-related disability adjusted life years (see Chapter 6), pointing out when exposure is generally acute or chronic. We have also mentioned some conditions, such as schizophrenia, which are not believed to be caused by alcohol, but which can be affected by alcohol, including treatment outcomes.

Unintentional and intentional injuries

Drinking and driving The risk of drinking and driving increases with both the amount of alcohol consumed and the frequency of high volume drinking occasions (Midanik *et al.* 1996), and blood alcohol concentration levels (Blomberg *et al.* 2002; Hingson and Winter 2003). A review of 112 studies provided strong evidence that impairment in driving skills begins with any departure from a zero blood alcohol concentration level (BAC) (Moskowitz and Fiorentino 2000). Comparison of blood alcohol concentrations (BACs) of drivers in accidents with the BACs of drivers not involved in accidents find that male and female drivers at all ages who had BACs between 0.2g/l and 0.49g/l had at least a three times greater risk of dying in a single vehicle crash. The risk increased to at least 6 times with a BAC between 0.5g/L and 0.79g/L and 11 times with a BAC between 0.8g/l and 0.99 g/L (Zador *et al.* 2000). The risks are greater for serious and fatal crashes, for single-vehicle crashes, and for younger people. Even relatively low doses of alcohol consumption (20g of alcohol) can impair driving in the presence of relative sleep deprivation (Horne *et al.* 2005). The use of alcohol increases both the possibility of being admitted to hospital from drink-drive injuries, and the severity of the injuries (Borges *et al.* 1998).

Injuries There is a relationship between the use of alcohol, largely in the short term, and the risk of fatal and non-fatal accidents and injuries (Cherpitel *et al.* 1995; Brismar and Bergman 1998; Smith *et al.* 1999; Macdonald *et al.* 2005). In an Australian study, the risk of sustaining an injury after consuming more than 60g of alcohol in a 6-hour period was ten times greater for women and two times greater for men (McLeod *et al.* 1999). In a Finnish study, an increasing volume of alcohol consumption increased the risk of fatal injury (Paljärvi *et al.* 2005). When analyzing drinking occasions, drinking at the level of one to two drinks on an occasion, regardless of frequency, did not increase the risk of fatal injury. Drinking four or more drinks at a time increased the risk of fatal injury, with the risk increasing with the frequency of drinking four or more times on an occasion, and with no evidence that tolerance to alcohol lowered the risk of fatal injuries among frequent heavy drinkers. Other studies have found that people who usually drink alcohol at lower levels, but who engage periodically in drinking large quantities of alcohol, are at particular risk (Watt *et al.* 2004). Alcohol increases the risk of attendance at hospital emergency rooms in a dose dependent manner (Cherpitel 1993; Cherpitel *et al.* 2003; Borges *et al.* 2004; Cherpitel *et al.* 2005); between 20% and 80% of emergency room admissions can be alcohol-related (Hingson and Howland 1987).

Alcohol and injuries

There is a relationship between the use of alcohol and the risk of fatal and non-fatal accidents and injuries. People who usually drink alcohol at lower levels, but who engage periodically in drinking large quantities of alcohol, are at particular risk.

Alcohol alters the treatment course of injured patients and can lead to surgical complications (Smith *et al.* 1999) and a greater likelihood of death (Li *et al.* 1994).

Suicide Heavy drinking is a major risk factor for suicide and suicidal behaviour among both young people and adults (Lesage *et al.* 1994, Andrews and Lesinsohn 1992; Beautrais 1998). There is a direct relationship between alcohol consumption and the risk of suicide and attempted suicide, which is stronger for intoxication than for overall consumption (Rossow 1996).

Neuropsychiatric conditions

Depression There is a linear relationship between alcohol consumption and symptoms of depression and anxiety, with increasing prevalence of symptoms with greater consumption (Alati *et al.* 2005).

A number of studies have consistently shown that people with depression and mood disorders are at increased risk of alcohol dependence and vice versa (Regier *et al.* 1990; Merikangas *et al.* 1998; Swendsen *et al.* 1998; Kringlen *et al.* 2001; de Graaf *et al.* 2002; Petrakis *et al.* 2002; Sonne and Brady 2002; Farrell *et al.* 2001; Farrell *et al.* 1998; Jacobi *et al.* 2004; Bijl *et al.* 1998; Pirkola *et al.* 2005). Alcohol-dependent individuals demonstrate a two- to three-fold increase in risk of depressive disorders (Hilariski and Wodarki 2001; Schuckit 1996; Swendson *et al.* 1998), and there is evidence for a continuum in the magnitude of co-morbidity as a function of level of alcohol use (Kessler *et al.* 1996; Merikangas *et al.* 1998; Rodgers *et al.* 2000). For example, one American study found that in any one year, 12% of individuals with unipolar depression were dependent on alcohol (Grant *et al.* 2004), see Table 5.2. Conversely, 28% of people dependent on alcohol had a major depressive disorder, Table 5.3. Similarly, the German Health Interview and Examination Survey found that whereas 56% of people diagnosed with DSM-IV “alcohol abuse and dependence” had one psychiatric diagnosis, 22% had two, 8% three, and 14% four or more diagnoses (Jacobi *et al.* 2004).

Alcohol and depression

Alcohol-dependent individuals demonstrate a two- to three-fold increase in risk of depressive disorders, with a greater risk the greater the level of alcohol consumption. In a substantial number of cases, alcohol use disorders precede the onset of depression.

Although depression may precede heavy alcohol consumption or alcohol use disorders, there is substantial co-morbidity where the onset of alcohol use disorders precedes the onset of depressive disorders (Merikangas *et al.* 1998; Kessler *et al.* 1996; Rehm *et al.* 2004). Furthermore, many depressive syndromes markedly improve within days or weeks of abstinence (Brown and Schuckit 1988; Dackis *et al.* 1986; Davidson 1995; Gibson and Becker 1973, Penick *et al.* 1988; Pettinati *et al.* 1982; Willenbring 1986). There are several plausible biological mechanisms by which alcohol dependence may cause depressive disorders (Markou *et al.* 1998).

Table 5.2 The risk of alcohol dependence in people with mood disorders (US data)¹.

Comorbid Mood Disorders* and Substance Abuse			
	Any substance abuse or dependence (%)	Alcohol dependence (%)	Alcohol abuse (%)
Any Mood Disorder	32.0	4.9	6.9
Any Bipolar Disorder	56.1	27.6	16.1
Bipolar I	60.7	31.5	14.7
Bipolar II	48.1	20.8	18.4
Unipolar Depression	27.2	11.6	5.0

NOTES: *Mood disorders include depression and bipolar disorder.
Bipolar disorder, or manic depression, is characterized by extreme mood swings.
Bipolar I disorder is the most severe bipolar disorder.
Bipolar II disorder is less severe.
Unipolar depression is depression without manic episodes.
SOURCE: Data reported in the table are based on findings of the Epidemiologic Catchment Area study (Regier et al. 1990).

¹The categories alcohol dependence and alcohol abuse are mutually exclusive.

Table 5.3 The risk of mood disorders in people with alcohol dependence (US data).

Prevalence of Psychiatric Disorders in People with Alcohol Abuse and Alcohol Dependence				
Comorbid Disorder	Alcohol abuse		Alcohol dependence	
	1-year rate (%)	Odds ratio	1-year rate (%)	Odds ratio
National Comorbidity Survey¹				
Mood disorders	12.3	1.1	29.2	3.6*
Major depressive disorder	11.3	1.1	27.9	3.9*
Bipolar disorder	0.3	0.7	1.9	6.3*
Anxiety disorders	29.1	1.7	36.9	2.6*
GAD	1.4	0.4	11.6	4.6*
Panic disorder	1.3	0.5	3.9	1.7
PTSD	5.6	1.5	7.7	2.2*
Epidemiologic Catchment Area² study				
Schizophrenia	Lifetime rate (%)	Odds ratio	Lifetime rate (%)	Odds ratio
	9.7	1.9	24	3.8

NOTES: *Odds ratio was significantly different from 1 at 0.05 level. The odds ratio represents the increased chance that someone with alcohol abuse or dependence will have the comorbid psychiatric disorder (e.g., a person with alcohol dependence is 3.6 times more likely to also have a mood disorder compared to a person without alcohol dependence).
The 1-year rate of a disorder reflects the percentage of people who met the criteria for the disorder during the year prior to the survey.
The lifetime rate reflects the percentage of people who met the criteria for the disorder at any time in their lifetime.
SOURCES: ¹Kessler et al. 1996. ²Regier et al. 1990.

Alcohol dependence No matter how drinking is measured (Grant and Harford 1990; Muthen *et al.* 1992; Dawson and Archer 1993; Hall *et al.* 1993; Caetano and Tam 1995; Midanik *et al.* 1996; Caetano *et al.* 1997), the risk of alcohol dependence increases with both the volume of alcohol consumption and a pattern of drinking larger amounts on an occasion (Caetano *et al.* 1997; Caetano and Cunradi 2002). Both the UK based OPCS national psychiatric morbidity survey (Farrell *et al.* 2001) and the US based NHIS-88 survey (Caetano *et al.* 1997) found that the risk of alcohol dependence increased linearly with the volume of alcohol consumption, with a pattern of drinking that included the consumption of five or more drinks per day considerably increasing the risk in the US study.

The association between alcohol consumption and dependence should not be seen as flowing in one direction only, i.e. from drinking to alcohol dependence. One of the characteristics of alcohol dependence is self-perpetuation. Once installed, dependence itself influences both the pattern and volumes of alcohol consumption, which in turn leads to the maintenance of dependence.

Alcohol dependence is particularly common amongst young adults (Farrell *et al.* 2001; Caetano 1999; Caetano and Cunradi 2002), with frequent drinking at ages 14-15 years predicting alcohol dependence at age 20-21 years (Bonomo *et al.* 2004). There is a progression from alcohol use through harmful use to alcohol dependence (Ridenour *et al.* 2003), and an increasing risk of dependence with duration of exposure to alcohol. One half of people who eventually become dependent do so within ten years of the first use of alcohol (Wagner and Anthony 2002), although the most severe forms of alcohol dependence are rare before the age of 30 years (Coulthard *et al.* 2002).

The two factors that contribute to the development of alcohol dependence are psychological reinforcement and biological adaptation within the brain (World Health Organization 2004; Spanagel and Heilig 2005).

Nerve damage (peripheral neuropathy) Clinical studies find that between one quarter and one third of alcohol dependent patients have damage to those nerves of the body dealing both with the senses and movement, and in particular those supplying the legs (Monforte *et al.* 1995). The risk and the severity of the damage increase as lifetime use of alcohol increases. The effect is independent of malnutrition, but the extent to which malnutrition worsens the damage is unclear. The extent to which alcohol in lower doses increases the risk of peripheral neuropathy is not known.

Cognitive impairment, dementia, and brain damage Alcohol consumption has both immediate and long-term effects on the brain and neuropsychological functioning. The relationship between heavy alcohol consumption and cognitive impairment is well established (Williams and Skinner 1990). People drinking 70 to 84 grams of alcohol per day over an extended period of time show some cognitive inefficiencies; people drinking 98 to 126 grams of alcohol per day show mild cognitive deficits; and 140 grams or more per day results in moderate cognitive deficits similar to those found in people with diagnosed alcohol dependence (Parsons and Nixon 1998).

There is some evidence that amongst men and women aged between 20 and 64 years that abstainers have poorer cognitive function than light drinkers (up to 20g alcohol per day for men and 10g alcohol per day for women) (Rodgers *et al.* 2005), but this seems largely but not completely due to selection effects and poorer physical functioning in the abstainers as opposed to the lighter drinkers (Anstey *et al.* 2005).

There is some indication that light alcohol consumption may reduce cognitive impairment (Ganguli *et al.* 2005) and the risk for vascular-caused dementia in older people, whereas the effects on Alzheimer's disease and cognition remain uncertain, with some studies finding a relationship (Stampfer *et al.* 2005) and others not (Gunzerath *et al.* 2004). Frequent alcohol drinking in middle aged people was associated with cognitive impairment and harmful effects on the brain in later life in one Finnish study, which was more pronounced if there was a genetic susceptibility to dementia (Antilla *et al.* 2004).

Heavy drinking accelerates shrinkage of the brain, which in turn leads to cognitive decline (Rourke and Loberg 1996; Oscar-Berman and Marinkovic 2003). During adolescence, alcohol can lead to structural changes in the hippocampus (a part of the brain involved in the learning process) (De Bellis *et al.* 2000) and at high levels can permanently impair brain development (Spear 2002). There appears to be a spectrum of brain damage in individuals with long-term alcohol dependence, ranging from moderate deficits to the severe psychosis of Wernicke-Korsakoff syndrome, which causes confusion, disordered gait, double vision and inability to retain new information.

Alcohol consumption and **tobacco use** are closely linked behaviours. Thus, not only are people who drink alcohol more likely to smoke (and vice versa) but also people who drink larger amounts of alcohol tend to smoke more cigarettes. Smoking rates among people with alcohol dependence have been estimated to be as high as 90 percent. Similarly, smokers are far more likely to consume alcohol than are non-smokers, and smokers who are dependent on nicotine have a 2.7 times greater risk of becoming alcohol dependent than non-smokers (see Drobles 2002 and John *et al.* 2004).

Although not considered to be caused by alcohol, not only is hazardous and harmful alcohol use more common among people with a diagnosis of **schizophrenia** (Hulse *et al.* 2000), but there is also evidence that even low levels of alcohol consumption can worsen the symptoms of this condition as well as interfere with the effectiveness of some standard medications (Castaneda *et al.* 1998). Furthermore, improved treatment outcomes have been achieved when harmful alcohol use and the schizophrenia have been treated in an integrated fashion (Mueser and Kavanagh 2001). The co-occurrence between alcohol use disorder and schizophrenia maybe be due to biological factors (a common neurological basis that might reinforce the positive effects of alcohol) and psychological and socio-environmental factors (alleviation of the consequences of mental ill-health and the promotion of socialization) (Drake and Muser 2002).

Gastrointestinal conditions

Long term exposure of alcohol increases the risk of liver cirrhosis (Figure 5.3), and acute and chronic pancreatitis (Corrao *et al.* 1999). For men who die between the ages of 35 and 69 years, the risk of death from liver cirrhosis increases from 5 per 100,000 at no alcohol consumption to 41 per 100,000 at 4 or more drinks per day (Thun *et al.* 1997).

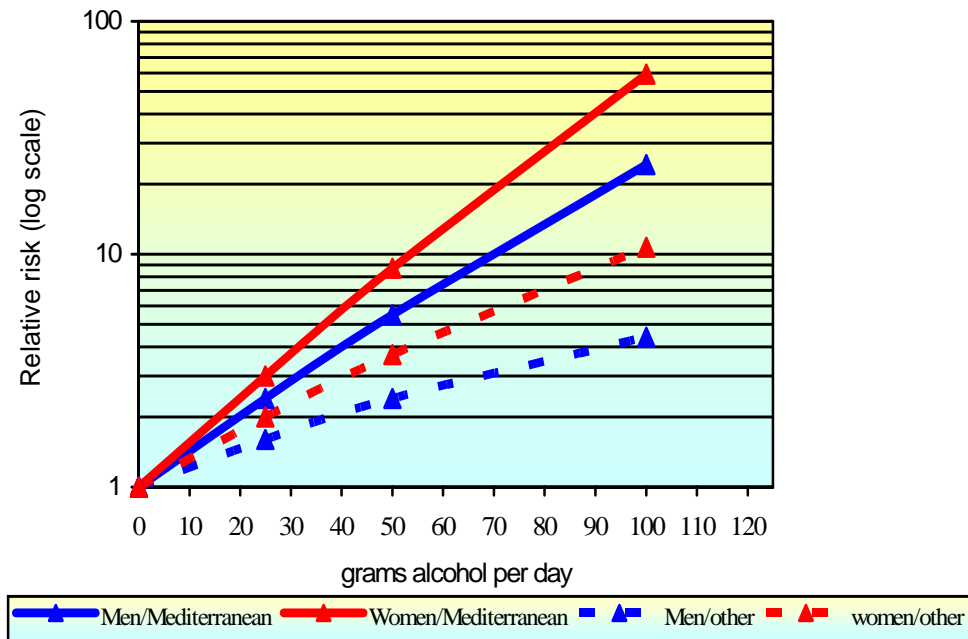


Figure 5.3. Relative risks of liver cirrhosis by alcohol intake for men and women, living in Mediterranean areas and in other areas. Source: Corrao *et al.* (1999).

Although a strong correlation exists between the risk of cirrhosis, the product of daily consumed alcohol in grams and the time of alcohol consumption, only approximately 20% of people with alcohol dependence develop liver cirrhosis (Seitz and Homan 2001). Some studies point to the existence of genetic factors which predispose to alcoholic liver disease. Thus, with respect to alcoholic cirrhosis, the concordance of homozygous (identical) twins was almost 15% compared to 5% for heterozygous (non-identical) twins (Lumeng and Crabb 1994). Polymorphism of ethanol-metabolizing enzymes and/or mutations may also contribute to the risk of alcoholic liver disease. Some studies also show that increased incidence of some HLA-antigens, such as B8, Bw40, B13, A2, DR3 and DR2, are associated with an increased risk of developing alcoholic liver disease (Lumeng and Crabb 1994).

Drinking pattern is also of importance, since periodic drinking of larger quantities of alcohol carries a lower risk compared to continuous drinking for a longer period of time. There is an interaction with hepatitis C infection, with infection increasing the risk of liver cirrhosis at any given level of alcohol consumption, and increasing the severity of the cirrhosis (Schiff 1997; Schiff and Ozden 2003). There is also an apparent interaction with aliphatic alcohol congeners arising from homemade spirits, which increase the risk of cirrhosis (Szucs *et al.* 2005). At any given level of alcohol consumption, women have a higher likelihood of developing liver cirrhosis than men (Mann *et al.* 2003) (see Figure 5.3). Some studies have suggested that increased body mass index (BMI) and blood glucose may independently increase the risk of alcoholic liver disease (Naveau *et al.* 1997; Raynard *et al.* 2002). There has also been a suggestion that wine drinkers have a lower risk of alcohol induced cirrhosis than spirit or beer drinkers (Becket *et al.* 2002).

Gallstones and diabetes

There is some evidence that alcohol might reduce the risk of gallstones, although this finding is not consistent across all studies. Low doses of alcohol decrease the risk of type II diabetes compared with abstainers, but higher doses increase the risk.

There is apparently no association between alcohol consumption and the risk of gastric and duodenal ulcer (Corrao *et al.* 1999; Corrao *et al.* 2004). There is some evidence that alcohol might reduce the risk of gallstones (cholelithiasis) (Leitzmann *et al.* 1998; see Ashley *et al.* 2000; Rehm *et al.* 2003; Rehm *et al.* 2004), although this finding is not consistent across all studies

(Sahi *et al.* 1998, Kratzer *et al.* 1997). This is in contrast to the increased risk of developing gallstones in patients with cirrhosis of the liver.

Endocrine and metabolic conditions

Diabetes The relationship with type II diabetes appears to be U- or J-shaped, with low doses decreasing the risk compared with abstainers in both men and women and higher doses increasing the risk (Anbani *et al.* 2000; Rimm *et al.* 1995, Perry *et al.* 1995, Stampfer *et al.* 1988; Hu *et al.* 2001; Rehm *et al.* 2004; Wei *et al.* 2000; Wannamethee *et al.* 2002). Although this finding is not present in all studies (Holbrook *et al.* 1990; Monterrosa *et al.* 1995), it is probably due to alcohol's effect of increasing insulin sensitivity in low doses (10g-20g alcohol a day) (Facchini *et al.* 1994; Flanagan *et al.* 2000).

Weight gain Alcohol represents an important source of energy content of 7.1 kcal/g (Lieber 1988), with every component of the energy-balance equation being affected by the ingestion of alcohol. Moderate amounts of alcohol enhance energy intake due to the caloric content of the alcohol (Rose *et al.* 1995) as well as its appetite-enhancing effects (Siler *et al.* 1998; Forsander 1994). Experimental evidence from several metabolic studies showed an enhancement of a positive fat balance, and thus alcohol being a risk factor for the development of a positive energy balance and weight gain, with the fat being preferentially deposited in the abdominal area (see Suter 2005). In drinkers with alcohol dependence, a larger fraction of the alcohol energy might not be an available source of energy due to the induction of the microsomal ethanol-oxidizing system (Levine *et al.* 2000), and alcohol substituting calorie intake due to meal skipping (Hillers and Massey 1985; Rissanen *et al.* 1987).

Although many epidemiologic studies find a positive relationship between alcohol intake and body weight (Gordon *et al.* 1983; Gordon and Doyle 1986; Rissanen *et al.* 1991; Wannamethee and Shaper 2003) not all do so (Liu *et al.* 1995). This seems largely to be explained by gender, age and ethnic differences (Klatsky *et al.* 1977; Suter *et al.* 1997; Suter 2005). In a study of Swiss restaurant keepers, although abstainers had a higher body weight than moderate alcohol consumers (Meyer *et al.* 1999), limiting the analysis to daily alcohol consumers found a linear increase of the body mass index (BMI) with increasing alcohol intake up to a daily consumption of more than 125g alcohol. Alcohol seems to be particularly important as a risk factor for overweight in drinkers with a high-fat diet and in those who are already overweight (Suter *et al.* 1999).

Gout Alcohol appears to increase the risk of high blood levels of uric acid in a dose dependent manner (Sugie *et al.* 2005), a risk factor for gout, as well as the risk of

gout (an inflammatory arthritis), itself, increasing in a dose dependent manner with alcohol consumption (Choi *et al.* 2004).

Cancers

Alcohol is a carcinogen and long term exposure increases the risk of cancers of the mouth, oesophagus (gullet), larynx (upper airway), liver and female breast, and to a lesser extent, cancers of the stomach, colon and rectum in a linear relationship, Figure 5.4, with no evidence of a threshold effect (Bagnardi *et al.* 2001a; Bagnardi *et al.* 2001b). The mechanisms by which alcohol induces carcinogenesis are hypothesized to include the interaction of cytochrome P-4502E1 (CYP2E1), which metabolizes ethanol to acetaldehyde and is involved in the metabolism of various procarcinogens (Poschl and Seitz 2004). The annual risk of death from alcohol-related cancers (mouth, gullet, throat and liver) increases from 14 per 100,000 for non-dinking middle-aged men to 50 per 100,000 at 4 or more drinks (40g alcohol) a day (Thun *et al.* 1997).

Breast cancer

Alcohol increases the risk of female breast cancer. The cumulative risk by age 80 years increases from 88 per 1000 non-drinking women to 133 per 1000 women who, at baseline, drank 6 drinks (60g) a day.

There is strong evidence that alcohol increases the risk of female breast cancer (one of the most frequent cause of death among younger women) in a dose dependent manner at all ages (Collaborative Group on Hormonal Factors in Breast Cancer 2002). The cumulative risk by age 80 years increases from 88 per 1000 non-drinking women to 133 per 1000 women who, at baseline, drank 6 drinks (60g) a day. It is possible that alcohol increases the risk of breast cancer by increasing sex hormone levels that are known to be a risk factor for breast cancer.

A pooled analysis of original data from nine case controlled studies found that people who drank alcohol had a lower risk for some non-hodgkin lymphomas, but not all (a group of heterogeneous diseases characterized by the malignant transformation of healthy lymphoid cells) (Morton *et al.* 2005). The reduced risk was not related to level of alcohol consumption, and former drinkers had a similar risk to never drinkers. It is unclear the extent to which the findings could be explained by some unidentified confounders.

Also, as noted above, there is a consistent relationship between alcohol and lung cancer (English *et al.* 1995), believed to be mediated by smoking (Bandera *et al.* 2001).

Studies have also considered whether or not alcohol is genotoxic or mutagenic - a substance that can induce permanent changes in the way that cells, tissues, and organs function, which may contribute to the development of cancer. A number of studies have suggested that alcohol has weak genotoxic potential following metabolic changes (Obe and Anderson 1987; Greim 1998). Although the importance of this is not clear (Phillips and Jenkinson 2001), a proposal was considered, but not decided, for the classification of ethanol by the European Chemicals Bureau (1999) of the European Commission as a category 2 mutagen (substances which should be regarded as mutagenic to man) under the Dangerous Substances Directive (67/548/EEC) classification system (Annex VI) (European Commission 2005).

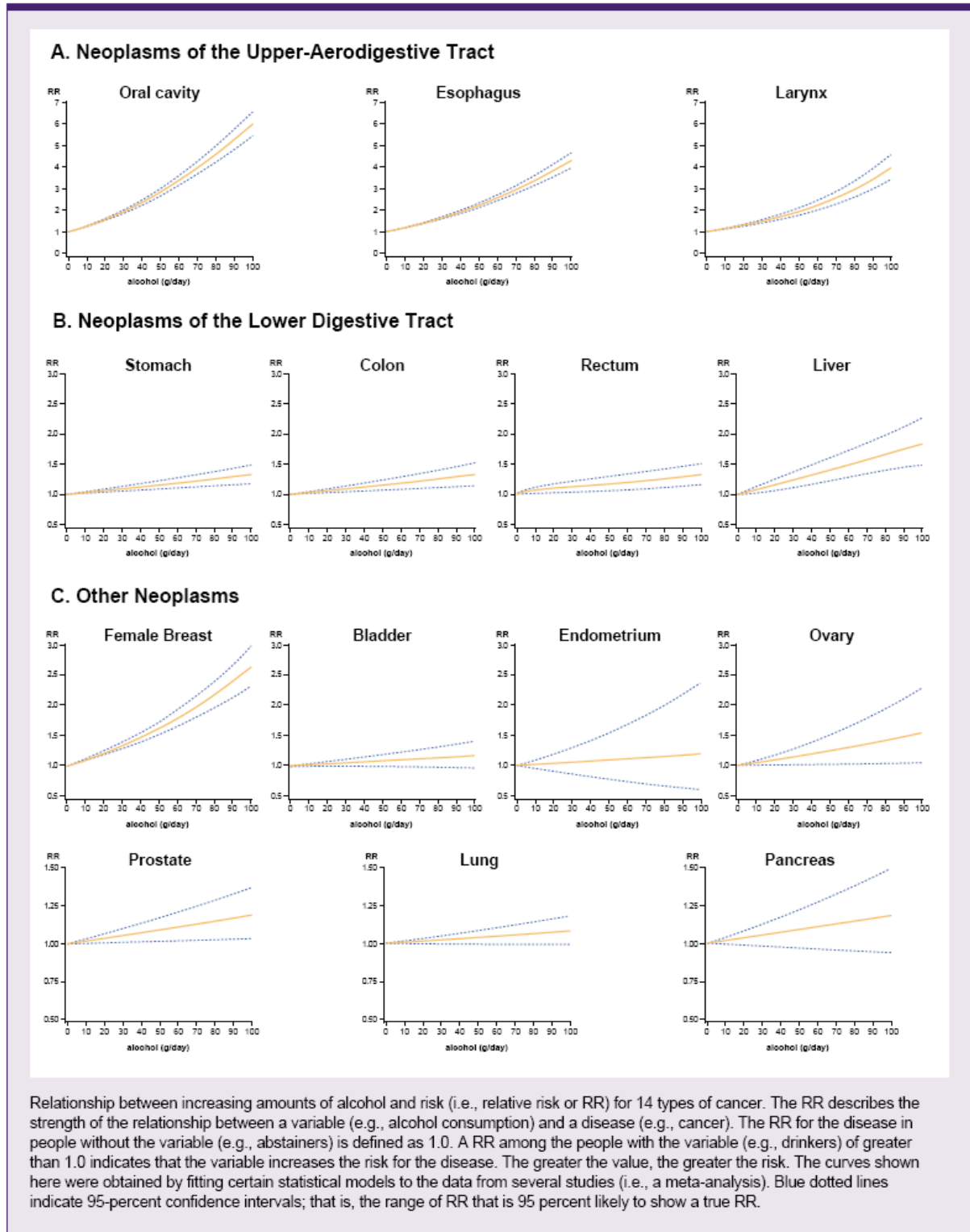


Figure 5.4 Relationship between levels of alcohol consumption and risk for 14 types of cancer. Source: Corrao *et al.* 2004.

Cardiovascular diseases

(For discussion of coronary heart disease, see page 158 below)

Hypertension Alcohol raises blood pressure and increases the risk of hypertension in a dose dependent manner (Beilin *et al.* 1996; Curtis *et al.* 1997; English *et al.* 1995; Grobbee *et al.* 1999; Keil *et al.* 1997; Klatsky 1996; Klatsky 2001), Figure 5.5.

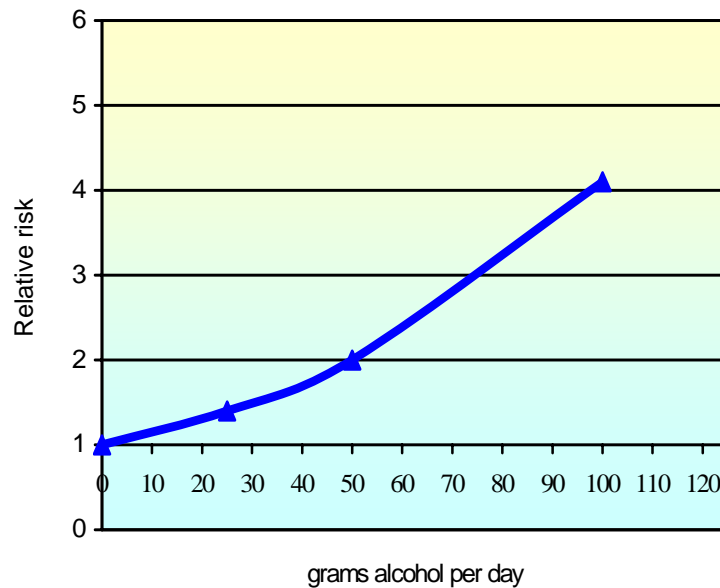


Figure 5.5 Relative risks of hypertension by alcohol intake. Source: Corrao *et al.* (1999).

Stroke There are two main types of stroke: ischaemic stroke which follows a blockage of an artery supplying blood to the brain; and haemorrhagic stroke (also including sub-arachnoid haemorrhage) which follows bleeding from a blood vessel within the brain. Alcohol increases the risk of haemorrhagic stroke (Corrao *et al.* 1999; Reynolds *et al.* 2003), Figure 5.6. Many individual studies have found that light drinking reduces the risk of ischaemic stroke (Beilin *et al.* 1996; Hillbom 1998; Keil *et al.* 1997; Kitamura *et al.* 1998; Knuiman and Vu 1996; Sacco *et al.* 1999; Thun *et al.* 1997; Wannamethee and Shaper 1996). Whereas one systematic review combining all studies found no clear evidence of a protective effect of light to moderate drinking on the risk of either ischaemic stroke or overall stroke (Mazzaglia *et al.* 2001), a more recent review found a clear J-shaped relationship between alcohol consumption and risk of ischaemic stroke, with consumption levels of up to 24g a day reducing the risk, whereas consumption levels of 60 or more grams per day increased the risk (Reynolds *et al.* 2003). The relationship is moderated by a genotype that influences high density lipoprotein cholesterol that is one of the biochemical mediators of the protective effect. In the absence of the genotype there is no statistical relationship between alcohol consumption and risk of ischaemic stroke; whereas in its presence alcohol consumption increases the risk of ischaemic stroke (Mukamal *et al.* 2005).

Episodic heavy drinking is an important risk factor for both ischaemic and haemorrhagic stroke, and is particularly important as a cause of stroke in

adolescents and young people. Up to 1 in 5 of ischaemic strokes in persons less than 40 years of age are alcohol-related, with a particularly strong association among adolescents (Hillbom and Kaste 1982).

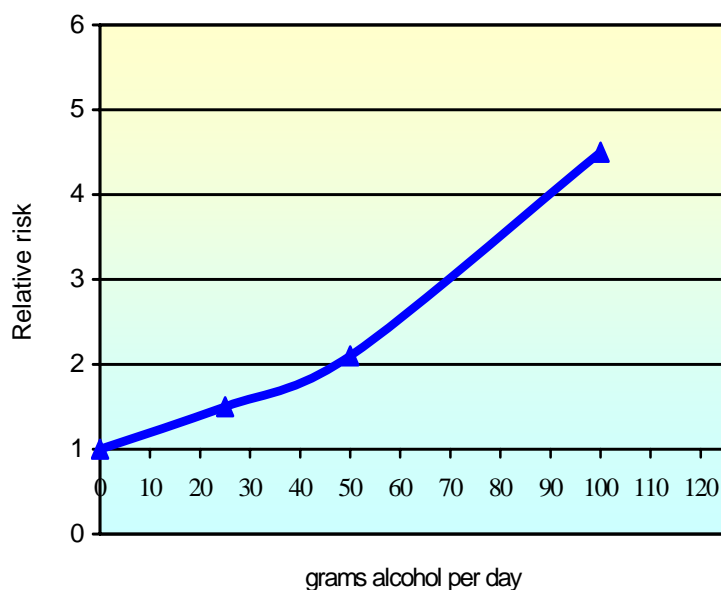


Figure 5.6 Relative risks of haemorrhagic stroke by alcohol intake. Source: Corrao *et al.* (1999).

Irregularities in heart rhythms Episodic heavy drinking increases the risk of heart arrhythmias and sudden coronary death, even in people without any evidence of pre-existing heart disease (Robinette *et al.* 1979; Suhonen *et al.* 1987; Wannamethee and Shaper 1992; Mukamal *et al.* 2005). Atrial fibrillation appears the most common form of arrhythmia induced by both consistent heavy alcohol consumption and high volume drinking occasions. It has been estimated that in 15%-30% of patients with atrial fibrillation, the arrhythmia may be alcohol-related, with possibly 5%-10% of all new episodes of atrial fibrillation explained by excess alcohol use (Rich *et al.* 1985).

Heart rhythms

Episodic heavy drinking increases the risk of heart arrhythmias and sudden coronary death, even in people without any evidence of pre-existing heart disease.

Cardiomyopathy Over a sustained period of time (five years or more), a high consumption of alcohol (more than 90g a day) can lead to cardiomyopathy, a disease of the heart muscle (Urban-Marquez *et al.* 1989) that leads to an enlarged heart and thinning of the heart muscle (Piano 2002). One third of men with alcohol dependence but with no symptoms of heart disease were found to have a considerably reduced heart function (Urban-Marquez *et al.* 1989), with an increased risk as the level of alcohol consumption rises. The extent to which alcohol in lower doses increases the risk of cardiomyopathy is not known.

Immune system

Alcohol can interfere with the normal functions of various components of the immune system (Nelson and Kolls 2002), and a high level of alcohol consumption can lead to immune deficiency, causing increased susceptibility to certain infectious diseases (US Department of Health and Human Services 2000; Estruch 2001), including pneumonia (Fernandez-Sola *et al.* 1995), tuberculosis (Cook 1998), and possibly HIV (Meyerhoff 2001). Part of the immune deficiency is exacerbated by malnutrition and liver disease (Estruch 2001).

Lung diseases

Acute respiratory distress syndrome (ARDS) is a severe form of lung injury that results from blood infections, trauma, pneumonia and blood transfusions (Guidot and Roman 2002). Clinical studies find that the presence of “alcohol abuse” and alcohol dependence independently increase the risk of ARDS two- to four-fold in patients with sepsis or trauma and may play a role in ARDS in as many as half of all patients with the syndrome (Guidot and Hart 2005). Although alcohol itself does not cause acute lung injury, it renders the lung susceptible to the inflammatory stresses of sepsis and trauma. In the United States, ARDS affects some 75,000 to 150,000 people each year (Guidot and Roman 2002), meaning that ARDS matches cirrhosis in terms of alcohol-related deaths in the United States. The extent to which there is a dose response relationship between lower levels of alcohol consumption and the risk of lung injury is not known.

Post-operative complications

Alcohol increases the risk of post-operative complications for general surgery, including infection, bleeding problems and cardiopulmonary insufficiency requiring intensive care (Tønnesen and Kehlet 1999). A Spanish study found a dose response relationship between alcohol consumption and risk of admittance to intensive care following general surgery (Delgad-Rodriguez *et al.* 2003).

Skeletal conditions

There appears to be a dose-dependent relationship between alcohol consumption and osteoporosis and risk of fracture in both men and women (US Department of Health and Human Services 2000; Preedy *et al.* 2001). It seems that the association between heavy alcohol use and decreased bone mass and increased fracture risk is less prevalent in women than in men (Sampson 2002), and there is even some evidence that women who consume alcohol in small doses generally have a higher bone mass than do women who abstain (Turner and Sibonga 2001; Williams *et al.* 2005), although at higher doses, alcohol reduces bone mass (Kogawa and Wada 2005).

In high doses, although in a dose dependent manner, alcohol is a cause of muscle disease and a decrease in muscle strength. It is probably the most common cause of

muscle disease, affecting between one and two thirds of all people with alcohol dependence (Urban-Marquez *et al.* 1989; Preedy *et al.* 2001).

Reproductive conditions

Alcohol can have negative consequences for both male and female reproduction. Alcohol use affects the endocrine glands and hormones involved in male reproduction and can reduce fertility through sexual dysfunction and impaired sperm production (Emanuele and Emanuele 2001). Alcohol consumption during early adolescence may suppress the secretion of specific female reproductive hormones, thereby delaying puberty and adversely affecting the maturation of the reproductive system (Dees *et al.* 2001). Beyond puberty, alcohol has been found to disrupt normal menstrual cycling, impairing fertility (Emanuele *et al.* 2002). There is also some evidence that alcohol is a risk factor for risky sexual behaviour (Markos 2005).

Pre-natal conditions

Alcohol shows reproductive toxicity. Prenatal exposure to alcohol can be associated with a distinctive pattern of intellectual deficits that become apparent later in childhood, including reductions in general intellectual functioning and academic skills as well as deficits in verbal learning, spatial memory and reasoning, reaction time,

Pregnancy

Alcohol, even at low average volumes of consumption, and particularly during the first trimester of pregnancy, can increase the risk of spontaneous abortion, low birth weight, prematurity and intra-uterine growth retardation.

balance, and other cognitive and motor skills (Mattson *et al.* 2001; Chen *et al.* 2003; Koditowakko *et al.* 2003). Some deficits, like problems with social functioning, appear to worsen as these individuals reach adolescence and adulthood, possibly leading to an increased rate of mental health disorders (Jacobson and Jacobson 2002). Although these deficits are

most severe and have been documented most extensively in children with Foetal Alcohol Syndrome (FAS), children pre-natally exposed to lower levels of alcohol can exhibit similar problems (Gunzerath *et al.* 2004) in a dose dependent manner (Sood *et al.* 2001), exacerbated by episodic heavy drinking (Jacobson and Jacobson 1994; Jacobson *et al.* 1998; Streissguth *et al.* 1993 1994).

There is some evidence that alcohol even at low average volumes of consumption, and particularly during the first trimester of pregnancy can increase the risk of spontaneous abortion, low birth weight, prematurity and intra-uterine growth retardation (Abel 1997; Bradley *et al.* 1998; Windham *et al.* 1997; Albertsen *et al.* 2004; Rehm *et al.* 2004; Albertsen *et al.* 2004). There is also some evidence that alcohol may reduce milk production in breastfeeding mothers (Mennella 2001; Gunzerath *et al.* 2004).

ALCOHOL AND THE RISK OF HEART DISEASE

J-shaped function Alcohol, in low doses, reduces the risk of coronary heart disease (Gunzerath *et al.* 2004). Objectively defined higher quality studies find less of a protective effect than lower quality studies (Corrao *et al.* 2000). A review of higher

quality studies, found that the risk of coronary heart disease decreased to 80% of the level of non-drinkers at 20 grams (two drinks) of alcohol per day, Figure 5.7. Most of the reduction in risk occurred by the level of one drink every second day. Beyond two drinks a day (the level of alcohol consumption with the lowest risk), the risk of heart disease increases, the risk exceeding that of an abstainer beyond a consumption level of 80g a day.

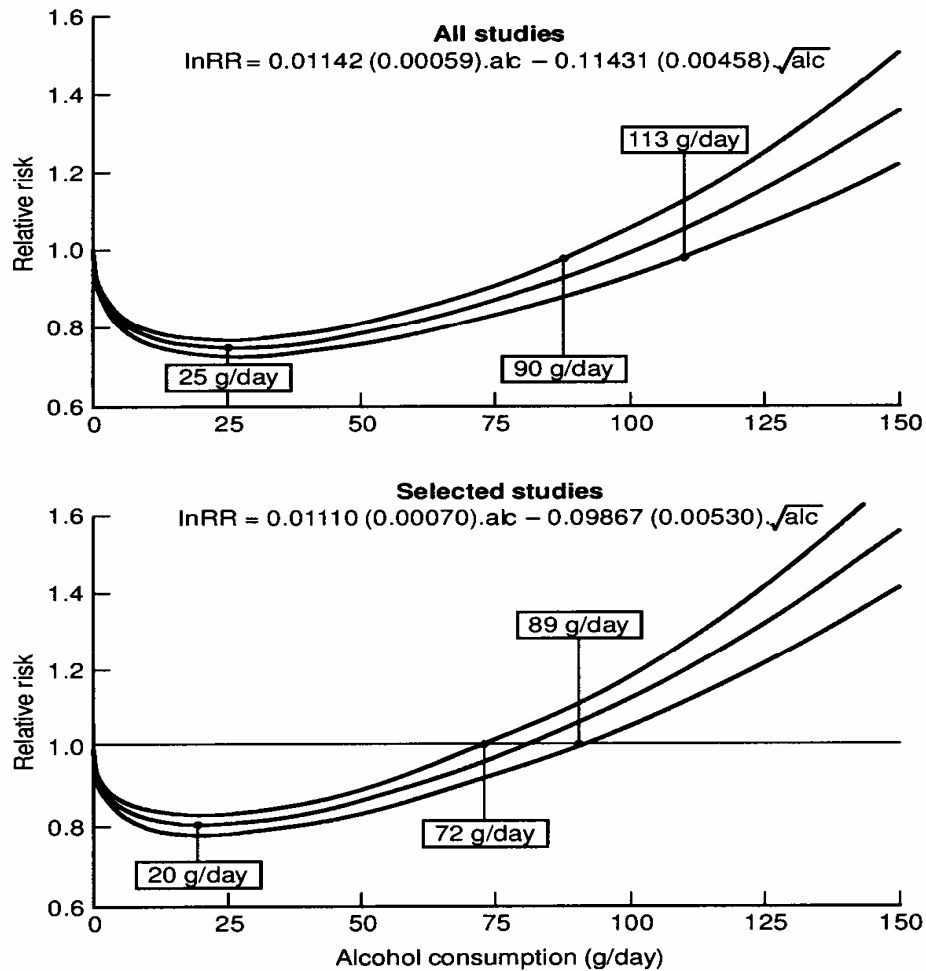


Figure 5.7 Functions (and corresponding 95% confidence intervals) describing the dose-response relationship between reported alcohol consumption and the relative risk of coronary heart disease obtained by pooling all the 51 included studies and the 28 selected cohort studies for which a high quality score was assigned. The fitted models (with standard errors in parentheses) and three critical exposure levels (nadir point, maximum dose showing statistical evidence of protective effect, and minimum dose showing statistical evidence of harmful effect) are reported. *Reproduced from: Corrao et al. (2000).*

The protective effect of alcohol is greater for non-fatal heart attacks than for fatal heart attacks, for men than for women and for people studied in Mediterranean countries than in non-Mediterranean countries. Alcohol's effect in reducing the risk is only relevant to middle aged and older adults, who are at increased risk for heart disease. All of the health benefits of alcohol for the individual drinker are summarized in Box 5.3.

Impact of high doses Whereas low doses of alcohol may protect against heart disease, high doses increase the risk, and high volume drinking occasions may precipitate cardiac arrhythmias, myocardial ischaemia or infarction and coronary death (Trevisan *et al.* 2001a; Trevisan *et al.* 2001b; Murray *et al.* 2002; Gmel *et al.* 2003 Britton and Marmot 2004; Trevisan *et al.* 2004).

Coronary heart disease

Alcohol, in low doses, reduces the risk of coronary heart disease, with 80% reduced risk at a consumption of two drinks a day (20g alcohol). Beyond two drinks a day (the level of alcohol consumption with the lowest risk), the risk of heart disease increases, being more than the risk of an abstainer beyond a consumption level of 80g a day.

Biochemical basis The relationship between alcohol consumption and the risk of coronary heart disease is biologically plausible and independent of beverage type (Mukamal *et al.* 2003; Mukamal *et al.* 2005). Alcohol consumption raises levels of high density lipoprotein cholesterol (HDL) (Klatsky 1999). HDL removes fatty deposits in blood vessels and thus is associated with a lower risk of coronary heart disease deaths. Moderate alcohol intake favourably affects blood clotting profiles, reducing the risk of heart disease (McKenzie and Eisenberg 1996; Reeder *et al.* 1996; Gorinstein *et al.* 2003; Imhof and Koenig 2003; Burger *et al.* 2004). Alcohol's impact on coagulation mechanisms is likely to be immediate and, since lipid modification in older age groups produces significant benefit, the impact mediated through elevation of HDL cholesterol can probably be achieved by alcohol consumption in middle age.

The biochemical changes that might reduce the risk of heart disease result equally from beer, wine or spirits and are due to both polyphenols and ethanol (Gorinstein and Trakhtenberg 2003); although red wine has the highest content of polyphenols, the biochemical changes do not result from grape juice or wine from which the alcohol has been removed (Sierksma 2003; Hansen *et al.* 2005). In contrast with these biochemical changes, there is evidence that alcohol consumption, in a dose dependent manner, and episodic heavy drinking increase the risk of calcification of the coronary arteries in young adults (Pletcher *et al.* 2005), a marker of atherosclerosis that is predictive of future heart disease (Pletcher *et al.* 2004).

J-shaped relationship not found in all studies Although the relationship between lower levels of alcohol consumption and reduced risk of coronary heart disease is found in many studies, it is not found in all. A study of a group of employed Scottish men aged over 21 years found no elevated risk for coronary heart disease among abstainers, compared to light and moderate drinkers (Hart *et al.* 1999). Other studies of the general population, where respondents might be expected to have reduced their drinking due to poor health, have found no differences in death rates between light drinkers and abstainers (Fillmore *et al.* 1998a, Fillmore *et al.* 1998b; Leino *et al.* 1998). A meta-analysis of 54 published studies tested the extent to which a systematic misclassification error was committed by including as 'abstainers' many people who had reduced or stopped drinking, a phenomenon associated with ageing and ill health. The studies judged to be error free found no significant all-cause or cardiac protection, suggesting that the cardiac protection afforded by alcohol may have been over-estimated (Fillmore *et al.* 2006).

BOX 5.3 Health benefits of alcohol to the individual drinker		
	Condition	Summary of findings
Social well being	<i>Pleasure</i>	General population studies have found that alcohol consumption relates to positive sensations and improved subjective health, influenced by culture, the setting in which drinking occurs, and people's expectations about alcohol's effects.
	<i>Work</i>	There is a J-shaped relationship between alcohol consumption and risk of sickness absence, which may reflect a higher extent of health problems in abstainers.
Neuropsychiatric conditions	<i>Cognitive functioning and dementia</i>	Light alcohol consumption may reduce the risk for vascular-caused dementia. The effects of alcohol on Alzheimer's disease and cognition remain uncertain, with some studies finding a beneficial effect and others not.
Gastrointestinal, endocrine and metabolic conditions	<i>Gallstones</i>	There is some evidence that alcohol might reduce the risk of gallstones, although this finding is not consistent across all studies.
	<i>Type II diabetes</i>	The relationship with type II diabetes appears to be U-shaped, with low doses decreasing the risk compared with abstainers and higher doses increasing the risk. Not all studies find a decreased risk from lighter drinking.
Cardiovascular diseases	<i>Ischaemic stroke</i>	There is a J-shaped relationship between alcohol consumption and risk of ischaemic stroke, with low doses of alcohol consumption (up to 24g a day) decreasing the risk.
	<i>Coronary heart disease (CHD)</i>	There is a J-shaped relationship between alcohol consumption and risk of CHD. One meta-analysis has estimated a 20% decreased risk of CHD at reported consumption levels of 20g/day. However, the protective effect appears to be reduced in very old age. Although the relationship between alcohol consumption and the risk of CHD is biologically plausible, concern still remains that the size of the effect may have been overestimated due to alcohol measurement problems and confounders that have not been adequately controlled in all studies.
Skeletal conditions		There is some evidence that women who consume alcohol in small doses generally have a higher bone mass than do women who abstain.
Total mortality		In older people, compared with people who do not drink, small quantities of alcohol reduce the overall risk of dying. In a UK study, the level of alcohol consumption with the lowest risk for total mortality (nadir) occurred at 4 g per day for women aged 65 years and over and 11 g per day for men aged 65 years and over.

Un-healthier lifestyle in abstainers Some studies in England and the United States have found that compared to non-drinkers, light drinkers had generally healthier lifestyles in terms of diet, physical activity and not-smoking (Wannamethee and Shaper 1999; Barefoot *et al.* 2002) and higher incomes (Hamilton and Hamilton 1997; Zarkin *et al.* 1998). It has been suggested that this could have explained the apparent increased risk of heart disease in non-drinkers compared with light drinkers. Although not found in a Finnish study (Poikolainen *et al.* 2005), examples of factors more commonly associated with non-drinking status included being older and non-white, being widowed or never married, having less education and income, lacking access to health care or preventive health services, having co-morbid health conditions such as diabetes and hypertension, having lower levels of mental well-being, being more likely to require medical equipment, having worse general health, and having a higher risk for cardiovascular disease (Naimi *et al.* 2005). For factors in which there were multiple risk categories, there was a graded relationship between increasing levels of risk and an increased likelihood of being a non-drinker.

An Australian study found that non-drinkers had a range of characteristics known to be associated with anxiety, depression and other facets of ill health, such as low status occupations, poor education, current financial hardship, poor social support and recent stressful life events, as well as increased risk of depression, all of which could explain an increased risk of heart disease amongst non-drinkers compared with light drinkers (Rodgers *et al.* 2000; Greenfield *et al.* 2002). One American study found that, whereas alcohol consumption reduced the risk of coronary heart disease in white men, it increased the risk in black men, suggesting that the cardioprotective effect could be explained by consistent confounding of lifestyle characteristics of drinkers (Fuchs *et al.* 2004).

Increased risk based on lifetime consumption The British Regional Heart study has confirmed that as alcohol consumption tends to decrease with age, epidemiological studies based on baseline measurement lead to an underestimation of risk (Emberson *et al.* 2005). Whereas baseline alcohol intake displayed U-shaped relations with cardiovascular disease and all-cause mortality, with light drinkers having the lowest risks and non-drinkers and heavy drinkers having similarly high risks, the nature of these relations changed after adjustment for average intake over the twenty year duration of the study; risks associated with non-drinking were lowered, and risks associated with moderate and heavy drinking increased, Figure 5.8.

Regular heavy drinkers had a 74% higher risk of a major coronary event, a 133% higher risk of stroke, and a 127% higher risk of all-cause mortality than did occasional drinkers (these estimates were 8%, 54%, and 44% before adjustment for intake variation). It is also important to note that the reduction in risk with alcohol consumption may become less and disappear, the longer the time when subjects in studies are followed-up (Nielsen *et al.* 2005).

Reduced protection in very old age Few studies have examined how the relative risk between alcohol consumption and heart disease changes with old age (Grønbaek *et al.* 1998). In general, relative risks for risk factors for coronary heart disease converge towards 1.0 with increasing age (Abbott *et al.* 1997), including alcohol (Abrams *et al.* 1995). The Honolulu heart study found that comparing drinkers with non-drinkers, the relative risk converged towards 1.0, with increasing age, such that there was no evidence for a protective effect in men aged 75 years or older (Abbott *et al.* 2002). Further, in this age group, there is an increased over-recording of coronary heart disease on death certificates. The Framingham Heart Study found that over-recording of heart disease on death certificates increased exponentially

with age, such that at an age of death of 85 years or more, over-recording was estimated to be doubled (Lloyd-Jones *et al.* 1998).

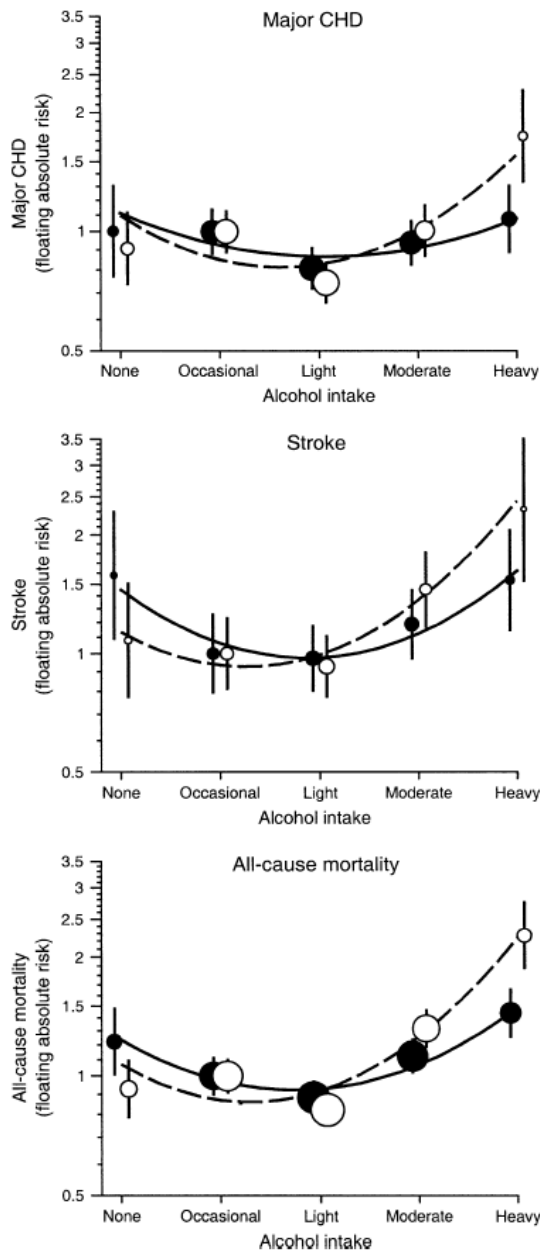


Figure 5.8. Relative hazard of major coronary heart disease (CHD) (coronary death and nonfatal myocardial infarction), stroke, and all cause mortality by alcohol intake, among British Regional Heart Study men originally free from cardiovascular disease followed from 1978/1980 to 1998/2000. The black circles and solid line correspond to baseline alcohol intake levels, and the white circles and dashed line correspond to “usual” alcohol intake levels obtained after adjustment for individual variation in alcohol intake. The size of each plotting symbol indicates the amount of statistical information on which each estimate is based. The vertical lines show 95% confidence intervals for the absolute risks. Source: Emberson *et al.* 2005.

IS THERE A RISK FREE LEVEL OF ALCOHOL CONSUMPTION?

The shape of the relationship between alcohol consumption and death depends on both the distribution of the causes of death amongst the population studied, and on the level and patterns of alcohol consumption within the population. At younger ages deaths from accidents and violence (which are increased by alcohol consumption) predominate, while coronary heart disease deaths (which are reduced by alcohol consumption) are rare. The position is reversed at older ages. There is some

evidence that at any given volume of drinking, those drinking higher amounts on a given drinking occasion have a higher risk of death (Tolstrup *et al.* 2004).

The risk of dying

The level of alcohol consumption with the lowest risk of death is zero for women aged less than 45 years and men aged less than 35 years. It is 4 g per day for women aged 65 years and over, and 11 g per day for men aged 65 years and over.

There is a positive, largely linear relationship between alcohol consumption and risk of death in populations or groups with low coronary heart disease rates (which includes younger people everywhere). On the other hand there is a J or, among older populations, a U shaped relationship between alcohol consumption and risk of death in populations with high

rates of coronary heart disease. The exact age when the relationship changes from a linear to a J or U shape depends on the distribution of causes of death, but in European countries occurs at an age of death of 50 to 60 years (Rehm and Sempos 1995). The effects of this changing risk curve on overall levels of health in Europe can be seen in Chapter 6.

As with coronary heart disease, the level of consumption in the individual associated with the least risk of death varies from country to country. Thus, studies from southern and central European countries, with higher consumption levels at least until recently, find the level of consumption associated with the lowest rate of death to be higher (Farchi *et al.* 1992; Brenner *et al.* 1997; Keil *et al.* 1997; Renaud *et al.* 1998) than countries with lower alcohol consumption levels (English *et al.* 1995; White 1999).

In the United Kingdom, it has been estimated that the level of alcohol consumption with the lowest risk of death for women is zero aged under 45 years, 3 g per day aged 45 to 64 years and 4 g per day aged 65 years and over, Figure 5.9.

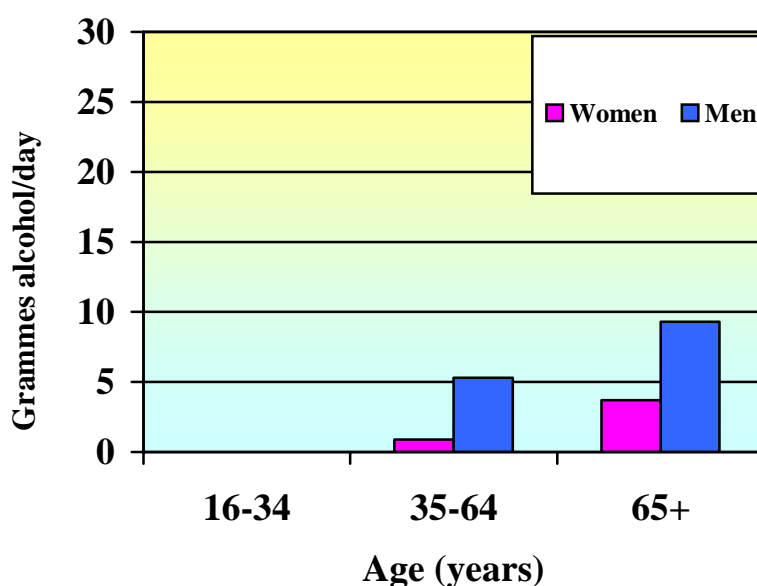


Figure 5.9 Level of alcohol consumption with lowest risk to death (UK estimates). Source: White *et al.* (2002).

Analytical techniques and the J-shaped curve Due to the way that questionnaires ask about alcohol consumption, studies that relate the risk of harm to levels of alcohol consumption summarize alcohol consumption within discrete categories, whereas the distribution between individuals is, in fact, continuous. Categorizing the alcohol intake has several disadvantages: high and low risk individuals could be merged (e.g., for highest alcohol consumption group), and thereby dilute the estimated influence; and the number and placement of category boundaries may affect the estimates and thereby the level of alcohol consumption with the lowest risk of ill-health. A statistical technique called Generalized Additive Models (GAM) can overcome this problem (Hastie and Tibshirani 1990).

When this technique was applied to the results of the Copenhagen Heart Study, it was found that the relationship between alcohol consumption and risk of death was dependent on whether or not non-drinkers (in this study defined as people who drank less than 12g of alcohol a week) were included in the analysis (Johansen *et al.* 2005). A J-shape resulted when non-drinkers were included in the analysis, Figure 5.10 (blue line), with the usual finding that light drinkers have a reduced risk of death over a range of up to one drink a day for women and up to two drinks a day for men. However, if non-drinkers were removed from the analysis, a positive linear relationship was found between alcohol intake and risk of death for both men and women (red line). This analysis suggested that for anyone who drank 12g or more of alcohol per week, there was an increased risk of death, even for low alcohol intake, and there was no evidence of a threshold effect (i.e. there was a straight line relationship, rather than an increased risk only after a certain level of alcohol consumption).

Thus, this study suggests that the J-shaped curve relating alcohol to the risk of death is due to an increased risk in persons who drink less than one drink per week, rather than from a benefit of drinking alcohol; that J-shaped curves overestimate the increased risk of death in drinkers with very low levels of alcohol intake (the first part of the J-shaped curve) compared with those who drink at the level of alcohol consumption with the lowest risk of death; and that J-shaped curves imply that the level of alcohol consumption with the lowest risk of death occurs at too high a level of alcohol consumption.

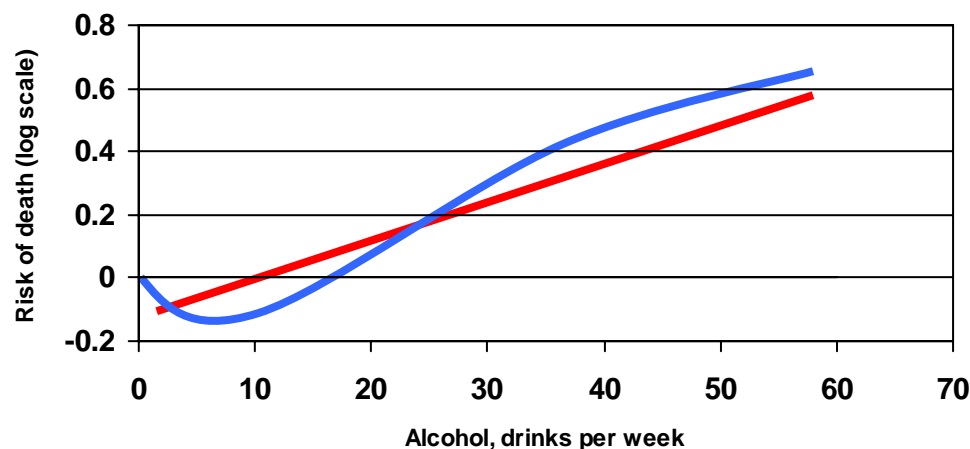


Figure 5.10 Risk of death in men when non-drinkers included in the analysis (blue line) and excluded from analysis (red line). Source: Johansen *et al.* (2005), Copenhagen city heart study. Modelled using General Additive Models.

The impact of alcohol and health across the lifespan is summarized in Box 5.4.

WHAT DETERMINES RISK FOR ALCOHOL-RELATED ILL-HEALTH?

Hippocrates, writing 2500 years ago, advised anyone coming to a new city to enquire whether it was likely to be a healthy or unhealthy place to live, depending on its geography and the behaviour of its inhabitants (“whether they are fond of excessive drinking”) (Hippocrates, translated by Lloyd 1978). He continued “as a general rule, the constitutions and the habits of a people follow the nature of the land where they live”. The impact of the area and population in which people live is clearly demonstrated by studies of large scale migrations from one culture to another, in which, for example, an increase in risk factors and coronary heart disease is observed when individuals migrate from a low to a high risk culture and assume the lifestyle of the new culture (Kagan *et al.* 1974). In other words, and this applies to many risk factors and conditions (Rose 1992), including suicide (Durkheim, translated by Spaulding and Simpson 1952), the behaviour and health of individuals are profoundly influenced by a society’s collective characteristics and social norms. Chapter 6 will show that this also applies to alcohol, where there is a relationship between the overall per capita alcohol consumption and the number of individuals in a population with harmful alcohol use and alcohol use disorders (Skog 1991; Lemmens 2001; Academy of Medical Sciences 2004). The rest of this section will describe other influences that have a direct impact in determining risk for alcohol-related health.

Genetic influences

Genetic background influences the risk of alcohol use disorders. The classic twin study design compares the resemblances for a condition of interest between monozygotic (MZ, identical) twins and dizygotic (DZ, fraternal) twins, in order to determine the extent of genetic influence, or heritability, of the condition. Heritability can be calculated because MZ twins are genetically identical, whereas DZ twins share only half their genes. The method relies on the “equal-environment assumption,” that is, that the similarity between the environments of both individuals in a pair of MZ twins is the same as the similarity between the environments of members of pairs of DZ twins, although there is clearly an interaction between genes and the environment (Heath and Nelson 2002).

While twin studies do not identify specific genes influencing a condition, they do provide important information on the condition’s genetic impact (more general properties of its inheritance pattern, such as whether genes act independently of one another, or in concert, to influence a condition), which aspects of the condition are most heritable, whether the same genes are influencing the condition in both genders, and whether multiple conditions share any common genetic influences. When data on twins are augmented by data on their family members, the study is termed a twin/family study and can provide more precise information about whether parents transmit a behavioural condition to their offspring genetically or via some aspect of the familial environment (cultural transmission). When detailed data about the environment are collected, twin and twin/family studies can provide information about how environmental factors interact with genetic predisposition to produce a disease.

Box 5.4 Alcohol and health across the lifespan					
	Pre-natal	Childhood	Young adulthood	Middle age	Older age
Social consequences			The pleasures from alcohol use occur amongst drinkers		
		The negative social consequences affect all ages			
Injuries			Young adults are common perpetrators and are at particular risk		
		Intentional and unintentional injuries affect all ages			
Neuropsychiatric conditions			Young adults are common perpetrators of intentional injuries and are at particular risk of both intentional and unintentional injuries		
		The consequences of neuropsychiatric conditions affect all ages			
Gastrointestinal conditions			Although alcohol dependence affects all adult ages, young adults are at increased risk		
			Middle aged and older people are at increased risk from brain damage and cognitive impairment		
Cancers			Although liver cirrhosis is more common in middle and older age, young adults are also at risk		
		Cancers are more likely to occur in middle and older age			
Cardiovascular diseases			Hypertension, stroke and irregularities in heart rhythms can affect all adult ages		
			Episodic heavy drinking is an important risk factor for stroke in young adults		
Pre-natal conditions			Coronary heart disease is rare in young adults		
			The reduced risk for coronary heart disease becomes more important in middle age and older adults		In very old adults, the reduced risk seems to disappear
The consequences of pre-natal alcohol related harm extend across the lifespan					

Some twin and family studies have suggested that the proportion of heritability of alcohol dependence is between 50% and 60% (Cook and Gurling 2001; Dick and Forud 2002; US Department of Health and Human Services 2000). The current literature mostly focuses on alcohol dependence, but there is reason to believe that what is heritable about heavy or problematic drinking reaches more broadly than diagnosable alcohol dependence (Schuckit *et al.* 2004).

Analyses of 987 people from 105 families in the initial sample of the Collaborative Study on the Genetics of Alcoholism (COGA), a large-scale family study designed to identify genes that affect the risk for alcohol dependence and alcohol-related characteristics and behaviours, provided evidence that regions on 3 chromosomes contained genes that increase the risk of alcohol dependence (Reich *et al.* 1998). The strongest evidence was for regions on chromosomes 1 and 7, with more modest evidence for a region on chromosome 2. The replication sample, which comprised 1,295 people from 157 families, confirmed the previous findings, albeit with less statistical support (Foroud *et al.* 2000).

Variants of the genes *ADH2*, *ADH3* and *ALDH2* substantially (although not completely) protect carriers from developing alcohol dependence by making them uncomfortable or ill after drinking alcohol (Reich *et al.* 1998). The genes encode alcohol dehydrogenase and aldehyde dehydrogenase respectively, two of the key liver enzymes involved in the metabolism of alcohol to its final end product acetate.. Analyses of non alcohol dependent sibling pairs in the initial sample of the Collaborative Study on the Genetics of Alcoholism (COGA) produced evidence for a protective region on chromosome 4, in the general vicinity of the alcohol dehydrogenase (*ADH*) genes (Williams *et al.* 1999; Edenberg 2000; Saccone *et al.* 2000).

Other risk factors

At any given level of alcohol consumption, women appear to be at increased risk from the chronic harms done by alcohol, with differing sizes of risk with different illnesses. This is probably due to the fact that women have a lower amount of body water per weight than do men (Swift 2003). Thus, when a woman and a man with the same approximate weight and age consume the same amount of alcohol, the alcohol concentration will be higher in the woman, because the alcohol is dissolved in a smaller volume of body water.

Who is at risk?

Genes, gender, age and socio-economic status affect who is at risk of the harm done by alcohol, with some genes increasing and others decreasing the risk of alcohol use disorders, and, at any given level of alcohol consumption, women, children and adolescents and those with lower socio-economic status being at increased risk.

Consistently across countries and studies, alcohol dependence and alcohol-related mortality is highest in adults with lower socio-economic status (Romelsjo and Lundberg 1996; Leclerc *et al.* 1990; Lundberg and Osterberg 1990; Makela *et al.* 1997; Makela 1999; Loxely *et al.* 2004). There is also an interaction between alcohol consumption and poverty in terms of violent crimes such as homicide, with higher rates when these two risk factors are

combined than could be expected from the addition of both individual risk factors (Parker 1993). In England, for men aged 25–69 years, those in the lowest socio-economic status (SES) category (unskilled labour) had a 15-fold higher risk of alcohol-related mortality than professionals in the highest SES category (Harrison and Gardiner 1999). In Sweden, up to 30% of the differential mortality for middle aged men by socioeconomic group is explained by alcohol consumption (Hemström 2001). These findings match social gradients in health, in which poor social and economic circumstances affect health throughout life (Wilkinson and Marmot 2003). For alcohol, these probably work both ways, with harmful alcohol consumption being a result of, and a way of coping with, harsh economic and social conditions, as well as alcohol dependence leading to downward social mobility.

Children have greater vulnerability to alcohol than adults. As well as usually being physically smaller, they lack experience of drinking and its effects. They have no context or reference point for assessing or regulating their drinking, and, furthermore, they have built no tolerance to alcohol. From mid-adolescence to early adulthood there are major increases in the amount and frequency of alcohol consumption and alcohol-related problems (Wells *et al.* 2004; Bonomo *et al.* 2004). Those with heavier consumption in their mid-teens tend to be those with heavier consumption, alcohol dependence and alcohol related harm, including poorer mental health, poorer education outcome and increased risk of crime in early adulthood (Jefferis *et al.* 2005). Drinking by adolescents and young adults is associated with automobile crash injury and death, suicide and depression, missed classes and decreased academic performance, loss of memory, blackouts, fighting, property damage, peer criticism and broken friendships, date rape, unprotected sexual intercourse that places people at risk for sexually transmitted diseases, HIV infection and unplanned pregnancy (Williams and Knox 1987).

DOES REDUCING ALCOHOL USE IMPROVE HEALTH?

There are health benefits from reducing or stopping alcohol consumption. Part of the harm done by alcohol is immediately reversible; accidents and injuries and the risk of low birth weight and other pre-natal conditions can be completely reversed if alcohol is removed. Young people who cut down on their drinking as they move into early adulthood reduce their risk of alcohol related harm (Toumbouro *et al.* 2004).

An example of a longer term condition with rapid, sometimes almost immediate remission is depression.

Most studies find that many depressive syndromes markedly improve within days to weeks of abstinence (Brown and Schuckit 1988; Dackis *et al.* 1986; Davidson 1995; Gibson and Becker 1973, Penick *et al.* 1988; Pettinati *et al.* 1982; Willenbring 1986).

As described in more detail in Chapter 7, healthcare-based interventions for hazardous and harmful alcohol consumption reduce alcohol consumption, as well as demonstrating reductions in alcohol related problems (Moyer *et al.* 2002) and alcohol-related mortality (Cuijpers *et al.* 2004). The community based Malmö study,

Improving health

All acute harms from alcohol can be avoided if alcohol consumption is reduced. Depressive syndromes markedly improve within days to weeks of abstinence. Reductions of alcohol consumption are followed by fairly rapid decreases in liver cirrhosis deaths.

undertaken during the 1970s, demonstrated that under the right conditions, the effects can be dramatic. An intervention for heavy drinkers resulted in half the deaths that occurred in the control group without the intervention at six year follow-up (Kristenson *et al.* 1983).

Some chronic diseases depend on lifetime exposure, and thus risk may be reduced but not completely eliminated by removal of alcohol. On the other hand, population-based studies find that reductions in alcohol consumption in populations are associated with fairly rapid decreases in chronic diseases, such as deaths from liver cirrhosis (Ledermann 1964) (see Chapter 6). Time series analyses have shown that decreases in per capita consumption were associated with considerable concurrent reductions in deaths from liver cirrhosis (e.g. Ramstedt 2001; Skog 1980; and especially Cook and Tauchen 1982).

CONCLUSION

Although alcohol brings with it a number of pleasures, its use is not risk free. The overall amount of alcohol consumed, the frequency of consumption and the frequency and volume of episodic heavy drinking, independently and together, increase a wide range of social, mental and physical harms and illnesses. The risk for these harms is largely dose dependent, with no evidence for a threshold effect. That is, the greater the amount of alcohol consumed, both regularly and on any one occasion, the greater is the risk. For some conditions (acute respiratory distress syndrome, cardiomyopathy, nerve damage and muscle damage), it seems that the risk only increases following heavy and/or sustained alcohol consumption, although even at these higher levels, there is a dose response relationship. For some conditions (particularly injuries and cardiovascular diseases), the risk is largely, but not exclusively, mediated by patterns of episodic heavy drinking.

The harms are partially offset by a number of benefits, primarily a reduction in the risk of coronary heart disease. Thus the overall risk of death is a balance between the harms that alcohol causes, which can be present at all ages, and the benefits from coronary heart disease, which is largely an illness in older age. This means that for women under the age of 45 years and for men under the age of 35 years, the level of alcohol consumption with the lowest risk to death is zero. In very old age, it seems that the reduced risk for coronary heart disease is much less, and it is likely again that any level of alcohol consumption might increase the risk of death.

The harm done by alcohol not only affects the drinker, but also those other than the drinker. Such harms (which could be termed environmental alcohol damage (EAD)), are wide ranging and include violence, homicide, harm to intimate partners and children, other crime, the consequences of road traffic accidents, and harm to the developing baby.

The risk for all types of harms is lessened, and for most conditions, reversed with a reduction of alcohol consumption, both the overall volume of consumption and consumption at any one time.

How the impact of alcohol on the individual summates for Europe as a whole is discussed in the next chapter.

REFERENCES

- Abbey, A., Zawacki, T., Buck, P.O., Clinton, A. and McAuslan, P. (2001). Alcohol and Sexual Assault. *Alcohol Health and Research World*, 25 (1), 43–51.
- Abbott, R.D., Sharp, D.S., Burchfile, C.M. *et al.* (1997). Cross-sectional and longitudinal changes in total and high-density lipoprotein cholesterol levels over a 20-year period in elderly men: the Honolulu Heart Program. *Annals of Epidemiology* 7 417-424.
- Abbott RD, Curb JD, Rodriguez BL, Masaki KH, Yano K, Schatz IJ, Ross GW, Petrovitch H. (2002) Age-related changes in risk factor effects on the incidence of coronary heart disease. *Ann Epidemiol.* Apr;12(3):173-81.
- Abel EL (1997) Maternal alcohol consumption and spontaneous abortion. *Alcohol and Alcoholism*, 32, 211–219.
- Abrams, J., Vela, B. S., Coultas, D. B., Samaan, S. A., Malhotra, D. and Roche, R. J. (1995). Coronary risk factors and their modification: lipids, smoking, hypertension, estrogen and the elderly. *Current Problems in Cardiology*, 20, 533-610.
- Academy of Medical Sciences (2004). Calling Time: The nation's drinking as a major public health issue. www.acmedsci.ac.uk. Accessed 2004.
- Alati, R., Lawlor, D.A., Najman, J.M., Willimas, G.M., Bor, W. and O'Callaghan, M. (2005). Is there really a 'J-shaped' curve in the association between alcohol consumption and symptoms of depression and anxiety? Findings from the Mater-University Study of pregnancy and its outcomes. *Addiction* 100 643-651.
- Albano, E. and Clot, P. (1996). Free radicals and ethanol toxicity. IN V.R.Preedy and R.R. Watson (Eds.). *Alcohol and the gastrointestinal tract*, pp57-68. CRC Press: Boca Raton, FL.
- Albertsen, A., Andersen, A-M, Olsen, J. and Grønbaek, M. (2004). Alcohol consumption during pregnancy and risk of preterm delivery. *American Journal of Epidemiology* 159 155-161.
- Allen, J., Nicholas, S., Salisbury, H. and Wood, M. (2003). Nature of burglary, vehicle and violent crime in C. Flood-Page and J. Taylor (eds). *Crime in England and Wales 2001/2002: Supplementary Volume*. Home Office Statistical Bulletin 01/03. London: Home Office.
- Ajani UA, Hennekens CH, Spelsberg A, Manson JE (2000) Alcohol consumption and risk of type 2 diabetes mellitus among US male physicians *Arch Intern Med* 160:1025–1030.
- Ames, G.M.; Grube, J.W.; And Moore, R.S. (1997). The relationship of drinking and hangovers to workplace problems: An empirical study. *Journal of Studies on Alcohol* 58(1):37–47.
- Anderson, P. (1995) Alcohol and risk of physical harm. In Holder, H.D. and Edwards, G., eds. *Alcohol and Public Policy: Evidence and Issues*. Oxford, Oxford Medical Publications.
- Anderson, P. (2003). The Risk of Alcohol. PhD thesis. Nijmegen, Radboud University. http://webdoc.ubn.kun.nl/mono/a/anderson_p/riskofal.pdf.
- Anderson, P., Cremona, A., Paton, A., Turner, C. and Wallace, P. (1993) The Risk of alcohol. *Addiction* 88, 1493-1508.
- Andrews JA, Lewinsohn PM (1992) Suicidal attempts among older adolescents: prevalence and co-occurrence with psychiatric disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 655–662.

Anstey, K.J., Windsor, T.D., Rodgers, B., Jorm A.F., and Christensen, H (2005). Lower cognitive test scores observed in alcohol abstainers are associated with demographic, personality, and biological factors: the PATH Through Life Project *Addiction*, 100 , 1291–1301.

Antilla, T., Helkala, E-L., Viitanen, M., Kareholt, I., Fratiglioni, L., Winblad, B., Soininen, H., Tuomilehto, J., Nissinen, A. and Kivipelto, M. (2004) Alcohol drinking in middle age and subsequent risk of mild cognitive impairment and dementia in old age: a prospective population based study. *British Medical Journal*. 329 539-545.

Archer, J., Holloway, R. and McLoughlin, K. (1995) Self-reported physical aggression among young men. *Aggressive Behavior*, 21, 325–342.

Ashley MJ, Rehm J, Bondy S, Single E, Rankin J (2000) Beyond ischemic heart disease: are there other health benefits from drinking alcohol? *Contemporary Drug Problems*, 27:735–777.

Australian Bureau of Statistics (1991), *1989–90 National Health Survey Summary of Results, Australia*. Catalogue No. 4364.0, Commonwealth of Australia.

Babor TF, Caetano R, Casswell S, Edwards G, Giesbrecht N, Graham K, Grube JW, Gruenewald PJ, Hill L, Holder HD, Homel R, Österberg E, Rehm J, Room R and Rossow I (2003). Alcohol: No Ordinary Commodity. Research and Public Policy. Oxford, Oxford Medical Publication, Oxford University Press.

Bagnardi, V.; Blangiardo, M.; La Vecchia, C.; *et al.* (2001a). Alcohol consumption and the risk of cancer: A meta-analysis. *Alcohol Research and Health* 25(4):263–270.

Bagnardi, V.; Blangiardo, M.; La Vecchia, C.; *et al.* (2001b) A meta-analysis of alcohol drinking and cancer risk. *British Journal of Cancer* 85(11): 1700–1705.

Bandera E.V., Freudenheim J.L., and Vena J.E. (2001) Alcohol and lung cancer: a review of the epidemiologic evidence. *Cancer Epidemiology, Biomarkers and Prevention* 10, 813-821.

Barefoot, J.C., Grønnebæk, M., Feaganes, J.R., McPherson, R.S., Williams, R.B. and Siegle, I.C. (2002) Alcoholic beverage preference, diet, and health habits in the UNC Alumni Heart Study *Am J Clin Nutr* 76:466-72.

Baum-Baicker, C. (1987) The psychological benefits of moderate alcohol consumption: a review of the literature. *Drug and Alcohol Dependence*, 15, 305-322.

Beautrais AL (1998) *Risk factors for suicide and attempted suicide amongst young people*. A report to the National Health and Medical Research Council.
<http://www.nhmrc.gov.au/publications/synopses/mh12syn.htm> Accessed 2005.

Becker, U., Grønnebæk, M., Johansen, D. Thorkild, I., and Sørensen, A. (2002) Lower risk for alcohol-induced cirrhosis in wine drinkers. *Hepatology* 35 868-875.

Beilin LJ, Puddey IB, Burke V (1996) Alcohol and hypertension—kill or cure? *Journal of Human Hypertension*, 10(2):S1–S5.

Bijl, R.V., Ravelli, A. and van Zessen, G. (1998). Prevalence of psychiatric disorder in the general population: results of the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Soc Psychiatry Psychiatr Epidemiol* 33 587-595.

Blankfield A, Maritz JS (1990) Female alcoholics IV: admission problems and patterns. *Acta Psychiatrica Scandinavica*, 12, 445–450

Blomberg, R.D., Peck, R.C., Moskowitz, H., Burns, M. and Fiorentino, D. (2002). *Crash Risk of Alcohol Involved Driving*. National Highway Traffic Safety Administration, Washington, D.C..

Bonomo, Y., Coffey, C., Wolfe, R., Lynskey, M., Bowes, G. and Patton, G. (2001) Adverse outcomes of alcohol use in adolescents. *Addiction*, 96, 1485–1496.

Bonomo, Y.A., Bowes, G., Coffey, C., Carlin, J.B. and Patton, G.C. (2004) Teenage drinking and the onset of alcohol dependence: a cohort study over seven years. *Addiction* 99 1520-1528.

Book, S.W. and Randall, C.L. (2002) Social anxiety disorder and alcohol use. *Alcohol Research and Health* 26 130-135.

Borges, G., Cherpitel, C. and Mittleman, M. (2004) Risk of injury after alcohol consumption: a case-crossover study in the emergency department. *Social Science and Medicine* 58 1191-1200.

Borges, G., Cherpitel, C.J., Medina Mora, M.E., Mondragón, L. and Casanova, L. (1998). Alcohol consumption in emergency room patients and the general population: a population-based study. *Alcohol Clin Exp Res*, 22 (9): 1986-1991.

Bot, S.M., Engels, R.C.M.E. and Knibbe, R.A. (2005). The effects of alcohol expectancies on drinking behaviour in peer groups: observations in a naturalistic setting. *Addiction* 100 1270-1279.

Bradley KA, Badrinath S, Bush K, Boyd-Wickizier J, Anawalt B (1998) Medical risks for women who drink alcohol. *Journal of General Internal Medicine*, 13:627–639.

Brecklin, L.R. and Ullman, S.E. (2002). The roles of victim and offender alcohol use in sexual assaults: results from the National Violence Against Women Survey. *Journal of Studies on Alcohol*, 63 (1): 57–63.

Brenner, H., Arndt, V., Rothenbacher, D., Schuberth, S., Fraisse, E. and Fliedner, T. (1997) The association between alcohol consumption and all-cause mortality in a cohort of male employees in the German construction industry, *International Journal of Epidemiology*, 26, 85-91.

Brismar, B. and Bergman, B. (1998) The significance of alcohol for violence and accidents. *Alcoholism: Clinical and Experimental Research* , 22 , 2995–3065.

Britton A, McKee M (2000) The relation between alcohol and cardiovascular disease in Eastern Europe: explaining the paradox. *Journal of Epidemiology and Community Health*, 54:328–332.

Britton, A. and Marmot, M. (2004) Different measures of alcohol consumption and risk of coronary heart disease and all-cause mortality: 11 year follow-up of the Whitehall II Cohort Study. *Addiction* 99 109-116.

Brown SA, Schuckit MA (1988) Changes in depression among abstinent alcoholics. *Journal of Studies on Alcohol*, 49:412–417.

Brown, S.A., Goldman, M.S., Inn, A. and Anderson, L.R. (1980) Expectations of reinforcement from alcohol: their domain and relation to drinking patterns. *Journal of Consulting and Clinical Psychology*, 48,419-426.

Budd, T. (2003) Alcohol-related assault: findings from the British Crime Survey. Home Office Online Report 35/03. <http://www.homeoffice.gov.uk/rds/pdfs2/rdsolr3503.pdf>.

Burger M; Mensink G; Bronstrup A; Thierfelder W; Pietrzik K (2004) Alcohol consumption and its relation to cardiovascular risk factors in Germany. *Eur J Clin Nutr* 2004 Apr;58(4):605-14.

Bushman B.J. and Cooper H.M. (1990) Effects of alcohol on human aggression: An integrative research review. *Psychological Bulletin* 107, 341-354.

Bushman B.J. (1997) Effects of alcohol on human aggression: validity of proposed mechanisms. In: Galanter, M., ed. *Recent Developments in Alcoholism*, Vol. 13, *Alcohol and Violence*, pp. 227-244. New York: Plenum Press.

Caetano, R. and Cunradi, C. (2002) Alcohol dependence: a public health perspective. *Addiction* 97 633-645.

Caetano, R. and Tam, T. W. (1995) Prevalence and correlates of DSM-IV and ICD-10 alcohol dependence: 1990 U.S. National Alcohol Survey. *Alcohol and Alcoholism*, 30, 177-186.

Caetano, R. (1999). The identification of alcohol dependence criteria in the general population. *Addiction* 94 255-267.

Caetano, R., Schafer, J. and Cunradi, C.B. (2001) Alcohol-related intimate partner violence among white, black and Hispanic couples in the United States. *Alcohol Research and Health* 25 58-65.

Caetano, R., Tam, T., Greenfield, T. K., Cherpitel, C. J. and Midanik, L. T. (1997) DSM-IV alcohol dependence and drinking in the U.S. population: a risk analysis. *Annals of Epidemiology*, 7, 542-549.

Castaneda R, Sussman N, Levy O'Malley M, Westreich L (1998) A review of the effects of moderate alcohol intake on psychiatric and sleep disorders. In: Galanter M, (Ed.) *Recent developments in alcoholism: The consequences of alcoholism*, Vol 14 edn. pp. 197–226. New York: Plenum Press.

Chadwick DJ, Goode JA (1998) *Alcohol and cardiovascular diseases*. John Wiley and Sons, Chichester.

Chen, W-J., Maier, S.E., Parnell, S.E. and West, J.R. (2003) Alcohol and the developing brain: neuroanatomical studies. *Alcohol Research and Health* 27 174-180.

Chermack, S.T.; Walton, M.A.; Fuller, B.E.; And Blow, F.C. (2001) Correlates of expressed and received violence across relationship types among men and women substance abusers. *Psychology of Addictive Behaviors* 15(2):140–151.

Cherpitel C.J., Bond, J., Ye, Y., Borges, G., Macdonald, S and Giesbrecht, N. (2003) A cross-national meta-analysis of alcohol and injury: data from the Emergency Room Collaborative Alcohol Analysis Project (ERCAAP). *Addiction* 98 1277-1286.

Cherpitel CJ (1992) The epidemiology of alcohol-related trauma. *Alcohol Health and Research World*, 16, 191–196.

Cherpitel CJ (1997) Alcohol and violence-related injuries in the emergency room. *Recent Developments in Alcoholism*, 13, 105–118.

Cherpitel CJ, Tam T, Midanik L, Caetano R, Greenfield T (1995) Alcohol and nonfatal injury in the US general population: a risk function analysis. *Accident Analysis Prevention*, 27, 651–661.

Cherpitel, C.J., Ye, Y., Bond, J., Rehm, J., Poznyak, V., Macdonald, S., Stafström, M. and Hao, W. (2005). Multi-level analysis of alcohol-related injury among emergency department patients: a cross-national study. *Addiction* 100 1840-1850.

Cherrington, E.H. (Editor-in-chief) (1925) *Standard Encyclopaedia of the Alcohol Problem*, Vol. 1. Westerville OH: Aarau-Buckingham.

Choi HK; Atkinson K; Karlson EW; Willett W; Curhan G (2004) Alcohol intake and risk of incident gout in men: a prospective study. *Lancet* 2004 Apr 17;363(9417):1277-81.

Collaborative group on hormonal factors in breast cancer. (2002) Alcohol, tobacco and breast cancer - collaborative reanalysis of individual data from 53 epidemiological studies, including 58,515 women with breast cancer and 95,067 women without the disease. *British Journal of Cancer*, 87, 1234 – 1245.

Collins J.J. and Schlenger W.E. (1988) Acute and chronic effects of alcohol use on violence. *Journal of Studies on Alcohol* 49, 516-521.

Collins, J. J. and Messerschmidt, P. M. (1993) Epidemiology of alcohol-related violence. *Alcohol Health and Research World*, 17, 93–100.

Collins, J. J. (1993) Drinking and violence: an individual offender focus. In: Martin, S. E., ed. *Alcohol and Interpersonal Violence: Fostering Multidisciplinary Perspectives*, pp. 221–235. Research Monograph no. 24. Rockville, MD: NIAAA.

- Cook PJ, Tauchen G (1982) The effect of liquor taxes on heavy drinking. *Addiction*, 13:379–390.
- Cook, C.H., and Gurling, H.D. (2001). Genetic predisposition to alcohol dependence and problems. In N Heather, TJ Peters, T Stockwell (Eds.), *International Handbook of Alcohol Problems and Dependence*. West Sussex, U.K: John Wiley and Sons, Ltd.
- Cook, R.T. (1998). Alcohol abuse, alcoholism and damage to the immune system – a review. *Alcoholism: Clinical and Experimental Research* 22 1927-1942.
- Corrao G, Luca R, Bagnardi V, Zambon A, Poikolainen K (2000) Alcohol and coronary heart disease: a meta-analysis. *Addiction*, 95(10), 1505–1523.
- Corrao, G., Bagnardi, V., Zambon, A. and Arico, S. (1999) Exploring the dose- response relationship between alcohol consumption and the risk of several alcohol-related conditions: a meta-analysis *Addiction* 94, 1551-1573.
- Corrao, G., Bagnardi, V., Zambon, A. and La Vecchia C. (2004) A meta-analysis of alcohol consumption and the risk of 15 diseases. *Preventive Medicine* 38 613-619.
- Coulthard, M., Farrell, M., Singleton, N. and Meltzer, H. (2002). Tobacco, alcohol and drug use and mental health London: Office for National Statistics.
- Cuijpers, P., Riper, H. and Lemmens, L. (2004). The effects on mortality of brief interventions for problem drinking: a meta-analysis. *Addiction* 99 839-845.
- Curtis A.B., Sherman J.A., Strogatz D.S., Raghunathan T.E., Siobàn H. (1997) Alcohol consumption and changes in blood pressure among African Americans—The Pitt county study. *American Journal of Epidemiology*, 146(9):727–733.
- Dackis CA, Gold MS, Pottash ALC, Sweeney DR (1986) Evaluating depression in alcoholics. *Psychiatry Research*, 17(2):105–109.
- Darkes, J. and Goldman, M.S. (1993) Expectancy challenge and drinking reduction: experimental evidence for a mediational process. *Journal of Consulting and Clinical Psychology*, 61,344-353.
- Darves-Bornoz, J., Lepine, J., Choquet, M., Berger, C., Degiovanni, A., and Gaillard, P. (1998). Predictive factors of chronic stress disorder in rape victims. *European Psychiatry*, 13(6): 281–287.
- Davidson KM (1995) Diagnosis of depression in alcohol dependence: changes in prevalence with drinking status. *British Journal of Psychiatry*, 166:199–204.
- Dawson, D.A. and Archer, L.D. (1993) Relative frequency of heavy drinking and the risk of alcohol dependence. *Addiction* 88, 1509-1518.
- De Bellis M.D., Clark DB, Beers S.R. *et al.* (2000): Hippocampal volume in adolescent-onset alcohol use disorders. *Am J Psychiatry* 157 (5) : 737-744.
- De Graaf, R., Bijl, R.B., Smit, F., Vollebergh, W.A.M. and Spijker, J. (2002) Risk factors for 12-month co morbidity of mood, anxiety and substance use disorders: findings from the Netherlands mental health survey and incidence study. *Am J Psychiatry* 159 620-629.
- Dees, W.L., Srivatsava, V.K., and Hiney, J.K. (2001) Alcohol and female puberty. *Alcohol Research and Health* 25 271-275.
- Delgado-Rodríguez, M., Gómez-Ortega, A., Mariscal-Ortiz, M., Palma-Pérez, S. and Sillero-Arenas, M. (2003). Alcohol drinking as a predictor of intensive care and hospital mortality in general surgery: a prospective study *Addiction*, 98 , 611–616.
- Dick, D.M. and Foroud, T. (2002). Genetic strategies to detect genes involved in alcoholism and alcohol-related traits. *Alcohol Research and Health* 26 172-180.
- Drake, R.E. and Muser, K.T. (2002). Co-occurring alcohol use disorder and schizophrenia. *Alcohol research and Health* 26 99-102.

- Drobes, D. (2002) Concurrent alcohol and tobacco dependence. *Alcohol Research and Health* 26 136-142.
- Duffy, J. C. (1992) The measurement of alcohol consumption. In Ed. J. C. Duffy *Alcohol and illness*, 19-25. Edinburgh University Press.
- Durkheim, E., translated by Spaulding, J.A. and Simpson, G. (1952). *Suicide: A study in sociology*. London, Routledge and Kegan Paul Ltd.
- Eckardt MJ, File SE, Gessa GL, Grant KA, Guerri C, Hoffman PL, Kalant H, Koop GF, Li TK, Tabakoff B (1998) Effects of moderate alcohol consumption on the central nervous system. *Alcoholism, Clinical and Experimental Research*, 22, 248-259.
- Edenberg, H.J. (2000). Regulation of the mammalian alcohol dehydrogenase genes. *Progress in Nucleic Acid Research and Molecular Biology* 64:295–341.
- Emanuele, M.A. and Emanuele, N.V. (2001) Alcohol and the male reproductive system. *Alcohol Research and Health* 25 282-287.
- Emanuele, M.A., Wezeman, F. and Emanuele, N.V. (2002) Alcohol's effect on female reproductive function. *Alcohol Research and Health* 26 274-281.
- Emberson, J.R., Shaper, A.G., Wannamethee, S.G., Morris, R.W. and Whincup, P.H. (2005). Alcohol intake in middle age and risk of cardiovascular disease and mortality: accounting for variation for intake variation over time. *American Journal of Epidemiology* 161 856-863.
- English DR, Holman CD, Milne E, Winter MJ, Hulse GK, Codde G, Bower CI, Cortu B, de Klerk N, Lewin GF, Knuiman M, Kurinczuk JJ, Ryan GA (1995) *The quantification of drug caused morbidity and mortality in Australia*. Canberra: Commonwealth Department of Human Services and Health.
- Estruch, R. (2001). Nutrition and infectious disease. In N Heather, TJ Peters, T Stockwell (Eds.), *International Handbook of Alcohol Problems and Dependence*. West Sussex, U.K: John Wiley and Sons, Ltd.
- European Chemicals Bureau (1999)
http://ecb.jrc.it/classlab/SummaryRecord/5598r2_sr_CMR1098.doc.
- European Commission (2005) *ANNEX VI General Classification And Labelling Requirements For Dangerous Substances And Preparations*
http://ec.europa.eu/comm/environment/dansub/pdfs/annex6_en.pdf.
- Facchini F, Chen YD, Reaven GM (1994) Light to moderate alcohol intake is associated with enhanced insulin sensitivity. *Diabetes Care* 17:115–119.
- Fagan, J. (1990) Intoxication and aggression. In: Tonry, M. and Wilson, J. Q., eds. *Drugs and Crime*, pp. 241–320. Chicago: University of Chicago Press.
- Farchi, G., Fidanza, F., Mariotti, S. and Menotti, A. (1992) Alcohol and mortality in the Italian rural cohorts of the Seven Countries Study, *International Journal of Epidemiology*, 21, 74-81.
- Farrell, M., Howes, S., Bebbington, P., Brugha, T., Jenkins, R., Lewis, G., Marsden, J., Taylor, C. and Meltzer, H. (2001). Nicotine, alcohol and drug dependence and psychiatric co-morbidity. *British Journal of Psychiatry* 179 432-437.
- Farrell, M., Howes, S., Taylor, C., Lewis, G., Jenkins, R., Bebbington, P., Jarvis, M., Brugha, T., Gill, B. and Meltzer, H. (1998). Substance misuse and psychiatric co-morbidity: an overview of the OPCS national psychiatric morbidity survey. *Addictive Behaviours* 23 909-918.
- Fernandez-Sola, J., Junque, A., Estruch, R., Monfote, R., Torres, A. and Urbano-Marquez, A. (1995). High alcohol intake as a risk and prognostic factor for community acquired pneumonia. *Archives of Internal medicine* 155 1649-1654.

- Fillmore, K.M., Golding, J.M., Graves, K.L. *et al.* (1998a) Alcohol consumption and mortality: I. Characteristics of drinking groups, *Addiction*, 93,183- 203.
- Fillmore, K.M., Golding, J.M., Graves, K.L. *et al.* (1998b) Alcohol consumption and mortality: III. Studies of female populations, *Addiction*, 93, 219- 229.
- Fillmore, K.M., Kerr, W.C., Stockwell, T., Chikritzhs, T. and Bostrom, A. (2006). Moderate alcohol use and reduced mortality risk: Systematic error in prospective studies. *Addiction Research and Theory* 2006, 1–31
- Flanagan DE, Moore VM, Godsland IF, Cockington RA, Robinson JS, Phillips DI (2000) Alcohol consumption and insulin resistance in young adults. *Eur J Clin Invest* 30:297–301.
- Foroud, T.; Edenberg, H.J.; Goate, A.; *et al.* (2000). Alcoholism susceptibility loci: Confirmation studies in a replicate sample and further map-ping. *Alcoholism: Clinical and Experimental Research* 24:933–945.
- Forsander O.A. (1994). Hypothesis: factors involved in the mechanisms regulating food intake affect alcohol consumption. *Alcohol Alcohol* 29: 503–512.
- Freudenheim JL, Ritz J, Smith-Warner SA, *et al.* (2005) Alcohol consumption and risk of lung cancer: a pooled analysis of cohort studies. *Am J Clin Nutr* 2005;82:657– 67.
- Fu H. and Goldman N. (2000) Association between health-related behaviours and the risk of divorce in the USA. *Journal of Biosocial Science* 32, 63-88.
- Fuchs, F.D., Chambless, L.E., Folsom, A.R., Eigenbrodt, M.L., Duncan, B.B., Gilbert, A. and Szklo, M. (2004). Association between Alcoholic Beverage Consumption and Incidence of Coronary Heart Disease in Whites and Blacks. The Atherosclerosis Risk in Communities Study. *Am J Epidemiol* 60:466–474.
- Ganguli, M., Vander Bilt, J., Saxton, J.A., Shen, C. and Dodge, H.H. (2005). Alcohol consumption and cognitive function in late life. *Neurology* 65 1210-1217.
- Gerson, L. and Preston. D. (1979) Alcohol consumption and the incidence of violent crime. *Journal of Studies on Alcohol*, 40, 307–312.
- Giancola, P.R., Helton, E.L., Osborne, A.B., Terry, M.K., Fuss, A.M., and Westerfield, J.A. (2002) The effects of alcohol and provocation on aggressive behavior in men and women. *Journal of Studies on Alcohol*, 63(January), 64-73.
- Gibson S, Becker J (1973) Changes in alcoholics' self-reported depression. *Quarterly Journal of Studies on Alcohol*, 34(3):829–836.
- Gmel, G. and Rehm, J. (2003). Harmful alcohol use. *Alcohol Research and Health* 27 52-62.
- Gmel, G., Gutjahr, E. and Rehm, J. (2003) How stable is the risk curve between alcohol and all-cause mortality and what factors influence the shape? A precision-weighted hierarchical meta-analysis. *European Journal of Epidemiology* 18 631-642.
- Goerdt A., Koplan J.P., Robine J.M., Thuriaux M.C., and van Ginneken J.K. (1996) Non-fatal health outcomes: concepts, instruments and indicators. In: Murray C.J.L. and Lopez A.D., eds. *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries and Risk Factors in 1990 and Projected to 2020*, pp. 201-246. Boston: Harvard School of Public Health.
- Gordon T, Doyle JT. (1986). Alcohol consumption and its relationship to smoking, weight, blood pressure, and blood lipids. The Albany Study. *Arch Intern Med* 146: 262–265.
- Gordon T, Kannel WB. (1983). Drinking and its relation to smoking, blood pressure, blood lipids and uric acid. The Framingham Study. *Arch Intern Med* 143: 1366–1374.

Gorinstein, S. and Trakhtenberg, S. (2003). Alcohol beverages and biochemical changes in blood. *Addiction Biology* 8 445-454.

Gorinstein, S., Caspi, A., Goshev, I., Asku, S., Salnikow, J., Scheler, C., Delgado-Licon, E., Rosen, A., Wesz, M., Libman, I. and Trakhtenberg, S. (2003) Structural changes in plasma circulating fibrinogen after moderate beer consumption as determined by electrophoresis and spectroscopy. *Journal of Agricultural and Food Chemistry*, 51, 822-827.

Graham K, Wells S (2001) Aggression among young adults in the social context of the bar. *Addiction Research*, 9(3):193–219.

Graham K, West P (2001) Alcohol and crime: examining the link. In N Heather, TJ Peters, T Stockwell (Eds.), *International Handbook of Alcohol Problems and Dependence*. West Sussex, U.K: John Wiley and Sons, Ltd.

Graham, K., Leonard, K. E., Room, R., Wild, T. C., Pihl, R. O., Bois, C. *et al.* (1998) Current directions in research on understanding and preventing intoxicated aggression. *Addiction*, 93, 659–676.

Graham, K., West, P. and Wells, S. (2000) Evaluating theories of alcohol-related aggression using observations of young adults in bars. *Addiction*, 95, 847–673.

Grant, B. and Harford, T. (1990) The relationship between ethanol intake and DSM-III alcohol dependence. *Journal of Studies on Alcohol*, 51, 448-456.

Grant, B.F., Stinson, F.S., Dawson, D.A., Chou, P., Dufour, M.C., Compton, W., Pickering, R.P. and Kaplan, K. (2004) Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders. *Archives of General Psychiatry* 61 807-816.

Greenfield, L.A. (1998). "Alcohol and Crime: An Analysis of National Data on the Prevalence of Alcohol Involvement in Crime." Report prepared for the Assistant Attorney General's National Symposium on Alcohol Abuse and Crime. Washington, DC: U.S. Department of Justice.

Greenfield, L.A. and Henneberg, M.A. (2001) Victim and Offender self-reports of alcohol involvement in crime. *Alcohol Research and Health* 25 20-31.

Greenfield, T.K., Rehm, J., and Rodgers, J.D. (2002) Effects of depression and social integration on the relationship between alcohol consumption and all-cause mortality. *Addiction*, 97, 29–38.

Greim H (Ed.) (1998) Ethanol. Toxikologisch-arbeitsmedizinische Begründungen von MAK-Werten, 26. Lieferung, VCH-Verlag, Weinheim.

Grobbée DE, Rimm EB, Keil U, Renaud SC (1999) Alcohol and the cardiovascular system. In: *Health issues related to alcohol consumption*. Macdonald I, ed. Blackwell and ILSI, Oxford.

Grønbaek M, Deis A, Becker U, Hein HO, Schnohr P, Jensen G, Borch-Johnsen K, Sørensen TIA. Alcohol and mortality: is there a U-shaped relation in elderly people? *Age and Ageing* 1998;27:739-44.

Grønbaek M, Johansen D, Becker U, Hein HO, Schnohr P, Jensen G, Vestbo J, Sørensen TIA. Changes in alcohol intake and mortality: A longitudinal population-based study. *Epidemiology* 2004;15(2):222-8.

Grønbaek M., Mortensen, E. L., Mygind, K., Andersen, A. T., Becker, U., Gluud, C., Sørensen, T. I. A., (1999). Beer, wine, spirits and subjective health. *J. Epidemiol. Community Health* 53, 721-724.

Gullar-Castillon P, Rodriguez-Artalejo F, Diez Ganan LD, Banegas Banegas JR, Lafuente Urdinguio PL, Herruzo Cabrera RH (2001) - Consumption of alcoholic beverages and subjective health in Spain. *J Epidemiol Community Health*; 55(9):648-52.

Guidot, D.M. and Hart, C.M. (2005). Alcohol abuse and acute lung injury: epidemiology and pathophysiology of a recently recognised association. *Journal of Investigative Medicine* 53 235-245.

Guidot, D.M. and Roman, J. (2002). Chronic ethanol ingestion increases susceptibility to acute lung injury. *Chest* 122 309S-314S.

Gunzerath, L., Faden, V., Zakhari, S and Warren, K. (2004) National Institute on Alcohol Abuse and Alcoholism report on moderate drinking. *Alcoholism: Clinical and Experimental Research* 28 829-847.

Gutjahr E, Gmel G, Rehm J (2001) Relation between average alcohol consumption and disease: an overview. *European Addiction Research*, 7(3):117–127.

Haines, B. and Graham, K. (2005). Violence prevention in licensed premises. In Stockwell T, Gruenewald P, Toumbourou J, and Loxley W, eds. *Preventing harmful substance use: The evidence base for policy and practice*. Chichester: Wiley.

Hall, W., Saunders, J.B., Babor, T.F., Aasland, O.G., Amundsen, A., Hodgson, R. and Grant, M. (1993) The structure and correlates of alcohol dependence: WHO collaborative project on the early detection of persons with harmful alcohol consumption: III. *Addiction* 88, 1627-1636.

Hamilton, V. and Hamilton, B. (1997) Alcohol and earnings: does drinking yield a wage premium. *Canadian Journal of Economics* 30 135-151.

Hansen AS, Marckmann P, Dragsted LO, Finne Nielsen IL, Nielsen SE, Gronbaek M. (2005) Effect of red wine and red grape extract on blood lipids, haemostatic factors, and other risk factors for cardiovascular disease. *Eur J Clin Nutr.* 59(3):449-55.

Hansen, W. B. (1997) *A Social Ecology Theory of Alcohol and Drug Use Prevention Among College and University Students. Designing Alcohol and Other Drug Prevention Programs in Higher Education: Bringing Theory into Practice*, pp. 155–176. Washington: US Department of Education.

Harrison, L. and Gardiner, E. (1999) Do the rich really die young? Alcohol-related mortality and social class in Great Britain, 1988–94. *Addiction*, 94, 1871–1880.

Hart CL, Smith GD, Hole DJ, Hawthorne VM (1999) Alcohol consumption and mortality from all causes, coronary heart disease, and stroke: results from a prospective cohort study of Scottish men with 21 years of follow up. *British Medical Journal*, 318, 1725–1729.

Hastie T, and Tibshirani R. (1990). *Generalized Additive Models*. London: Chapman and Hall.

Hauge, R. and Irgens-Jensen, O. (1986) Relationship between alcohol consumption, alcohol intoxication and negative consequences of drinking in four Scandinavian countries. *British Journal of Addiction*, 81, 513–524.

Heath , D.B. (2000). *Drinking occasions. Comparative perspectives on alcohol and culture*. Philadelphia: Brunner/Mazel.

Heath, A.C. and Nelson, E.C. (2002) Effects of the interaction between genotype and environment. *Alcohol Research and Health* 26 193-201.

Heath, D.B. (1995) Some generalisations about alcohol and culture. In Heath, D.B., ed. *International Handbook on Alcohol and Culture* (pp. 348-361) Westport CT: Greenwood.

Hemström, Ö. (2001). The contribution of alcohol to socioeconomic differentials in mortality – the case of Sweden. In Ed. Norström T. *Consumption, drinking patterns, consequences and policy responses in 15 European countries*. Stockholm, National Institute of Public Health.

Hilarski C; Wodarki JS (2001) Comorbid substance abuse and mental illness: Diagnosis and treatment. *Journal of Social Work Practice in the Addictions*, 1(1):105–119.

Hill AB (1965) The environment and disease: association or causation? *Proceedings of the Royal Society of Medicine*, 58:295–300.

Hillbom M (1998) Alcohol consumption and stroke: benefits and risks. *Alcoholism, Clinical and Experimental Research*, 22(7):352S–358S.

Hillbom, M. and Kaste, M. (1982) Alcohol intoxication: a risk factor for primary subarachnoid hemorrhage, *Neurology*, 32, 706-711.

Hillers VN, Massey LK. (1985). Interrelationship of moderate high alcohol consumption with diet and health status. *Am J Clin Nutr* 41: 356–362.

Hingson R, Howland J (1987) Alcohol as a risk factor for injury or death resulting from accidental falls: a review of the literature. *Journal of Studies on Alcohol*, 48, 212–219.

Hingson, R. and Winter, M. (2003). Epidemiology and consequences of drinking and driving. *Alcohol Research and Health* 27 63-78.

Hippocrates (1978). Hippocratic writings. Edited with an introduction by G.E.R. Lloyd. Harmondsworth (Penguin).

Hoaken PNS, Assaad JM, Phil RO (1998) Cognitive functioning and the inhibition of alcohol-induced aggression. *Journal of Studies on Alcohol*, 59:599–607.

Holbrook, T.L., Barrett-Connor, E. and Wingard, D.L. (1990). A prospective population based study of alcohol and non-insulin dependent diabetes mellitus. *Am J Epidemiol* 132 902-909.

studHorne, J.A., Reyner, L.A. and Barrett, P.R. (2003). Driving impairment due to sleepiness is exacerbated by low alcohol intake. *Occup. Environ. Med.* 60 689-692.

Hu, F.B., Manson, J.E., Stampfer, M.J. *et al.* (2001). Diet, lifestyle and the risk of type 2 diabetes mellitus in women. *New Engl J Med* 345 790-797.

Hull, J. G. (1981) A self-awareness model of the causes and effects of alcohol consumption. *Journal of Abnormal Psychology*, 90, 586–600.

Hull, J.G. and Bond, C.F. (1986) Social and behavioural consequences of alcohol consumption and expectancy: a meta-analysis. *Psychological Bulletin*, 99, 347-360.

Hull, J.G. and Stone, L.B. (2004). Alcohol and self-regulation. In Eds R.F. Baumeister and K.D. Vohs. *Handbook of self-regulation*, pp 466-491. London: the Guilford Press.

Hull, J.G., Levenson, R.W., Young R.D. and Sher, K.J. (1983) Self-awareness-reducing effects of alcohol consumption. *Journal of Personality and Social Psychology*, 44,461-473.

Hulse G, Saunders GK, Roydhouse RM, Stockwell TR, Basso MR (1999) Screening for hazardous alcohol use and dependence in psychiatric inpatients using the AUDIT questionnaire. *Drug and Alcohol Review*, 19, 291–298.

Imhof, A and Koenig, W. (2003) Alcohol inflammation and coronary heart disease. *Addiction Biology* 8 271-277.

Ito, T. A., Miller, N. and Pollock, V. E. (1996) Alcohol and aggression: a meta-analysis on the moderating effects of inhibitory cues triggering events, and self-focused attention. *Psychological Bulletin*, 120, 60–82.

Jacobi, I., Wittchen, H.-U., Holting, C., Hofler, M., Pfister, H., Muller, N. and Lieb, R. (2004). Prevalence, co-morbidity and correlates of mental disorders in the general population: results from the German Health Interview and Examination Survey (GHS). *Psychological Medicine* 34 597-611.

Jacobson JL, Jacobson SW (1994) Prenatal alcohol exposure and neurobehavioral development: where is the threshold? *Alcohol Health Res World* 18:30–36.

Jacobson JL, Jacobson SW, Sokol RJ, Ager JW Jr (1998) Relation of maternal age and pattern of pregnancy drinking to functionally significant cognitive deficit in infancy. *Alcohol Clin Exp Res* 22:345–351.

Jacobson, J.L. and Jacobson, S.W. (2002) Effects of prenatal alcohol exposure on child development. *Alcohol Research and Health* 26 282-286.

Jeavons CM, Taylor SP (1985) The control of alcohol-related aggression: redirecting the inebriate's attention to socially appropriate conduct. *Aggressive Behavior*, 11:93-101.

Jefferis, B.J.M.H., Powwer, C. and Manor, O. (2005) Adolescent drinking level and adult binge drinking in a national birth cohort. *Addiction* 100 543-549.

Johansen D, Gronbaek M, Overvad K, Schnohr P, Andersen PK (2005) Generalized additive models applied to analysis of the relation between amount and type of alcohol and all-cause mortality. *Eur J Epidemiol.* 20(1):29-36.

John, U., Meyer, C., Rumpf, H-J. and Hapke, U. (2004). Smoking, nicotine dependence and psychiatric comorbidity – a population-based study including smoking cessation after three years. *Drug and Alcohol dependence* 76 287-295.

Kagan, A., Harris, B.R., Winkelstein, W. etc al (1974). Epidemiological studies of coronary heart disease and stroke in Japanese men living in Japan, Hawaii and California: demographic, physical, dietary and biochemical characteristics. *Journal of Chronic Disorders* 27 345-364.

Kaufman Kantor, G., And Asdigian, N. (1997) When women are under the influence: Does drinking or drug use by women provoke beatings by men? In: Galanter, M., ed. *Alcohol and Violence: Epidemiology, Neurobiology, Psychology, Family Issues. Recent Developments in Alcoholism*, Vol. 13. New York: Plenum Press, pp. 315-336.

Kaufman Kantor, G., And Straus, M.A. (1987) The “drunken bum” theory of wife beating. *Social Problems* 34(3):214-230.

Keil, U., Chambless, L. E., Doring, A., Filipiak, B. and Stieber, J. (1997) The relation of alcohol intake of coronary heart disease and all-cause mortality in a beer-drinking population, *Epidemiology*, 8, 150- 156.

Kelly AB, Halford K, Young RMcd (2000) Maritally distressed women with alcohol problems: the impact of a short-term alcohol-focused intervention on drinking behaviour and marital satisfaction. *Addiction*, 95, 1537-1549.

Kessler R, Crum R, Warner L, Nelson C, Schulenberg J, Anthony J (1997) Lifetime co-occurrence of DSM-III-R alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. *Archives of General Psychiatry* 54, 313-321.

Kessler R, Nelson C, McGonagle K, Edlund M, Frank R, Leaf P (1996) The epidemiology of co-occurring addictive and mental disorders: Implications for prevention and service utilization. *American Journal of Orthopsychiatry*, 66, 17-31.

Kitamura A, Iso H, Sankai T, et al. (1998) Alcohol intake and premature coronary heart disease in urban Japanese men. *American Journal of Epidemiology*, 147(1):59-65.

Klatsky AL (1996) Alcohol, coronary heart disease, and hypertension. *Annual Review of Medicine*, 47:149-160.

Klatsky AL, Friedman GD, Siegelau AB, Gerard MJ. (1977). Alcohol consumption and blood pressure: Kaiser-Permanente multiphasic health examination data. *N Engl J Med* 296: 1194-1200.

Klatsky, A. L. (1999) Moderate drinking and reduced risk of heart disease, *Alcohol Research and Health*, 23, 15-22.

Klatsky, A.L. (2001). Cardiovascular system. In Heather, N., Peters, T.J. and Stockwell, T., eds. *International handbook of alcohol dependence and problems*. Chichester: John Wiley and Sons, Ltd.

Knuiman MW, Vu HT (1996) Risk factors for stroke mortality in men and women: the Busselton

Study. *Journal of Cardiovascular Risk*, 3(5):447–452.

Kodituwakko, P.W., Kalber, W. and May, P.A. (2001) The effects of prenatal alcohol exposure on executive functioning. *Alcohol Research and Health* 25 192-198.

Kogawa M, Wada S. (2005) Osteoporosis and alcohol intake *Clin Calcium.*, 15(1):102-5.

Komro, K. A., Williams, C. L., Forster, J. L., Perry, C. L., Farbakhsh, K. and Stigler, M. H. (1999) The relationship between adolescent alcohol use and delinquent behaviors. *Journal of Child and Adolescent Substance Abuse*, 9, 13–28.

Kratzer W, Kachele R, Mason A, Muche R, Hay B, Wiesneth W, Hill V, Beckh K, Adler G (1997) Gallstone prevalence in relation to smoking, alcohol, coffee consumption and nutrition: the Ulm Gallstone Study. *Scandinavian Journal of Gastroenterology*, 32, 953–958.

Kringlen, E., Tirgersen, S. and Cramer, V. (2001) A Norwegian psychiatric epidemiological study *Am J Psychiatry* 158 1091-1098.

Kristenson, H., Ohlin, M.B., Hultin-Nosslin, E., Trelle, E. and Hood, B. (1983). Identification and intervention of heavy drinking in middle-aged men. Results and follow-up of 24-60 months of long-term study with randomised controls. *Alcoholism: clinical and experimental research* 7 203-209.

Lang A, Martin S (1993) Alcohol-related violence: An individual offender focus. In: *Alcohol and interpersonal violence: Fostering multidisciplinary perspectives*, pp. 221–236. Washington, DC: United States Department of Health and Human Services.

Last, J. (2001). A dictionary of epidemiology. (Fourth edition ed.) Oxford: Oxford University Press.

Leclerc, A., Lert, F. and Fabien, C. (1990) Differential mortality: some comparisons between England and Wales, Finland and France, based on inequality measures, *International Journal of Epidemiology*, 19, 1001-1010.

Ledermann S. (1964) *Alcool, Alcolism, Alcolisation*. Vol. 2. Presses Universitaires de France, Paris.

Leino, E.V., Romelsjo, A., Shoemaker, C. *et al.* (1998) Alcohol consumption and mortality: II. Studies of male populations, *Addiction*, 93,205- 218.

Leitzmann MF, Giovannucci EL, Rimm EB, Stampfer MJ, Spiegelman D, Wing AL, Willett WC (1998) The relation of physical activity to risk for symptomatic gallstone disease in men. *Annals of Internal Medicine*, 128, 417–425.

Lemmens, P.H. (2001) Relationship of alcohol consumption and alcohol problems at the population level. In Heather, N., Peters, T.J. and Stockwell, T., eds. *International handbook of alcohol dependence and problems*. Chichester: John Wiley and Sons, Ltd.

Leonard K.E. and Rothbard J.C. (1999) Alcohol and the marriage effect. *Journal of Studies on Alcohol* (Suppl. 13), 139-146S.

Leonard, K. E., Quigley, B. M. and Collins, R. L. (2002) Physical aggression in the lives of young adults: prevalence, location, and severity among college and community samples. *Journal of Interpersonal Violence*, 17, 533–550.

Leonard, K.E. (2005). Alcohol and intimate partner violence: when can we say that heavy drinking is a contributory cause of violence? *Addiction* 100 422-425.

Lesage AD, Boyer R, Grunberg F, Vanier C, Morissette R, Ménard-Buteau C, Loyer (1994) Suicide and mental disorders: a case-control study of young men. *American Journal of Psychiatry*, 151, 1063–1068.

Levine JA, Harris MM, Morgan MY. (2000). Energy expenditure in chronic alcohol abuse. *Eur J Clin Invest* 30: 779–786.

- Li G, Smith GS, Baker SP (1994) Drinking behaviour in relation to cause of death among U.S. adults. *American Journal of Public Health*, 84:1402–1406.
- Lieber CS. (1988). The influence of alcohol on nutritional status. *Nutr Rev* 46: 241–254.
- Lipsey, M.W.; Wilson, D.B.; Cohen, M.A.; And Derzon, J.H. (1997) Is there a causal relationship between alcohol use and violence? A synthesis of evidence. In: Galanter, M., ed. *Alcohol and Violence: Epidemiology, Neurobiology, Psychology, Family Issues. Recent Developments in Alcoholism*, Vol. 13. New York: Plenum Press, pp. 245–282.
- Liu S, Serdula MK, Williamson DF, Mokad AH, Byers T. (1994). A prospective study of alcohol intake and change in body weight among US Adults. *Am J Epidemiol* 140: 912–920.
- Lloyd-Jones, D.M., Martin, D.O., Larson, M.G. and Levy, D. (1998). Accuracy of death certificates for coding coronary heart disease as the cause of death. *Ann Intern Med.* 129 1020-6.
- Loxely, W., Toumbourou, J.W., Stockwell, T., Haines, B., Scott, K., Godfrey, C., Waters, E., Patton, G., Fordham, R., Gray, D., Marshall, J., Ryder, D., Siggers, S., Sanci, L and Williams, J. (2004) The prevention of substance use, risk and harm in Australia. Canberra: National Drug Research Institute and Centre for Adolescent Health.
- Lumeng, L. and Crabb, D.W. (1994). Genetic aspect and risk factors in alcoholism and alcoholic liver disease. *Gastroenterology* 107 572.
- Lundberg, O. and Osterberg, E. (1990) Klass och alkohol. Bidrar klasskillnader i alkoholrelaterad dödlighet till dödlighetsskillnaderna i Sverige? *Alkoholpolitik, Tidskrift för nordisk alkoholforskning*, 7, 196-204.
- Macdonald, S., Cherpitel, C. J., Borges, G., DeSouza, A., Giesbrecht, N. and Stockwell, T. (2005). The Criteria for Causation of Alcohol in Violent Injuries Based on Emergency Room Data From Six Countries. *Addictive Behaviors*, 30: 103-113.
- Makela , P., Valkonen, T. and Martelin, T. (1997) Contribution of deaths related to alcohol use to socio-economic variation in mortality: register based follow up study, *British Medical Journal*, 315.
- Mäkelä, K., Mustonen, H., (1988). Positive and negative consequences related to drinking as a function of annual alcohol intake. *Brit. J. Addict.* 83, 403-408.
- Mäkelä, K., Simpura, J., (1985). Experiences related to drinking as a function of annual alcohol intake and by sex and age. *Drug Alcohol Depend.* 15, 389-404.
- Mäkelä, P. (1999) Alcohol-related mortality as a function of socio-economic status. *Addiction*, 94, 867–886.
- Mäkelä, Pia., Fonager, K., Hibell, B., Nordlund, S., Sabroe, S., and Simpura, J. (1999). *Drinking habits in the Nordic countries*. Oslo: National Institute for Alcohol and Drug Research.
- Makkai T (1997) Alcohol and disorder in the Australian community: Part I—Victims. *Trends and Issues in Crime and Criminal Justice* No 76. Canberra: Australian Institute of Criminology.
- Mangione, T.W.; Howland, J.; Amick, B.; et al. (1999). Employee drinking practices and work performance. *Journal of Studies on Alcohol* 60:261–270.
- Mann, R.E., Smart, R.G. and Govoni, R. (2003) The epidemiology of alcoholic liver disease. *Alcohol Research and Health* 27 209-219.
- Markos, A.R. (2005). Alcohol and sexual behaviour. *International Journal of STD and AIDS* 16 123-127.
- Markou A, Kosten TR, Koob GF (1998) Neurobiological similarities in depression and drug dependence: a self-medication hypothesis. *Neuropsychopharmacology*, 18(3):135–174.

Marmot, M.G.; North, F.; Feeney, A.; And Head, J. (1993) Alcohol consumption and sickness absence: From the Whitehall II study. *Addiction* 88:369–382.

Martin, S. E. and Bachman, R. (1997) The relationship of alcohol to injury in assault cases. In: Galanter, M., ed. *Recent Developments in Alcoholism*, vol. 13, pp. 42–56. New York: Plenum Press.

Martin, S. E. (1992) The epidemiology of alcohol-related interpersonal violence. *Alcohol Health and Research World*, 16, 230–237.

Mattson, S.N., Schoenfeld, A.M. and Riley, E.P. (2001) Teratogenic effects of alcohol on brain and behaviour. *Alcohol Research and Health* 25 175-191.

Mazzaglia, G., Britton, A.R., Altmann, D.R., and Chenet, L. (2001) Exploring the relationship between alcohol consumption and non-fatal or fatal stroke: systematic review. *Addiction* 96, 1743-1756.

Mckenzie, C. and Eisenberg, P. R. (1996) Alcohol, coagulation, and arterial thrombosis, in: Zakhari, S. and Wassef, M., eds. *Alcohol and the Cardiovascular System*, chapter 22, pp. 413-439 (Bethesda, MD, National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism).

McLeod R., Stockwell T, Stevens M, Phillips M (1999) The relationship between alcohol consumption patterns and injury. *Addiction*, 94, 1719–1734.

Mennella, J. (2001) Alcohol's effect on lactation. *Alcohol Research and Health* 25 230-234.

Merikangas KR, Mehta RL, Molnar BE, *et al.* (1998) Comorbidity of substance use disorders with mood and anxiety disorders: results of the International Consortium in Psychiatric Epidemiology. *Addictive Behaviors: An International Journal*, 23(6):893–907.

Meyer R, Suter PM, Vetter W. (1999). Alcohol—a risk factor for overweight? *Schweiz Rundsch Med Prax* 88: 1555–1561.

Meyerhoff, D.J. (2001). Effects of alcohol and HIV infection on the central nervous system. *Alcohol Research and Health* 25 288-298.

Midanik, L. T. (1999) Drunkenness, feeling the effects and 5 plus measures. *Addiction*, 94, 887–897.

Midanik, L. T., Tam, T. W., Greenfield, T. K. and Caetano, R. (1996) Risk functions for alcohol-related problems in a 1988 US sample, *Addiction*, 91, 1427-1437.

Midanik, L., Tam, T., Greenfield, T. K. and Caetano, R. (1996) On taking risks. *Addiction*, 91, 1453-1456.

Miller BA, Downs WR (1993) The impact of family violence on the use of alcohol by women. *Alcohol Health and Research World*, 17, 137–143.

Miller BA, Downs WR, Gondoli DM (1989) Spousal violence among alcoholic women as compared with a random household sample of women. *Journal of Studies on Alcohol*, 50, 533–540.

Miller, B.A.; Maguin, E.; And Downs, W.R. (1997) Alcohol, drugs, and violence in children's lives. In: Galanter, M., ed. *Recent Developments in Alcoholism: Volume 13. Alcoholism and Violence*. New York: Plenum Press, pp. 357–385.

Mirrlees-Black, C. (1999). *Domestic violence: findings from a new British Crime Survey self-completion questionnaire*. Home Office Research Study No. 191. London: Home Office.

Monterrosa A.E., Haffner, S.M., Stern, M.P., Hazuda, H.P. (1995). Sex difference in lifestyle factors predictive of diabetes in Mexican Americans. *Diabetes Care* 18 448-456.

Monforte, R., Estruch, R., Valls-Solé, J., Nicolás, J., Villalta, J. and Urbano-Marquez, A. (1995) Autonomic and peripheral neuropathies in patients with chronic alcoholism. A dose-related toxic effect of alcohol. *Archives of Neurology* 52, 45–51.

Morton, L.M., Zheng, T., Holford, T.R., Holly, E.A., Chiu, B.C.H., Costantini, A.S., Stagnaro, E., Willett, E.V., Maso, L.D., Serraino, D., Chang, E.T., Cozen, W., Davis, S., Severson, R.K., Bernstein, L., Mayne, S.T., Dee, F.R., Cerhan, J.R., Hartge, P. (2005). Alcohol consumption and risk of non-Hodgkin lymphoma: a pooled analysis. *Lancet Oncol* 6: 469–76.

Moskowitz, H. and Fiorentino, D. (2000). A review of the literature on the effects of low doses of alcohol on driving related skills. Springfield, VA: US Department of Transportation, National Highway Traffic Safety Administration.

Moyer, A., Finney, J.W., Swearingen, C.E. and Vergun, P. (2002) Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. *Addiction*, 97: 279–292.

Mueser KT, Kavanagh D (2001) Treating comorbidity of alcohol problems and psychiatric disorder. In N Heather, TJ Peters, T Stockwell (Eds), *International Handbook of Alcohol Dependence and Problems*, John Wiley and Sons.

Mukamal KJ, Chung H, Jenny NS, Kuller LH, Longstreth WT Jr, Mittleman MA, Burke GL, Cushman M, Beauchamp NJ Jr, Siscovick DS (2005) Alcohol use and risk of ischemic stroke among older adults: the cardiovascular health study. *Stroke*, 36(9):1830-4.

Mukamal KJ, Jensen MK, Gronbaek M, Stampfer MJ, Manson JE, Pischon T, Rimm EB. (2005) Drinking frequency, mediating biomarkers, and risk of myocardial infarction in women and men. *Circulation*. 112(10):1406-13.

Mukamal KJ, Tolstrup JS, Friberg J, Jensen G, Gronbaek M. (2005) Alcohol consumption and risk of atrial fibrillation in men and women: the Copenhagen City Heart Study. *Circulation*.;112(12):1736-42.

Mukamal, K.J., Conigrave, K.M., Mittleman, M.A., Camargo, C.A., Stampfer, M.J., Willett, W.C. and Rimm, E.B. (2003) Roles of drinking pattern and type of alcohol consumed in coronary heart disease in men. *New England Journal of Medicine*, 348, 109-118.

Mullahy, J. and Sindelar, J.L. (1996) Employment, unemployment and problem drinking. *Journal of Health Economics* 1996 15 409-434.

Murdoch, D., Pihl, R. O. and Ross, D. (1990) Alcohol and crimes of violence: present issues. *International Journal of the Addictions*, 25, 1065–1081.

Murray RP, Connett JE, Tyas SL, *et al.* (2002) Alcohol volume, drinking pattern, and cardiovascular disease morbidity and mortality: is there a U-shaped function? *American Journal of Epidemiology*, 155(3):242–248.

Murray, C. J. L. and Lopez, A. (1996) Quantifying the burden of disease and injury attributable to ten major risk factors, in: Murray, C. and Lopez, A., eds. *The Global Burden of Disease: a comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020*, pp. 295-324 (Boston, Harvard School of Public Health on behalf of the World Health Organization and the World Bank).

Mustonen, H. and Mäkelä, K. (1999) Relationships between characteristics of drinking occasions and negative and positive experiences related to drinking Drug Alcohol Depend 56 79-84.

Muthen, B., Grant, B. and Hasin, D. (1992) *Subgroup Differences in Factor Structure for DSM-III-R and Proposed DSM-IV Criteria for Alcohol Abuse and Dependence in the 1988 National Health Survey*. Los Angeles, CA: UCLA Graduate School of Education.

Naimi, T.S., Brown, D.W., Brewer, R.D., Giles, W.H., Menash, G., Serdula, M.K., Mokdad, A.H., Hungerford, D.W., Lando, J., Naimi, S. and Stroup, D.F. (2005). Cardiovascular risk factors and confounders among nondrinking and moderate-drinking US adults. 28 369-373.

Naveau, S., Giraud, V., Borotto, E., Aubert, A., Capron, F., and Chaput, J. (1997). Excess weight risk factor for alcoholic liver disease. *Hepatology* 25, 108-11.

Nelson, S. and Kolls, J.K. (2002). Alcohol, host defence and society. *Nature Reviews Immunology* 2 205-209.

Nielsen NR, Thygesen LC, Johansen D, Jensen G, Gronbaek M (2005) The influence of duration of follow-up on the association between alcohol and cause-specific mortality in a prospective cohort study. *Ann Epidemiol.* 15(1):44-55.

Norström, T. Ed. (2001). *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries*. Stockholm: National Institute of Public Health, European Commission.

Nyström, M., (1992). Positive and negative consequences of alcohol drinking among young university students in Finland. *Brit. J. Addict.* 87, 715-722.

O'Farrell, T. J. and Choquette, K. (1991) Marital violence in the year before and after spouse-involved alcoholism treatment. *Family Dynamics of Addiction Quarterly*, 1, 32–40.

O'Farrell, T. J., Fals-Stewart, W., Murphy, M. and Murphy, C. M. (2003) Partner violence before and after individually based alcoholism treatment for male alcoholic patients. *Journal of Consulting and Clinical Psychology*, 71, 92–102.

O'Farrell, T. J., Murphy, C. M., Neavins, T. M. and Van Hutton, V. (2000) Verbal aggression among male alcoholic patients and their wives in the year before and two years after alcoholism treatment. *Journal of Family Violence*, 15, 295–310.

O'Farrell, T. J., Van Hutton, V. and Murphy, C. M. (1999) Domestic violence before and after alcoholism treatment: a two year longitudinal study. *Journal of Studies on Alcohol*, 60, 317– 321.

Obe G, Anderson D (1987) Genetic effects of ethanol. *Mut Res* 186: 177–200.

Olenick NL, Chalmers DK (1991) Gender-specific drinking styles in alcoholics and nonalcoholics. *Journal of Studies on Alcohol*, 52, 324–330.

Oscar-Berman, M. and Marinkovic, K. (2003) Alcoholism and the brain: an overview. *Alcohol Research and Health* 27 125-133.

Paljärvi, T., Mäkelä, P. and Poikolainen, K. (2005). Pattern of drinking and fatal injury: a population-based follow-up study of Finnish men. *Addiction* 100 1851-1859.

Parker, R. (1993) Alcohol and theories of homicide. In: Adler, F. and Laufer, W., eds. *Advances in Criminological Theories*, vol. 4, pp. 113–142. New Brunswick, NJ: Transaction Publishers.

Parker, R. N. and Auerhahn, K. (1998) Alcohol, drugs and violence. *Annual Review of Sociology*, 24, 291–311.

Parsons OA, Nixon SJ (1998) Cognitive functioning in sober social drinkers: a review of the research since 1986. *Journal of Studies on Alcohol*, 59, 180–190.

Peele, S. and Brodsky, A. (2000). Exploring psychological benefits associated with moderate alcohol use. *Drug and Alcohol Dependence* 60 221-247.

Peele, S. and Grant, M. (Eds) (1999) *Alcohol and Pleasure: A Health Perspective*. Washington DC: International Center for Alcohol Policies.

Penick EC, Powell BJ, Liskow BI, Jackson JO, Nickel EJ (1988) The stability of coexisting psychiatric syndromes in alcoholic men after one year. *Journal of Studies on Alcohol*, 49:395–405.

Pernanen, K. (1991) *Alcohol in Human Violence*. New York: Guilford Press.

- Pernanen, K., Cousineau, M. M., Brochu, S. and Sun, F. (2002) *Proportions of Crimes Associated with Alcohol and Other Drugs in Canada*. Ottawa: Canadian Centre on Substance Use.
- Perry IJ, Wannamethee SG, Walker MK, Thomson AG, Whincup PH, Shaper AG (1995) Prospective study of risk factors for development of non-insulin dependent diabetes in middle aged British men. *British Medical Journal*, 310(6979):560–4.
- Peterson, J.B., Rothfleisch, J., Zelazo, P. and Pihl, R.O. (1990) Acute alcohol intoxication and neuropsychological functioning. *Journal of Studies on Alcohol* 51, 114-122.
- Petrakis, I.L., Gonzalez, G., Rosenheck, R. and Krystal, J.H. (2002) Comorbidity of alcoholism and psychiatric disorders. *Alcohol Research and Health* 26 81-89.
- Pettinati H, Sugerman A, Maurer HS (1982) Four-year MMPI changes in abstinent and drinking alcoholics. *Alcoholism, Clinical and Experimental Research*, 6:487–494.
- Phillips B.J. and Jenkinson, P. (2001) Is ethanol genotoxic? A review of the published data. *Mutagenesis* 16 91-101.
- Piano, M.R. (2002). Alcoholic cardiomyopathy. *Chest* 121 1638-1650.
- Pihl, R. O., Peterson, J. B. and Lau, M. A. (1993) A biosocial model of the alcohol–aggression relationship. *Journal of Studies on Alcohol*, 11, 128–139.
- Pirkola, S.P., Isometsa, E., Suvisaari, J., Aro, H., Joukamaa, M., Poikolainen, K., Koskinen, S., Aromaa, A. and Lonnqvist, J.K. (2005). DSM-IV mood-, anxiety- and alcohol use disorders and their co-morbidity in the Finnish general population. *Soc Psychiatry psychitar epidemiol* 40 1-10.
- Pletcher MJ, Tice JA, Pignone M, *et al.* (2004) Using the coronary artery calcium score to predict coronary heart disease events: a systematic review and meta-analysis. *Arch Intern Med* 164:1285–92.
- Pletcher, M.J., Varosy, P., Kiefe, C.I., Lewis, C.E., Sidney, S. and Hulley, S.B. (2005). Alcohol consumption, binge drinking and early coronary calcification: findings from the coronary artery risk development in young adults (CARDIA) study. *American Journal of Epidemiology* 161 423-433.
- Pliner, P. and Cappell, H. (1974) Modification of affective consequences of alcohol: a comparison of solitary and social drinking. *Journal of Abnormal Psychology*, 83, 418-425.
- Poikolainen, K., Vahtera, J., Virtanen, M., Linna, A., and Kivimäki, M. (2005). Alcohol and coronary heart disease risk—is there an unknown confounder? *Addiction*. 100 1150-1157.
- Poikolainen, K., Vartiainen, E., (1999). Wine and good subjective health. *Am. J. Epidemiol.* 150, 47-50.
- Poschl, G. and Seitz, H.K. (2004). Alcohol and cancer. *Alcohol Alcohol* 39 155-65.
- Preedy, V.R., Mantle, D. and Peters, T.J. (2001). Alcoholic muscle, skin and bone disease. In N Heather, TJ Peters, T Stockwell (Eds.), *International Handbook of Alcohol Problems and Dependence*. West Sussex, U.K: John Wiley and Sons, Ltd.
- Prescott E, Grønbaek M, Becker U, Sørensen TIA. Alcohol intake and the risk of lung cancer: Influence of type of alcoholic beverage. *Am J Epidemiol* 1999;149:463-70.
- Puddey IB, Rakic V, Dimmitt SB, Beilin LJ (1999) Influence of drinking on cardiovascular disease and cardiovascular risk factors: a review. *Addiction*, 94:649–663.
- Puffer R. and Griffith G.W. (1967) *Patterns of Urban Mortality*, Scientific Publication No. 151. Washington DC: Pan American Health Organization.
- Quigley B.M. and Leonard K.E. (1999) Husband alcohol expectancies, drinking, and marital conflict styles as predictors of severe marital violence among newlywed couples. *Psychology of Addictive Behaviors* 13, 49-59.

Ramstedt, M. (2001) Per capita alcohol consumption and liver cirrhosis mortality in 14 European countries, *Addiction*, 96, Supplement 1, S19-S34.

Ramstedt, M. (2002) Alcohol-related mortality in 15 European countries in the postwar period. *European Journal of Population*. 2002;18:307-23.

Ramstedt, M. (2003). Alcohol consumption and liver cirrhosis mortality with and without mention of alcohol - the case of Canada. *Addiction* 98 1267-1276.

Raynard, B., Balian, A., Fallik, D., Capron, F., Bedossa, P. Chaput, J-C., and Naveau, S. (2002). Risk factors of fibrosis in alcohol-induced liver disease. *Hepatology* 35, 635-638.

Reeder, V. C., Aikens, M. L., Li, X.-N. and Booyse, F. M. (1996) Alcohol and the fibrinolytic system, in: Zakhari, S. and Wassef, M., eds. *Alcohol and the Cardiovascular System*, chapter 21, pp. 391-411 Bethesda, MD, National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism.

Regier, D.A.; Farmer, M.E.; Rae, D.S. *et al.* (1990). Comorbidity of mental disorders with alcohol and other drug abuse: Results from the Epidemiologic Catchment Area (ECA) study. *JAMA: Journal of the American Medical Association* 264:2511–2518.

Rehm J, Room R, Graham K Monteiro M, Gmel G, and Sempos CT, (2003) The relationship of average volume of alcohol consumption and patterns of drinking to burden of disease: an overview. *Addiction* 98 1209-1228.

Rehm J, Room R, Monteiro M, Gmel G, Graham K, Rehn T, Sempos CT, Frick U, Jernigan D. Alcohol. (2004) In: WHO (ed), *Comparative quantification of health risks: Global and regional burden of disease due to selected major risk factors*. Geneva: WHO.

Rehm J. and Rossow I. (2001) The impact of alcohol consumption on work and education. In: Klingemann H. and Gmel G. (eds.) *Mapping the Social Consequences of Alcohol Consumption*, pp. 67-77. Dordrecht: Kluwer Academic Publishers.

Rehm, J. and Gmel, G. (1999) Patterns of alcohol consumption and social consequences. Results from an 8 year follow-up study in Switzerland. *Addiction* 94 899-912.

Rehm, J. and Gmel, G. (2000) Gaps and needs in international alcohol epidemiology. *Journal of Substance Use* 5, 6-13.

Rehm, J. and Sempos, C. T. (1995) Alcohol consumption and all-cause mortality—questions about causality, confounding and methodology, *Addiction*, 90, 493-498.

Rehm, J., Ashley, M., Room, R. *et al.* (1996) Emerging paradigm of drinking patterns and their social and health consequences, *Addiction*, 91, 1615-1621.

Reich, T.; Edenberg, H.J.; Goate, A.; Williams, J.T.; Rice, J.P.; Van Eerdewegh, P.; Foroud, T.; Hesselbrock, V.; Schuckit, M.A.; Bucholz, K.; Porjesz, B.; Li, T.K.; Conneally, P.M.; Nurnberger, J.I., Jr.; Tischfield, J.A.; Crowe, R.A.; Cloninger, C.R.; Wu, W.; Shears, S.; Carr, K.; Crone, C.; Willig, C.; and Begleiter, H. (1998) Genome-wide search for genes affecting the risk for alcohol dependence. *Am J Med Genet* 81(3):207–215.

Renaud, S., Guegen, R., Schenker, J. and D'houtard, A. (1998) Alcohol and mortality in middle-aged men from eastern France, *Epidemiology*, 9 184-188.

Reynolds K; Lewis LB; Nolen JDL; Kinney GL; Sathya B; He J (2003) Alcohol consumption and risk of stroke *Journal of the American Medical Association* 289 (5): 579-588.

Rich, E. C., Siebold, C. and Champion, B. (1985) Alcohol-related acute atrial fibrillation. A case-control study and review of 40 patients, *Archives of Internal Medicine*, 145, 830- 833.

Richardson, A. and Budd, T. (2003) *Alcohol, Crime and Disorder: a Study of Young Adults*. Home Office Research Study 263. London: Home Office Research, Development and Statistics Directorate.

- Ridolfo, B., And Stevenson, C. (2001). The Quantification of Drug-Caused Mortality and Morbidity in Australia, 1998. Canberra: Australian Institute of Health and Welfare.
- Rimm EB, Chan J, Stampfer M, Colditz GA, Willett W (1995) Prospective study of cigarette smoking, alcohol use, and the risk of diabetes in men. *British Medical Journal*, 310, 555–559.
- Rissanen A, Sarlio-Lahteenkorva S, Alfthan G, Gref CG, Keso L, Salaspuro M. (1987). Employed problem drinkers: a nutritional risk group? *Am J Clin Nutr* 45: 456–461.
- Rissanen AM, Heliövaara M, Knekt P, Reunanen A, Aromaa A. (1991). Determinants of weight gain and overweight in adult Finns. *Eur J Clin Nutr* 45: 419–430.
- Robinette, C. D., Hrubec, Z. and Fraumeni, J. F. (1979) Chronic alcoholism and subsequent mortality in World War II veterans, *American Journal of Epidemiology*, 109, 687- 700.
- Rodgers B, Korten AE, Jorm AF, Jacomb PA, Christensen H, Henderson AS (2000) Non-linear relationships in associations of depression and anxiety with alcohol use. *Psychological Medicine*, 30(2):421–432.
- Rodgers, B., Korten, A.E., Jorm, A.F., Christensen, H., Henderson, S. and Jacomb, P.A. (1990). Risk factors for depression and anxiety in abstainers, moderate drinkers and heavy drinkers. *Addiction* 95, 1833–1845.
- Rodgers, B., Windsor, T.D., Anstey, K.J., Dear, K.B.G., Jorm A.F., and Christensen, H. (2005). Non-linear relationships between cognitive function and alcohol consumption in young, middle-aged and older adults: the PATH Through Life Project *Addiction*, 100 , 1280–1290.
- Romelsjö, A. and Lundberg, M. (1996) The changes in the social class distribution of moderate and high alcohol consumption and of alcohol-related disabilities over time in Stockholm County and in Sweden, *Addiction*, 91, 1307-1323.
- Room, R. (2005). Drinking patterns as an ideology. *Addiction* 100 1803-1804.
- Room, R., Babor, T. and Rehm, J. (2005). Alcohol and Public Health. *Lancet* 365 (Feb. 5): 519-530.
- Room, R., Bondy, S. J. and Ferris, J. (1995) The risk of harm to oneself from drinking, Canada 1989. *Addiction*, 90, 499– 513.
- Room, R., Rehm, J., Trotter, R.T., Paglia, A., and Üstün, T.B. (2001) Cross-cultural views on stigma, valuation, parity, and societal values towards disability. In: Üstün T.B., Chatterji S., Bickenbach J.E., Trotter R.T., Room R., Rehm J., and Saxena S., eds. *Disability and Culture: Universalism and Diversity*, pp. 247-291. Seattle: Higrife and Huber.
- Rose D, Murphy SP, Hudes M, Viteri FE. (1995). Food energy remains constant with increasing alcohol intake. *J Am Diet Assoc* 95: 698–700.
- Rose, G. (1992) *The strategy of preventive medicine*. Oxford: Oxford University Press.
- Rossow I. (2000) Suicide, violence and child abuse: review of the impact of alcohol consumption on social problems. *Contemporary Drug Problems* 27, 397-434.
- Rossow I., Pernanen K., and Rehm J. (2001) Alcohol, suicide and violence. In: Klingemann H. and Gmel G. (eds.) *Mapping the Social Consequences of Alcohol Consumption*, pp. 93-112. Dordrecht: Kluwer Academic Publishers.
- Rossow, I. and Hauge, R. (2004). Who pays for the drinking? Characteristics of the extent and distribution of social harms from others' drinking. *Addiction* 99 1094-1102.
- Rossow, I. (1996) Alcohol and suicide –beyond the link at the individual level. *Addiction* 1996 91 1463-1469.

Rossow, I. (1996) Alcohol related violence: the impact of drinking pattern and drinking context. *Addiction*, 91, 1651– 1661.

Rothman KJ, Greenland S (1998) Causation and causal inference. In: *Modern epidemiology*. 2nd edn. Rothman KJ, Greenland S, eds. Lippincott-Raven Publishers, Philadelphia, PA.

Rourke, S.B., And Löberg, T. (1996) The neurobehavioral correlates of alcoholism. In: Nixon, S.J., ed. *Neuropsychological Assessment of Neuropsychiatric Disorders*, 2d ed. New York: Oxford University Press, pp. 423–485.

Sacco RL, Elkind M, Boden-Albala B, *et al.* (1999) The protective effect of moderate alcohol consumption in ischemic stroke. *Journal of the American Medical Association*, 281(1):53–60.

Saccone, N.L.; kwon, J.M.; corbett, J.; *et al.* (2000). A genome screen of maximum number of drinks as an alcoholism phenotype. *American Journal of Medical Genetics (Neuropsychiatric Genetics)* 96:632–637.

Sahi T, Paffenbarger RSJ, Hsieh CC, Lee IM (1998) Body mass index, cigarette smoking, and other characteristics as predictors of self-reported, physician-diagnosed gallbladder disease in male college alumni. *American Journal of Epidemiology*, 147, 644–651.

Sampson, H.W. (2002) Alcohol and other factors affecting osteoporosis risk in women. *Alcohol Research and Health* 26 292-298.

Sayette, M. A., Wilson, T. and Elias, M. J. (1993) Alcohol and aggression: a social information processing analysis. *Journal of Studies on Alcohol*, 54, 399–407.

Schiff, E.R. and Ozden N (2003). Hepatitis C and alcohol. *Alcohol Research and Health* 27 232-239.

Schiff, E.R. (1997). Hepatitis C and alcohol *Hepatology* 26 (suppl 1) 39s-42s.

Schuckit MA (1996) Alcohol, anxiety, and depressive disorders. *Alcohol Health and Research World*, 20(2):81–85.

Schuckit MA; Smith TL; Anderson KG; Brown SA (2004). Testing the level of response to alcohol: social information processing model of alcoholism risk--a 20-year prospective study. *Alcohol Clin Exp Res* 2004 Dec;28(12):1881-9.

Seitz, H.K. and Homan, N. (2001). Effect of alcohol on the orogastrointestinal tract, the pancreas and the liver. In N Heather, TJ Peters, T Stockwell (Eds.), *International Handbook of Alcohol Problems and Dependence*. West Sussex, U.K: John Wiley and Sons, Ltd.

Sharps, P. W., Campbell, J., Campbell, D., Gary, F. and Webster, D. (2001) The role of alcohol use in intimate partner femicide. *American Journal on Addictions*, 10, 122 –135.

Sierksma A. (2003). Moderate alcohol consumption and vascular health. PhD Thesis. Utrecht University, Utrecht, The Netherlands.

Siler SQ, Neese RA, Christiansen MP, Hellerstein MK. (1998). The inhibition of gluconeogenesis following alcohol in humans. *Am J Physiol* 275: E897–E907.

Skog O-J (1980) Liver cirrhosis epidemiology: some methodological problems. *British Journal of Addiction*, 75:227–243.

Skog, O-J. (1991) Drinking and the distribution of alcohol consumption. In: Pittman D.J. and Raskin White H. (eds.) *Society, Culture, and Drinking Patterns Reexamined*, pp.135-156. New Brunswick: Alcohol Research Documentation.

Smith, G.S.; Branas, C.C.; And Miller, T.R. (1999) Fatal nontraffic injuries involving alcohol: A metaanalysis. *Annals of Emergency Medicine* 33(6):659–668.

Sonne, S.C. and Brady, K.T. (2002) Bipolar disorder and alcoholism. *Alcohol Research and Health* 26 103-108.

Sood B, Delaney-Black V, Covington C, Nordstrom-Klee B, Ager J, Templin T, *et al.* (2001) Prenatal alcohol exposure and childhood behaviour at age 6-7 years: dose response effect. *Paediatrics* 108:e34-5.

Spanagel, R. and Heilig, M. (2005). Addiction and its brain science. *Addiction* 100 1813-1822.

Spear L. (2002) Adolescent brain and the college drinker: Biological basis of propensity to use and misuse alcohol. *J Stud Alc suppl.* 14: 71-81.

Stampfer MJ, Colditz GA, Willett WC, Manson JE, Arky RA, Hennekens CH, Speizer FE (1988) A prospective study of moderate alcohol drinking and risk of diabetes in women. *American Journal of Epidemiology*, 128(3):549–58.

Stampfer, M.J., Kang, J.H., Chen, J., Cherry, R., and Grodstein, F. (2005). Effects of Moderate Alcohol Consumption on Cognitive Function in Women. *N Engl J Med* 352:245-53.

Stockwell, T., Lang, E. and Rydon, P. (1993) High risk drinking settings: the association of serving and promotional practices with harmful drinking. *Addiction*, 88, 1519–1526.

Streissguth AP, Bookstein FL, Sampson PD, Barr HM (1993) *The Enduring Effects of Prenatal Alcohol Exposure on Child Development, Birth Through 7 Years: A Partial Least Squares Solution.* University of Michigan Press, Ann Arbor.

Streissguth AP, Sampson PD, Olson HC, Bookstein FL, Barr HM, Scott M, Feldman J, Mirsky AF (1994) Maternal drinking during pregnancy: attention and short-term memory in 14-year-old offspring—a longitudinal prospective study. *Alcohol Clin Exp Res* 18:202–218.

Stuart, G. L., Ramsey, S. E., Moore, T. M., Kahler, C. W., Farrell, L. E., Recupero, P. R. and Brown, R. A. (2003) Reductions in marital violence following treatment for alcohol dependence. *Journal of Interpersonal Violence*, 18, 1113–1131.

Sugie T; Imatou T; Miyazaki M; Une H (2005) The effect of alcoholic beverage type on hyperuricemia in Japanese male office workers. *J Epidemiol* 2005 Mar;15(2):41-7.

Suhonen, O., Aromaa, A., Reunanen, A., and Knekt, P. (1987) Alcohol consumption and sudden coronary death in middle-aged Finnish men. *Acta Medica Scandinavica*, 221,335-41.

Suter P.M., Hasler, E., Meyer R, Vetter W. (1999). Modulation of the alcohol effects on body weight by the family history of overweight. *Int J Obesity* 23(Suppl 5): S94.

Suter P.M., Hasler, E., Vetter, W. (1997). Effects of alcohol on energy metabolism and body weight regulation: Is alcohol a risk factor for obesity? *Nutr Reviews* 55: 157–171.

Swahn, M. H. and Donovan, J. E (2004) Correlates and predictors of violent behavior among adolescent drinkers. *Journal of Adolescent Health*, 34, 480–492.

Swahn, M. H. (2001) Risk factors for physical fighting among adolescent drinkers. *American Journal of Epidemiology*, 153, S72.

Swendsen JD, Merikangas KR, Canino GJ, *et al.* (1998) Comorbidity of alcoholism with anxiety and depressive disorders in four geographic communities. *Comprehensive Psychiatry*, 39(4):176–184.

Swift, R. (2003) Direct measurement of alcohol and its metabolites. *Addiction* 98 (suppl 2) 73-80.

Szucs, S., Sarvary, A., McKee, M. and Adany, R. (2005). Could the high level of cirrhosis in central and eastern Europe be due partly to the quality of alcohol consumed? An exploratory investigation. *Addiction* 100 536-542.

Testa, M. and Parks, K.A. (1996). The role of women's alcohol consumption in sexual victimization. *Aggression and Violent Behaviour*, 1 (3): 217–234.

Testa, M., Quigley, B.M. and Leonard, K.E. (2003). Does alcohol make a difference? Within-participants comparison of incidents of partner violence. *Journal of Interpersonal Violence* 18 735-743.

Thom, B. (2001) A social and political history of alcohol. In Heather, N., Peters, T.J. and Stockwell, T., eds. *International handbook of alcohol dependence and problems*. Chichester: John Wiley and Sons, Ltd.

Thun MJ, Peto R, Lopez AD, Monaco JH, Henley SJ, Heath CWJ, Doll R (1997) Alcohol consumption and mortality among middle-aged and elderly US adults. *The New England Journal of Medicine*, 337, 1705–1714.

Tolstrup, J.S., Jensen, M.K., Tjønneland, A., Overvad, K. and Grønbaek, M. (2004) Drinking pattern and mortality in middle-aged men and women. *Addiction* 99 323-330.

Toumbouro, J.W., Williams, I.R., White, V.M., Snow, P.C., Munro, G.D. and Schofield, P.E. (2004) Prediction of alcohol-related harm from controlled drinking strategies and alcohol consumption trajectories. *Addiction* 99 498-508.

Trevisan, M., Dorn, J., Falkner, K., Russell, M., Ram, M., Muti, P., Freudenheim, J.L., Nochajski, T and Hovey, K. (2004) Drinking pattern and risk of non-fatal myocardial infarction: a population-based case-control study. *Addiction* 99 313-322.

Trevisan, M.T.; Ram, M.; Hovey, K.; *et al.* (2001a) Alcohol drinking patterns and myocardial infarction. *American Journal of Epidemiology* 153(11): S97.

Trevisan, M.T.; Schisterman, E.; Mennotti, A.; *et al.* (2001b). Drinking pattern and mortality: The Italian Risk Factor and Life Expectancy Pooling Project. *Annals of Epidemiology* 11:312–319.

Turner, R.T. and Sibonga, J.D. (2001) Effects of alcohol use and estrogen on bone. *Alcohol Research and Health* 25 276-281.

Tønnesen, H. and Kehlet, H. (1999) Preoperative alcoholism and postoperative morbidity. *British Journal of Surgery*, 86, 869– 874.

Urbano-Marquez A., Estruch, R., Navarro-lopez, F., Grau, J.M. and Rubin, E. (1989). The effects of alcoholism on the skeletal and cardiac muscle. *New England Journal of Medicine* 320 409-415.

US Department of Health and Human Services (2000). 10th Special report to the US Congress on Alcohol and Health. Washington, US Department of Health and Human Services.

Vahtera J, Poikolainen K, Kivimaki M, Ala-Mursula L, Pentti J (2002). Alcohol intake and sickness absence: a curvilinear relation. *Am J Epidemiol*, 15;156(10):969-76.

Wagner, F.A., and Anthony, J.C. (2002). From first drug use to drug dependence: developmental periods of risk for dependence upon marijuana, cocaine and alcohol. *Neuropsychopharmacology* 26 479-488.

Wannamethee SG, Shaper AG (1996) Patterns of alcohol intake and risk of stroke in middle-aged British men. *Stroke*, 27:1033–1039.

Wannamethee SG, Shaper AG (2003) Alcohol, body weight, and weight gain in middle-aged men. *Am J Clin Nutr* 77:1312–1317.

Wannamethee, G. and Shaper, A. G. (1992) Alcohol and sudden cardiac death, *British Heart Journal*, 68, 443-448.

Wannamethee, S.G. and Shaper, A.G. (1999) Type of alcoholic drink and risk of major coronary heart disease events and all-cause mortality. *American Journal of Public Health* 89 685-690.

Wannamethee, S.G., Shaper, A.G., Perry, I.J. and Alberti, K.G.M.M. (2002). Alcohol consumption and the incidence of type II diabetes *Journal of Epidemiology and Community Health* 56:542-548.

- Watson, D. and Parsons, S. (2005). Domestic Abuse of Women and Men in Ireland: Report on the National Study of Domestic Abuse National Crime Council: www.crimecouncil.ie.
- Watt, K., Purdie, D.M., Roche, A.M. and McClure, R.J. (2004) Risk of injury from acute alcohol consumption and the influence of confounders. *Addiction* 99 1262-1273.
- Wechsler, H., Davenport, A., Dowdall, G., Moeykens, B. and Castillo, S. (1994) Health and behavioral consequences of binge drinking in college: a national survey of students at 140 campuses. *JAMA*, 272, 1672–1677.
- Wechsler, H., Dowdall, G. W., Davenport, A. and Castillo, S. (1995) Correlates of college student binge drinking. *American Journal of Public Health*, 85, 921–926.
- Wechsler, H., Dowdall, G. W., Maenner, G., Gledhill-Hoyt, J. and Lee, H. (1998) Changes in binge drinking and related problems among American college students between 1993 and 1997: results of the Harvard School of Public Health College Alcohol Study. *Journal of American College Health*, 47, 57–68.
- Wei M, Gibbons LW, Mitchell TL, Kampert JB, Blair SN (2000) Alcohol intake and incidence of type 2 diabetes in men. *Diabetes Care* 23(1):18–22.
- Wells S., Graham K., and West P. (2000) Alcohol-related aggression in the general population. *Journal of Studies on Alcohol*. 61, 626-632.
- Wells, J.E., Horwood, L.J. and Fergusson, D.M. (2004) Drinking patterns in mid-adolescence and psychosocial outcomes in late adolescence and early adulthood. *Addiction* 99 1529-1541.
- Wells, S. and Graham, K. (2003). Aggression involving alcohol: Relationship to drinking patterns and social context, *Addiction*, 98(1), 33-42.
- Wells, S., Graham, K. and West, P. (2000) Alcohol-related aggression in the general population. *Journal of Studies on Alcohol*, 61, 626–632.
- Wells, S., Graham, K., Speechley, M. and Koval, J.J. (2005) Drinking patterns, drinking contexts and alcohol-related aggression among late adolescent and young adult drinkers. *Addiction* 100 933-944.
- White, H.R. and Chen, P-H (2002). Problems drinking and intimate partner violence. *Journal of Studies on Alcohol*, 63: 205–214.
- White, I. R. (1999) The level of alcohol consumption at which all-cause mortality is least, *Journal of Clinical Epidemiology*, 52, 967-975.
- White, I.R., Altmann, D.R. and Nanchahal, K. (2002) Alcohol consumption and mortality: modelling risks for men and women at different ages. *British Medical Journal* 325 191-198.
- Widom, C.S. and Hiller-Sturmhofel, S. (2001) Alcohol abuse as a risk factor for and consequence of child abuse. *Alcohol Research and Health* 25 52-57.
- Wiley, J. A. and Weisner, C. (1995) Drinking in violent and nonviolent events leading to arrest: Evidence from a survey of arrestees. *Journal of Criminal Justice* 23, 461-476.
- Wilkinson, R. and Marmot, M. Eds. (2003). *Social determinants of health. The solid facts*. Copenhagen: World Health Organization Regional Office for Europe.
- Willenbring ML (1986) Measurement of depression in alcoholics. *Journal of Studies on Alcohol*, 49:412–417.
- Williams CM, Skinner AE (1990) The cognitive effects of alcohol abuse: a controlled study. *British Journal of Addiction*, 85, 911–917.
- Williams FG, Knox R (1987) Alcohol abuse intervention in a university setting. *Journal of American*

College Health, 36, 97–102.

Williams FM, Cherkas LF, Spector TD, MacGregor AJ. (2005) The effect of moderate alcohol consumption on bone mineral density: a study of female twins. *Ann Rheum Dis.* 64(2):309-10.

Williams, J.T.; Begleiter, H.; Porjesz, B.; *et al.* (1999) Joint multipoint linkage analysis of multivariate qualitative and quantitative traits. II. Alcoholism and event-related potentials. *American Journal of Human Genetics* 65:1148–1160.

Windham GC, Von Behren J, Fenster L, *et al.* (1997) Moderate maternal alcohol consumption and risk of spontaneous abortion. *Epidemiology*, 8(5):509–514.

World Health Organization (1992) *The ICD-10 Classification of mental and behavioral disorders*. Geneva, World Health Organization.

World Health Organization (2001) *The International Classification of Functioning, Disability and Health*. Geneva: World Health Organization.

World Health Organization (2004). *Neuroscience of psychoactive substance use and dependence*. Geneva: World Health Organization.

Zador, P., Krawchuk, S. and Voas, R. (2000). Alcohol-related relative risk of driving fatalities and driver impairment in fatal crashes in relation to driver age and gender: an update using 1996 data. *Journal of Studies on Alcohol* 61 387-395.

Zarkin, G.A., French, M.T., Mroz, T. and Bray, J. (1998) Alcohol use and wages: new results from the National Household Survey on Drug Abuse. *Journal of Health Economics* 17 53-68.

Zhang L, Wieczorek W, Welte J (1997) The nexus between alcohol and violent crime. *Alcoholism, Clinical and Experimental Research*, 21, 1264–1271.

Chapter 6: Alcohol and Europe

Alcohol places a significant burden on several aspects of human life in Europe, which can broadly be described as 'health harms' and 'social harms'. Seven million adults report being in fights when drinking over the past year and (based on a review of a small number of national costing studies) the economic cost of alcohol-attributable crime has been estimated to be €33bn in the EU for 2003. This cost is split between police, courts and prisons (€15bn), crime prevention expenditure and insurance administration (€12bn) and property damage (€6bn). Property damage due to drink-driving has also been estimated at €10bn, while the intangible cost of the physical and psychological effects of crime has been valued at €9bn-€37bn.

An estimated 23 million Europeans are dependent on alcohol in any one year, with the pain and suffering this causes for family members leading to an estimated intangible impact of €68bn. Estimates of the scale of harm in the workplace are more difficult, although nearly 5% of drinking men and 2% of drinking women in the EU15 report a negative impact of alcohol on their work or studies. Based on a review of national costing studies, lost productivity due to alcohol-attributable absenteeism and unemployment has been estimated to cost €9bn-€19bn and €6bn-€23bn respectively.

Looking from a health perspective, alcohol is responsible for about 195,000 deaths each year in the EU, although it is also estimated to delay 160,000 deaths in older people mainly through its cardioprotective effect for women who die after the age of 70 years (although due to methodological problems, this is likely to be an over-estimate of the number of deaths delayed). A more accurate estimate is likely to be the 115,000 net deaths caused in people up to the age of 70, which avoids most of the likely overestimate of alcohol's preventive effect in older age. These figures are also relative to a situation of no alcohol use, and the net effect would be much greater if we look at the lowest-risk level of drinking. Measuring the impact of alcohol through Disability-Adjusted Life Years (DALYs) lessens this problem, and shows that alcohol is responsible for 12% of male and 2% of female premature death and disability, after accounting for health benefits. This makes alcohol the third highest of twenty-six risk factors for ill-health in the EU, ahead of overweight/obesity and behind only tobacco and high blood pressure.

This health impact is seen across a wide range of conditions, including 17,000 deaths per year due to road traffic accidents (1 in 3 of all road traffic fatalities), 27,000 accidental deaths, 2,000 homicides (4 in 10 of all murders), 10,000 suicides (1 in 6 of all suicides), 45,000 deaths from liver cirrhosis, 50,000 cancer deaths, of which 11,000 are female breast cancer deaths, and 17,000 deaths due to neuropsychiatric conditions as well as 200,000 episodes of depression (which also account for 2.5 million DALYs). The cost of treating this ill-health is estimated to be €17bn, together with €5bn spent on treatment and prevention of harmful alcohol use and alcohol dependence. Lost life can either be valued as lost productive potential (€36bn excluding health benefits), or in terms of the intangible value of life itself (€145bn-€712bn after accounting for health benefits).

Young people shoulder a disproportionate amount of this burden, with over 10% of youth female mortality and around 25% of youth male mortality being due to alcohol. Little information exists on the extent of social harm in young people, although 6% of 15-16 year old students in the EU report fights and 4% report unprotected sex due to their own drinking.

Between countries, alcohol plays a considerable role in the lowered life expectancy in the EU10 compared to the EU15, with the alcohol-attributable gap

in crude death rates estimated at 90 (men) and 60 (women) per 100,000 population. Within countries, many of the conditions underlying health inequalities are associated with alcohol, although the exact condition may vary (e.g. cirrhosis in France, violent deaths in Finland). Worse health in deprived areas also appears to be linked to alcohol, with research suggesting that directly alcohol-attributable mortality is worse in deprived areas beyond that which can be explained by individual-level inequalities.

Many of the harms caused by alcohol are borne by people other than the drinker responsible. This includes 60,000 underweight births, as well as 16% of child abuse / neglect and 5-9 million children living in families adversely affected by alcohol. Alcohol also affects other adults, including an estimated 10,000 deaths in drink-driving accidents for people other than the drink-driver, with a substantial share of alcohol-attributable crime also likely to occur to others. Parts of the economic cost are also paid by other people or institutions, including much of the estimated €33bn due to crime, €17bn for healthcare systems, and €9bn-€19bn of absenteeism.

Natural experiments and time-series analyses both show that the health burden from alcohol is related to changes in consumption. These changes show the behaviour of the heaviest drinkers more than lighter drinkers (given that e.g. the top 10% of drinkers account for one-third to one-half of total consumption in most countries), but also tap into the wider tendency for populations to change their levels of consumption collectively. Across the whole population, the impact of a one-litre change in consumption on levels of harm is highest in the low-consuming countries of the EU15 (northern Europe), but still significant for cirrhosis, homicide (men only), accidents, and overall mortality (men only) in southern Europe. While some have argued that the greater change in northern Europe reflects the 'explosive' drinking culture there, this may also reflect the greater proportional size of a one-litre change in the low-consuming northern European countries. Overall, it has been estimated that a one litre decrease in consumption would decrease total mortality in men by 1% in southern and central Europe, and 3% in northern Europe.

INTRODUCTION

The evidence for alcohol's causal relation to a number of consequences on the individual level has been summarized in Chapter 5. This chapter builds on this by showing what the evidence means for Europe as a whole, transforming changes in individual risk to levels of harm in European society. The chapter deals first with social harms (e.g. crime, the workplace), before discussing the scale of health consequences (both positive and negative) based on work undertaken by the WHO. Finally, the chapter describes how changes in a society's levels of consumption relate to changing levels of harm – which sometimes show different results from the changes in individuals' drinking presented in the previous chapter. Use is made throughout of the estimate of the social costs of alcohol in Europe, which was presented in Chapter 3. As stated previously, it is strongly advised that any reader who wishes to use these figures should consult Box 3.3 in Chapter 3 to ensure that the results are used accurately.

SOCIAL HARMS

The myriad results of drinking outside of damage to health – usually referred to as the ‘social consequences’ of alcohol – form an important part of society’s view of alcohol, yet research into this area is yet to fulfil its potential (Klingemann and Gmel 2001). To date there have been relatively few European comparative studies, and it is frequently impossible to make meaningful comparisons across countries. The lack of good records for many of the harms, combined with different ways of recording alcohol’s involvement, makes the task doubly difficult. Further complications include the numerous possible biases in associational figures related to alcohol, such as the potentially different chances of being arrested when drunk (either higher, due to reduced ability to avoid arrest, or lower, due to the increased demands on police forces at times of peak alcohol consumption).

In response, a number of surveys have been conducted looking at people’s reports of consequences of drinking, both with young people (e.g. ESPAD) and adults (e.g. ECAS). While these add valuable perspectives to an area otherwise lacking much data, they are hard to interpret – does a higher rate in one country compared to another mean that the problems are actually more widespread, or simply that more people believe in a link between drinking and outcomes? In America, for example, all objective measures of risky consumption and harm (average consumption, drinking 5+ drinks on one occasion, liver disease and alcohol-related fatal crashes) decreased between 1984 and 1990, but drinkers’ reports of social consequences rose dramatically.

This raises the question of what exactly these surveys show (Room and Hradilova Selin 2004). For harms that are truly ‘social’ in that they depend on being noticed as harms by others, this question is relatively unproblematic and self-reports from the drinker (Room and Hradilova Selin 2004) or by others (Room 2000) can be used with a certain level of confidence. For example, many drinking-related marital problems depend on the spouse’s view on whether drinking is a problem, and do not exist ‘independently’ of this. However, for the rarer but more severe categories of harm that can meaningfully be measured relatively ‘objectively’ – such as the frequency of workplace accidents or the risk of perpetrating a violent crime – there are substantial problems in interpreting a drinkers’ attribution as reflecting the objectively-measured causal role (Gmel *et al.* 2000).¹

This explains why changes in cultural views of the effects of drinking can result in drinkers’ experience of alcohol-related problems increasing at a time when objectively-measured harms are decreasing. The limitations of *only* using drinkers’ self-reported attributions of alcohol-related problems have been clearly identified (Dawson and Room 2000), but, unfortunately, few of the resulting recommendations have yet resulted in further research (research that does exist is only on the individual level, and is, therefore, covered in Chapter 5). Nevertheless, self-reports *are meaningful* in the sense that they show people’s own views on the level of social problems related to alcohol, even if they do not fully capture all the harms that exist separately from people’s attributions. Bearing these caveats in mind, then, the first half of this chapter summarises the existing research on social harms, looking in turn at crime, the family, the workplace, and nuisance and harassment.

¹ It should be further noted that even the ‘objective’ epidemiological studies are usually vulnerable to biases in memory and definition (e.g. the boundary between disorder and harmless fun); see Room (2000).

Crime

Alcohol use is associated with crime in all European countries, and is particularly involved with violent crimes (see Table 6.1). It should be borne in mind that this shows how far alcohol is *associated* with violence, which is likely to be greater than its *causal* role (Rossow, Pape, and Wichstrøm 1999; see also Chapter 5). The data presented for different countries are also not directly equivalent given large and often opaque methodological variations, and the issue of whether victims' drinking is included is generally unclear.

Nevertheless, both Table 6.1 and a review of studies conducted in North America and northern Europe (Rossow, Pernanen, and Rehm 2001) found that the proportion of *violent crimes* reported to be committed under the influence of alcohol is highest in the Nordic countries. Other surveys in the Nordic countries have also found 2%-3% of men and 1%-2% of women have been physically harmed by a drunk person in the past year (Mäkelä *et al.* 1999; Rossow and Hauge 2004). In contrast, a survey within the ECAS project found the highest rates of people who report being in a fight when drinking come from Germany, the UK (both >5% of drinking men) and Ireland (>10%), with the lowest rates of around 1% coming from Italy and Sweden (Ramstedt and Hope 2003). Interpretation of these results is, however, complicated by the unknown total number of fights in each country.

Even within violent crimes as a whole, the involvement of alcohol may vary. In Finland, Germany, Norway, Poland and the UK, assault associations seem higher than those for *robbery and sexual crimes*, although the range of results is also greater and more spread out between victim and offender drinking. *Vandalism* also shows a strong association with alcohol where data is available (Belgium, Estonia, Latvia and Norway), as does theft in a number of countries. The alcohol-crime link for all of these is stronger for drinking to intoxication (cf. Chapter 5) – in the UK, for example, 24% of all violent offences are committed by 18-24 year old binge-drinkers, compared to 16% for other regular drinkers and 5% by occasional- or non-drinkers of the same age (Matthews and Richardson 2005).

Crime and beliefs about alcohol

Differences in the relation of crime to alcohol across different countries – and, in particular, those that do not reflect volumes or patterns of drinking covered in Chapter 4 – suggest that 'drunken comportment' has important effects on levels of crime in a given society (cf. also Chapters 2 and 5). However, it is also possible to argue that these results mainly arise because some Europeans believe more in a link between alcohol and violence than other Europeans. Only the ECAS study has investigated this in any detail, by looking into views on responsibility and predictability of actions done when drunk (Room and Bullock 2002). This found that drinkers' responsibility for their actions when drunk was seen as highest in France but lowest in Germany and Italy, while over 50% more in Italy believed that "anyone might become violent after drinking too much" compared to Finland. These results suggest that there are significant variations between countries in understandings of drunken behaviour, but these may not follow a simple pattern across Europe.

Similarly ambiguous are the results of time-series analyses, which compare trends in recorded crime with changes in recorded levels of consumption. This method, therefore, implicitly includes all of the possible causal mechanisms between alcohol in crime, going beyond just the intoxication of the perpetrator to include intoxication in the victim and any tendency for drinking occasions to add to potential conflict situations. These can be presented as either the *percentage change per litre of*

consumption, or combining this percentage change with the total level of consumption to find the implied *alcohol-attributable fraction of all crimes*. However, these results can point in opposite directions, as the % change per litre of consumption tends to be greater in countries where the level of consumption is lower, i.e. northern Europe.

Table 6.1 Selected crimes and their relation to alcohol

	Country	% linked to alcohol	Type of link ²
All crimes	Belgium	20	Intoxication
	England & Wales	25	Under-the-influence
	Finland	47	Intoxication, prisoners
	Germany	7	Under-the-influence
	Hungary	35	Intoxication
	Latvia	34	Under-the-influence
	Lithuania	21	Under-the-influence
Violent crime	Belgium	40	Intoxication
	England & Wales	48	Under-the-influence
	Estonia	60-70	Alcohol-related
	Finland	66	Intoxication, prisoners (assault)
	France	25	1973 data; Alcohol-related (assault)
	Germany	24	Under-the-influence
	Norway	80	Intoxication
	Spain	42	Under-the-influence, victims in A&E
Sweden	86	Intoxication	
Robbery	England & Wales	19	Under-the-influence
	Finland	53	Intoxication, prisoners
	Norway	40	Intoxication
	Poland	40	Intoxication
Sex offences / Rape	England & Wales	58	Alcohol-related
	Finland	49	Intoxication, prisoners
	Germany	29	Under-the-influence
	Norway	60	Intoxication

As discussed in the text, the methodology underlying these data is not consistent – any comparisons of these values should, therefore, be done highly cautiously.

¹ Sources are: Belgium, Estonia, Hungary, Norway, Poland and Sweden (Rehn, Room, and Edwards 2001); Finland (Murdoch, Pihl, and Ross 1990; Salomaa 1995); France (Murdoch, Pihl, and Ross 1990); Germany (Bühringer et al. 2002); Latvia and Lithuania (Alcohol Policy Network 2005); Spain (MacDonald et al. 2005); UK (Leontaridi 2003)

² As described by the source of data – Intoxication: either victim or offender's view on whether offender was intoxicated; BAC: Blood Alcohol Concentration from police test; Under-the-influence: described as such in the source; Attribution: either victim or offender attributes harm to drinking; Alcohol-related: either an unspecified link, a self-report of any alcohol use in the 4-6 hrs immediately prior to the event, or a positive but unspecified BAC level.

Looking at *assaults*, for example, the alcohol-attributable fraction was moderately larger in Sweden and Norway (50%) than France (33%), with no significant effect found in Denmark (Lenke 1990). In contrast, the effect of a one litre change in consumption was far weaker in France than elsewhere, but the much higher level of consumption in France gave a much more similar role of alcohol in assaults overall.² A similar result can be seen for *homicide*, where northern European countries show much stronger effects per litre – a result often explained as the result of ‘explosive’ drinking patterns there (Room and Rossow 2001; Rossow, Parnanen, and Rehm 2001). Yet once more, those countries showing smaller effects per litre are also those with higher levels of consumption, with a net result that the estimate of the number of alcohol-attributable homicides per capita is similar in northern and southern Europe (see under ‘homicide’ below, and also the discussion of time-series analyses more generally towards the end of this chapter). While this type of country-level analysis is valuable in order to escape from some of the biases inherent in most other individual-level methods, it also assumes that the relationship between changes in consumption and crime is constant at all levels of drinking, which may or may not be the case in practice.

The evidence presented here and in the preceding chapter shows that alcohol is associated with some types of crime to some degree across the whole of Europe – including southern Europe – and much of this seems to be due to alcohol’s causal role. Yet, despite the importance of knowing how many crimes occur due to alcohol across different countries, we are, unfortunately, left with insufficient evidence to say anything more conclusive about patterns of alcohol and crime in Europe. This represents a major gap in the available data, given that the number of assaults reported to the police that are *linked* to alcohol is likely to be of an order of magnitude of 350,000 each year or more (although evidently not all the assaults linked to alcohol will be due to alcohol in a causal sense; see below).³ An even higher potential indicator comes from ECAS survey data, which suggests that seven million adults have been in fights when drinking in the past year, although, once more, this says nothing about how many of these were *due* to drinking.⁴ The lack of data for any other indicators is reflected in the recommendations for future research in Chapter 10.

Estimating the cost of alcohol-attributable crime

Despite the absence of robust comparable data on alcohol and crime, it is possible to make a tentative aggregate-level estimate to show the potential scale of alcohol-attributable crime costs across Europe, and also, hopefully to act as an incentive to conducting future research (cf. the recommendations in Chapter 10). This is based on the review of previous studies presented in Chapter 3, in which several studies attempted to estimate the crime cost due to alcohol. These national-level studies have often found it to be a substantial element of the final direct tangible cost, and have generally used one of two different approaches:

² The data for France stop at 1958, which limits the ability to generalise from these results to more recent periods. Lenke also notes problems with the historical consumption data used for the calculation in France.

³ This assumes that alcohol is linked to one-quarter of all assaults (25% was chosen as it is the level of the lowest associational figure found in Table 6.1 above). Offence rate data is taken from the European Sourcebook of Crime and Criminal Justice Statistics (Killias *et al.* 2003); it should be noted that there are substantial differences in the definition of an ‘assault’ between European countries.

⁴ ECAS results for the aged 18-64 years drinking population in France, Finland, Germany, Ireland, Italy, Sweden and the UK (Ramstedt and Hope 2003) were extended to the EU15 according to the average for the ‘ECAS region’ (effectively northern Europe, central Europe and southern Europe). These were turned into numbers of people according to WHO HFA population data for 15-69 year olds and the abstinence figures covered in chapter 4.

1. First, studies have simply used the associations of alcohol and each type of crime as a maximum figure for the causal role, and presented the resulting costs as ‘up to’ a certain value, e.g. the UK study performed by the Prime Minister’s Strategy Unit (Leontaridi 2003). While methodologically coherent, the figures in practice are often interpreted as estimates of the causal role; this means that the social cost is inflated relative to its likely value.
2. The second method has been to interview prisoners or arrestees, and ask them whether they believe they would have committed the crime if they were not drunk (Collins and Lapsley 2002; Pernanen *et al.* 2002). This then provides an estimate of the proportion of crimes that prisoners/arrestees themselves believe are due to alcohol. Although this method is far from ideal, the fact that “*the choice is between methods that are all lacking in some respects*” (Pernanen *et al.* 2000:56) has meant an increasing use of this method in sophisticated recent studies. In the Canadian study of federal inmates, 24% of crimes were committed by people who were drunk at the time, but only 17% of crimes (between one quarter and one third less) were described as due to alcohol (either dependence or drunkenness).
3. It is theoretically possible to create a third method to estimate the crime cost, although this has not been attempted by any of the reviewed studies. This

Box 6.1 – ALCOHOL AND CRIME

- Alcohol is associated with crime – and especially violent crime – across the EU.
- An estimated 7m adults report being in fights when drinking in the past year.
- The tangible cost of crime due to alcohol has been estimated at €33bn in the EU in 2003. This is split between police, courts & prisons (€15bn); crime prevention expenditure (burglar alarms) & insurance administration (€12bn); and property damage (€6bn).

would be based upon the alcohol-attributable fractions for each offence type from the time-series analyses discussed above. While this would avoid some of the biases inherent in people’s perceptions of causality, time-series analyses tend to be more robust when countries are pooled together (to get a greater number of time points), which limits their accuracy for short time periods in individual countries.

Although these can be adapted to produce an estimate of crime costs in Europe,⁵ the absence of comparable data on alcohol-attributable (or even alcohol-related) crime clearly precludes any attempt to adjust these estimates for the level of crime due to alcohol in each country.

This methodological problem is true for all of the cost components (as discussed under ‘Methodological Issues’ in Chapter 3), but may be particularly problematic for the crime estimate. This should be borne in mind while interpreting the results, and prevents any possible comparison of crime costs between individual countries.

⁵ As with the other cost components, the crime costs estimates are based on scaling the crime costs in each study according to a common indicator, such as government public order expenditure (see chapter 3). To address the issue of causality, the results of alcohol-related crime costs are presented in Table 3.1, before the overall result is reduced as described in footnote 6.

Of the three methods outlined above, it is the second method using prisoner attributions – representing the current ‘state of the art’ – that forms the basis of the headline figure for the crime costs.⁶ Our overall estimate for the total cost to Europe of crime *due* to alcohol is, therefore, €33bn in 2003.⁷ The greatest cost within this is for spending on police, courts and prisons (€15bn), although this still accounts for less than half the costs. The remaining amount is made up of costs in anticipation of crime (crime prevention expenditure such as burglar alarms, together with the administration of insurance) that costs an estimated €12bn, and property damage from crime that accounts for a further €6bn.

Beyond these tangible costs, we can also place a value on the physical and psychological effect of violent crime on the victims. Depending on the value given to a quality adjusted life year (QALY) (a similar measure to a DALY but derived from people’s responses rather than expert evaluations), these intangible costs of crime come to €9bn-€37bn per year (€52bn for the cost of alcohol-related crime).

The family

Table 6.2 Domestic violence and its relation to alcohol

The methodology underlying these data is not consistent – any comparisons should be done cautiously. See Table 6.1 for sources.

	Country	% linked to alcohol	Type of link <small>see Table 6.1 above</small>
Domestic violence	France	30	Alcohol-related
	England & Wales	53	Under-the-influence
	Iceland	71	Attribution
	Ireland	34	Attribution (trigger)
	Netherlands	71	Alcohol-related
	Portugal	30	Intoxication
	Spain	16	Alcohol (or other drug) related
	Switzerland	25	Alcohol-related
		26	Attribution
		40	Alcohol-related

While the harm done to families has been a factor in debates on alcohol for a significant amount of time (see Chapter 3), and a causal role of alcohol has been established for a number of harms (see Chapter 5), it is only recently that any research has been done to quantify the level of this harm within Europe. Domestic violence has been the subject of the most investigation, often within a similar framework to the crimes discussed above, and 16%-71% of domestic or intimate partner violence has been linked to alcohol across Europe (see Table 6.2).

Most Europeans believe alcohol to be causally linked, with a European survey finding that “alcoholism” – cited by nearly 19 of every 20 citizens of *each* Member State – is regarded as the leading cause of domestic violence (Eurobarometer 1999).

Alcohol has similarly been linked to individuals’ home lives or marriages, with 4% of men and 2% of women across seven countries saying this has been harmed by their drinking (Ramstedt and Hope 2003). Fewer problems were mentioned in southern Europe than elsewhere, although, once more, it is impossible to know if this is due to

⁶ Using the figures presented above, this suggests a reduction of 29% from the cost of crime associated with alcohol to the cost of crime caused by alcohol.

⁷ The cost using the time-series analysis method was €27bn, and the cost of crime related to alcohol was €46bn. The time-series analysis method is based on results showing that 70%-80% of violent crime was associated with alcohol in Norway/Sweden while only 50% was causally due to alcohol according to time-series analyses. This suggests a reduction of 38% from the cost of crime associated with alcohol to the cost of crime caused by alcohol.

cultural biases or a real difference in the level of harm. A similar question has also been asked of 45-64 year-olds in Krakow (Poland) and Karvina-Havirov (Czech Republic), which found a very high level of reported home life problems among men (Bobak *et al.* 2004). In both studies and as found elsewhere, men report more family problems from their own drinking than women, a pattern that is likely to stem from the difference in male and female drinking covered in Chapter 4.

Less information is available on child abuse and neglect, but there has still been sufficient evidence from clinical case studies for one major review to ascribe 16% of child abuse to alcohol use (English *et al.* 1995), a finding accepted by two more recent reviews (Single *et al.* 1999; Ridolfo and Stevenson 2001). Reports from Denmark, Hungary, the Netherlands, Portugal, Spain and the UK support a figure of this magnitude, with alcohol related in various ways to 10%-50% of cases (McNeill 1998; Sundhedsministeriet [Ministry of Health] 1999; WHO 2004).

BOX 6.2 – HARMS TO THE FAMILY

- Alcohol is estimated to be a causal factor in 16% of child abuse and neglect.
- 4.7m-9.1m children (6%-12%) live in families adversely affected by alcohol.
- The intangible cost of alcohol dependence to family members has been estimated at €68bn in the EU

Besides the drinking of parents, young people's own drinking can also damage their home-life. More than 6% of 15-16 year old students report suffering problems with their parents due to their drinking, equivalent to over 700,000 young people.⁸ In the EU15 this was as common for girls as boys (possibly reflecting the greater similarity in their drinking habits; see Chapter 4), but problems were twice as common in boys compared to girls in the EU10.

Alcohol dependency

The prevalence of alcohol dependence in the EU was estimated in Chapter 4 to be 23m people, with the risks of becoming dependent on alcohol covered in Chapter 5. This section attempts to look at the harms associated with alcohol dependence, although few data are available to make European-level estimates.

Only one study has attempted to quantify the intangible impact of a relative's alcohol dependence, based on people's willingness to pay for a hypothetical effective treatment for a family member (Jeanrenaud *et al.* 2003; Jeanrenaud and Pellegrini 2004). If this is extended across Europe using the estimates of alcohol dependence above, then we can estimate that the intangible impact of alcohol dependence on family members is €68bn per year.

Living with harmful drinking and alcohol dependent parents is a risk for a number of problems later in life, and affects a substantial number of children. A previous report for the European Commission on 'Alcohol and the Family' used Danish and Finnish research to estimate the number of children living in families adversely affected by alcohol (McNeill 1998). Updating this research for the present day in the enlarged EU, and adding new research from the UK National Association for the Children of Alcoholics as a lower bound (Callingham 2002), we can estimate that 4.7m-9.1m children (6%-12%) in the EU live in families adversely affected by alcohol.

⁸ Population-weighted EU averages presented – population data of 15-16 year olds taken from Eurostat; young people's reported harms from the ESPAD study (Hibell *et al.* 2004).

Work and alcohol

Despite employers' interest in reducing the burden of alcohol in the workplace, there is a lack of information on the exact scale of work-related harm due to difficulties in measurement. For example, very few studies have robustly quantified lowered productivity in the workplace due to the previous day's drinking, although one study by recruitment consultants in the UK estimated a 27% drop in productivity for each hungover day at a total cost of £1.8bn (reed.co.uk 2004). Outside Europe there is a similar lack of research, with one New Zealand study finding that 12% of employed drinkers had experienced reduced productivity at work due to their drinking, which rose to 30% of the 10% that drank the most (Jones, Casswell, and Zhang 1995).

Slightly better data are available for alcohol-related absenteeism in Europe. One study in Denmark, Finland, Norway and Sweden found that 3%-6% of all men and

Box 6.3 – ALCOHOL AND THE WORKPLACE

- Nearly 5% of drinking men and 2% of drinking women in the EU15 report a negative impact of alcohol on their work or studies
- 3%-6% of men and 1%-4% of women in the Nordic countries have not gone to work because of their drinking
- Lost productivity due to alcohol-attributable absenteeism and unemployment costs the EU €9bn-€19bn and €6bn-€23bn respectively each year

1%-4% of all women have not gone to work at least once in the past year due to their drinking. Consequences of this type were also much more common for 19-34 year olds than older ages for both men and women (Mäkelä *et al.* 1999). Alcohol's role can also be estimated from the perceptions of employers, although evidently their views may not match the experiences of the drinkers themselves. Bearing this in mind, 12% of companies in Ireland mentioned alcohol as a cause of short-term absences for men (of which one-quarter saw it as the primary cause), while 3% believed the

same to be true for women (with one-third seeing it as the primary cause; IBEC 2004). Alcohol was seen to be less implicated in long-term absences.

Alcohol has also been shown to relate to unemployment, with heavy drinking increasing the risk of being unemployed relative to lighter drinking at the same time as unemployment increases the risk of heavy drinking (see Chapters 3 and 4).

In total, nearly 5% of drinking men and 2% of drinking women across seven EU15 countries reported a negative impact of alcohol on their work or studies in the past year (Ramstedt and Hope 2003). This ranged from 3% or less for men in Sweden and France, to over 9% in the UK and Ireland (the same pattern also holding for women). In Ireland (data not reported for other countries), young people were much more likely to report problems with work than other age groups, particularly young women (10% at age 18-29 years compared to 1% for 30-49 year-olds).

As the paucity of information here suggests, further research is needed to compare the impact of alcohol on the workplace in different EU countries (in similar fashion to that for crime, described above). Nevertheless, using the review of national-level studies described in Chapter 3, we can estimate that alcohol use caused a potential €9bn-€19bn worth of productivity to be lost in the EU in 2003 due to absenteeism, and a further €6bn-€23bn of lost productivity due to unemployment. As stated throughout this chapter, these figures not only provide a tentative estimate of the

scale of alcohol-attributable harm in Europe, but will also, hopefully, act as an incentive to action on the research recommendations outlined in Chapter 10.

Nuisance and harassment

Information on the scale of alcohol-related nuisance and harassment is only available from the Nordic countries, which are unlikely to be fully representative of the whole EU. Nevertheless, this research does suggest that nuisance and harassment may be one of the areas with the widest impact. Around 1 in every 5 people in the Nordic countries has been kept awake at night by 'drunken noises' (ranges are for national averages from four countries: 16%-22% men, 22%-24% of women). Nearly as many people have been harassed in a public place by drunk people (12%-26% men; 14%-25% women), while around 10% of men (8%-12%) and 20% of women (15%-25%) have been afraid of drunk people in the street (Mäkelä *et al.* 1999; Rossow and Hauge 2004). In parallel to most of the harms from people's own drinking (e.g. work-related harms), these problems from other people's drinking were more likely at younger than older ages for both sexes (Mäkelä *et al.* 1999; Rossow and Hauge 2004).

HEALTH HARMS

A global study of health risks conducted by the World Health Organization allows us to make an estimate of the overall effect of alcohol on health in Europe (see Box 6.4). All of the figures presented here are for the net effect of alcohol compared to no consumption of alcohol at all – in other words, taking into account the beneficial effects of some patterns of low-level alcohol consumption on some illnesses. This raises some problems, however, because (as discussed in Chapter 5) the lowest-risk level for alcohol consumption in much of Europe is above zero at older ages. In practice, this means that the results presented here are underestimates of the full-scale of alcohol-related harm, if by this we mean the harm compared to the lowest risk situation.

Methodological issues

The results are particularly sensitive to the risk estimate for heart disease One recent study has suggested that when changes in alcohol intake are taken into account, the J-shaped risk curve can still be found but the risk ratios for heart disease and overall mortality are substantially altered (Embersson *et al.* 2005; see Figure 5.8 in Chapter 5). Overall, the study showed a lower mortality rate in drinkers as a whole (compared to non-drinkers) using the conventional method, but a *greater* mortality rate using a single measure of average intake (conventional all-cause mortality risk for drinkers of 0.86 compared to abstainers, but 1.11 using revised method; present authors' calculations from published results).

The results are unlikely to be accurate at older ages The relative risk of alcohol for coronary heart disease declines with age (Abrams *et al.*, 1995), but in most estimations of alcohol-related harm, including this report, the same relative risks have been used for all age groups (see Chapter 5). This leads to an overestimation of deaths caused and prevented by alcohol in older age groups, which is especially relevant for coronary heart disease deaths prevented, where there is almost certainly

an overestimate using the current methodology. It is likely that the majority of the beneficial effects of alcohol would be significantly reduced if age-specific relative risk estimates are used (Rehm *et al.* 2005). Further, there may be inaccuracy in death certificate recording in older age, whereby a higher proportion of deaths are recorded as ischaemic heart disease (see Chapter 5).

Box 6.4 – THE WHO'S GLOBAL BURDEN OF DISEASE STUDY

*The figures presented here are all adapted from the Global Burden of Disease (GBD) study on the relative impact of different health risks internationally.*⁹

- **Adapting the figures:** the GBD figures were originally calculated for the three WHO sub-regions of Europe. These sub-regional figures have been turned into EU-wide figures on the basis of the size of the adult population in each country.¹⁰
- **Patterns of drinking:** due to evidence of an independent effect of ways of drinking (see chapter 5), the GBD study tried to look at the effect of both the volume of alcohol and the way that it is drunk:
 - A crude attempt was made to summarize drinking patterns (sometimes based on expert opinion alone), giving each country a score of 1 (least harmful) to 4 (most harmful).
 - These patterns combined information on abstinence, heavy drinking occasions, drinking with meals and drinking in public places.
 - A multilevel modelling technique was then used to look at the different impact of volume of drinking for each pattern, looking only where drinking patterns are thought to play a large part (heart disease and injury).
- **The EU10 and EU15:** Although scores of 1 and 3 are found in both regions, EU10 countries mainly had a score of 3, while most of the EU15 had a score of 1. The more harmful patterns in the EU10 were calculated as having a greater negative health impact, which explains the differences shown in Figures 6.3 and 6.4 below.¹¹

A net beneficial effect only occurs for deaths at older age The net impact of alcohol on mortality is very different at different ages, due to the changing conditions

⁹ For details, see (Rehm *et al.* 2003a; Rehm *et al.* 2003b; Rehm *et al.* 2004). ICD-10 codes are given for each health area below; to convert to ICD-9 codes, use the list available from http://www3.who.int/whosis/burden/estimates/GBD_cause_list.pdf.

¹⁰ For two areas (intentional injury and unintentional injury), the figures gained using the method in Box 6.4 were disaggregated into two component parts (homicide and suicide for intentional injury, road traffic accidents and other accidents for unintentional injury). This was done by applying the reported age-scaled Alcohol Attributable Fractions (AAFs) from the GBD study to reported numbers of deaths taken from the WHO's Health For All database (figures were adjusted so that these came to the same total as that using the more general method). Parallel methods were also done within cancer (breast cancer) and gastrointestinal conditions (cirrhosis), with the reported AAF applied to the mortality and morbidity found elsewhere in the GBD project, and the figures for the remaining conditions (other cancers and type II diabetes) obtained from the residual figure.

¹¹ More precisely, the average pattern for the EURO-A sub-region was 1.34, while EURO-B was 2.93 and EURO-C 3.62. The different aggregate values for the EU10 and EU15 are because all of the EU15 countries are in sub-region EURO-A, while the EU10 countries are split between EURO-A (Cyprus, Malta, Slovenia), EURO-B (Poland and Slovakia) and EURO-C (Estonia, Hungary, Latvia, Lithuania). Calculated independently, the population-weighted pattern value for the EU15 is 1.27 and the EU10 is 2.80.

that people die from during the life-course (see Chapter 5) (Britton and McPherson 2001; McPherson 2004). Drinking has a damaging effect on health overall in youth and middle-age, but this can be obscured by the small beneficial impact at older ages given the greater overall rate of death with increasing age (White, Altmann, and Nanchahal 2004; Connor *et al.* 2005). This is illustrated in Figure 6.1, which shows the share of deaths attributable to alcohol in EU citizens who die younger than age 70 years. For those who die between the ages of 60 and 69 years, 5% of the 449,000 male deaths and 1% of the 247,000 female deaths are due to alcohol. This means that alcohol is responsible for a *net* 115,000 deaths up to the age of 70 in the EU.¹²

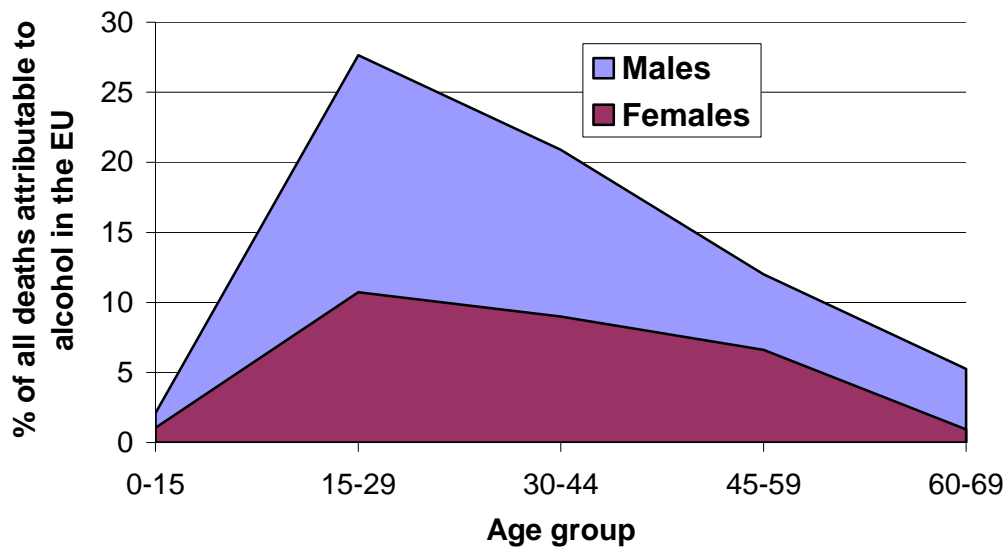


Figure 6.1 The share of deaths attributable to alcohol in EU citizens younger than age 70 years (year 2000). Source: GBD data (Rehm 2005).

Another way to view this is to consider potential years of life lost due to alcohol. Without accounting for the methodological problems described above, recent Canadian data shows that it is only in the age group 80+ years that alcohol leads to a benefit, Figure 6.2.

The number of deaths caused by drinking above the lowest-risk level is much higher than the 'overall' number of deaths Alcohol mortality figures are very sensitive to the situation they are being compared with – in other words, whether they are relative to no alcohol at all, or relative to level of drinking with the lowest risk of death (nadir). This can be seen in the detailed UK analysis (White, Altmann, and Nanchahal 2004), where the net effect of alcohol use in women was only 166 deaths, but drinking over the nadir (0-24g alcohol/day depending on age) caused over 3,500 deaths. This was over 85% of the total number of deaths before taking into account the cardioprotective effect, suggesting that the number of deaths above the nadir in the EU will be much closer to the gross figure (see below) than the net figure.

¹² This is based on the Rehm 2005 paper shown in Figure 6.1 and uses the same population-scaling method as described for the main results in Box 6.4.

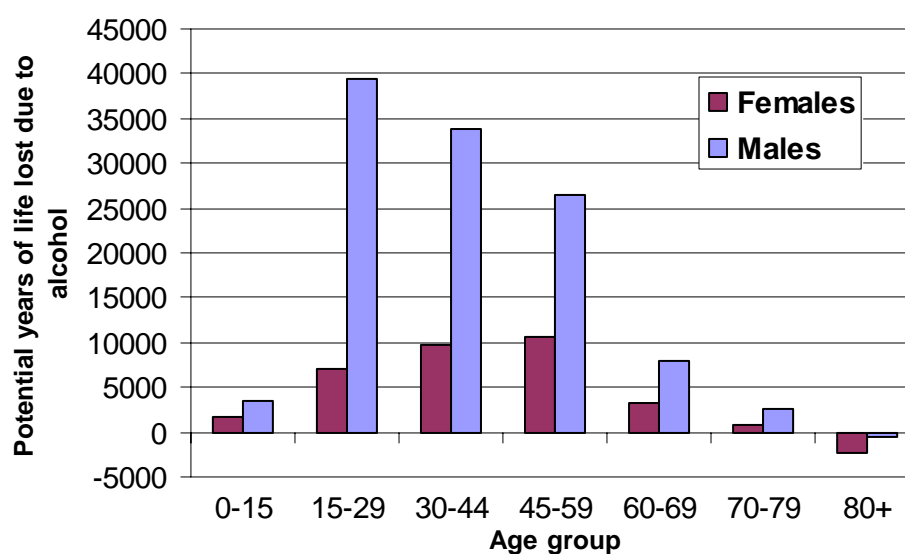


Figure 6.2 The potential years of life lost in Canada due to alcohol (year 2001). Source: Rehm *et al.* (2005).

Deaths due to alcohol in the EU

It can be estimated that within the 25 countries of the European Union, alcohol causes nearly 195,000 deaths each year (Figure 6.3); when the six other study countries are included this figure rises to 260,000. This is equivalent to 6% of all male deaths, together with 2.5% of all female mortality

At the same time, without taking all of the above methodological problems into account, it is estimated that around 160,000 deaths are delayed in Europe (particularly for women) relative to a situation of no drinking at all. As described above, caution should be taken in using these figures, since most of the deaths delayed are occurring at an age of death of more than 70 years, and particularly more than 80 years, where there is considerable uncertainty in the reliability of the estimates.

Looking at the full age-range – and bearing in mind the substantial methodological problems discussed above – the estimated net effect of 35,000 deaths in the EU breaks down into a large *negative* impact on men (nearly 5% of all mortality) and a *positive* but smaller effect for women (3%). Looking at the more limited age range – where the estimate is likely to be more accurate, but the impact on those over 70 is omitted – the net 115,000 deaths breaks down into a large negative impact on men (5% of all mortality) and a smaller but still negative impact on women (1%). The difference between men and women is due to both the fact that women die at older ages than men (thus accentuating the potential beneficial impact of alcohol) and due to women's less hazardous and harmful drinking, which also accentuates a reduced risk for coronary heart disease.

Burden of ill-health

The other way of assessing the scale of alcohol as a public health problem is to examine the whole burden of illness and disease, looking at years of healthy life. The

WHO uses a measure called Disability-Adjusted Life Years (DALYs) to estimate the number of healthy years of life lost due to each risk factor. For example, while a year of perfect health will count as 1 and a year of death will be 0, a year of damaged health that significantly affects Quality of Life will be somewhere in between. DALYs measure a gap in health between the current position and what could be achieved.¹³ The results differ from the mortality estimates in two key ways:

- First, illnesses that kill people earlier in life will become more important;
- Second, non-fatal conditions such as depression, which significantly damage people's quality of life, will become more important.

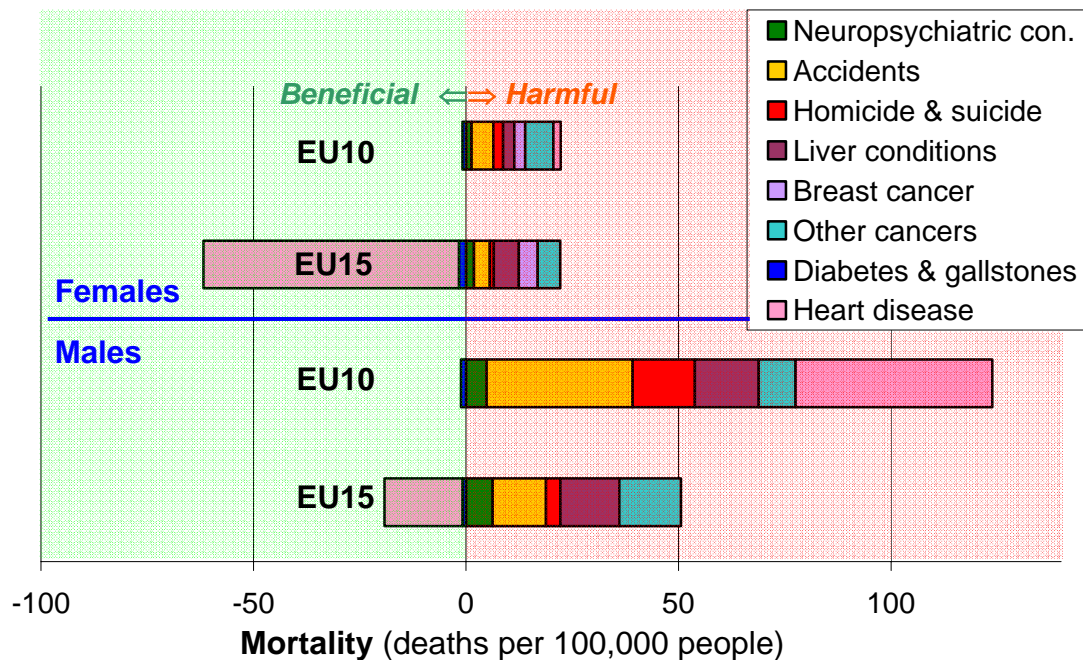


Figure 6.3 Alcohol-attributable mortality in the European Union

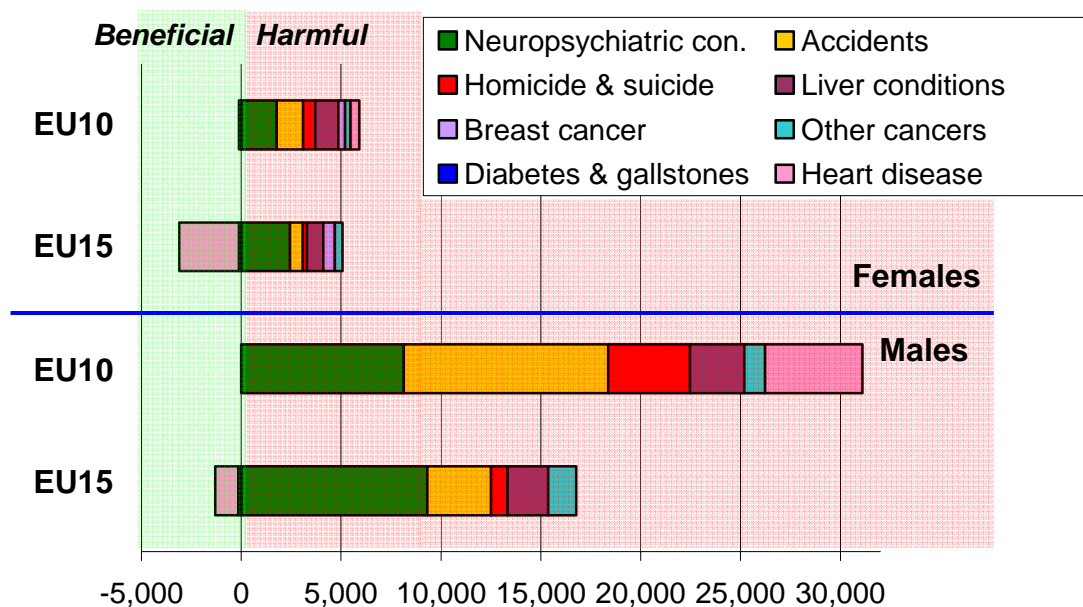
Adapted from WHO's Global Burden of Disease study (Rehm et al. 2004)

This has the added advantage of reducing the problem of whether to compare alcohol to no consumption at all, or to the lowest-risk drinking level. Looking at the previous UK example, any alcohol use is responsible for 23,000 years of life lost each year in women (6% of the total), but drinking above the nadir only changes this to 25,000 years of life lost (White, Altmann, and Nanchahal 2004). While this difference is still significant, it is clearly of a different order of magnitude from the same question in the context of mortality.

Using this method of assessing morbidity losses, alcohol is responsible for the loss of over 4.5 million DALYs every year in the EU (7.4% of all DALYs; see Figure 6.4). Again, this is principally for men, accounting for 12% of all male ill-health and

¹³ It should be noted that DALYs cannot be expressed in terms of the indicator of health expectancy that has been adopted within the European Community Health Indicators (ECHI) project. Although similar in many ways, Healthy Life Years were chosen due to their positive orientation (valuing health rather than disability) and greater ease of communication. See http://ec.europa.eu/comm/health/ph_information/implement/wp/indicators/docs/ev_20050125_rd01_en.pdf.

premature death and a smaller but still sizeable 2% of all female ill-health and premature death. The larger proportion of the burden arises from alcohol-related neuropsychiatric conditions and accidents.



Burden of death and ill-health (DALYs per million people)

Figure 6.4 Alcohol-attributable burden of death and ill-health in the European Union

Adapted from WHO's Global Burden of Disease study (Rehm et al. 2004)

This makes alcohol the third-leading risk factor for death and disability in the European Union, ahead of obesity/overweight and nearly four times that of illicit drugs (see Figure 6.5). Only blood pressure and tobacco account for a greater morbidity toll.

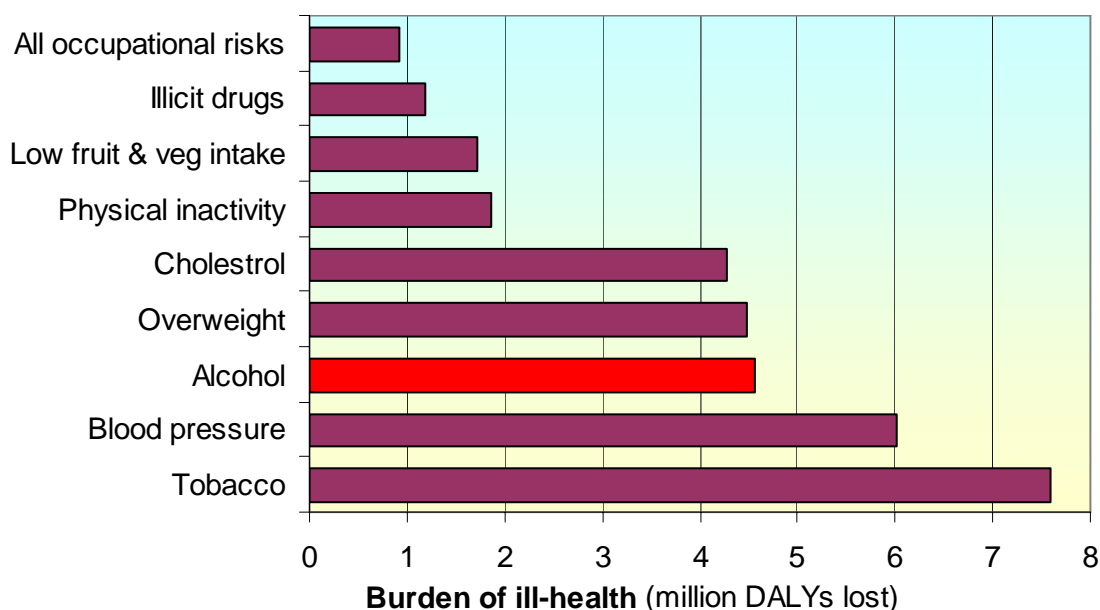


Figure 6.5 Top 9 risk factors for ill-health in the European Union. *Adapted from WHO's Global Burden of Disease study (Rehm et al. 2004)*

Intentional injury – homicide and suicide¹⁴

Over 2,000 **homicide** deaths per year are attributable to alcohol use – a small proportion of the total harm done by alcohol, but 4 of every 10 homicides that occur in the European Union. In the EU15 this reflects the burden of homicide more generally, but in the EU10 alcohol disproportionately affects homicide in men (accounting for half of all male murders). Beyond alcohol, the total homicide rates are generally much higher in the EU10 than the EU15 (most strongly of all in the Baltic countries), although it must be noted that there is considerable overlap between individual countries within the two groups. Taking the individual crime as the focus (as for other crimes above), studies from Finland, France (1973), Germany, Norway, Poland, Sweden and the UK suggest that 40%-70% of homicides are alcohol-related in some way (see footnote to Table 6.1 for sources). A more objective way to look at this is through the results of time-series analyses in 13 EU15 countries and Norway as part of the ECAS project (Rossow 2001; see below). Although the effect per litre was greater in northern Europe, the higher consumption levels in southern Europe mean that the overall estimated number of alcohol-attributable homicides is estimated to be similar in northern and southern Europe (see Figure 6.6). In actual fact, the estimated share of all homicides that are due to alcohol is slightly higher in southern (61% of all homicides) than northern Europe (50% of a higher homicide rate; see also the more detailed discussion under ‘crime’ above).

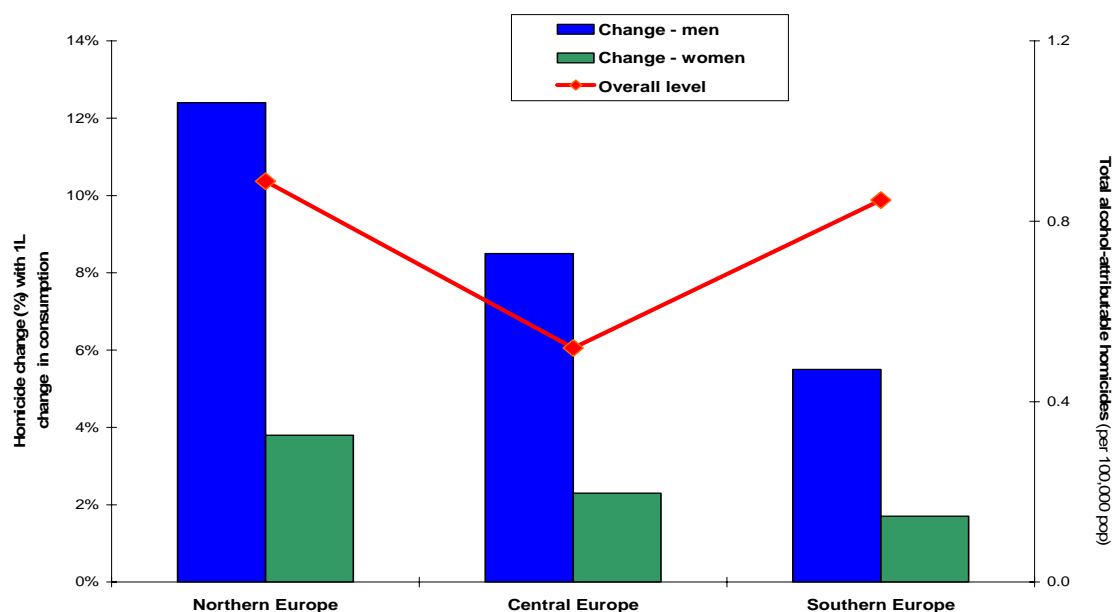


Figure 6.6 Homicides and alcohol in northern, central and southern Europe. Source: Rossow 2001

¹⁴ Unlike for the other health categories described in this chapter, two separate estimates are available for deaths due to homicide/suicide – (i) using the technique described in Box 6.5 (i.e. population-scaling the overall results), based on ICD-10 X60-Y09, Y35-Y36, Y87.0, Y87.1; or (ii) combining the deaths due to homicide (ICD-10 X85-Y09) and suicide (ICD-10 X60-X84) in each country with the alcohol-attributable fractions for each age and sex presented in the GBD study. The second method is likely to be more accurate as it is country-specific and more detailed, but it is not comparable with the other mortality figures reported in this chapter. For this reason, the numbers of deaths presented in this chapter in the ‘Intentional Injury’ section are slightly lower than those presented in the ‘Mortality’ section (including Figure 6.2).

Deaths by **suicide** account for 7%-8% of the total deaths due to alcohol, a toll that is greater for men. The 10,000 deaths represent more than 1 in every 6 suicides and nearly 1 in 4 of those in the EU10. Male suicide is also much more common in the EU10 in parallel fashion to most alcohol-related conditions (although the candidate countries of Bulgaria and Romania have relatively low levels). Southern Europe contains some of the lowest suicide levels in Europe, although the lowest, Greece, where suicide is one-fifteenth as common a cause of death as in Lithuania, has many more deaths of undetermined intent, suggesting that differing recording practices on death certificates may also be at work. However, this fits with previous research conducted on a national level that suggests stronger alcohol effects on suicide are found in the Nordic countries than in France, Portugal or Hungary (Rossow, Pernanen, and Rehm 2001) or more generally in southern and central Europe (Norström *et al.* 2001).

Morbidity figures are only available for intentional injuries as a whole, but confirm the substantial role of murder, assault, suicide and attempted suicide in the European burden of disease. Although less pronounced than for mortality, alcohol-attributed intentional injuries nevertheless reduce EU health by 350,000 DALYs, and are around twice as prominent in the EU10 as in the EU15.

Unintentional injury – drink-driving and other accidents¹⁵

The best estimate from the GBD suggests that more than 1 in 3 **road traffic fatalities** are due to alcohol. These drink-driving deaths are not equally split between genders, with 15,000 male deaths compared to 2,000 deaths for females. It has also been estimated that 2%-3% of all journeys in the EU15 have a drinking driver (European Transport Safety Council 2003), with research consistently showing that the share of alcohol involvement rises with the severity of the problem. For example, alcohol-related accidents were 11% of all traffic accidents in Latvia in 1999, but accounted for 32% of serious and 39% of fatal accidents (Baltic Data House 2001). Looking only at damage to property, the cost of traffic accidents in the EU has been estimated to be €10bn in 2003.

A large body of evidence suggests that the burden of alcohol-related traffic fatalities has a different weight in different regions of Europe. Overall traffic fatality rates are significantly worse in southern Europe

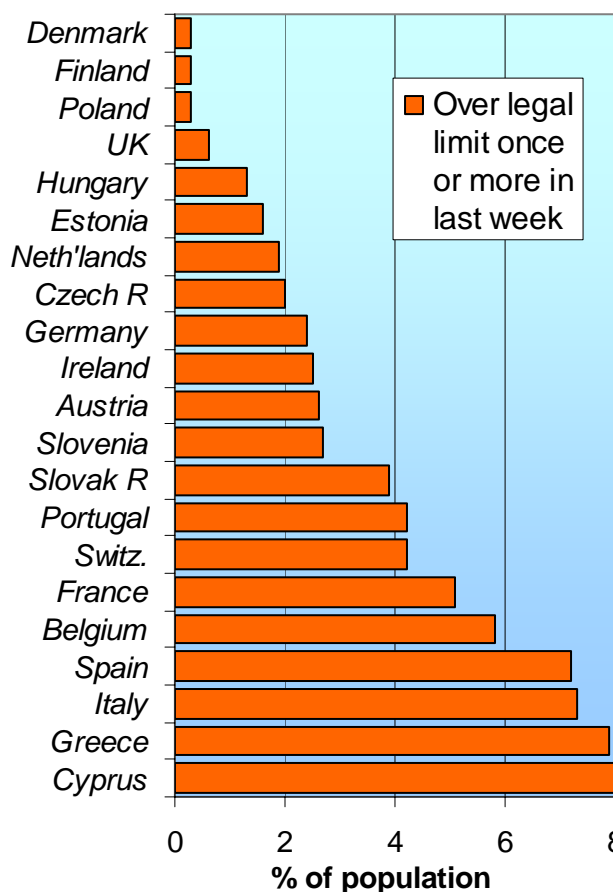


Figure 6.7 Drink-driving behaviour in Europe

Source: *Project on Social Attitudes to Road Traffic Risk in Europe* (Sardi & Evers 2004). Cyprus result (21.8%) is off the displayed scale.

¹⁵ ICD-10 V01-X59, Y40-Y86, Y88,Y89; road traffic fatalities based on ICD-9 E810-819, E826-829, E929.0 (HFA database and GBD sources do not give ICD-10 codes).

than the rest of the EU15 and much of the EU10, something that has become much more apparent over the last 30 years. Although one third of Europeans say they never drink and drive, the variations are so wide that this is true for five-times the proportion of Swedes than Italians (Sartre 1998). Respect for the legal limits follows a similar pattern, with southern Europeans being far more likely to say they exceed this than others in the EU15 and EU10 (see Figure 6.7; Sardi and Evers 2004). The differential between the EU10 and EU15 is also much worse than before the mid 1980s, where a lower EU10 rate for women has been replaced by a 50% greater rate than the EU15 in recent years.

Other **accidental causes of death** show an even larger gap across Europe, with EU10 death rates from injury and poisoning, accidental falls, accidental drowning and other external causes all at least double the EU15 rate. Interestingly, the EU15 has more work-related accidents, yet the death rate for these is higher in the EU10 (other than Portugal, Spain and Italy), suggesting differences in accident reporting, health and safety practice, or accident severity across the EU. Similarly, when school students are asked about accidents due to alcohol, more EU15 students report either an injury or going to hospital due to their drinking than those in the EU10, although the highest values were found in the UK and Ireland (Hibell *et al.* 2004).

The cost due to alcohol in human lives is even higher for this group of 'other accidents' than for drink-driving, with a toll of 27,000 deaths. Together with road traffic accidents this accounts for 1.1m DALYs, the majority for men, and accounting for one quarter of the male burden of disease and disability from alcohol.¹⁶

Neuropsychiatric conditions¹⁷

Neuropsychiatric disorders include depression and epilepsy, as well as directly alcohol-attributable disorders such as alcohol psychoses and dependence. On their own these account for an enormous part of ill-health in Europe, equivalent to 4% of the entire burden of Europe's death and disease. This also means that the alcohol-attributable part of them is the single most important aspect of alcohol-attributable morbidity, with the associated 2.5m DALYs corresponding to over 45% of the alcohol burden. A conservative estimate of depression accounts for 150,000 DALYs of this, equivalent to over 200,000 major depressive episodes across Europe each year.¹⁸ Given that most neuropsychiatric conditions are damaging to health rather than fatal, it is unsurprising that they lead to 'only' 17,000 deaths (a much smaller proportion of the total burden than for morbidity).

Neuropsychiatric conditions are also one of the few areas that affect the EU15 much more than the EU10. Mental and behavioural disorders have been falling in the EU10 since the mid-1990s while rising in the EU15, reaching the stage in 2001 that the standardized death rate in the EU15 compared to the EU10 was double for males and sevenfold for females. Unusually, male deaths ascribed to alcohol psychoses and alcohol dependence (ICD-9 codes 291 and 303; ICD-10 F10) are now more evenly distributed across Europe, following the 'spike' in deaths in the Baltic countries and Hungary in the mid-1990s.

¹⁶ For clarity of meaning, the shares of particular conditions within the burden of disease and disability (as well as mortality) are expressed as the percentage of the detrimental (gross) impact.

¹⁷ ICD-10 F01-F99, G06-G98.

¹⁸ Estimate obtained by combining the GBD alcohol-attributable fraction for depression with the HFA figures on the numbers of depressive episodes in the EU countries each year.

Gastrointestinal conditions¹⁹

Cirrhosis of the liver is one of the most well-known harms stemming from alcohol consumption, and is often used as a general indicator of alcohol-related harm. Looking across the whole of the EU, over 45,000 cirrhosis deaths are caused by alcohol, accounting for nearly two thirds of all cirrhosis deaths and one quarter of all alcohol-attributable mortality. The relative impact of cirrhosis is greater in mortality than morbidity, however, with the large number of deaths equivalent to only 75,000 DALYs due to the relatively late onset of much cirrhosis. For both deaths and DALYs, about twice the harm occurs to men as women, probably due in large part to differences in alcohol use (see chapter 4).

Looking at cirrhosis rates more generally, it is interesting to notice that there is a convergence in cirrhosis rates within the EU15.²⁰ The main cause of this has been the relative fall in deaths in southern European countries, from 6 times that of northern European countries between 1950 and 1980 to less than double the (increased) northern European rates in 2001.²¹ This can be attributed to changes in drinking in southern Europe (see Figure 6.8), which saw a large decrease in consumption alongside the fall in cirrhosis rates (see also Chapter 4). This is further supported by a cross-national comparison of 15 western European countries which shows that countries with high per capita consumption generally have high mortality rates from cirrhosis (Ramstedt 1999; Ramstedt 2002).

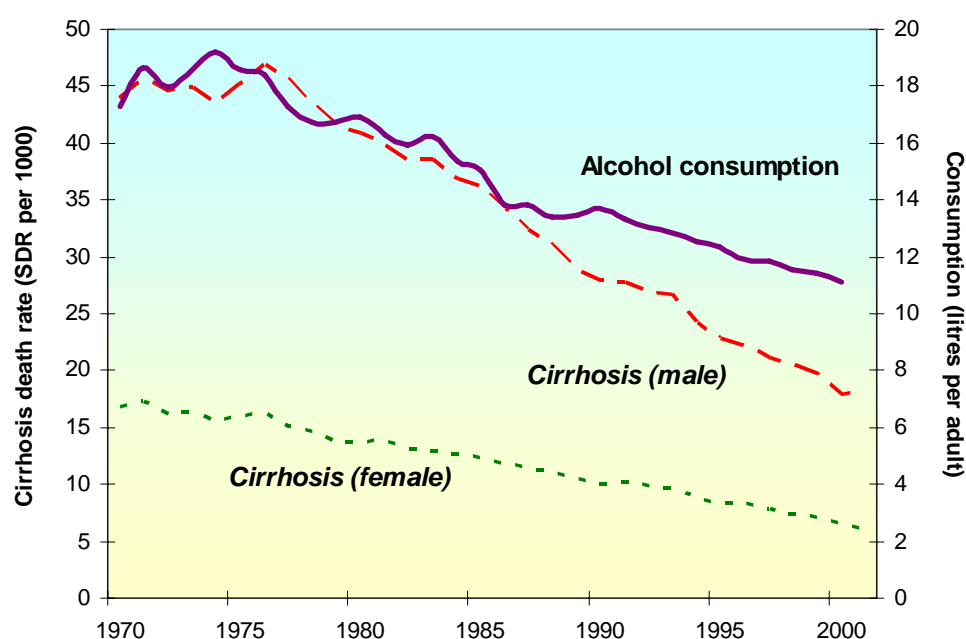


Figure 6.8 – Alcohol consumption and cirrhosis rates in southern Europe
Source: Un-weighted average of France, Italy, Greece, Spain and Portugal data from the HFA database

¹⁹ ICD-10 K20-92.

²⁰ Convergence measured using the coefficient of variation (see chapter 4). Historical mortality data taken from the WHO's HFA database (<http://www.euro.who.int/hfad>).

²¹ 1950s analysis taken from the ECAS study (Ramstedt 2001a); 2001 comparison is authors' own analysis of HFA data.

Cirrhosis levels within the EU10 have also converged slightly, but although some countries have similar levels to the EU15, others – such as Romania and Hungary – have much higher levels. The anomalously high rates in Hungary, Slovenia and Romania have not yet been fully explained, although recent research suggests that hepatotoxic compounds in illegally-produced spirits may be partly responsible (Szücs *et al.* 2005) (see Chapter 5); certainly these countries all have very high levels of unrecorded consumption (see Chapter 4).

Endocrine and metabolic conditions²²

The GBD included the protective effect of alcohol on type II diabetes within the EURO-A sub-region (there was insufficient evidence to extend this to other regions; see also Chapter 5). It has been estimated that this prevents nearly 6,000 deaths and 50,000 DALYs per annum.

Cancers²³

Alcohol is an important modifiable risk factor for cancer (Danaei *et al.* 2005), and, although not consistently prominent in public debates on the health risks from alcohol, the more than 50,000 deaths due to cancer represent the single largest cause of death arising from alcohol use. Unlike most alcohol-related harms, cancers are also a particular risk for women, with 11,000 of the deaths being those of female Europeans dying from alcohol-attributed breast cancer every year. In both cases, alcohol-attributable cancer has a greater negative impact through death than disability, due to a combination of relatively higher age of death (and, therefore, fewer life-years lost) and relatively greater case fatality.

Reproductive conditions²⁴

Although a number of reproductive conditions have been linked to alcohol (see Chapter 5), only the results for low birth weight were presented within the GBD project. Nevertheless, alcohol is responsible for 1%-2% of low birth weight in Europe, equivalent to 5,000 DALYs, of which nearly half are in the EU10. Using European data on the numbers of births of low birth weight, we can estimate that alcohol is responsible for 60,000 underweight births each year in the EU.²⁴

Cardiovascular conditions²⁵

Alcohol can be both detrimental and beneficial for heart disease depending on the quantity consumed and the patterns of drinking involved (see Chapter 5). The European Union is a case in point of this ambiguous effect, with 150,000 net deaths being delayed in the EU15 and 17,000 net deaths caused in the EU10 (if the EU countries are instead grouped into regions where alcohol has a positive or negative effect on cardiovascular mortality, then the gross figures are 155,000 deaths delayed and 22,000 deaths caused).²⁵ Although the cardioprotective effect of alcohol is well established, the size of these estimates may be a significant overestimate (see Chapter 5 and discussion above), and caution should be used in interpreting these numbers.

This situation in Europe contrasts starkly with estimates for the rest of the world, given that alcohol globally causes over 250,000 deaths through cardiovascular

²² ICD-10 E10-E14.

²³ ICD-10 C00-C97.

²⁴ ICD-10 P00-P96; Data on low birth weight (defined as under 2500g in the GBD) and total numbers of births from the WHO's HFA database.

²⁵ ICD-10 I00-I09. Note that the calculation of mortality outside of western Europe was estimated using a different method based on alternative assumptions (see Rehm *et al.* 2004 for details).

conditions alone. In more similar fashion to global trends though, health and mortality gains for women are much greater than those for men.

Directly alcohol-attributable mortality

Outside of the GBD study, it is possible to look at changing levels of alcohol-attributable harm through conditions that are classified as alcohol-related (e.g. the country reports in WHO 2004). These have been examined in detail among the EU15 in the second half of the 20th century, looking at areas of cultural and geographical similarity (here referred to as southern, northern and central European) and using a combined mortality measure covering several ICD codes (AAA).²⁶ This found that there was a roughly five-fold difference throughout the last 50 years between the area of Europe with the highest AAA mortality rates compared to the area with the lowest. Perhaps surprisingly, the actual ranking of the areas also reversed in this period. Between 1950 and 1965, AAA mortality rates were highest in southern Europe and lowest in northern Europe for both men and women, but in 1995 the converse was true. This is due to both declining rates in southern Europe and increasing rates in most of northern Europe, although Sweden peaked in the early 1980s. Mortality rates also increased in most of central Europe, with the exceptions of Austria and Belgium which have seen declines in the most recent period.

As discussed in Chapter 5, these conditions are particularly vulnerable to variations in coding practices, which can make them difficult to compare across time and space. In this case, there is no correlation at first sight between average consumption per adult and AAA-deaths across the EU15, Figure 6.9.

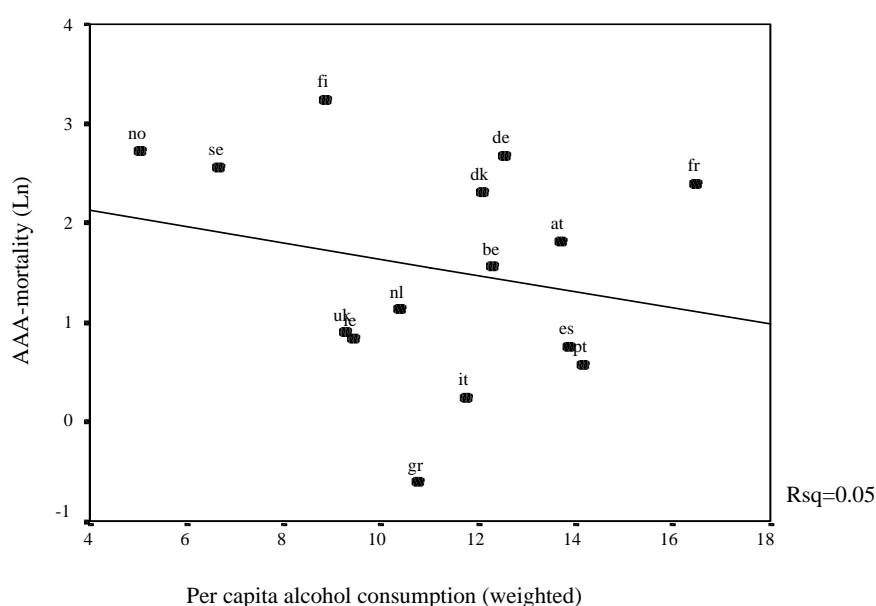


Figure 6.9 Relationship between per capita alcohol consumption and AAA-mortality²⁷ Average for the period 1987-1995. Source: Ramstedt (2001c).

²⁶ Combined measure includes “alcoholism”/alcohol dependence syndrome (ICD-9 303), alcoholic psychosis (ICD-9 291), alcohol poisoning (ICD-9 E860), “alcohol abuse” (ICD-9 305.0), alcoholic cardiomyopathy (ICD-9 425.5), alcoholic gastritis (ICD-9 535.3) and alcoholic polyneuropathy (ICD 357.5; Ramstedt 2001a).

²⁷ Combined measure includes “alcoholism”/alcohol dependence syndrome (ICD-9 303), alcoholic psychosis (ICD-9 291), alcohol poisoning (ICD-9 E860), “alcohol abuse” (ICD-9 305.0), alcoholic

This could be seen to confirm a general scepticism towards the use of ecological data for inferences about causal relationships (Robinson 1950) – if another factor that is related with alcohol consumption and alcohol-related mortality is omitted, the estimated effect of alcohol will be biased. However, if the countries are separated into the three groups of countries, then the relationship between consumption levels and AAA-mortality is strongly positive (Ramstedt 2001c), Figure 6.10. This suggests both that recording practices are affected by cultural factors, and that consumption levels are related to AAA-mortality rates within a single culture.

A striking contemporary example of the effect of alcohol consumption on mortality can be seen over the past decades in England and Wales, where sharp rises in directly alcohol-attributable mortality have followed sharp rises in alcohol consumption. A national analysis of mortality where alcohol is an underlying cause found that the rates doubled between 1979 and 2000 (Baker and Rooney 2003), while a regional study found an even steeper increase for the mention of alcohol on mortality certificates (Goldacre *et al.* 2004). These studies show how consumption changes can have both a lagged effect as well as a near-immediate impact on levels of harm (see below; this has also been predicted theoretically, cf. Rehm and Gmel 2001). Here, the rise in mortality coexists with a period of relatively stable alcohol consumption (at least until a rise in the mid-1990s) but immediately follows a period of rapidly expanding alcohol consumption (which rose from 6.5 to 10.5 litres per adult between the years 1961 and 1979).

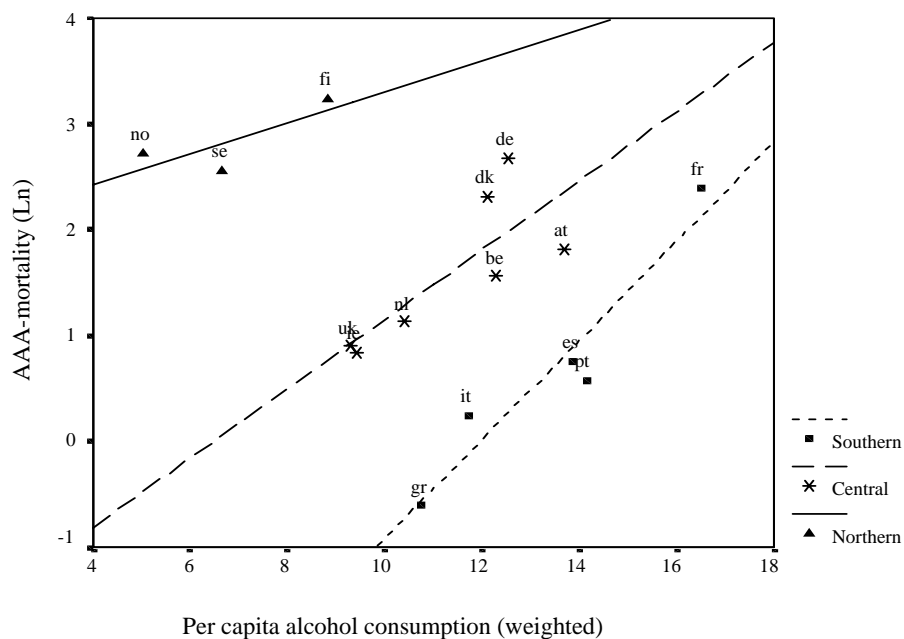


Figure 6.10 Relationship between per capita alcohol consumption and male AAA-mortality²⁸ in northern, central and southern Europe. Average for the period 1987-1995. Source: Ramstedt (2001c).

cardiomyopathy (ICD-9 425.5), alcoholic gastritis (ICD-9 535.3) and alcoholic polyneuropathy (ICD 357.5; Ramstedt 2001a).

²⁸ Combined measure includes "alcoholism"/alcohol dependence syndrome (ICD-9 303), alcoholic psychosis (ICD-9 291), alcohol poisoning (ICD-9 E860), "alcohol abuse" (ICD-9 305.0), alcoholic cardiomyopathy (ICD-9 425.5), alcoholic gastritis (ICD-9 535.3) and alcoholic polyneuropathy (ICD 357.5; Ramstedt 2001a).

Cost of ill-health

The cost of treating illnesses caused by alcohol has been estimated at €17bn in 2003 (2.0% of total EU health expenditure). In parallel to the GBD results, this figure takes into account the health benefits from drinking (although using a different and more approximate methodology; see Chapter 3). Beyond this, there is a further €5bn spent on treatment and prevention of harmful alcohol use and alcohol dependence.²⁹

Cost of lost life

The significant level of lost life due to alcohol described in this chapter can be valued either in terms of lost potential or production, or in terms of how much people are willing to pay to change risks to their health (see Box 3.3 in Chapter 3 for a discussion of intangible costs). Using the first method, alcohol consumption in 2003 is estimated to cause €36bn of future lost production in the EU. However, this method suffers from a number of disadvantages, not least that future production is not an adequate way of valuing life itself (see discussion in Chapter 3). Alternatively, the cost of lost life in the form of DALYs can be valued intangibly, according to the WHO's Commission on Macroeconomics and Health valuation (three times a country's GDP per capita) (Eichler *et al.* 2004). This leads to an estimate for the intangible cost of lost life as €260bn in 2003. However, this depends heavily on the value given to a DALY, which has varied substantially between studies (Eichler *et al.* 2004). Two other plausible figures are the lower value implied given by the decisions of the UK's National Institute of Clinical Excellence (Raftery 2001), or the higher value used in the UK government's costings of crime and road safety (Carthy *et al.* 1999; Dubourg, Hamed, and Thorns 2005). Applying these to the net loss of DALYs above, we estimate that the intangible cost of lost life in the EU was between €145bn and €712bn in 2003.

THE BURDEN OF ALCOHOL IN EUROPE

Harms to young people

The burden of ill-health due to alcohol is disproportionately shouldered by young men in Europe, 13,000 of whom die in the EU each year.³⁰ This represents 1 in every 4 deaths of young men, rising to nearly 1 in 3 in the EU10. Alcohol is responsible for a slightly smaller but still substantial death toll in young women, with the 2,000 deaths corresponding to 11% of female mortality at this age across the EU. The extent to which this is a greater burden than at any other age is shown by Figure 6.1 above,

²⁹ Several studies did not include costs for treatment or prevention, but it is difficult to tell whether this was due to a different organization of costs (where treatment is incorporated under residential psychiatric hospitals under healthcare) or data limitations. The studies reviewed produced a range of €1bn-€18bn for treatment and prevention, in all probability due to actual differences in spending as well as partial inclusions elsewhere and a simple inability to estimate some of the costs. For these reasons, this estimate should be treated with some caution.

³⁰ Estimates use the same recalculation method for the other GBD statistics, but the data for young people (aged 15-29 years) are taken from the age-disaggregated paper presented by Rehm, using an earlier paper (Rehm and Gmel 2002).

illustrating how the proportion of deaths due to alcohol is greatest on those aged 15-29 for both men and women.

The high level of harms to young people is due to the importance of intentional and unintentional injury as primary causes of death in young people, as opposed to heart disease later in life (see Chapter 5). Even in countries where alcohol is estimated to delay more deaths than it causes (such as England and Wales), drinking is a major cause of death at young ages, and still has a detrimental impact in most of middle age (see Figure 6.11).

Alcohol-related crime and disorder is also considerable among young people, with the only comparison to adults (from Estonia) suggesting that alcohol plays a greater part in assaults committed by juveniles than adults. A third of a million 15-16 year old students in the European Union report fights due to their own drinking (8% of boys and 4% of girls), although less in the South of the EU15 and, for girls, less in the EU10 (Hibell *et al.* 2004). Similarly, 220,000 students report getting into trouble with the police due to their drinking (4%), with higher rates for central European students and northern European girls than elsewhere. These figures are likely to be even higher for older young adults (17-30 year olds), as shown in Danish and Polish research. Young people also seem to see alcohol as an important cause of aggressive behaviour (in research from the Netherlands, the most important cause; KPMG 2001).

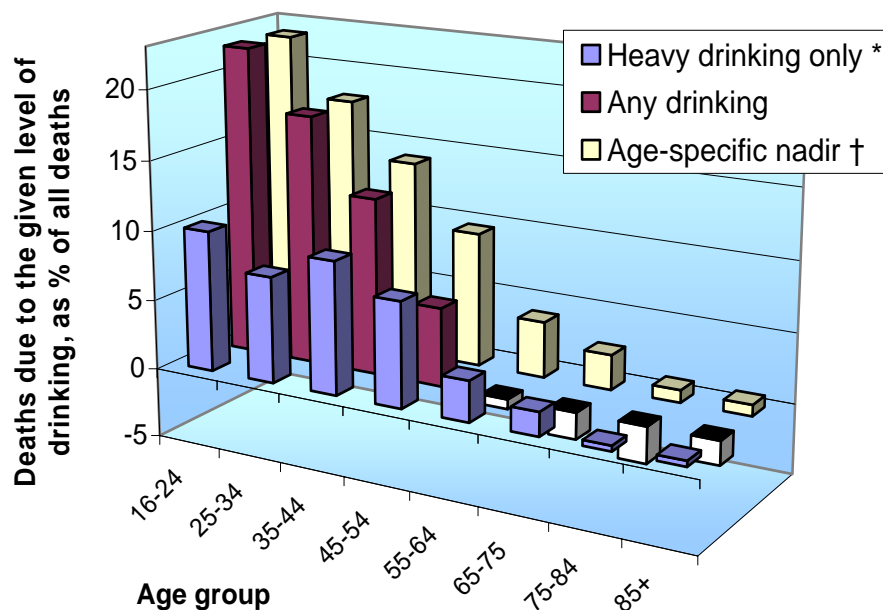


Figure 6.11 Male deaths due to different levels of consumption by age group in England and Wales 1997 * **Heavy drinking defined as 280+ g per week**; † **Age-specific nadir for men is zero (aged 16-34), 20g/wk (35-44), 50g/wk (45-54), 70g/wk (55-64), 80g/wk (65+)**. Source: (White, Altmann, and Nanchahal 2004).

Box 6.5 – The burden of alcohol in Europe	
Crime	Alcohol attributable crime estimated to cost European police, courts and prisons €15bn per year, as well €12bn in crime prevention expenditure & insurance administration and €6bn of criminal damage. The pain and suffering of crime victims has also been valued at €9bn–€37bn.
The family	5-9 million children are estimated to live in families adversely affected by alcohol at any one time.
Workplace	Based on a review of national costing studies, lost productivity due to alcohol-attributable absenteeism and unemployment has been estimated to cost €9bn–€19bn and €6bn–€23bn respectively.
Intentional injuries	Over 2,000 homicides (4 in 10 of all murders) and around 10,000 suicides (1 in 6 of all suicides) are attributable to alcohol each year.
Unintentional injuries	17,000 deaths are attributable to drink-driving each year (1 in 3 of the total), as well as 27,000 accidental deaths.
Neuropsychiatric conditions	Nearly half the burden of alcohol-attributable premature death and disability in Europe is due to neuropsychiatric conditions (alcohol dependence, depression, epilepsy), equivalent to 2.5 million DALYs. These conditions also account for 17,000 deaths each year.
Gastrointestinal, endocrine and metabolic conditions	Alcohol causes 45,000 deaths per year through cirrhosis of the liver, although the protective effect on type II diabetes delays almost 6,000 deaths per annum.
Cancers	Cancers are the largest single cause of alcohol-attributable death, accounting for 50,000 deaths each year. 11,000 of these are breast cancer deaths in women.
Cardiovascular disease	The EU as a whole demonstrates the dual direction of alcohol's potential effect on heart disease, with an estimated 150,000 net cardiovascular disease deaths being <i>delayed</i> in the EU15, but 17,000 net CVD deaths being <i>caused</i> in the EU10. Health gains for women are much greater than those for men. It should be emphasized that the size of the number of delayed deaths is likely to be an overestimate, and largely occurs at an age of death over 70 years, and particularly over 80 years.
Total health impact	More broadly, alcohol is responsible for 12% of male and 2% of female premature death and disability, after accounting for health benefits. Alcohol is a cause of a net loss of life up to the age of 70 years.

Other results from the ESPAD survey suggest that over 5% of 15-16 year old students have regretted sex they had due to alcohol. Worryingly from a public health perspective, 200,000 students (3.6%) report unprotected sex due to drinking – with girls in some countries being substantially more likely than boys to report this (UK, Sweden, Iceland, Finland). To a lesser extent, students also report having problems at work/school (2.4%) or with their teachers (1.2%) due to their drinking. As discussed repeatedly throughout this chapter, it is unclear how far the perceived role of alcohol in youth crime, education and sexual behaviour reflects its 'actual' role.

Inequalities between European countries

As has been noted even before the expansion of the EU on 1 May 2004 (WHO and European Commission 2002), there is a substantial health gap across Europe, with a difference in life expectancy at birth between EU countries of as much as 10 years. Despite substantial variations between different countries, there is a clear geographical pattern whereby no EU10 country other than Malta has a life expectancy equal to that of the lowest-ranking EU15 state. On average, this means that a child born in the EU10 in 2001 will have five years of life less than the average baby in the EU15.³¹ Understanding and acting on the 'health gap' is, therefore, both a new and substantial challenge for the European Union in the coming years.

Against this background, it is clear that many of the individual conditions that contribute to the health gap are linked to alcohol (McKee, Adany, and MacLehose 2004). Death rates from injuries and violence are consistently high in the EU10, as are cirrhosis rates in several countries. Patterns of drinking also ensure that alcohol exacerbates rather than mitigates the numerous other negative effects of drinking in eastern Europe. The estimates above suggest that alcohol is responsible for a difference in the crude death rate of approximately 90 extra deaths per 100,000 people for men and 60 per 100,000 for women (as well as 16,000 DALYs per million people for men and 4,000 DALYs per million for women) in the EU10, compared with the EU15. Although other factors are likely to play a role in the conditions that constitute the gap between countries (e.g. availability of weapons, social insecurity), these figures strongly suggest that alcohol is a key risk factor behind the divide.

Inequalities within European countries

Alcohol also contributes to health inequalities *within* countries, a finding that is unsurprising given the concentration of risky alcohol use in lower socioeconomic groups (see Chapter 4) and the greater mortality from directly alcohol-related conditions (see Chapter 5). For example, alcohol addiction in Sweden is the 2nd most important cause of inequalities in the burden of ill-health for men (7th for women), with several other alcohol-related diseases such as ischaemic heart disease and self-inflicted injuries also prominent (Ljung *et al.* 2005).

Many of the conditions that are responsible for health inequalities are strongly linked to alcohol, including external causes (e.g. violence, accidents), stroke and liver disease (across the EU15), ischaemic heart diseases (northern Europe) and cancer (southern Europe) (Kunst *et al.* 1998; Dalstra *et al.* 2004). Alcohol's role in these inequalities may be different in different countries, however; for example, the two countries with the largest inequalities in men aged 45-59 are France and Finland, but while the former finds this to be mainly due to liver cirrhosis and alcohol-related cancers, the latter is caused primarily through violent deaths (Kunst *et al.* 1998). A review by the International Agency for Research on Cancer (IARC) noted a likely role of alcohol in inequalities found for certain cancers in France and Italy, and were also suggestive of a possible role in Denmark, Switzerland and the UK, but not in Finland or Sweden (Møller and Tønneson 1997).

Research has also looked at alcohol's role in heart disease inequalities (measured by level of education), which show a north-south gradient within Europe – i.e. the levels

³¹ WHO Health for All database, 1 June 2004 edition.

of relative and absolute inequality are higher in northern than in southern Europe. Looking across six EU15 countries, countries with high levels of heavy drinking (>4 glasses a day for men, >3 for women) and low levels of lighter drinking (1-4 glasses a day for men, 1-3 for women) have greater levels of inequality in heart disease between different educational groups. Heavy drinking also positively correlates noticeably with cerebrovascular disease, although there was no link to the level of lighter drinking. These correlations are from a small number of countries only, and are also sensitive to the cut-off point for heavy consumption, but they do suggest that drinking levels are linked to inequalities in heart disease at the population level (Mackenbach *et al.* 2000).

These conditions similarly seem to be linked to inequalities between geographical regions, as well as inequalities between individuals – although data are only available for the UK. There, it has been estimated that alcohol's role in certain cancers, cirrhosis and suicide explain 6% of the 40,000 excess deaths in socio-economically deprived areas (Law and Whincup 1998), although heavy alcohol use appeared to decrease the gap for heart disease mortality (Morris *et al.* 2001). Tobacco- and alcohol-related cancers in the UK are 2-3 times more common in areas of the most deprivation than the least, with the difference between these and lung cancer suggesting a strong role of alcohol in Scotland, Ireland and Northern Ireland in particular (Quinn *et al.* 2005). A study of the North-West of England also found that chronic liver disease mortality and hospital episodes due to directly alcohol-attributable conditions were correlated with the deprivation levels of individual wards (Hughes *et al.* 2004).

Research from Finland further suggests that socioeconomic variables act on the collective as well as the individual level. Areas with the most manual workers had 20% more mortality directly attributable to alcohol than areas with the least, even after accounting for the *individual* relationship of occupation to mortality (Blomgren *et al.* 2004). Similar effects held for unemployment, urbanisation and social cohesion (measured as both 'family cohesion' and voter turnout), which accounted for around 40% of the alcohol-attributable mortality gap between areas *after taking account of all of these variables on the level of the individual*. This suggests that the drinking behaviour of people living nearby may be important for the behaviour of the individual, although further work is needed to separate this out from psychosocial mechanisms, nutritional variables and other possible area-level effects (Galea, Rudenstine, and Vlahov 2005).

It is also worth noting that gender health inequalities are linked to alcohol, which again is unsurprising given the gender differences in drinking discussed in Chapter 4. For example, men were five times more likely to die from a directly alcohol-attributable cause than women across the EU15 in 1995 (see above and Ramstedt 2001a). In Finland in the 1990s for those aged 15 years, alcohol will cause on average the loss of 2 years of life for men but just under ½ year for women. This means alcohol is responsible for 22% of the gender gap in life expectancy, and is more important than smoking for the gap in deaths up to the age of 50-55 years (Martelin, Mäkelä, and Valkonen 2004).

Harm to others

Much of the harm discussed here and in Chapter 5 occurs to people other than the drinker, although it is often difficult to say how much. Box 6.6 describes the key areas in which drinking has consequences for people other than the drinker. However, it is by no means complete, and future research may enable us to quantify deaths due to accidents other than drink-driving, lowered productivity at the workplace, or the un-estimated costs such as lost working time in crime or accident victims.

Box 6.6 – Harm to others in Europe	
Negative social consequences	One in five people in the Nordic countries have been kept awake by 'drunken noises', while 10% of men and 20% of women have been afraid of drunk people in the street.
Crime	Seven million adults report getting in fights due to their drinking each year, while 40% of all murders result from drinking.
Other harms	As shown in Box 6.5, alcohol places a large burden on the ◇ workplace (€9bn-€19bn) ◇ criminal justice system (€33bn) ◇ victims of crime (€9bn-€37bn of pain and suffering) ◇ drinkers' families (5m-9m children adversely affected) and others.
Drink-driving	Based on UK and US data, we can estimate that nearly 10,000 pedestrians, passengers or non-drinking drivers are killed each year due to <i>other people</i> who drink and drive. ³²
Babies	60,000 underweight births each year are due to the alcohol consumption of the parents.
Total social cost	The total tangible cost of alcohol in Europe in 2003 was €125bn, and is borne by both drinkers and non-drinkers.

THE BURDEN OF HARM AND CHANGES IN CONSUMPTION

This chapter has so far considered the full scale of harm that would be avoided in a hypothetical Europe without alcohol. However, this is not the goal of European public health policy, which instead needs to be supported by further evidence on how alcohol-related harm at a societal level changes with actual changes in drinking behaviour. This can then be used to inform the discussion on the types of alcohol policies covered in Chapter 7.

³² Official UK data suggest that less than half of the people killed or seriously injured in drink-drive crashes are the drink-drivers themselves (Department for Transport 2004), while similar results have been reported in the US (Miller, Lestina, and Spicer 1998). The UK proportion has been applied to the GBD figures above to make an estimate for the whole EU. Motorcyclists, cyclists and undetermined deaths/serious casualties were not included in these calculations as the division between 'drink-rider' and others is not possible from the data. Note that the UK data includes all crashes involving a drunk-driver, while the mortality estimate is for the smaller number of deaths caused by (not just involving) drink-drivers.

Much of the evidence in this context looks at changes in national per capita alcohol consumption over time. This chapter, therefore, starts with a brief discussion of what ‘per capita alcohol consumption’ actually measures, before moving on to the evidence from ‘natural experiments’, where consumption levels underwent a sharp change. Finally, the bulk of this section looks at how fluctuations in consumption levels link to fluctuations in harms over time (‘time-series analyses’).

What does ‘average consumption’ measure?

At its simplest, ‘average adult consumption’ refers to the total amount of pure alcohol drunk (calculated from the strength of different alcoholic drinks) divided by the number of adults in a population. This tends to relate to the proportion of heavy drinkers in a population – for example, Rose reported a very high correlation between mean consumption and the prevalence of heavy drinking across 32 countries (Rose and Day 1990). Similarly high correlations have also been shown within English regions (see Figure 6.12; Primatesta, Falaschetti, and Marmot 2002) and for sex- and age-specific subgroups across the Nordic countries (Mäkelä *et al.* 1999; Mäkelä *et al.* 2001).

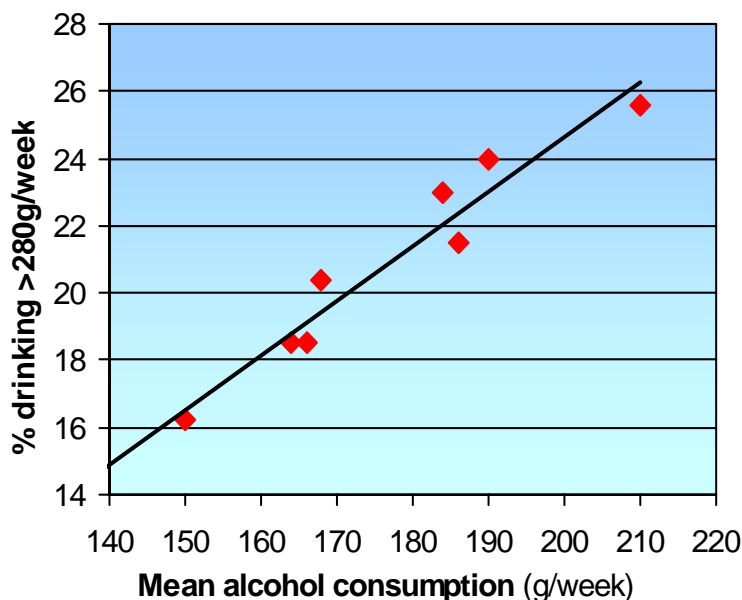


Figure 6.12 Alcohol consumption and the proportion of heavy drinkers in 8 English regions, 2002. (Source: Primatesta 2002)

Yet rather than showing anything useful for policymaking, average consumption could simply measure the drinking of heavy drinkers, who account for much of the alcohol drunk in a country. In the United States, for example, the top 2.5% of drinkers consume around a quarter of the total consumption, and the top 30% of drinkers account for nearly all (85%-90%) of the alcohol drunk (Greenfield and Rogers 1999). Corresponding figures for Europe seem to be slightly lower, but the top 10% of the European *population* still drink between a third and a half of all consumption (compared to 60%-70% in the US).³³

However, other evidence suggests that there is more to average consumption levels than simply the heavy drinkers. When Figure 6.12 is recalculated to look at the *average drinker* (the median) rather than the *average of all drinkers* (the mean), there was a reduced but still very strong relationship ($r > 0.7$) between average and heavy drinkers (Colhoun *et al.* 1997).³⁴ More comprehensive analyses from a variety of

³³ France, the Netherlands and Denmark are towards the lower end of this range, while the other Nordic countries plus Switzerland are towards the top (Lemmens 1991; Skog 1991; Mäkelä *et al.* 1999; Lemmens 2001; SFA 2004).

³⁴ If the amount drunk by each drinker is placed in order, the **median** is the middle value – i.e. there are as many drinkers below it as above it. Thus, 6 is the median number of the set 1, 1, 2, 6, 20, 20, 27.

countries worldwide (including Germany, the Netherlands, Switzerland and the UK from Europe) further show that there is an ‘impressive regularity’ in how average consumption links to the consumption levels of groups up and down the consumption scale (Skog 1985; Lemmens 1995).

One explanation of this is that people affect and are affected by the drinking behaviour of people around them, so that changes in drinking levels “spread like waves in water” through a society (Skog 2001c:327). Although this theory (known as the ‘theory of collective consumption’) has attracted some criticism with the argument that it can be difficult to test in practice, principally due to a lack of explicit definition of terms and mechanisms (Gmel and Rehm 2000), such criticism has been rejected, noting in particular that the ‘impressive regularities’ mentioned above demand a convincing explanation (Skog 2001c:330).

As a final note, it is worth being aware of how this idea *differs* from the earlier ‘Ledermann’ theory (Ledermann 1956; Lemmens 2001). The ‘theory of collective consumption’ rejects the idea of an unvarying mathematical relationship, and instead explains a consistent finding in countries through a lower-level social process (Skog 1985). Where wider forces have different effects on different people, or where this social process breaks down – in particular, where there are group divisions such as gender, class or race – then it is unsurprising when sub-populations move in different directions (Skog 2001c:330). For example, divergent trends in the Netherlands can be seen by age (Garretsen *et al.* 1999), gender (Neve *et al.* 1993) and other combinations of factors (Knibbe *et al.* 1985), as well as very clearly by socioeconomic status in Sweden (Romelsjö and Lundberg 1996). Yet changes in consumption still tend to happen across the whole population, as shown in the ‘impressive regularities’ noted above as well as several longitudinal studies – including from the Netherlands (Neve *et al.* 1993), Italy,³⁵ and Finland in the 1960s (Mäkelä 2002) – showing mean consumption and numbers of heavy drinkers moving in tandem.

In conclusion then, changes in ‘average adult consumption’ will show the behaviour of the heaviest drinkers more than lighter drinkers, but also tap into the wider tendency for populations to change their levels of consumption collectively. This is no unbreakable law, and sub-groups often show distinctive trends, as discussed at length in Chapter 4. Nevertheless, changes in ‘average consumption’ are *likely* to reflect the parallel movement of the whole population of drinkers – a finding that is important for interpreting the changes in levels of harm, to which we now turn.

Average consumption and levels of harm

The link of consumption levels to levels of harm for the individual has already been discussed in Chapter 5, showing that the mortality risk curve is largely linear at younger ages and J- or U-shaped at older ages. When these are aggregated to the population level, however, we can expect different results simply from theoretical considerations on risk curves.³⁶ The large amount of alcohol drunk by the heaviest

³⁵ Data from Italy in the 1990s (author’s calculation from data in Scafato *et al.* 2002) shows a very high correlation ($r > 0.95$) between mean consumption and the proportion of heavy wine drinkers in the male population. Other data from the same period similarly shows a reduction in the numbers of people giving 2 or more affirmative answers to the CAGE questionnaire 1997-2000, alongside a 5% reduction in consumption (Osservatorio Permanente Giovani ed Alcool 2001).

³⁶ For example, a *linear risk curve* would mean that any increase or decrease in average consumption would have a constant effect – so that it would not matter if the change occurred in the heaviest drinkers

drinkers (discussed above) also affects what we should expect, as the lowest-risk *population* consumption level for a U-shaped risk curve will be lower than that of *individuals* (Skog 1991). How much lower will depend on whether changes in average consumption are mainly a reflection of heavy drinkers or of lighter drinkers (see above), as well as on the precise risk curve, the numbers of abstainers, and the incidence of the different diseases associated with alcohol.

Although we do not currently know the population consumption level that leads to the fewest deaths, reasonable assumptions suggest that it could be as much as *five-times less* than that for an individual drinker (Skog 1996). In countries with high rates of coronary heart disease, this level may be around 3 litres of absolute alcohol per capita. In countries with low rates of coronary heart disease, the level is likely to be substantially lower.

Given that all European countries already consume in excess of this estimated level, we may expect reductions in alcohol consumption to lead to a net reduction in mortality (Anderson and Lopez 1996). There are two ways of testing whether these theoretical speculations are borne out in practice – through natural experiments, and through time-series analysis.

Natural experiments

A natural experiment that occurred nearly one hundred years ago illustrates the relationship between alcohol consumption and the harm done by alcohol. Prompted by the shortage of food supply during the First World War (but also motivated by state revenues and temperance concerns (Eriksen 2003)), the Danish government imposed a number of alcohol restrictions and tax increases in 1917 and 1918.

The result of this was that spirits prices multiplied, and that per capita consumption dropped sharply from about 10 litres in 1916 to a little more than 2 litres in 1918. In subsequent years, consumption grew somewhat but remained on a low level, 3-4 litres, until after the Second World War. As can be seen in Figure 6.14, the drop in alcohol consumption in 1917 and 1918 was accompanied by a marked decline in all of the harm indicators. Deaths from alcohol psychosis dropped by 97% between 1916 and 1918, and deaths from cirrhosis of the liver by 48% (Thorsen 1990).

Similar relationships happened in Paris during both world wars, when extreme shortages of alcohol were followed by dramatic declines in cirrhosis mortality (Ledermann 1964). More recently, the anti-alcohol campaign pursued by Gorbachev from 1985-88 was followed by a dramatic *decrease* in death rates, followed by an even steeper *increase* in death rates as alcohol consumption increased in the early 1990s following socio-economic transition (Bobak *et al.* 2004). The changes were particularly seen for AAA-mortality (see footnote 25 above) but were also strong for accidents, violence, cardiovascular diseases and other conditions where alcohol is a risk factor (Anderson 1998; Room 2001). Similarly, the increased alcohol consumption that occurred in Poland at the time of political and economic transition in the 1990s was associated with marked increases in deaths from liver disease and alcohol poisoning (Wojtyniak *et al.* 2005).

or the previous abstainers. Conversely, a condition with an **exponential risk curve** would be more sensitive to any changes in the highest-risk drinkers than changes lower down the distribution (Lemmens 1995).

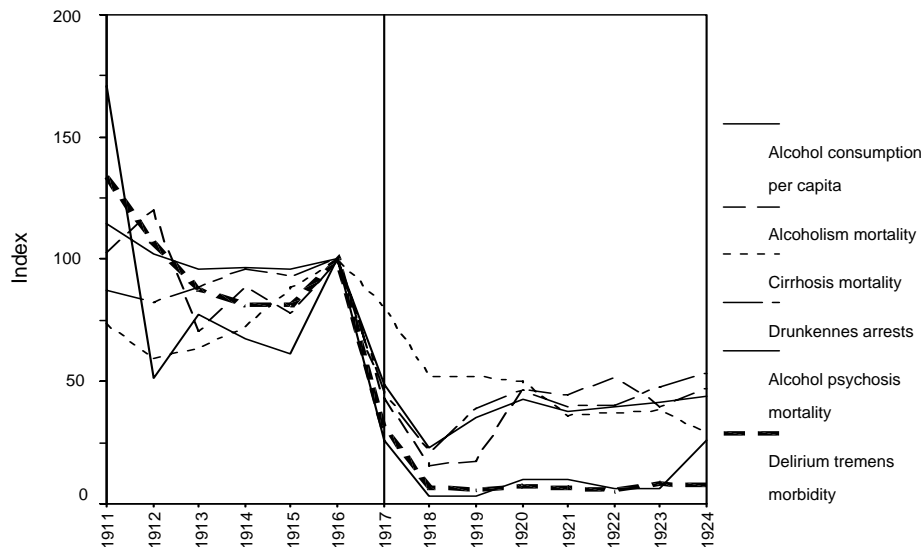


Figure 6.14 Per capita alcohol consumption and indicators of alcohol-related harm in Denmark 1911-1924. *Index, 1916 = 100.* **Source:** (Thorsen 1990)

Time series data

The connection between changes in population drinking and mortality has been comprehensively investigated within the ECAS study (Norström *et al.* 2001), using time-series analysis (ARIMA-modelling; see Box and Jenkins 1976) in 14 European countries for the years 1950 to 1995.³⁷ This technique analyses the relationship between yearly changes in consumption and harm, and estimates the relative change in mortality for a change in per capita consumption of one litre of pure alcohol.

The country-specific results were pooled for three country-groups that were assumed to represent three different drinking cultures: 'high-consuming' countries (France, Italy, Portugal and Spain), 'mid-consuming' countries (Austria, Belgium, Denmark, Ireland, Netherlands, U.K. and West Germany³⁸) and 'low-consuming' countries (Finland, Norway and Sweden).³⁹ The pooling has the advantage of strengthening the statistical associations, and makes cross-cultural comparisons of alcohol effects possible while preserving country-specific results. Results are summarized in Table 6.3 and results for men in mid-consuming countries shown graphically in Figure 6.15. Heart disease and all-cause mortality are then discussed in more detail given the complexity in transforming the individual-level risk to the societal level.

As can be seen from Table 6.3, nearly all conditions and total mortality showed a stronger effect of a one-litre change in consumption in the low-consuming countries

³⁷ Outside of Europe, similar results have been found using a parallel methodology in Canada (Skog 2003; Ramstedt 2004; Rossow 2004; Norström 2004; Ramstedt, in press).

³⁸ ECAS here looked only at West Germany as sufficient data were not available for Germany as a whole.

³⁹ These country groups are also described within ECAS as 'wine-drinking' (high-consuming), 'beer-drinking' (medium-consuming) and 'former spirits-drinking' (low-consuming) cultures, in terms of the beverage type that is traditionally associated with the country (see chapter 4). Neither terminology is fully satisfactory: both beverage preferences and consumption levels are changing within Europe, to the extent that the classifications become inaccurate (see chapter 4).

(i.e. northern Europe) than elsewhere. While it has been argued that this stems from the 'explosive' drinking patterns in northern Europe (e.g. Rossow 2001), the stronger effect may also reflect the increased proportional size of a one-litre change in these low-consuming countries (as discussed in more detail under 'crime' above; the total role of alcohol in these harms is discussed midway through this chapter).

Table 6.3 Change in death rates (%) from a 1 litre increase in alcohol consumption
*Changes are per capita and are calculated separately for low, medium and high consuming European countries for men (M) and women (F). Source: (Norström et al. 2001). Key: * = Significant at the 5% level*

Country group (alcohol consumption)	Low		Medium		High	
	M	F	M	F	M	F
Cirrhosis	32*	17*	9*	5*	10*	11*
Alcohol dependence, psychosis and poisoning	35*	75*	18*	27*	3	1
Accidents	9*	10*	3*	3*	2*	2*
Suicide	9*	12*	0	3*	0	1
Homicide	18*	8	11*	7*	7*	2
IHD	-1	1	1	2*	1	0
Total mortality	3*		1*		1*	

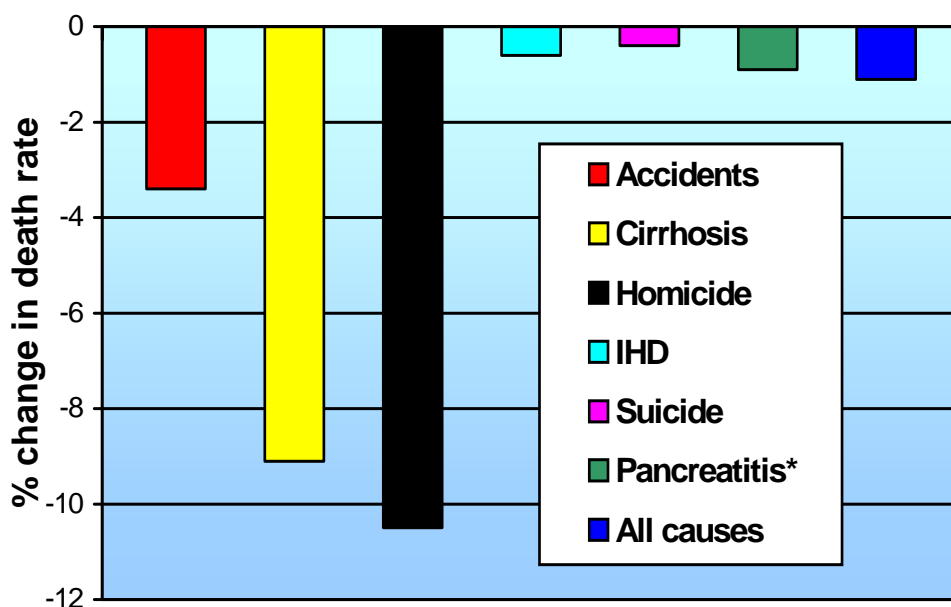


Figure 6.15 Percentage reduction in male death rate when per capita alcohol consumption is reduced by 1L per year. *Medium consuming European countries. Source: (Norström et al. 2001). Key: *Both men and women.*

Irrespective of this debate, many of these relationships were found in more than one of the ECAS European regions. Significant positive relationships between consumption and harm were still found for at least one gender in medium- and high-consuming countries for cirrhosis, accidents, and homicide, with medium-consuming countries also showing an effect for at least one gender for directly alcohol-attributable mortality, suicide and heart disease (the latter being discussed in more detail below). When examined in more detail, the higher northern European effect for accident mortality was due to accidental falls and 'other accidents', but a stronger effect was, in fact, found in high- and medium-consuming countries for traffic accident mortality (Skog 2001a).

Out of the 14 individual countries examined, significant relationships for men were found in 14 countries for cirrhosis, 9 for accidents, 8 for mortality, 7 for other alcohol-related diseases (mainly 'alcoholism', alcoholic psychoses and alcohol poisoning) and 6 for homicide (Rossow 2001; Norström *et al.* 2001; Skog 2001b; Ramstedt 2001b; Ramstedt 2001c). Not displayed in Table 6.3 are the results for pancreatitis mortality, which also showed a significant relationship (for men and women combined) in most western European countries of about 5%-15% per litre, and was again stronger in northern Europe with estimated effects of 30% for Sweden and 50% for Norway (Norström *et al.* 2001).

The results for women tended to be significant in fewer countries, but were still found in 9 countries for cirrhosis and accidents, 7 for other alcohol-related diseases, and only one (Sweden) for homicide. The reduced sensitivity of the method to indicators of harm in women is perhaps unsurprising, given that per capita alcohol consumption reflects the heaviest drinkers much more than other subgroups (see above), and that women drink less than men (see Chapter 4).

Time-series analysis outside of ECAS

The ECAS results have generally been supported by other time-series studies in Europe, often using smaller groups of countries or different time periods. For example, a significant and positive relationship between alcohol and mortality of approximately the same magnitude was reported for a more recent time period (1982-1990) in 25 European countries (Her and Rehm 1998). The finding of a significant alcohol effect that was stronger per litre in northern than in southern Europe was also replicated using the ECAS data itself by Gmel *et al.* (Gmel, Rehm, and Frick 2001).

Similarly, a markedly stronger effect has been found for suicide in Sweden (13% per litre) than in France (3% per litre) (Norström 1995) or Portugal (Skog *et al.* 1995), and no effect was found in Switzerland (Gmel, Rehm, and Ghazinouri 1998). In most cases, it seems that consumption of spirits is more closely related to suicide. Thus, only spirit consumption was significantly related to suicide in Sweden, whereas in Norway beer as well as spirits consumption had a significant effect (Norström and Rossow 1999). Of the very small number of studies that have looked at alcohol poisoning specifically, none have found a significant positive relationship with overall consumption, although one (using quarterly data in Finland 1983-99) has also found a relationship to spirits consumption (Poikolainen, Leppanen, and Vuori 2002).

While most of these analyses are performed on mortality data, another study has examined how consumption links to changes in morbidity using quarterly data in Stockholm county (Sweden) from 1980-94. This found that cirrhosis morbidity responded to changes in population drinking in Sweden, whereas an index of other

alcohol-related diseases, (“alcoholism”, alcohol psychoses and alcohol poisonings) did not (Leifman and Romelsjö 1997). The authors suggested that population drinking might be less important for certain alcohol-specific diagnoses, which are mostly given to the most socially marginalized and severely alcohol-dependent subjects.

Heart disease and patterns of drinking

Most time-series analyses do not consider an independent effect of patterns of drinking, which have been shown to be important for both health and social outcomes (see above and Chapter 5). One way to do this is to try and combine average consumption and patterns within existing methods, by conducting separate levels of time-series analyses for different patterns of drinking (see Box 6.4 and Rehm *et al.* 2004). As discussed in more detail in Chapter 4, it should be borne in mind that there are some severe methodological concerns with the single measure of drinking pattern used here. Nevertheless, the multilevel analysis found that the pattern value was predictive of outcomes – overall consumption levels were significantly associated with injury mortality for both sexes and for all patterns, but the impact of greater consumption was substantially stronger in countries with more detrimental patterns of drinking.

The most ambivalent results are found for heart disease, where the ECAS analysis found *no relationship* between per capita consumption and ischaemic heart disease (IHD) mortality for any region within Europe (Hemström 2001)⁴⁰. In contrast, the GBD study weighted by pattern of drinking suggested a negative effect of alcohol on mortality across the world as a whole, such that a 1 litre *reduction* in per capita consumption would be associated with a 3% *reduction* in deaths from ischaemic heart disease in males, with no change in females. However, these findings differed for different patterns of drinking – in countries with the least harmful patterns of drinking (e.g. France and Italy), reduced alcohol consumption was associated with *increased* mortality, although only at roughly half the level that would be expected if the results of the individual-level studies were linearly extrapolated. The overall negative global effect was due to countries with a more harmful pattern of drinking (e.g. northern and eastern Europe), where there were positive links between trends in overall consumption and IHD-mortality.

These two studies, therefore, offer differing estimates as to whether increasing consumption would provide any protective effect on IHD-mortality in countries with the least detrimental patterns of drinking. However, the research does agree on two points of importance:

1. in eastern Europe there is greater mortality from IHD where consumption increases;
2. even for countries with less detrimental patterns of consumption, the individual-level cardioprotective effect is at best much less strong at the population level (and may even be non-existent) (Norström *et al.* 2001).

⁴⁰ In one country outside of Europe (Canada), a positive relationship has been found between per capita alcohol consumption and male ischaemic heart disease (IHD) mortality, but not female IHD mortality, where no significant relationship was found (Ramstedt, in press).

CONCLUSION

This chapter has presented as complete a picture as currently possible of the harm done by alcohol to Europe. It is clear that alcohol-related harm covers a large number of areas – from family problems to absenteeism at work to loss of life – and it is not possible to gauge the significance of these harms by looking at one area alone. Many of these harms are proportionally more heavily shouldered by young people than other ages, in particular for loss of life where alcohol causes one quarter of all deaths in young men. Much is made of the effect of alcohol in delaying death, but this should be interpreted with much caution. Due to methodological problems, the size of the numbers of deaths delayed is likely to be overestimated, and even without accounting for these problems, it is only at ages 70 years or older that there is a net benefit from alcohol. A sizeable burden is also placed on people other than the drinker, with the harm to others stretching into several domains of human life including crime, health and 'intangible costs'. Alcohol is also heavily implicated in social inequalities, both within and between countries. Finally, research evidence clearly shows that these levels of harm are affected by changes in the population level of consumption. This is a useful point of departure for considering effective policies to reduce the burden of alcohol, which is the subject of the next chapter.

REFERENCES

- Alcohol Policy Network (2005). *Country profile updates*.
<http://www.eurocare.org/btg/countryreports/index.html>
- Anderson, P. and Lopez, A. D. (1996). *Alcohol and Health*. Copenhagen: WHO Regional Office for Europe.
- Baker, A. and Rooney, C. (2003). "Recent Trends in Alcohol-Related Mortality, and the Impact of ICD-10 on the Monitoring of These Deaths in England and Wales." *Health Statistics Quarterly*, 17: 5-14.
- Baltic Data House (2001). *Economic research about the influence of taxes imposed on alcohol and influence of price policy on alcohol consumption; research about accidents caused by alcohol intoxication*. Riga, LV: Market and Social Research Group, Baltic Data House, Baltic Institute of Social Sciences.
- Blomgren, J., Martikainen, P., Mäkelä, Pia., and Valkonen, T. (2004). "The Effects of Regional Characteristics on Alcohol-Related Mortality—a Register-Based Multilevel Analysis of 1.1 Million Men." *Social Science and Medicine*, 58: 2523-35.
- Bobak, M., Room, R., Pihart, H., Kubinova, R., Malyutina, S., Pajak, A., Kurilovitch, S., Topor, R., Nikitin, Y., and Marmot, M. (2004). "Contributions of Drinking Patterns to Differences in Rates of Alcohol Related Problems Between Three Urban Populations." *Journal Of Epidemiology and Community Health*, 58: 238-42. <http://jech.bmjournals.com/cgi/content/full/58/3/238>
- Box, G. E. P. and Jenkins, G. M. (1976). *Time Series Analysis: Forecasting and Control, 2nd Ed.*, San Francisco: Holden Day.
- Britton, A. and McPherson, K. (2001). "Mortality in England and Wales Attributable to Current Alcohol Consumption ." *Journal Of Epidemiology and Community Health*, 55: 383-88. <http://jech.bmjournals.com/cgi/content/abstract/55/6/383>
- Bühringer, G., Augustin, R., Bergmann, E., Bloomfield, K., Funk, W., Burckhard, J., Kraus, L., Merfert-Diete, C., Rumpf, H-R., Simon, R., and Toppich, R. (2002). *Alcohol Consumption and Alcohol-Related Problems in Germany*. translated from 2000 German edition, Seattle / Toronto / Bern / Göttingen: Hogrefe & Huber Publishers.

Callingham, M. (2002). *National Association for the Children of Alcoholics (NACOA) survey: initial findings*. http://www.nacoa.org.uk/pdf/Summary_of_Callingham_research.pdf

Carthy, T., Chilton, S., Covey, J., Hopkins, L., Jones-Lee, M., Loomes, G., Pidgeon, N., and Spencer, A. (1999). "On the Contingent Valuation of Safety and the Safety of Contingent Valuation: Part 2-The CV/SG "Chained" Approach." *Journal of Risk and Uncertainty*, 17(3): 187-213.

Colhoun, H., Ben-Shlomo, Y., Dong, W., Bost, L., and Marmot, M. (1997). "Ecological Analysis of Collectivity of Alcohol Consumption in England: Importance of Average Drinker ." *British Medical Journal*, 314: 1164. <http://bmj.bmjournals.com/cgi/content/full/314/7088/1164>

Collins, D. and Lapsley, H. (2002). Counting the cost: estimates of the social costs of drug abuse in Australia in 1998-9. Canberra: Australian Government Printing Service [http://www.health.gov.au/internet/wcms/publishing.nsf/Content/health-pubhlth-publicat-mono.htm/\\$FILE/mono49.pdf](http://www.health.gov.au/internet/wcms/publishing.nsf/Content/health-pubhlth-publicat-mono.htm/$FILE/mono49.pdf)

Connor, J., Broad, J., Jackson, R., Vander Hoorn, S., and Rehm, J. (2005). *The burden of death, disease and disability due to alcohol in New Zealand*. ALAC Occasional Publication No. 23. Wellington, New Zealand: ALAC. <http://www.alac.org.nz/InpowerFiles/Publications/CategorisedDocument.Document2.3097.7a0b0776-972a-4969-ac6a-8da98f326f93.pdf>

Dalstra, J. A. A., Kunst, A. E., Borrell, C., Breeze, E., Cambois, E., Costa, G., Geurts, J. J. M., Lahelma, E., Van Oyen, H., Rasmussen, N. K., Regidor, E., Spadea, T., and Mackenbach, J. P. (2004). "Socioeconomic Differences in the Prevalence of Common Chronic Diseases: an Overview of Eight European Countries." *International Journal of Epidemiology*, 34(2): 316-26.

Dawson, D. and Room, R. (2000). "Towards Agreement on Ways to Measure and Report Drinking Patterns and Alcohol-Related Problems in Adult General Population Surveys: the Skarpö Conference Overview ." *Journal of Substance Abuse*, 12: 1-21.

Department for Transport (2004). *Road casualties: Great Britain 2003*. London: The Stationery Office.

Dubourg, R., Hamed, J., and Thorns, J. (2005). *Estimating the cost of the impacts of violent crime on victims*. Section 3 in "The economic and social costs of crime against individuals and households 2003/04", Home Office online report 30/05. <http://www.homeoffice.gov.uk/rds/pdfs05/rdsolr3005.pdf>

Eichler, H. G., Kong, S. X., Gerth, W. C., Mavros, P., and Jönsson, B. (2004). "Use of Cost-Effectiveness Analysis in Healthcare Resource Allocation Decision-Making: How Are Cost-Effectiveness Thresholds Expected to Emerge?" *Value in Health*, 7(5): 518-28.

Emberson, J. R., Shaper, A. G., Wannamethee, S. G., Morris, R. W., and Whincup, P. H. (2005). "Alcohol Intake in Middle Age and Risk of Cardiovascular Disease and Mortality: Accounting for Intake Variation Over Time." *American Journal of Epidemiology*, 161(9).

English, D. R., Holman, C. D. J., Milne, E., Winter, M. J., Hulse, G. K., and colleagues (1995). *The quantification of drug-caused morbidity and mortality in Australia 1995*. Canberra: Commonwealth Department of Human Services and Health.

Eriksen, S. (2003). "Denmark." *Alcohol and Temperance in Modern History*, Edited by J. S. Blocker, D. M. Fahey, and I. R. Tyrrell. Oxford, England: ABC Clío.

Eurobarometer (1999). *Europeans and their views on domestic violence against women*. Eurobarometer 51.0. By INRA (Europe) for DG X of the Commission. http://ec.europa.eu/comm/public_opinion/index_en.htm

European Transport Safety Council (2003). *Cost-effective EU transport safety measures*.

Galea, S., Rudenstine, S., and Vlahov, D. (2005). "Drug Use, Misuse, and the Urban Environment." *Drug and Alcohol Review*, 24(2): 127-36.

Garretsen, H. F. L., Bongers, I. M. B., van Oers, J. A. M., and van de Goor, L. A. M. (1999). "The Development of Alcohol Consumption and Problem Drinking in Rotterdam 1980-1994: More Problem Drinking Amongst the Young and Middle Aged." *Alcohol and Alcoholism*, 34(5): 733-40.

Gmel, G. and Rehm, J. (2000). "The Empirical Testability of Skog's Theory of Collective Drinking Behaviour." *Drug and Alcohol Review*, 19(4): 391-99.

Gmel, G., Rehm, J., and Frick, U. (2001). "Methodological Approaches to Conducting Pooled Cross-Sectional Time Series Analysis: the Example of the Association Between All-Cause Mortality and Per Capita Alcohol Consumption for Men in 15 European States." *European Addiction Research*, 7(3): 128-37.

Gmel, G., Rehm, J., and Ghazinouri, A. (1998). "Alcohol and Suicide in Switzerland – an Aggregate-Level Analysis." *Drug and Alcohol Review*, 17: 27-37.

Gmel, G., Rehm, J., Room, R., and Greenfield, T. K. (2000). "Dimensions of Alcohol-Related Social and Health Consequences in Survey Research." *Journal of Substance Abuse*, 12: 113-38.

Goldacre, M. J., Duncan, M., Griffith, M., and Cook-Mozaffari, P. (2004). "Alcohol As a Certified Cause of Death in a 'Middle England' Population 1979-1999: Database Study." *Journal of Public Health*, 26(4): 343-46.

Greenfield, T. K. and Rogers, J. D. (1999). "Who Drinks Most of the Alcohol in the U.S.? The Policy Implications." *Journal of Studies on Alcohol*, 60: 78-89.

Hemström, Ö. (2001). "Per Capita Alcohol Consumption and Ischaemic Heart Disease Mortality." *Addiction*, 80: 83-99.

Her, M. and Rehm, J. (1998). "Alcohol and All-Cause Mortality in Europe 1982-1990: a Pooled Cross-Section Time-Series Analysis." *Addiction*, 93(9): 1335-40.

Hibell, B., Andersson, B., Bjarnason, T., Ahlström, S., Balakireva, O., Kokkevi, A., and Morgan, M. (2004). *The ESPAD Report 2003: alcohol and other drug use among students in 35 European countries*. Stockholm, Sweden: The Swedish Council for Information on Alcohol and Other Drugs (CAN) and The Pompidou Group at the Council of Europe. www.espad.org

Hughes, K., Tocque, K., Humphrey, G., and Bellis, M. A. (2004). *Taking measures: a situational analysis of alcohol in the North West*. Liverpool: UK: Public Health North West Alcohol Strategy Group, at th Centre for Public Health, Faculty of Health and Applied Social Sciences, Liverpool John Moores University. http://www.cph.org.uk/cph_pubs/reports/CH/Taking_Measures.pdf

IBEC (2004). *Workplace absence survey 2004*. Dublin: IBEC. <http://www.ibec.ie>

Jeanrenaud, C. and Pellegrini, S. (2004). "Valuing Intangible Costs of Substance Abuse in Monetary Terms." *Poster displayed at the 4th iHEA World Congress, San Francisco, June 2003 [conference proceeding]* <http://www.unine.ch/irer/alcool.html>

Jeanrenaud, C., Priez, F., Pellegrini, S., Chevrou-Severac, H., and Vitale, S. (2003). *Le coût social de l'abus d'alcool en Suisse [The social costs of alcohol in Switzerland]*. Neuchâtel, Switzerland: Institut de recherches économiques et régionales, Université de Neuchâtel.

Jones, S., Casswell, S., and Zhang, J-F. (1995). "The Economic Costs of Alcohol-Related Absenteeism and Reduced Productivity Among the Working Population of New Zealand." *Addiction*, 90(11): 1455-61.

Killias, M., Barcaly, G., Smit, P., Fernando Asbi, M., Tavares, C., Aubusson de Cavarlay, B., Jehle, J-M., von Hofer, H., Gruszczynska, B., Hysi, V., and Aromaa, K. (2003). *European Sourcebook of Crime and Criminal Justice Statistics (second edition)*.

Klingemann, H. and Gmel, G. (2001). *Alcohol and Its Social Consequences - the Forgotten Dimension*, Dordrecht, Netherlands: Klumer Academic Publishers on behalf of WHO-EURO.

Knibbe, R., Drop, M. J., van Reek, J., and Saenger, G. (1985). "The Development of Alcohol Consumption in the Netherlands: 1958-1981." *British Journal of Addiction*, 80: 411-19.

KPMG (2001). *Excessive alcohol consumption in the Netherlands: trends and social costs*. Hoofddorp: KPMG Economic Consulting. www.kpmg.nl/bea

Kunst, A. E., Groenhof, F., Mackenbach, J. P., and EU Working Group on Socioeconomic Inequalities in Health (1998). "Occupational Class and Cause Specific Mortality in Middle Aged Men in 11 European Countries: Comparison of Population Based Studies." *British Medical Journal*, 316: 1636-42.

Law, M. R. and Whincup, P. H. (1998). "Why Is Mortality Higher in Poorer Areas and in More Northern Areas of England and Wales?" *Journal Of Epidemiology and Community Health*, 52: 344-52.

Ledermann, S. 1956. *Alcool, Alcoolisme, Alcoolisation*, Paris: Presses Universitaires de France.

Leifman, H. and Romelsjö, A. (1997). "The Effect of Changes in Alcohol Consumption on Mortality and Admissions With Alcohol Related Diagnoses in Stockholm County - a Time Series Analysis." *Addiction*, 92: 1523-36.

Lemmens, P. (1991). (*Measurement and Distribution of Alcohol Consumption (Dissertation)*). Maastricht: University of Limburg.

Lemmens, P. (1995). "Individual Risk and Population Distribution of Consumption." Pp.38-61 in *Alcohol and public policy: evidence and issues*, Edited by H. D. Holder and G. Edwards. Oxford: Oxford University Press.

Lemmens, P. (2001). "Relationship of Alcohol Consumption and Alcohol Problems at the Population Level." Pp.395-411 in *International handbook of alcohol dependence and problems*, Edited by N. Heather, T. J. Peters, and T. Stockwell.

Lenke, L. (1990). *Alcohol and criminal violence: time series analyses in a comparative perspective*. Stockholm, Sweden: Almqvist & Wiksell International.

Leontaridi, R. (2003). *Alcohol misuse: How much does it cost?* London: Cabinet Office. <http://www.number10.gov.uk/files/pdf/econ.pdf>

Ljung, R., Peterson, S., Hallqvist, J., Heimerson, I., and Diderichsen, F. (2005). "Socioeconomic Differentials in the Burden of Disease in Sweden." *Bulletin of the World Health Organization*, 83: 92-99.

MacDonald, S., Cherpitel, C., Borges, G., DeSouza, A., Giesbrecht, N., and Stockwell, T. (2005). "The Criteria for Causation of Alcohol in Violent Injuries Based on Emergency Room Data From Six Countries." *Addictive Behaviors*, 30(1): 103-13.

Mackenbach, J. P., Cavelaars, A. E. J. M., Kunst, A. E., Groenhof, F., and EU Working Group on Socioeconomic Inequalities in Health (2000). "Socioeconomic Inequalities in Cardiovascular Disease Mortality: An International Study." *European Heart Journal*, 21: 1141-51.

Martelin, T., Mäkelä, Pia., and Valkonen, T. (2004). "Contribution of Deaths Related to Alcohol or Smoking to the Gender Difference in Life Expectancy: Finland in the Early 1990s." *European Journal of Public Health*, 14: 422-27.

Matthews, S. and Richardson, A. (2005). Findings from the 2003 Offending, Crime and Justice Survey: alcohol-related crime and disorder. Home Office . <http://www.homeoffice.gov.uk/rds/pubintro1.html>

Mäkelä, Pia. (2002). "Whose Drinking Does a Liberalization of Alcohol Policy Increase? Change in Alcohol Consumption by the Initial Level in the Swedish Panel Survey in 1968 and 1969." *Addiction*, 97: 701-6.

Mäkelä, Pia., Fonager, K., Hibell, B., Nordlund, S., Sabroe, S., and Simpura, J. (1999). *Drinking habits in the Nordic countries*. Oslo: National Institute for Alcohol and Drug Research.

Mäkelä, Pia., Fonager, K., Hibell, B., Nordlund, S., Sabroe, S., and Simpura, J. (2001). "Episodic Heavy Drinking in Four Nordic Countries: a Comparative Survey Study." *Addiction*, 96: 1575-89.

McKee, M., R. Adany, and L. MacLehose (2004). "Health Status and Trends in Candidate Countries." *Health policy and European Union enlargement*, Edited by M. McKee, L. MacLehose, and E. Nolte. Open University Press.

McNeill, A. (1998). *Alcohol problems in the family*. A report to the European Union, published by Eurocare and COFACE (Confederation of Family Organisations in the EU).

McPherson, K. (2004). "Disaggregating the Health Consequences of Alcohol by Age and Sex [Editorial]." *Addiction*, 99: 661-62.

Miller, T. R., Lestina, D. C., and Spicer, R. S. (1998). "Crash Costs in the United States by Age, Blood Alcohol Level, Victim Age, and Restraint Use." *Accident Analysis and Prevention*, 30(2): 137-50.

Morris, R. W., Whincup, P. H., Lampe, F. C., Walker, M., Wannamethee, S. G., and Shaper, A. G. (2001). "Geographic Variation in Incidence of Coronary Heart Disease in Britain: the Contribution of Established Risk Factors." *Heart*, 86: 277-83.

Møller, H. and H. Tønneson (1997). "Alcohol Drinking, Social Class and Cancer." Pp.251-63 in *Social inequalities and cancer*, Edited by M. Kogevinas, N. Pearce, M. Susser, and P. Boffetta. Lyon: International Agency for Research on Cancer.

Murdoch, D., Pihl, R. O., and Ross, D. (1990). "Alcohol and Crimes of Violence: Present Issues." *The International Journal of the Addictions*, 25(9): 1065-81.

Neve, R., Diederiks, J. P., Knibbe, R., and Drop, M. J. (1993). "Developments in Drinking Behavior in The Netherlands From 1958 to 1989, a Cohort Analysis." *Addiction*, 88: 611-21.

Norström, T. (1995). "Alcohol and Suicide: a Comparative Analysis of France and Sweden." *Addiction*, 90: 1463-69.

Norström, T. (2004). "Per Capita Alcohol Consumption and All-Cause Mortality in Canada, 1950-98." *Addiction*, 99(10): 1274-78.

Norström, T., Ö. Hemström, M. Ramstedt, I. Rossow, and O-J. Skog (2001). "Mortality and Population Drinking." *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries*, Edited by T. Norström. Stockholm: National Institute of Public Health, European Commission.

Norström, T. and Rossow, I. (1999). "Beverage Specific Effects on Suicide." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 16: 74-82.

Osservatorio Permanente Giovani ed Alcool (2001). *Italians and alcohol: consumption, trend and attitudes in Italy and in the regions (IV National DOXA National Survey)*. http://ec.europa.eu/comm/health/ph_determinants/life_style/alcohol/documents/ev_20050120_co021_en.pdf

Pernanen, K., Brochu, S., Cousineau, M-M., Cournoyer, L-G., and Sun, F. (2000). Attributable fractions for alcohol and illicit drugs in relation to crime in Canada: conceptualization, methods and internal consistency of estimates. *Bulletin on Narcotics*. Vienna: United Nations International Drug Control Programme

Pernanen, K., Cousineau, M-M., Brochu, S., and Sun, F. (2002). *Proportion of crimes associated with alcohol and other drugs in Canada*. Canadian Centre for Substance Abuse.

Poikolainen, K., Leppanen, K., and Vuori, E. (2002). "Alcohol Sales and Fatal Alcohol Poisonings: A Time-Series Analysis." *Addiction*, 97(8): 1037-40.

Primatesta, P., Falaschetti, E., and Marmot, M. (2002). *Average alcohol consumption and patterns of drinking [unpublished]*.

Quinn, M., Wood, H., Cooper, N., and Rowan, S. (2005). *Cancer Atlas of the United Kingdom and Ireland 1991–2000. Studies on Medical and Population Subjects No. 68*. Palgrave Macmillan, with the permission of Her Majesty's Stationery Office.
<http://www.statistics.gov.uk/statbase/Product.asp?vlnk=14059>

Raftery, J. (2001). "NICE: Faster Access to Modern Treatments? Analysis of Guidance on Health Technologies." *British Medical Journal*, 323: 1300-1303.

Ramstedt, M. (1999). "Liver Cirrhosis Mortality in 15 European Countries." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 16(English Supplement): 55-73.

Ramstedt, M. (2001a). "Alcohol-Related Mortality in 15 European Countries in the Postwar Period." *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries*, Edited by T. Norström. Stockholm: National Institute of Public Health, European Commission.

Ramstedt, M. (2001b). "Alcohol and Suicide in 14 European Countries." *Addiction*, 96(Supplement 1): S59-S75.

Ramstedt, M. (2001c). "Per Capita Alcohol Consumption and Liver Cirrhosis Mortality in 14 European Countries." *Addiction*, 96(Supplement 1): S19-S34.

Ramstedt, M. (2002). "Alcohol-Related Mortality in 15 European Countries in the Postwar Period." *European Journal of Population*, 81: 307-23.

Ramstedt, M. (2004). "Alcohol Consumption and Alcohol-Related Mortality in Canada - a Regional Analysis of the Period 1950-2000." *Canadian Journal of Public Health*, 95: 121-26.

Ramstedt, M. (In press). "Alcohol and suicide at the population level - the Canadian experience". *Drug and Alcohol Review*.

Ramstedt, M. and Hope, A. (2003). *The Irish drinking habits of 2002: Drinking and drinking-related harm, a European comparison*. Dublin: Department of Health and Children.

reed.co.uk (2004). *24-hr drinking will be bad for business, say UK workers*.
<http://www.reed.co.uk/research.aspx>

Rehm, J. (2005). "Volume of Alcohol Consumption, Patterns of Drinking and Burden of Disease in the European Region - Implications for Alcohol Policy." *10th meeting of national counterparts for alcohol policy in the WHO European Region, Stockholm 13-15 April 2005 [conference proceeding]*

Rehm, J. and Gmel, G. (2001). "Aggregate Time-Series Regression in the Field of Alcohol." *Addiction*, 96: 945-54.

Rehm, J. and Gmel, G. (2002). "Average Volume of Alcohol Consumption, Patterns of Drinking and Mortality Among Young Europeans in 1999." *Addiction*, 97: 105-9.

Rehm, J., Rehn, N., Room, R., Monteiro, M., Gmel, G., Jernigan, D., and Frick, U. (2003a). "Global Distribution of Average Volume of Alcohol Consumption and Patterns of Drinking." *European Addiction Research*, 9(4): 147-56.

Rehm, J., Room, R., Graham, K., Monteiro, M., Gmel, G., and Sempos, C. T. (2003b). "The Relationship of Average Volume of Alcohol Consumption and Patterns of Drinking to Burden of Disease: an Overview." *Addiction*, 98(9): 1209-28.

Rehm, J., R. Room, M. Monteiro, G. Gmel, K. Graham, N. Rehn, C. T. Sempos, U. Frick, and D. Jernigan (2004). "Alcohol." *Comparative quantification of health risks: Global and regional burden of disease due to selected major risk factors*, Edited by M. Ezzati, A. D. Lopez, A. Rodgers, and C. J. L. Murray. Geneva: WHO.

Rehn, N., Room, R., and Edwards, G. (2001). *Alcohol in the European Region - Consumption, Harm and Policies*, Copenhagen: WHO Europe.

Ridolfo, B. and Stevenson, C. (2001). *The quantification of drug-caused mortality and morbidity in Australia 1998*. Canberra: Australian Institute of Health and Welfare.

Robinson, W. S. (1950). "Ecological Correlations and the Behavior of Individuals." *American Sociological Review*, 15: 351-57.

Romelsjö, A. and Lundberg, M. (1996). "The Changes in the Social Class Distribution of Moderate and High Alcohol Consumption and of Alcohol-Related Disabilities Over Time in Stockholm County and in Sweden." *Addiction*, 91(9): 1307-23.

Room, R. (2000). "Concepts and Items in Measuring Social Harm From Drinking." *Journal of Substance Abuse*, 12: 93-111.

Room, R. and Bullock, S. (2002). "Can Alcohol Expectancies and Attributions Explain Western Europe's North-South Gradient in Alcohol's Role in Violence?" *Contemporary Drug Problems*, 69(3): 619-48.

Room, R. and K. Hradilova Selin (2004). "Alkoholproblem: Definitioner, Metoder, Data [Alcohol Problems: Definitions, Methods, Data; English Version]." Pp.57-74 in *Svenska drykesvanor och deras konsekvenser i början av det nya milleniet (Swedish drinking habits and their consequences at the beginning of the new millenium)*, Edited by K. Hradilova Selin. Stockholm: SoRAD.

Room, R. and Rossow, I. (2001). "The Share of Violence Attributable to Drinking." *Journal of Substance Use*, 6: 218-28.

Rose, G. and Day, S. (1990). "The Mean Population Predicts the Number of Deviant Individuals." *British Medical Journal*, 301: 1031-34.

Rossow, I. (2001). "Drinking and Violence: a Cross-Cultural Comparison of the Relationship Between Alcohol Consumption and Homicide in 14 European Countries." *Addiction*, 96(S1): S77-S92.

Rossow, I. (2004). "Alcohol and Homicide in Canada." *Contemporary Drug Problems*, 31: 541-59.

Rossow, I. and Hauge, R. (2004). "Who Pays for the Drinking? Characteristics of the Extent and Distribution of Social Harms From Others' Drinking." *Addiction*, 99(9): 1094.

Rossow, I., Pape, H., and Wichstrøm, L. (1999). "Young, Wet & Wild? Associations Between Alcohol Intoxication and Violent Behaviour in Adolescence." *Addiction*, 94(7): 1017-31.

Rossow, I., K. Permanen, and J. Rehm (2001). "Accidents, Suicide and Violence." Pp.93-112 in *Mapping the social consequences of alcohol consumption*, Edited by H. Klingemann and G. Gmel.

Salomaa, J. (1995). "The Costs of the Detrimental Effects of Alcohol Abuse Have Grown Faster Than Alcohol Consumption in Finland." *Addiction*, 90(4): 525-37.

Sardi, G. M. and C. Evers (2004). "Drinking and Driving." *European drivers and road risk: part 1 - reports on principal analyses*, Edited by Sartre. Institut National de Recherche sur les Transports et leur Sécurité INRETS.

Sartre (1998). *The attitude and behaviour of European car drivers to road safety*. <http://sartre.inrets.fr/>

Scafato, E., Massari, M., Russo, R., and Bartoli, G. (2002). *Il consumo di bevande alcoliche: generazioni a confronto [The consumption of alcoholic drinks: a comparison of generations]*. Osservatorio Nazionale Alcol - OssFAD. <http://progetti.iss.it/binary/ofad/publ/0009.1112083242.pdf>

SFA (2004). *Zahlen und Fakten 2004: Alkohol [Data and facts 2004: Alcohol]*. Lausanne: Schweizerische Fachstelle für Alkohol- und andere Drogenprobleme (SFA). [http://www.sfa-ispa.ch/DocUpload/a-konsum\[1\].pdf](http://www.sfa-ispa.ch/DocUpload/a-konsum[1].pdf)

Single, E., Robson, L., Rehm, J., and Xie, X. (1999). "Morbidity and Mortality Attributable to Alcohol, Tobacco and Illicit Drug Use in Canada." *American Journal of Public Health*, 89: 385-90.

Skog, O-J. (1985). "The Collectivity of Drinking Cultures: a Theory of the Distribution of Alcohol Consumption." *British Journal of Addiction*, 80(1): 83-99.

Skog, O-J. (1991). "Drinking and the Distribution of Alcohol Consumption." Pp.135-56 in *Society, culture, and drinking patterns reexamined*, Edited by D. J. Pittman and H. White. New Brunswick: Alcohol Research Documentation.

Skog, O-J. (1996). "Public Health Consequences of the J-Curve Hypothesis of Alcohol Problems." *Addiction*, 91: 325-37.

Skog, O-J. (2001a). "Alcohol Consumption and Mortality Rates From Traffic Accidents, Accidental Falls, and Other Accidents in 14 European Countries." *Addiction*, 96(S1): 49-58.

Skog, O-J. (2001b). "Alcohol Consumption and Overall Accident Mortality 14 European Countries." *Addiction*, 96(S1): 35-47.

Skog, O-J. (2001c). "Commentary on Gmel & Rehm's Interpretation of the Theory of Collectivity of Drinking Culture." *Drug and Alcohol Review*, 20(3): 325-31.

Skog, O-J. (2003). "Alcohol and Fatal Accidents in Canada 1950-1998." *Addiction*, 98: 883-93.

Skog, O-J., Teixeira, Z., Barrias, J., and Moreira, R. (1995). "Alcohol and Suicide - the Portuguese Experience." *Addiction*, 90: 1053-61.

Sundhedsministeriet [Ministry of Health] (1999). *"De samfundsøkonomiske konsekvenser af alkoholforbrug" [The Economic consequences of alcohol consumption] in Denmark*. 2nd edition. Copenhagen, Denmark: Ministry of Health. <http://www.im.dk/publikationer/alkoholrapport/index.htm>

Szücs, S., Sárváry, A., McKee, M., and Adany, R. (2005). "Could the High Level of Cirrhosis in Central and Eastern Europe Be Due Partly to the Quality of Alcohol Consumed? An Exploratory Investigation." *Addiction*, 100: 536-42.

Thorsen, T. (1990). *Hundrede års alkoholmisbrug [One hundred years of alcohol misuse]*. Copenhagen: Alkohol- og Narkotikarådet.

White, I. R., Altmann, D., and Nanchahal, K. (2004). "Mortality in England and Wales Attributable to Any Drinking, Drinking Above Sensible Limits and Drinking Above Lowest Risk Levels." *Addiction*, 99(6): 749-56.

WHO (2004). *Global status report on alcohol 2004*. Geneva: Department of Mental Health and Substance Abuse, World Health Organization.

WHO and European Commission (2002). *Health status overview for countries of Central and Eastern Europe that are candidates for accession to the European Union*. www.euro.who.int/Document/E76888.pdf.

Chapter 7 – The effectiveness of alcohol policy

Alcohol policies can be grouped within five headings: (i) policies that reduce drinking and driving; (ii) policies that support education, communication, training and public awareness; (iii) policies that regulate the alcohol market; (iv) policies that support the reduction of harm in drinking and surrounding environments; and (v) policies that support interventions for individuals. Since the 1970s, considerable progress has been made in the scientific understanding of the relationship between alcohol policies, alcohol consumption and alcohol-related harm.

The drinking-driving policies that are highly effective include unrestricted (random) breath testing, lowered blood alcohol concentration (BAC) levels, administrative license suspension, and lower BAC levels for young drivers. The limited evidence does not find an impact from designated driver and safe drive programmes. Alcohol locks can be effective as a preventive measure, but as a measure with drink driving offenders only work as long as they are fitted to a vehicle. The World Health Organization has modelled the impact and cost of unrestricted breath testing compared with no testing; applying this to the Union finds an estimated 111,000 years of disability and premature death avoided at an estimated cost of €233 million each year.

The impact of policies that support education, communication, training and public awareness is low. Although the reach of school-based educational programs can be high because of the availability of captive audiences in schools, the population impact of these programs is small due to their current limited or lack of effectiveness. Recommendations exist as to how the effectiveness of school-based programmes might be improved. On the other hand, mass media programmes have a particular role to play in reinforcing community awareness of the problems created by alcohol use and to prepare the ground for specific interventions.

There is very strong evidence for the effectiveness of policies that regulate the alcohol market in reducing the harm done by alcohol, including taxation and managing the physical availability of alcohol (limiting hours and days of sale and raising the minimum drinking age). Alcohol taxes are particularly important in targeting young people and the harms done by alcohol. If alcohol taxes were used to raise the price of alcohol in the EU15 by 10%, over 9,000 deaths would be prevented during the following year and an approximate estimate suggests that €13bn of additional excise duty revenues would also be gained. The evidence shows that if opening hours for the sale of alcohol are extended more violent harm results. The World Health Organization has modelled the impact of alcohol being less available from retail outlets by a 24 hour period each week; applying this to the Union finds an estimated 123,000 years of disability and premature death avoided at an estimated implementation cost of €98 million each year.

Restricting the volume and content of commercial communications of alcohol products is likely to reduce harm. Advertisements have a particular impact in promoting a more positive attitude to drinking amongst young people, and, even in advertisements that do not portray drinking of alcohol, young people perceive the characters as heavy drinkers. Self-regulation of commercial communications by the beverage alcohol industry does not have a good track record for being effective. The World Health Organization has modelled the impact of an advertising ban; applying this to the Union finds an estimated 202,000 years of disability and premature death avoided, at an estimated implementation cost of €95 million each year.

There is growing evidence for the impact of strategies that alter the drinking context in reducing the harm done by alcohol. However, these strategies are primarily applicable to drinking in bars and restaurants, and their effectiveness relies on adequate enforcement. Passing a minimum drinking age law, for instance, will have little effect if it is not backed up with a credible threat to remove the licenses of outlets that repeatedly sell to the under-aged. Such strategies are also more effective when backed up by community-based prevention programmes.

There is extensive evidence for the impact of brief advice, particularly in primary care settings, in reducing harmful alcohol consumption. The World Health Organization has modelled the impact and cost of providing primary care-based brief advice to 25% of the at-risk population; applying this to the Union finds an estimated 408,000 years of disability and premature death avoided at an estimated cost of €740 million each year.

Using the World Health Organization's models, and compared to no policies at all, a comprehensive European Union wide package of effective policies and programmes that included random breath testing, taxation, restricted access, an advertising ban and brief physician advice, is estimated to cost European governments €1.3billion to implement (about 1% of the total tangible costs of alcohol to society and only about 10% of the estimated income gained from a 10% rise in the price of alcohol due to taxes in the EU15 countries), and is estimated to avoid 1.4 million years of disability and premature death a year, equivalent to 2.3% of all disability and premature death facing the European Union.

INTRODUCTION

Evidence base

Over the last twenty five years, considerable progress has been made in the scientific understanding of the relationship between alcohol policies, alcohol consumption and alcohol-related harm (for example, see Bruun *et al.* 1975; Edwards *et al.* 1994; Babor *et al.* 2003). The evidence base includes time series analyses, econometric analyses, community studies and randomized controlled trials of interventions. Alcohol policies can be grouped within five headings: policies that reduce drinking and driving; policies that support education, communication, training and public awareness; policies that regulate the alcohol market; policies that support the reduction of harm in drinking and surrounding environments; and policies that support interventions for individuals with hazardous and harmful alcohol consumption and alcohol dependence. Although it is changing, the evidence base is still largely dominated by studies from North America, northern Europe, and Australia and New Zealand. Although there is no reason to believe that the results do not have policy significance for Europe as a whole, there is a need to broaden the evidence base across countries and cultures, a theme that we return to in Chapter 10. The chapter gives more space to discussing the evidence in relation to advertising policies, since this is a policy area of current substantial debate.

Summary sections

Each policy area is summarized with a table of effectiveness ratings. We have done this by using an updated version of the effectiveness ratings that were provided by Babor *et al.* (2003), using the classification system of Table 7.1.

Table 7.1 Effectiveness ratings used in this chapter.

Effectiveness	Breadth of Research Support	Cost Efficiency
<p>This criterion refers to the scientific evidence demonstrating whether a particular strategy is effective in reducing alcohol consumption, alcohol-related problems or their costs to society. The following rating scale was used:</p> <p>0 Evidence indicates a lack of effectiveness + Evidence for limited effectiveness. ++ Evidence for moderate effectiveness. +++ Evidence of a high degree of effectiveness ? No studies have been undertaken or there is insufficient evidence upon which to make a judgment.</p>	<p>The highest rating was influenced by the availability of integrative reviews and meta analyses. Breadth of research support was evaluated independent of the rating of effectiveness (i.e., it is possible for a strategy to be rated low in effectiveness but to also have a high rating on the breadth of research supporting this evaluation). The following scale was used:</p> <p>0 No studies of effectiveness have been undertaken + Only one well designed study of effectiveness completed. ++ From 2 to 4 studies of effectiveness have been completed. +++ 5 or more studies of effectiveness have been completed. ? There is insufficient evidence on which to make a judgment.</p>	<p>This criterion seeks to estimate the relative monetary cost to the state to implement, operate and sustain this strategy, regardless of effectiveness. For instance, increasing alcohol excise duties does not cost much to the state but may be costly to alcohol consumers. In this criterion, the lowest possible cost is the highest standard. Therefore, the higher the rating, the lower the relative cost to implement and sustain this strategy. The following scale was used:</p> <p>o Very high cost to implement and sustain + Relatively high cost to implement and sustain. ++ Moderate cost to implement and sustain. +++ Low cost to implement and sustain. ? There is no information about cost or cost is impossible to estimate.</p>

Source: Babor *et al.* (2003).

Estimates and costs of policy impact

Throughout the chapter, we also report the results of the World Health Organization’s CHOICE (CHOosing Interventions that are Cost-Effective) model, which provides estimates of the impact and cost of implementing policies in reducing Disability Adjusted Life Years (DALYs) (see Chapter 6) due to harmful alcohol use (Tan Torres *et al.* 2003; WHO 2002; Ezzati *et al.* 2002; Rehm *et al.* 2004; Chisholm *et al.* 2004; Rehm *et al.* 2003a,b; 2004; Rehm *et al.* 2001; Stouthard *et al.* 2000), re-calculated for the European Union. The CHOICE model determines intervention effectiveness via a state transition population model (Lauer *et al.* 2003), taking into account births, deaths and the impact of alcohol. Two scenarios are modelled over a lifetime (100 years): 1) no interventions available to reduce hazardous and harmful alcohol use (defined in the CHOICE model as more than 20g alcohol a day for women and more than 40g alcohol a day for men); and 2) the population-level impact of each specified intervention, implemented for a period of 10 years. The difference represents the population-level health gain due to the implementation of the intervention, discounted at 3% and age-weighted.

Costs covered in the CHOICE model are costs to governments and include *programme-level costs* associated with running the intervention, such as administration, training and media (Adam *et al.* 2003; Johns *et al.* 2003), and *patient-level costs* such as primary care visits (Fleming *et al.* 2000). The costs were calculated in international dollars (Adam *et al.* 2003; Johns *et al.* 2003) and

converted into euros, such that one euro buys the same quantity of health care resources in England as it does in Hungary. The model does not capture potential increases in workforce and household productivity among heavy drinkers following intervention, nor does it incorporate the economic consequences of alcohol-related crime, violence and harm reduction. Government's receipts from taxes are not counted.

CHOICE modelled specified interventions, which are described in each section. The models are used for illustrative purposes to give an indication of the impact and cost of certain interventions. **The fact that a specific intervention is modelled (for example reducing the availability of alcohol, or banning advertising) does not imply that the specified intervention is the one recommended for European policy (see Chapter 10).** Rather, since the model compares the intervention of a Europe without the specified intervention, its prime purpose is to provide comparisons for policy makers between the impact and costs of different types of interventions. The results are presented for three regions of the European Union, based on the WHO classification, Table 7.2.

Table 7.2 WHO classification of European Union countries based on mortality rates¹.

Europe A Very low child and very low adult mortality	Europe B Low child and low adult mortality	Europe C Low child and high adult mortality
Austria Belgium Czech Republic Denmark Finland France Germany Greece Ireland	Italy Luxembourg Malta Netherlands Portugal Slovenia Spain Sweden United Kingdom	Cyprus Poland Slovakia Estonia Hungary Latvia Lithuania

Social welfare and other sectors

Although this is not discussed in detail, alcohol policy should also be embedded in sound social welfare and fiscal policies. Social and economic policies that seek to improve conditions for the healthy development of children and youth, reduce disadvantage, increase equity, and strengthen communities will have a range of benefits including lower rates of the harm done by alcohol (Blane *et al.* 1996; Marmot and Wilkinson 1999).

REDUCING DRINKING AND DRIVING

Policies that regulate the alcohol market

Policies that regulate the alcohol market, including the price of alcohol, the location, density, and opening hours of sales outlets, controls on the availability of alcohol, and

¹ For full listing of countries in the three Europe sub-regions, see World Health Organization 2002.

on the promotion and advertising of alcohol, have an impact in reducing drinking and driving and related fatalities (see below) (Grube and Stewart 2004).

Lowering blood alcohol concentration (BAC)² levels

Lowering BAC levels consistently produces positive results in drink-driving behaviour at all levels and also leads to further reductions in alcohol road traffic accidents (Jonah *et al.* 2000).

US experience

Although many studies have been published on the effectiveness of the 0.8g/L blood alcohol concentration (BAC) laws in the US (Johnson and Walz 1994; Hingson *et al.* 1996; Hingson *et al.* 2000; Foss *et al.* 1998; 2001; Apsler *et al.* 1999; Voas and Tippetts 1999; Villaveces *et al.* 2003), they have varied in the statistical methods and the type of outcome measure used, so it is difficult to integrate the findings into an overall estimate of the effectiveness of the law (Beirness and Simpson 2002). A time-series analysis analyzed the introduction of the 0.8g/L in 19 states from 1982 to 2000, accounting for other key safety laws (administrative license suspension/revocation and safety belt laws), as well as economic conditions that might influence the effectiveness of the 0.8g/L law (Tippetts *et al.* 2005). The effect size combined across all 19 locations showed a 15% decline in the rate of drinking drivers in fatal crashes after the 0.8g/L laws were introduced. The reduction was greater in states that had an administrative license suspension/revocation law and implemented frequent sobriety checkpoints. The introduction of low BACs of 0.2g/L for young or inexperienced drivers has led to reductions in fatal crashes of from 9% to 24%. Studies in California demonstrated that publicity doubled the impact of new laws and new enforcement efforts (Voas and Hause 1987).

Australian experience

The reduction of the legal BAC limit from 0.8g/L to 0.5g/l in New South Wales found a 7% reduction in all serious crashes, an 8% reduction in fatal crashes, and an 11% reduction in single vehicle night time crashes (Henstridge *et al.* 1997). In comparison, random breath testing was associated with decreases of 19%, 48% and 26%, respectively. A simple pre-post comparison of the aggregate crash data for the three years prior to and following the introduction of the lower BAC limit from 0.8g/L to 0.5g/L in Queensland revealed net reductions of 11% for crashes which resulted in a hospital admission, 15% for injury crashes (but for which no one was admitted), and 12% for property damage crashes (Smith 1987; 1988). However, it does appear that some of the impact of lowering BAC levels wears off over time because, initially, drivers grossly exaggerate the certainty of apprehension in response to the publicity, but gradually become used to the new law and realize that their chances of detection are, in fact, not very high. Making motorists uncertain about the real risk of detection may paradoxically be the key to cost-effective deterrence (Homel 1988; Nagin 1998).

² BAC (sometimes called BAL, blood alcohol level), represents the amount of ethanol in a given amount of blood, and is noted as "weight by volume." The most commonly used measurements are grams of ethanol per 100 millilitre of blood (g/100ml), sometimes expressed as percentage by volume commonly used in the United States, and milligrams of ethanol per millilitre of blood (mg/ml), equivalent to grams per litre (g/L), used in much of Europe. For example, 0.05 g/100ml=0.05%=0.5 mg/ml=0.5g/L. In this report, g/L is used.

European experience

Lowering the BAC level from 0.5g/L to 0.2g/L level in Sweden in 1990 led to a reduction of fatal alcohol-related accidents by between 8% and 10% (Ross and Klette 1995; Norström 1997; Norström and Laurell 1997; Lindgren 1999; Borschos 2000). Denmark reduced its BAC from 0.8g/l to 0.5g/l on 1st March 1998. There

was some evidence for a reduction in all motor vehicle injury accidents and in accidents involving a driver with a BAC of greater than 0.5g/L in 1998, compared with 1997 (Bernhoft and Behrendorff 2003), but no change in fatal accidents.

Drink driving laws

The World Health Organization has modelled the impact and cost of unrestricted breath testing compared with no testing; applying this to the Union finds an estimated 111,000 years of disability and premature death avoided at an estimated cost of €233 million each year.

Unrestricted (random) breath testing

Unrestricted or random breath testing means that motorists are stopped with no restrictions by police and required to take a breath test, even if they have not been suspected of having committed an offence or been involved in an accident. Any motorist, at any time, may be required to take a test, and there is nothing that the driver can do to influence the chances of being tested. Testing varies from day to day and from week to week, and refusal to submit to a breath test is equivalent to failing. Twenty three studies of unrestricted breath testing and selective testing have found a decline of 22% (range 13%-36%) in fatal crashes, with slightly lower decreases for non-injury and other accidents for such enforcement strategies (Shults *et al.* 2001).

Australian experience

Australia is one of the countries with the most experience of random breath testing. In 1999, 82% of Australian motorists reported having been stopped at some time, compared with 16% in the UK and 29% in the US (Williams *et al.* 2000). The result was that fatal crash levels dropped 22%, while alcohol-involved traffic crashes dropped 36%, and remained at this level for over four years (Homel 1988; Arthurson 1985). A time series analysis for four Australian states found that unrestricted breath testing was twice as effective as selective checkpoints (Henstridge *et al.* 1997). For example, in Queensland, unrestricted breath testing resulted in a 35% reduction in fatal accidents, compared with 15% for checkpoints. Since their implementation, the drink driving enforcement and publicity campaigns in Victoria have persisted in their effectiveness in reducing serious crashes during peak alcohol consumption times (Tay 2005a; 2005b).

European experience

In the Netherlands, the implementation of experimental random breath testing resulted in a reduction of drivers with alcohol in their blood, but especially drivers with BAC levels above 0.5 g/L, the national legal limit (Mathijssen and Wesemann 1993).

License suspension

Suspending the license of those convicted of impaired driving is only partially effective as a way to reduce drink driving recidivism and alcohol-related crashes. Without some form of education, counselling or treatment program, the effects of suspension upon alcohol-impaired driving last only as long as the driver is incapacitated by the license suspension, and these periods can be relatively short (McKnight and Voas 1991; Ross 1992). The deterrent effect of any penalty is

benefited by certainty and immediacy (Ross 1984; Ross 1992; McKnight and Voas 2001). A review of 46 studies on license suspension found that suspension was followed by an average reduction of 5% in alcohol-related accidents and a reduction of 26% in fatal accidents (Zobeck and Williams 1994).

There is little evidence that prison sentences or fines have a specific deterrent effect by promoting avoidance of future offences (Voas 1986). Nevertheless, the authority to impose a prison sentence may provide the legal basis for referring offenders to treatment programs, which have been shown to reduce recidivism of drink driving in first and multiple offenders (Voas and Tippetts 1990). A meta-analysis of 215 independent evaluations of remedial programs found them to yield an average reduction of 8%-9%, both in recurrence of alcohol-impaired driving offences and in alcohol-related accidents (Wells-Parker *et al.* 1995).

Alcohol locks

One action to prevent drink driving offenders from driving while impaired is to place interlocks in the ignition to prevent an impaired driver from operating the vehicle. To operate a vehicle equipped with an ignition interlock device, the driver must first provide a breath specimen. If the breath alcohol concentration of the specimen exceeds the predetermined level, the vehicle will not start. As a measure to reduce circumvention of the device (i.e. someone else blows into the mouthpiece), random retests are required while the vehicle is running. Interlocks can also be used as a preventive measure, by being fitted to public service and heavy goods vehicles.

One review of eight studies of interlock programs conducted under the authority of a local court or a motor vehicle department found them to be more effective than full license suspension in preventing recidivism among alcohol-impaired drivers (Voas *et al.* 1999). However, seven of the studies found that, once the interlock is removed, offenders have the same recidivism rate as suspended offenders.

A systematic Cochrane review identified one randomised controlled trial (RCT), ten controlled trials, and three ongoing trials (Willis *et al.* 2004). In the RCT, recidivism was lower in the intervention group while the device was still installed in the vehicle, but the benefit disappeared once the device was removed. In all 13 non-randomised controlled trials, interlock participants again had lower recurrence of offences than the controls. However, the favourable results did not extend to the time period after the interlock was removed.

In 2000, a European research consortium explored the feasibility of alcolock programs in EU countries and concluded that impaired driving offences were reduced during interlock program participation and that accident rates were also reduced (Mathijssen 2005). As a result of the feasibility study, alcolock initiatives are being implemented in Belgium, Finland, Germany, Netherlands, Norway, Spain and Sweden. In the Netherlands, the target group will consist of DWI offenders who undergo a medical/psychiatric assessment and are declared "not unfit to drive", which represents about 10% of the multiple recidivists or those with a BAC above 1.8g/L, who are assessed. The alcolock program will be mandatory under administrative law and will have a duration of two years with the possibility of a six-month extension. It is estimated that the cost per installed alcolock is €2,200. Based on an estimated 65% reduced crash rate for alcolock users, the estimated benefit of the program is an annual reduction of 4-5 fatalities, at an annual program cost of €0.9 million.

Alcolock devices and programs were introduced in Sweden in 1999, with two types of programs (Bjerre 2005). A primary prevention strategy was initiated to prevent alcohol impaired driving in three commercial transport companies (buses, trucks, taxis). A secondary prevention trial was begun as a voluntary 2-year program for drink driving offenders involving strict medical requirements, including counselling and regular checkups by a medical doctor. Alcolocks in commercial vehicles have been well accepted by professional drivers, their employers, and their passengers, and the number of vehicles with alcolocks as a primary prevention measure is rapidly growing in Sweden. Three of 1000 starts in the primary prevention program were blocked by the alcolock after measuring a BAC higher than the legal limit and lock point of 0.2g/L. Only 11% of eligible drink driving offenders took part in the voluntary, secondary prevention program, of whom 60% had a diagnosis of alcohol dependence. During the program, alcohol consumption decreased as measured by five biological alcohol markers, and the rate of drink driving offences fell sharply from a yearly rate of approximately 5% to almost zero. However, those dismissed from the program appeared to return to their previous drink driving behaviour.

Restrictions on young or inexperienced drivers

Reviews have found that lower BAC limits for young drivers (for example, 0.1g/L to 0.2g/L) reduce injuries and crashes (Hingson *et al.* 1991 1994; Zwerling and Jones 1999), with reductions of between 9% and 24% for fatal crashes (Shults *et al.* 2001). A national study of US states found a net decrease of 24% in the number of young drivers with positive BACs as a result of lower BAC limits for young drivers (Voas *et al.* 1999). A combination of raising the minimum legal drinking age to 21 years and establishing zero tolerance (<0.2g/L BAC) for drivers younger than age 21 years are associated with substantial reductions in alcohol-positive involvement in fatal crashes in drivers younger than age 21 years in the United States from 1982 to 1997 (Voas *et al.* 2003). Graduated driver licence programmes place restrictions on the circumstances under which young or novice drivers are allowed to drive, such as prohibiting driving during certain hours or driving with other young people in the vehicle. Such programmes, which frequently have BACS of <0.2g/L, are effective in reducing motor vehicle fatalities among 15-17-year-old drivers by up to 19% (Morrisey *et al.* 2005).

Server training and civil liability

Training programmes for servers and bartenders for preventing impaired driving by identifying impairment, refusing service and providing transportation have been evaluated in North America, Australia, and the Netherlands. These have demonstrated a significant improvement in server knowledge and attitude, as well as discouraging over-consumption and encouraging alternative beverages. This effect is particularly strong when coupled with a change in the serving and sales practices of the licensed place, and with training for managers (Rydon *et al.* 1996; Saltz 1997). Success in reducing the risk of drink-driving has not been found in all studies, even when mandating the training of servers as a condition of licensing (Lang *et al.* 1998). However, when implemented as part of more comprehensive community-based programmes, responsible server programmes have been found to be effective, particularly for night time crashes for young people (Holder and Wagenaar 1994; Wagenaar *et al.* 2000).

The civil liability of alcohol retail establishments, who serve alcohol to intoxicated customers, has been established, particularly in the United States, often based upon common law, with very limited spread to other countries, but including Australia and Canada.

The importance of enforcement

An enforcement activity in which plain clothes officers visited licensed establishments that were serving visibly intoxicated customers showed a three-fold increase in refusals of service to pseudo-customers simulating signs of intoxication and a one-fourth drop in the percentage of arrested drivers coming from bars and restaurants (McKnight and Streff, 1994). The savings in accident costs were estimated at €75 for each Euro cost of enforcement.

This liability has been primarily reactive, that is, as a means of legal redress after service to an intoxicated person resulted in personal loss or injury (Mosher 1979 1987). This may, for instance, occur when an intoxicated driver, served by a retail establishment, crashes and injures or kills an innocent bystander. However, server liability can also be a preventive policy to encourage safer beverage serving practices and to prevent drink driving (Mosher 1983; 1987; Holder *et al.* 1993). States within the US that hold bar owners and staff legally liable for damage attributable to alcohol intoxication have lower rates of traffic fatalities (Chaloupka *et al.* 1993; Ruhm 1996; Sloan *et al.* 1994a) and homicide (Sloan *et al.* 1994b), compared to states that do not have this liability. When one State deliberately distributed publicity about the legal liability of servers, there was a 12% decrease in single-vehicle night-time injury-producing traffic crashes

(Wagenaar and Holder 1991), mediated by the effects of legal liability on the attitudes and behaviour of bar owners and staff (Holder *et al.* 1993; Sloan *et al.* 2000).

In many jurisdictions, it is illegal to sell an alcoholic beverage to purchasers considered to be at risk of injury, including the underage and the intoxicated. Violations can result in criminal actions and fines against sellers and administrative action, such as fines and license suspensions, against the establishments. Enforcement of laws prohibiting service to an intoxicated customer is rarer than enforcement of laws prohibiting sales to an underage customer. Most actions against servers appear to occur when the illegal service results in some form of harm, rather than from routine enforcement activity. The efficiency of alcohol-control efforts can be enhanced by focusing enforcement on establishments that are the most persistent violators. Arrested drivers queried for the sources of their last drink can identify the greatest sources of trouble.

Designated Driver and safe ride programmes

There is no universal definition of a “designated driver.” The most common definition requires that the designated driver abstain from all alcohol, be assigned before alcohol consumption, and drive other group members to their homes (see Ditter *et al.* 2005). Other definitions employ a risk and harm reduction strategy, in which the primary goal is not necessarily abstinence, but to keep the designated driver’s blood alcohol content (BAC) at less than the legal limit.

In practice, it appears that only a minority of designated drivers remain completely abstinent, and many people may apply the designated driver concept in ways that are unsafe. In a California survey, only 56% of respondents said that the designated driver should be chosen before drinking begins, and only 64% expected the driver to abstain from alcohol for 4 hours before driving (Lange *et al.* 1998). Also in some

cases, the “designated driver” may be chosen based on who in the group is the least intoxicated (Knight *et al.* 1993; DeJong and Wintzen 1999). Timmerman *et al.* (2003) found that the mean BAC for 66 designated drivers leaving university bars was 0.6g/L.

A systematic review was conducted to assess the evidence of effectiveness of designated driver programs for reducing alcohol-impaired driving and alcohol-related crashes by evaluating population-based campaigns that encourage designated driver use, and programs conducted in drinking establishments that provide incentives for people to act as designated drivers (Ditter *et al.* 2005). Only one study of a population based designated driver promotion campaign was identified. Survey results indicated a 13% increase in respondents “always” selecting a designated driver, but no significant change in self-reported alcohol-impaired driving or riding with an alcohol impaired driver (Boots and Midford 1999). Seven studies (five of which were reported in the same journal article, and six of which were by the same two principal authors) evaluated the number of patrons who identified themselves as designated drivers before and after programs were implemented, with a mean increase of 0.9 designated drivers per night (Brigham *et al.* 1995; Meier *et al.* 1998; Simons-Morton and Cummings 1997). An eighth study reported a 6% decrease in self-reported driving or riding in a car with an intoxicated driver among respondents exposed to an incentive program (Boots 1994).

Interpretation of these results was complicated by the fact that only two of the studies (Brigham *et al.* 1995; Simons-Morton and Cummings 1997) reported the number of patrons or groups of patrons in the bar during each observation period. Thus, although the incentive programs generally found small increases in the number of patrons identifying themselves as designated drivers, the extent to which these changes related to actual designated driver use was unclear. Finally, it was impossible to estimate the public health effects of observed changes in the number of self-identified designated drivers without information on what their behaviour would have been in the absence of a designated driver program. Thus, due to the small effect sizes observed, and the limitations of the outcome measures, the present evidence is insufficient to draw any conclusions about the effectiveness of either type of designated driver promotion program evaluated.

Further, no study has evaluated whether the use of designated drivers actually decreases alcohol-related motor vehicle-related injuries. However, some studies of designated drivers have assessed their BACs, which are strongly associated with crash risk. Studies indicate that the BACs of designated drivers are generally lower than those of their passengers and also lower than those of other drivers who are not acting as designated drivers (Lange *et al.* 2000), but still often higher than the legal limit for drinking and driving (Timmerman *et al.* 2003).

The potential impact of designated driver programs on alcohol consumption is another important consideration. Several studies indicate an increase in passenger alcohol consumption when a designated driver is available. One study estimated that the mean increase in the BACs of passengers of designated drivers was 0.17 g/L, (Harding *et al.* 2001), with young and high-risk drinkers particularly likely to increase consumption (Knight *et al.* 1993; DeJong and Wintzen 1999; Boots and Midford 1999).

Several communities have organizations that provide free rides largely to individuals who drive while being alcohol impaired. A survey of 335 ride services in response to calls from passengers or the drinking places serving them found the biggest obstacle to be the inability of more than 15% of the programs to transport the driver's vehicle

The Saving Lives Project

The Saving Lives Project conducted in six communities in Massachusetts, USA was designed to reduce alcohol-impaired driving and related problems such as speeding (Hingson *et al.*, 1996). In each community a full time coordinator from the local government organized a task force representing various city departments. Programs were designed locally and involved a host of activities including media campaigns, business information programs, speeding and drunk driving awareness days, speed watch telephone hotlines, police training, high school peer-led education, Students Against Drunk Driving groups, college prevention programs, and other activities. During the five years that the program was in operation, sites that received the Saving Lives intervention produced a 25% greater decline in fatal crashes than the rest of Massachusetts, a 47% reduction in the number of fatally injured drivers who were positive for alcohol as well as a 5% decline in visible crash injuries and an 8% decline in crash injuries affecting 16-25 year olds. In addition, there was a decline in self-reported driving after drinking (specifically among youth) as well as observed speeding. The greatest fatal and injury crash reductions occurred in 16-25 year old age group.

(Harding, Apsler and Goldfein 1998). Drivers were reluctant to leave their vehicles behind or return to the drinking location to collect their vehicles. Ross (1992) suggested that one approach to individuals could be to provide them with free taxi rides to drinking places. This would ensure their inability to drive away and, consequently, a heavy drinker would be forced to find alternative transportation to return home, as the vehicle would not be at the drinking location. One study found that if the safe ride program had not been in place 44% of drinkers would have driven themselves home (Sarkar *et al.* 2005). One third of the drinkers did not feel they had control over their choice to avoid drinking and driving.

School based education courses

A systematic review of the literature to assess the effectiveness of school-based programs for reducing drinking and driving and riding with drinking drivers identified thirteen peer reviewed papers or technical reports which met specified quality criteria and included evaluation outcomes of interest (Elder *et al.* 2005). The papers evaluated three classes of interventions: school based instructional programs, peer organizations, and social norming campaigns. For instructional programs, whereas the median effects of five studies found no effect on self-reported drinking and driving (Harre and Field 1998; Klepp *et al.* 1995; Shope *et al.* 1996; D'Amico and Fromme 2002; Sheehan *et al.* 1996), the median effects of four studies found a reduction in self-reported riding with drinking drivers (Harre and Field 1998; Newman *et al.* 1992; Wilkins 2000; Sheehan *et al.* 1996). Only one study looked at crashes and found no effect (Shope *et al.* 2001). Two studies of the effectiveness of peer organization programmes were unable to provide evidence for effect (Leaf and Preusser 1995; Klitzner *et al.* 1994). Two studies of social norming programmes appeared to reduce drink driving, and led to more frequent use of designated drivers (Cimini *et al.* 2002; Foss *et al.* 2001).

Community programmes for safe driving

Although commonly used, public information programs that disseminate information about drinking and driving through the mass media have, by themselves not demonstrated any benefit in reducing alcohol-related accidents (Haskins 1985). However, broad based community prevention programmes that include public information seem to be effective (Hingson *et al.* 1996; see below).

Policies to reduce drink-driving

Summary

The drinking-driving policies that are highly effective include lowered blood alcohol concentration (BAC) levels, unrestricted (random) breath testing, administrative license suspension, and lower BAC levels and graduated licenses for young drivers Table 7.3. Whilst alcolocks can be used as a preventive measure, their use for drink driving offenders lasts for only as long as the device is fitted. There is no evidence for an effective impact from designated driver and safe drive programmes or from school-based education courses. To be effective, drink driving laws must be publicized. If the public is unaware of a change in the law or an increase in its enforcement, it is unlikely that it will affect their drinking and driving. When incorporated as part of community programmes, drink driving measures appear to have increased effectiveness.

Table 7.3 Effectiveness ratings for drink-driving countermeasures

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Lowered BAC levels	+++	+++	+++
Random breath testing (RBT)	+++	++	+
License suspension	+++	++	++
Alcohol locks	+	+	+
Low BAC for youth	+++	++	+++
Graduated licensing	++	++	+++
Server training and civil liability	+	++	+
Designated drivers and ride services	O	+	++
School based education courses	?/O	+	+
Community programmes	++	++	+

¹For definitions see Table 7.1
Source: Babor *et al.* (2003) (modified).

Impact and costs of drink drive measures

The World Health Organization's CHOICE modelled two independent effects on alcohol-related traffic injuries: drink-driving laws, estimated to reduce traffic fatalities by 7% if widely implemented within a region (Shults *et al.* 2001), adjusted for the current level of implementation; and enforcement via random breath testing (RBT), estimated to reduce fatalities by a further 6-10% (Peek-Asa 1999; Shults *et al.* 2001). The model found that the full implementation of random breath testing (compared to no random breath testing) throughout the European Union (EU) prevents between 161 (EuroB countries) and 460 (EuroC countries) DALYs per million people per year, at an estimated cost of between €43 (EuroC countries) and €62 (EuroB countries) per 100 people per year (see Figures 7.11 and 7.12 at end of chapter). The model estimated that unrestricted breath testing in Europe, compared with no breath testing, can avoid 111,000 years of disability and premature death at an estimated cost of €233 million each year (adapted from Chisholm *et al.* 2004).

EDUCATION, COMMUNICATION, AND PUBLIC AWARENESS

This section discusses four areas under the heading of education, communication, training and public awareness: mass media and counter-advertising, low-risk drinking guidelines, warning labels on alcohol products and school-based education.

Mass Media and Counter-Advertising

Although most media portrayals of alcohol are in the form of commercial advertisements, public health and safety perspectives are also portrayed in the mass media. Public service announcements on television or radio, paid counter-advertisements, billboards, magazine articles, newspaper pieces, and news or feature stories on television and radio all attempt to provide information about the risks and complications associated with drinking.

Public service announcements (PSAs) are messages prepared by nongovernmental organizations, health agencies or by media organizations for the purposes of providing important information for the benefit of a particular audience. In contrast to paid advertising, PSAs depend upon donated time or space for distribution to the public. When applied to alcohol, PSAs usually deal with "responsible drinking," the hazards of driving under the influence of alcohol, and related topics. Despite their good intentions, PSAs are considered an ineffective antidote to the high-quality pro-drinking messages that appear much more frequently as paid advertisements in the mass media (see Ludwig 1994; Murray *et al.* 1996).

In many cases the messages in PSAs are intended to be particularly relevant to drinking by youth (Connolly *et al.* 1994; Holder 1994). Reviews point to the limited impact on alcohol use and alcohol-related problems from mass media interventions that use a universal strategy (Gorman 1995). Nevertheless, a Canadian study (Casiro *et al.* 1994) found that after a T.V. campaign on the dangers of alcohol consumption during pregnancy, more women concluded that drinking would put their baby at risk, and attributed this information to television. In general, there is a need for more research to find out what audiences perceive and understand from mass media campaigns (Martin 1995). Looking at how media set the public policy agenda is potentially more fruitful (Casswell 1997). For example, portrayal of alcohol issues in the news media (print, T.V. and radio) tends to be simplistic, sensational and dramatic (Gusfield 1995), and focuses on stories about individual people rather than

alcohol in its social perspective. These portrayals raise interesting questions about the way news reporting may shape public attitudes and policy about alcohol, but this area has not been extensively researched.

Counter-advertising involves disseminating information about a product, its effects, or the industry that promotes it, in order to decrease its appeal and use. It is distinct from other types of informational campaigns in that it directly addresses the fact that the particular commodity is promoted through advertising (Stewart 1997). Tactics include health warning labels on product packaging and media literacy efforts to raise public awareness of the advertising tactics of an industry, as well as prevention messages in magazines and on television. Counter-advertising may also be a module in community or school prevention programs (e.g., Giesbrecht *et al.* 1990; Greenfield and Zimmerman 1993), and be used as part of the multiple agenda of government spirits board retail systems (Goodstadt and Flynn 1993).

In most countries, the number of public service announcements and counter-advertisements on alcohol issues are at best a small fraction of the volume of alcohol advertisements (see Fedler *et al.* 1994; Wyllie *et al.* 1996) and are rarely seen on television. Moreover, the quality of counter-advertising is often poor. A study of high school students in the Moselle region in France (Pissochet *et al.* 1999) found that respondents considered alcohol risk prevention advertising to be less effective than alcohol advertising, and daily drinkers were more critical than intermittent and non-drinkers.

Media advocacy However, mass media marketing can be used to reinforce community awareness of the problems created by alcohol use and to prepare the ground for specific interventions (Casswell *et al.* 1990; Holder and Treno 1997). Education and public information approaches can be used not just to seek to persuade the individual drinker to change his or her behaviour, but also to mobilise public support for prevention approaches that have demonstrated effectiveness (Casswell and Gilmore 1989), including limiting the availability of alcohol, drinking and driving countermeasures, and regulation and harm reduction in and around drinking environments. Media advocacy can also be used to support a shift in public opinion for policy changes (Wallack *et al.* 1993), for example, the introduction of standard drinks labelling on all Australian alcohol containers (Stockwell and Single 1997).

Low risk drinking guidelines

Epidemiological research on the effects of moderate drinking on cardiovascular problems (see Chapter 5) has created political pressures in some countries to provide the public with promotional and educational material about the benefits of moderate alcohol use. Surveys in several countries have noted an increase in the number of adults who are aware of these health benefits. For example, in New South Wales, Australia, the proportion identifying health benefits increased from 28% in 1990 to 46% in 1994, with relaxation (54%) and cardiovascular benefits of moderate drinking (39%) most often mentioned (Hall 1995). In this context, official or semi-official guidelines have been adopted in a number of countries on “moderate” drinking or “low-risk drinking” (e.g., Bondy *et al.* 1999). Given the complex considerations that underlie any such guidelines, it is not surprising that the guidelines vary considerably from one country to another (Stockwell 2001). There is, at present, little research on the impact of these messages (Walsh *et al.* 1998). Furthermore, it is unclear whether such messages should be expected to lead to

decreases or increases in alcohol consumption and problems (Casswell 1993). In both Denmark (Strunge 1998) and England (Cabinet Office 2003), sensible drinking messages based on the concept of unit drinks, whilst having an impact on knowledge, have had a very limited impact on behaviour.

Warning labels on alcohol products

Warning labels on beverage containers that are required in Canada and the United States typically emphasize the potential for birth defects when alcohol is consumed during pregnancy and the danger of alcohol impairment when drinking and driving or operating machinery. Health risks are also mentioned. Some states require posted warnings of alcohol risks in establishments that serve

or sell alcohol. In the US, the appearance on labels or in advertisements of any positive health-related statement is prohibited (Alcohol and Tobacco Tax and Trade Bureau 2003). Reasons for such a ruling include (1) there are serious health risks associated with alcohol consumption, even moderate consumption; (2) the health benefits of moderate alcohol consumption do not apply universally, but only to a discrete segment of the population; (3) there are many groups of people who should abstain from, or minimize, their consumption of alcohol; (4) allowing health claims would undermine the Government warning label; and (5) explanatory statements are insufficient to clarify a misleading health claim.

A fairly extensive amount of research has been conducted in connection with mandated warning labels on alcoholic beverage containers in the United States, (Kaskutas 1995). Studies have found that a significant proportion of the population report having seen warning labels (Hilton 1993; Graves 1993; Greenfield *et al.* 1993; Kaskutas and Greenfield 1992), and there is some evidence that warning labels may increase knowledge regarding the risks of drinking and driving and drinking during pregnancy (Kaskutas and Greenfield 1992; Greenfield 1997; Greenfield and Kaskutas 1998; Greenfield *et al.* 1999; Kaskutas and Greenfield 1997), with some evidence for a dose-response relationship between pregnancy-related conversations about drinking while pregnant and the number of types of messages seen (Kaskutas *et al.* 1998). No direct impacts of warning labels on consumption or alcohol-related

US warning labels

GOVERNMENT WARNING: (1) According to the Surgeon general, women should not drink alcoholic beverages during pregnancy because of the risk of birth defects. (2) Consumption of alcoholic beverages impairs your ability to drive a car or operate machinery, and may cause health problems.

problems have been reported (MacKinnon *et al.* 2000; Grube and Nygaard 2001; Agostinali and Grube 2002). However, where there is a risk to health in consuming alcoholic beverages, and, in particular, during pregnancy, when taking medication or when driving or operating machinery, consumers should be informed about the risks, even if the evidence is limited for the impact of warning labels.

French Loi Evin

A health message must be included on all alcohol advertisements:

L'abus d'alcool est dangereux pour la santé

(Alcohol abuse is dangerous for health)

Although there is limited evidence for the impact of warning labels on alcoholic products in reducing the harm done by alcohol, European consumers should still receive accurate and consistent information on the potential of the harms done by alcohol.

School based education

The goal of most school-based alcohol education programs is to change the adolescent's drinking beliefs, attitudes, and drinking behaviours, or to modify factors such as general social skills and self-esteem that are assumed to underlie adolescent drinking.

Informational approaches Earlier school-based interventions relied solely on informational approaches and taught students about the effects and the dangers of alcohol use. Such programs have not been found to be effective (Botvin *et al.* 1995a 1995b; Hansen 1994; Tobler 1992). Although they can increase knowledge and change attitudes toward alcohol use, actual use remained largely unaffected. In addition, there is some evidence that simply providing information about the dangers of different substances may, in some cases, actually increase use (Hansen 1980 1982).

School based education

Despite many years of research, the effect sizes for most school based programmes are small and program failures are common. This suggests that, until there is more evidence for effectiveness, it is not a good use of scarce resources to invest heavily in school based education programmes.

Resistance and normative education approaches Scientific evaluations of school and university based resistance and normative education interventions have produced mixed results with regard to alcohol, with some evidence for effectiveness (Dielman 1995; Botvin and Botvin 1992; Hansen 1992 1993 1994; Ellickson 2003), including those aimed at reducing harmful alcohol consumption in university students (Baer *et al.* 1992, Marlatt *et al.* 1995, Marlatt *et al.* 2002), some of which are screening and intervention programs (Marlatt *et al.* 1998, Baer *et al.* 2001) (see below), and educational programmes based on the social norm concept (e.g. the need to conform to what is acceptable to their peers) (Mattern and Neighbors 2004;

Project Northland

Project Northland, was a school and community intervention designed to prevent or delay the onset of drinking among young adolescents in 10 communities in north-eastern Minnesota (Perry *et al.* 1993, 1996). The primary intervention was a series of school-based resistance-skills, media literacy, and normative education sessions. The program also provided parents with information on adolescent alcohol use. Task forces in some communities were involved in local policy actions such as the passage of local laws requiring responsible beverage service training. Evaluation of the project found that although it had a positive influence on alcohol knowledge and family communication about alcohol, it had no sustained impact on alcohol use (Williams *et al.* 1995; Perry *et al.* 1996; Perry *et al.* 1998).

Kypri and Langley 2003, Perkins 2002); but also criticisms of the methodology and discounting of the effectiveness (Brown and Kreft 1998; Foxcroft *et al.* 1997; Gorman 1996 1998; Paglia and Room 1999).

The Alcohol Misuse and Prevention Study (AMPS) is typical of school-based education programs that focus on pressures to use alcohol, risks of alcohol use, and ways to resist pressures to drink (Shope *et al.* 1996a 1996b). The AMPS program had positive effects on alcohol knowledge (Shope *et al.* 1992), but few effects on drinking behaviour (Shope *et al.* 1996a). Other school-based alcohol resistance skills programs have produced similar results (Botvin *et al.* 1995a; Klepp *et al.* 1995).

A good example of a well-designed study is the School Health and Alcohol Harm Reduction Project (SHAHRP study) from Australia, which aimed to reduce alcohol-related harm in secondary school students (McBride *et al.* 2004). The study found that the intervention group (which received eight to ten 40 to 60 minute lessons on skill-based activities to minimize harm at age 13 years, and twelve further skills based activities delivered over 5-7 weeks at age 14 years) consumed significantly less alcohol at 8-month follow-up, after the first phase of the intervention (31% difference). However, at final follow-up, 17 months after the intervention, the total amount of alcohol consumed by intervention and comparison had lessened to a 9% difference. After the first phase of the programme at 8-month follow-up, intervention students were less likely to consume to risky levels (26% difference), but by seventeen months after programme completion, the difference was only 4%, Figure 7.1. There was a significant difference between the study groups in the harm they reported associated with their own use of alcohol after both phases of the intervention, which was maintained 17 months after the intervention (23% difference).

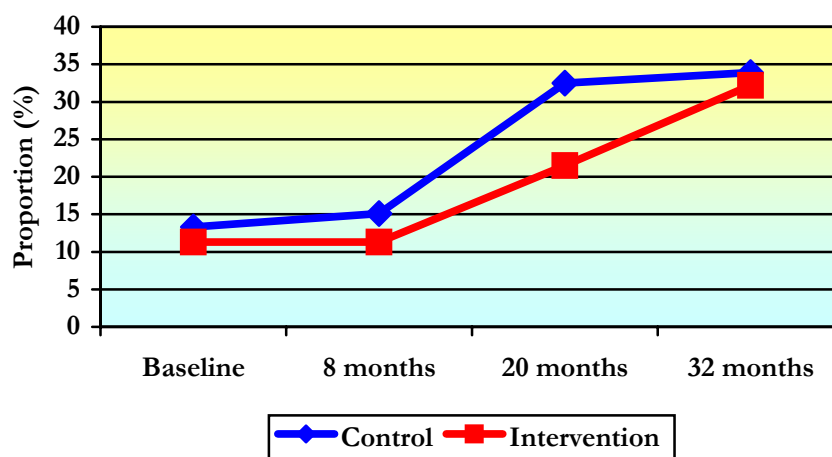


Figure 7.1 The impact of 2 education sessions (after baseline and one year later) in the intervention group compared to the control group (no education sessions) on binge drinking in 13-15 year olds. Source: McBride *et al.* (2004).

Media literacy Other school based initiatives have used media literacy efforts to teach young people to resist persuasive appeals of alcohol advertising, with some small positive effects (Austin and Johnson 1997) on resistance to such advertising (Slater *et al.* 1996) and reductions in drinking and in the number of times young people went to high-risk social environments where alcohol consumption was likely (Canzer 1996).

Midwestern Prevention Project

The Midwestern Prevention Project was implemented in 50 public schools in 15 communities in the State of Kansas (USA). A replication was conducted in 57 schools and 11 communities in another state. The intervention consisted of five components: (a) a 10-13-session school-based program with 5 booster sessions, (b) a mass media program, (c) a parent education and organization program, (d) training of community leaders, and (e) local policy changes initiated by the community organization. Differences between program and comparison schools in self-reported prevalence of monthly drinking were significant after one year (MacKinnon *et al.* 1991; Pentz *et al.* 1989) but they did not differ after 3 years (Johnson *et al.* 1990).

Family and community interventions Some programs include both individual-level education and family or community-level interventions (Werck *et al.* 2003; Bauman *et al.* 2002; Turrisi *et al.* 2001). Well-designed evaluations suggest that even comprehensive school-based prevention programs may not be sufficient to delay the initiation of drinking, or to sustain a small reduction in drinking beyond the operation of the program. (Perry *et al.* 1993 1996 1998; Williams *et al.* 1995; MacKinnon *et al.* 1991; Pentz *et al.* 1989; Johnson *et al.* 1990).

Over the longer term (more than 3 years), the Strengthening Families Programme (SFP), showed promise as an effective prevention intervention, with a number needed to treat (NNT) for three alcohol initiation behaviours (alcohol use, alcohol use without permission and first drunkenness) of 9 (Spath *et al.* 2001a; 2001b), Figure 7.2. This means that nine students have to receive the programme for one to benefit. One other study also highlighted the potential value of culturally focused skills training over the longer-term (NNT = 17 over 3.5 years for 4 + drinks in the last week) (Schinke *et al.* 2000). This means that 17 students have to receive the programme for one to benefit.

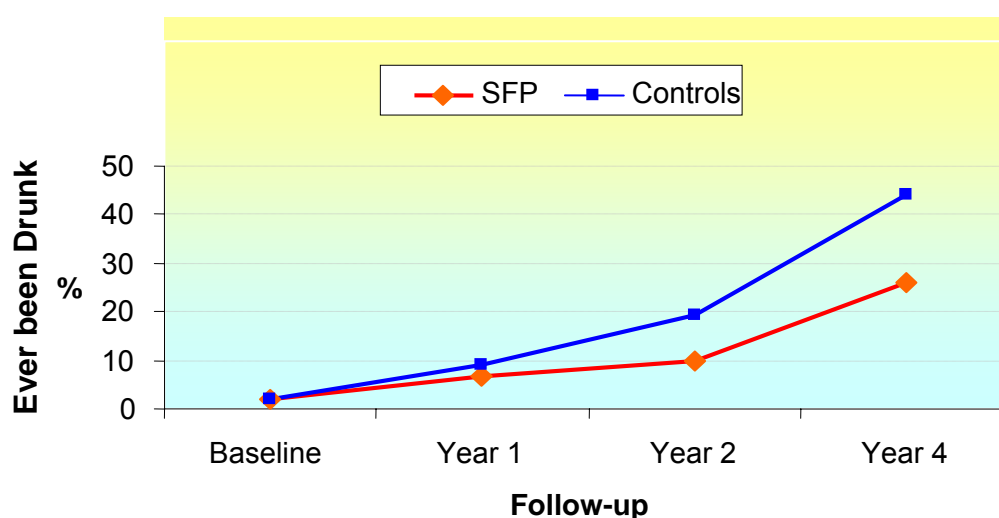


Figure 7.2 The impact of the Strengthening Families Programme on ever having been drunk. Source: Spoth *et al.* (2001a 2001b).

A **Cochrane review** of long term prevention for the primary prevention in young people found that 23 of 56 studies reviewed were ineffective in the short term, Table 7.4 (Foxcroft *et al.* 2003). The review was unable to make any firm conclusions about the effectiveness of prevention interventions in the short- and medium term.

Table 7.4 Effectiveness of primary prevention programmes for young people in the short, medium and long term. Source: Foxcroft *et al.* 2004.

Follow-up:	Partially effective	Ineffective	“Negative” effect
Short-term (1 year or less)	14	23	3
Medium-term (1-3 years)	13	19	2
Long-term (over 3 years)	3	6	0

Can the success of education programmes be improved? A number of suggestions have been made as to how the impact of school based education programmes might be improved (Marlatt *et al.* 2002, Hawks *et al.* 2002, McBride 2002; 2003; 2005). Based on the evidence of effective programmes, it is suggested that programs can be improved by:

- adopting adequate research design;
- encouraging program planners to adopt a formative phase of development that involves talking to young people and testing the intervention with young people and teachers;
- providing the program at relevant periods in young people’s development;
- ensuring programs are interactive and based on skill development;
- setting behaviour change goals that are relevant and inclusive of all young people;
- including booster sessions in later years;
- including information that is of immediate practical use to young people;
- including appropriate teacher training for interactive delivery of the program;
- making effective programs widely available; and
- adopting marketing strategies that increase the exposure of effective programs.

These improvements to school education research and program development cannot occur in isolation from the practical implementation of programs at the school level. Identification of barriers and strategies that lead to effective alcohol education are important. Evidence based implementation and practice research will enhance this development and reinforce school alcohol education as an important strategy in a community approach for dealing with youth alcohol issues. Public investment in school alcohol education should be accompanied with both research expenditure to improve practice and with adequate training to ensure quality standards are met.

Policies to support Education, Communication, Training and Public Awareness

Summary

Public service announcements, public education campaigns, and particularly those that focus on low risk drinking guidelines have limited evidence for effectiveness, although media advocacy approaches are important to gain public support for policy changes, Table 7.5. Although there is limited evidence for the impact of warning labels, there is an argument for their use in relation to consumer protection and consumer rights. Although there are individual examples of the beneficial impact of school-based education, systematic reviews and meta-analyses find that the majority of well-evaluated studies show no impact even in the short-term. A policy that fails more often than not cannot be considered an effective policy option. One family-based programme may show some promise, but has only been evaluated in a particular US context and needs a large amount of further research. There is considerable experience of what might be best practice in school-based education programmes, but currently unconvincing evidence for their effectiveness. This is not to imply that education programmes should not be delivered, since all people do need to be informed about the use of alcohol and the harm done by it, but school based education should not be seen as the only and simple answer to reduce the harm done by alcohol.

Table 7.5 Effectiveness ratings for education and public awareness

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Public service messages	O	+++	++
Warning labels	O	+	+++
Alcohol education in schools	O/+	+++	+

¹For definitions see Table 7.1
Source: Babor *et al.* (2003) (modified).

Impact and costs of education type measures Due to lack of convincing evidence, the CHOICE model did not assess the impact or costs of education-based interventions.

REGULATION OF THE ALCOHOL MARKET

This section considers the impact of three different measures to regulate the alcohol market; price and tax measures; restrictions on availability; and advertising, promotion and sponsorship. Although each is considered in turn, these policy measures do not act in isolation.

Price and tax measures to reduce the harm done by alcohol

The impact of price changes on alcohol consumption and the harm done by alcohol has been more extensively investigated than any other potential alcohol policy measure (Ornstein 1980; Ornstein and Levy 1983; Godfrey 1988; Leung and Phelps 1991; Österberg 1995; USDHHS 1997; Österberg 2001).

Alcohol taxes

If alcohol taxes were used to raise the price of alcohol in the EU15 by 10%, over 9,000 deaths would be prevented during the following year and around €13bn of additional excise duty revenues would be gained.

Econometric studies are available at least from the following European countries: Austria, Belgium, Denmark, Germany, Finland, France, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, and the United Kingdom (Ahtola *et al.* 1986;

Huitfeldt and Jorner 1972; Lau 1975; Ornstein 1980; Ornstein and Levy 1983; Olsson 1991; Edwards *et al.* 1994; Österberg 1995; 2000). The price-elasticities for alcoholic beverages estimated in different studies have shown that when other factors remain unchanged, an increase in price has generally led to a decrease in alcohol consumption, and that a decrease in price has usually led to an increase in alcohol consumption, with the size of the elasticities sometimes dependent on the relative presence or absence of other alcohol policy measures (Farrell *et al.* 2003; Trolldal and Ponicki 2005).

An analysis of annual data from Australia, Canada, Finland, New Zealand, Norway, Sweden, and the United Kingdom from the mid 1950's to the mid 1980's found price elasticities of -0.35 for beer, -0.68 for wine, and -0.98 for spirits (Clements *et al.* 1997). This means that if the price of beer is raised by 10%, beer consumption would fall by 3.5%; if the price of wine was increased by 10%, wine consumption would fall by 6.8%; and if the price of spirits increased by 10%, spirits consumption would fall by 9.8%. There are differences between countries and within countries over time, in the way that alcohol consumers react to changes in the price of alcoholic beverages. This is reflected in the diversity of price elasticity values cited across studies from any given country (Österberg 1995; Chaloupka, Grossman and Saffer 2002). Reviews of demand models from 1989 and 1990 in the United Kingdom found that the demand for beer, wine, and spirits was generally price-inelastic, with the demand for wines and distilled spirits being more responsive to prices than the demand for beer (Godfrey 1989 1990). More recent estimates found price

Box 7.1: Price elasticities

Economists and econometric studies use the term **elasticity** to measure how much alcohol consumption or alcohol-related harm changes when the price of alcohol changes.

Price elastic Alcohol is described as **price elastic** when the percent change in the amount of alcohol consumed is **greater** than the percent change in price.

Price inelastic Alcohol is described as **price inelastic** when the percent change in the amount of alcohol consumed is **less** than the percent change in price.

For example, an elasticity of -2 would mean that a 10% rise in the price of alcohol would lead to a 20% fall in consumption, and would be described as 'price elastic'.

Price inelastic does **not mean** that consumption is not responsive to the price. It only means that the proportional change is less.

elasticities of -0.48 for beer consumed on premises, -1.03 for beer purchased and consumed off premises, -0.75 for wine, and -1.31 for spirits (Huang 2003).

Changes in alcohol consumption are not only determined by changes in price, but also by changes in income. The European Comparative Alcohol Study analyzed price and income (as measured by expenditure) elasticities for alcohol during the period 1960s to 1990s for 14 European countries, Table 7.6 (Lepannen *et al.* 2000).

Table 7.6 Mean elasticities of alcohol demand for selected European countries, averaged for the years 1980-1995.

Country	Elasticities	
	Price of alcohol	Income (measured as expenditure on alcohol adjusted for consumer purchasing power)
Austria	-0.026	0.930
Belgium	-0.438	1.083
Denmark	-0.573	0.414
Finland	-0.680	0.761
France	-0.308	0.520
Greece	-0.199	0.469
Ireland	-0.392	0.542
Italy	-0.087	0.890
Netherlands	-1.688	0.769
Norway	-1.308	0.879
Portugal	-0.166	0.917
Spain	-0.314	0.868
Sweden	-0.855	1.200
UK	-0.681	0.620
Mean	-0.551	0.776

Source: Lepannen *et al.* (2000).

The price elasticities indicate that demand for alcoholic beverages is more easily controllable by excise taxes in the northern European countries than elsewhere. Demand appears to be least sensitive to prices in the southern European countries. Although in the northern European countries the prices of alcoholic beverages are set at a relatively high level by taxes, the estimated value of the price elasticities indicated that the taxes were not set at their tax revenue-maximizing level even in these countries. That is, taxes could be set higher to generate further tax intakes for the governments. Between the 1960s and 1990s, the price elasticities converged separately across the northern and the southern European countries.

The similar values of the income elasticities indicate that consumers view alcoholic beverages as normal goods, and not luxuries. Between the 1960s and 1990s, the expenditure elasticities converged across all the European countries.

The price of alcohol and consumer expenditure on alcohol accounted for over half (56%) of the variation in alcohol consumption between the countries (Lepannen *et al.* 2004). However, when taking into account the different cultural characteristics of the countries themselves, price and expenditure were responsible for 11% of the variation in alcohol consumption between the countries. Finally, the variation in alcohol consumption levels decreased when prices were set at an equal level between the countries, but appeared to increase slightly when real expenditures were equalized between the countries. This shows that price is more important than expenditure in bringing about a convergence of alcohol consumption between countries.

Price and beverage preferences Examining a series of purposeful price adjustments by Systembolaget (the Swedish alcohol monopoly) throughout the years 1984 to 1993, allows the responses of consumers to changes in patterns of prices to be examined (Ponicki *et al.* 1997; Gruenewald *et al.* 2000a). Beverages were classified into “low”, “medium” and “high” quality groups by beverage type (beer, wine and spirits, based on 1990 real prices) and the impacts of changes in the real prices of these beverages within quality classes upon consumption within and between quality classes were examined. Increasing the prices within quality classes decreased sales within classes, increased sales in lower quality classes within beverage types, and increased sales in lower quality classes between beverage types. A flat price increase across all beverages led to a 1.7% drop in sales, a price increase that resulted in higher prices for higher quality beverages led to a 2.8% increase in sales, and a price increase that resulted in higher prices for lower quality beverages led to a 4.2% drop in alcohol sales.

Another natural experiment occurred in Switzerland with its reform of spirits taxes, which came into effect on 1 July 1999. Previously, the tax rate per litre of pure alcohol for domestic spirits was Swiss francs 26.00 and for foreign spirits between Swiss francs 32.00 and 58.00, according to the type of beverage and its alcohol content. The fiscal reform also liberalized the import of spirits. The result was a reduction of between 30% and 50% in the retail price of foreign spirits. Prices of domestic spirits, however, did not change. Spirits consumption increased significantly (by 28.6%) in the total sample, and specifically in young males and in individuals who were low-volume drinkers at baseline (Heeb *et al.* 2003). Consumption of alcohol overall, or of wine or beer, did not change significantly. No indication of effects of substitution was found. Alcohol-related problems also increased significantly; the significance disappeared, however, after controlling for spirits consumption, indicating that the increase of alcohol-related problems at follow-up was mainly mediated through the increased consumption of spirits.

Price effects in young people and heavy drinkers Studies have found that increases in the price of alcohol reduce the alcohol consumption of young people, with a greater impact on more frequent and heavier drinkers than on less frequent and lighter drinkers (Grossman *et al.* 1987; Coate and Grossman 1988; Laixuthai and Chaloupka 1993; Chaloupka and Wechsler 1996; Cook and Moore 2002). Beyond levels of drinking, price has also been found to influence drinking to intoxication. One large survey in the US found that a 10% increase in price would decrease the number of intoxication episodes per month by 8% (defined as consuming 5+ drinks on one occasion; Sloan *et al.* 1995). The impact of alcohol taxes differs with age,

with the impact of increasing age in youth possibly swamping the impact of price (Gius 2005).

Although alcoholic beverages appear to behave in the market like most other consumer goods, the demand for alcoholic beverages in some consumers may differ from other products because of the addictive nature of alcohol. The addictive nature of alcohol implies that an increase in the past consumption of alcohol would raise the current consumption; and thus the price elasticity in the short-term, which holds past consumption constant, would be smaller in absolute value than the price elasticity in the long-term, which allows past consumption to vary. For example, a price increase in 2004 would reduce consumption in 2004, with consumption in previous years held constant. Because of the addictive nature of alcohol, it would be expected that consumption in 2005 and in all future years would also fall. Consequently, the reduction in consumption, observed over several years (i.e., in the long term) after the price increase, would exceed the reduction observed in 2004 (i.e., in the short term). Studying the relationship between price and alcohol consumption by young adults ages 17 to 29 has found this to be the case (Grossman *et al.* 1998). Ignoring previous years' consumption (and thus the addictive aspects of alcohol) the price elasticity of demand for alcohol was -0.29. However, when previous years' consumption (and thus the addictive aspects of alcohol) was taken into account, the estimated long-term price elasticity of demand was more than twice as high at -0.65, indicating that price had a much greater influence on alcohol consumption. This also means that about one half of the reason that heavy drinking young adults do not reduce their consumption is the difficulty (costs) of overcoming the addictive nature of alcohol.

Price of alcohol and use of other drugs It is also important to know the impact of price changes of alcohol on the use of other substances. An English study of 43 polysubstance users investigated the influence of price upon hypothetical purchases of alcohol, amphetamine, cocaine and ecstasy. As the price of alcohol rose, it was found that amphetamine to some extent substituted the use of alcohol, more cocaine was used in addition to alcohol, and the use of ecstasy remained independent (Sumnall *et al.* 2004). How this translates to the real world and amongst non-poly-substance users is not known.

Effects of price on dependence and frequency of drinking Increasing the price of alcohol reduces heavier drinking (Coate and Grossman 1988; Kenkel 1993 1996; Manning *et al.* 1995), as well as alcohol dependence (Farrell *et al.* 2003).

Effects of price on the harm done by alcohol A wide range of studies have found that increasing the price of alcohol and beer reduces road traffic accidents and fatalities among people of all ages, but particularly for younger drivers (Saffer and Grossman 1987a,b; Kenkel 1993; Ruhm 1996 Chaloupka and Laixuthai 1997 Dee 1999; Mast *et al.* 1999; Dee and Evans 2001; Chaloupka *et al.* 2002 Saffer and Chaloupka 1989; Evans *et al.* 1991; Chaloupka *et al.* 1993; Sloan *et al.* 1994a; Mullahy and Sindelar 1994a). For example, a policy adjusting the US beer tax for the inflation rate since 1951 to the mid-1980s would have reduced total road traffic fatalities by 11.5 percent and fatalities among 18- to 20-year-olds by 32.1 percent (Chaloupka *et al.* 1993).

Increases in alcohol prices reduce cirrhosis death rates (Grossman 1993; Cook and Tauchen 1982), intentional and unintentional injuries (Sloan *et al.* 1994; Grossman and Markowitz 1999), workplace injuries (Ohsfeldt and Morrisey 1997) and sexually transmitted disease rates (Chesson *et al.* 2000). In the United Kingdom, it has been estimated that a 10% rise in the prices of alcoholic beverages would lead to a drop of

7.0% in male and 8.3% in female cirrhosis mortality, a drop of 5.0% for male victims and 7.1% for female victims of homicide, and a drop of 28.8% for male and 37.4% for female deaths from explicitly alcohol-involved causes (alcohol dependence, poisoning, etc.) (Academy of Medical Sciences 2004). Higher beer prices have been shown to lead to reductions in rapes and robberies (Cook and Moore 1993), homicides (Sloan *et al.* 1994), crime (Saffer 2001), child abuse (Markowitz and Grossman 1998; Markowitz and Grossman 2000), wife abuse (Markowitz 2000) violence at universities (Grossman and Markowitz 2001), and violence-related injuries (Matthews *et al.* 2005).

Impact and costs of tax measures Using the elasticities of the ECAS project (Leppänen, Sullström, and Suoniemi 2001), it is possible to estimate the effect of a tax rise that would raise the price of alcohol by 10% in each country. It should be stressed that this takes no account of any rise in smuggling or cross-border shopping due to a lack of data; in practice, policy decisions will take account of anticipated changes in these areas. Using the ECAS report analysis, it can be predicted that countries in Southern Europe would experience a drop in consumption of 2%, while the fall in Central Europe would be 5% and that in Northern Europe 8%. If these estimates are combined with the ECAS analysis of the effect of changes in consumption on health outcomes (Norström *et al.* 2001), it can be estimated that a 10% price rise would save over 9,000 deaths in the EU15 each year. This would include over 4% fewer deaths from liver disease for men (and 3% for women), 1% fewer deaths among men and women from accidents, and 5% fewer deaths among men due to homicide. Furthermore, in Finland, Sweden and Norway – where the effects of both price (on consumption) and consumption (on harm) are stronger – it is estimated there would be a 6-7% fall in suicide deaths and accidents, together with a 20% decrease in directly alcohol-related deaths for men and a 40% fall in women.

When looked at from the public accounts view, it can be roughly estimated that a 10% price rise would also give around €13bn of additional excise duty revenues within the EU.³ This is likely to be something of an overestimation, given that it takes no account of smuggling/cross-border shopping or the effect of price rises on all beverages at the same time (compared to individual beverage elasticities). Even accounting for the former and only looking at one beverage though,⁴ a detailed official UK analysis shows that spirits duties could be raised by 40% before the maximum revenue is achieved (Huang 2003). The potential for increased tax revenues even in a relatively high-tax country such as the UK was further demonstrated when beer and wine were examined – the current duties were so much lower than the maximum revenue point that it proved impossible to say exactly where this would be.

³ The tax rise from a 10% change in price is estimated from data on the share of tax in price given in the WHO Global Status Report on Alcohol 2004 (WHO 2004). The changed tax take is then calculated for each beverage separately from the tax rate per litre of pure alcohol (taken from the spirits industry organisation CEPS), changes in consumption from tax rises (above), adult per capita consumption, and adult population (both from the WHO's HFA database).

⁴ The UK estimate for spirits includes the effect of *spirits* price changes on *beer and wine* consumption (known as 'cross-price elasticities'). This has the effect of lowering the tax rate at which the maximum tax revenue is obtained in this case. However, it is extremely difficult to model the effect of simultaneous price rises in multiple beverage types, which is why the effects of beverage-specific rises are given here.

Price measures

Summary

An increase in the price of alcohol reduces alcohol consumption, hazardous and harmful alcohol consumption, alcohol dependence, the harm done by alcohol, and the harm done by alcohol to others than the drinker, Table 7.7. The exact size of the effect will vary from country to country and from beverage to beverage. There is very strong evidence for the effectiveness of alcohol taxes in targeting young people and the harms done by alcohol.

Table 7.7 Effectiveness ratings for pricing and taxation

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Taxes	+++	+++	+++

¹For definitions see Table 7.1
Source: Babor *et al.* (2003).

Impact and costs

The World Health Organization's CHOICE modelled the impact of a tax on alcohol set at the current level increased by 25%, compared with no tax at all, and adjusted for the observed or expected level of unrecorded use (taken as a close proxy measure for untaxed consumption) due to illicit production and smuggling, using published price elasticities (Ornstein and Levy 1983; Babor *et al.* 2003). The model estimated that the current level of taxation plus a 25% increase can prevent between 503 (EuroB countries) and 1576 (EuroA countries) DALYs per million people per year, at a cost of between €18 (EuroC countries) and €38 (EuroA countries) per 100 people per year (see Figures 7.11 and 7.12 at the end of the chapter). The model estimated that the current level of tax with a 25% increase in the tax rate throughout Europe, compared with no tax on alcohol, can prevent an estimated 656,000 years of disability and premature death at an estimated cost of €159 million each year (adapted from Chisholm *et al.* 2004).

Restrictions on the availability of alcohol

Total or partial bans on the sale of alcohol It is clear from historical evaluations of the prohibition periods in North American and the Nordic countries (Aaron and Musto 1981; Paulson 1973) and from studies of current more limited prohibitions, that total bans on alcohol production and sales can reduce alcohol-related problems (Chiu *et al.* 1997; Bowerman 1997). However, where there has been a substantial demand for illicit alcohol, it has been met partly by illegal operators, often with associated violence in the enforcement of the illegal market (Johansen 1994; Österberg and Haavisto 1997).

Total prohibition is clearly politically un-acceptable in contemporary Europe, even if the potential for reducing alcohol problems does exist. However, that is not to say that bans on alcohol sales for specific persons in the population (e.g., children and adolescents, see below), or in specific circumstances (d'Abbs and Togni 2000) cannot be applied with demonstrated success.

Restrictions on eligibility to purchase and sell alcohol During the mid twentieth century, broad restrictions on who could purchase alcohol were fairly common. The most elaborate example of such controls was the Bratt system in Sweden, where a rationing scheme assigned a limit to each adult on how much spirits could be purchased (Tigerstedt 2000). Other types of schemes included those where drinkers convicted of violent assaults could be banned from bars and cafés.

Whilst rationing is clearly politically unacceptable in contemporary Europe, there is no doubt that general alcohol rationing schemes, such as the Bratt system in effect in Sweden until 1955 (Norström 1987) and the system in effect in Greenland from 1979 to 1982 (Schechter 1986) were responsible for reducing liver cirrhosis mortality, violence, and other consequences of heavy drinking. In Poland during the early 1980s, when alcohol rationing limited each adult to half a litre of spirits per month, episodic heavy drinking was reduced, mental hospital admissions for alcoholic psychosis fell by 60%, deaths from liver diseases dropped by 25%, and deaths from injuries by 15% (Moskalewicz and Swiatkiewicz 2000).

Sales to minors For young people, laws that raise the minimum legal drinking age reduce alcohol sales and problems among young drinkers (Grube and Nygaard 2001; Babor *et al.* 2003).

Although legal restrictions on the age at which young people may purchase alcohol vary widely from country to country, ranging typically from 16 to 21 years of age, almost all countries legally restrict these sales. A review of 132 studies published between 1960 and 1999 found very strong evidence that changes in minimum drinking age laws can have substantial effects on youth drinking and alcohol-related harm, particularly road traffic accidents, often for well after young people reached the legal drinking age (Waagenar and Toomey 2000). Many studies have found that raising the minimum legal drinking age from 18 to 21 years decreased single vehicle night time crashes involving young drivers by 11% to 16% at all levels of crash severity (Klepp *et al.* 1996; Saffer and Grossman 1987a,b; Wagenaar 1981 1986; Wagenaar and Maybee 1986; O'Malley and Wagenaar 1991; Voas and Tippet 1999). Changes in the minimum drinking age are related to changes in other alcohol-related injury admissions to hospitals (Smith 1988) and injury fatalities (Jones *et al.* 1992). One study from Denmark, where a minimum 15-year age limit was introduced for off-premise purchases, found that there was an effect in reducing teenagers' drinking, but that the drinking of those above as well as below the age limit was affected (Møller 2002).

The importance of enforcement The full benefits of a higher drinking age are only realized if the law is enforced. Despite higher minimum drinking age laws, young people do succeed in purchasing alcohol (e.g., Forster *et al.* 1994 1995; Preusser and Williams 1992; Grube 1997). In most EU countries in the ESPAD study (see Chapter 4), a majority of 15-16 year old students thought that getting any type of alcoholic beverage was fairly easy or very easy, rising to 70-95% for beer and wine (Hibell *et al.* 2004). Such sales result from low and inconsistent levels of enforcement, especially when there is little community support for underage alcohol sales enforcement (Wagenaar and Wolfson 1994 1995). Even moderate increases in enforcement can reduce sales to minors by as much as 35% to 40%, especially when combined with media and other community activities (Grube 1997; Wagenaar *et al.* 2000).

Regulating retail outlets for alcohol Alcohol can be purchased through "off-premise" or "on-premise" sales. For off-premise sales, where alcohol is consumed elsewhere, regulations can be made on the type, strength and packaging of the

alcoholic beverage and the time, costs and location of alcohol sales. For on-premise sales, where alcohol is consumed in the bar or café, regulations can specify drink sizes, disallow discount drink promotions or require on-premise staff to receive training in responsible beverage service. They may also regulate the design of the bar or café, and include specifications on such matters as food service, availability of entertainment, and other non-alcohol-related matters (see section on reducing harm in drinking and surrounding environments below).

A **licence** issued by a local or central administration is required in many countries before some types of alcoholic drinks can be sold, either on licensed premises or from off-licences. In some countries the licensing of outlets selling spirits is much stricter than regulations on the retail sale of beer and wine. There are many reasons and benefits for licensing retail sales (Lehto 1995). One is to make sure that outlets observe other regulations such as age limits and opening times. Another is to ensure that tax is collected on every drop of alcohol sold. When the system is used to restrict the number of outlets, most often the aim is to prevent health and public order problems by limiting the alcohol supply. Licensing systems have also been used to control the standard of licensed premises, for instance to deny licences to places that are perceived to encourage harmful drinking and to grant licences to outlets that appear to encourage less harmful drinking.

One means to regulate sales of alcohol is through government-owned alcohol outlets, **retail monopolies**, which still operate in parts of the US and much of Canada, as well as in the Nordic countries. Off-premise monopoly systems reduce alcohol consumption and alcohol-related problems. Studies of privatisation of sales of alcoholic beverages in the United States show substantial variations in increases in consumption (cf, Mulford, Ledolter and Fitzgerald 1992; Wagenaar and Holder 1991), with observed increases ranging between 13% and 150% (Wagenaar and Holder 1995). When Finland changed from selling beer only in government monopoly stores to selling it also in grocery stores in 1968, alcohol consumption rose by 46% in the following year, alcohol problem rates increased (Mäkelä *et al.* 2004), and drinking among 13 to 17-year-olds increased (Valli 1998). Noval and Nilsson (1984) found that total alcohol consumption in Sweden was substantially higher when medium-strength beer could be purchased in grocery stores between 1965 and 1977, rather than only in state monopoly stores.

Number of retail outlets/outlet density Outlet density refers to the number of outlets available for the retail purchase of alcohol. The smaller the number of outlets for alcoholic beverages, the greater the difficulty in obtaining alcohol, a situation that is likely to deter alcohol use and problems (Gruenewald *et al.* 1993). This can be seen in practice in Finland, Sweden, Britain and North America.

Finnish studies have found an overall impact on alcohol consumption from changes in the number of outlets (Kuusi 1957; Lehtonen 1978; Mäkinen 1978). The most dramatic change was observed in 1969, when beer up to 4.7% alcohol was allowed to be sold by grocery stores, and it also became easier to get a restaurant license. The number of off-premise sales points increased from 132 to about 17,600, and on-premise sales points grew from 940 to over 4000 (Österberg 1979). In the following year, alcohol consumption increased by 46%. In the following five years, mortality from liver cirrhosis increased by 50%, hospital admissions for alcoholic psychosis increased by 110% for men and 130% for women, and arrests for drunkenness increased by 80% for men and 160% for women (Poikolainen 1980).

Swedish studies have also found an overall impact on alcohol consumption and alcohol-related harm from changes in the number of outlets (Noval and Nilsson 1984;

Hibell 1984). A time-series analysis found that motor vehicle accidents were significantly reduced in three of four age groups when the right to sell 4.5% beer in groceries was retracted; there was a significant fall in hospital admissions for alcohol-specific diagnoses among those aged under 20 years, but no effect on assaults, suicides and falls (Ramstedt 2002).

However, **Norwegian studies** of the effects of opening wine and spirit outlets in places where beer was already available found a shift away from other beer and home produced spirits, with little effect on overall consumption. This suggests that, where there is already some availability of alcohol, the effects on total consumption of changes in the number of off-sale stores selling one or another type of beverage are minor (Mäkelä *et al.* 2002).

Recent years have seen the transformation of the night-time economy in **British cities** and towns (Hobbs *et al.* 2003; Chatterton and Hollands 2003), with older pubs being replaced by large branded drinking warehouses run by national or international chains. In Manchester City Centre, for example, the capacity of licensed premises increased by 240% between 1998 and 2001, whilst the number of assaults reported to the police increased by 225% between 1997 and 2001 (Hobbs *et al.* 2003).

North American studies have looked at the association of outlet density with rates of drinking driving collisions (Blose and Holder 1987; Gruenewald *et al.* 1993). Four studies report no impact of outlet density on drinking-driving or collision measures (Gruenewald and Ponicki 1995; Kelleher *et al.* 1996; Meliker *et al.* 2004; Lapham *et al.* 2004). However, a larger number of studies (eight) have reported a significant impact of outlet density on alcohol consumption and drinking driving collision (Scribner, MacKinnon and Dwyer 1994; Gruenewald *et al.* 1996; Gruenewald *et al.* 1999; Gruenewald, Johnson and Treno, Jewell and Brown 1995; 2002; LaScala *et al.* 2001; Treno, Grube and Martin 2003; Escobedo and Ortiz 2002; Cohen, Mason and Scribner 2002), and assaults, particularly in high population density areas (Gruenewald *et al.* 1996). On balance, the research indicates that increasing numbers of outlets will increase alcohol-related collisions and fatalities (see Mann *et al.* 2005 for a more detailed description). Outlet density has also been associated with an increased risk of pedestrian injury collisions (LaScala *et al.* 2000), and violent assaults (Alaniz *et al.* 1998; Stevenson *et al.* 1998; Zhu *et al.* 2004).

The distribution of alcohol-related crashes (single-vehicle night-time crashes) is also related to the distribution of on-premise outlets and rates of these crashes decrease with greater distance from concentrated areas (Gruenewald *et al.* 1996). Further, greater outlet concentrations have a greater impact on alcohol-related crashes in areas with greater amounts of highway traffic (Gruenewald and Johnson 2000), and in lower income areas (LaScala, Gruenewald and Gerber 2000).

Research has examined the associations between outlet density and measures of student and underage drinking. Outlet density has been found to be closely related to heavy drinking and drinking-related problems among college students (Weitzman *et al.* 2003); other associations were found for the number of commercial sources of alcohol and binge drinking and drinking in inappropriate places for students age 16 to 17 years (Dent *et al.* 2005).

The impact of changes in availability will depend on local circumstances (Abbey, Scott and Smith 1993). Thus, whereas changes occurring across a country have an impact (Gruenewald, Ponicki and Holder 1993; Wagenaar and Holder 1996), when changes in availability are more local, there may be no impact (Gruenewald *et al.* 2000b). In the first case, it is difficult to avoid the effects of reduced availability. In the

local case, it is possible to travel outside the local geographic area to obtain alcohol. Further, equivalent reductions in local areas can have different effects. A 10% reduction in the number of outlets in high density areas will have negligible effects on the distances between people and outlets. A 10% reduction in the number of outlets in low density areas may result in the elimination of the only outlets easily accessible by drinkers.

In sum, outlet density is, in general, positively associated with alcohol consumption and alcohol-related problems: the higher the density, the higher consumption and problems will likely be, (Her *et al.* 1998; 1999), Figure 7.3, although the extent to which changes in densities over time affect rates of problem outcomes is not always certain (Gorman *et al.* 2001).

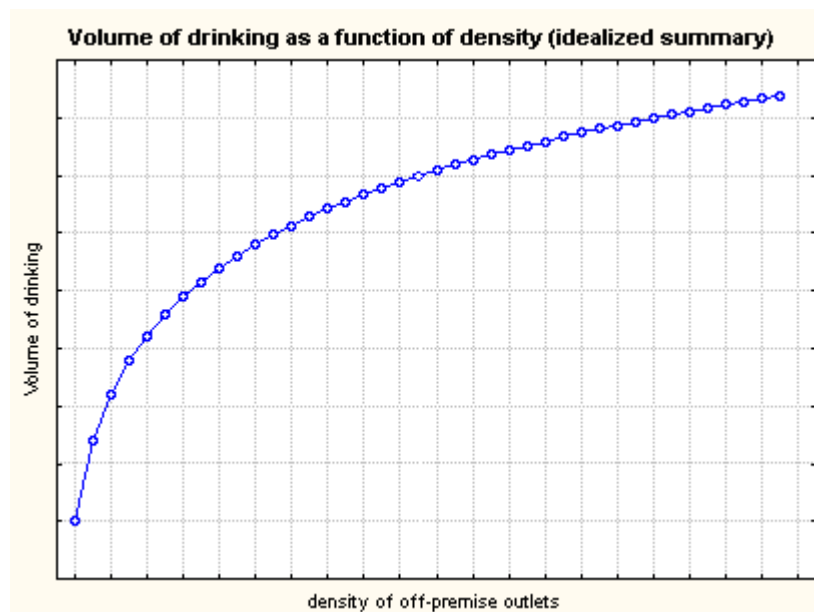


Figure 7. 3 Illustration of the relationship between volume of drinking as a function of outlet density (Source: Her *et al.* 1999a)

Hours and days of retail sale A number of studies have indicated that although changing either hours or days of alcohol sale can redistribute the times at which many alcohol related crashes and violent events related to alcohol take place (e.g., Smith 1988; Nordlund 1985), it does so at the cost of an overall increase in problems. Around-the-clock opening in Reykjavik, for instance, produced net increases in police work, in emergency room admissions and in drink-driving cases. The police work was spread more evenly throughout the night, but this necessitated a change in police shifts to accommodate the new work (Ragnarsdottir *et al.* 2002). A study in Western Australia showed that extending opening hours from midnight to 1.00am increased violent incidents at the later night venues by 70% (Chikritzhs, Stockwell and Masters 1997; Chikritzhs and Stockwell 2002), Figure 7.4. The increased problems associated with the late trading venues appeared to result from increased alcohol consumption rather than increased opportunity for crime to occur, since there was no apparent difference between the two groups after controls for alcohol sales. The blood alcohol levels (BALs) of drivers in road crashes, who had been drinking at the extended trading premises, were significantly higher than those drinking at the control premises. Similar studies have also found that assaults at licensed premises are much more likely to occur during extended trading periods, with the most frequent time being midnight to 3am (Briscoe and Donnelly 2003a).

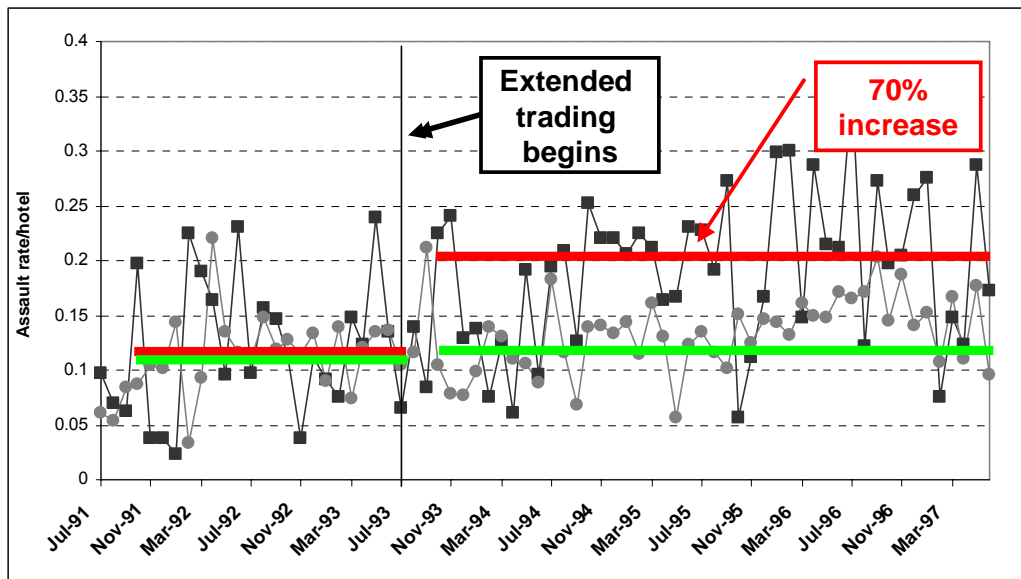


Figure 7.4 Assault rates for hotels that closed at 1 am [■] and those that closed at midnight [●] Perth, WA. Source: Chikritzhs and Stockwell (2002).

A study in Sweden (Norström and Skog 2001 2002 2005) found a net 3.6% increase in alcohol sales with Saturday opening of government alcohol stores, although the changes in harm were not big enough to be significant. The Saturday opening occurred at a time when alcohol was more readily available from other sources, including restaurants and bars, groceries (up to 3.5% alcohol concentration) and travellers' imports.

There is also evidence that restricting days and hours of sale reduces problems. In the 1980s Sweden re-instituted Saturday closing for spirits and wine off-premise sales after studies showed that Saturday sales were associated with increased rates of domestic violence and public drunkenness (Olsson and Wikström 1982). In 1984, Norway reintroduced Saturday closing, with a resultant decrease in domestic violence and disruptive intoxication (Nordlund 1985).

Restricting availability

Summary

Raising and implementing a minimum age of purchase for alcohol, and reducing the availability of alcohol through restrictions on the number and density of outlets and the days and hours of sale all reduce alcohol related harm, Table 7.8.

Table 7.8 Effectiveness ratings for restrictions on the availability of alcohol

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Minimum drinking age	+++	+++	++
Government retail outlets	+++	+++	+++
Number of outlets	++	+	+++
Density of outlets	++	++	+++
Hours and days of sale	++	+++	+++

¹For definitions see Table 7.1
Source: Babor *et al.* (2003) (modified)

Impact and costs

The World Health Organization's CHOICE modelled reduced access to and availability of alcohol through estimating what would happen if alcohol could not be purchased for a 24-hour period at the week-end (although not politically acceptable across contemporary Europe, this option was chosen by the WHO team, based on Scandinavian data, which has been shown to reduce consumption and alcohol-related harm (Leppanen 1979; Nordlund 1984; Norström and Skog 2003)). Based on these studies, a modest reduction of 1.5-3.0% in the incidence of hazardous drinking and 1.5-4.0% in alcohol-related traffic fatalities was modelled. If implemented throughout the European Union, the model estimated that such an intervention can prevent between 251 (EuroA countries) and 689 (EuroC countries) DALYs per million people per year, at a cost of between €12 (EuroC countries) and €23 (EuroA countries) per 100 people per year (see Figures 7.11 and 7.12 at the end of the chapter). Although it is not known for how long the effects might last, the model estimated that such an intervention throughout Europe can prevent an estimated 123,000 years of disability and premature death at an estimated cost of €98 million each year (adapted from Chisholm *et al.* 2004).

Alcohol advertising, promotion and sponsorship

Introduction

Beverage alcohol is prominent among the many branded consumer goods that young people, in particular, increasingly use as a way of signalling their identity and place in the world. The producers and marketers of beverage alcohol, many of whom are global players (Babor *et al.* 2003, Jernigan 1997), use sophisticated promotional practices to target specific groups such as those starting to drink, regular young drinkers and established young drinkers (Academy of Medical Sciences 2004). This marketing utilizes multiple channels (youth radio, television, events, websites, mobile phones) and diverse modalities (advertising, sponsorship, branding) (Jernigan and O'Hara 2005). Such marketing of alcohol to young people is at the forefront of what is termed post-modern marketing (Cooke *et al.* 2004; Jernigan and O'Hara 2005). Advertising and branding are crafted to mirror and express dominant representations of youth culture and lifestyles (Klein 1999; Jackson *et al.* 2000). Promotion is never static, even in established markets, as new cohorts of young people become available as targets for marketing activity on a continual basis as they mature (Saffer 2002).

A total marketing strategy has five steps: product development, pricing, physical availability, market segmentation and targeting, and advertising and promotion campaigns (Cowan and Mosher 1985; Kotler 1992). This section will consider the impact of each of the five marketing steps on alcohol consumption, with the greater discussion on the impact of advertising and promotion campaigns, and will discuss some aspects of regulating marketing practices, and in particular self-regulation.

New product development

New product development has been particularly active since the 1990s (Jackson *et al.* 2000; Mosher and Johnsson 2005), and started with designer drinks characterised by brightly coloured and innovative packaging, delivering the product benefits of strength, flavour and portability, such as bottled ciders and fortified fruit wines. The boom in designer drinks lasted until the mid-1990s, when a new range of alcoholic soft drinks, which became known as 'alcopops', emerged. Alcopops were then superseded by 'pre-mix cocktails' (blends of spirits, soft drinks and other unique flavourings that are not readily concocted by consumers themselves), and a trend towards mixing high energy soft drinks (such as Red Bull) with spirits (such as vodka). A development of this trend has been the introduction of 'ready-to-drink' alcoholic energy drinks that are sold on the basis of their stimulant properties. These drinks contain a blend of vodka, caffeine, glucose and taurine and have an average alcohol content of 5.4%. Another type of product – strong spirits designed to be consumed in one mouthful from small 'shot' glasses - is becoming increasingly popular. Brands include 'Aftershock' and 'Goldshlager', and are chosen by young drinkers because their strength gives an immediate hit, and their strong flavours (for example cinnamon), brand names and packaging have created associations with daring behaviour (see Hastings *et al.* 2005).

Whether they be wine coolers, (Goldberg *et al.* 1994), designer drinks (McKeganey *et al.* 1996), or alcopops (Barnard and Forsyth 1998), studies of young people's attitudes and behaviour in several countries have documented that such new products are the drinks of choice of young people and can contribute both to heavier drinking and to lowering the age of onset of drinking. In some instances, these products seem to be competing directly with the youth market for illegal drugs (Jackson *et al.* 2000).

The brand imagery of designer drinks - in contrast to that of more mainstream drinks - matched many 14 and 15 year olds' perceptions and expectations of drinking, with consumption of designer drinks tending to be in less controlled circumstances and associated with heavier alcohol intake and greater drunkenness (Hughes *et al.* 1997). Data from the Health Behaviour in School-aged Children study found that in Wales, alcopops consumption matched the entire increase in weekly drinking of alcohol between 1994 and 1996 among 11 and 12 year olds, half the increase for 13 and 14 year-olds, and most of the increase for 15 and 16 year old girls (Roberts *et al.* 1999). Swedish surveys have found that alcopops and sweet ciders accounted for more than half the recorded increase in alcohol consumption among 15 and 16 year old boys between 1996 and 1999, and two-thirds of the increase in consumption among girls, at a time when alcohol consumption among Swedish adults remained stable (Romanus 2000).

Industry representatives do not deny the importance of new products designed to reach "new drinkers" or "entry-level drinkers" or some similar term: "*No matter where in the world they are drunk, and at what kind of occasion, there is no doubt that FABs (flavoured alcoholic beverages) are consumed by younger drinkers. The*

combination of packaging, taste and alcoholic content gives them little appeal to older drinkers” (Euromonitor 2004; 6, Section 22.15).

Pricing

The impact of price on consumption has been discussed above. There has been a considerable trend towards popular drinking venues offering promotional deals and ‘happy hours’ (temporary price-cuts) on products regularly consumed by young drinkers (see Hastings *et al.* 2005). Examples include: a never ending vodka glass (purchase one glass of vodka and refill it as often as you like); buy-one-drink and get-one-free happy hours, and cheap deals on popular drinks on particular nights of the week. Alcohol price promotions are associated with increased binge drinking (Kuo *et al.* 2003)

Availability

The impact of availability on consumption has been discussed above. Alcohol advertising can also take place at the **point of purchase**, including exterior and interior advertisements for alcoholic beverages; alcohol-branded functional objects provided free to retailers (e.g., counter change mats with an alcohol company logo); beer placement (e.g., single cans or bottles chilled in buckets near checkout locations); and the presence of low-height advertisements (i.e., advertisements placed in the sight line of children and adolescents as opposed to adults) (CDC 2003). For non-drinkers aged 12-13 years, exposure to in-store beer displays are predictive of drinking onset by age 14-15 years (Ellickson *et al.* 2005).

Market segmentation and targeting

Research in the United States shows that alcohol companies have placed significant amounts of advertising where youth are more likely per capita to be exposed to it than adults (Jernigan *et al.* 2005). In 2002 in the US, underage youth saw 45% more beer and ale advertising, 12% more distilled spirits advertising, 65% more low-alcohol refresher advertising, and 69% less advertising for wine than persons 21 years and older (Jernigan *et al.* 2004). Girls aged 12 to 20 years were more likely to be exposed to beer, ale, and low-alcohol refresher advertising than women in the group aged 21 to 34. Girls' exposure to low-alcohol refresher advertising increased by 216% from 2001 to 2002, while boys' exposure increased 46%.

Magazines are the most tightly targeted of the measured media. Two studies to date have looked at alcohol advertising in this medium. Following on research suggesting that cigarette brands popular among youth ages 12 to 17 were more likely than other brands to be advertised in magazines (King *et al.* 1998), Sanchez *et al.* (2000) selected a convenience sample of 15 magazines, 11 with the highest youth readership (greater than 1.9 million readers) and 4 with the lowest youth readership (less than 0.8 million), and assessed the volume of influence by counting advertising pages for alcohol and tobacco in each magazine. The authors found a relationship between the size of youth readership and alcohol and tobacco advertisements, with magazines with more youth readers containing more alcohol and tobacco advertisements. Similar findings were made by Garfield *et al.* (2003), who found that after adjustment for other magazine characteristics, the advertisement rate ratio was 1.6 more times for beer and spirits for every additional one million adolescent readers. Wine industry advertising was not associated with adolescent readership, Figure 7.5.

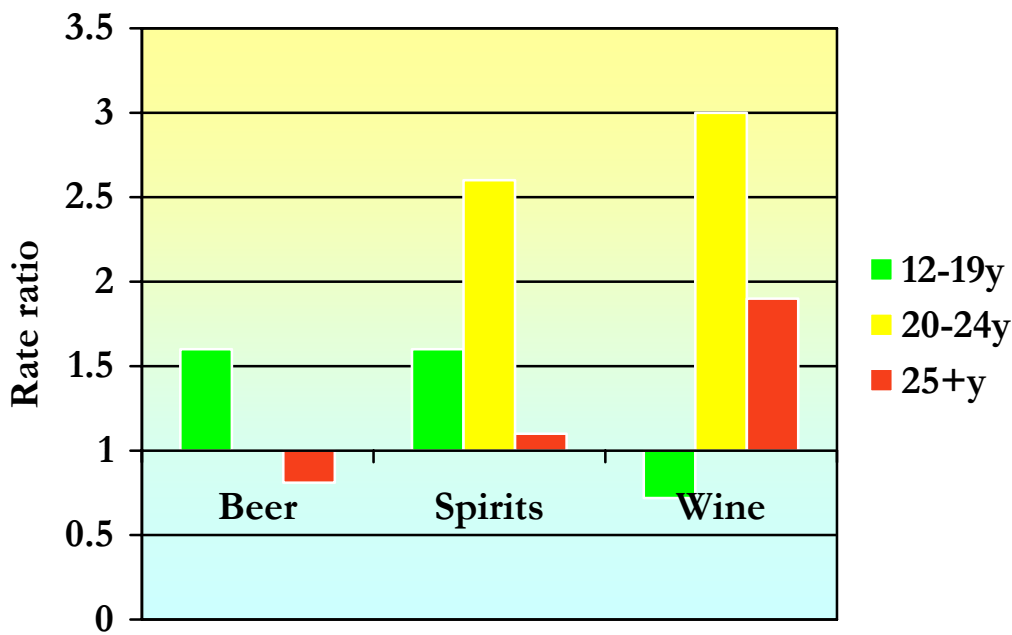


Figure 7.5 Magazine readership and alcohol advertisements. The advertisement rate ratio for every additional 1 million adolescent readers. For example, a US magazine that has 1 million more readers aged 12-19 years than another US magazine will have 1.6 times the number of beer and spirits advertisements. Source: Garfield *et al.* (2003).

Advertising and promotion campaigns

Television portrayal of alcohol use has been given a lot of attention. When people are seen drinking on television they seem to be drinking alcohol most of the time (Brown and Witherspoon 2002). Pendleton *et al.* (1991), for example, found that every 6.5 min a reference to alcohol was made in their sample of 50 programmes on British television. Especially in fictional series the consumption of alcohol was prominently present. Furnham *et al.* (1997) concentrated on the portrayal of alcohol and drinking in six British soap operas and concluded that 86% of all programmes contained visual or verbal references to alcoholic beverages. More alcohol was consumed than any other kind of drink, but the sample of programmes almost never referred to the hazards of alcohol consumption.

Content analyses of portrayals of alcohol use on television suggest that incidences of drinking occur frequently and that these portrayals present drinking as a relatively consequence-free activity (Christenson *et al.* 2000; Grube 1993; Mathios *et al.* 1998; Wallack *et al.* 1990). Television characters who drink tend to be “high status” characters who are wealthy, successful, attractive, and in senior-level occupations. Their drinking is often associated with happiness, social achievement, relaxation, and camaraderie (Hundley 1995; Wallack *et al.* 1990).

Content analyses of the appeals used in alcohol advertisements suggest that drinking is portrayed as being an important part of sociability, physical attractiveness, masculinity, romance, relaxation and adventure (Grube 1993; Finn and Strickland 1982; Madden and Grube 1994). Many alcohol advertisements use rock music, animation, image appeals, and celebrity endorsers, which increase their popularity with underage television viewers (Aitken 1989; Grube 1993; Jones and Donovan

2001; Martin *et al.* 2002; Waiters *et al.* 2001). Not surprisingly, then, alcohol commercials are among the most likely to be remembered by teenagers and the most frequently mentioned as their favourites (Aitken 1989; Aitken *et al.* 1988; Aitken *et al.* 1988; Grube 1993).

A number of studies have attempted to understand the process by which exposure to alcohol advertising and incidental portrayals of drinking on television and music videos (DuRant *et al.* 1997; Robinson *et al.* 1998) influence alcohol-related beliefs and behaviours in children and adolescents. Aas and Klepp (1992), Atkin (1990), and Austin and Meili (1994) have argued that alcohol use is a learned behaviour, part of the adolescent socialization process. They contend that adolescents, particularly those who have not yet begun to experiment personally with alcohol, actively and deliberately seek information about alcohol from cultural sources as well as family and peers. One of the primary sources is television, which may present only a distorted view of the realities of alcohol use (Atkin 1990; Austin and Nach-Ferguson 1995; Christenson *et al.* 2000; Grube 1993; Kelly and Donohew 1999; Mirazee *et al.* 1989; Wallack *et al.* 1990).

High school boys who are heavier television viewers drink more than lighter viewers (Tucker 1985; Atkin 1990), although this is not the case for all programme viewing (Klein *et al.* 1993). Heavier viewers are more likely than lighter viewers to agree that “people who drink are happy” and “you have to drink to have fun at a sporting event” (Neuendorf 1985). More recently, it was found that television viewing was related to initiation of drinking over an 18-month period (Robinson *et al.* 1998) Each 1-hour increase in television viewing at baseline was associated with a 9% increased risk for initiating drinking during the following 18 months.

Music and music videos An analysis of music that is popular with youth found that 17% of lyrics across all of the genres contained references to alcohol (Roberts *et al.* 1999). Alcohol was mentioned more frequently in rap music (47%) than in other genres, such as country-western (13%), top 40 (12%), alternative rock (10%), and heavy metal (3%). A common theme is getting intoxicated or high, although drinking also is associated with wealth and luxury, sexual activity, and crime or violence. As with television and film, consequences of drinking are mentioned in few songs and antiuse messages occur rarely. Product placements or brand name mentions occurred in approximately 30% of songs with alcohol mentions and are especially common in rap music (48%). From 1979 to 1997, rap music song lyrics with references to alcohol increased fivefold (from 8% to 44%); those exhibiting positive attitudes rose from 43% to 73%; and brand name mentions increased from 46% to 71% (Herd 2005). There were also significant increases in songs mentioning champagne and liquor (mainly expensive brand names) when comparing songs released after 1994 with those from previous years. In addition, there were significant increases in references to alcohol to signify glamour and wealth, and using alcohol with drugs and for recreational purposes. The findings also showed that alcohol use in rap music was much more likely to result in positive than negative consequences.

A similar pattern is found for music videos. DuRant *et al.* (1997) found that rap music videos contained the highest percentage of depictions of alcohol use, whereas rhythm and blues videos showed the least alcohol use. Additionally, alcohol use was found in a higher proportion of music videos that had any sexual content than in videos that had no sexual content. Both the content, which has been shown to glamourize the use of alcohol, and the advertisements surrounding the music videos have a potential to make drinking alcohol more enticing to young viewers.

Use of alcohol by adolescents has been associated with higher levels of music video exposure (Robinson *et al.* 1998; Durant *et al.* 1997; Brown and Witherspoon 2002). Robinson *et al.* (1998) found a 31% increased risk of drinking initiation over 18 months for each 1-hour increase in watching music videos. Another study of the effects of popular music videos on adolescent risk behaviour found a positive association between exposure to rap music videos and an increased likelihood of alcohol use among African American female adolescents (Wingood *et al.* 2003). Results of a 12-month follow-up showed that adolescents with a greater exposure to rap music videos were 1.5 times more likely to have used alcohol than were adolescents with less exposure to rap music videos. A Dutch study examined the association between music video viewing and the amount of drinking in adolescents (Van Den Bluck and Beullens 2005). The results showed that the quantity of alcohol consumed while going out in February 2004 was related to the adolescents' overall TV viewing and their music video exposure a year earlier. Even after controlling for gender, school year, and drinking in 2003, these results remained significant.

Films Content analyses indicate that alcohol is shown or consumed in most films. Thus, 92% (185) of the 200 most popular US movies for 1996–1997 contained images of drinking (Roberts *et al.* 1999). Underage use of alcohol occurred in approximately 9% of these films. In general, drinking was associated with wealth or luxury in 34% of films that contained alcohol references and pro-use statements or overt advocacy of use occurred in 20% of these films. Statements that advocated against drinking appeared in only 9% of the films with alcohol references. In all, 57% of films with alcohol references portrayed no consequences to the user at all. Similar findings have emerged from other content analyses (Everett *et al.* 1998). Surprisingly, an analysis of children's animated feature films found that 47% of them depicted alcohol or drinking (Thompson and Yokota 2001). None of these animated films contained an overt health warning about alcohol use and good or neutral characters accounted for most of the drinking portrayals.

In terms of images of drinkers, a content analysis of 100 films from 1940 to 1989 compared drinkers with non-drinkers; drinkers were depicted more positively than non-drinkers (McIntosh *et al.* 1999). Specifically, drinkers were rated as having a higher socio-economic status, being more attractive, having more romantic and sexual involvements, and being more aggressive than non-drinkers. These films, however, presented negative consequences associated with drinking, such as death and loss of loved ones, on an equal basis with positive consequences, such as wealth and romance. A similar analysis of films produced from 1906 to 2001 found alcohol use to be portrayed predominantly in a normalized fashion, compared with demonized portrayals of illicit drugs, such as cannabis (Cape 2003).

Studies of the effects of exposure to depictions of drinking in films on youth are rare (Thompson 2005). In one study, college students were exposed to one of two versions of *A Star is Born*; one depicted the negative consequences of drinking for the lead character, whereas the other version had the negative consequences deleted (Bahk 1997; 2001). Viewing the version that had deleted scenes led to more favourable attitudes toward drinking and to stronger intentions to drink. In a similar study, college students were exposed to a series of film clips that depicted negative consequences of spirits consumption, positive consequences, or a control condition with no drinking (Kulick and Rosenberg 2001). Results indicated that participants who viewed the clips that showed positive consequences of drinking had significantly higher positive alcohol expectancies compared with controls. The control group and the group that viewed the clips that showed negative consequences did not differ in their intentions to drink spirits in the next week. Other research showed a positive correlation between parental restrictions on non-childhood movies and a decreased

likelihood of adolescent drinking. Dalton *et al.* (2002), for example, found that the prevalence of drinking among middle school students decreased as parental restrictions that were placed on viewing films increased. The prevalence of having tried alcohol was 46% for youth with no parental viewing restrictions, 16% for youth with partial restrictions, and 4% for those with complete restrictions. These prevalence rates held constant, even after controlling for other variables, such as student and parenting characteristics.

Paid placements Paid placements of products in films, television, books, and video games is another way to embed alcoholic beverages in the daily lives of young people. Media placement decisions are the result of extensive market research and the use of standard market research databases to assess the demographic profiles of the audiences for various media vehicles, as well as the effectiveness of such vehicles in delivering target audiences to firms interested in placing advertising in them (Jernigan and O'Hara 2005).

Internet The rapid rise of information technology and, in particular, the Internet has given manufacturers a new promotional opportunity. Sophisticated web sites have been created using technology to produce interactive arenas with impressive graphics and eye-catching animation. Research on alcohol portrayals on the Internet has focused on youth access, exposure to alcohol marketing, and the potential attractiveness of commercial alcohol web sites to youth. Research has not addressed the content of non-commercial web sites that focus on alcohol products or drinking cultures. Similarly, no study has addressed the potential effects on consumption by youth of exposure to alcohol portrayals and promotion on the Internet. The Center for Media Education (quoted in Grube and Waiters (2005)) found that commercial alcohol web sites are easily accessible to youth, and are often accessed from search engines through nonrelated key word searches for games, entertainment, music, contests, and free screensavers. Content analyses of web sites that are registered to large alcohol companies revealed that young drinkers are targeted through a glorification of youth culture that offers humour, hip language, interactive games and contests, audio downloads of rock music, and community-building chat rooms and message boards. Overall, these sites were found to promote alcohol use. Only a handful of them included any information on the harm done by alcohol.

Grass roots and viral Grass-roots level marketing has also increased during the 1990s through the use of technologies such as the Internet, the adoption of racial, ethnic, and other holidays and celebrations and the expansion of sponsorship from sporting events to popular music concerts as alcohol marketing opportunities (McBride and Mosher 1985:143; Alaniz and Wilkes 1998), to events in which alcohol is often a central part of the activities, thereby embedding products in young people's lifestyles and daily practices (Aaker 1996; Fleming and Zwiebach 1999). Viral marketing techniques are also popular to encourage users to bring their friends to Internet sites, including features that permit users to send e-mail and mobile phone text messages to friends (Cooke *et al.* 2002). Little research has been done to date on the impact of such marketing on young people.

Sports sponsorship Commercial sponsorship has expanded greatly since the 1980's, led by the tobacco industry, but with the alcohol industry in second place (Meenaghan 1991, Meerabeau *et al.* 1991). As a result, alcohol sponsorship has become common across the world in all the key areas of youth culture: music, sport, dance, film and television (see Table 7.9).

Sponsorship brings a number of potential benefits to the sponsor. It can provide a means of avoiding regulations on direct advertising (Meerabeau *et al.* 1991). It is an

inexpensive form of advertising which can easily reach favoured market segments (young men are both the keenest sports fans and the heaviest drinkers), and these consumers are less critical of it than traditional forms of advertising. Further, sponsorship of large international sports events can allow a company's brand to cross borders into countries where direct alcohol marketing may be severely restricted or even banned.

Table 7.9 Examples of alcohol sponsorship activity.

Company	Sponsored Event	Country
Athinaiki Zithopiiia (Athenian Brewery S.A.)	Athens 2004 Olympic Games	Greece
Steinlager	All Blacks (http://www.steinlager.com/allblacks/)	New Zealand
Amstel	UEFA Champion's League (http://www.uefa.com/competitions/ucl/)	Europe
McDowell brands	Football events and teams, and the Derby (http://www.mcdowellindia.com/frame_events.html)	India
Bailey's	'Sex and the City'	UK
Anheuser-Busch	Olympic Games and the United States' three Olympic Training Centres (Van Komen 2000)	USA
Smirnoff Vodka	Night-club events and linked radio shows which are branded as 'The Smirnoff Experience' (http://www.smirnoffexperience.com/intro.htm)	Global

Source: Cooke *et al.* (2002)

Research on the effects of sponsorship is limited, and much more is needed. Sponsorship produces higher levels of awareness than advertising amongst both users and non-users of the brand being examined (Hoek *et al.* 1997). For non-drinkers aged 12-13 years, exposure to beer concession stands at sporting events displays is predictive of drinking onset by age 14-15 years (Ellickson *et al.* 2005). Further, attendance at family entertainment venues associated with sporting events is predictive of alcohol consumption amongst 12-13 year olds (Thomsen *et al.* 2004).

Changing expectancies, beliefs, and attitudes

Social norms reflect one's beliefs about both the normality and appropriateness of particular beliefs and behaviours and, as a result, often create pressure to conform and behave in a particular way (Aas and Klepp 1992; Austin and Johnson 1997a; 1997b; Austin and Knaus 2000; Austin and Meili 1994; Austin and Nach-Ferguson 1995; Thomsen and Rekve 2004). In most cases, this pressure is internal and reflects what we think others will expect of us in particular situations. As suggested by social cognitive theory, social norms are often learned through observation and vicarious experiences. Teenagers, for example, who see other teenagers drink – on

television or in a real-life setting – may come to believe that all teenagers drink, in turn creating pressure to conform to this normative standard (Aas and Klepp 1992). The problem is that teenagers tend to overestimate the frequency of drinking by other teenagers, thus creating beliefs and related pressures that are not consistent with reality (Aas and Klepp 1992).

For children and adolescents who have not yet begun to drink, **expectancies** are influenced by normative assumptions about teenage drinking as well as through the observation of drinking by parents, peers, and models in the mass media (Aas 1993; Ary *et al.* 1993; Cumsille *et al.* 2000; Curran *et al.* 1997; Grube and Wallack 1994; Jackson *et al.* 1999; Webb *et al.* 1996). A growing body of research has linked exposure to portrayals of alcohol use in the mass media with the development of positive drinking expectancies by children and adolescents (Andsager *et al.* 2002; Austin and Johnson 1997a; 1997b; Austin and Knaus 2000; Austin and Meili 1994; Aitken 1989; Aitken *et al.* 1988; Austin and Knaus 2000; Austin and Meili 1994; Austin and Nach-Ferguson 1995; Austin *et al.* 2000; Dunn and Yniguez 1999; Grube and Wallack 1994; Kelly and Edwards 1988; Kotch *et al.* 1986; Martin *et al.* 2002; Hill and Caswell 2001).

Many studies suggest that **portrayals of incidental drinking** in entertainment media and messages and images in advertising influence beliefs and behaviours in those who are under the legal drinking age (Aitken 1989; Atkin 1990; Connolly *et al.* 1994; Jones and Donovan 2001; Martin *et al.* 2002; Waiters *et al.* 2001; Wyllie *et al.* 1998). Positive alcohol expectancies, in turn, have also been linked to current adolescent alcohol use (Aas 1993; Aas *et al.* 1995; Aas *et al.* 1998; Austin and Johnson 1997a; 1997b; Brown *et al.* 1987; Connelly *et al.* 1994; Grube and Wallack 1994; Kotch *et al.* 1986). Some of these studies, however, have been criticized in that they have not provided sufficient empirical support to assert a causal link between media exposure and attitudes and behaviours (Kohn and Smart 1984; Smart 1988), and also because some have reported very small effect sizes (Beccaria 2001; Grimm 2002; Nelson 1999; Strickland 1983).

Content analysis suggests that many alcohol advertisements link drinking with valued personal attributes (e.g., sociability, elegance, physical attractiveness) and with desirable outcomes (e.g., success, relaxation, romance, adventure) (Strickland *et al.* 1982). In general, children and adolescents find alcohol advertising with celebrity endorsers, humour, animation, and popular music to be particularly appealing (Chen and Grube 2002; Atkin and Block 1983). Adolescent boys are especially attracted to alcohol advertisements that depict sports (Slater *et al.* 1996; 1997).

One relatively large study looked into connections between **children's awareness** of alcohol advertising and their knowledge and beliefs about drinking (Grube 1995; Grube and Wallack 1994). The students' awareness of alcohol advertising was ascertained through presentations of a series of still photographs taken from television commercials for beer, with all references to the product or brand deleted. The children were asked if they had seen each advertisement and, if so, to identify the product being advertised. Children who were more aware of advertising had increased knowledge of beer brands and slogans as well as more positive beliefs about drinking, which was maintained with statistical accounting for the possibility that prior beliefs and knowledge could affect the children's awareness of the advertising.

Thus, a recent study found that young people with more **positive affective responses** to alcohol advertising held more favourable drinking expectancies,

perceived greater social approval for drinking, believed drinking was more common among peers and adults, intended to drink more as adults, and drank with higher frequency and in greater quantities (Chen and Grube 2002). These results were maintained, even though the reciprocal effects of alcohol consumption, intentions, and beliefs on positive effect toward alcohol advertising were controlled statistically.

Amongst 15 to 20 year olds, alcohol advertising is influential in shaping young people's attitudes and perceptions about alcohol advertising messages, which are in turn predictive of both positive expectancies and intentions to drink, suggesting that the effects of alcohol advertising on intentions to drink are mediated by cognitive responses to advertising messages and positive expectancies (Fleming *et al.* 2004). Fourteen year olds with greater exposure to advertisements in magazines, at sporting and music events and on television are more advertisement-aware than those with less exposure, as were teens who watch more TV, pay attention to beer advertisements and know adults who drink (Collins *et al.* 2003). Amongst 10-17 year olds, the perceived likeability of beer advertisements is a function of the positive affective responses evoked by the specific elements featured in the advertisements. Liking of specific elements featured in beer advertisements significantly contributed to the overall likeability of these advertisements and subsequently to advertising effectiveness indicated by purchase intent of product and brand promoted by these advertisements (Chen *et al.* 2005).

Changing behaviour

The impact of alcohol advertisements in changing behaviour can be measured by both consumer studies and population-based (largely econometric) studies.

Consumer studies

The impact that advertising can have on young people's behaviour is well illustrated by **smoking**, where it has been accepted that advertising is associated with cigarette use. A systematic review of nine longitudinal studies that followed up a total of over 12,000 baseline non-smokers found that exposure to tobacco advertising and promotion was associated with the likelihood that adolescents will start to smoke (Lovato *et al.* 2003). Based on the strength of this association, the consistency of findings across numerous observational studies, the temporality of exposure and smoking behaviours observed, as well as the theoretical plausibility regarding the impact of advertising, the review concluded that tobacco advertising and promotion increases the likelihood that adolescents will start to smoke.

Similar results have been found for **food preferences**, where a systematic review found: reasonably strong evidence, from 14 studies, that exposure to food promotion influences children's food preferences; strong and consistent evidence, from 7 studies, that exposure to food promotion influences children's purchasing and purchase-related behaviour; modest evidence, from 11 studies, that exposure to food promotion influences children's food consumption behaviour; evidence from 6 studies of a significant relationship between *television viewing* and diet, obesity and cholesterol; evidence from one study that greater exposure to *food adverts* was associated with higher snacking and calorific consumption; evidence, from 8 studies, that food promotion exerts an influence on children's food behaviour and diet *independently of* other influences such as parents' behaviour or price; and,

importantly, evidence, from 13 studies that food promotion influences children's brand preferences and their category preferences (Hastings *et al.* 2003).

Heavy drinking when it is not there

The importance of how young people perceive advertisements is illustrated by a study in which three groups of US college students (two-thirds of whom were aged 20 years or below) were exposed to the same set of two beer advertisements (Proctor *et al.* 2005). In these advertisements, the codes stipulate that the actors are not to be younger than 25 years of age and are not supposed to appear to be younger than 21 years of age. The results showed that while all actors were perceived to be, on average, older than the legal purchase age (21 years), the actors in one of the advertisements appeared younger than the minimum (real) age requirement of 25 years. All characters in the advertisements were perceived as attractive, with the female character being rated the highest. Although neither of the commercials depicted the physical act of drinking, the student raters nevertheless perceived the characters to be binge drinkers, in one advertisement perceived as consuming more than 5 drinks on normal occasions and more than 10 drinks on celebratory occasions. These data suggest that the information content of some advertisements, reflected perhaps in the actors' behaviour, appearance, language and situational context, conveys the message that the characters are heavy episodic drinkers, something that is not easily captured by advertising codes.

Early survey research of children and adolescents provided some evidence of links between **alcohol** advertising and a greater likelihood of drinking (Aitken *et al.* 1988; Atkin and Block 1980; Atkin *et al.* 1983 1984; Austin and Meili 1994; Austin and Nach-Ferguson 1995; Grube 1995; Grube and Wallack 1994; Wyllie *et al.* 1998a,b). The effects were small, however, and a few studies found no significant relationships (Adlaf and Kohn 1989; Strickland 1982 1983). Further, the survey study designs were unable to establish whether, for example, the advertisements caused the behaviours, or whether pre-existing behaviours led to an increased awareness of the advertisements.

A number of studies have attempted to find out whether children and adolescents who like alcohol advertisements have different drinking behaviours from those who do not like the advertisements. In one study of 213 children aged 7 to 12 years, the more the children liked alcohol advertisements, the more likely they were to have experimented with alcohol (Austin and Nach-Ferguson 1995).

New Zealand studies One New Zealand study that tracked a random sample of 677 teenagers over several years found that young men who, at age 15 years, could recall more alcohol commercials (mostly beer advertisements) drank greater quantities of beer when they were 18 than did those who could recall fewer commercials at age 15 (Connolly *et al.* 1994). However, opposite results were found for women.

A more recent study of 500 New Zealand children aged between 10 and 17 years found that the degree to which the children liked a set of beer advertisements influenced how much they expected to drink at age 20 years (Wyllie *et al.* 1998a). Statistical analysis concluded that, while liking alcohol advertising influences current

drinking status and intentions, the reverse does not seem to be true. In a similar study of an older age group, stronger results were reported in 1,012 randomly-selected 18- to 29-year-olds (Wyllie *et al.* 1998b). In this case, the more the respondents liked the alcohol advertisements, the more likely they were to drink at greater rates and to agree with positive belief statements such as “Drinking is a good way to escape from the hassles of everyday life.” Most important, the more they liked the advertisements, the more they reported drinking problems such as getting into a physical fight because of drinking. Statistical modelling concluded that alcohol advertising and responses to alcohol advertising influence drinking beliefs, behaviours, and problems rather than the other way around.

US studies In 1998, the US National Institute on Alcohol Abuse and Alcoholism funded three longitudinal studies. Ellickson *et al.* (2005) followed over 3,000 13–15-year-olds for three years. Comparing drinkers and non-drinkers at baseline, they found that exposure to in-store beer displays predicted drinking onset for non-drinkers after 2 years, and exposure to advertising in magazines and beer concession stands at sports or music events predicted frequency of drinking after two years. They found no significant predictive effect of exposure to television advertising for either drinkers or non-drinkers. However, Stacy *et al.* (2004) did find effects for television advertising. They began with a cohort of 2,250 12–13-year-olds and, using a combination of exposure and recall variables, found that an increase in viewing television programmes containing alcohol commercials was associated with a 44% increased risk of beer use, a 34% increased risk of wine or liquor use and a 26% increased risk of engaging in three-drink episodes a year later. Finally, the third study that used longitudinal data showed that market-level alcohol advertising expenditures were related positively to self-reported exposure to alcohol advertising and to individual-level alcohol consumption among youth and young adults, although the effects were small (Snyder *et al.* 2002).

Population studies

There have been mixed findings from population based studies, Table 7.10 (see Calfee and Scheraga 1994; Saffer 1995 1996). A UK study suggested that a 1-percent decrease in alcohol advertising would be associated, at most, with a 0.1-percent decrease in consumption (Godfrey 1994). U.S. data from 1970 through 1990 has also been analyzed to investigate changes in per capita consumption as a function of changes in advertising. Although the years with higher total wine and spirits advertising had higher relative levels of consumption, a model that accounted for changes over time found no evidence that changes in advertising were related to changes in consumption (Fisher and Cook 1995). The results did indicate that increased advertising of spirits was linked to a drop in the market share for wine, suggesting that such advertising may realign market share.

Later studies have suggested significant effects of alcohol advertising on alcohol-related problems (Saffer 1991 1997; Saffer and Dave 2004). Countries with partial restrictions had 16% lower alcohol consumption rates and 10% lower motor vehicle fatality rates than did countries with no restrictions, and countries with complete bans on television alcohol advertisements had 11% lower consumption rates and 23% lower motor vehicle fatalities rates than did countries with partial restrictions (Saffer 1991 1993b). After accounting for regional price differences and population variables such as income and religion, increases in alcohol advertising were found to be significantly related to increases in total and night time vehicle fatalities across US states (Saffer 1997). It was estimated that a total ban on alcohol advertising might

reduce motor vehicle fatalities by as much as 5,000 to 10,000 lives per year.

Table 7.10 Results of econometric studies of advertising on alcohol use and harm variables.

TIME SERIES STUDIES			
Blake and Nied (1997)	UK	1952-1991	Small increase due to advertising
Bourgeois and Barnes (1979)	Canada	1951-1974	No effect of advertising
Calfee and Scheraga (1994)	France Germany, Netherlands Sweden		No effect of advertising
Duffy (1987)	UK	1963-1983	No effect of advertising
Duffy (1991)	UK	1963-1985 quarterly	No effect of advertising
Duffy (1995)	UK	1963-1988 quarterly	No effect of advertising
Duffy (2001)	UK	1964-1996 quarterly	No effect of advertising
Franke and Wilcox (1987)	US	1964-1984 quarterly	Small increase due to beer and wine advertising
Grabowski (1976)	US	1956-1972	No effect of advertising
Lee and Trembley (1992)	US	1953- 1983	No effect of advertising
McGuinness (1980)	UK	1956-1975	Small increase due to spirits advertising
McGuinness (1983)	UK	1956-1979	Small increase due to beer advertising
Nelson (1999)		US quarterly	No effect of advertising
Nelson and Moran (1995)	US	1964-1990	No effect of advertising
Selvanathan (1989)	UK	1955-1975	Small increase due to beer advertising
CROSS-SECTIONAL STUDIES			
Goel and Morey (1995)	US	1959-1982	Increase due to advertising
Saffer (1997)	US	1986-1989 quarterly	Increase due to advertising
BAN STUDIES			
Interrupted Time Series			
Makowsky and Whitehead (1991)	Saskatchewan		No effect of advertising
Ogborne and Smart (1980)	Manitoba		No effect of advertising
Smart and Cutler (1976)	British Columbia		No effect of advertising
Multivariate			
Ornstein and Hanssens (1985)	US	1974-1978	Increase due to advertising
Saffer (1991)	OECD	1970-1990	Bans lead to reduction
Young (1993)	OECD	1970-1990	Mixed results
Nelson and Young (2001)	OECD	1970-1990	Bans lead to increase
Saffer and Dave (2002)	OECD	1970-1995	Bans lead to reduction

Source: Saffer and Dave (2003).

Amongst US 12 to 16 year-olds, the elasticity of advertising expenditure with respect to past month alcohol use was estimated at about 0.08 and with respect to past month binge participation at about 0.14 (Saffer and Dave 2003). The data suggested that the complete elimination of alcohol advertising could reduce adolescent monthly alcohol use by about 24% and binge participation by about 42%. The size of the effect was similar to a doubling of the price of alcohol, which was estimated to reduce adolescent monthly alcohol use by 28%, and binge drinking by 51%.

Econometric studies of the impact of advertising have a number of weaknesses that stem from the fact that they are dependent on the construction of complex equations to model an extremely sophisticated social phenomenon (Smart 1988; Godfrey 1989; Harrison and Godfrey 1989; Saffer 1996): data on key variables, most notably advertising expenditure, are often missing; advertising spending is assumed to be an accurate marker of advertising effectiveness, whereas content is also important (Strickland 1982); models do not account for consumers' active involvement in the communication process (Casswell 1995), leading to more effective advertisements (Casswell and Zhang 1998); complications such as feedback, the potential reciprocity of advertising and consumption levels, and advertising wear-out are frequently ignored; and they focus on advertising and ignore the integrated nature of marketing.

Not surprisingly, therefore, other studies have concluded that a total ban on broadcast alcohol advertising has no measurable effects on alcohol consumption, probably and largely due to substitution effects (Nelson 2003).

A physiological basis for marketing

Cue reactivity studies in alcohol-dependent adults have shown atypical physiological, cognitive, and neural responses to alcohol-related stimuli that differ from the responses of light drinkers. Adolescents aged 14 to 17 years with alcohol use disorders showed substantially greater brain activation to alcoholic beverage pictures than control youths, predominantly in brain areas linked to reward, desire, positive affect (Tapert *et al.* 2003). The degree of brain response to the alcohol pictures was highest in youths who consumed more drinks per month and reported greater desires to drink, Figure 7.6.

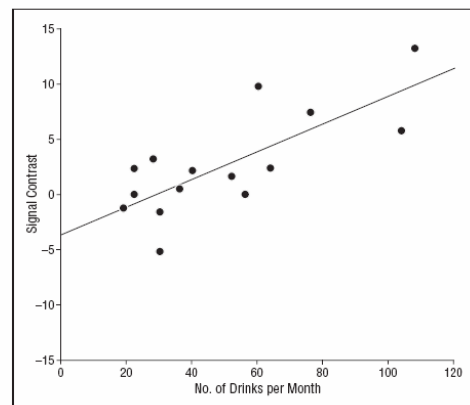


Figure 7.6 Blood oxygen level-dependent response signal contrast in the right precuneus/posterior cingulate region during exposure to alcoholic beverage pictures relative to non-alcoholic beverage pictures plotted as a function of drinks consumed per month for adolescents with alcohol use disorders. Source: Tapert *et al.* (2003).

Self-regulation of alcohol marketing

Regulation has three components: legislation (defining appropriate rules); enforcement (initiating actions against violators); and adjudication (deciding whether a violation has taken place and imposing an appropriate sanction) (Swire 1997). The term '**self-regulation**' means that the industry rather than the government is doing

the regulation. However, it is not necessarily the case that government involvement is entirely lacking. Instead of taking over all three components of regulation, industry may be involved in only one or two. For example, an industry may be involved at the legislation stage by developing a code of practice, while leaving enforcement to the government, or the government may establish regulations, but delegate enforcement to the private sector. Sometimes government will mandate that an industry adopt and enforce a code of self-regulation. Frequently an industry will engage in self-regulation in an attempt to stave off government regulation. Alternatively, self-regulation may be undertaken to implement or supplement legislation (Kuitenbrower 1997). The term **'co-regulation'** is sometimes used when the rules are developed, administered and enforced by a combination of government agencies and industry bodies (see Caswell and Maxwell 2005). In the United Kingdom, for example, broadcast advertising is co-regulated by Ofcom, the statutory body overseeing content and structure of the communications sector with responsibility for auditing, and the industry body, the Advertising Standards Authority, which has become a "one-stop shop" for all advertising standards and consumer complaints.

The claimed advantages of self-regulation over governmental regulation include efficiency, increased flexibility, increased incentives for compliance, and reduced cost. For example, it is argued that industry participants are likely to have superior knowledge of the subject compared to a government agency (Michael 1995). This factor may be particularly important where technical knowledge is needed to develop appropriate rules and determine whether they have been violated. Second, it is argued that self-regulation is more flexible than government regulation (Michael 1995). It is easier for a trade association to modify rules in response to changing circumstances than for a government agency to amend its rules. Moreover, self-regulation can be more tailored to the particular industry than government regulation. Another argument in support of self-regulation is that it provides greater incentives for compliance (Swire 1997). It is thought that if rules are developed by the industry, industry participants are more likely to perceive them as reasonable. Companies may be more willing to comply with rules developed by their peers rather than those coming from the outside. Fourth, it is argued that self-regulation is less costly to the government because it shifts the cost of developing and enforcing rules to the industry (Campbell 1999).

Critics of self-regulation question the basis for the arguments in favour of self-regulation. For example, while acknowledging that industry may possess greater technical expertise than government, it has been questioned whether companies will use that expertise to the benefit of the public, suggesting instead that they are more likely to employ their expertise to maximize the industry's profits (Swire 1997). Similarly, the idea that industry will comply more willingly with its own regulations than those imposed from the outside might seem somewhat weak where industry is actively involved in developing regulations. Leaving regulation to the industry can create the possibility that industry may subvert regulatory goals to its own business goals (Baker and Miller 1997). Self-regulatory groups may be more subject to industry pressure than government agencies. Moreover, the private nature of self-regulation may fail to give adequate attention to the needs of the public or the views of affected parties outside the industry. Many question the adequacy of enforcement in self-regulatory regimes, recognizing that industry may be unwilling to commit the resources needed for vigorous self-enforcement (Balkam 1997). It is also unclear whether industry has the power to enforce adequate sanctions. At most, a trade association may punish non-compliance with expulsion. Whether expulsion is an effective deterrent depends on whether the benefits of membership are important (Peritt 1997). Where a company can make greater profit by ignoring self-regulation than complying, it is likely to do so, especially where non-compliance is not easily

detected by the consumer or likely to harm the particular company's reputation (Swire 1997).

Codes of content typically include commitments not to couple alcohol with social and sexual success, and not to show intoxication or link alcohol with younger people or with driving. Research has consistently shown that the interpretation of these provisions varies depending on whether the review is being conducted by an industry appointed body, representatives of the public or the specific target audience involved. For example, an Australian study reported that representatives of the general public found a large sample of advertisements in violation of the relevant voluntary code, while the industry review board did not (Saunders and Yap 1991). As noted above, the content of contemporary marketing is increasingly sophisticated, subtle and interactive. This presents an increased challenge for monitoring and control of content. Brown (1995) identifies increasing use of post-modern elements in modern advertising – scepticism, subversiveness, irony, anarchy, playfulness and paradox. The fact that viewers are “active recipients” of advertising creates another major difficulty for the application of codes of content. Advertising messages are received and understood in the context of the recipients' lived experience. For example, advertisements that contain cues to indicate intoxication, without expressly showing it, can reinforce the norms supportive of heavy drinking. Research has documented that young people interpret advertisements as indicating drinking to intoxication (Wyllie *et al.* 1997; 1998) but these advertisements would not necessarily be perceived as such by all viewers. Similarly, while many codes restrict the use of young people in advertisements, having them present is not necessary for an advertisement to be appealing to under-age drinkers – it is enough to show the lifestyles to which young adults aspire (Hill and Caswell 2001). Thus, much alcohol marketing is likely to be effective in appealing to underage young people without violating the codes.

US self-regulation An example of the fragility of self-regulatory systems comes from the advertising of spirits on US television, as reported by Campbell (1999): *“The broadcast advertising of spirits was prohibited by the “Code of Good Practice” of the Distilled Spirits Council of the United States (DISCUS 1995), the national trade association of producers and marketers of distilled spirits. In March 1996, Seagram, the second largest marketer of distilled spirits, violated the Code of Practice by airing a spirits advertisement on a small sports cable network. A few months later, it violated the ban again by airing an advertisement on an ABC affiliate in Corpus Christi, Texas. Instead of imposing sanctions, however, DISCUS voted in November 1996 to repeal the voluntary prohibition (see Campbell 1999). According to DISCUS's President, the association saw no basis for allowing the broadcast advertising of beer and wine and not other alcoholic beverages. The members of DISCUS were undoubtedly aware of the Supreme Court's decision in 44 Liquormart, Inc. v. Rhode Island announced in May 1996, which struck down a state law prohibiting the advertisement of spirits prices. This decision effectively removed the credible threat of government regulation. Although DISCUS repealed the ban on broadcast advertising, other provisions of the DISCUS Code of Practice remained in effect. For example, the Code cautioned that distilled spirits should be portrayed ‘in a responsible manner’ and ‘should not be advertised or marketed in any manner directed or primarily intended to appeal to persons below the legal purchase age.’”*

The Federal Trade Commission (FTC) (1999) has questioned the efficacy of self-regulatory provisions. In August 1998, the FTC began an inquiry into the advertising practices of eight of the nation's top marketers of beer, wine, and spirits. It specifically sought information about how the companies had implemented Code provisions that prohibited advertising intended to appeal to or reach persons below

the legal drinking age. At the same time, the FTC (1998) filed a complaint against a beer advertisement that depicted young adults partying and drinking beer on a sail boat. The complaint noted that the advertisements were inconsistent with the Beer Institute's Code because they portrayed boating passengers drinking beer "while engaged in activities that require a high degree of alertness and coordination to avoid falling overboard." These actions by the FTC suggest that the self-regulatory codes of the alcoholic beverages industry are not being effectively enforced.

In 2003, the Federal Trade Commission commented that self-regulation practices had improved since the 1999 Report, although it expressed concern "*that unless care is taken, alcohol advertisements targeted to young legal drinkers also may appeal to those under the legal age*"; the reliability of its conclusions have been questioned (Mosher and Johnsson 2005).

Australian self-regulation In its 2003 report, the National Committee for the Review of Alcohol Advertising (NCRAA) found that approximately 5% of all complaints received by the Advertising Standards Board (ASB) relate to alcohol advertising. None of the 361 complaints about a total of 48 different alcohol advertisements has been upheld.

Adjudicating advertisements in Australia

Between May 1998 and April 1999, 11 alcohol advertising complaints (relating to 9 separate advertisements) were lodged with the Advertising Standards Board (ASB) by members of the general public. Marketing experts and advertising students were asked, without knowing the ASB's rulings, to judge whether the advertisement(s) breached any of the clauses of the Australian Association of National Advertisers' Code of Ethics or Alcoholic Beverages Advertising Code (Jones and Donovan 2002). A majority of the expert judges perceived breaches of the Codes for seven of the nine advertisements. For all nine of the advertisements, a majority of the university students felt that each of the advertisements was in breach of one or more of the Codes of Practice. The ASB had ruled that none of the advertisements breached any of the Codes.

The alcohol advertising code, the Alcoholic Beverages Advertising Code (ABAC), was established by the alcohol beverage industry and deals with alcohol-specific advertising issues, such as appeal to young people and alcohol consumption being linked to sporting or sexual success. The industry has established an Adjudication Panel to hear complaints which fall under the ABAC Code. Since its establishment in 1998, the ABAC Adjudication Panel has heard a total of 20 complaints. Of this total, five were upheld and thirteen were dismissed. During its review, NCRAA concluded that the current system does not address public health concerns about alcohol advertising and use: the general public is largely unaware of the complaint resolution system and, in particular, how to make complaints; there is insufficient reporting of how complaints are adjudicated and the outcomes of those complaints; the current system does not apply to all forms of advertising, for example, internet advertising and promotions; and the effectiveness of the current system is compromised by the amount of time taken to resolve complaints.

Advertising controls

Summary

There is evidence that **new product development** is attractive to and readily consumed by underage drinkers. **Price promotions** increase binge drinking and exposure to **point of purchase** advertising predicts onset of youth drinking. There is evidence for **targeting** of alcohol advertisements to underage drinkers, and consistent evidence that **exposure** to television, music videos and sponsorship which contain alcohol advertisements predicts onset of youth drinking and increased drinking. **Consumer studies** have shown that alcohol advertisements lead to positive expectancies and attitudes about alcohol. Consumer studies also show that exposure to tobacco advertising increases **smoking initiation** amongst young people, exposure to food advertising changes children's **food consumption behaviour**, and there is increasing evidence that exposure to alcohol advertisements increase **initiation of alcohol use** amongst adolescents. Despite the difficulties of population-based studies, there is a range of evidence with some **econometric studies** finding a relationship between the volume of advertising and drinking behaviour and outcomes, and others not. There is some evidence that advertising affects brain activity linked to rewards and desires. In conclusion, restricting the volume of commercial communications of alcohol products is likely to reduce harm, Table 7.11. Since advertisements have a particular impact in promoting a more positive attitude to drinking amongst young people, and, even in advertisements that do not portray drinking of alcohol, young people perceive the characters as heavy drinkers, it is likely that restricting the content of advertisements will reduce harm, although this has not been specifically evaluated. To date, self-regulation of commercial communications by the beverage alcohol industry does not have a good track record for being effective.

Table 7.11 Effectiveness ratings for advertising controls.

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Reducing the volume of advertising	+ / ++	++	+++
Advertising content controls	?	O	++

¹For definitions see Table 7.1

Source: Babor *et al.* (2003) (modified).

Impact and costs

The World Health Organization's CHOICE modelled the impact of advertising controls based on a 2%-4% reduction in the incidence of hazardous alcohol use, derived from international time-series analyses of the impact of an advertising ban (Grube and Agostinelli 2000; Saffer 2000; Saffer and Dave 2002). Although not politically acceptable in contemporary Europe, were an advertising ban to be implemented throughout the Union, the model estimated that it can prevent between 300 (EuroB countries) and 616 (EuroC countries) DALYs per million people per year, at a cost of between €12 (EuroC countries) and €23 (EuroA countries) per 100 people per year (see Figures 7.11 and 7.12 at the end of the chapter). The model estimated that a ban on advertising implemented throughout the Union, could prevent 202,000 years of disability and premature death, at an estimated cost of €95 million each year (adapted from Chisholm *et al.* 2004).

POLICIES THAT REDUCE HARM IN DRINKING AND SURROUNDING ENVIRONMENTS

Licensed drinking environments

Licensed drinking environments are associated with drunkenness (Snow and Landrum 1986), drink-driving (Fahrenkrug and Rehm 1994; Gruenewald *et al.* 1996; O'Donnell 1985; Single and McKenzie 1992) and problem behaviours such as aggression and violence (Ireland and Thommeny 1993; Rossow 1996; Stockwell *et al.* 1993), with some licensed premises being associated with a disproportionate amount of harm (Sherman 1992; Stockwell 1997; Briscoe and Donnelly 2003a). Aspects of the bar environment that increase the likelihood of alcohol-related problems (Graham and Homel 1997) include serving practices that promote intoxication, an aggressive approach taken to closing time by bar staff and local police (Tomsen 1997), the inability of bar staff to manage problem behaviour (Homel *et al.* 1992; Wells *et al.* 1998), general characteristics of the environment such as crowding and permissiveness of bar staff (Homel and Clark 1994), the general type of bar (Gruenewald *et al.* 1999; Stockwell *et al.* 1992), and physical comfort, the degree of overall 'permissiveness' in the bar, the availability of public transport, and aspects of the ethnic mix of customers (Homel *et al.* 2004).

Responsible beverage service Nearly all evaluations in training bar staff in responsible beverage service when backed up with enforcement have demonstrated improved knowledge and attitudes among participants (Graham 2000; Graham *et al.* 2002; Hauritz *et al.* 1998a; Homel *et al.* 1997), although this wears off over time (Hauritz *et al.* 1998b). These studies have also shown some effects on serving practices (Johnsson and Berglund 2003), but not always (Donnelly and Briscoe 2003). Whilst servers are usually willing to intervene with customers who are visibly intoxicated (Gliksman *et al.* 1993), they generally will not intervene with individuals solely on the basis of the customer's estimated blood alcohol concentration (BAC) or number of drinks consumed (Howard-Pitney *et al.* 1991; Saltz and Stanghetta 1997; Gliksman *et al.* 1993; McKnight 1991). In addition, training tends to decrease bad serving practices such as "pushing" drinks and increase "soft" interventions such as suggesting food or slowing service. In terms of the effects on customer intoxication, several studies have found that server training results in lower BAC levels of customers generally (Geller *et al.* 1987; Russ and Geller 1987) and fewer customers with high BAC levels (Lang *et al.* 1998; Saltz 1987; Stockwell *et al.* 1993). Moreover, time series analyses of mandatory server training suggest that training is associated with fewer visibly intoxicated customers (Dresser 2000) and fewer single-vehicle night-time injury-producing crashes (Holder and Wagenaar 1994). Studies of the impact of adhering to bar policies for avoiding intoxication (Stockwell 2001) have also found modest effects in reducing heavy consumption and high risk drinking (Howard-Pitney *et al.* 1991; Lang *et al.* 1998; Wallin *et al.* 1999; Toomey *et al.* 2001), but were not as successful as originally expected (Stockwell 2001). Responsible beverage service programs are frequently included in broad-based interventions (Homel *et al.* 2001) that have shown reductions in violence (Homel *et al.* 1997; Wallin *et al.* 2003; Felson *et al.* 1997; Putnam *et al.* 1993; Maguire *et al.* 2003).

Active enforcement The impact of responsible beverage service is greatly enhanced when there is active, but ongoing enforcement of laws prohibiting sale of alcohol to intoxicated customers (Jeffs and Saunders 1983; McKnight and Streff 1994; Saltz and Stanghetta 1997; Homel *et al.* 2001). Increasing the perceived risk of apprehension for an offence can deter individuals from future violations of the law (e.g. Homel 1988; Nagin 1998; Sherman *et al.* 1998). This is a cost effective intervention in which the benefits greatly exceed the costs (Levy and Miller 1995).

Community action in holiday resorts

The goal of the Surfers Paradise project was to reduce violence and disorder associated with the high concentration of licensed establishments in the resort town of Surfers Paradise in Queensland, Australia (Homel *et al.* 1997). The project involved three major strategies: (1) the creation of a Community Forum including the development of task groups and a safety audit; (2) the implementation of risk assessments, Model House Policies, and a Code of Practice; (3) regulation of licensed premises by police and spirits licensing inspectors. This project and its replications in three North Queensland cities (Cairns, Townsville and Mackay) resulted in significant improvements in alcohol policy enforcement, in the bar environment, in bar staff practices, and in the frequency of violence (Hauritz *et al.* 1998a). Following the intervention, the number of incidents per 100 hours of observation dropped from 9.8 at pre-test to 4.7 in Surfers Paradise and from 12.2 at pre-test to 3.0 in the replication sites. However, the initial impact of the project was not sustained. Two years following the intervention in Surfers Paradise, the rate had increased to 8.3, highlighting the need to find ways to maintain gains achieved from community action projects.

Enforcement also seems to be a necessary component for voluntary codes of responsible beverage service to be successful (Lang and Rumbold 1997; Homel *et al.* 1997). One study found that a programme combining stricter enforcement of alcohol sales laws and training in responsible beverage service had a significant effect in reducing the rate of violent crimes between 10 pm and 6 am (Wallin *et al.* 2003). There is some evidence that enforcement checks prevent alcohol sales to minors (Wagenaar *et al.* 2005), restricted to the specific establishments checked and with limited diffusion to the whole community; most of the enforcement effect decayed within three months, suggesting that a regular schedule of enforcement is necessary to maintain deterrence. Further, there is some evidence that enforcement activity focuses more on breaches committed by patrons or minors, rather than licensees or vendors who are in breach of the intoxication provisions of the liquor laws (Donnelly and Briscoe 2003; Briscoe and Donnelly 2003b).

Legal liability Holding servers legally liable for the consequences of providing more alcohol to persons who are already intoxicated or those under age has shown consistent benefits as a policy measure in the US (Holder *et al.* 1993; Sloan *et al.* 2000), with lower rates of traffic fatalities (Chaloupka *et al.* 1993; Ruhm 1996; Sloan *et al.* 1994a; Wagenaar and Holder 1991) and homicide in states with such liability (Sloan *et al.* 1994b), compared to states that do not have the liability. Such use of legal liability is uncommon outside of the United States (with the exception of some cases in Australia and Canada).

Geographical analysis (Wilson and Dufour 2000) can be used to identify specific drinking localities and problems related to alcohol, particularly motor vehicle crashes, pedestrian injuries, and violence (Gruenewald *et al.* 2002). This allows targeted public health and law enforcement approaches, as shown in Figure 7.7.

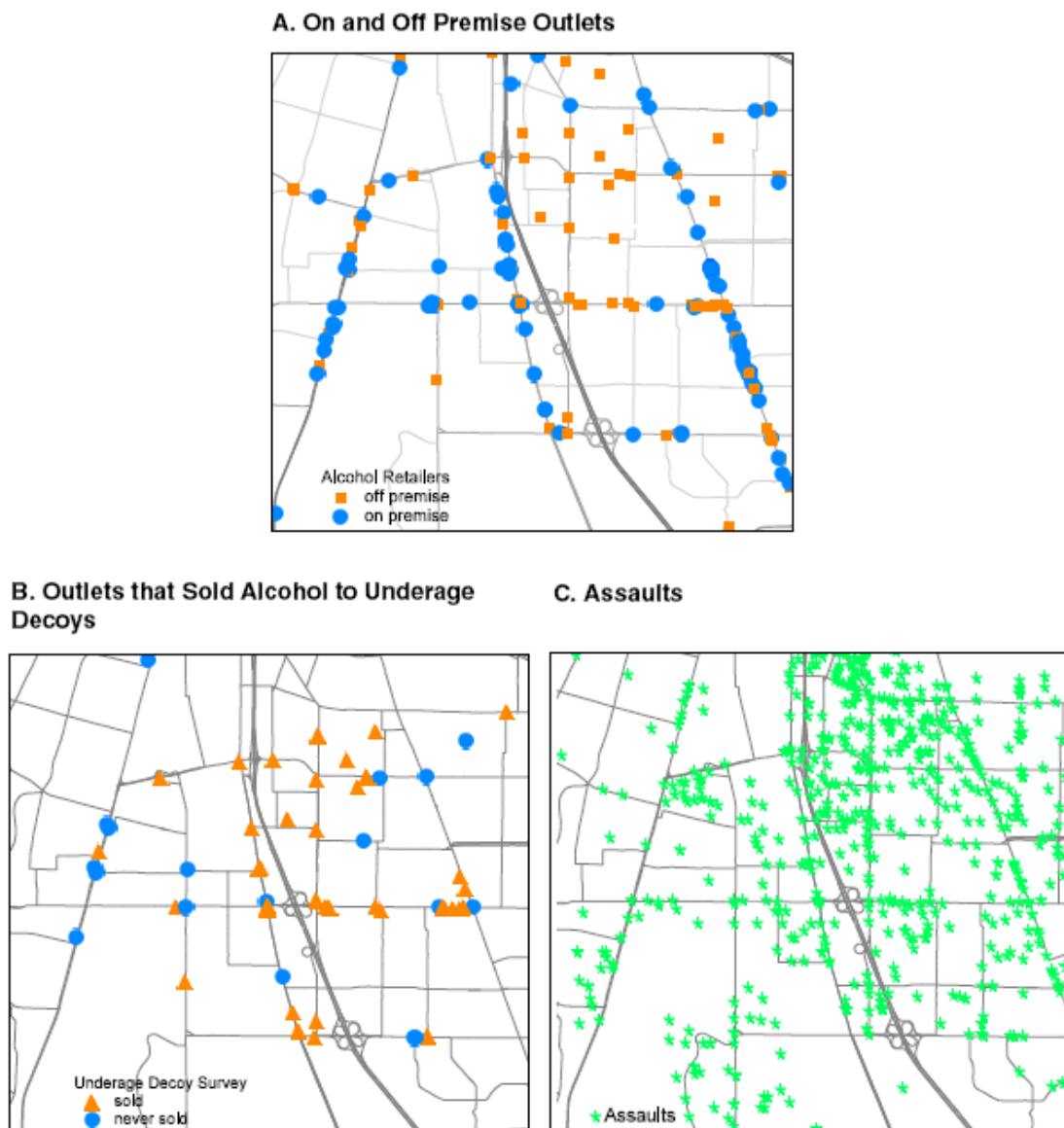


Figure 7.7 Illustration of the use of maps and mapping in alcohol policy. These tools can be used to study the locations of alcohol outlets and alcohol-related problems. Figure A shows all the alcohol outlets in a given geographic area. Outlets that sold alcohol to underage decoys are shown in figure B, and assaults in figure C. Source: Gruenewald *et al.* (2002).

Other harm reduction approaches The risks of aggression, violence and injury (Stockwell, Lang and Rydon 1993) vary according to the physical bar-room environment (Graham *et al.* 1980; Stockwell *et al.* 1993; Homel and Clark 1994) and the behaviour and communication skills of bar staff (Hauritz *et al.* 1998a; Wells *et al.* 1998). Accordingly, interventions that focus on changing the barroom environment (e.g. changes in rules or policies related to games, management of queues and re-

The Safer Bars programme

The *Safer Bars* program developed in Canada includes a risk assessment (Graham 1999) and a training component (Braun *et al.* 2000) for owners, managers and all staff. The program was designed to increase early intervention by staff, improve teamwork and staff abilities in managing problem behaviour, and reduce the risk of injury to patrons. The *Safer Bars* training was shown to be highly valued by bar staff and managers and demonstrated a significant impact on knowledge and attitudes (Graham *et al.* 2002). There was also a significant effect in reducing both moderate (e.g. pushing and holding) and severe (e.g. punching and kicking) aggression (Graham *et al.* 2004). The effects were lessened when there was high turnover of managers and door and security staff.

entry to the bar, modifications of the social or physical environment and improvement in staff communication and intervention skills) have been shown to be effective in reducing harms from drinking in these settings, without necessarily altering overall consumption levels (Homel *et al.* 1997; Graham *et al.* 2004; see also review by Graham 2000).

Interventions focused on public transportation Various studies using a variety of methodologies have identified public transport availability as a key issue (d'Abbs, Forner and Thomsen 1994; Homel *et al.* 1997; Homel *et al.* 1991; Engineer *et al.* 2003) moderating the incidence of alcohol-related violence around licensed premises. Where there is a high concentration of licensed premises, a lack of public transport has the effect of retaining large groups of intoxicated and frustrated people in a small area. No direct evaluations of the impact of strategies to improve transport have been identified, although such interventions have been part of larger multi-component interventions that demonstrated reductions in violence (Homel *et al.* 1997; Hauritz *et al.* 1998) as well as interventions that did not show a reduction in violence (d'Abbs and Forner 1995).

Safer drink containers It is well-established that intentional and unintentional injuries from broken drinking vessels are relatively common in licensed premises. This relationship led to the logical suggestion that replacing conventional glass vessels with tempered glass should reduce injuries. However, a randomised controlled trial comparing conventional glassware with tempered (toughened) glassware (Warburton and Shepherd 2000) reported increased injuries to staff from accidental breakage of tempered glassware. As yet, there is no research on the impact of tempered glass on intentional injuries to patrons.

Reducing harm in drinking environments

Summary

There is growing evidence for the impact of strategies that alter the drinking context in reducing the harm done by alcohol, Table 7.12. However, these strategies are

primarily applicable to drinking in bars and restaurants, and their effectiveness relies on adequate enforcement. Passing a minimum drinking age law, for instance, will have little effect if it is not backed up with a credible threat to remove the licenses of outlets that repeatedly sell to the under-aged. Such strategies are also more effective when backed up by community-based prevention programmes (see below).

Table 7.12 Effectiveness ratings for drinking environments.

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Responsible beverage service	+	+++	++
Active enforcement	++	+	+
Server liability	+++	+	+++
Enforcement of on-premise regulations	++	+	+
Public transport	?	+	+
Safer bar environment/containers	?	O	++

¹For definitions see Table 7.1
Source: Babor *et al.* (2003) (modified).

Community mobilization approaches

Community based prevention programmes can be effective in reducing drinking and driving, alcohol related traffic fatalities and assault injuries (Giesbrecht 2003; Stockwell and Gruenewald 2001; Holmila 1997; Holder 1998; Hingson *et al.* 2005; Clapp *et al.* 2005). Community mobilization has been used to raise awareness of problems associated with on-premise drinking, develop specific solutions to problems, and pressure bar owners to recognize that they have a responsibility to the community in terms of such bar-related issues as noise level and customer behaviour (Hauritz *et al.* 1998; Homel *et al.* 1992; Putnam *et al.* 1993). Evaluation results from community mobilization approaches as well as documentation from grassroots projects (Arnold and Laidler 1994; Cusenza 1997) suggest that community mobilization can be successful at reducing aggression and other problems related to drinking in licensed premises.

A review of ten community-based prevention trials which have sought to reduce harm from alcohol (Aguirre-Molina and Gorman 1996; Chou *et al.* 1998; Douglas *et al.* 1990; in press; Gliksman *et al.* 1995 1999; Grube 1997; Hingson *et al.* 1996; Holder *et al.* 1997a 2000; Holder and Treno 1997; Johnson *et al.* 1990; Pentz *et al.* 1989a; Perry *et al.* 1993 1996; Voas 1997; Wagenaar *et al.* 1994; 2000) found that strategies included education and information campaigns, media advocacy, counter-advertising and health promotion, controls on selling and consumption venues and other regulations reducing access to alcohol, enhanced law enforcement and surveillance, and community organization and coalition development (Giesbrecht *et al.* 2003). Interventions which showed promise were those that paid particular attention to controls on access, included the environmental contexts of where the products are sold and distributed, and involved enforcement of public health polices (see also (Holder 1998a; 1998b).

Community and neighbourhood characteristics are important in moderating the pricing and promotion of beer (Harwood *et al.* 2003), as well as reducing binge drinking (Nelson *et al.* 2005). Communities with higher enforcement of minimum purchase ages have lower rates of alcohol use and binge drinking (Dent *et al.* 2005). Community action projects can mobilize awareness and concern about alcohol-related harm (Allamani *et al.* 1997; 2003; Holmila 2003). Social capital as measured by aggregate reports of student volunteerism is associated with a decreased risk of binge drinking, drunkenness and alcohol-related harm (Weitzman and Chen 2005), and as measured by high trust is related to a reduced risk of illegally produced and purchased alcohol (Lindstrom 2005).

Since 1996, a multi-component program based on community mobilization, training in responsible beverage service for servers and stricter enforcement of existing alcohol laws has been conducted in Stockholm, Sweden, leading to a 29% reduction in violent crimes in the intervention area, compared with the control area (Wallin *et al.* 2003), Figure 7.8.

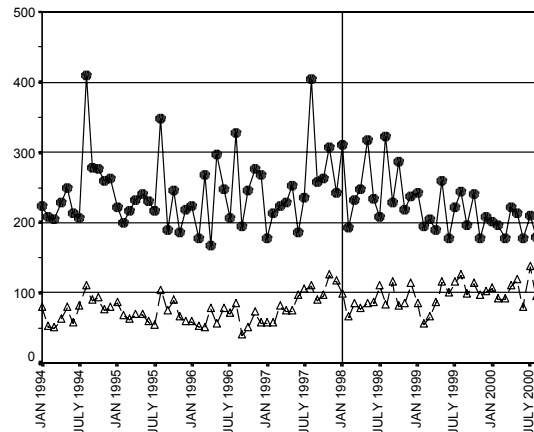


Figure 7.8 Police-reported violence in experimental area (filled circles) and in control area (triangles). Source: Wallin *et al.* (2003).

The Community Trials Project (Holder *et al.* 1997) was a five-component community-level intervention to reduce alcohol-related harm among all residents of three communities. The project included a media and mobilization component, a responsible beverage service component, a sales to youth component to reduce underage access to alcohol, a drinking and driving component, and an access component to reduce the availability of alcohol. The project led to reduction in drink driving accidents, assault injuries, and harmful alcohol use (Holder *et al.* 2000). Finally, cost-benefit analyses estimated that the trial resulted in savings of €2.9 for every €1 spent on program implementation, based upon reductions in automobile crashes alone (Holder *et al.* 1997).

A community intervention project in the Northern Territories in Australia aimed to reduce levels of alcohol consumption and related harm down to national levels by 2002 (d'Abbs 2004) by using a range of strategies including education, increased controls on alcohol availability, and expanded treatment and rehabilitation services (Stockwell *et al.* 2001; d'Abbs 2004). The Living With Alcohol (LWA) program was originally funded by a specific alcoholic beverage levy on the sale of alcohol products with more than 3% alcohol by volume until 1997, when a federal ruling prohibited states and territories from raising licence fees and additional taxes on alcoholic beverages, tobacco and petrol. As a direct result, the LWA levy was removed in August 1997 which, in turn, resulted in a fall in the real price of alcoholic beverages with more than 3% alcohol by volume (O'Reilly 1998). The Federal government continued to fund the LWA program at the same level until the year 2000. After this time, LWA funds were dispersed directly to the existing programs and services (d'Abbs 2004). The programme was effective in reducing acute (by 4.6 per 100,000 adults) and most likely chronic (by 3 per 100,000 adults) alcohol-related deaths in the Northern Territories, Figures 7.9 and 7.10, compared with reductions of 1.6 per 100,000 acute and 1.7 per 100,000 chronic alcohol-related deaths in the control area (Chikritzhs *et al.* 2005).

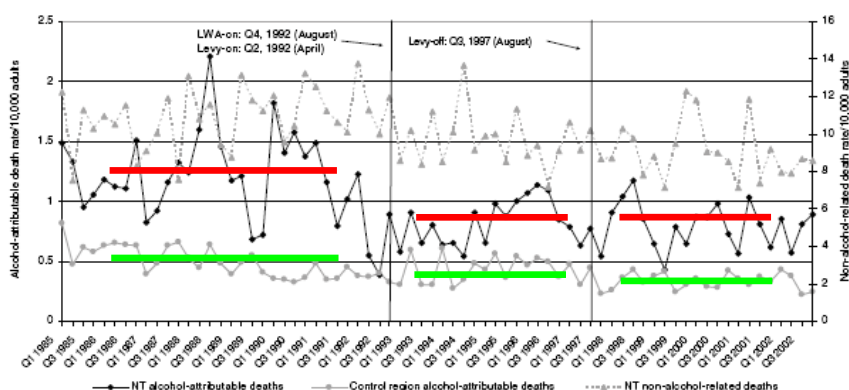


Figure 7.9 Trends in acute death rates per 10,000 adults in NT [●] and Control region [●] 1985-2002. Source: Chikritzhs *et al.* (2005).

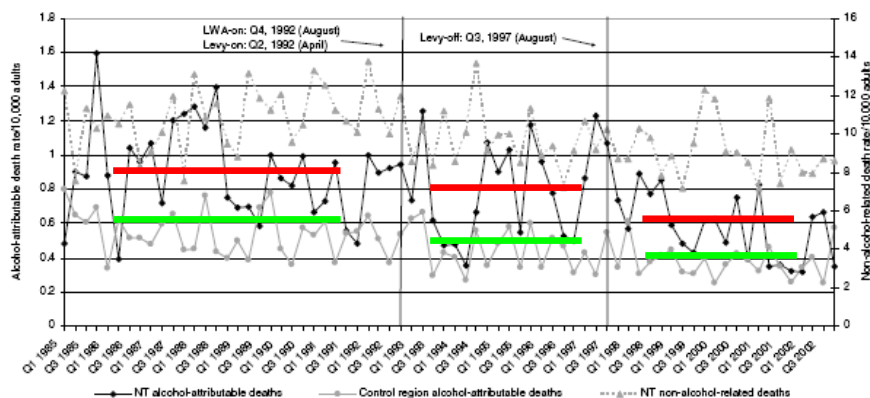


Figure 7.10 Trends in chronic death rates per 10,000 adults in NT [●] and Control region [●] 1985-2002. Source: Chikritzhs *et al.* (2005).

Reducing harm through community mobilization

Summary

Community mobilization and intervention projects are effective in reducing the harm done by alcohol, Table 7.13.

Table 7.13 Effectiveness ratings for community mobilization.

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Community mobilization	++	++	+

¹For definitions see Table 7.1
Source: Babor *et al.* (2003).

POLICIES THAT SUPPORT ADVICE AND TREATMENT FOR HAZARDOUS AND HARMFUL ALCOHOL CONSUMPTION AND ALCOHOL DEPENDENCE

Whilst the management of alcohol problems has clear benefit at the level of the individual, there is some limited evidence for its impact at the level of the population (Smart and Mann 1993; Smart and Mann 2000; Smart *et al.* 1989; Smart and Mann 1990; Mann *et al.* 1991). There is some evidence that declining liver cirrhosis rates might be associated with the increased treatment for alcohol problems in Ontario, Canada (Mann *et al.* 1988; Mann *et al.* 2005), Sweden (Romelsjo 1987) and North Carolina (Holder and Parker 1992).

Social welfare-based programmes Programs of structured home visits to support mothers, before and in the first two years after birth, have evidence supporting their effectiveness and cost effectiveness when targeted to vulnerable families (Mitchell *et al.* 2001; Loxley *et al.* 2004). These programs offer basic advice, practical assistance with nursing, and advocacy for access to services. They show evidence of positive outcomes for maternal alcohol use and infant health.

There is evidence for the value of both universal and selective parenting programs for pre-primary school age children to reduce child behaviour problems that predict

The impact of home visiting

Olds *et al.* (1997; 1998; 1999) evaluated a program involving regular home visiting by a nurse from late pregnancy until the child's second birthday for low income, unmarried and adolescent women having their first babies. The program focused upon supporting the mother, promoting positive attachment with the child and teaching parenting skills. Follow-up associated the program with reduced rates of alcohol use for the mothers during pregnancy, leading to reductions in alcohol-related cognitive impairment in the children as pre-schoolers. The children have been followed up to age 15 years, documenting reductions in their early initiation of alcohol use.

the emergence of harmful alcohol use (Serketich and Dumas 1995). There is evidence for positive outcomes (school adjustment and academic attainment) and good cost-benefit ratios from targeted programs to prepare children from high-risk families for primary school. Outcomes from these studies have been documented by following children through to adolescence, and have found reduced alcohol use (Schweinhart *et al.* 1993).

Advice to reduce alcohol use during pregnancy Of three good-quality behavioural counselling studies in primary care settings that targeted pregnant women making prenatal visits, two found no evidence for an effect on alcohol consumption (Handmaker *et al.* 1999; Chang *et al.* 1999) and one a possible effect which just failed to reach statistical significance (Reynolds *et al.* 1995). There is evidence for the impact of home visits for women with harmful alcohol use during an index pregnancy (Grant *et al.* 2005); home visits that assisted women in obtaining alcohol treatment and staying abstinent, and linking them with comprehensive community resources led to improved attendance at treatment, better treatment outcomes, and a greater likelihood of subsequent pregnancies being alcohol free.

The importance of pre-school

The Perry pre-school project in the United States found long-term program effects up to age 27, including a lower incidence of alcohol use and teenage pregnancy, lower risk of school drop out, increased likelihood of employment and reduced reliance on welfare (Schweinhart *et al.* 1993). Cost benefit analyses suggested savings of up to €6 for every €1 invested in the programme for a one year programme.

Workplace The workplace provides several opportunities for implementing prevention strategies, since the majority of adults are employed, spending a significant proportion of their time at work. The workplace can also be a risk factor for harmful alcohol use. A systematic review and meta-analysis of 485 studies with a combined sample size of 267,995 individuals found that job dissatisfaction was a powerful predictor for burnout, low self-esteem, depression, and anxiety (Faragher *et al.* 2005). Many studies have found significant associations between stress in the workplace and elevated levels of alcohol consumption (Martin and Roman 1996; Lehman *et al.* 1995; Parker and Farmer 1990; Greenberg and Grunberg 1995), increased risk of problem drinking (Bobak *et al.* 2005) and alcohol dependence (Head *et al.* 2004), and between alienation (an employee's broader sense of identity and control) and drinking behaviours (Seeman and Anderson 1983; Seeman *et al.* 1988; Lehman *et al.* 1995; Rospenda *et al.* 2000).

A series of evaluation studies have indicated that the workplace programs succeeded in returning substantial proportions of employees with alcohol problems to effective performance (Asma *et al.* 1980; Edwards *et al.* 1973; McAllister 1993; Spickard and Tucker 1984; Walsh *et al.* 1991 1992; Blum and Roman 1995). Supervisory training significantly increased positive attitudes toward workplace-based employee assistance programmes, increased the perceived likelihood of utilizing the service, and led to greater service utilization. (Googins and Kurtz 1981; Hoffman and Roman 1984). A workplace prevention training programme for stress management has been shown to reduce problem drinking from 20% to 11% and missing work because of a hangover from 16% to 6% (Bennett *et al.* 2004).

Brief advice for hazardous and harmful alcohol use Table 7.14, from the Mesa Grande study, an ongoing updated systematic review of the effectiveness of different treatments for hazardous and harmful alcohol consumption, ranks the effectiveness of 48 different treatment modalities (Miller and Wilbourne 2002). Mesa Grande summarizes the evidence after weighting the findings of studies by their methodological quality score; the higher the score, the better is the quality of the study. Study ratings also resulted in the assignment of an outcome logic score for each treatment modality for which specific efficacy could be inferred from the design. A positive outcome logic score is assigned when a study design permitted strong inference of a specific effect (e.g. comparison of the treatment with an untreated control), and a beneficial effect was reflected as a statistically significant difference. A negative outcome logic score is assigned when a study has a design logic that should clearly show a treatment effect if one were present (e.g. comparison with a no-treatment or placebo control). The Cumulative Evidence Score (CES) is the methodological quality score multiplied by the outcome logic score, summed across

all studies, with positive trials adding points and negative trials deducting points from the total. Treatment modalities are listed in Table 7.14 ranked by the CES.

Table 7.14 Effectiveness of treatments for hazardous and harmful alcohol consumption.

Treatment modality	CES	N
1. Brief advice	390	34
2. Motivational Enhancement	189	18
3. GABA Agonist (Acamprosate)	116	5
4. Community Reinforcement	110	7
5. Self-Change Manual (Bibliotherapy)	110	17
6. Opiate Antagonist (e.g.naltrexone)	100	6
7. Behavioural Self-Control Training	85	31
8. Behaviour Contracting	64	5
9. Social Skills Training	57	20
10. Marital Therapy – Behavioural	44	9
11. Aversion Therapy, Nausea	36	6
12. Case Management	33	5
13. Cognitive Therapy	21	10
14. Aversion Therapy, Sensitization	18	8
15. Aversion Therapy, Apnoeic	18	3
16. Family Therapy	15	4
17. Acupuncture	14	3
18. Client-Centred Counselling	5	8
19. Aversion Therapy, Electrical	-1	18
20. Exercise	-3	3
21. Stress Management	-4	3
22. Antidipsotropic - Disulfiram	-6	27
23. Antidepressant - SSRI	-16	15
24. Problem Solving	-26	4
25. Lithium	-32	7
26. Marital Therapy – Non-behavioural	-33	8
27. Group Process Psychotherapy	-34	3
28. Functional Analysis	-36	3
29. Relapse Prevention	-38	22
30. Self-Monitoring	-39	6
31. Hypnosis	-41	4
32. Psychedelic Medication	-44	8
33. Antidipsotropic - Calcium Carbimide	-52	3
34. Attention Placebo	-59	3
35. Serotonin Agonist	-68	3
36. Treatment as Usual	-78	15
37. Twelve Step Facilitation	-82	6
38. Alcoholics Anonymous	-94	7
39. Anxiolytic Medication	-98	15
40. Milieu Therapy	-102	14
41. Antidipsotropic – Metronidazole	-103	11
42. Antidepressant Medication	-104	6
43. Videotape Self Confrontation	-108	8
44. Relaxation Training	-152	18
45. Confrontational Counselling	-183	12
46. Psychotherapy	-207	19
47. General Alcoholism Counselling	-284	23
48. Education (tapes, lectures or films)	-443	39

CES = Cumulative Evidence Score.
N = Total number of studies evaluating this modality.

Source: Miller and Wilbourne (2002)

Brief advice heads the list of evidence-based treatment methods. There is a very large body of research evidence on alcohol brief advice, including at least 56 controlled trials of effectiveness (Moyer *et al.* 2002). There have been at least 14 meta-analyses and/or systematic reviews, using somewhat different aims and methods, of research on effectiveness of brief advice (Bien, Tonigan and Miller 1993; Freemantle *et al.* 1993; Kahan, Wilson and Becker 1995; Wilk, Jensen and Havighurst 1997; Poikolainen 1999; Irvin, Wyer and Gerson 2000; Moyer *et al.* 2002; D'Onofrio and Degutis 2002; Berglund, Thelander and Jonsson 2003; Emmen *et al.* 2004; Ballesteros *et al.* 2004a 2004b; Whitlock *et al.* 2004; Cuijpers, Riper and Lemmens 2004; Bertholet *et al.*, in press). All these have reached conclusions, in one form or another, favouring the effectiveness of brief advice in reducing alcohol consumption to low-risk levels among hazardous and harmful drinkers. The number needed to treat is about 8 for both hazardous and harmful alcohol consumption and for alcohol-related harm (Anderson 2003). This means that 8 patients at risk need to be offered advice for one to benefit.

There is mixed evidence of **longer-term effects** of brief advice. A trial based in family medicine in Wisconsin, USA reported continuing benefits for alcohol use, binge drinking episodes and frequency of excessive drinking among recipients of brief intervention compared with controls 4 years after intervention (Fleming *et al.* 2002). An Australian study reported that the benefits of receiving brief advice had disappeared after 10 years (Wutzke *et al.* 2002) and it was suggested that booster sessions would be necessary to maintain the effect over this period of time.

There is some evidence that brief advice reduces **alcohol-related mortality** (Cuijpers, Riper and Lemmens 2004), albeit from a small number of studies. Moyer *et al.* (2002) also reported that brief advice was effective on a composite of various

Brief advice

The World Health Organization has modelled the impact and cost of providing primary care based brief advice to 25% of the at-risk population; applying this to the Union finds an estimated 408,000 years of disability and premature death avoided at an estimated cost of €740 million each year.

drinking-related outcomes, including measures of alcohol-related problems. There is also direct evidence from an Australian study in general practice that brief advice is effective in reducing alcohol-related problems among those who receive them (Richmond *et al.* 1995). In a controlled study of mass screening and brief intervention with follow-up, for men in Malmo, Sweden, there was a

significant decline in hospital admissions and mortality in the treated group over a four year follow-up period, an 80% reduction in absenteeism in the four years following the study, a 60% reduction in total hospital days over five years, and a 50% reduction in all cause mortality over six years, which was maintained at 10-16 years follow-up (Kristenson *et al.* 2002).

There has been considerable concern about the ability to **engage health care providers** in delivering brief advice programmes (see Anderson *et al.* 2003). However, results from international trials (Anderson *et al.* 2004; Funk *et al.* 2005), and a meta-analysis (Anderson *et al.* 2004) have found that education and support programmes are effective and cost effective in increasing the involvement of primary care providers in delivering brief advice programmes.

After brief advice, behavioural skill training and pharmacotherapies dominate the remainder of the top 10 list of treatment methods supported by controlled trials (Table 7.14). It is also important to identify what has strong negative evidence for effect (i.e. does not work). Here one finds methods such as twelve-step facilitation, group psychotherapy, educational lectures and films, mandatory attendance at A.A. meetings, and relatively unspecified general alcoholism counselling, often of a confrontational nature.

Accident and emergency departments Brief advice delivered in emergency departments and trauma centres has been shown to be effective in reducing alcohol consumption (D'Onofrio and Degutis 2002; D'Onofrio *et al.* 1998; Longabaugh *et al.* 2001; Gentilello *et al.* 1999; Spirito *et al.* 2004; Mello *et al.* 2005) and alcohol-related harm (Monti *et al.* 1999; Gentilello *et al.* 1999; Longabaugh *et al.* 2001; Mello *et al.* 2005). A systematic review of 23 studies found evidence for reduced motor-vehicle crashes and related injuries, falls, suicide attempts, domestic violence, assaults and child abuse, alcohol-related injuries and injury emergency visits, hospitalizations and deaths, with reductions ranging from 27% to 65% (Dinh-Zarr *et al.* 2004).

Advice for hazardous and harmful alcohol consumption and alcohol dependence

Summary

There is extensive evidence for the impact of brief advice, particularly in primary care settings, in reducing harmful alcohol consumption, Table 7.15.

Table 7.15 Effectiveness ratings for interventions.

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Social welfare based programmes	+	+	+
Pregnancy based programmes	+	+	+
Work based programmes	++	+	+
Brief advice in primary care	+++	+++	++
Brief advice in accident and emergency departments	++	++	++

¹For definitions see Table 7.1

Source: Babor *et al.* (2003) (modified).

Impact and cost

In the CHOICE model, brief interventions such as physician advice provided in primary health care, which involve a small number of education sessions and psychosocial counselling, were modelled to influence the prevalence of hazardous drinking by increasing remission and reducing disability (Higgins-Biddle and Babor 1996; Moyer *et al.* 2002; Babor *et al.* 2003), which would have the effect of shifting the entire distribution of hazardous drinking downwards if applied to the total population at risk (a reduction in overall prevalence of 35-50%, equivalent to a 14-18% improvement in the rate of recovery over no treatment at all). The estimates were adjusted for treatment adherence (70%) and target coverage in the population (25% of hazardous drinkers). If implemented throughout the European Union, the model estimated that a brief intervention programme reaching 25% of the at risk population can prevent between 512 (EuroB countries) and 1056 (EuroC countries) DALYs per million people per year, at a cost of between €26 (EuroB countries) and €185 (EuroA countries) per 100 people per year (see Figures 7.11 and 7.12 at the end of the chapter). The model estimated that the provision of primary care based brief interventions to 25% of the at-risk population throughout the Union can prevent an estimated 408,000 years of disability and premature death at an estimated cost of €740 million each year (adapted from Chisholm *et al.* 2004).

COST-EFFECTIVENESS OF DIFFERENT POLICY OPTIONS

A summary of the estimated impact of different interventions, (DALYs prevented per million people per year) compared to a Europe with none of these policies is shown in Figure 7.11, and the estimated costs (Euro per 100 people per year) in Figure 7.12, for the three regions of the European Union, based on the WHO classification, Table 7.2.

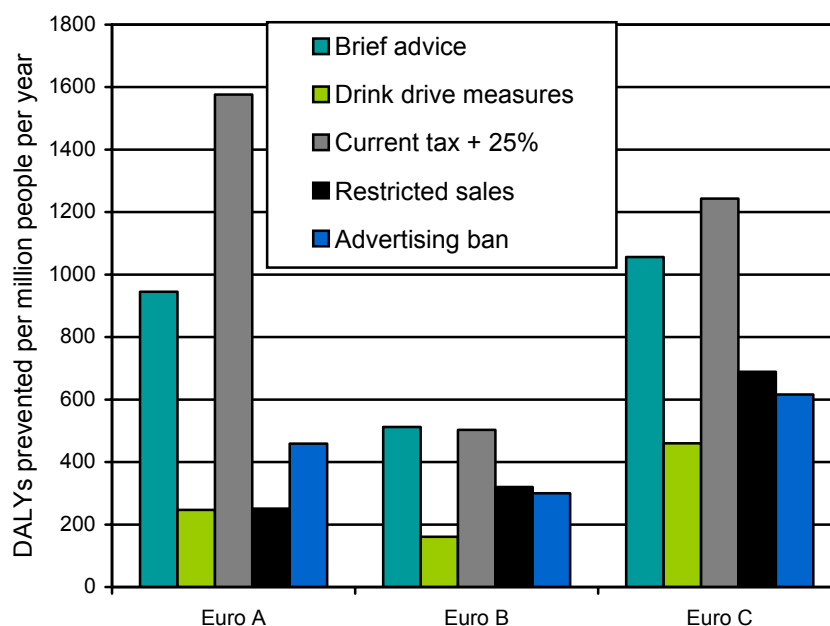


Figure 7.11 The impact of different policy options (DALYs prevented per million people per year) in the three sub-regions of EU25. Source: Chisholm *et al.* (2004) (adapted).

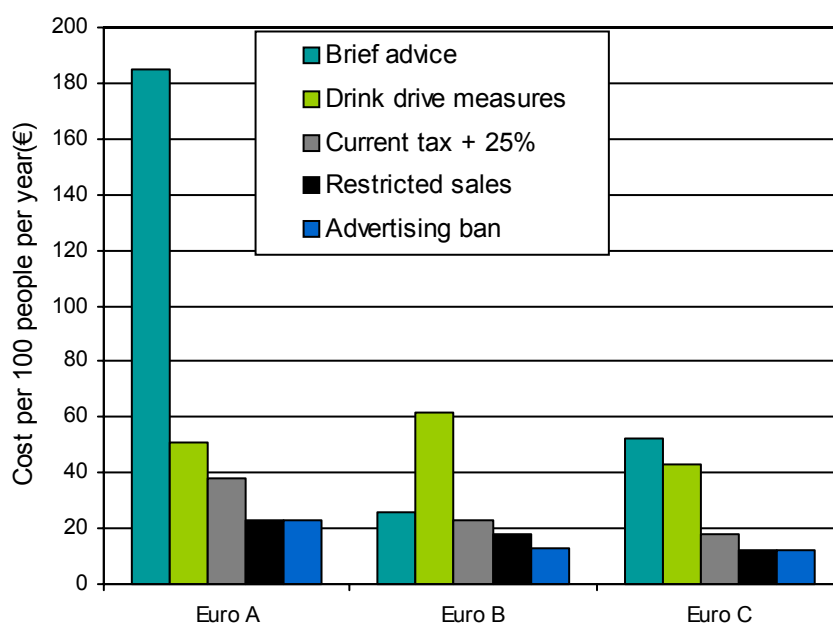


Figure 7.12 The cost of different policy options (per 100 people per year (€)) in the three sub-regions of EU25. Source: Chisholm *et al.* (2004) (adapted).

In all three regions, taxation (current tax levels with a 25% increase in tax, compared to no tax) has the greatest impact in reducing the harm done by alcohol, followed by brief interventions delivered by primary providers to 25% of the at risk population.

The three regulatory measures, (taxation, restricted sales and advertising controls) are the cheapest in terms of cost to implement, with drink driving measures and brief interventions being the most expensive. Although brief interventions are the most expensive to implement, it should be noted that within health service expenditure, brief interventions for hazardous and harmful alcohol consumption are one of the most cost effective of all health service interventions in leading to health gain (Anderson *et al.* 2005).

Cost effectiveness

Figures 7.13 to 7.15 show the cost effectiveness of the different interventions, singly and in combination. The vertical axis (log scale) is the cost (€) per 100m people per year and the horizontal axis (log scale) is the number of DALYs prevented per million people per year. The blue diagonal lines (also on a log scale moving from right to left) show the cost effectiveness in Euros per DALY prevented, ranging from €100 per DALY (bottom right) to €10,000 per DALY (top left). So, for example, in Figure 7.13, it is estimated that a policy setting the tax at the current level plus 25% (♦) at a cost of €38 per 100 people per year could prevent 1576 DALYs per million people per year with a cost effectiveness ratio of €241 per DALY prevented. It should be emphasized that all the interventions for reducing hazardous and harmful alcohol use show a highly favourable ratio of cost to effect. Each DALY averted by these efficient strategies costs considerably less than average annual income per capita, a threshold proposed by the Commission on Macroeconomics and Health for an intervention to be considered *very cost-effective* (WHO 2001, WHO 2002:108).

It is clear in all three sub-regions of the European Union, that taxation (*and ♦), restricted access (+), and advertising bans (-) are the most cost-effective policy options. But, it should also be noted that, compared with other health service interventions, brief interventions (◆) are also highly cost effective, with a cost effectiveness ratio of between €493 (EuroC countries) and €1959 (EuroA countries). Implementing all five options is also extraordinarily cheap, compared to the social cost of alcohol (see Chapter 6). Compared with no programme at all, a programme that included brief physician advice, random breath testing, current taxation plus 25%, restricted access and an advertising ban (■) would cost only €1.3 billion, and avert 1.4 million alcohol related DALYs a year.

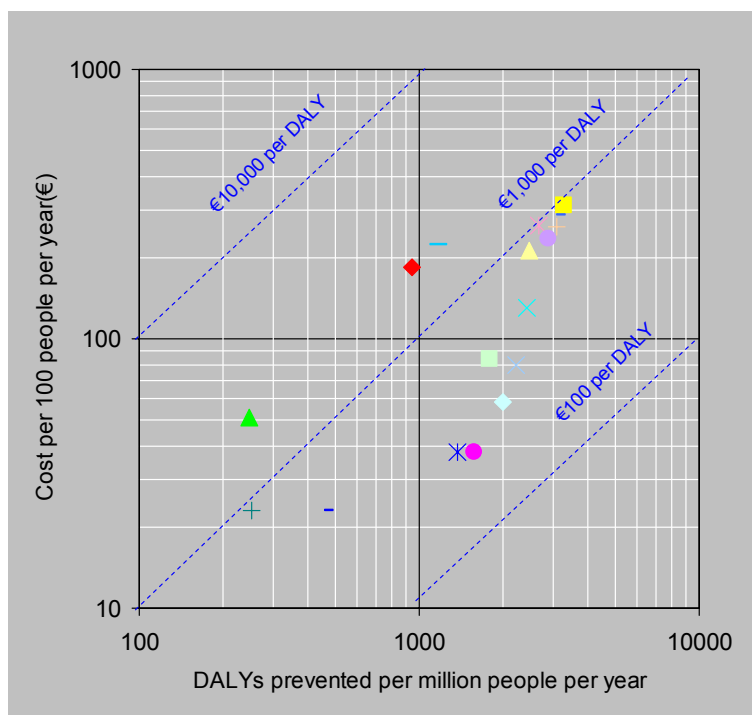


Figure 7.13 Cost effectiveness of different policy options for **EU25 A** countries (log scales). Diagonal lines show cost effectiveness in € per DALY prevented. (Legend, see below). Source: Chisholm *et al.* (2004) (adapted).

- ◆ **A. Brief physician advice (25% coverage)**
- ▲ **B. Random Breath Testing**
- ✱ **C1. Current tax**
- **C2. Current tax + 25%**
- ⊕ **D. Restricted access (sales)**
- **E. Advertising ban**
- **F1. Brief advice+RBT**
- ◇ **F2. Tax+Ad Ban**
- **F3. Tax+RBT**
- ▲ **F4. Brief advice+Tax**
- ⊗ **F5. Tax+Ad Ban+Restrict access**
- ✱ **F6. Brief advice+Tax+RBT**
- **F7. Brief advice+Tax+Ad Ban**
- ⊕ **F8. Brief advice+Tax+Ad Ban+Restrict access**
- **F9. Brief advice+Tax+Ad Ban+RBT**
- ⊗ **F10. Tax+Ad ban+Restrict access+RBT**
- **F11. Brief advice+Tax+Ad ban+RBT+Restrict access**

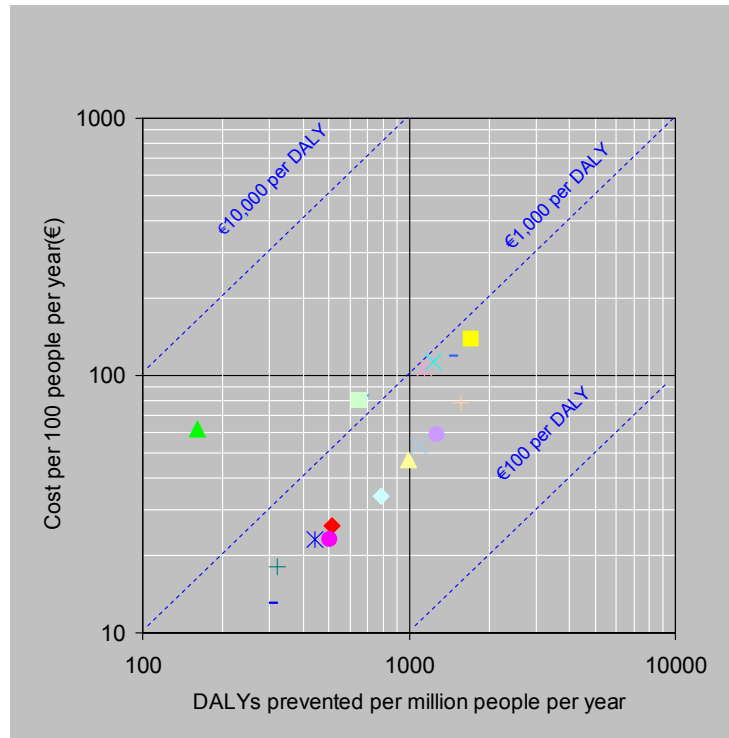


Figure 7.14 Cost effectiveness of different policy options for **EU25 B** countries (log scales). Diagonal lines show cost effectiveness in € per DALY prevented. (Legend, see Figure 7.13). Source: Chisholm *et al.* (2004) (adapted).

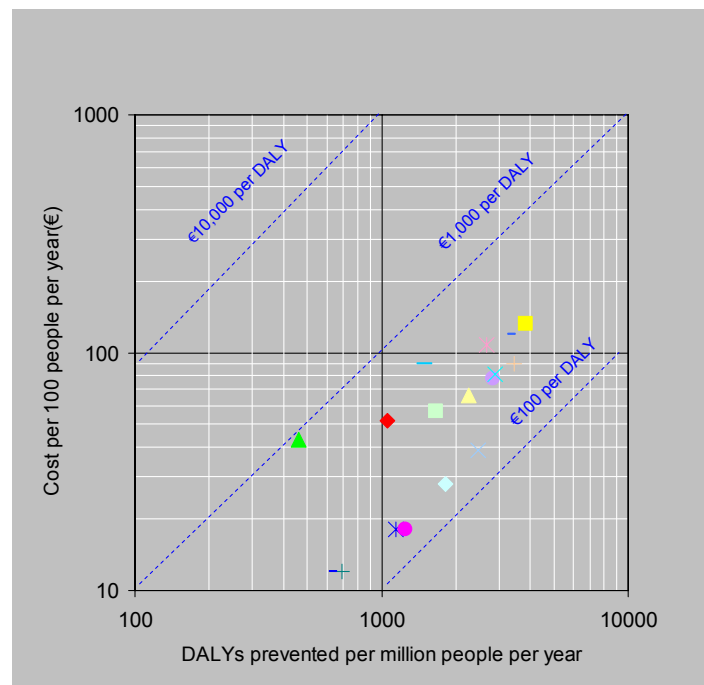


Figure 7.15 Cost effectiveness of different policy options for **EU25 C** countries (log scales). Diagonal lines show cost effectiveness in € per DALY prevented. (Legend, see Figure 7.13). Source: Chisholm *et al.* (2004) (adapted).

CONCLUSION

There is a wealth of evidence to advise which alcohol policies and programmes work and which do not work to reduce the harm done by alcohol. Although there is a dominance of North American literature in testing the effectiveness of alcohol policy options, the robustness of the evidence is strengthened by a consistency of evidence over time and in different jurisdictions, countries and cultures. What is particularly striking is that the policies which work are those that foster a supportive environment in which individuals are enabled to make healthy choices, although such evidence does not always translate into policy (Marmot 2004).

Programmes and policies that are directed to the individual, such as school based educational programmes are the least effective. This is not to say that such programmes should be abandoned; rather, it is not a good use of scarce resources to invest heavily in such programmes, recognizing at the same time that mass media programmes have a particular role to play in reinforcing community awareness of the problems created by alcohol use and to prepare the ground for specific interventions.

The exception to the lack of effectiveness of individually-based programmes is where problems or risk of problems are already occurring; there is strong evidence that brief interventions based in healthcare settings for individuals with existing hazardous and harmful alcohol consumption are effective in reducing the harm done by alcohol. What is also clear is that both enforcement and comprehensive approaches are important. For example, the impact of responsible beverage service is much enhanced when there is active enforcement and the support of community based prevention programmes.

The other striking conclusion is that alcohol policy is not only effective, but it is also cheap. Compared with no programme at all, a comprehensive programme that is modelled to reduce the burden of alcohol to the Union by nearly one third would only cost the governments of the Union as a whole an estimated €1.3 billion a year, about 1% of the total tangible costs of alcohol to society and only about 10% of an estimate of the income gained from a 10% rise in the price of alcohol due to taxes in the EU15 countries.

REFERENCES

- Aaker, D.A. (1996). *Building strong brands*. New York: The Free Press.
- Aaron, P., and Musto, D. (1981). Temperance and prohibition in America: An historical overview. In M.H. Moore and D. Gerstein, (Ed.), *Alcohol and public policy: Beyond the shadow of Prohibition*, pp.127-181. Washington, DC: National Academy Press.
- Aas, H. and Klepp, K.I. and Laberg, J.C. and Aarø, L.E. (1995): Predicting adolescents' intentions to drink alcohol: Outcome expectancies and self-efficacy. *Journal of Studies on Alcohol* 56: 293-299.
- Aas, H. and Klepp, K.I. (1992): Adolescents' alcohol use related to perceived norms. *Scandinavian Journal of Psychology* 33: 315-325.
- Aas, H. (1993): Adaptation of the Alcohol Expectancies Questionnaire (AEQ-A): A short version For use among 13-year-olds in Norway. *Scandinavian Journal of Psychology* 34: 107-118.
- Aas, N.H. and Leigh, B.C. and Anderssen, N. and Jakobsen, R. (1998): Two-year longitudinal

study of alcohol expectancies and drinking among Norwegian adolescents. *Addiction* 93: 373-384.
Abbey, A., Scott, R. O. and Smith, M. J. (1993) Physical, subjective, and social availability: their relationship to alcohol consumption in rural and urban areas, *Addiction*, 88, 489–499.

Academy of Medical Sciences (2004). Calling Time: The nation's drinking as a major public health issue. www.acmedsci.ac.uk.

Adam T, Evans D, Murray CJ. (2003). Econometric estimation of country-specific hospital costs. *Cost-effectiveness and Resource Allocation*; 1: 3, (www.resource-allocation.com).

Adlaf, E. M. and Kohn, P. M. (1989). Alcohol advertising, consumption, and abuse: A covariance-structural modeling look at Strickland's data. *British Journal of Addictions* 84: 749-757.

Agostinelli, G. and Grube, J.W. (2002). Alcohol counter-advertising and the media: A review of recent research. *Alcohol Research and Health* 26: 15-21.

Aguirre-Molina, M. and Gorman, D.M. (1996): Community-based approaches for the prevention of alcohol, tobacco, and other drug use. *Annual Review of Public Health* 17: 337–358.

Ahtola, J., Ekholm, A., and Somervuori, A. (1986) Bayes estimates for the price and income elasticities of alcoholic beverages in Finland from 1955 to 1980. *Journal of Business and Economic Statistics*, 4, 199-208.

Aitken, P.P. and Eadie, D.R. and Leather, D.S. and McNeill, R.E.J. and Scott, A.C. (1988): Television advertisements for alcohol drinks do reinforce under-age drinking. *British Journal of Addiction* 83: 1399-1419.

Aitken, P.P. and Leather, D.S. and Scott A.C. (1988): Ten to sixteen-year-olds' perceptions of advertisements for alcoholic drinks. *Alcohol and Alcoholism* 23: 491-500.

Aitken, P.P. (1989): Television alcohol commercials and under-age drinking. *International Journal of Advertising* 8: 133-150.

Alaniz M.L., Cartmill, R.S., and Parker R.N. (1998) Immigrants and violence: the importance of neighborhood context. *Hispanic Journal of Behavioral Sciences* 20, 155-174.

Alaniz, M.L., and Wilkes, C. (1998). Pro-drinking messages and message environments for young adults: The case of alcohol industry advertising in African American, Latino, and Native American communities. *Journal of Public Health Policy*, 19(4), 447-471.

Alcohol and Tobacco Tax and Trade Bureau (2003) Health Claims and Other Health-Related Statements in the Labeling and Advertising of Alcohol Beverages (99R–199P) Federal Register / Vol. 68, No. 41 / Monday, March 3, 2003 / Rules and Regulations.

Allamani, A., Basetti Sani I., Voller, F., Cipriani, F., Ammannati, P. and Centurioni, A (2003). Experiences from a community alcohol action research in Scandicci, Florence *Nordic Studies on Alcohol and Drugs* 20 105-109.

Anderson P, Gual A, and Colom, J. (2005). Alcohol and Primary Health Care: Clinical Guidelines on Identification and Brief Interventions. Department of Health of the Government of Catalonia: Barcelona.

Anderson, P. (2003). The Risk of Alcohol. PhD thesis. Nijmegen, Radboud University. http://webdoc.ubn.kun.nl/mono/a/anderson_p/riskofal.pdf.

Anderson, P., Kaner, E. Wutzke, S, Wensing, M., Grol, R., Heather, N. and Saunders, J. (2003). Attitudes and management of alcohol problems in general practice: descriptive analysis based on findings of a WHO international Collaborative Survey. *Alcohol and Alcoholism* 38 597-601.

Anderson, P., Kaner, E., Wutzke, S., Funk, M., Heather, N., Wensing, M., Grol, R., Gual, A. and Pas, L. (2004). Attitudes and managing alcohol problems in general practice: an interaction analysis based on Findings from a WHO Collaborative Study. *Alcohol and Alcoholism* 39:351-356.

Anderson, P., Laurant, M., Kaner, E., Grol, R. and Wensing, M. (2004). Engaging general practitioners in the management of alcohol problems: Results of a meta-analysis. *Journal of Studies on Alcohol*. 65 191-199.

Andsager, J.L. and Austin, E.W. and Pinkleton, B.E. (2002): Gender as a variable in the interpretation of alcohol-related messages. *Communication Research* 29: 246-269.

Arnold M.J. and Laidler T.J. (1994) *Situational and Environmental Factors in Alcohol-Related Violence*, Vol. 7. Canberra, Australia: Government Publishing Services.

Arthurson, R. (1985) *Evaluation of random breath testing*. Sydney: Traffic Authority of New South Wales, Research Note RN 10/85.

Ary, D.V. and Tildesley, E. and Hops, H. and Andrews, J. (1993): The influence of parent, sibling, and peer modeling and attitudes on adolescent use of alcohol. *International Journal of the Addictions*.

Asma, F.E.; Hilker, R.R.J.; Shevlin, J.J.; And Golden, R.G. (1980). Twenty-five years of rehabilitation of employees. *Journal of Occupational Environmental Medicine* 22:241-244.

Atkin CK, Block M. (1983). Effectiveness of celebrity endorsers. *Journal of Advertising Research* 23:57-61.

Atkin, C. K. (1990) Effects of televised alcohol messages on teenage drinking patterns. *Journal of Adolescent Health Care* 11, 10-24.

Atkin, C. K. and Block, M. (1980). *Content and effects of alcohol advertising*, Washington: Bureau of Tobacco, Alcohol and Firearms.

Atkin, C. K., Hocking, J. and Block, M. (1984). Teenage drinking: Does advertising make a difference? *Journal of Communication* 34: 157-167.

Atkin, C. K., Neuendorf, K. and McDermott, S. (1983). The role of alcohol advertising in excessive and hazardous drinking. *Journal of Drug Education* 13: 313-324.

Austin, E.W. and Johnson, K.K. (1997a): Immediate and delayed effects of media literacy training on third graders' decision making for alcohol. *Health Communication* 9: 329-349.

Austin, E.W. and Johnson, K.K. (1997b): Effects of general and alcohol-specific media literacy training on children's decision making about alcohol. *Journal of Health Communication* 2: 17-42.

Austin, E.W. and Knaus, C. (2000): Predicting the potential for risky behavior among those "too young" to drink as the result of appealing advertising. *Journal of Health Communication* 5: 13-27.

Austin, E.W. and Meili, H.K. (1994): Effects of interpretations of televised alcohol portrayals on children's alcohol beliefs. *Journal of Broadcasting and Electronic Media* 38: 417-435.

Austin, E.W. and Nach-Ferguson, B. (1995): Sources and influences of young school-age children's general and brand-specific knowledge about alcohol. *Health Communication* 7: 1-20.

Austin, E.W. and Pinkleton, B.E. and Fujioka, Y. (2000): The Role of interpretation processes and Parental discussion in the media's effects on adolescents' use of alcohol. *Pediatrics* 105: 343-349.

Austin, E.W., and Nach-Ferguson, B. (1995). Sources and influences of young school-age children's general and brand-specific knowledge about alcohol. *J Health Commun* 7(1):1-20.

Babor TF, Caetano R, Casswell S, Edwards G, Giesbrecht N, Graham K, Grube JW, Gruenewald PJ, Hill L, Holder HD, Homel R, Österberg E, Rehm J, Room R and Rossow I (2003). *Alcohol: No Ordinary Commodity. Research and Public Policy*. Oxford, Oxford Medical Publication, Oxford University Press.

Baer, J.S. *et al.* (1992) An experimental test of three methods of alcohol risk reduction with young adults. *Journal of Consulting and Clinical Psychology*, 60: 974-979.

- Baer, J.S. *et al.* (2001) Brief intervention for heavy drinking college students: 4-year follow-up and natural history. *American Journal of Public Health*, 91: 1306-1310.
- Bahk CM. (2001). Perceived realism and role attractiveness in movie portrayals of alcohol drinking. *Am J Health Behav* 25:433– 46.
- Baker, D.I. and Miller, W.T. (1997). Privacy, Antitrust and the National Information Infrastructure: Is Self-Regulation of Telecommunications-Related Personal Information a Workable Tool?, in PRIVACY AND SELF-REGULATION IN THE INFORMATION AGE (NTIA 1997), available at <http://www.ntia.doc.gov/reports/privacy/privacy_rpt.htm>.
- Balkam, S. (1997). Content Ratings for the Internet and Recreational Software, in Privacy And Self-Regulation In The Information Age (NTIA 1997), available at <http://www.ntia.doc.gov/reports/privacy/privacy_rpt.htm>.
- Ballesteros, J., Duffy, J. C., Querejeta, I., Arino, J. and Gonzales-Pinto, A. (2004a) Efficacy of brief interventions for hazardous drinkers in primary care|: systematic review and meta-analysis, *Alcoholism: Clinical and Experimental Research*, 28, 608-618.
- Ballesteros, J., Gonzalez-Pinto, A., Querejeta, I. and Arino, J. (2004b) Brief interventions for hazardous drinkers delivered in primary care are equally effective in men and women, *Addiction*, 99, 103-108.
- Baltussen, R., Adam, T., Tan Torres, T., Hutubessy, R., Acharya, A., Evans, D.B. and Murray, C.J.L. (2004). Generalized Cost-effectiveness Analysis: a guide. Geneva, World Health Organization. [http:// www.who.int/ whosis](http://www.who.int/whosis).
- Barlow T. and Wogalter M.S. (1993) Alcoholic beverage warnings in magazine and television advertisements. *Journal of Consumer Research* 20, 147-156.
- Barnard M, Forsyth AJM. (1998). Alcopops and under-age drinking: changing trends in drink preference. *Health Educ.* 6:208–12.
- Barnett WS. (1993). Benefit-cost analysis of preschool education: findings from a 25- year follow-up. *American Journal of Orthopsychiatry* 63(4):500–508.
- Bauman, K.E. *et al.* (2002) Influence of a family program on adolescent smoking and drinking prevalence. *Prev. Sci.*, 3: 35-42.
- Beccaria, F. (2001): The Italian debate on alcohol advertising regulation. *Contemporary Drug Problems* 28 (4): 48-50.
- Beirness, D.J. and Simpson, H.M. (2002) The Safety Impact of Lowering the BAC Limit for Drivers in Canada. Ottawa: Traffic Injury Research Foundation.
- Bennett JB; Patterson CR; Reynolds GS; Wiitala WL; Lehman WE (2004). Team awareness, problem drinking, and drinking climate: workplace social health promotion in a policy context. *Am J Health Promot* Nov-Dec;19(2):103-13.
- Berglund, M., Thelander, S. and Jonsson, E. (Eds.) (2003). *Treating Alcohol and Drug Abuse: An Evidence-based Review* (Weinheim, Wiley-VCH).
- Bernhoff IM, Behrensdorff I. (2003) Effect of lowering the alcohol limit in Denmark *Accid Anal Prev.* 35(4):515-25.
- Bertholet, N., Daepfen, J-B., Wiattlisbach, V., Fleming, M. and Burnand, B. (in press) Brief alcohol intervention in primary care: systematic review and meta-analysis, *Archives of Internal Medicine*.
- Bien T. H., Miller, W. R. and Tonigan, J. S. (1993) Brief interventions for alcohol problems: a review, *Addiction*, 88, 315-335.

Bjarnason, T., *et al.* (2003) Alcohol culture, family structure and adolescent alcohol use: multilevel modelling of frequency of heavy drinking among 15-16 year old students in 11 European countries. *J. Stud. Alcohol*, 64(2): 200-8.

Bjerre B Primary and secondary prevention of drink driving by the use of alcohol lock device and program: Swedish experiences *Accid Anal Prev* 2005 Nov;37(6):1145-52.

Blake, D. and A. Nied, (1997). The Demand for Alcohol in the United Kingdom, *Applied Economics*, 29, 1655-1672.

Blane, D., Brunner, E. and Wilkinson, R. (1996). *Health and social organization*. London: Routledge.

Blose J.O. and Holder H.D. (1987) Liquor-by-the-drink and alcohol-related traffic crashes: a natural experiment using time-series analysis. *Journal of Studies on Alcohol* 48, 52-60.

Bourgeois, J. and J. Barnes, (1979). Does Advertising Increase Alcohol Consumption?, *Journal of Advertising Research* 19, 19-29.

Blum, T.C., And Roman, P.M. (1995). *Cost-Effectiveness and Preventive Implications of Employee Assistance Programs*. Rockville, MD: Substance Abuse and Mental Health Services Administration; Publication RP0907.

Bobak M; Pikhart H; Kubinova R; Malyutina S; Pajak A; Sebakova H; Topor-Madry R; Nikitin Y; Caan W; Marmot M (2005). The association between psychosocial characteristics at work and problem drinking: a cross-sectional study of men in three Eastern European urban populations. *Occup Environ Med* Aug;62(8):546-50.

Bondy S.J., Rehm J., Ashley M.J., Walsh G., Single E., and Room R. (1999) Low-risk drinking guidelines: scientific evidence. *Canadian Journal of Public Health* 90, 264-270.

Borschos, B. (2000) *Evaluation of the Swedish drunken driving legislation implemented on February 1, 1994*. [On-line] Presented at the 15th International Conference on Alcohol, Drugs and Traffic Safety, Stockholm, Sweden: 22-26 September. Available from: <http://www.vv.se> Accessed: January 2004.

Botvin G. J. and Botvin E. M. (1992). Adolescent tobacco, alcohol, and drug abuse: Prevention strategies, empirical findings, and assessment issues. *Developmental and Behavioral Pediatrics* 13, 290-301.

Botvin, G. J., Baker, E. and Dusenbury, L. (1995a) Long term follow-up results of a randomized drug abuse prevention trial. *Journal of the American Medical Association*, 273, 1106–1112.

Botvin, G. J., Schinke, S. P., Epstein, J. A., Diaz, T. and Botvin, E. M. (1995b) Effectiveness of culturally focused and generic skills training approaches to alcohol and drug abuse prevention among minority adolescents two-year follow-up results. *Psychology of Addictive Behaviours*, 9, 183–194.

Bowerman R.J. (1997) Effect of a community-supported alcohol ban on prenatal and other substance abuse. *American Journal of Public Health* 87, 1378-1379.

Boyd, R. and B. Seldon, (1990). The Fleeting Effect of Advertising, *Economic Letters*, 34.

Braun K. and Graham K. with Bois C., Tessier C., Hughes S., and Prentice L. (2000) *Safer Bars Trainer's Guide*. Toronto, Canada: Centre for Addiction and Mental Health.

Briscoe, S. and Donnelly, N. (2003a) Problematic licensed premises for assaults in inner Sydney, Newcastle and Wollongong. *Australian and New Zealand Journal of Criminology*, 36, 18-33.

Briscoe, S. and Donnelly, N. (2003b) Liquor licensing enforcement activity in New South Wales. *Alcohol Studies Bulletin*, no. 4, Sydney: NSW Bureau of Crime Statistics and Research.

Brown S. (1995). Post-modern marketing research – no representation without taxation. *J Mrkt Res Soc.* 37(3):287–310.

Brown, J. and Witherspoon, E. (2002) The mass media and American adolescents' health. *Journal of Adolescent Health* 31, 153–170.

Brown, J.H. and Kreft, I.G.G. (1998) Zero effects of drug prevention programs: Issues and solutions. *Evaluation Review* 22, 3-14.

Brown, S.A. and Christiansen, B.A. and Goldman, M.S. (1987): The alcohol expectancy questionnaire: An instrument for the assessment of adolescent and adult alcohol expectancies. *Journal of Studies on Alcohol* 48: 483-491.

Bruun K., Edwards G., Lumio M., Mäkelä K., Pan L., Popham R.E., Room R., Schmidt W., Skog O.-J., Sulkunen P., and Österberg E. (1975) *Alcohol Control Policies in Public Health Perspective*. Helsinki: The Finnish Foundation for Alcohol Studies.

Cabinet Office (2003). Alcohol Harm Reduction Strategy for England.

Calfee, J. and C. Scheraga, (1994). The Influence of Advertising on Alcohol Consumption: A Literature Review and An Econometric Analysis of Four European Nations, *International Journal of Advertising*, vol. 13, no. 4, p. 287-310.

Campell, A.J. (1999). Self-Regulation and the media. *Federal Communications Law Journal*. 1999:3, 711-772.

Canzer B. (1996) Social marketing approach to media intervention design in health and lifestyle education. *Dissertation Abstracts International* 57, 647A.

Cape GS. (2003). Addiction, stigma and movies. *Acta Psychiatr Scand* 10:163– 9.

Casiro O.G., Stanwick R.S., Pelech A., Taylor, V., Friesen, F., Fast, M., Peabody, D., Alto, L., Edye-Mazowita G, Dean, H, and Esquivel, A. (1994) Public awareness of the risks of drinking alcohol during pregnancy: The effects of a television campaign. *Canadian Journal of Public Health* 85, 23-27.

Casswell S, Zhang J. (1998). Impact of liking for advertising and brand allegiance on drinking and alcohol-related aggression: a longitudinal study. *Addiction*. 93(8):1209–17.

Casswell S. (1997) Public discourse on alcohol. *Health Promotion International* 12, 251- 257.

Casswell S. (1995). Does alcohol advertising have an impact on public health? *Drug Alcohol Rev.* 14:395–404.

Casswell, S. and Maxwell, A. (2005). Regulation of Alcohol Marketing: A Global View *Journal of Public Health Policy* (2005) 26, 343–358.

Casswell, S. (1993) Commentary: Public discourse on the benefits of moderation: implications for alcohol policy development. *Addiction* 88, 459-465.

Casswell, S. and Gilmore, L. (1989) Evaluated community action project on alcohol. *Journal of Studies on Alcohol*, 50, 339-346.

Casswell, S., Ranson, R. and Gilmore, L. (1990). Evaluation of a mass-media campaign for the primary prevention of alcohol-related problems. *Health Promotion International* 5 9-17.

CDC (2003) Point-of-Purchase Alcohol Marketing and Promotion by Store Type --- United States, 2000—2001 April 11, 2003 / 52(14):310-313
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5214a4.htm>.

Chaloupka F.J., Saffer H., and Grossman M. (1993) Alcohol-control policies and motor-vehicle fatalities. *Journal of Legal Studies* 22, 161-186.

Chaloupka, F.J, Grossman, M. and Saffer, H. (2002) The effects of price on alcohol consumption and alcohol-related problems. *Alcohol Research and Health*, 26, 22-34.

Chaloupka, F.J., And Laixuthai, A. (1997). Do youths substitute alcohol and marijuana? Some econometric evidence. *Eastern Economic Journal* 23(3):253– 276.

Chaloupka, F.J., And Wechsler, H. (1996). Binge drinking in college: The impact of price, availability, and alcohol control policies. *Contemporary Economic Policy* 14(4):112–124.

Chaloupka, F.J.; Grossman, M.; And Saffer, H. (1998). The effects of price on the consequences of alcohol use and abuse. In: Galanter, M., ed. *Recent Developments in Alcoholism, Volume 16: The Consequences of Alcohol*. New York: Plenum Press, pp. 331–346.

Chatterton, P. and Hollands, R. (2003) *Urban Nightscapes: Youth Cultures, Pleasure Spaces and Corporate Power*. Routledge: London.

Chen M-J, Grube JW. (2002). TV beer and soft drink advertising: what young people like and what effects? *Alcohol Clin Exp Res* 26(6):900– 6.

Chen MJ; Grube JW; Bersamin M; Waiters E; Keefe DB (2005). Alcohol advertising: what makes it attractive to youth? *J Health Commun Sep*;10(6):553-65.

Chesson, H.; Harrison, P.; And Kassler, W.J. (2000). Sex under the influence: The effect of alcohol policy on sexually transmitted disease rates in the United States. *Journal of Law and Economics* 43(1): 215–238.

Chikritzhs, T. and Stockwell, T.R. (2002) The impact of later trading hours for Australian public houses (hotels) on levels of violence. *Journal of Studies on Alcohol*, 63, 591-599.

Chikritzhs, T., Stockwell, T. and Masters, L. (1997) *Evaluation of the public health and safety impact of extended trading permits for Perth hotels and nightclubs*. Perth: National Centre for Research into the Prevention of Drug Abuse, Curtin University.

Chikritzhs, T., Stockwell, T. Pascal, R. (2005). The impact of the Northern Territory's Living With Alcohol program, 1992–2002: revisiting the evaluation *Addiction*, 100 1625–1636.

Chisholm, D., Rehm, J., Van Ommeren, M., and Monteiro, M. (2004). Reducing the Global Burden of Hazardous Alcohol Use: a Comparative Cost-Effectiveness Analysis. *Journal of Studies on Alcohol*, 65(6): 782-93.

Chiu A.Y., Perez P.E., and Parker R.N. (1997) Impact of banning alcohol on outpatient visits in Barrow, Alaska. *Journal of the American Medical Association* 278, 1775-1777.

Chou, C-P. and Montgomery, S. and Pentz, M.A. and Rohrbach, L.A. and Johnson, C.A. and Flay, B.R. and MacKinnon, D.P. (1998): Effects of a Community- based prevention program on decreasing drug use in high-risk adolescents. *American Journal of Public Health* 88 (6): 944–948.

Christenson, P.G. and Henriksen, L. and Roberts, D.F. (2000): Substance use in popular prime time television. Office of National Drug Control Policy: Mediascope.

Cimini MD, Page JC, and, Trujillo D. (2002). Using peer theater to deliver social norms information: the Middle Earth Players program. *The Report on Social Norms* 2:1–8 (working paper 8).

Clapp, J.D., Johnson, M., Voas, R.B., Lange, J.E., Shillington, A. and Russell, C. (2005). Reducing DUI among US college students: results of an environmental prevention trial *Addiction*, 100 , 327–334.

Clements, K.W. and Selvanathan, S. (1991) The economic determinants of alcohol consumption. *Australian Journal of Agricultural Economics*, 35, 209-231.

Clements, K.W.; Yang, W.; and Zheng, S.W. (1997). Is utility additive? The case of alcohol. *Appl Econ* 29(9):1163–1167.

Coate D. and Grossman M. (1988) Effects of alcoholic beverage prices and legal drinking ages on youth alcohol use. *Journal of Law and Economics* 31, 145-171.

Cohen, D.A., Mason, K. and Scribner, R. (2002). The Population Consumption Model, Alcohol Control Practices, and Alcohol-related Traffic Fatalities. *Preventive Medicine*, 34 (2): 187-97.

Colan, N.B., And Schneider, R. (1992).The effectiveness of supervisor training: One-year follow up. *Journal of Employee Assistance Research* 1:83–95.

Collins RL; Schell T; Ellickson PL; McCaffrey D (2003). Predictors of beer advertising awareness among eighth graders. *Addiction* Sep;98(9):1297-306.

Connolly, G.M. and Casswell, S. and Zhang, J.F. and Silva, P.A. (1994): Alcohol in the mass media and drinking by adolescents: A longitudinal study. *Addiction* 89: 1255-1263.

Cook P.J. and Moore, M.J. (1993) Taxation of alcoholic beverages. *Economics and the Prevention of Alcohol-Related Problems*. National Institute of Alcohol Abuse and Alcoholism, Rockville, MD.

Cook P.J. and Tauchen, G. (1982) The effect of liquor taxes on heavy drinking. *Bell Journal of Economics*, 13, 379-390.

Cook, P.J. and Moore, M.J. (2002). The economics of alcohol abuse and alcohol control policies. *Health Affairs* 2002 21 120-133.

Cooke, E., Hastings, G, Wheeler, C., Eadie, D., Moskalewicz, J., Dąbrowska, K. (2004) Marketing of Alcohol to Young People: A Comparison of the UK and Poland. *Eur Addict Res* 2004;10:1-7.

Cooke, E., Hastings, G. and Anderson, S. (2002) Desk research to examine the influence of marketing and advertising by the alcohol industry on young people's alcohol consumption. Research prepared for the World Health Organization by the Centre for Social Marketing at the University of Strathclyde.

Cowan, R., and Mosher, J.F. (1985). Public health implications of beverage marketing: Alcohol as an ordinary consumer product. *Contemporary Drug Problems*, 12(4), 621-657.

Cuijpers, P., Riper, H. and Lemmens, L. (2004) The effects on mortality of brief interventions for problem drinking: a meta-analysis, *Addiction*, 99, 839-845.

Cumsille, P.E. and Sayer, A.G. and Graham, J.W. (2000): Perceived exposure to peer and Adult drinking as predictors of growth in positive alcohol expectancies during adolescence. *Journal of Consulting and Clinical Psychology* 68: 531-536.

Curran, P.J. and Stice, E. and Chassin, L. (1997): The relation between adolescent alcohol use And peer alcohol use: A longitudinal random coefficients model. *Journal of Consulting and Clinical Psychology*.

Cusenza S. (1998) Organizing to reduce neighborhood alcohol problems: A frontline account. *Contemporary Drug Problems* 25, 99-111.

d'abbs P. and Togni S. (2000) Liquor licensing and community action in regional and remote Australia: a review of recent initiatives. *Australian and New Zealand Journal of Public Health* 24, 45-53.

d'Abbs, P. (2004) Alignment of the policy planets: behind the implementation of the Northern Territory (Australia) Living With Alcohol programme. *Drug and Alcohol Review*, 23, 55–66. .

d'Abbs, P. and Forner, J. (1995) *An evaluation of measures designed to reduce nightclub related violence and disorder in Darwin*. Darwin: Menzies School of Health Research.

d'Abbs, P., Forner, J. and Thomsen, P. (1994) *Darwin Nightclubs: A Review of Trading Hours and Related Issues*. Darwin: Menzies School of Health Research.

D'Amico EJ, Fromme K. (2002). Brief prevention for adolescent risk-taking behavior. *Addiction* 97:563–74 .

D'Onofrio, G., Degutis, L.C. (2002) Preventive care in the emergency department: Screening and brief intervention for alcohol problems in the emergency department: A systematic review. *Academic Emergency Medicine* 9, 627-638.

Dalton MA, Ahrens MB, Sargent JD, *et al.* (2002). Relation between parental restrictions on movies and adolescent use of tobacco and alcohol. *Eff Clin Pract* 5:1– 10.

Dee, T.S. (1999). State alcohol policies, teen drinking and traffic accidents. *Journal of Public Economics* 72(2): 289–315.

Dee, T.S., And Evans, W.N. (2001). Teens and traffic safety. In: Gruber, J., ed. *Risky Behavior Among Youth: An Economic Perspective*. Chicago: University of Chicago Press, pp. 121–165.

DeJong W. and Langford L.M. (2002) A typology for campus-based alcohol prevention: moving toward environmental management strategies. *Journal of Studies on Alcohol Suppl.* No.14, 140-147.

Dent CW; Grube JW; Biglan A (2005) Community level alcohol availability and enforcement of possession laws as predictors of youth drinking. *Prev Med* 2005 Mar;40(3):355-62.

Dent, C.W. (2005). Community Level Alcohol Availability and Enforcement of Possession Laws as Predictors of Youthful Drinking. *Preventive Medicine*, 40, 355-362. *Addiction Research*, 5 (6): 451-472.

Dielman T.E. (1995) School-based research on the prevention of adolescent alcohol use and misuse: Methodological issues and advances. In: Boyd G.M., Howard J., and Zucker R.A. (eds.) *Alcohol problems among adolescents: Current directions in prevention research*, pp. 125-146. Hillsdale, NJ: Lawrence Erlbaum.

Dinh-Zarr T, Goss C, Heitman E, Roberts I, DiGuseppi C. (2004). Interventions for preventing injuries in problem drinkers. *The Cochrane Database of Systematic Reviews* Issue 3.

Distilled Spirits Council of the United States, I. (1998). Code of good practice for distilled spirits advertising and marketing (1998). Available: <http://www.discus.org/industry/code/>.

Ditter SM; Elder RW; Shults RA; Sleet DA; Compton R; Nichols JL (2005). Effectiveness of designated driver programs for reducing alcohol-impaired driving a systematic review *Am J Prev Med Jun;28(5 Suppl):280-7*.

Donnelly, N. and Briscoe, S. (2003) Signs of intoxication and server intervention among 18-39-year-olds drinking at licensed premises in New South Wales, Australia. *Addiction*, 98, 1287-1295.

Donnelly, N., and Briscoe, S. (2005) Intelligence-led regulation of licensed premises In Stockwell T, Gruenewald P, Toumbourou J, and Loxley W, eds. *Preventing harmful substance use: The evidence base for policy and practice*. Chichester: Wiley.

D'onofrio, G. and Degutis, L. C. (2002) Preventive care in the emergency department; screening and brief intervention for alcohol problems in the emergency department: a systematic review, *Academic Emergency Medicine*, 9, 627-638.

D'Onofrio, G., Bernstein, E., Bernstein, J., Woolard, R., Brewer, Ph. A., Craig, S.A. *et al.* (1998) Patients with alcohol problems in the emergency department, part 2: Intervention and referral. *Academic Emergency Medicine* 5, 1210-1217.

Douglas, R.R. and Prentice, L. and Rylett, M. and Gliksman, L. (in press): Applied democracy in the reduction of community problems: Alcohol policy development in rural communities. MAP Manual.

Douglas, R.R. (1990): Formulating alcohol policies for community recreation facilities: Tactics and problems. In: Giesbrecht, N., Conley, P. Denniston, R.W. Gliksman, L. Holder, H.D. Pederson, A.,

Room, R. and Shain, M. (eds): Research, Action and the Community: Experiences in the Prevention of Alcohol and Other Drug Problems. Rockville, Maryland: U.S. Department of Health and Human Services.

Dresser J. (2000) Comparing Statewide Alcohol Server Training Systems. (Unpublished manuscript).

Duffy, M. (1991). Advertising in Demand Systems: Testing a Galbraithian Hypothesis, Applied Economics, 23, 485-496.

Duffy, M., (1995). Advertising in Demand Systems for Alcoholic Drinks and Tobacco: A Comparative Study, Journal of Policy Modeling, vol. 17 no. 6, p. 557-577.

Duffy, M. (2001). Advertising in Consumer Allocation Models: Choice if Functional Form, Applied Economics, 33, 437-456.

Duffy, M., (1987) The Demand for Alcoholic Drink in the United Kingdom, 1963-78, Applied Economics, 15, 1983, 125-140.

Dunn, M.E. and Yniguez, R.M. (1999): Experimental demonstration of the influence of alcohol advertising on the activation of alcohol expectancies in memory among fourth and fifth-grade children. Experimental Clinical Psychopharmacology 7: 473-83.

DuRant, R.H. and Rome, E.S. and Rich, M. and Allred, E. and Emans, S. J. and Woods, E.R. (1997): Tobacco and alcohol use behaviors portrayed in music videos: A content analysis. American Journal of Public Health 87: 1131-1135.

Edwards G., Anderson P., Babor T.F., Casswell S., Ferrence R., Giesbrecht N., Godfrey C., Holder H.D., Lemmens P., Mäkelä K., Midanik L.T., Norström T., Österberg E., Romelsjö A., Room R., Simpura J., and Skog O.-J. (1994) Alcohol Policy and the Public Good. Oxford: Oxford University Press.

Edwards, D.; Iorio, V.; Berry, N.H.; And Gunderson, E.K.E. (1973). Prediction of success for alcoholics in the Navy: A first look. Journal of Clinical Psychology 29(1):86-89.

Elder RW; Nichols JL; Shults RA; Sleet DA; Barrios LC; Compton R (2005). Effectiveness of school-based programs for reducing drinking and driving and riding with drinking drivers a systematic review Am J Prev Med Jun;28(5 Suppl):288-304.

Ellickson PL; Collins RL; Hambarsoomians K; McCaffrey DF (2005). Does alcohol advertising promote adolescent drinking? Results from a longitudinal assessment. Addiction Feb;100(2):235-46.

Emmen, M. J., Schippers, G. M., Bleijenberg, G. and Wollsheim, H. (2004) Effectiveness of opportunistic brief interventions for problem drinking in a general hospital setting: systematic review. *British Medical Journal*, 328, 318-322.

Engineer, R., Phillips, A., Thompson, J. and Nicholls, J. (2003) *Drunk and disorderly: a qualitative study of binge drinking among 18 to 24 yr olds*. London: Home Office Research Studies.

Escobedo, L.G. and Ortiz, M. (2002). The Relationship Between Liquor Outlet Density and Injury and Violence in New Mexico. Accident Analysis Prevention. 34 (5): 689-94.

Euromonitor International. (2004). The World Market for Spirits and FABs. Euromonitor International. London, England; Section 22. .

Evans,W.N., Neville, D., Graham, J.D., (1991). General deterrence of drunk driving: evaluation of recent American policies. Risk Analysis 11, 279-289.

Everett SA, Schnuth RL, Tribble JL. (1998). Tobacco and alcohol use in top-grossing American films. J Comm Health 23:317- 24.

Ezzati M, Lopez AD, Rodgers A *et al.* (2002). Selected major risk factors and global and regional burden of disease. *Lancet*; 360: 1347-1360.

Fahrenkrug H. and Rehm J. (1995) Drinking contexts and leisure-time activities in the prephase of alcohol-related road accidents by young Swiss residents. *Sucht* 41, 169-180.

Faragher, E.B., Cass, M. and Cooper, C.L. (2005). The relationship between job satisfaction and health: a meta-analysis *Occup Environ Med* 2005;62:105–112.

Farrell, S., Manning, W.G. and Finch, M.D. (2003). Alcohol dependence and the price of alcoholic beverages. *Journal of Health Economics* 22 117-147.

Federal Trade Commission (1998) Beck's North America, Inc., Complaint, available at <<http://www.ftc.gov/os/1998/9808/9823092.cmp.htm>>.

Federal Trade Commission. (1999). Self-regulation in the alcohol industry: A review of industry efforts to avoid promoting alcohol to underage consumers. Washington, DC.

Federal Trade Commission. (2003). Alcohol Marketing and Advertising: A Report to Congress. Washington, DC: FTC, September 2003. Available at <http://www.ftc.gov/os/2003/09/alcohol08report.pdf>.

Fedler F., Philips M., Raker P.Schefsky, D. and Soluri, J. (1994) Network commercial promote legal drugs: Outnumber anti-drug PSA's 45-to-1. *Journal of Drug Education* 24, 291-302.

Fell, J., Voas, R.B., Lange,J.E. (1997). Designated driver concept: extent of use in the USA. *Journal of Traffic Medicine*, 25(3-4),109-114.

Felson, M., Berends, R., Richardson, B. and Veno, A. (1997) Reducing pub hopping and related crime. In R., Homel, (Ed) *Policing for Prevention: Reducing Crime, Public Intoxication, and Injury*, Crime Prevention Studies, 7, New York: Criminal Justice Press.

Finn, T.A. and Strickland, D.E. (1982): A content analysis of beverage alcohol advertising: II. Television Advertising. *Journal of Studies on Alcohol* 43: 964-989.

Fisher, J.C., and Cook, P.A. (1995). *Advertising, Alcohol Consumption, and Mortality: An Empirical Investigation*. Westport, CT: Greenwood Press.

Fleming K; Thorson E; Atkin CK (2004). Alcohol advertising exposure and perceptions: links with alcohol expectancies and intentions to drink or drinking in underaged youth and young adults. *J Health Commun* Jan-Feb;9(1):3-29.

Fleming MF, Mundt MP, French MT *et al.* (2000). Benefit-cost analysis of brief physician advice with problem drinkers in primary care settings. *Medical Care*; 38: 7-18.

Fleming, D., and Zwiebach, P. (1999). UDV unveils global campaign for Johnnie Walker, its first ever. *Impact*, 29(23), 1, 18-19.

Fleming, M. F., Mundt, M., O., French, M. T. *et al.* (2002) Brief physician advice for problem drinkers: long-term efficacy and benefit-cost analysis, *Alcoholism: Clinical and Experimental Research*, 26, 36-43.

Forster, J.L., McGovern, P.G., Wagenaar, A.C., Wolfson, M., Perry, C.L. and Anstine, P.S. (1994) Ability of young people to purchase alcohol without age identification in northeastern Minnesota, USA. *Addiction* 89:699-705.

Forster, J.L., Murray, D.M., Wolfson, M. and Wagenaar, A.C. (1995) Commercial availability of alcohol to young people: Results of alcohol purchase attempts. *Preventive Medicine* 24:342-347.

Foss RD, Marchetti LJ, Holladay KA. (2001). Development and evaluation of a comprehensive program to reduce drinking and impaired driving among college students. Washington DC: U.S. Department of Transportation, National Highway Traffic Safety Administration. (DOT HS 809 396).

Foxcroft DR, Ireland D, Lister-Sharp DJ, Lowe G, Breen R. (2003). Longer-term primary prevention for alcohol misuse in young people: a systematic review. *Addiction*; 98: 397-411.

Foxcroft DR, Lister-Sharp D, Lowe G. (1997). Alcohol misuse prevention for young people: a systematic review reveals methodological concerns and lack of reliable evidence of effectiveness. *Addiction*; 92: 531-538.

Franke, G. and G. Wilcox, (1987). Alcoholic Beverage Advertising and Consumption in the United States, 1964-1984, *Journal of Advertising*, 16, 22-30.

Freemantle, N., Gill, P., Godfrey, C. *et al.* (1993) Brief Interventions and alcohol use. *Effective Health Care Bulletin No. 7.*(University of Leeds, Nuffield Institute for Health).

Funk, M., Wutzke, S., Kaner, E., Anderson, P., Pas, L., McCormick, R., Gual, A., Barfod, S., Saunders, J. (2005) A multi country controlled trial of strategies to promote dissemination and implementation of brief alcohol intervention in primary health care: Findings of a WHO Collaborative Study. *Journal of Studies on Alcohol* 66 379-388.

Garfield, C.F., Chung, P.J. and Rathouz, P.J. (2003). Alcohol advertising in magazines and adolescent readership. *Journal of American Medical Association* 289 2424-2429.

Geller E.S., Russ N.W., and Delphos W.A. (1987) Does server intervention training make a difference? An empirical field evaluation. *Alcohol, Health and Research World* 11, 64-69.

Gentilello, L.M., Rivara, F.P., Donovan, D.M., Jurkovich, G.J., Daranciang, E., Dunn, C.H., Villaveces, A., Copass, M., Ries, R.R. (1999) Alcohol Interventions in a trauma center as a means of reducing the risk of injury recurrence. *Annals of Surgery* **230**, 473-483.

Gentilello, L.M., Rivara, F.P., Donovan, D.M., Jurkovich, G.J., Daranciang, E., Dunn, C.H., Villaveces, A., Copass, M., Ries, R.R. (1999) Alcohol Interventions in a trauma center as a means of reducing the risk of injury recurrence. *Annals of Surgery* **230**, 473-483.

Giesbrecht N. (2000) Roles of commercial interests in alcohol policies: Recent developments in North America. *Addiction* 95 (Suppl. 4), 581-595S.

Giesbrecht N. and Greenfield T.K. (1999) Public opinions on alcohol policy issues: a comparison of American and Canadian surveys. *Addiction* 94, 521-531.

Giesbrecht N., Conley P., Denniston R., Gliksman L., Holder H.D., Pederson A., Room R., and Shain M. (eds.) (1990) *Research, Action, and the Community: Experiences in the Prevention of Alcohol and Other Drug Problems*. Rockville, Maryland: Office for Substance Abuse Prevention.

Giesbrecht, N. (2003). Alcohol, tobacco and local control. A comparison of several community-based prevention trials. *Nordic Studies on Alcohol and Drugs* 20 25-40.

Gius, M.P. (2005). An estimate of the effects of age, taxes and other socioeconomic variables on the alcoholic beverage demand of young adults. *The Social Science Journal* 42 13-24.

Gliksman L., Single E., McKenzie D., Douglas R., Brunet S., and Moffat K. (1993) The role of alcohol providers in prevention: An evaluation of a server intervention programme. *Addiction* 88, 1189-1197.

Gliksman, L. and Douglas, R. and Rylett, M. (1999): Two decades of municipal alcohol policy development: Challenges, solutions and findings in a Canadian province. In: Casswell, S. Holder, H. Holmila, M. Larsson, S. Midford, R. Moewaka Barnes, H. Nygaard, P. and Stewart, L. (eds.): *Kettil Bruun Society Thematic Meeting Fourth Symposium on Community Action Research and the Prevention of Alcohol and Other Drug Problems*. Auckland, New Zealand: Alcohol and Public Health Research Unit, University of Auckland.

Gliksman, L. and Douglas, R.R. and Rylett, M. and Narbonne-Fortin, C. (1995): Reducing problems through municipal alcohol policies: The Canadian experience in Ontario. *Drugs, Education, Prevention and Policy* 2 (2): 105-118.

Godfrey C. (1989) Factors influencing the consumption of alcohol and tobacco: the use and abuse of economic models. *British Journal of Addiction*, 84, 1123-1138.

Godfrey C. (1990) Modelling demand. In *Preventing alcohol and tobacco problems*, (A Maynard and P. Tether, Eds), Vol, pp. 35-53. Avebury, Aldershot.

Godfrey, C. (1988) Licensing and the demand for alcohol. *Applied Economics*, 20, 1541–1558.

Godfrey, C. (1994). Economic influence on change in population and personal substance behavior. In: Edwards, G., and Lader M., eds. *Addiction: Process of Change*. Society for the Study of Addiction Monograph No. 3. New York, NY: Oxford University Press, pp. 163–187.

Goel, R., and M. Morey, (1995). The Interdependence of Cigarette and Liquor Demand, *Southern Economic Journal*, vol. 62, no. 2, p. 441-459.

Goldberg ME, Gorn GJ, Lavack AM. (1994). Product innovation and teenage alcohol consumption: The case of wine coolers. *J Public Policy and Marketing*. 13(2):218–27.

Goodstadt M. and Flynn L. (1993) Protecting oneself and protecting others: refusing service, providing warnings, and other strategies for alcohol warnings. *Contemporary Drug Problems* 20, 277-291.

Googins, B., And Kurtz, N.R. (1981). Discriminating participating and non participating supervisors in occupational alcoholism programs. *Journal of Drug Issues* 11:199–216.

Gorman D.M. (1995) Are school-based resistance skills training programs effective in preventing alcohol abuse? *Journal of Alcohol and Drug Education* 41, 74-98.

Gorman D.M. (1996) Do school-based social skills training programs prevent alcohol use among young people? *Addiction Research*, 4 191-210.

Gorman D.M. (1998) The irrelevance of evidence in the development of school-based drug prevention policy, 1986-1996. *Evaluation Review* 22, 118-146.

Gorman, D., Speer, P.W., Gruenewald, P.J. and Labouvie, E.W. (2001) Spatial dynamics of alcohol availability, neighborhood structure and violent crime. *Journal of Studies on Alcohol*, 62, 628-636.

Grabowski, H. (1976). The Effects of Advertising on the Interindustry Distribution of Demand, *Explorations in Economic Research*, 3, 21-75.

Graham K. (1999) *Safer Bars: Assessing and Reducing Risks of Violence*. Toronto, Canada: Centre for Addiction and Mental Health.

Graham K. and Homel R. (1997) Creating safer bars. In: Plant M., Single E., and Stockwell T. (eds.) *Alcohol: Minimizing the Harm*, pp. 171-192. London, UK: Free Association Press.

Graham K., Jelley J., and Purcell J. (2002) Evaluation of the Safer Bars Training Program. Paper presented at an International Experts Forum: Setting the Agenda for Correctional Research in Substance Abuse, Charlottetown, Prince Edward Island, Canada.

Graham K., LaRocque L., Yetman R., Ross T.J., and Guistra E. (1980) Aggression and barroom environments. *Journal of Studies on Alcohol* 41, 277-292.

Graham, K. (2000) Preventive interventions for on-premise drinking: a promising but under-researched area of prevention. *Contemporary Drug Problems*, 27, 593-668.

Graham, K., Osgood, D.W., Zibrowski, E., Purcell, J., Gliksman, L. Leonard, K., Pernanen, K., Saltz, R.F. and Toomey, T.L. (2004) The effect of the Safer Bars programme on physical aggression in bars: results of a randomized controlled trial. *Drug and Alcohol review* 23 31-41.

Grant TM; Ernst CC; Streissguth A; Stark K (2005) Preventing alcohol and drug exposed births in Washington state: intervention findings from three parent-child assistance program sites *Am J Drug Alcohol Abuse* 2005;31(3):471-90.

Graves K. (1993) Evaluation of the alcohol warning label: a comparison of the United States and Ontario, Canada in 1990 and 1991. *Journal of Public Policy and Marketing* 12, 19-29.

Greenberg, E.S., And Grunberg, L. (1995). Work alienation and problem alcohol behavior. *Journal of Health and Social Behavior* 36(1):83–102.

Greenfield T.K. (1997) Warning labels: Evidence of harm-reduction from long-term American surveys. In: Plant M., Single E., and Stockwell T. (eds.) *Alcohol: Minimizing the Harm*, pp. 105-125. London: Free Association Books.

Greenfield T.K. and Kaskutas L.A. (1998) Five years' exposure to alcohol warning label messages and their impacts: Evidence from diffusion analysis. *Applied Behavioral Science Review* 6, 39- 68.

Greenfield T.K. and Zimmerman R. (eds.) (1993) *CSAP Prevention Monograph - 14: Second International Research Symposium on Experiences with Community Action Projects for the Prevention of Alcohol and Other Drug Problems*. Washington, US: Department of Health and Human Services.

Greenfield T.K., Giesbrecht N., Johnson S.P., Kaskutas L.A., Anglin L.T., Kavanagh L., Room R., and MacKenzie B. (1999) *US Federal Alcohol Control Policy Development: A Manual*. Berkeley, California: Alcohol Research Group.

Greenfield T.K., Graves K.L., and Kaskutas L.A. (1993) Alcohol warning labels for prevention: national survey results. *Alcohol, Health and Research World* 17, 67-75.

Grimm, M. (2002): A spirited debate. *American Demographics* 24 (4): 48-50.

Grossman M., Coate, D. and Arluck, G.M. (1987) Price sensitivity of alcoholic beverages in the United States: Youth, alcohol consumption. In *Advances in substance abuse: Behavioral and biological research. Control issues in alcohol abuse prevention: Strategies for states and communities*, (H.D. Holder, Ed.), pp. 169-198, JAI, Greenwich, CT.

Grossman, M. (1993). The economic analysis of addictive behavior. In: Hilton, M.E., and Bloss, G., eds. *Economics and the Prevention of Alcohol-Related Problems*. NIAAA Research Monograph No. 25, NIH Pub. No. 93–3513. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism, pp. 91–123.

Grossman, M., And Markowitz, S. Alcohol regulation and violence on college campuses. In: Grossman, M., and Hsieh, C.R., eds. (2001). *Economic Analysis of Substance Use and Abuse: The Experience of Developed Countries and Lessons for Developing Countries*. Cheltenham, United Kingdom: Edward Elgar, pp. 257–289.

Grossman, M., Markowitz, S., (1999). *Alcohol Regulation and Violence on College Campuses*. Working Paper 7129, National Bureau of Economic Research, Cambridge, MA.

Grube J, Agostinelli G. (2000). *Alcohol Advertising and Alcohol Consumption: a review of recent research*. Prevention Research Centre: Berkeley, California.

Grube JW; Stewart K (2004) Preventing impaired driving using alcohol policy. *Traffic Inj Prev* 2004 Sep;5(3):199-207.

Grube, J. (1997): Preventing sales of alcohol to minors: results from a community trial. *Addiction* 92 (supplement 2): S251–S260.

Grube, J. W. (1993). Alcohol portrayals and alcohol advertising on television. *Alcohol Health and Research World*, 17, 6166.

Grube, J. W. and Wallack, L. (1994) Television beer advertising and drinking knowledge, beliefs, and intentions among school children. *American Journal of Public Health* 84, 254–259.

Grube, J.W. and Nygaard, P. (2001) Adolescent drinking and alcohol policy. *Contemporary Drug Problems* 28:87-132.

Grube, J.W. and Waiters, E. (2005) Alcohol in the Media: Content and Effects on Drinking Beliefs and Behaviors Among Youth *Adolesc Med* 16 (2005) 327–343.

Grube, J.W. (1995). Television alcohol portrayals, alcohol advertising, and alcohol expectancies among children and adolescents. In: Martin, S.E., and Mail, P., eds. *Effects of the Mass Media on the Use and Abuse of Alcohol*. NIAAA Research Monograph No. 28. NIH Pub. No. 95-3743. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism, pp. 105–121.

Gruenewald P.J., Millar A.B., and Roeper P. (1996) Access to alcohol: geography and prevention for local communities. *Alcohol Health and Research World* 20, 244-251.

Gruenewald P.J., Ponicki W.R., and Holder H.D. (1993) The relationship of outlet densities to alcohol consumption: a time series cross-sectional analysis. *Alcoholism: Clinical and Experimental Research* 17, 38-47.

Gruenewald P.J., Stockwell T., Beel A., and Dyskin E.V. (1999) Beverage sales and drinking and driving: The role of on-premise drinking places. *Journal of Studies on Alcohol* 60, 47-53.

Gruenewald, P. J., Ponicki, W. R., Holder, H. D. and Romelsjo, A. (2000a) Alcohol prices, beverage quality and the demand for alcohol: quality substitutions and price elasticities, *Journal of Studies on Alcohol*.

Gruenewald, P. J., Millar, A. B., Ponicki, W. R. and Brinkley, G. (2000b) Physical and economic access to alcohol: the application of geostatistical methods to small area analysis in community settings, in: WILSON, R. and DUFOUR, M. (Eds) *Small Area Analysis and the Epidemiology of Alcohol Problems*, NIAAA Monograph, pp. 163–212 (Bethesda, MD, NIAAA).

Gruenewald, P. J., Millar, A., Treno, A. J., Ponicki, W. R., Yang, Z. and Roeper, P. (1996) The geography of availability and driving after drinking, *Addiction*, 91, 967–983.

Gruenewald, P. J., Ponicki, W. R. and Holder, H. D. (1993) The relationship of outlet densities to alcohol consumption: a time series cross-sectional analysis, *Alcoholism: Clinical and Experimental Research*, 17, 38–47.

Gruenewald, P.J. and Johnson, F.W. (2000) *Drinking, Driving and Crashing: a traffic flow model of alcohol related motor vehicle accidents*, Technical Report no. PG1706 (Berkeley, CA, Prevention Research Center).

Gruenewald, P.J. and Treno, A.J. (2000). Local and global alcohol supply: economic and geographic models of community systems *Addiction* (2000) 95 (Supplement 4), S537–S549.

Gruenewald, P.J. and Ponicki, W.R. (1995). The Relationship of the Retail Availability of Alcohol and Alcohol Sales To Alcohol-related Traffic Crashes. *Accident Analysis Prevention*, 22 (2): 249-59.

Gruenewald, P.J., Johnson, F.W. and Treno, A.J. (2002). Outlets, Drinking and Driving: A Multilevel Analysis of Availability. *Journal of Studies on Alcohol*. 63 (4): 460-8.

Gruenewald, P.J., Remer, L. and Lipton, R. (2002). Evaluating the Alcohol Environment: Community Geography and Alcohol Problems *Alcohol research and Health* 26 42-48.

Gusfield J. (1995) Meta-analytic perspective on "alcohol in American culture". In: Martin S.E. and Mail P. (eds.) *Effects of the Mass Media on the Use and Abuse of Alcohol*: NIAAA Research Monograph No. 28, pp. 31-35. Bethesda, Maryland: National Institute on Alcohol Abuse and Alcoholism.

Haines, B. and Graham, K. (2005). Violence prevention in licensed premises. In Stockwell T, Gruenewald P, Toumbourou J, and Loxley W, eds. *Preventing harmful substance use: The evidence base for policy and practice*. Chichester: Wiley.

- Hall, W. (1995) Changes in public perceptions of the health benefits of alcohol use, 1989 to 1994. *Australian and New Zealand Journal of Public Health*, 20 (1): 93-95.
- Handmaker NS, Miller WR, Manicke M. (1999). Findings of a pilot study of motivational interviewing with pregnant drinkers. *J Stud Alcohol* 60(2).
- Hansen D.J. (1980) Drug education: Does it work? *Evaluation Studies Review Annual* 6, 572- 603.
- Hansen D.J. (1982) Effectiveness of alcohol and drug education. *Journal of Alcohol and Drug Education* 27, 1-13.
- Hansen D.J. (1992) School-based substance abuse prevention: A review of the state of the art in curriculum, 1980-1990. *Health Education Research* 7, 403-430.
- Hansen D.J. (1993) School-based alcohol prevention programmes. *Alcohol, Health and Research World* 17, 54-61.
- Hansen D.J. (1994) Prevention of alcohol use and abuse. *Preventive Medicine* 23, 683-687.
- Harding, W.M. and Caudill, B.D. (1997). Does the use of designated drivers promote excessive alcohol consumption? In C. Mercier-Guyon (Ed.), *Proceedings of the 14th Annual Conference on Alcohol, Drugs and Traffic Safety, Volume 3*. Annecy, France, 21-26 September, 1997 (pp.1359-1364). Annecy, France: Centre d'Etudes et de Recherches en Medecine du Traffic.
- Harding, W.M., Apsler, R. and Goldfein, J. (1998). *A Directory of Ride Service Programs*. Final Technical Report, DOT HS 807 290. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration.
- Harre N, Field J. (1998) Safe driving education programs at school: lessons from New Zealand. *Aust NZ J Public Health* 22:447–50.
- Harrison L, Godfrey C. (1989) Alcohol advertising controls in the 1990's. *Int J Advertising*. 8(2):167–80.
- Harwood EM; Erickson DJ; Fabian LE; Jones-Webb R; Slater S; Chaloupka FJ (2003) Effects of communities, neighborhoods and stores on retail pricing and promotion of beer. *J Stud Alcohol* 2003 Sep;64(5):720-6.
- Haskins, J.B. (1985). The role of mass media in alcohol and highway safety campaigns. *Journal of Studies on Alcohol*, 10, 184-191.
- Hastings GB, Stead M, McDermott L, Forsyth AJM, MacKintosh AM, Rayner M *et al.* (2003). *Review of Research on the Effects of Food Promotion to Children – Final Report and Appendices*. Prepared for the Food Standards Agency. Published on Food Standards Agency website. Available at <http://www.food.gov.uk/multimedia/pdfs/foodpromotiontochildren1.pdf>, accessed 28 April 2005.
- Hastings, G., Anderson, S., Cooke, E., and Gordon, R. (2005). Alcohol Marketing and Young People's Drinking: A Review of the Research *Journal of Public Health Policy* (2005) 26, 296–311.
- Hauritz M., Homel R., Townsley M., Burrows T., and McIlwain G. (eds.) (1998a) *An Evaluation of the Local Government Safety Action Projects in Cairns, Townsville and Mackay: A Report to the Queensland Department of Health, the Queensland Police Service and the Criminology Research Council*. Australia: Griffith University, Centre for Crime Policy and Public Safety; School of Justice Administration.
- Hauritz, M., Homel, R., McIlwain, G., Burrows, T. and Townsley, M. (1998) Reducing violence in licensed venues through community safety action projects: the Queensland experience. *Contemporary Drug Problems*, 25(3), 511-551.
- Hawks, D. *et al.* (2002) *Prevention of psychoactive substance use – A selected review of what works in the area of prevention*. National Drug Research Institute, Perth, Western Australia, Australia and World Health Organisation, Geneva (www.ndri.curtin.edu.au/pdfs/who_review.pdf).

Head, J., Stansfeld, S.A. and Siegrist, J. (2004). The psychosocial work environment and alcohol dependence: a prospective study *Occup Environ Med* 2004;61:219–224.

Heeb, J-L., Gmel, G., Zurbrügg, C., Kou, M. and Rehm, J. (2003). Changes in alcohol consumption following a reduction in the price of spirits: a natural experiment in Switzerland. *Addiction* 98 1433-1446.

Henstridge, J., Homel, R., and Mackay P. (1997) *The Long-Term Effects of Random Breath Testing in Four Australian States: A Time Series Analysis*. Canberra, Australia: Federal Office of Road Safety.

Her, M., Giesbrecht N., Room, R. and Rehm, J. (1998). Implications of privatizing/Deregulating Alcohol Retail Sales: A Projection of Alcohol Consumption in Ontario. *Journal of Substance Abuse* 10 (4): 355-373.

Her, M., Giesbrecht, N., Room, R. and Rehm, J. (1999). Privatizing Alcohol Sales and Alcohol Consumption: Evidence and Implications. *Addiction* 94(8): 1125-1139.

Herd D (2005). Changes in the prevalence of alcohol use in rap song lyrics, 1979-97 *Addiction* Sep;100(9):1258-69.

Hibell, B. (1984) Mellanölets borttagande och indikationer på alkoholskadeutvecklingen (The withdrawal of medium beer and indications on alcohol damages). In Nilsson, T. (ed) *När mellanölet försvann* (When the medium beer was withdrawn). 121-172. Linköping: Samhällsvetenskapliga institutionen, Universitetet i Linköping.

Hibell, B., Andersson, B., Bjarnason, T., Ahlström, S., Balakireva, O., Kokkevi, A., and Morgan, M. (2004). *The ESPAD Report 2003: alcohol and other drug use among students in 35 European countries*. Stockholm, Sweden: The Swedish Council for Information on Alcohol and Other Drugs (CAN) and The Pompidou Group at the Council of Europe.

Higgins-Biddle JC, Babor TF. (1996). *Reducing Risky Drinking*. Report prepared for the Robert Wood Johnson Foundation, Farmington, University of Connecticut Health Center.

Hill, L. and Caswell, S. (2001) Alcohol advertising and sponsorship: commercial freedom or control in the public interest. In Eds. Heather, N., Peters, T.J. and Stockwell, T. *International Handbook of alcohol dependence and problems*. Chichester: John Wiley and Sons Ltd. pp 823-846, 2001.

Hilton, M. E. (1993). An overview of recent findings on alcoholic beverage warning labels, *Journal of Public Policy and Marketing* 12(1): 1-9.

Hingson RW; Zakocs RC; Heeren T; Winter MR; Rosenbloom D; De Jong W (2005) Effects on alcohol related fatal crashes of a community based initiative to increase substance abuse treatment and reduce alcohol availability *Inj Prev* 2005 Apr;11(2):84-90.

Hingson, R. McGovern, T. Howland, J. Heeren, T. Winter, M. and Zakoos, R. (1996) Reducing alcohol-impaired driving in Massachusetts: The Saving Lives Program. *American Journal of Public Health*, 86, 6: 791-797.

Hingson, R., Heeren, T. and Winter, M. (1994). Lower legal blood alcohol limits for young drivers. *Public Health Reports*, 109(6), 739-744.

Hingson, R., Howland, J., Heeren, T. and Winter, M. (1991). Reduced BAC limits for young people (impact on night fatal) crashes. *Alcohol, Drugs and Driving*, 7(2),117-127.

Hobbs, D. *et al.* (2003) *Bouncers: Violence and Governance in the Night-time Economy*. Oxford University Press: Oxford.

Hoek J, Gendall P, Jeffcoat M, Orsman D (1997). Sponsorship and advertising: a comparison of their effects. *Journal of Marketing Communications*, 3: 21-32.

Hoffman, E., And Roman, P.M. (1984). Effects of supervisory style and experientially based frames

of reference on organizational alcoholism programs. *Journal of Studies on Alcohol* 45:260–267.

Holder H.D. (1994) Mass communication as an essential aspect of community prevention to reduce alcohol-involved traffic crashes. *Alcohol, Drugs and Driving*, 10, 3-4.

Holder H.D. and Wagenaar A.C. (1994) Mandated server training and reduced alcohol-involved traffic crashes: A time series analysis of the Oregon experience. *Accident Analysis and Prevention* 26, 89-97.

Holder H.D., Gruenewald P.J., Ponicki W.R., Treno A.J., Grube J.W., Saltz R.F., Voas R.B., Reynolds R., Davis J., Sanchez L., Gaumont G., and Roeper P. (2000) Effect of community-based interventions on high-risk drinking and alcohol-related injuries. *Journal of the American Medical Association* 248, 2341-2347.

Holder H.D., Janes K., Mosher J., Saltz R., Spurr S., and Wagenaar A.C. (1993). Alcoholic beverage server liability and the reduction of alcohol-involved problems. *Journal of Studies on Alcohol* 54, 23-36.

Holder, H.D. and Saltz, R.F. and Grube, J.W. and Voas, R.B. and Gruenewald, P.J. and Treno, A.J. (1997a): A community prevention trial to reduce alcohol-involved accidental injury and death: overview. *Addiction* 92 (supplement 2): S155–S171.

Holder, H.D. and Treno, A.J. (1997). Media advocacy in community prevention: news as a means to advance policy change. *Addiction* 92 S189-199.

Holder, H.D. (1998a) *Alcohol and the Community: A Systems Approach to Prevention*. Cambridge: Cambridge University Press.

Holder, H.D. (1998b) Planning for alcohol-problem prevention through complex systems modeling: Results from SimCom. *Substance Use and Misuse*, 33(3), 669-692.

Holder, H.D., Saltz, F.R., Grube J.W., Treno, A.J., Reynolds, R.I., Voas, R.B., Gruenewald, P.J. (1997) Summing up: lessons from a comprehensive community prevention trial. *Addiction*, 92 (suppl.): S293-S301.

Holder, H.D., Treno, A., and Levy, D. (2005). Community Systems and Ecologies of Drug and Alcohol Problems In Stockwell T, Gruenewald P, Toumbourou J, and Loxley W, eds. *Preventing harmful substance use: The evidence base for policy and practice*. Chichester: Wiley.

Holmila, M. (2003). The evaluation of the Metropolitan project; process and causality. Allamani, A. and Ammannati, P. and Basetti Sani, I. (1999): Early experiences of the Alcohol Community Project in Florence, Italy. In: *Community Action to Prevent Alcohol Problems*. WHO Europe Document EUR/ICP/LVNG 03 03 01 (A).

Holmila, M. (ed.) (1997): *Community Prevention of Alcohol Problems*. London: Macmillan Press Ltd in Association with the WHO European Office.

Hommel R., Hauritz M., Wortley R., McIlwain G., and Carvolth R. (1997) Preventing alcohol-related crime through community action: The Surfers Paradise Safety Action Project. *Crime Prevention Studies* 7, 35-90.

Hommel R., McIlwain, and Carvolth R. (2001) Creating safer drinking environments. In: Heather N., Peters T.J., and Stockwell T. (eds.) *Handbook of Alcohol Dependence and Alcohol-Related Problems*, pp. 721-740. Chichester, UK: John Wiley and Sons.

Hommel R., Tomsen S., and Thommeny J. (1992) Public drinking and violence: Not just an alcohol problem. *Journal of Drug Issues* 22, 679-697.

Hommel, R. and Clark, J. (1994) The prediction and prevention of violence in pubs and clubs. *Crime Prevention Studies*, 3, 1– 46.

Hommel, R. (1988) Random breath testing in Australia: A complex deterrent. *Australian Drug and Alcohol Review* 7, 231-241.

Homel, R. (1988), *Policing and punishing the drinking driver: A study of general and specific deterrence*. New York: Springer-Verlag.

Homel, R., Carvolth, R., Hauritz, M., McIlwain, G. and Teague, R. (2004). Making licensed venues safer for patrons: what environmental factors should be the focus of interventions. *Drug and Alcohol review* 23 19-29.

Homel, R., Hauritz, M., Wortley, R., McIlwain, G. and Carvolth, R. (1997) Preventing alcohol-related crime through community action: the Surfers Paradise Safety Action Project. *Crime Prevention Studies*, 7, 35–90.

Howard-Pitney B., Johnson M.D., Altman D.G., Hopkins R., and Hammond N. (1991) Responsible alcohol service: A study of server, manager, and environmental impact. *American Journal of Public Health* 81, 197-199.

Huang, C. D. (2003) *Econometric Models of Alcohol Demand in the United Kingdom* [On-line] HM Customs and Excise: London. Available from: <http://www.hmce.gov.uk> Accessed: January 2004.

Hughes, K., MacKintosh, A.M., Hastings, G., Wheeler, C., Watson, J., and Inglis, J. (1997) Young People, Alcohol and Designer Drinks *British Medical Journal*, 8 February 1997, 314: 414-418.

Huitfeldt, B. and Jorner, U. (1972) Efterfrågan på rusdrycker i Sverige [The demand for alcoholic beverages in Sweden]. Rapport från Alkoholpolitiska utredningen [Report from the Alcohol Policy Commission]. Government Official Reports, Stockholm.

Hundley, H. L. (1995). The naturalization of beer in Cheers. *Journal of Broadcasting and Electronic Media* 39: 350-359.

Ireland C.S. and Thommeny J.L. (1993) The crime cocktail: Licensed premises, alcohol and street offences. *Drug and Alcohol Review* 12, 143-150.

Irvin, C. B., Wyer, P. C. and Gerson, L. W. (2000) Preventive care in the emergency department, Part II: Clinical preventive services - an emergency medicine evidence-based review, *Academic Emergency Medicine*, 7, 1042-1054.

Jackson, C. and Henriksen, L., and Dickinson, D. (1999): Alcohol-specific socialization, parenting behaviors and alcohol use by children. *Journal of Studies on Alcohol*, 60, 362-367.

Jackson, M.C., Hastings, G., Wheeler, C., Eadie, D., and MacKintosh, A.M. (2000). Marketing alcohol to young people: Implications for industry regulation and research policy. *Addiction*, 95(Supplement 4), S597-S608.

Jefferies, B.W. and Saunders, W.M. (1983) Minimizing alcohol related offences by enforcement of the existing licensing legislation. *British Journal of Addiction*, 78, 67-77.

Jernigan D, O'Hara J. (2004). Alcohol advertising and marketing. In: National Research Council and Institute of Medicine, *Reducing Underage Drinking: A Collective Responsibility*, RJ Bonnie and ME O'Connell, eds. (Washington DC: National Academies Press), 625-653.

Jernigan DH; Ostroff J; Ross C; O'Hara JA (2004). Sex differences in adolescent exposure to alcohol advertising in magazines. *Arch Pediatr Adolesc Med* Jul;158(7):629-34.

Jernigan, D. and O'Hara, J. (2005). Alcohol Advertising and Promotion. In Eds. Pp 625-653.

Jernigan, D.H. (1997). *Thirsting for markets: The global impact of corporate alcohol*. San Rafael: The Marin Institute for the Prevention of Alcohol and Other Drug Problems.

Jernigan, D.H., Ostroff, J. and Ross, C. (2005). Alcohol Advertising and Youth: A Measured Approach *Journal of Public Health Policy* (2005) 26, 312–325.

Jewell, R.T. and Brown, R.W. (1995) Alcohol availability and alcohol-related motor vehicle accidents. *Applied Economics* 27:759-765.

Johansen P.O. (1994) Markedet som ikke ville dø. Forbudstiden og de illegale alkoholmarkedene i Norge og USA (The market that would not die [Times of prohibition and the illegal alcohol markets in Norway and the US]. Oslo, Norway: National Directorate for Prevention of Alcohol and Drug Use.

Johns B, Baltussen R, Adam T, Hutubessy R. (2003). Programme costs in the economic evaluation of health interventions. *Cost-effectiveness and Resource Allocation*; 1: 1.

Johnson, C.A., Pentz, M.A., Weber, M.D., Dwyer, J.H., Baer, N. MacKinnon, D.P., Hansen, W.B. and Flay, B.R. (1990) Relative effectiveness of comprehensive community programming for drug abuse prevention with high risk and low risk adolescents. *Journal of Consulting and Clinical Psychology*, 58, 447-456.

Johnsson, K.O. and Berglund, M. (2003). Education of key personnel in student pubs leads to a decrease in alcohol consumption among the patrons: a randomized controlled trial. *Addiction* 98 627-633.

Jonah, B., Mann, R., Macdonald, S., Stoduto, G., Bondy, S., and Shaikh, A. (2000) The effects of lowering legal blood alcohol limits: A review. In: Proceedings of the 15th International Conference on Alcohol, Drugs and Traffic Safety. Stockholm, Sweden. www.icadts.com.

Jones, N.E., Pieper, C.F. and Robertson, L.S. (1992) Effect of legal drinking age on fatal injuries of adolescents and young adults. *American Journal of Public Health* 82:112-115.

Jones, S.C. and Donovan, R.J. (2001): Messages in alcohol advertising targeted to youth. *Australian and New Zealand Journal of Public Health* 25: 126-131.

Jones; S.C., and Donovan, R.J. (2002). Self-regulation of alcohol advertising: Is it working for Australia? Source: Journal of Public Affairs, Volume 2, Number 3, 1 August 2002, pp. 153-165(13).

Kahan, M., Wilson, L. and Becker, L. (1995) Effectiveness of physician-based interventions with problem drinkers: a review, *Canadian Medical Association Journal*, 152, 851-859.

Kaskutas L.A. (1995) Interpretations of risk: The use of scientific information in the development of the alcohol warning label policy. *International Journal of the Addictions* 30, 1519-1548.

Kaskutas L.A. and Greenfield T.K. (1992) First effects of warning labels on alcoholic beverage containers. *Drug and Alcohol Dependence* 31, 1-14.

Kaskutas L.A. and Greenfield T.K. (1997) Behavior change: the role of health consciousness in predicting attention to health warning messages. *American Journal of Health Promotion* 11, 183-193.

Kaskutas L.A., Greenfield T.K., Lee M., and Cote J. (1998) Reach and effects of health messages on drinking during pregnancy. *Journal of Health Education* 29, 11-17.

Kelleher, K.J., Pope, S.K., Kirby, R.S. and Rickert, V.I. (1996). Alcohol Availability and Motor Vehicle Fatalities . *Journal of Adolescent Health*; 19 (5) Nov 96, p.325-30.

Kelly, K. and Donohew, L. (1999): Media and primary socialization theory. *Substance Use and Misuse* 34: 1033-1045.

Kelly, K.J. and Edwards, R.W. (1998): Image advertisements for alcohol products: Is their appeal associated with adolescents' intention to consume alcohol? *Adolescence* 33: 47-59.

Kenkel, D.S. (1993) Driving, driving and deterrence: the effectiveness and social costs of alternative policies. *Journal of Law and Economics*, 36, 877-913.

King, C., Siegel, M., and Celebucki, C. (1998). Adolescent exposure to cigarette advertising in magazines: An evaluation of brand-specific advertising in relationship to youth advertising. *Journal of the American Medical Association*, 279, 516-520.

Klein JD, Brown JD, Childers KW, *et al.* (1993). Adolescents' risky behavior and media use. *Pediatrics* 92:24 – 31.

Klein, N. (1999). *No logo: Taking on the brand bullies*. New York: Picador.

Klepp K, Kelder SH, Perry CL. (1995). Alcohol and marijuana use among adolescents: long-term outcomes of the Class of 1989 Study. *Ann Behav Med* 17:19 –24.

Klepp K.I., Kelder S.H., Perry C.L. (1995) Alcohol and marijuana use among adolescents: Long-term outcomes of the Class of 1989 Study. *Annals of Behavioral Medicine* 17, 19-24.

Klepp, K.I.; Schmid, L.A.; Murray, D.M. (1996) Effects of the increased minimum drinking age law on drinking and driving behavior among adolescents. *Addiction Research*, 4:237-244.

Klitzner M, Gruenewald PJ, Bamberger E, Rossiter C. (1994). A quasi-experimental evaluation of Students Against Driving Drunk. *Am J Drug Alcohol Abuse* 20:57–74.

Kohn, P.M. and Smart, R.G. (1984): The impact of television advertising on alcohol consumption: An experiment. *Journal of Studies on Alcohol* 045: 295-301.

Kotch, F.B. and Coulter, M.L. and Lipsitz, A. (1986): Does televised drinking influence children's attitudes toward alcohol? *Addictive Behaviors* 11: 67-70.

Kotler, P. (1992). *Marketing management: Analysis, planning, implementation, and control* (7th edition). Englewood Cliffs, NJ: Prentice Hall.

Kristenson, H., Osterling, A., Nilsson, J. A. and Lindgarde, F. (2002) Prevention of alcohol-related deaths in middle-aged heavy drinkers, *Alcoholism, Clinical and Experimental Research*, 26, 478-484.

Kuitenbrouwer, F. (1997) Self-Regulation: Some Dutch Experiences, in *Privacy And Self-Regulation In The Information Age* (NTIA 1997).
Aavailable at <http://www.ntia.doc.gov/reports/privacy/privacy_rpt.htm>.

Kulick AD, Rosenberg H. (2001). Influence of positive and negative film portrayals of drinking on adolescents' alcohol outcome expectancies. *J Appl Soc Psychol* 31:1492–9.

Kuo M; Wechsler H; Greenberg P; Lee H (2003). The marketing of alcohol to college students: the role of low prices and special promotions. *Am J Prev Med* 2003 Oct;25(3):204-11.

Kuusi, P. (1957) *Alcohol sales experiment in rural Finland*. Helsinki: Finnish Foundation for Alcohol Studies, vol 3A.

Kypri, K. and Langley, J.D. (2003) Perceived social norms and their relation to university student drinking. *J. Stud. Alcohol*, 64(6): 829-34.

Laixuthai, A., And Chaloupka, F.J. (1993). Youth alcohol use and public policy. *Contemporary Policy Issues* 11(4):70–81.

Lang E. and Rumbold G. (1997) The effectiveness of community-based interventions to reduce violence in and around licensed premises: A comparison of three Australian models. *Contemporary Drug Problems* 24, 805-826.

Lang E., Stockwell, T., Rydon, P., and Beel, A. (1998) Can training bar staff in responsible serving practices reduce alcohol-related harm? *Drug and Alcohol Review* 17, 39-50.

Lapham, S.C., Gruenewald, P.J., Remer, L. and Layne, L. (2004). New Mexico's 1998 Drive-up Liquor Window Closure. Study I: Effect on Alcohol-involved Crashes. *Addiction*, 99 (5): 598-606.

Lascaia, E. A., Gruenewald, P. J. and Gerber, D. (2000) Demographic and environmental correlates of pedestrian injury collisions: a spatial analysis, *Accident Analysis and Prevention*, 35, 651–658.

LaScala, E.A., Johnson, F. and Gruenewald, P.J. (2001) Neighborhood characteristics of alcohol-related pedestrian injury collisions: A geostatistical analysis. *Prevention Science*, 2, 123-134.

Lau, H.H. (1975) Cost of alcoholic beverages as a determinant of alcohol consumption. In *Research advances in alcohol and drug problems*, (RJ Gibbins, Y. Israel and H. Kalant, Eds), Vol. 22, pp[211-245. Wiley, New York.

Lauer JA, Murray CJL, Roehrich K, Wirth H. (2003). PopMod: a longitudinal population model with two interacting disease states. *Cost Effectiveness and Resource Allocation*; 1: 6.

Leaf WA, Preusser DF. (1995). Evaluation of youth peer-to-peer impaired driving programs. Final report. Washington DC: National Highway Traffic Safety Administration, (HS 808 309).

Lee, B. and V. Tremblay, (1992). Advertising and the US Market Demand for Beer, *Applied Economics*, 24, 69-76.

Lehman, W.E.; Farabee, D.; Holcom, M.; And Simpson, D.D. (1995). Prediction of substance abuse in the workplace: Unique contributions of personal background and work environment variables. *Journal of Drug Issues* 25:253–274.

Lehto, J. (1995). *Approaches to alcohol control policy*. WHO Regional Publications. European Series No 60. Copenhagen: WHO Regional Office for Europe.

Lehtonen, O. (1978) Anniskeluravintoloiden kehityspiirteitä ja –näkyviä 1962-1980 (Development and prospects of the restaurant industry, 1962-1980). *Alkoholipolitiikka* 43:290-298.

Leppänen K. (1979). Valtakunnallisen lauantausulkemiskokeilun vaikutuksista alkoholijuomien myyntiin (Effects of national Saturday closing experiment on alcohol sales). *Alkoholipolitiikka*; 44: 20-21.

Leppänen, K., Sullström, R., and Suoniemi, I. (2001). Effects of Economic Factors on Alcohol Consumption in 14 European Countries. *Nordisk Alkoholidskrift (Nordic Studies on Alcohol and Drugs)*, 18(English Supplement): 100.

Leung, S. and Phelps, C. (1991) My kingdom for drink. A review of estimates of the price sensitivity of demand for alcoholic beverages. In: Hilton, M. E. and Bloss, G., eds. *Economics and the Prevention of Alcohol-Related Problems*, pp. 1–32. Rockville, MD: US Department of Health and Human Services, National Institute on Alcohol Abuse and Alcoholism (NIAAA).

Levy D.T. and Miller T.R. (1995) A cost-benefit analysis of enforcement efforts to reduce serving intoxicated patrons. *Journal of Studies on Alcohol* 56, 240-247.

Lindgren, A. (1999). Effects of The Swedish Policies To Combat Drunken Driving. Paper presented at the European Symposium on Community Action to Prevent Alcohol Problems, November 18-20, 1999 in Porto, Portugal.

Lindstrom M (2005) Social capital, the miniaturisation of community and consumption of homemade liquor and smuggled liquor during the past year *Eur J Public Health* 2005 Aug 2; pS1101-1262.

Longabaugh, R., Woolard, R.F., Nirenberg, T.D., Minugh, A.P., Becker, B., Clifford, P.R., Carty, K., Sapadeo, F. and Gogineni, A. (2001) Evaluating the effects of a brief motivational intervention for injured drinkers in the emergency department. *Journal Studies on Alcohol* 62, 806-816.

Lovato C, Linn G, Stead LF, Best A. (2003). Impact of tobacco advertising and promotion on increasing adolescent smoking behaviours. *The Cochrane Database of Systematic Reviews*, Issue 3. Art. No.: CD003439. DOI: 10.1002/14651858.CD003439.

Loxely, W., Toumbourou, J.W., Stockwell, T., Haines, B., Scott, K., Godfrey, C., Waters, E., Patton, G., Fordham, R., Gray, D., Marshall, J., Ryder, D., Saggars, S., Sanci, L and Williams, J. (2004). The prevention of substance use, risk and harm in Australia. Canberra: National Drug Research Institute and Centre for Adolescent Health.

Ludwig M.J. (1994) Mass media and health education: A critical analysis and reception study of a selected anti-drug campaign. *Dissertation Abstracts International* 55, 1479A.

MacKinnon D.P., Johnson C.A., Pentz M.A., Dwyer J.H., Hansen W.B., Flay B.R., Wang E.Y.-I. (1991) Mediating mechanisms in a school-based drug prevention program. First-year effects of the Midwestern Prevention Project. *Health Psychology* 10, 164-172.

MacKinnon D.P., Pentz M.A., and Stacy A.W. (1993) The alcohol warning label and adolescents: The first year. *American Journal of Public Health* 83, 585–587.

Madden, P.A. and Grube, J.W. (1994): The frequency and nature of alcohol and tobacco advertising in televised sports, 1990 through 1992. *American Journal of Public Health*, 84: 297-290.

Maguire, M., Nettleton, H., Rix, A. and Raybould, S. (2003) *Reducing alcohol related violence and disorder: an evaluation of the 'TASC' project*. London: Home Office Research, Development and Statistics Directorate.

Mäkelä P., Tryggvesson K., and Rossow I. (2002) Who drinks more or less when policies change? The evidence from 50 years of Nordic studies. In: Room R. (ed.) *The Effects of Nordic Alcohol Policies: Analyses of Changes in Control Systems*. Publication No. 42. Helsinki: Nordic Council for Alcohol and Drug Research.

Mäkinen, H. (1978) Kunnallisten keskiolutkieltojen vaikutukset. Tapaustutkimus viidessä kunnassa. (Effects of banning medium beer in municipalities. Case study in five municipalities). Helsinki: Alkoholipoliittisen tutkimuslaitoksen tutkimusseloste 122.

Makowsky, C., and P. Whitehead (1991). Advertising and Alcohol Sales: A Legal Impact Study, *Journal of Studies on Alcohol*, vol. 52, no. 6, p. 555-566.

Mann, R.E., Rehm, J.T., Giesbrecht, N., Room, R., Adlaf, E.M., Gmel, G., Graham, K., Österberg, E. and Smart, R. (2005). The Effect of Different Forms of Alcohol Distribution and Retailing on Alcohol Consumption and Problems – An Analysis of Available Research. A Report Prepared for the Beverage Alcohol System Review Panel. Centre for Addiction and Mental Health, 2005.

Mann, R.E., Smart, R., Anglin, L. and Adlaf, E. (1991) Reduction in cirrhosis deaths in the United States: Associations with *per capita* consumption and AA membership. *Journal of Studies on Alcohol* 52, 361-365.

Mann, R.E., Smart, R., Anglin, L. and Rush B. (1988) Are decreases in liver cirrhosis rates a result of increased treatment for alcoholism. *British Journal of Addiction* 83, 683-688.

Mann, R.E., Smart, R.G., Rush, B.R., Zalzman, R.F. and Suurvali, H. (2005). Cirrhosis mortality in Ontario: effects of alcohol consumption and Alcoholics Anonymous participation. *Addiction* 100 1669-1679.

Mann, R.E., Vingilis, E.R., Leigh, G., Anglin, L. and Blefgen, H. (1986). School-based programmes for the prevention of drinking and driving: issues and results. *Accident Analysis and Prevention*, 18(4).

Manning, W.G., Blumberg, L., Moulton, L.H., (1995). The demand for alcohol: the differential response to price. *Journal of Health Economics* 14, 123–148.

Markowitz, S. And Grossman, M. (2000). The effects of beer taxes on physical child abuse. *Journal of Health Economics* 19(2):271–282.

Markowitz, S. (2000). The price of alcohol, wife abuse and husband abuse. *Southern Economic Journal* 67(2):279–303.

Markowitz, S., And Grossman, M. (1998). Alcohol regulation and domestic violence towards children. *Contemporary Economic Policy* 16(3):309–320.

- Marmot, M. (2004). Evidence based policy or policy based evidence? *British medical Journal* 328 906-907.
- Marlatt, G.A. and Witkiewitz, K. (2002) Harm reduction approaches to alcohol use: health promotion, prevention and treatment. *Addictive behaviour*, 27: 867-886.
- Marlatt, G.A. *et al.* (1998) Screening and brief intervention for high-risk college student drinkers: results from a 2-year follow-up assessment. *J. Consult. Clin. Psychol.* 66:604-15.
- Marmot, M. and Wilkinson, R.G. (Eds) (1999). *Social determinants of health*. Oxford, Oxford University Press.
- Martin, J.K., And Roman, P. (1996). Job satisfaction and drinking among employed persons. *Work and Occupations* 23:115–142.
- Martin, S.E. and Snyder, L.B. and Hamilton, M. and Fleming-Milici, F. and Slater, M.D. and Stacy, A. and Meng-Jinn, C. and Grube, J.W. (2002): Alcohol advertising and youth. *Alcoholism: Clinical and Experimental Research* 26: 900-906.
- Martin, S.E. (1995) Alcohol and the mass media: Issues, approaches, and research directions. In S. Martin (ed.), *The Effects of Mass Media on the Use and Abuse of Alcohol* (pp. 277-295). Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.
- Mast, B.D.; Benson, B.L.; And Rasmussen, D.W. (1999). Beer taxation and alcohol-related traffic fatalities. *Southern Economic Journal* 66(2):214–249.
- Mathijssen, R. (2005). In *Alcohol Interlock Programs*. Ottawa: Traffic Injury Research Foundation.
- Mathijssen, R. and Wesemann, P. (1993) The role of police enforcement in the decrease of DWI in The Netherlands, 1983-1991. In H.-D. Utzelmann, G. Berghaus, and G. Kroj (eds.) *Alcohol, Drugs and Traffic Safety - T92: Band 3*, pp.1216-1222 (Proceedings of the 12th International Conference on Alcohol, Drugs and Traffic Safety, September 28 to October 2, 1992, Cologne, Germany.).
- Mathios, A. and Avery, R. and Shanahan, J. and Bisogini, C. (1998): Alcohol portrayals on prime-time television: Manifest and latent messages. *Journal of Studies on Alcohol* 59: 305-310.
- Mattern, J.L. and Neighbors, C. (2004) Social norms campaigns: examining the relationship between changes in perceived norms and changes in drinking levels. *Journal of Studies on Alcohol*, 65(4): 489-493.
- Matthews, K., Shepherd, J. and Sivarajasingham, V. (2005). The price of beer and violence-related injury in England and Wales.
- Mcallister, P.O. (1993). An evaluation of counseling for employer-referred problem drinkers. *Health Bulletin* 51:285–294.
- McBride, N. (2002) *Systematic literature review of the school drug education*. Monograph No 5. Perth, Western Australia: National Drug Research Institute.
- McBride, N. (2003) A systematic review of school drug education *Health Education Research* 18 729-742.
- McBride, N. (2005). The evidence base for school drug education interventions. In Stockwell T, Gruenewald P, Toumbourou J, and Loxley W, eds. *Preventing harmful substance use: The evidence base for policy and practice*. Chichester: Wiley.
- McBride, N., Farrington, F., Midford, R., Meulners, L. and Phillips, M. (2004). Harm minimization in school drug education: final results of the School Health and Alcohol Harm Reduction Project (SHAHRP). *Addiction* 99 278-291.
- McBride, R., and Mosher, J.F. (1985). Public health implications of the international alcohol industry: Issues raised by a World Health Organization project. *British Journal of Addiction*, 80, 141-147.

McGuiness, T. (1980). An Econometric Analysis of Total Demand for Alcoholic Beverages in the U.K. 1956- 1975, *Journal of Industrial Economics*, 29, 85-105.

McGuiness, T. (1983). The Demand for Beer, Spirits and Wine in the UK, 1956-1979, in Grant, Plant and Williams, eds. *Economics and Alcohol* Gardner Press, Inc. New York. Pp 238-242.

McIntosh WD, Bazzini DG, Smith SM, *et al.* (1999). Alcohol in the movies: characteristics of drinkers and nondrinkers in films from 1940 to 1989. *J Appl Soc Psychol* 29:1191– 9.

McKeganey N, Forsyth A, Barnard M, Hay G. (1996). Designer drinks and drunkenness amongst a sample of Scottish schoolchildren. *BMJ*. 313:401.

McKnight A.J. (1990) Intervention with alcohol-impaired drivers by peers, parents and purveyors of alcohol. *Health Education Research: Theory and Practice* 5, 225-236.

McKnight, A. J. (1991) Factors influencing the effectiveness of server-intervention education. *Journal of Studies on Alcohol* 52, 389-397.

McKnight, A.J. and Streff, F.M. (1994). The effect of enforcement upon service of alcohol to intoxicated patrons of bars and restaurants. *Accident Analysis and Prevention*, 26(1),79-88.

McKnight, A.J. and Voas, R.B. (1991). The effect of license suspension upon DWI recidivism. *Alcohol, Drugs and Driving*, 7(1), 43-54.

McKnight, A.J. and Voas, R.B. (2001) Prevention of alcohol-related road crashes. In: Heather N., Peters T.J., and Stockwell T. (eds.) *International Handbook of Alcohol Dependence and Problems*, pp. 741-770. Chichester, UK: John Wiley and Sons.

McKnight, A.J., Langston, E.A., McKnight, A.S., Resnick, J.A. and Lange, J.E. (1995). *Why People Drink and Drive: The Bases of Drinking-and-driving Decisions*. Publication No. DOT HS 808 251. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration.

McKnight, A.J., Preusser, D.F., Psootka, J., Katz, D.B. and Edwards, J.M. (1979). Youth Alcohol Safety Education Criteria Development. NTIS Publication No. PB80-17894-0. Washington, DC: US Department of Transportation.

Meenaghan T (1991). Sponsorship – legitimising the medium. *European Journal of Marketing*, 25(11): 5-10.

Meerabeau E, Gillett R, Kennedy M, Adeoba J, Bypass M, Tabi K (1991). Sponsorship and the drinks industry in the 1990s. *European Journal of Marketing*, 25(11): 39-56.

Meliker, J.R., Maio, R.F., Zimmerman, M.A., Kim, H.M., Smith, S.C. and Wilson, M.L. (2004). Spatial Analysis of Alcohol-related Motor Vehicle Crash Injuries in Southeastern Michigan. *Accident Analysis Prevention*, 36 (6): 1129-35.

Mello, M.J., Nirenberg T.D., Longabaugh, R., Woolard, R., Minugh,A., Becker, B., Baird, J., Stein, L. (2005) Emergency department brief motivational interventions for alcohol with motor vehicle crash patients. *Annals of Emergency Medicine*, 4, 620-625.

Michael, D.C. (1995). Federal Agency Use of Audited Self-Regulation as a Regulatory Technique, *Admin. L. Rev.* 171, 181-82.

Miller, W. and Wilbourne, P. (2002). Mesa Grande: a methodological analysis of clinical trials of treatments for alcohol use disorders. *Addiction*, 97, 265-277.

Minister For Health Victoria (2003) Report To The Ministerial Council Of Drug Strategy Review of the Self-Regulatory System for Alcohol Advertising By the National Committee for the Review of Alcohol Advertising .

Mirazee, E. and Kingery, P.M. and Pruitt, B.E. (1989): Sources of drug information among

- adolescent students. *Journal of Drug Education* 21 (2): 95-106.
- Mitchell P, Sanson A, Spooner C, Copeland J, Vimpani G, Toumbourou JW, *et al.* (2001). *The Role of Families in the Development, Identification, Prevention and Treatment of Illicit Drug Problems*. A literature review prepared for the National Illicit Drug Strategy Working Committee and the National Health and Medical Research Council. Canberra: Commonwealth of Australia.
- Mohler-Kuo M; Rehm J; Heeb JL; Gmel G (2004). Decreased taxation, spirits consumption and alcohol-related problems in Switzerland. *J Stud Alcohol* 65(2):266-73.
- Møller, L. (2002) Legal restrictions resulted in a reduction of alcohol consumption among young people in Denmark. In: Room, R. (ed.) *The Effects of Nordic Alcohol Policies: What happens to Drinking and Harm when Controls Change?* Nordic Council for Alcohol and Drug Research: Helsinki. 155-166.
- Monti, P.M., Colby, S.S.M., Barnett, N.P., Spirito, A., Rohsenow, D.J., Myers, M. Woolard, R., Lewander W. (1999) Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. *Journal of Consulting and Clinical Psychology* 67, 989-994.
- Monti, P.M., Colby, S.S.M., Barnett, N.P., Spirito, A., Rohsenow, D.J., Myers, M. Woolard, R., Lewander W. (1999) Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. *Journal of Consulting and Clinical Psychology* 67, 989-994.
- Morrisey MA; Grabowski DC; Dee TS; Campbell C (2005) The strength of graduated drivers license programs and fatalities among teen drivers and passenger *Accid Anal Prev* 2005 Sep 16; pS0001-4575.
- Mosher, J.F. and Johnsson, D. (2005) Flavored Alcoholic Beverages: An International Marketing Campaign that Targets Youth *Journal of Public Health Policy* (2005) 26, 326–342.
- Mosher, J.M. (1979) Dram shop law and the prevention of alcohol-related problems. *Journal of Alcohol Studies*, 40:773-798.
- Mosher, J.M. (1983) Server intention: a new approach for preventing drug driving. *Accident Analysis and Prevention* 15, 483-497.
- Mosher, J.M. (1987) *Liquor Liability Law*. New York: Matthew-Bender.
- Moskalewicz J. and Swiatkiewicz G. (2000) Alcohol consumption and its consequences in Poland in the light of official statistics. In: Leifman H. and Edgren Henrichsen N. (eds.) *Statistics on Alcohol, Drugs and Crime in the Baltic Sea Region*, pp. 143-161. Publication No. 37. Helsinki: Nordic Council for Alcohol and Drug Research.
- Moyer A, Finney JW, Swearingen CE, Vergun P. (2002). Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. *Addiction*; 97: 279-292.
- Mulford, A., Ledolter, J. and Fitzgerald, J.L. (1992). Alcohol Availability and Consumption: Iowa Sales Data Revisited. *Journal of Studies on Alcohol*, 53 (5):487-494.
- Mullahy, J., Sindelar, J.L., (1994). Do drinkers know when to say when? An empirical analysis of drunk driving. *Economic Inquiry* 32, 383–394.
- Murray J.P., Stam A., and Lastovicka J.L. (1996) Paid- versus donated-media strategies for public service announcement campaigns. *Public Opinion Quarterly* 60, 129.
- Nagin, D. S. (1998) Criminal deterrence research at the outset of the 21st century. In Tonry, M., ed. *Crime and Justice: A Review of the Research Vol 25*, 1-42. Chicago: University of Chicago Press.
- Nelson J. (1999). Broadcast Advertising and US Demand for Alcoholic Beverages, *Southern Economic Journal* 65(4) 774-790.

Nelson J. P. and Young, D. J. (2001). Do advertising bans work? An international comparison, *International Journal of Advertising*, 20, 273-296.

Nelson JP, Moran JR. (1995). Advertising and US alcoholic beverage demand: System-wide estimates. *Applied Economics* 27:1225–36.

Nelson JP. (2001). Alcohol advertising and advertising bans: a survey of research methods, results, and policy implications. *Advertising and Differentiated Products* 10:239–95.

Nelson TF; Naimi TS; Brewer RD; Wechsler H (2005) The state sets the rate: the relationship among state-specific college binge drinking, state binge drinking rates, and selected state alcohol control policies *Am J Public Health* 2005 Mar;95(3):441-6.

Nelson, J.P. (1999): Broadcast advertising and US demand for alcoholic beverages. *Southern Economic Journal* 65: 771-790.

Nelson, J.P. (2003). Advertising Bans, Monopoly, and Alcohol Demand: Testing for Substitution Effects using State Panel Data *Review of Industrial Organization* 22: 1–25, 2003.

Neuendorf KA. (1985). Alcohol advertising and media portrayals. *Journal of the Institute of Socioeconomic Studies* 10:67– 78.

Newman IM, Anderson CS, Farrell KA. (1992). Role rehearsal and efficacy: two 15-month evaluations of a ninth-grade alcohol education program. *J Drug Educ* 22:55– 67.

Nordlund S. (1985) Effects of Saturday closing of wine and spirits shops in Norway. Paper presented at the 31st International Institute on the Prevention and Treatment of Alcoholism, Rome, Italy, June 2-7. SIFA Mimeograph No. 5/85. Oslo: National Institute of Alcohol Research.

Nordlund S. (1984). Effekten av lørdagsstengningen ved Vinmonopolets butikker (Effects of Saturday closing of the wine/liquor monopoly outlets). *Alkoholpolitik – Tidsskrift for nordisk alkoholforskning*; 1: 221-229.

Norström T, Skog OJ. (2003). Saturday opening of alcohol retail shops in Sweden: an impact analysis. *Journal of Studies on Alcohol*; 64: 393-401.

Norström T. (1987) Abolition of the Swedish rationing system: effects on consumption distribution and cirrhosis mortality, *British Journal of Addiction* 82, 633-641.

Norström, T (2000) Outlet density and criminal violence in Norway, 1960-1995, *Journal of Studies on Alcohol* 61:907-911.

Norstrom, T. and Skog, O.-J. (2005) Saturday opening of alcohol retail shops in Sweden: an experiment in two phases. *Addiction* 100 767–776.

Norström, T. (1997). Assessment of the impact of the 0.02% BAC-limit in Sweden. *Studies on Crime and Crime Prevention* 6, 245-258.

Norström, T. and Skog, O.-J. (2001) Alcohol and mortality: methodological and analytical issues in aggregate analyses. *Addiction*, 96, supplement 1, 5-17.

Norström, T., Ö. Hemström, M. Ramstedt, I. Rossow, and O.-J. Skog. (2001). Mortality and Population Drinking. *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries*, T. Norström. Stockholm: National Institute of Public Health, European Commission.

Norström, Thor and Skog, Ole-Jørgen (2002) Saturday opening of alcohol retail shops in Sweden: an impact analysis. Presented at the 28th Annual Alcohol Epidemiology Symposium of the Kettil Bruun Society for Social and Epidemiological Research on Alcohol, Paris, 3-7 June.

Noval, S. and Nilsson, T. (1984) Mellanölets effekt på konsumtionsnivån och tillväxten hos den totala alkoholkonsumtionen (The effects of medium beer on consumption levels and the rise in overall alcohol consumption). In Nilsson, T. (ed) När mellanölet försvann (When the medium beer was withdrawn). 77-93. Linköping: Samhällsvetenskapliga institutionen, Universitetet i Linköping.

O'Donnell M. (1985) Research on drinking locations of alcohol-impaired drivers: Implications for prevention policies. *Journal of Public Health Policy* 6, 510-525.

Ogborne, A., and Smart, R., (1980). Will Restrictions on Alcohol Advertising Reduce Alcohol Consumption?, *British Journal of Addiction*, 75, 293-296.

Ohsfeldt, R.L., And Morrissey, M.A. (1997). Beer taxes, workers' compensation and industrial injury. *The Review of Economics and Statistics* 79(1):155–160.

Olds DL, Eckenrode JJ, Henderson CR. (1997). Long-term effects of home visitation on maternal life course and child abuse and neglect. Fifteen-year follow-up of a randomized trial. *Journal of American Medical Association* 278:637–643.

Olds DL, Henderson CR, Cole RE. (1998). Longterm effects of nurse home visitation on children's criminal and antisocial behavior. Fifteen-year follow-up of a randomized trial. *Journal of American Medical Association* 280:1238–1244.

Olds DL, Henderson CR, Kitzman HJ, Eckenrode JJ, Cole RE, Tatelbaum RC. (1999). Prenatal and infancy home visitation by nurses: recent findings. *The Future of Children* 9(1):44–65.

Olsson O. and Wikström P.H. (1982) Effects of the experimental Saturday closing of liquor retail stores in Sweden. *Contemporary Drug Problems* 11, 325-353.

Olsson, O. (1991) Prisets och inkomstens betydelse för alkoholbruk, missbruk och skador [The effect of prices and income on alcohol consumption and related problems]. The Swedish Council for Information on Alcohol and other Drugs (CAN), Stockholm.

O'Malley, P.M. and Wagenaar, A.C. (1991) Effects of minimum drinking age laws on alcohol use, related behaviors and traffic crash involvement among American youth: 1976-1987. *Journal of Studies on Alcohol* 52:478-491.

Ornstein, S. and Hanssens, D., (1985). Alcohol Control Laws and the Consumption of Distilled Spirits and Beer, *Journal of Consumer Research*, 12, 200-213.

Ornstein, S. I. (1980) Control of alcohol consumption through price increases. *Journal of Studies on Alcohol*, 41, 807–818. Ornstein, S. I. and Levy, D. (1983) Price and income elasticities and the demand for alcoholic beverages. In: Galanter, M., ed. *Recent Developments in Alcoholism*, pp. 303–345, 339. New York: Plenum.

Ornstein, S.I. (1980) Control of alcohol consumption through price increases. *Journal of Studies on Alcohol*, 41, 807-818.

Ornstein, S.I. and Levy, D. (1983) Price and income elasticities and the demand for alcoholic beverages. In *Recent developments in alcoholism*, Vol. 1, (Galanter, M., Ed.), pp. 303-345. Plenum, New York.

Österberg, E. and Haavisto, K. (1997) Alkoholsmugglingen till Finland under 1990-talet (Smuggling of alcoholic beverages into Finland in the 1990s) *Nordisk Alkohol- and Narkotikatidskrift* 14:290-303.

Österberg, E. (1979) Recorded consumption of alcohol in Finland, 1950-1975. Helsinki: Social Research Institute of Alcohol Studies, report No 125.

Österberg, E. (1995) Do alcohol prices affect consumption and related problems? In: Holder, H. and Griffith, E., eds. *Alcohol and Public Policy*, pp. 145–163. Oxford: Oxford University Press.

Österberg, E. (2001) Effects of price and taxation. In: Heather, N., Peters, T. J. and Stockwell, T., eds. *International Handbook of Alcohol Dependence and Problems: Part VI: Prevention of Alcohol Problems*, pp. 685–698. Chichester: John Wiley and Sons, Ltd.

Parker, D.A, And Farmer, G.C. (1990). Employed adults at risk for diminished self-control over alcohol use: The alienated, the burned out, and the unchallenged. In: Roman, P.M., ed., *Alcohol*

Problem Intervention in the Workplace: Employee Assistance Programs and Strategic Alternatives. New York, NY: Quorum Books, pp 27–43.

Paulson R.E. (1973) *Women's Suffrage and Prohibition: A comparative study of equality and social control*. Glenview, IL: Scott, Foresman and Company.

Peek-Asa C. (1999) The effect of random alcohol screening in reducing motor vehicle crash injuries. *American Journal of Preventive Medicine*; 16 (1S): 57-67.

Pentz M.A., Dwyer J.H., MacKinnon D.P., Flay B.R., Hansen W.B., Wang E.Y.-I., and Johnson C.A. (1989) A multi-community trial for primary prevention of drug abuse. Effects on drug use prevalence. *Journal of the American Medical Association* 261, 3259-3266.

Perkins, H.W. (2002) Social Norms and the prevention of alcohol Misuse in collegiate contexts. *Journal of Studies on Alcohol*, supplement 14: 164-172.

Perritt, H.H. (1997) Regulatory Models for Protecting Privacy in the Internet, in Privacy And Self-Regulation In The Information Age (NTIA 1997), available at <http://www.ntia.doc.gov/reports/privacy/privacy_rpt.htm>.

Perry C.L., Williams C.L., Forster J.L., Wolfson M., Wagenaar A.C., Finnegan J.R., McGovern P.G., Veblen-Mortenson S., Komro K.A., and Anstine P.S. (1993) Background, conceptualization and design of a community-wide research program on adolescent alcohol use: Project Northland. *Health Education Research: Theory and Practice* 8, 125-136.

Perry C.L., Williams C.L., Komro K.A., Veblen-Mortenson S., Forster J.L., Bernsten-Lachter R., Pratt L.K., Munson K.A., and Farbaksh K. (1998) Project Northland--phase II: Community action to reduce adolescent alcohol use. Paper presented at the Kettil Bruun Society Thematic Meeting, February, Russell, Bay of Islands, New Zealand.

Perry C.L., Williams C.L., Veblen-Mortenson S., Toomey T.L., Komro K.A., Anstine P.S., McGovern P.G., Finnegan J.R., Forster J.L., Wagenaar A.C., and Wolfson M. (1996) Project Northland: Outcomes of a community-wide alcohol use prevention program during early adolescence. *American Journal of Public Health* 86, 956-965.

Pissochet P., Biache P., and Paille F. (1999) Alcool, publicite et prevention: le regard des jeunes [Alcohol, advertising and prevention: young people's point of view] *Alcoologie* 21, 15-24.

Poikolainen, K. (1980) Increase in alcohol-related hospitalizations in Finland 1969-1975. *British Journal of Addiction* 75, 281-291.

Poikolainen, K. (1999) Effectiveness of brief interventions to reduce alcohol intake in primary health care populations: a meta-analysis, *Preventive Medicine*, 28, 503-509.

Ponicki, W. R., Holder, H. D., Gruenewald, P. J. and Romelsjo, A. (1997) Altering the price spectrum in Sweden for alcoholic beverages according to ethanol content, *Addiction*, 92, 859–870.

Preusser, D.F. and Williams, A.F. (1992) Sales of alcohol to underage purchasers in three New York counties and Washington, D.C. *Journal of Public Health Policy* 13:306-317.

Proctor, D.W., Babor, Y.F. and Xuan, Z. (2005). Effects of cautionary messages and vulnerability factors on viewers' perceptions of alcohol advertisements. *J Stud Alcohol* 66 648-657.

Putnam, S.L., Rockett, I.R.H. and Campbell, M.K. (1993) Methodological issues in community-based alcohol related injury prevention projects: Attribution of project effects. In T.K. Greenfield and R. Zimmermann, (Eds.). *Experiences with community action projects: New research in the prevention of alcohol and other drug problems*. Rockville, MD: Centre for Substance Abuse Prevention.

Ragnarsdottir, T., Kjartansdottir, A. and Davidsdottir, S. (2002) Effect of extended alcohol serving hours in Reykjavik, Iceland. In: Room, R., ed. *The Effects of Nordic Alcohol Policies*, pp. 145– 154. NAD Publication 42. Helsinki: Nordic Council for Alcohol and Drug Research.

Ramstedt M. (2002) The repeal of medium strength beer in grocery stores in Sweden: the impact on alcohol-related hospitalizations in different age groups. In: Room R. (ed.) *The Effects of Nordic Alcohol Policies: Analyses of Changes in Control Systems* Publication No. 42. Helsinki: Nordic Council for Alcohol and Drug Research.

Rehm J, Gutjahr E, Gmel G. (2001). Alcohol and all-cause mortality: a pooled analysis. *Contemporary Drug Problems*; 28: 337-361.

Rehm J, Rehn N, Room R, Monteiro M, Gmel G, Jernigan D, Frick U. (2003a). The global distribution of average volume of alcohol consumption and patterns of drinking. *European Addiction Research*; 9: 147-156.

Rehm J, Room R, Monteiro M, Gmel G, Graham K, Rehn N, Sempos CT, Jernigan D. (2003b). Alcohol as a risk factor for global burden of disease. *European Addiction Research*; 9: 157-164.

Rehm J, Room R, Monteiro M, Gmel G, Graham K, Rehn T, Sempos CT, Frick U, Jernigan D. (2004). Alcohol. In: WHO (ed), *Comparative quantification of health risks: Global and regional burden of disease due to selected major risk factors*. Geneva: WHO.

Reynolds KD, Coombs DW, Lowe JB, Peterson PL, et al. (1995). Evaluation of a self-help program to reduce alcohol consumption among pregnant women. *Int J Addict* 30(4):427-443.

Richmond, R., Heather, N., Wodak, A., Kehoe, L. and Webster, I. (1995) Controlled evaluation of a general practice-based brief intervention for excessive drinking, *Addiction*, 90, 119-32.

Roberts DF, Henriksen L, Christensen PG. (1999). Substance use in popular movies and music. Washington, DC: Office of National Drug Control Policy.

Roberts, C., Blakey, V., and Tudor-Smith, C. (1999). Impact of "alcopops" on regular drinking by young people in Wales. *Drugs: Education, Prevention and Policy*, 6(1), 7-15.

Robinson TN, Chen HL, Killen JD. (1998). Television and music video exposure and risk of adolescent alcohol use. *Pediatrics* 102:e54-9.

Romanus, G. (2000). Alcopops in Sweden: A supply side initiative. *Addiction*, 95(Supplement 4), S609-S619.

Romelsjo, A. (1987) Decline in alcohol-related inpatient care and mortality in Stockholm County, *British Journal of Addiction*, 82, 653-663.

Rospenda, K.M.; Richman, J.A.; Wislar, J.S.; And Flaherty, J.A. (2000). Chronicity of sexual harassment and generalized work-place abuse: Effect on drinking outcomes. *Addiction* 95(12):1805-1820.

Ross, H.L. (1984). *Deterring the Drinking Driver: Legal Policy and Social Control*, 2nd edn. Lexington, MA: Lexington Books.

Ross, H.L. (1992) *Confronting Drunk Driving: Social Policy for Saving Lives*. New Haven, CT: Yale University Press.

Rosow I. (1996) Alcohol related violence: The impact of drinking pattern and drinking context. *Addiction* 91, 1651-1661.

Ruhm, C.J. (1996) Alcohol policies and highway vehicle fatalities. *Journal of Health Economics* 15, 435-454.

Russ N.W. and Geller E.S. (1987) Training bar personnel to prevent drunken driving: A field evaluation. *American Journal of Public Health* 77, 952-954.

Rydon, P., Stockwell, T., Lang, E. and Beel, A. (1996). Pseudo-drunk-patron evaluation of bar-staff compliance with Western Australian liquor law. *Australian and New Zealand Journal of Public Health*, 20, 31-34.

Saffer, H. (1991). Alcohol advertising bans and alcohol abuse: An international perspective. *J Health Econ* 10(1):65–79.

Saffer, H. (1993). Alcohol advertising bans and alcohol abuse: Reply. *J Health Econ* 12(2):229–234.

Saffer, H. (1995). Alcohol advertising and alcohol consumption: Econometric studies. In: Martin, S.E., and Mail, P., eds. *Effects of the Mass Media on the Use and Abuse of Alcohol*. NIAAA Research Monograph No. 28. NIH Pub. No. 95-3743. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism, pp. 83–99.

Saffer H. (1996). Studying the effects of alcohol advertising on consumption. *Alcohol Health Res World*. 20(4):266–72.

Saffer, H. (1997). Alcohol advertising and motor vehicle fatalities. *Rev Econ Stat* 79(3):431–442.

Saffer H. (2000). *Alcohol Consumption and Alcohol Advertising Bans*. Working Paper 7758, National Bureau of Economic Research; Cambridge, MA.

Saffer, H. (2001). Substance abuse control and crime: Evidence from the National Survey of Drug Abuse. In: Grossman, M., and Hsieh C.R., eds. *Economic Analysis of Substance Use and Abuse: The Experience of Developed Countries and Lessons for Developing Countries*. Cheltenham, United Kingdom: Edward Elgar pp. 291–307.

Saffer, H. (2002) Alcohol advertising and youth. *Journal of Studies of Alcohol Supply*, 14 173-181.

Saffer, H. and Chaloupka, F. (1989). Breath testing and highway fatality rates. *Applied Economics*, 21, 901-912.

Saffer H, Dave D. (2002). Alcohol Consumption and Alcohol Advertising Bans. *Applied Economics*, 34: 1325-1334.

Saffer, H. and Dave, D. (2003). NBER working paper series alcohol advertising and alcohol consumption by adolescents Working Paper 9676 <http://www.nber.org/papers/w9676>.

Saffer, H. and Dave, D. (2004) Alcohol Consumption and Alcohol Advertising Bans. *Applied Economics*, 34, 1325-1334.

Saffer, H. and Grossman, M. (1987a) Beer taxes, the legal drinking age, and youth motor vehicle fatalities. *Journal of Legal Studies*, 16, 351-374.

Saffer, H. and Grossman, M. (1987b) Drinking age laws and highway mortality rates: cause and effect. *Economic Inquiry* 25, 403-417.

Saltz R.F. (1987) The roles of bars and restaurants in preventing alcohol-impaired driving: An evaluation of server intervention. *Evaluation and the Health Professions* 10, 5-27.

Saltz, R.F. and Stanghetta P. (1997) A community-wide Responsible Beverage Service program in three communities: early findings. *Addiction*, 92, S237-S249.

Sarkar S; Andreas M; de Faria F (2005) Who uses safe ride programs: an examination of the dynamics of individuals who use a safe ride program instead of driving home while drunk. *Am J Drug Alcohol Abuse* 2005;31(2):305-25.

Saunders B, Yap E. (1991). Do our guardians need guarding? An examination of the Australian system of self-regulation of alcohol advertising. *Drug Alcohol Rev.* 10:15–7.

Schechter E. (1986) Alcohol rationing and control systems in Greenland. *Contemporary Drug Problems* 13, 587-620.

Schinke, S. P., Tepavac, L. and Cole, K. C. (2000) Preventing substance use among Native American youth: three-year results. *Addictive Behaviours*, 25, 387–397.

School Health, Education Unit. (2003). UK young people and alcohol – attitudes to drinking 1983–2001. UK Trends: Young People's Health Related Behavior. 1:2–8.

Schweinhart LJ, Barnes HV, Wiekart DP. (1993). *Significant Benefits: The High/Scope Perry Pre-School Study Through Age 27*. Monograph of the High Scope Educational Research Foundation No. 10. Ypsilanti, MI: High Scope Press.

Scribner, R.A., MacKinnon, D.P. and Dwyer, J.H. (1994). Alcohol Outlet Density and Motor Vehicle Crashes in Los Angeles County Cities. *Journal of Studies on Alcohol*. 55 (4), 447-53.

Seeman, M., and Anderson, C.S. (1983). Alienation and alcohol: The role of work, mastery, and community in drinking behavior. *American Sociological Review* 48(1):60–77.

Seeman, M.; Seeman, A.Z.; And Budros, A. (1988). Powerlessness, work, and community: A longitudinal study of alienation and alcohol use. *Journal of Health and Social Behavior* 29(3):185–198.

Selvanathan, E. (1989). Advertising and Alcohol Demand in the UK: Further Results, *International Journal of Advertising*, 8, 181-188.

Serketich WJ, Dumas JE. (1996). The effectiveness of behavioral parent training to modify antisocial behavior in children: a metaanalysis. *Behavior Therapy* 27:171–186.

Sheehan M, Schonfeld C, Ballard R, Schofield F, Najman J, Siskind V. (1996). A three-year outcome evaluation of a theory based drink driving education program. *J Drug Educ* 26:295–312.

Sherman, L.W. (1992) Attacking crime: Police and crime control. In *Modern policing*, eds M. Tonry and N. Morris, Chicago: University of Chicago Press.

Shope J.T., Copeland L.A., Maharg R., Dielman T.E. (1996a) Effectiveness of a high school alcohol misuse prevention program. *Alcoholism: Clinical and Experimental Research* 20, 791-798.

Shope J.T., Copeland L.A., Marcoux B.C., and Kamp M.E. (1996b) Effectiveness of a school-based substance abuse prevention program. *Journal of Drug Education* 26, 323-337.

Shope J.T., Dielman T.E., Butchart A.T., Campanelli P.C., and Kloska D.D. (1992) An elementary school-based alcohol misuse program: a follow-up evaluation. *Journal of Studies on Alcohol* 53, 106-121.

Shope JT, Elliott MR, Raghunathan TE, Waller PF. (2001). Long-term follow-up of a high school alcohol misuse prevention program's effect on students' subsequent driving. *Alcohol Clin Exp Res* 25:403–10.

Shults R.A., Elder R.W., Sleet D.A., Nicholas J.L., Alao M.O., Carande-Kulis V.G., Zaza S., Sosin D.M., Thompson R.S., and the Task Force on Community Preventive Services (2001) Reviews of evidence regarding interventions to reduce alcohol-impaired driving. *American Journal of Preventive Medicine* 21, 66-88.

Single E. and McKenzie D. (1992) The epidemiology of impaired driving stemming from licensed establishments. Presented at 18th Annual Alcohol Epidemiology Symposium, Toronto, June 1-5.

Slater M, Rouner D, Domenech-Rodriguez M, *et al.* Adolescent responses to TV beer ads and sports content/context: gender and ethnic differences. *Journalism and Mass Communication Quarterly* 1997;74:108– 22.

Slater M, Rouner D, Murphy K, *et al.* (1996). Adolescent male reactions to TV beer ads: the effects of sports content and programming context. *J Stud Alcohol* 57:425–33.

Slater M.D., Rouner D., Murphy K., Beauvais F., VanLeuven J., and Domenech-Rodriguez M.M. (1996) Adolescents counterarguing of TV beer advertisements: Evidence for effectiveness of alcohol education and critical viewing discussions. *Journal of Drug Education* 26, 143-158.

Sloan F.A., Reilly B.A., and Schenzler C.M. (1994a) Tort liability versus other approaches for deterring careless driving. *International Review of Law and Economics* 14, 53-71.

Sloan F.A., Reilly B.A., and Schenzler C. (1994b) Effects of prices, civil and criminal sanctions and law enforcement on alcohol-related mortality. *Journal of Studies on Alcohol* 55, 454-465.

Sloan, F.A., Stout, E.M., Whetten-Goldstein, K., and Liang, L. (2000) *Drinkers, Drivers and Bartenders: Balancing Private Choices and Public Accountability*. Chicago, Illinois: The University of Chicago Press.

Sloan, F.A.; Reilly, B.A.; and Schenzler, C. (1995). Effects of tort liability and insurance on heavy drinking and driving. *J Law Econ* 38(1): 49-77.

Smart, R. and Cutler R. (1976). The Alcohol Advertising Ban in British Columbia: Problems and Effects on Beverage Consumption, *British Journal of Addiction*, 71, 13-21.

Smart, R.G. and Mann, R.E. (1990) Are increased levels of treatment and Alcoholics Anonymous membership large enough to create the recent reductions in liver cirrhosis? *British Journal of Addiction* 85, 1385-1387.

Smart, R.G. and Mann, R.E. (1993) Recent liver cirrhosis declines: estimates of the impact of alcohol abuse treatment and Alcoholics Anonymous. *Addiction* 88 193-198.

Smart, R.G. and Mann, R.E. (2000) The impact of programs for high-risk drinkers on population levels of alcohol problems. *Addiction* 95, 37-52.

Smart, R.G., Mann, R.E. and Anglin, L. (1989) Decrease in alcohol problems and increased Alcoholics Anonymous membership. *British Journal of Addiction* 54, 507-513.

Smart, R.G. (1988): Does alcohol advertising affect overall consumption? A review of empirical studies. *Journal of Studies on Alcohol* 49: 314-323.

Snow R.W. and Landrum J.W. (1986) Drinking locations and frequency of drunkenness among Mississippi DUI offenders. *American Journal of Drug and Alcohol Abuse* 12, 389-402.

Snyder LB, Hamilton M, Fleming-Milici F, et al. (2002). The effect of alcohol advertising on youth 15-26 years old. *Alcohol Clin Exp Res* 26(6):900-6.

Spickard, W.A., and Tucker, P.J. (1984). An approach to alcoholism in a university medical center complex. *Journal of the American Medical Association* 252:1894-1897.

Spirito, A., Monti, P.M., Barnett, N.P., Colby, S.M., Sindelar, H., Rohsenow, D.J., Lewander W., Myers, M. (2004) A randomised clinical trial of a brief motivational intervention for alcohol-positive adolescents treated in an emergency department. *The Journal of Pediatrics*, 145,396-402.

Spoth R., et al. (2001) Randomized trial of brief family interventions for general populations: adolescent substance use outcomes 4 years following baseline. *J. Consult. Clin. Psychol.*, 69:627-42.

Spoth, R. L., Redmond, C., Trudeau, L. and Shin, C. (2001a) Longitudinal substance initiation outcomes for a universal preventive intervention combining family and school programs. *Psychology of Addictive Behaviours*, 16, 129-134.

Spoth, R. L., Redmond, C. and Shin, C. (2001b) Randomized trial of brief family interventions for general populations adolescent substance use outcomes 4 years following baseline. *Journal of Consulting and Clinical Psychology*, 69, 1-15.

Spoth, R., C. Redmond, et al. (2004) Brief family intervention effects on adolescent substance initiation: school-level growth curve analyses 6 years following baseline. *J Consult. Clin. Psychol.*, 72(3): 535-42.

Stacy AW, Zogg JB, Unger JB, Dent CW. (2004). Exposure to televised alcohol ads and subsequent adolescent alcohol use. *Am J Health Behav*.28:498-509.

Stevenson, R.J., Lind, B. and Weatherburn, D. (1999) Relationship between alcohol sales and assault in New South Wales, Australia. *Addiction* 94:397-410.

Stewart K. (1997) Environmentally oriented alcohol prevention policies for young adults. In: Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Prevention, Secretary's Youth Substance Abuse Prevention Initiative: Resource papers. Pre-publication documents, pp. 107–157. Rockville, MD: Author.

Stickwell, T. and Single, E. (1997). Standard unit labelling of alcohol containers. In Plant, M., E. Single and T. Stickwell (Eds). *Alcohol: Minimizing the harm. What works*. London: Free Association Books.

Stockwell T. (2001) Editor's introduction to prevention of alcohol problems. In: Heather N., Peters T.J., and Stockwell T. (eds.) *Handbook of Alcohol Dependence and Alcohol-Related Problems*, pp. 680-683. Chichester, UK: John Wiley and Sons.

Stockwell T., Somerford P., and Lang E. (1992) The relationship between license type and alcohol-related problems attributed to licensed premises in Perth, Western Australia. *Journal of Studies on Alcohol* 53, 495-498.

Stockwell, T. and Gruenewald, P. (2001) Controls on the availability of alcohol. In Heather, N., Peters, T.J. and Stockwell, T., eds. *International handbook of alcohol dependence and problems*. Chichester: John Wiley and Sons, Ltd.

Stockwell, T. (1997) Regulation of the licensed drinking environment: A major opportunity for crime prevention. In *Policing for prevention: Reducing crime, public intoxication and injury*, ed. R. Homel, Monsey NY: Criminal Justice Press.

Stockwell, T. (2001) Responsible alcohol service: Lessons from evaluations of server training and policing initiatives. *Drug and Alcohol Review*, 20, 257-265.

Stockwell, T., Chikritzhs, T., Hendrie, D., Fordham, R., Ying, F., Phillips, M. *et al.* (2001) The public health and safety benefits of the NT's Living With Alcohol program. *Drug and Alcohol Review*, 20, 167–180.

Stockwell, T., Lang, E. and Rydon, P. (1993) High risk drinking settings: the association of serving and promotional practices with harmful drinking. *Addiction*, 88, 1519– 1526.

Stouthard ME, Essink-Bot ML, Bonsel GL, on behalf of the Dutch Disability Weights Group. (2000). Disability Weights for diseases: a modified protocol and results for a Western European region. *European Journal of Public Health*; 10: 24-30.

Strategy Unit (2003). Strategy Unit Alcohol Harm Reduction project. Interim Analytical Report. UK Government: Strategy Unit.

Strickland DE, Finn TA, Lambert MD. (1982). A content analysis of beverage alcohol advertising: I. Magazine advertising. *J Stud Alcohol* 43:655–82.

Strickland DE. (1982). Alcohol advertising: content and controversy. *J Advertising*. 1:223–36. .

Strickland, D.E. (1983). Advertising exposure, alcohol consumption and misuse of alcohol. In: Grant, M.; Plant, M.; and Williams, A., eds. *Economics and Alcohol: Consumption and Control*. New York, NY: Gardner Press, pp. 201–222.

Strickland, D.E. (1982). Alcohol advertising: Orientations and influence. *J Advertising* 1:307–319.

Strunge, H. (1998). Danish experiences of national campaigns on alcohol 1990-1996. *Drugs: Education Prevention and Policy* 5 73-79.

Sumnall HR; Tyler E; Wagstaff GF; Cole JC (2004) A behavioural economic analysis of alcohol, amphetamine, cocaine and ecstasy purchases by polysubstance misusers *Drug Alcohol Depend* 76(1):93-9.

Swire, P.P (1997) Markets, Self-Regulation, and Government Enforcement. In *Privacy And Self-Regulation In The Information Age* (NTIA 1997). Available at <http://www.ntia.doc.gov/reports/privacy/privacy_rpt.htm>.

Tan Torres T, Baltussen RM, Adam T *et al.* (2003). *Making choices in health: WHO guide to cost-effectiveness analysis*. Geneva: World Health Organization.

Tapert SF; Cheung EH; Brown GG; Frank LR; Paulus MP; Schweinsburg AD; Meloy MJ; Brown SA (2003). Neural response to alcohol stimuli in adolescents with alcohol use disorder. *Arch Gen Psychiatry* Jul;60(7):727-35.

Tay R (2005a) Drink driving enforcement and publicity campaigns: are the policy recommendations sensitive to model specification? *Accid Anal Prev* 2005 Mar;37(2):259-66.

Tay R (2005b) The effectiveness of enforcement and publicity campaigns on serious crashes involving young male drivers: Are drink driving and speeding similar? *Accid Anal Prev* 2005 Sep;37(5):922-9.

Thompson KM (2005). Addicted media: substances on screen *Child Adolesc Psychiatr Clin N Am* Jul;14(3):473-89, ix.

Thompson KM, Yokota F. (2001). Depiction of alcohol tobacco and other substances in G-rated animated feature films. *Pediatrics* 107:1369– 73.

Thomsen SR; Rekve D; Lindsay GB (2004). Using "Bud World Party" attendance to predict adolescent alcohol use and beliefs about drinking. *J Drug Educ* 34(2):179-95.

Thomsen, S.R. and Rekve, D. (2004). Television and drinking expectancies. *Nordic Studies on Alcohol and Drugs* 21 17-28.

Tigerstedt C. (2000) Discipline and public health. In Sulkunen P., Sutton C., Tigerstedt C., and Warpenius K. (eds.) *Broken Spirits: Power and Ideas in Nordic Alcohol Control*, pp. 93-112. NAD Publication No. 39. Helsinki: Nordic Council for Alcohol and Drug Research.

Timmerman M, Geller E, Glindemann K, Fournier A. (2003) Do the designated drivers of college students stay sober? *J Safety Res* 34:127–33.

Tippetts AS; Voas RB; Fell JC; Nichols JL (2005) A meta-analysis of .08 BAC laws in 19 jurisdictions in the United States. *Accid Anal Prev* 2005 Jan;37(1):149-61.

Tobler N.S. (1992) Prevention programs can work: research findings. *Journal of Addictive Diseases* 11, 1-28.

Tomsen S. (1997). A top night out: social protest, masculinity and the culture of drinking violence. *British Journal of Criminology* 37, 990-1002.

Toomey T.L., Wagenaar A.C., Gehan J.P., Kilian G., Murray D.M., and Perry C.L. (2001) Project ARM: Alcohol risk management to prevent sales to underage and intoxicated patrons. *Health Education and Behavior* 28, 186-99.

Treno, A.J., Grube, J.W. and Martin, S.E. (2003). Alcohol Availability as a Predictor of Youth Drinking and Driving: A Hierarchical Analysis of Survey and Archival Data. *Alcohol, Clinical Experimental Research*. 27 (5): 835-40.

Trolldal, B. and Ponicki, W. (2005). Alcohol price elasticities in control and license states in the United States, 1982-99. *Addiction*.

Tucker LA. (1985). Television's role regarding alcohol use among teenagers. *Adolescence* 20: 593– 8.

Turrisi, R. *et al.* (2001) Examination of the short-term efficiency of a parent intervention to reduce college student drinking tendencies. *Psychology of Addictive Behaviours*, 15:366-372.

US Department of Health and Human Services (USDHHS) (1997) *Ninth Special Report to the US Congress on Alcohol and Health from the Secretary of Health and Human Services*, no. 97– 4017. Rockville, MD: US Department of Health and Human Services, Public Health Service, National Institute of Health (NIH), National Institute on Alcohol Abuse and Alcoholism (NIAAA).

Valli, R. (1998) Forandringar i ungdomarnas alkoholvanor nar mellanolet slapptes fritt: Fallet Jakobstad (Changes in young people's alcohol consumption with improved availability of medium strength beer: The case of Pietarsaari) *Nordisk Alkohol- and Narkotikatidskrift* 15:168-175.

Van Den Bluck, J and Beullens, K. (2005) television and music video exposure and adolescent alcohol use while going out. *Alcohol and Alcoholism* 2005 40(3):249-253.

Villaveces A; Cummings P; Koepsell TD; Rivara FP; Lumley T; Moffat J (2003). Association of alcohol-related laws with deaths due to motor vehicle and motorcycle crashes in the United States, 1980-1997. *Am J Epidemiol* Jan 15;157(2):131-40.

Voas RB; Tippetts AS; Fell JC (2003) Assessing the effectiveness of minimum legal drinking age and zero tolerance laws in the United States. *Accid Anal Prev* 2003 Jul;35(4):579-87.

Voas, R.B. and Tippetts, A.S. (1999) Relationship of alcohol safety laws to drinking drivers in fatal crashes. Washington, DC: National Highway Traffic Safety Administration.

Voas, R.B. (1986). Evaluation of jail as a penalty for drunken driving. *Alcohol, Drugs and Driving: Abstracts and Reviews*, 2(2),47-70.

Voas, R.B. (1997): Drinking and driving prevention in the community: program planning and implementation. *Addiction* 92 (Supplement 2): S201–S219.

Voas, R.B. and Hause, J.M. (1987). Deterring the drinking driver: the Stockton experience. *Accident Analysis and Prevention*, 19(2),81-90.

Voas, R.B. and Tippetts, A.S. (1990). Evaluation of treatment and monitoring programs for drunken drivers. *Journal of Traffic Medicine*, 18, 15-26.

Voas, R.B., Marques, P.R., Tippetts, A.S. and Beirness, D.J. (1999). The Alberta Interlock Program: the evaluation of a province-wide program. *Addiction*, 94,1857-1867.

Wagenaar A.C. and Holder H.D. (1991) Effects of alcoholic beverage server liability on traffic crash injuries. *Alcoholism: Clinical and Experimental Research* 15, 942-947.

Wagenaar A.C. and Toomey T.L. (2000) Alcohol policy: gaps between legislative action and current research. *Contemporary Drug Problems* 27, 681-733.

Wagenaar AC; Toomey TL; Erickson DJ (2005). Preventing youth access to alcohol: outcomes from a multi-community time-series trial *Addiction*, 100 , 335–345.

Wagenaar, A. C. and Holder, H. D. (1996) The scientific process works: seven replications now show significant wine sales increases after privatization, *Journal of Studies on Alcohol*, 57, 575–576.

Wagenaar, A.C. and Holder, H.D. (1995) Changes in alcohol consumption resulting from the elimination of retail wine monopolies: Results from five U.S. states. *Journal of Studies on Alcohol* 56:566-572.

Wagenaar, A.C. and Maybee, R.G. (1986) Legal minimum drinking age in Texas: Effects of an increase from 18 to 19. *Journal of Safety Research* 17:165-178.

Wagenaar, A.C. and Murray, D.M. and Toomey, T.L. (2000): Communities Mobilizing for Change on Alcohol (CMCA): effects of a randomized trial on arrests and traffic crashes. *Addiction* 95 (2): 209–217.

Wagenaar, A.C. and Murray, D.M. and Wolfson, M. and Forster, J.L. and Finnengan, J.R. (1994): Community Mobilizing for Change on Alcohol: design of a randomized community trial. *Journal of Community Psychology (CSAP Special Issue)*: 79–101.

Wagenaar, A.C. and Wolfson, M. (1994) Enforcement of the legal minimum drinking age in the United States. *Journal of Public Health Policy* 15:37-53.

Wagenaar, A.C. and Wolfson, M. (1995) Deterring sales and provision of alcohol to minors: A study of enforcement in 295 counties in four states. *Public Health Reports* 110:419-427.

Wagenaar, A.C. (1981) Effects of the raised legal drinking age on motor vehicle accidents in Michigan. *HSRI Research Review* 11(4):1-8.

Wagenaar, A.C. (1986) Preventing highway crashes by raising the legal minimum age for drinking: The Michigan experience 6 years later. *Journal of Safety Research* 17:101-109.

Wagenaar, A.C. and Holder, H.D. (1991). Change from Public to Private Sale of Wine: Results from Natural Experiments in Iowa and West Virginia. *Journal of Studies on Alcohol*, 52 (2):162-173.

Walters, E.D. and Treno, A.J. and Grube, J.W. (2001): Alcohol advertising and youth: A focus-group analysis of what young people find appealing in alcohol advertising. *Contemporary Drug Problems* 28: 695-718.

Wallack, L. and Grube, J.W. and Madden, P.A. and Breed, W. (1990): Portrayals of alcohol on prime-time television. *Journal of Studies on Alcohol* 51: 428-437.

Wallack, L., Dorfman, L., Jernigan, D. and Themba, M. (1993). *Media advocacy and public health – power for prevention*. Newbury Park, CA: Sage.

Wallin E., Hjalmarsson K., Lindewald B., and Andréasson S. (1999). Effects of RBS Training: A Focus Group Study. Paper presented at the 25th annual meeting of the Kettil Bruun Society for Social and Epidemiological Research on Alcohol, Montreal, Canada.

Wallin E; Norstrom T; Andreasson S (2003) Alcohol prevention targeting licensed premises: a study of effects on violence *J Stud Alcohol* 2003 Mar;64(2):270-7.

Wallin, E. and Andréasson, S. (2005). Effects of a community action program on problems related to alcohol consumption at licensed premises In Stockwell T, Gruenewald P, Toumbourou J, and Loxley W, eds. *Preventing harmful substance use: The evidence base for policy and practice*. Chichester: Wiley.

Wallin, E., Norstrom, T. and Andreasson, S. (2003) Alcohol Prevention Targeting Licensed Premises: A Study of Effects on Violence. *Journal of Studies on Alcohol*, 64, 271-277.

Wallin, E., Norström, T. and Andréasson, S. (2003) Alcohol prevention targeting licensed premises: a study of effects on violence. *Journal of Studies on Alcohol*, 64, 270-277.

Walsh G.W., Bondy S.J., and Rehm J. (1998) Review of Canadian low-risk drinking guidelines and their effectiveness. *Canadian Journal of Public Health* 89, 241-247.

Walsh, D.C.; Hingson, R.W.; Merrigan, D.M.; *et al.* (1992). A randomized trial of alternative treatments for problem-drinking employees: Study design, major findings, and lessons for worksite research. *Journal of Employee Assistance Research* 1:112–147.

Walsh, D.C.; Hingson, R.W.; Merrigan, D.M.; *et al.* (1991). A randomized trial of treatment options for alcohol-abusing workers. *New England Journal of Medicine* 325:775–782.

Warburton A.L. and Shepherd J.P. (2000) Effectiveness of toughened glassware in terms of reducing injury in bars: a randomized controlled trial. *Injury Prevention* 6, 36-40.

Webb, J.A. and Baer, P.E. and Getz, J.G. and McKelvey, R.S. (1996): Do fifth graders' attitudes and intentions toward alcohol predict seventh-grade use? *Journal of the American Academy of Child and Adolescent Psychiatry* 35: 1611-1617.

Weitzman ER; Chen YY (2005) Risk modifying effect of social capital on measures of heavy alcohol consumption, alcohol abuse, harms, and secondhand effects: national survey findings. *J Epidemiol Community Health* 2005 Apr;59(4):303-9.

Weitzman, E.R., Folkman, A., Folkman, K.L. and Wechsler, H. (2003). Relationship of Alcohol Outlet Density to Heavy and Frequent Drinking and Drinking-related Problems among College Students at Eight Universities. *Health and Place*, 9 (1): 1-6.

Wells S., Graham K., and West P. (1998) "The good, the bad, and the ugly": Responses by security staff to aggressive incidents in public drinking settings. *Journal of Drug Issues* 28, 817-836.

Wells-Parker, E., Bangert-Drowns, R., McMillen, R. and Williams, M. (1995). Final results from a meta- analysis of remedial interventions with DUI offenders. *Addiction*, 90(7),907-926.

Werck, C.E. (2003) One-year follow-up results of the STARS for Families alcohol prevention program. *Health Educ. Res.*, 18: 74-87.

Whitlock, E. P., Polen, M. R., Green, C. A., Orleans, T. and Klein, J. (2004) Behavioral counseling interventions in primary care to reduce risky/harmful alcohol use by adults: a summary of the evidence for the US Preventive Services Task Force. *Annals of Internal Medicine*, 140, 557-568.

Wilk, A. I., Jensen, N. M. and Havighurst, T. C. (1997) Meta-analysis of randomized control trials addressing brief interventions in heavy alcohol drinkers, *Journal of General Internal Medicine*, 12, 274-283.

Wilkins TT. (2000). The "Stay Alive From Education" (SAFE) program: description and preliminary pilot testing. *J Alcohol Drug Educ* 45:1–11.

Williams C.L., Perry C.L., Dudovitz B., Veblen-Mortenson S., Anstine P.S., Komro K.A., and Toomey T.L. (1995) A home-based prevention program for sixth-grade alcohol use: Results from Project Northland. *Journal of Primary Prevention* 16, 125-147.

Williams, A.F., Ferguson, S.A., and Cammisa, M.X. (2000) Self-Reported Drinking and Driving Practices and Attitudes in Four Countries and Perceptions of Enforcement. Arlington, VA: Insurance Institute for Highway Safety.

Willis C, Lybrand S, Bellamy N. (2004). Alcohol ignition interlock programmes for reducing drink driving recidivism. *The Cochrane Database of Systematic Reviews* 2004, Issue 3.

Wilson, R., And Dufour, M., Eds. (2000). *Epidemiology of Alcohol Problems in Small Geographic Areas*. NIAAA Research Monograph No. 36. NIH Pub. No. 00–4357. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.

Wingood GM, DiClemente RJ, Bernhardt JM, *et al.* (2003). A prospective study of exposure to rap music videos and African American female adolescents' health. *Am J Public Health* 98:437– 9.

World Health Organization. (2001). *Macroeconomics and health: Investing in health for economic development*. Final Report of the Commission on Macroeconomics and Health. Geneva: World Health Organization.

World Health Organization (2002). Reducing Risks, Promoting Health Life. World Health Report 2002. Geneva, World Health Organization.

Wutzke, S., Conigrave, K., Saunders, J. and Hall, W. (2002) The long-term effectiveness of brief interventions for unsafe alcohol consumption: a 10-year follow-up, *Addiction*, 97, 665-675.

Wyllie A, Holibar F, Casswell S, Fuamatu N, Aioluputea K, Moewaka Barnes H, *et al.* (1997). A qualitative investigation of responses to televised alcohol advertisements. *Contemporary Drug Problems*. 24: 103–32.

Wyllie A, Zhang JF, Casswell S. (1998a). Responses to televised alcohol advertisements associated with drinking behaviour of 10-17-year-olds. *Addiction*. 93(3):361–71.

Wyllie, A.; Zhang, J.F.; and Casswell, S. (1998b) Positive responses to televised beer advertisements associated with drinking and problems reported by 18- to 29-year-olds. *Addiction* 93(5):749–760.

Wyllie A., Waa A. and Zhang J.F. (1996) Alcohol and Moderation Advertising Expenditure and Exposure: 1996. Auckland, New Zealand: University of Auckland.

Young, D. (1993). Alcohol Advertising Bans and Alcohol Abuse: Comment, *Journal of Health Economics*, 12, 213-228.

Zhu, L., Gorman, D.M. and Horel, S. (2004). Alcohol outlet density and violence: a geospatial analysis. *Alcohol and Alcoholism* 39 369-375.

Zobeck, T.S. and Williams, G.D. (1994). Evaluation Synthesis of the Impacts of DWI Laws and Enforcement Methods: Final Report. Contract No. ADM-281-89-0002. Rockville, MD: Office of Policy Analysis, National Institute on Alcohol Abuse and Alcoholism (NIAAA).

Zwerling, C. and Jones, M.P. (1999) Evaluation of the effectiveness of low blood alcohol concentration laws for younger drivers. *American Journal of Preventive Medicine* 16 (Suppl. 1), 76-80.

Chapter 8 – Alcohol policy in Europe

In contrast to most of the 20th century, countries no longer make their national alcohol policies in an international vacuum. Instead, policies dealing with alcohol must take into account three different aspects of the international arena – (i) international and European legal obligations; (ii) other policies dealing with alcohol as an economic commodity; and (iii) international actions to reduce the harm done by alcohol.

The most prominent international legal obligations are the General Agreement on Tariffs and Trade (GATT) dealing with goods, and the General Agreement on Trade in Services (GATS). Past cases on these have shown that the World Trade Organization (WTO) will prioritize health over trade in some circumstances (for example, a ban on asbestos imports), although policies must pass a series of strict tests in order to be maintained. Future developments should be monitored to ensure that trade negotiators are aware of the health implications of both current and future agreements,

However, by far the greater effect on alcohol policy in practice has come from the trade law of the European Union (EU). Most of the cases relating to alcohol stem from the 'national treatment' rule on taxation, which means that states are forbidden from discriminating – either directly or indirectly – in favour of domestic goods against those from elsewhere in the EU. No exceptions can be made to this on health grounds, with the result that countries face certain restrictions in the design of their tax policy. Other rules on monopolies have also led to much of the Nordic alcohol monopolies being removed, although the off-premise retail monopolies have been upheld by the European Court of Justice (ECJ). In contrast, the increasingly influential ECJ has unambiguously supported advertising bans in Catalonia and France, accepting that "it is in fact undeniable that advertising acts as an encouragement to consumption".

Alcoholic drinks are also dealt with as economic commodities through agriculture and taxation policy at the European level. Standardized excise duties are a longstanding goal of the EU in order to reduce market distortions, where large differences in tax rates between nearby countries lead to large amounts of shopping abroad. This leads to lost revenue for the high-tax government, as well as creating pressure to lower taxation rates, as has occurred in some of the Nordic countries.

The production of alcoholic drinks in the form of wine receives €1.5 billion worth of support each year through the Common Agricultural Policy (CAP). For some time there has been an imbalance in the CAP, with increasing consumption, a more recent fall in demand and greater international competition leading to a considerable surplus of European wines. The economic and political importance of these subsidies, and in particular the problems of wine producers, makes it hard to progress from a public health perspective.

The international body most active on alcohol has been the World Health Organization (WHO), whose European office has undertaken several initiatives to reduce alcohol-related harm in its 52 Member States. These include the European Alcohol Action Plan, the European Charter on Alcohol and two ministerial conferences, which confirmed the need for alcohol policy (and public health more broadly) to be developed without any interference from commercial or economic interests.

Although the EU itself cannot pass laws simply to protect human health (Member States have not conferred this power on the European institutions), some policies dealing with the internal market can incorporate substantial health

concerns, such as the alcohol advertising clause within the Television Without Frontiers Directive. Otherwise, the EU's action on alcohol has come through 'soft law', in the form of non-binding resolutions and recommendations urging Member States to act in a certain way, such as the 2001 Commission Recommendation on the maximum permitted blood alcohol content for drivers of motorized vehicles. Partly driven by the sudden growth of alcopops from 1995, alcohol policy has become more politically prominent in recent years, leading to a 2001 Council resolution on the Europe-wide problem of drinking by young people, in particular children and adolescents, and the Council's invitation to the Commission to produce a strategy on alcohol-related harm in Europe, which, as of early 2006, is currently being drafted.

WORLD TRADE LAW AND ALCOHOL

Why is trade law relevant for alcohol policy?

As with any other economic commodity, policies dealing with alcohol must fit with the legal obligations made by states to each other within a body of international treaties that have built up since the end of the Second World War. These commitments reduce the scope for states to enact protectionist policies, but what this means for public health policy has generally been interpreted in two ways. Some commentators – in particular those from health or social issue backgrounds – have expressed concerns about how trade rules (particularly on a global level) may constrain health or social policy within a trading system that prioritizes commercial goals above health. Others – mainly from business, governmental or economic spheres – have responded with confidence that governments are safe to pursue health aims as long as they follow the rules when doing so. The reality, inevitably, is more complicated than either view. As a World Health Organization (WHO) paper notes in the context of just one provision, the rules are so complex that states “should view simplistic assertions about [them] with scepticism” (Fidler and Drager 2003:10).

The easiest way to understand the health impact of the two levels of trade agreements (European and global) is to work down from the highest level, with the World Trade Organization (WTO; see Box 8.1). This includes a variety of commitments built up over several treaties, in particular the General Agreement on Tariffs and Trade (GATT) dealing with goods, and the General Agreement on Trade in Services (GATS) that focuses on services (see Box 8.2). The GATS in particular has aroused much debate due to its potential scope, as it defines ‘services’ in a way that incorporates most types of human activity. For example, although alcohol is a good and covered by GATT, alcohol policy could be far more affected by service commitments that cover the production, wholesale, distribution, retail and advertising of alcohol.

BOX 8.1 – THE WORLD TRADE ORGANIZATION (WTO)

- *History:* The main international agreements today can be traced back to the General Agreement on Tariffs and Trade (GATT), which was one of the 'Bretton Woods Institutions' set up to help the world economy recover from the Second World War. Countries since then have negotiated progressively wider-ranging agreements with the goal of further liberalizing world trade and increasing standards of living, counteracting the tendency of states to put up trade barriers to protect domestic vested interests.
- *Process:* Within each trade round, member countries make *offers* (to liberalize their domestic markets) and *requests* (asking other countries to liberalize in certain sectors) until agreement can be reached by all. From a European perspective, it is important to note that the European Commission (EC) negotiates on behalf of all Member States – so whatever the ambivalences within the European Union (EU), this becomes a single position at the WTO negotiating table (Alavaikko 2002).
- *The Uruguay Round:* The trade round process was formalized at the end of the eighth round (known as the 'Uruguay Round') of negotiations in 1995 with the creation of the World Trade Organisation (WTO) to coordinate negotiating rounds – a moment that also considerably expanded the reach of the agreements into new areas such as intellectual property (the TRIPS agreement) and services (the General Agreement on Trade and Services – GATS).
- *Dispute Settlement:* The Uruguay Round also contained new powers to settle trade disputes between countries, allowing the WTO to put its blessing on retaliatory sanctions against the offending country. The case is initially passed on to a Panel appointed by the WTO Director-General, but following this either party can appeal on points of law to the WTO Appellate Body. The process itself is very slow, and at each stage the WTO only acts if the countries cannot negotiate an agreement between themselves. Together with Trade Policy Reviews undertaken by the WTO Secretariat – that “pose questions on member nations’ trade policies and create pressure for the homogenisation of these policies” (Alavaikko 2002:71) – this gives the WTO substantial power to discipline countries in accordance with their commitments.

Some observers have argued that for legal psychoactive substances such as alcohol, the objectives of the WTO are at odds with public health – “the promise of trade liberalization under the WTO is to reduce costs, increase choice, and expand the availability of consumer products in its 143 member countries. However, to varying extents members also pursue policies to restrict choice, reduce the availability, and increase the price of alcohol, with a view to reducing consumption—particularly among young people” (Gould and Schacter 2002). In practice, this could be interpreted that alcohol monopolies, certain tax structures, advertising bans, and controls over imports will all be ruled counter to world trade law. Even from an optimistic viewpoint, “*the best outcome that can be hoped for when any regulation becomes the subject of a trade complaint is that it will not be struck down*” (Gould 2005:360).

The health defence

To what extent this is true depends almost entirely on the interpretation of one part of the treaties – GATT Article XX and GATS Article XIV. These state that nothing in

either agreement “shall be construed to prevent the adoption or enforcement by any contracting party of measures...necessary to protect...human health,” as long as these measures are not a “disguised restriction on trade” or “unjustifiable discrimination.” It is up to the country defending a health policy to show that there is no ‘less trade restrictive’ alternative that would have the same effect, and that the policy is being used in good faith – although the value of a goal like human life is unquestioned (WTO Committee on Trade and Environment 2002).

Where a measure is very important for an aim such as health, it will be maintained by the WTO even if it is severely disruptive to trade (WHO and WTO 2002; WTO Committee on Trade and Environment 2002). However, where the measure is less than indispensable, the burdens of this ‘necessity test’ are ‘substantial and difficult’ – which could mean that the defence is not enough to protect health policies in practice (Fidler and Drager 2003).

Box 8.2 – Principles of world trade	
<i>Principle</i>	<i>What it means</i>
<p>Most Favoured Nation GATT Article I GATS Article II</p>	<p>The best treatment for one foreign trader must be extended to all the others, in effect making all WTO countries equally ‘most favoured nations’.</p> <p>This applies to all WTO members for everything except (i) regional free trade agreements (ii) to give preferential access to developing countries; (iii) in response to products seen to be traded unfairly; and (iv) for some services.</p>
<p>National Treatment GATT Article III GATS Article XVII</p>	<p>The best treatment for <i>domestic</i> traders is extended to treaty partners. Sometimes called ‘the golden rule of international trade law’ as it ensures <i>substantive</i> equality of treatment – this can mean that even formal equality is not enough.</p> <p>Under GATT, national treatment only applies when a product has entered a market; this allows differential treatment before entering a market (e.g. tariff barriers). This does not apply under GATS, making the commitment more powerful – as a result, it is a ‘positive listing’ article that countries can choose to sign up to in each area (exemptions are listed in the country schedules).</p>
<p>Market Access GATT Article XI GATS Article XVI</p>	<p>Broadly speaking, ‘market access’ simply means committing to open up a market in a given sector. As with the national treatment commitment, governments choose to offer market access in different sectors and can specify any limitations in each area.</p> <p>For goods, market access tends to refer to import quotas and is, therefore, a reduction/abolition of a numerical limit. In GATS, however, market access is defined as the absence of limits on (i) numbers of suppliers; (ii) value of transactions; (iii) output; (iv) employment; (v) the types of legal entity; and (vi) participation of foreign capital. In all cases, both numerical limits (including bans, seen as ‘a limit of zero’) and ‘economic needs tests’ are outlawed where commitments are made.</p>
<p>Monopolies GATT Article VIII GATS Article XVI</p>	<p>Monopolies must be carefully crafted to minimize the trade disruption they cause. Mainly this means they must trade in line with commercial considerations, not discriminate on any goods that affect private traders, and limit ‘mark-ups’ on imports.</p> <p>It should also be noted that monopolies would evidently break Market Access commitments, so must be written into the country’s schedule as an exemption (if relevant).</p>

Past cases can be a useful guide to how far health policies can be defended at the WTO. Few of the cases have been directly for alcohol, and most of those that do

exist are about tax systems seemingly designed to favour the locally produced drink.¹ Three other cases under GATT pre-date the WTO, with the US and Canada exchanging complaints in the late 1980s and early 1990s as regards their minimum pricing, taxation and marketing policies – but again, the GATT panel did not have to decide between trade and health interests in any of the cases, even if some of the policies concerned could be argued to be relevant to public health (documents L/6304, DS17/R, and DS23/R; see also Ferris, Room, and Giesbrecht 1993; Vingilis, Lote, and Seeley 1998; Room and West 1998).

Other areas of public health offer more insight into whether the health defence will be enough to defend discriminatory alcohol policies, such as the 1990 Thai Cigarettes case (DS10/R). Here a ban on tobacco imports was struck down on the basis of Market Access after the Thai government failed to demonstrate the laws were necessary for health, despite a WHO intervention during the panel to point out that “multinational tobacco companies had routinely circumvented national restrictions on advertising through indirect advertising and a variety of other techniques” (cited in Howse 2004). However, the panel’s reasoning explicitly allowed a number of other less trade-restrictive tobacco control policies to achieve the same objectives, including an advertising ban, labelling requirements, bans on harmful additives, and a tobacco retail monopoly. Following this ruling, and combined with domestic support, the Thai parliament passed two tobacco control acts in 1992 that reversed the rise in the prevalence of smoking (Bettcher and Shapiro 2001; WHO and WTO 2002:77).

This confirms the implications of the discussion above – it is not enough for a health policy to be defended simply because it works; it must also work in a way to disrupt trade as little as possible. For example, foreign exchange fees and locally supervised tax stamps may have ‘secured compliance with laws or regulations’ against cigarette smuggling in line with Article XX, but the Dominican Republic lost its case as it failed to explain why other GATT-consistent measures could not perform the same role (DS302/5, Nov 2004). Most recently of all, the WTO Appellate Panel ruled that the ‘public morals’ defence under Article XX was not enough to justify the US remote gambling laws, again on the grounds that the laws were not applied equally to domestic and foreign firms (DS285, in 2005). While some non-governmental organizations (NGOs) argued this would have serious ramifications for US gambling policy, the US government itself claimed this as a victory because it would be easily able to adjust its laws to fit the ruling.²

The first policy measure to be successfully defended in full at the WTO based on Article XX came in 2001, with the EC-Asbestos case (DS135). The EC successfully maintained a French ban on asbestos against Canada’s protests, with the WTO panel and appellate bodies both finding that the measure was justified to protect human health. Furthermore, the (more senior) appellate body also said that health effects may determine if one product is ‘like’ another if it affects their competitive relationship in the marketplace (WTO Committee on Trade and Environment 2002;

¹ For example, Chile’s tax went up steeply between an alcoholic strength of 35% (the level of Chilean pisco) and 40% (that of foreign spirits). In the Chilean as well as similar Korean and Japanese cases the WTO ruled against the tax policy, although none of these were being defended substantially on the basis of Article XX.

² This was only decided on appeal, as the original dispute resolution panel believed that bilateral talks between the US and Antigua were a less-trade distorting alternative. This was thrown out by the Appellate Body, as “consultations are by definition a process, the results of which are uncertain and therefore not capable of comparison with the measures at issue in this case.” See Bridges Trade Digest, 17 Nov 2004 and 13 Apr 2005, available from www.ictsd.org/weekly/archive.htm and the Public Citizen press release <http://www.citizen.org/pressroom/release.cfm?ID=1915>.

Slotboom 2003). Taken together, these cases show that the WTO – in certain conditions – is prepared to prioritize health over trade interests. However, there are other outstanding concerns relating to alcohol and WTO law, to which this chapter will return after examining how alcohol is affected by trade law at the European level.

THE ALCOHOL TRADE IN THE EUROPEAN INTERNAL MARKET

Although the binding global commitments of the WTO are potentially important for health policy, by far the greater effect in practice has come from the trade law of the EU (see Box 8.3 and Figure 8.1).³ In 1986, EC Member States signed the Single European Act as a commitment to completing a single internal market in Europe by 1993. This internal market would be a place ‘without internal frontiers’ where goods, people, services and capital could move freely, thereby enhancing competition and consumer choice (see also COM (1999) 624). One part of this is the common definition of an alcoholic drink for tax purposes (in 92/83/EC), which include a minimum strength of 0.5% alcohol by volume for beer, 1.2% for wine and intermediate products and 22% for spirits (there are also thresholds for lowered tax rates for ‘low alcohol’ types set at 2.8% for beer and 8.5% for wine and intermediate products).

BOX 8.3 – THE EUROPEAN UNION (EU)

- **History:** The EU is the end result of a sequence of treaties between growing numbers of European States, dating back to the creation of the European Coal and Steel Community in 1951. The most recent of these agreements is the Treaty of Nice in 2000, which paved the way for the EU to take in 10 new Member States largely from eastern Europe.
- **Powers:** In these treaties, Member States have given the European Community a legal status and conferred powers on the EU that allow it to make binding legislation – although only in certain areas. All action must stay within this legal base (sometimes known as the principle of *conferral*), and meet two further tests to avoid being ruled *ultra vires* (beyond its power):
 - **Subsidiarity** – the EU should only act if its aims can be better achieved (due to either scale or effect) on a European level rather than local or national one. Another way of seeing this is that all action should take place on the lowest level that it can work successfully.
 - **Proportionality** – each action must be ‘proportionate’ to its aims, i.e. ensure that the means employed are suitable, and they do not go beyond what is necessary to achieve the aim
- **Non-legislative actions:** Where these tests are not met, there is sometimes the possibility for the EU to adopt non-binding positions known as ‘soft law’. These are often in the form of *Recommendations* for Member States to act in a certain way, or expressing *Opinions* that may pave the way for later legislation.

³ Although not members of the EU, Iceland and Norway (together with Lichtenstein) are members of the European Economic Area (EEA). This enables them to participate in the Internal Market, but they do not have a voice in decision-making. These three countries plus Switzerland are also members of the European Free Trade Association (EFTA), which conducts trade negotiations on behalf of its members.

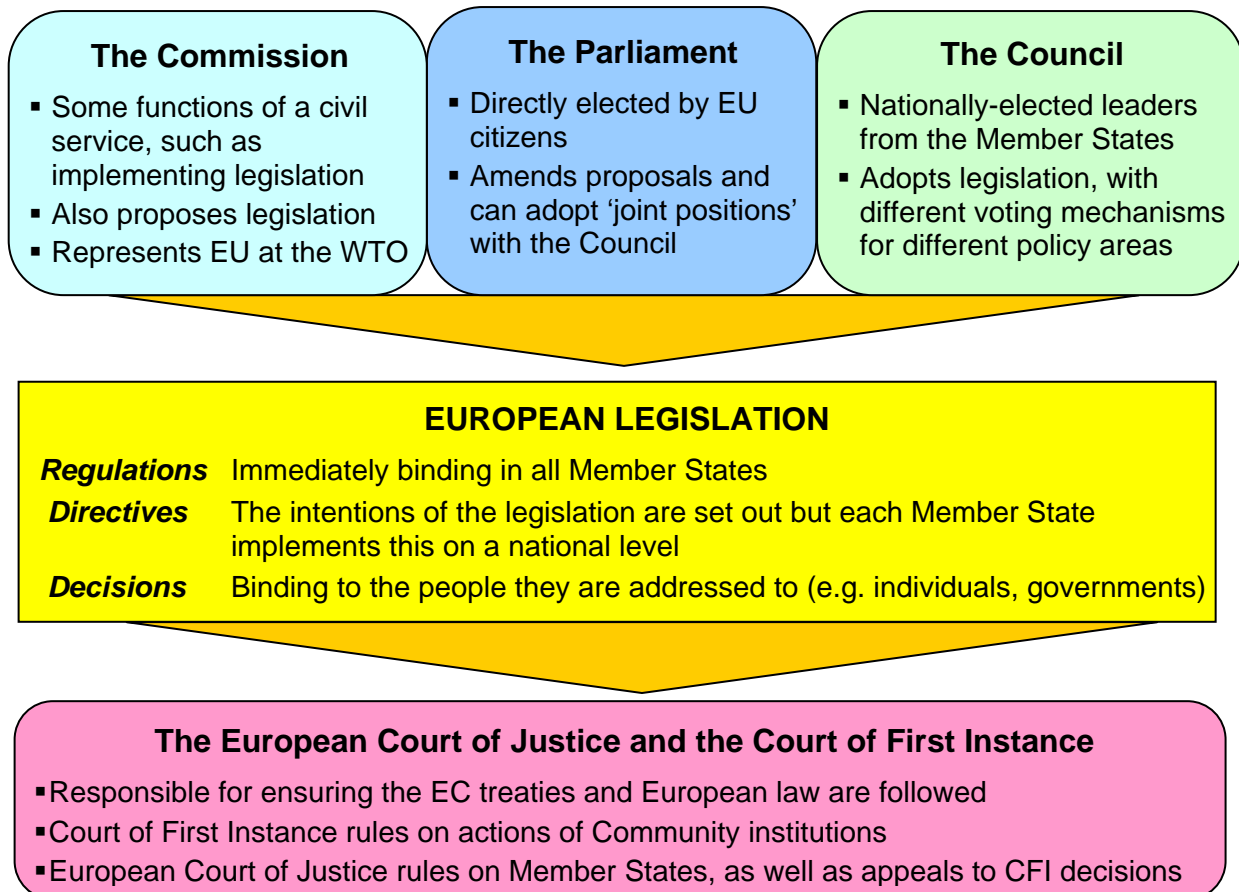


Figure 8.1 The key institutions of the EU

This market is certainly not yet complete, however, and discussions are ongoing to deepen and broaden it, such as in the proposed Services Directive.⁴ As on the global level, this introduces the question of how far public health policies can be maintained if they discriminate against other countries' trade interests. Contrary to the global level though, there is no one article that provides an overarching defence for health-motivated policies, which makes it important to look at the European trade rules commitment-by-commitment.

Tax and pricing policy

Most of the cases relating to alcohol stem from the 'national treatment' rule on taxation (article 90 ex 95)⁵, which allows no exceptions to be made on health grounds. This means that states are forbidden from discriminating in favour of domestic goods at the expense of those from elsewhere in the EU – which at its

⁴ Services are currently covered in analogous fashion to goods (articles 49, 46), but the Framework Directive on Services (COM (2004) 2) would go beyond this to remove many existing barriers to free trade. However, it has so far proved difficult to overcome the substantial differences between Member States on this policy.

⁵ These articles refer to the consolidated version of the European Community Treaty, available from http://ec.europa.eu/abc/treaties_en.htm.

simplest, has meant that French and Italian taxes favouring cognac over whisky were ruled illegal some time ago (C-168/78; C-169/78 & C-216/81).

Complications arise when there is uncertainty over whether drinks are 'similar', or whether dissimilar drinks types are nevertheless in competition with each other. On similarity, the courts have made clear that fruit and grape wines are similar, while champagne and fruit wines are less clear.⁶ Whisky and fruit wines have been found to be dissimilar though, due to a combination of objective criteria (e.g. raw materials, production processes, alcoholic strength) and whether they "*are capable of meeting the same needs from the point of view of consumers*" [C-243/84; "Johnny Walker"]

Perhaps the most famous case interpreting whether products were in competition comes from an examination of wine and beer in the UK in the 1980s. Here the court ruled that "*the tax policy of a Member State must not crystallize existing consumer habits so as to be biased in favour of the competing national industries,*" (the tax policy was also found to be disproportionate to any available criteria). Similarly, the 'cultural use' of a particular drink – in this case, drinking Danish aquavit with meals – has also been decided to be irrelevant for the *potential* competition of this drink with others [C-171/78 & C-68/79].⁷ Even for drinks in competition though, the Johnny Walker case found that there is no protectionist effect "*if a significant proportion of domestic production of alcoholic beverages falls within each of the relevant tax categories.*"⁸

Taken together, these cases suggest that Member States do have flexibility in setting the relative taxes on drinks but not to the extent that they can attach a greater tax to drinks only produced abroad. This means that a beer-producing country that taxes wine more than beer will have to be mindful of the relevant case law when setting tax rates, while it is perfectly free to tax beer more than wine (Elinder *et al.* 2003). A further judgement on valid criteria for taxation is likely to arrive with a pending case, where the Commission argues that the greater tax on wine over beer of identical alcohol content in Sweden is discriminatory (see IP/04/1280).

A similar conclusion has been reached on the legality of minimum pricing agreements, which may be ruled illegal where they stop low-price competition from abroad (as occurred for gin in the Netherlands in the 1970s; C-82/77). There have also been some discussions (particularly in the UK) on whether fixed minimum prices contravene European competition legislation on cartels. Legal opinions suggest that industry voluntary agreements may be illegal, but that statutory benchmarks within the marketplace are permissible, although further clarification has been requested (Baylis 2005; House of Commons Home Affairs Committee 2005).

Alcohol monopolies

EU attempts to reconcile monopolies and non-discrimination date back to the Treaty of Rome, and even by the 1970s, the European Court of Justice (ECJ) had shown

⁶ The champagne case was referred back to a national court to decide; see C-106/84; C-386/93 to C-377/93.

⁷ This has been clarified when a higher VAT on wine in Belgium was upheld: due to the high pre-tax price differential between beer and cheap wines, no practical effect of the tax could be observed, hence the drinks were not in potential competition [C-356/85].

⁸ An earlier case concerning France is also relevant here, finding that European law "does not prohibit the imposition on national products of internal taxation in excess of that on imported products" [C-86/78].

that while monopolies are allowable (e.g. case 91/78), exclusive import rights are not ('Manghera', C-59/75). Alcohol monopolies did not form part of the main agenda during the European Economic Area (EEA) accession negotiations, although the eventual 1994 agreement included a note where the countries stressed the importance of their monopoly systems. However, this was a statement of opinion rather than a legal agreement, and soon afterwards a European court ruled against the import rights of the Finnish monopoly in a landmark case (see Box 8.4; Österberg 1993; Lubkin 1996; Holder *et al.* 1998; Alavaikko and Österberg 2000).

Large parts of the alcohol monopolies in Finland, Norway and Sweden were, therefore, removed, leaving only the off-premise retail monopolies. While this was acceptable to the Commission, it took three further cases to establish that monopolies were legally valid as long as they fulfilled all Treaty requirements "save, however, for restrictions on trade which are inherent in the existence of the monopolies in question" (see Box 8.4).

Following these rulings the basis of the monopolies was unchallenged for several years, although practical details of the Swedish monopoly were sometimes questioned by the Commission (see Kühlnhorn and Trolldall 2000) while the EFTA Court ruled against the Norwegian monopoly on alcopops.⁹ However, in 2004 the Commission started proceedings against Sweden, arguing that the ban on consumers using private intermediaries to import alcohol is a disproportionate obstacle to the free movement of goods. Sweden maintains this is an integral and non-discriminatory part of the alcohol monopoly. It is currently unknown whether the court will accept the Commission's contentions that the restriction is not integral to the monopoly, and that public health can be protected by less trade-restrictive measures.

Box 8.4: KEY MONOPOLY CASES

Four case histories from the mid-1990s show the conditions under which alcohol monopolies can be maintained:

- **Restamark (E-194)** – the Finnish 'Restamark' company attempted to import alcoholic beverages against the Finnish law. The European Free Trade Association (EFTA) Court found that the import monopoly contravened the EEA agreement, a decision that helped unravel the Nordic import, export and wholesale monopolies.
- **Wilhelmson (E-6/96)** – the Norwegian shopkeeper Tore Wilhelmson appealed to the EFTA Court after being turned down for a beer licence by the state monopoly. The EFTA Court supported the retail monopoly.
- **Gunderson (E-1/97)** – again in Norway, Fritjof Gunderson asked the EFTA Court to allow him to sell wine in his store given that he could sell beer. Again, the EFTA Court defended the Norwegian policy
- **Franzén (C-189/95)** – in the only case to be brought under EU (rather than EEC) law, Harry Franzén deliberately broke the Swedish retail monopoly by selling wine in his shop. The ECJ ruled that the monopoly was non-discriminatory and therefore legal under EC commitments, and also decided that trade restrictions could be maintained if they were 'inherent to the existence of the monopoly'.

⁹ The case ruled against a restriction on (foreign-produced) alcopops being sold outside monopoly stores when (domestically-produced) beer of the same strength can be bought from grocery stores (E-9/00).

The health defence and advertising

For several EU Treaty commitments, restrictions of free trade can be defended on health grounds on similar terms to the WTO articles above. This includes quantitative restrictions (article 30, and has been broadly interpreted cf. C-8/74), the right of establishment (article 46), and services (article 55). As before though, these restrictions must be determined to be proportionate responses; that is, they cannot go beyond what is necessary to fulfil their aim.

This is particularly important for advertising regulations, which have been seen to reduce the ability of foreign firms to successfully enter a market compared to established ones, sometimes to a protectionist effect. Yet, despite the acceptance that advertising restrictions may discriminate against trade, only once has an advertising ban been struck down by the courts, and this was for a clearly discriminatory ban on certain drinks advertising (C-152/78, in parallel to C-168/78). Even here though, the court accepted that *“it is in fact undeniable that advertising acts as an encouragement to consumption”* (a verdict repeated in each of the more recent cases).

Box 8.5: THE LOI EVIN

The ban in France on alcohol advertising in ‘bi-national’ broadcasts¹ was upheld by the European Court of Justice in 2004. The court stated:

- *“It is for the Member States to decide on the degree of protection which they wish to afford to public health and on the way in which that protection is to be achieved”*
- *The law “[reduces] the occasions on which television viewers might be encouraged to consume alcoholic beverages”*
- *“The French rules on television advertising are appropriate to ensure their aim of protecting public health”*
- *The laws “do not go beyond what is necessary to achieve such an objective”*

¹ *Bi-national broadcasts are those to be broadcast in two countries only*

Source: C-262/02 and C-429/02

On only one other occasion has the court not fully confirmed the legality of an advertising restriction, when discussing a complete ban on alcohol advertising in print media in Sweden. As before though, previous points of law were confirmed, but the issue of whether a complete ban was proportionate was passed back to the Swedish national court – and it was they who ruled against the policy (the Gourmet Foods case, C-405/98).¹⁰

In the three other cases though, the courts have unambiguously supported advertising bans. First, a ban in Catalonia on advertising drinks over 23% absolute volume in public places was upheld with the comment that *“in principle, the [23%] criterion does not appear to be manifestly unreasonable as part of a campaign against alcoholism”* (C-190 and C-176/90). Second, in a celebrated recent case, a French ban on alcohol advertising in ‘bi-national broadcasts’ was upheld (the loi Evin; see Box 8.5 above). Most recently of all, the EFTA court affirmed the previous

¹⁰ The Swedish Market Court ultimately decided that the public health benefits of a print media ban were *not* proportionate to the restrictions on trade. Certain aspects of the situation did not help the case, such as the existence of ‘editorial advertising’ that tends to favour domestic goods, and the proliferation of internet advertising. In response, new legislation was passed outlawing print advertising for products over 16% alcohol volume, followed in January 2005 by compulsory warning labels on all print advertisements.

reasoning but left the advertising restrictions with no case to answer on a technicality (E-4/04).

Although yet another case is pending,¹¹ the basic opinion of the courts is clear: advertising restrictions may infringe trade commitments, but (if proportionate) they are justified by the aim of protecting health, since advertising acts as an encouragement to consumption.

Conclusions on trade law

In conclusion, it is inaccurate to suggest that the WTO or European courts have been entirely oblivious to health concerns when it comes to alcohol. Nevertheless, the lack of public health representation within trade negotiations (Room and West 1998:85) means that a number of risks should be monitored at the EU level, and, particularly, at the WTO:

- *Trade creep*: within the WTO, the most severe clauses are all voluntarily signed but then effectively locked-in, due to the cost of negotiating compensatory payments to other countries (Sinclair and Grieshaber-Otto 2002). This occurs in a context of ongoing pressure from commercial, trade and economic sectors to make further commitments and also pressure other countries to do so (Gould 2004). Perhaps of even more concern is the potential for WTO panels to interpret agreements more broadly than originally intended – even the US has made commitments on gambling that it has shown it never intended to make (see also Wallach 2005).¹² Furthermore, the ongoing process of negotiations may lead to new trade agreements with further implications for health policy, such as the ‘expropriation of investment’ agreements within the North American Free Trade Association (NAFTA; Gould 2005).

In light of these concerns, some WTO members (including Bulgaria, Poland, Slovenia, and Switzerland, but not the EU)¹³ have already attempted to exempt alcohol restrictions from advertising commitments under GATS (Gould 2005). In similar fashion, health stakeholders should, therefore, work with national and international trade representatives to make sure that the ‘health policy space’ for future generations is fully considered when making WTO trade commitments at the present time.

- *Domestic Regulation*: this clause in GATS (Article VI) commits states to negotiations aimed at ensuring that qualification, licensing and technical standards are “*not more burdensome than necessary to ensure the quality of the service*” (Honeck 2004). How to turn this broad commitment into a clearly defined regulation is currently under negotiation (Mamdouh 2004), with some expressing concern that it will become a necessity test for non-discriminatory policy (Sinclair 2000), making the vast majority of national

¹¹ On this occasion, a request from Norway for an EFTA opinion on the proportionality of an advertising ban within a specialty wine publication; E-4/04.

¹² The panel remarked, “the US may well have inadvertently undertaken specific commitments on gambling and betting services. However, it is not for the Panel to second-guess the intentions of the US at the time the commitment was scheduled. Rather, our role is to interpret and apply the GATS in light of the facts and evidence before us.” The panel’s verdict in this area was upheld in an appeal. See Bridges Trade Digest, 17 Nov 2004 and 13 Apr 2005, available from www.ictsd.org/weekly/archive.htm.

¹³ Before the accession of the new Member States in May 2004, Poland and Slovenia were represented separately from the EU at the WTO, and hence have made different commitments in certain areas.

policy potentially dependent on WTO Panel decisions (Wallach 2005). The WTO's working group on this has noted that a necessity test must "[demonstrate] credibly that such a test can be applied in a way that does not threaten legitimate regulatory autonomy" (Mattoo 2004), but even so some commentators have advised that the clause should be monitored in relation to health policy (Fidler and Drager 2003; Gould 2005).

- *The health defence*: article XIV within GATS has never been tested, and it has been suggested that there may be future challenges to labelling standards (violating trademark rights), ingredient disclosure rules (violating trade secrets); local monopolies, and advertising bans (favouring domestic producers) (Callard, Chitanhondh, and Weissman 2001; Grieshaber-Otto and Schacter 2002; Secretariat of the Pacific Community 2005). Similarly, there have been suggestions that other trade agreements – such as Technical Barriers to Trade (see e.g. WHO and WTO 2002), or the Trade-Related Aspects of Intellectual Property Rights (which has no overriding health defence) – may produce challenges to ingredient restrictions or compulsory health warnings (Secretariat of the Pacific Community 2005). In this context, research demonstrating the effectiveness of policy options (including mixes of policies) may well play an important role in future WTO cases.

Given these concerns, some commentators have stated that alcohol should be viewed as no ordinary commodity and that alcohol control policies should take precedence over trade negotiations (Grieshaber-Otto, Sinclair, and Schacter 2000; Jernigan *et al.* 2000). However, others have argued that such an approach would protect discriminatory control policies that might invite retaliatory measures (Chaloupka/Laixuthai 1996), making alcohol a potential bargaining tool in trade negotiations (Grieshaber-Otto and Schacter 2002). Moreover, there may not be the political will to achieve this in a WTO that is "*already staggering under the weight of the current trade agenda*" (Bettcher and Shapiro 2001:67). Nevertheless, the assembly of the World Medical Association has recently recommended that "measures affecting the supply, distribution, sale, advertising, promotion or investment in alcoholic beverages be excluded from international trade agreements" (World Medical Association 2005), while health ministers in the Pacific Region have agreed to work towards removing alcohol and tobacco from the Pacific Island Countries Trade Agreement (PICTA) in 2005.

Irrespective of this debate, it seems essential to improve the coordination between policymakers in the trade and health sectors to ensure any tensions between the sectors are minimized. A 2005 paper presented to the Executive Board of the World Health Organization made similar suggestions, arguing that health policymakers need to become more trade-aware, and that they also should help trade negotiators become more health-conscious (WHO 2005). It also noted that this "*requires rigorous research on the potential implications of trade agreements on health and of trade liberalization in health-related sectors on health-sector performance and health outcomes.*" The first half of this chapter suggests that these general health actions are as applicable in the alcohol policy sphere as when discussing health systems.

ALCOHOL AS AN ECONOMIC COMMODITY

International policies that deal with alcohol as an economic commodity can have important consequences for public health policy on alcohol. One positive example is that of the World Bank (the body providing loans and technical assistance to low and middle income countries in order to reduce poverty). In 2000, the Bank recognized that investment in alcoholic beverages was sensitive, and mandated all its employees to be 'highly selective' in only supporting projects "*with strong developmental impacts which are consistent with public health issues and social policy concerns*" (World Bank Group 2000).¹⁴

Of more importance in a European context is the position of health within economic decision-making within the EU. When taking actions to improve the workings of the European internal market, the EU institutions are legally obliged to ensure "a high level of human health protection" (see Box 8.6). Given that the EU has no legal powers to pass legislation specifically oriented to health (see below), this means that the only possibility of legislating for health on the European level is in the context of internal market reforms (as has been found for the legislation on tobacco advertising; see The ASPECT Consortium 2004).

This section looks in detail at four European policy areas that deal with the trade aspect of alcohol, and summarizes the significant implications of these for public health policy.

European alcohol taxes

Standardized excise duties are a longstanding goal of the EU, (see COM (72) 225 in the early 1970s), mainly because the combination of a single market together with wide excise variations leads to serious market distortions and lost tax revenue (see Chapter 3). Tax harmonization became a priority again in the 1980s with the extension of the internal market in the Single European Act, and a number of proposals for harmonized and target rates were put forward.

However, as fiscal policy requires unanimous agreement, the EU alcohol tax regime agreed in 1992 fell a long way short of full harmonization. The first of the two Directives – known as the Structures Directive (92/83/EEC) – detailed the method of calculating duty, the definitions of different products, and some of the derogations (exceptions). The excise rates themselves are detailed in the Approximating Directive (92/84/EEC), but are minimum rates only, with the target rates reduced to a (non-binding) note in the minutes. Wine was subject to no tax at all, leaving this beverage type as effectively un-harmonized.

One way of interpreting this is to see it as an attempt to let the market lead tax harmonization, with private individuals personally bringing back alcohol from abroad to avoid domestic duties (Holder *et al.* 1998). Large differences in tax rates between nearby countries, therefore, lead to large amounts of shopping abroad and lost revenue for high-tax governments, which will face pressure to lower their taxation rates (see also Chapter 3). Such chain reactions have occurred at several points

¹⁴ The Group has also published a report on gender inequalities in alcohol consumption and harms in Latin America and the Caribbean (Pyne, Claeson, and Correia 2002).

over the past 10 years, e.g. loosened import restrictions and the continuing tax differential between Denmark and Germany being followed by tax cuts in Denmark and then Sweden, and recent duty reductions in Denmark and Finland following the accession of Estonia to the EU. Private transfers may also rise in the near future, with the UK being challenged by the Commission through the ECJ for excessive penalties against small-scale smuggling by individuals in single vehicles, and also given recently expired derogations in Finland, Sweden and Denmark that previously allowed limits on private transfers within the EU.¹⁵

Box 8.6 The EU's legal commitment to health	
<i>Subject, and article in current Treaty</i>	<i>Description</i>
Activities of the EC <i>Article 3</i>	“The activities of the Community shall include...a contribution to the attainment of a high level of health protection”
Laws on the internal market <i>Article 95 (3)</i>	“The Commission, in its proposals... concerning health, safety, environmental protection and consumer protection, will take as a base a high level of protection, taking account in particular of any new development based on scientific facts.” “Within their respective powers, the European Parliament and the Council will also seek to achieve this objective.”
Public health in the EC <i>Article 152</i>	“A high level of human health protection shall be ensured in the definition and implementation of all Community policies and activities.” “Community action, which shall complement national policies, shall be directed towards improving public health, preventing human illness and diseases, and obviating sources of danger to human health.”
Other mentions <i>Articles 153, 175, 137</i>	Consumer protection: “In order to promote the interests of consumers and to ensure a high level of consumer protection, the Community shall contribute to protecting the health, safety and economic interests of consumers” Health and environment: “Community policy on the environment shall contribute to...protecting human health...” Workers' safety: “the Community shall support and complement the activities of the Member States in... improvement in particular of the working environment to protect workers' health and safety”
The health defence	Available to justify policies contrary to obligations on quantitative restrictions (article 30), free movement of workers (article 39 (3)), and on the right of establishment (article 46).

These likely increases in private transfers arise at the same time as a Commission-launched debate on alcohol excise duty rates, which is trying to find some way of reducing competition distortions, or at least to increase the minimum rates in line with inflation (24%) so that they do not become meaningless (COM (2004) 223). However, the EU Member States are still a long way from unanimous agreement on this issue. Many wine-producing countries see a zero tax on wine as essential for the functioning of the Common Agricultural Policy (CAP), especially given endemic problems in the European wine sector in recent years (see below). The higher-tax countries conversely feel that any move – even up-rating the minimum duties – should be conditional on introducing a positive duty for wine. Given the difficulties in

¹⁵ Norway has been able to retain border controls given that it lies outside the EU.

satisfying both these views simultaneously, it may be difficult for this long-running problem to be resolved within the current debate.

Aside from this relatively old problem for public health policy on alcohol, a new problem may arise from another Commission proposal from 2004, which suggested a further liberalization of intra-EU alcohol transfers (COM (2004) 227). The Directive would allow consumers buying non-commercially at distance – such as over the internet – to pay the tax level of the product's country of origin, even if they do not accompany it over the border themselves. It also proposed that the burden of proof over the indicative limits is changed from the individual (to show the goods are for private use) to the state (in showing that the goods are for commercial use). Industry groups have predicted that this would lead to 'agency traffic' where one person buys for many others on a non-commercial basis, and would make the commercial clause itself very difficult to police. More importantly in the present context, this would be likely to increase the scale of cross-border shopping and would thereby severely reduce Member States' control of their alcohol taxation policy. This is despite tobacco being exempted from the Directive on the grounds that "if applied to these products, the above principle would *inter alia* contradict the health policy advocated in Article 152 of the Treaty in particular (COM (2004) 227)."

Nevertheless, the Commission's proposal was supported by the European Economic and Social Council and the European Parliament, with the latter noting that "it is obvious that the amendments as formulated will mainly affect alcoholic beverages. Although no impact assessment has been carried out into the economic implications of such liberalisation, the Commission is not expecting any explosive increase in the type of transaction concerned." However, the proposal is far from a *fait accompli* at the time of writing (November 2005) – currently the Commission has rejected European Parliament amendments relating to the nature of 'personal use', and the Council has yet to issue its formal position on the draft.

Labelling and packaging

Wines and spirits traded within the EU internal market have to conform to a number of technical regulations, relating to both their labels and their packaging more generally. While these are based on trade and consumer concerns rather than health, it is worth being aware of this body of legislation as a context for potential future health-focused recommendations in this area (see Chapters 7 and 10).

Probably the greatest amount of regulation on labelling is dedicated to protecting producers' rights to use certain names when describing their drinks, a concern that also links to the TRIPS agreement in the WTO (see above). The key legislation for spirits in this regard is a 1989 Regulation on the definition, description and presentations of spirits (EEC 1576/89), which sets out the conditions necessary for a drink to be described as 'whisky', 'rum' etc. This includes a *minimum* alcoholic strength for each type of drink, generally set at 37.5% alcohol concentration (although there is some variation; whisky, for example, must be 40% concentration or greater), and also specifies the size that this is displayed on the label.

Legislation for wine is both more complicated and more controversial, with Regulation 753/2002 subject to considerable US pressure over protection for geographical indicators, resulting in the more recent Regulation 316/2004. Wine labels must include a set of compulsory information within a single field of vision (i.e. visible without turning the bottle), including alcoholic strength (with a specified

minimum text size, as for spirits), country of origin (for imports), production lot and other details.

More generally, all alcoholic drinks over 1.2% volume are required to state their alcohol content on their label (Directive 2000/13/EC Article 3.10). Amendments to the same Directive also require all products containing certain allergens to list these on the label (Directive 2003/89/EC). In addition, wine and spirits must indicate “contain sulphites” since November 2004. Directive 2005/26/EC allows further research to see if some other ingredients are (or are not) to be considered allergenic. Further requirements relating to ingredients listing may also be impending, following a recommendation from the Evaluation of EU Labelling Legislation that the feasibility of mandatory listing of ingredients on alcoholic beverages should be investigated.¹⁶ This was based on ‘strong convergence’ among stakeholders that this is desirable, and DG SANCO expect to propose legislation on labelling in response to the study in 2006.

Beyond labelling, EU law specifies common sizes for pre-packaged alcoholic drinks, which must be accepted for intra-Community trade by all EU countries (Directive 75/106/EEC). The specified sizes are the only allowable ones for wine and spirits, but Member States are allowed to use other sizes within their national markets for beer.¹⁷ Originally the harmonization was motivated by consumer protection, but more recent legislation on unit pricing, misleading advertising and labelling requirements have made this redundant. Nevertheless, a Commission proposal to replace this legislation (COM (2004) 708 final) recommended keeping similar fixed sizes for wine and spirits to help smaller producers given the power of buyers and sluggish growth.¹⁸ The Commission proposed that these fixed sizes should only be kept for 20 years to allow smaller producers time to adapt, after which the wine and spirits market would revert to free sizes.

Other EU internal market legislation

The most important other piece of internal market legislation involving alcohol is within audiovisual policy. Here the Television Without Frontiers (TVWF) Directive contains a specific clause on alcohol advertising (see Box 8.7) as well as a more general requirement that minors should be protected from programmes that may inhibit their physical, mental or moral development. The alcohol clause was included when freedom of movement of television programmes was introduced, so that the country of origin principle (where a programme legal in its home broadcasting country can be shown anywhere in the EU) can coexist with a ‘high level of health protection’. Current discussions on revising the legislative framework for audiovisual services include considerations of new media and below-the-line¹⁹ advertising (as outlined in

¹⁶ pp14, http://ec.europa.eu/comm/food/food/labellingnutrition/foodlabelling/effl_conclu.pdf.

¹⁷ For example, all spirits must come in containers of size 20-30-40-50-200-350-500-700-1000-1500-2000-2500-3000-4500ml. Sizes of 100-1125-5000-10000ml are also allowed for trade use only. For full details on the common sizes in wine and beer, see http://ec.europa.eu/eur-lex/en/consleg/main/1975/en_1975L0106_index.html; for details on the newly proposed sizes see COM (2004) 708 final.

¹⁸ See also “Pack sizes in the EU: Report on the extended impact assessment of sectors asking for fixed sizes” available from http://ec.europa.eu/comm/enterprise/prepack/packsizes/packsiz_en.htm.

¹⁹ Below the line is an advertising technique which uses less conventional methods of advertising, typically focusing on direct means of communication, most commonly direct mail and e-mail, and often using highly targeted lists of names to maximize response rates. This differs from above the line advertising which makes use of traditional media such as newspapers, magazines, radio and television.

Chapter 7), and there have been suggestions that product placement may be legalised for certain types of programmes (see The Economist “Lights, cameras, brands,” Oct 27 2005).

Several other proposals affecting alcohol are also under discussion at the present time, although their final form is uncertain. The most advanced of these is the Commission’s draft Health Claims Regulation (COM (2003) 424), which aims to better inform consumers and aid harmonisation of the market. In keeping with article 95, the draft regulation would only allow health claims if the product truly contributes to a healthy diet – and as such would exclude all alcoholic drinks over 1.2% alcohol by volume. At the time of this report (November 2005), this particular proposal (included in article 4) had been rejected by the European Parliament, although the Council had re-stated their determination to include the article in the final piece of legislation.

Other ongoing discussions relate to ingredients labelling for alcoholic drinks (discussed above) and the draft Sales Promotions Regulation. The most recent draft at the time of writing (November 2005) would place alcoholic beverages outside the scope of the legislation, although as this draft was rejected by Member States in late 2004 there is uncertainty as to the future of the whole regulation.

BOX 8.7: THE TELEVISION WITHOUT FRONTIERS DIRECTIVE (TVWF)

Article 15 of the TVWF requires that Member States must ensure *as a bare minimum* that alcohol advertising does not:

- “aim specifically at minors” (especially showing them drinking);
- link consumption to driving or “enhanced physical performance” (not including sport);
- suggest that alcohol “contributes towards social or sexual success”;
- “claim that alcohol has therapeutic qualities or that it is a stimulant, a sedative or a means of resolving personal conflicts”;
- “encourage immoderate consumption of alcohol or present abstinence or moderation in a negative light”;
- “place emphasis on high alcoholic content” as a plus point”.

Source: 89/552/EEC, amended by 97/36/EC

The Common Agricultural Policy

In the year 2002, €1.5 billion was spent by the European Union in the EU15 supporting the production of wine through the Common Agricultural Policy (CAP) – equivalent to 30 times the entire annual public health budget. The CAP was originally set up in the 1960s to ensure a fair standard of living for farmers and to secure the survival of small farms, although as the nature of the business has changed the objectives have shifted towards environmental and social concerns. Since the enlargement of the EU in 2004, six of the new Member States have also started to receive funds for restructuring vineyards, although the €20m they receive is only a small fraction of the total €450m restructuring budget.²⁰ As shown in Chapter 3, the production of wine is an important part of many regional economies in southern Europe, and it has been suggested that the value of wine output may be over 20% of the total value of agricultural output in some regions (Österberg and Karlsson 2002).

²⁰ The countries receiving money (in descending order of money given) are Hungary, Slovenia, the Slovak Republic, Cyprus, the Czech Republic and Malta). The relatively small amount of the budget they receive is mainly due to the much smaller total area of vineyards involved; see IP/04/1193.

Wine under the CAP has been experiencing problems since the 1970s, with expanding production (and later falling demand) leading to large wine surpluses. Wine policy has, therefore, involved bans on planting vines and distillation measures, with the result that wine production has fallen from an average of around 210m hectolitres to 180m since the early 1980s.²¹ The 'Agenda 2000' proposals included incentives to produce quality rather than table wine, and for a short period of time co-financed some sales promotion campaigns for the "health benefits of moderate wine consumption" (Regulations 2702/1999 and 2826/2000) (see also Lock and McKee 2005:20). However, after 2002, the Commission Regulations laying down detailed rules for applying Council Regulation (EC) No 2826/2000 on information and promotion actions for agricultural products on the internal market no longer include any message on health benefits as regards wine (see, for example Commission Regulation 1071/2005).

Nevertheless, a combination of intensified international competition (including cuts in export subsidies and tariffs due to GATS), a strong Euro, and recent high yields have led to a European surplus that stood at 35.5m hectolitres in 1999-2000 (Elinder *et al.* 2003; Furlani and *et al.* 2003), in parallel to a global surplus estimated at 57m hectolitres for 2004 (World Drinks Report, 28 April 2005).²² As an emergency measure, the Commission has agreed to pay €145m for crisis distillation in France and Spain, in return for digging up vines and curbing plantings (Bloomberg 29/4/05). This can be considered as a withdrawal of alcohol from the market, since the alcohol resulting from crises distillation can be used as fuel.

The CAP subsidies (including the indirect subsidy of crisis distillation) are likely to have distorted the market in wine, although quantifying this effect has proved difficult (Furlani and *et al.* 2003). The Commission has also admitted that the most recent CAP wine measures have not had the desired effect, and plans to launch a new strategy in Spring 2006 to try and rectify the structural imbalance (Just Drinks 15/3/05).

Absent from the CAP is any mention of articles 152 and 153 (see box 8.9) emphasizing the role of the Community to have a high level of human health protection in all its work (see also Lock and McKee 2005).²³ This is particularly striking given that the imbalance in the wine sector has hindered negotiations on tax harmonization, with some arguing that CAP wine reform is vital to move forward on tax (Elinder *et al.* 2003). Yet in parallel fashion to tobacco leaves – where the CAP subsidy has been described by the European Court of Auditors as "a misuse of public funds" – the economic and political importance of the subsidies makes it hard to progress from a public health perspective (Hämäläinen, Koivusalo, and Ollila 2004).

ALCOHOL POLICY ACROSS BORDERS

The international level also offers the opportunity for countries to come together in reducing the harm done by alcohol, with such action growing alongside trade-

²¹ European Commission official statistics obtained from http://ec.europa.eu/comm/agriculture/markets/wine/facts/index_en.htm.

²² Current negotiations at the WTO may also be relevant, with proposals to reduce allowable levels of trade-distorting support and possibly caps on all production and tariff supports in food and drink (Aroq Ltd. 2004).

²³ Although, under the new CAP system, farmers who receive direct income payments will have to respect, among others, environmental, health and safety standards.

oriented debates during the 20th century. One of the oldest of these agreements is the founding statement of the International Labour Organisation (ILO) dating from 1949, which forbids the payment of wages *'in the form of liquor of high alcoholic content'* or in taverns (except for the tavern's employees). Since then, the ILO has been active in trying to reduce workplace substance abuse around the world, including the publication of a 1995 Code of Practice on managing workplace alcohol-and-other-drug issues (ILO 1996).

A much more general agreement with some relevance for alcohol comes from the Council of Europe, who created the Convention for the Protection of Human Rights and Fundamental Freedoms in 1953. This Convention – separate from the EU institutions, but including all the EU states among its 46 members – is governed by the European Court of Human Rights, although cases rarely impact on alcohol policy. However, the Valencia authority lost a recent case for not securing the right to respect of the home, in this case from noise caused by local bars and clubs (application 4143/02).

The World Health Organization

Unsurprisingly, the international body most active on alcohol has been the World Health Organization (WHO), which has passed more than 10 alcohol-related resolutions at its governing World Health Assembly. In 1979, the Assembly noted that *"problems related to alcohol, and particularly to its excessive consumption, rank among the world's major public health problems."*

A similar sentiment was repeated over 25 years later in 2005, when the Assembly recognized that *"harmful drinking is among the foremost underlying causes of disease, injury, violence – especially domestic*

violence against women and children – disability, social problems and premature deaths, is associated with mental ill-health, has a serious impact on human welfare affecting individuals, families, communities and society as a whole, and contributes to social and health inequalities" (see Box 8.8).

Box 8.8: "PUBLIC HEALTH PROBLEMS CAUSED BY HARMFUL USE OF ALCOHOL"

Resolution 58.26, which was passed at the World Health Assembly in May 2005, requested the WHO to:

- Strengthen the WHO Secretariat's capacity to support states and reinforce the evidence on which policies work
- Draw up recommendations for effective policies and interventions
- Report to the 2007 Assembly on evidence-based strategies to reduce alcohol-related harm, including a comprehensive assessment of all alcohol-related public health problems
- Strengthen global & regional information systems
- Promote effective policies in health-care settings
- Collaborate with governments, health professionals, NGOs and others
- Consult with industry representatives
- Report to the 2007 Assembly on the progress made on this resolution

The WHO has also brokered the first ever global public health treaty, the Framework Convention on Tobacco Control (FCTC), which entered into force on 28 February 2005. The FCTC was agreed by all 192 Member States of the WHO in 2003 but only applies to those countries that have ratified it – at the beginning of November 2005,

this stood at the Union as a whole and 19 individual Member States, but states are freely able to join the convention at a later date.²⁴ Parties to the FCTC commit to minimum levels of tobacco control, including comprehensive bans on tobacco advertising; health warnings on tobacco packaging covering 30+% of the display areas; protection of citizens from tobacco smoke in workplaces, public transport, and indoor public places; and increased, harmonized tobacco taxes.

Drawing on the experience of the framework convention on tobacco control, Room (2006) has identified several justifications for an international legally binding agreement. These are (i) to protect consumers from the harm done by alcohol; (ii) the scope of the damage; (iii) substantial harm in most regions of the world; (iv) harm done by alcohol transcending national borders; (v) difficulty of dealing with the harm done by alcohol by countries in isolation; and (vi) lack of any suitable pre-existing convention or other international agreement.

Room noted that it would be technically possible to manage alcohol through an international agreement by adding it to the lists of substances covered by one or more of the three existing Conventions controlling drugs. For example, he reported that a “*psychotropic substance*” may be scheduled under the 1971 Convention “*if the World Health Organization finds that the substance has the capacity to produce a state of dependence, and central nervous system stimulation or depression, resulting in hallucinations or disturbance in motor function or thinking or behaviour or perception or mood, and that there is sufficient evidence that the substance is likely to be abused so as to constitute a public health and social problem warranting the placing of the substance under international control*” (United Nations 1976). He notes that, although the framers of the 1971 Convention had not intended alcohol to be included, it certainly qualifies according to the Convention’s Schedule II: “*substances whose liability to abuse constitutes a substantial risk to public health and which have little to moderate therapeutic usefulness*”.

Since adding alcohol to the 1971 Convention is unlikely to receive political support, an alternative option is to consider a Framework Convention on Alcohol Policy, similar to the FCTC. It has been suggested that such a convention should start from the basis of the very substantial health and social problems from alcohol, which make it “no ordinary commodity” to be dealt with like bread or orange juice in the marketplace. It has further been suggested that such a convention could then identify policy areas for collective action (including marketing restrictions and tackling the illicit trade in alcohol) as well as urging countries to implement effective and evidence-based policies within their national boundaries (Anderson 2004). This process could help to: mobilize national and global technical and financial support for alcohol policy; raise awareness across different government ministries (and other health bodies) on alcohol policy; strengthen national legislation and action; and mobilize NGOs and other members of civil society in support of alcohol policy.

The World Health Organization in Europe

The European Office of the WHO (WHO-EURO) has undertaken several initiatives to reduce alcohol-related harm in its Member States, of which there are currently 52, including all the states of the EU. The European Commission itself has long-standing

²⁴ <http://www.who.int/tobacco/framework/>, 7 November 2005.

Box 8.9: THE EUROPEAN CHARTER ON ALCOHOL

Adopted at the WHO Ministerial Conference in Paris in 1995, the Charter promoted five ethical principles:

1. All people have the right to a **family, community and working life** protected from accidents, violence and other negative consequences of alcohol consumption.
2. All people have the right to valid **impartial information and education**, starting early in life, on the consequences of alcohol consumption on health, the family and society.
3. All children and adolescents have the right to **grow up in an environment protected** from the negative consequences of alcohol consumption and, to the extent possible, from the promotion of alcoholic beverages.
4. All people with hazardous or harmful alcohol consumption and members of their families have the right to **accessible treatment and care**.
5. All people who do not wish to consume alcohol, or who cannot do so for health or other reasons, have the right to be safeguarded from **pressures to drink** and be supported in their non-drinking behaviour.

bilateral relations with WHO-EURO, although cooperation has been less structured for alcohol than in other fields such as obesity or mental health.

The first global Health for All targets in 1991 included a target to reduce the 'health-damaging consumption' of alcohol, and more specifically "to reduce alcohol consumption by 25% with particular attention to harmful alcohol use" (Harkin, Anderson, and Lehto 1995; Solco *et al.* 2003). In 1992, the WHO-EURO Member States adopted the European Alcohol Action Plan (EAAP) from 1993-2000 (World Health

Organization 1992), aiming to reduce overall consumption as well as using measures to combat high-risk drinking behaviours. This was followed three years later by a WHO Ministerial Conference, held in 1995 in Paris, The European Charter on Alcohol was agreed at this conference, setting out five ethical principles to underpin alcohol policy (see Box 8.9; World Health Organization 1995).

Evaluating the EAAP in 1998, WHO-EURO noted that over half of the countries had developed a country alcohol action plan and had a coordinating body responsible for its implementation (see WHO-EURO 1999; Rehn, Room, and Edwards 2001). Of those countries where data were available at the time of the review, 11 had seen a decrease in per capita consumption and 3 (Italy, Poland, Spain) had achieved the European target of the health for all (HFA) policy of a 25% reduction, but 11 countries had experienced an increase in consumption since 1992. The alcohol and hospitality industry were also considered to play an insufficient role in preventing alcohol-related harm.

The original Health for All target and the EAAP have both been superseded by more recent versions. The new target set from 2000 aims that "by the year 2015, the adverse health effects from the consumption of addictive substances such as tobacco, alcohol and psychoactive drugs should have been significantly reduced in all Member States." The new EAAP 2000-5 was adopted by WHO-EURO a year later in 1999 (World Health Organization 2000), and emphasized country-based planning and monitoring (see Box 8.8).

A second WHO ministerial conference was held in Stockholm in February 2001, addressing in particular the issue of young people and alcohol. The resulting 'Stockholm Declaration' not only reinforced the earlier European Charter on Alcohol, but also set a number of targets including:

- Reduced numbers of drinkers, levels of high-risk drinking, pressures (including marketing) and alcohol-related harm (especially for young people);
- Delayed onset of drinking in young people; and
- More alternatives to drinking, more young people's involvement in health-policy (including alcohol policy), and more education.

Furthermore, it confirmed the need for public health and alcohol policy to be developed without any interference from commercial or economic interests.

Action in several related areas has also referred to alcohol, including the 2005 WHO Ministerial Conference on Mental Health that committed Member States to address the causes of harmful alcohol use disorders, and to support NGOs that are active in this area. Similarly, the draft European Strategy for Child and Adolescent Health and Development (Feb 2005) mentions alcohol in the context of harm to unborn children, reducing exposure of late childhood to risky behaviours like alcohol, and prevention of risky behaviours of adolescents with respect to alcohol. The Regional Committee's discussions on the upcoming strategy on non-communicable diseases also noted that they were "conscious that the most prominent noncommunicable diseases are linked to common preventable risk factors such as tobacco, alcohol, overweight and physical inactivity" (EUR/RC54/REC/1).

Throughout this recent period, a key role of WHO-EURO (sometimes in conjunction with the WHO head office) has been to set out the scientific basis for alcohol policy. The most prominent of these publications have been three major books co-sponsored by WHO-EURO over the past 30 years, representing collaborative efforts to set out the current 'state of the knowledge' at the time of publication (Bruun *et al.* 1975; Edwards *et al.* 1994; Babor *et al.* 2003). This has been supplemented by a series of wide-ranging background documents on particular technical aspects of alcohol and alcohol policy (Walsh 1982; Grant 1985; Partanen and Montonen 1988; Plant 1989; Anderson 1991; Anderson 1993; Hannibal *et al.* 1994; Harkin, Anderson, and Lehto 1995; Anderson and Lehto 1995; Anderson 1995; Heather 1995; Ritson 1995; Anderson and Lopez 1995; Lehto 1995a; Lehto 1995b; Anderson 1996; Henderson, Hutcheson, and Davies 1996; Montonen 1996; Harkin, Anderson, and Goos 1997; Rehn, Room, and Edwards 2001; Klingemann and Gmel 2001; WHO-EURO 2005).

Following on from the second EAAP that finishes in 2005, the Regional Committee of WHO-EURO has recently endorsed a new Framework on Alcohol Policy. The core principles of the EAAP have been maintained – including the importance of Member States' obligations to their citizens, the precautionary principle and the need to formulate public health approaches by public health interests – but places more emphasis on strategic guidance and different policy options as well as international collaboration.²⁵

²⁵ The Resolution, Framework and background papers are available from http://www.euro.who.int/Governance/RC/RC55/20050920_1.

Box 8.10 Framework for Alcohol Policy in the European Region	
<i>Area</i>	<i>Aims and objectives</i>
Strategies and action plans	There is a need for an action plan at the appropriate level as well as a national alcohol strategy, with the capacity to both implement measures and monitor and follow-up the plan. Local communities, multiple community sectors, tax/availability restrictions, parental programmes, drink-driving enforcement, brief interventions, and workplace interventions should all be considered within such a strategy.
Alcohol-free situations	A number of groups and situations should be kept alcohol free, including: (1) Young People, (2) Young People's Environment; (3) Road Safety; (4) the Workplace; and (5) Pregnancy.
Drinking guidelines	Many people have found a difficulty in interpreting guidelines, which can be treated as a baseline to range upward from. The WHO continues to have the message that 'Less Is Better'. Individual drinking guidelines for problem drinkers should be delivered in a healthcare setting.
Preventing problems	A national focus day to raise awareness of preventing alcohol-related problems could be an effective way of generating support for other policies.
Further research needs	While there is enough evidence to implement policies, further research should fill gaps in: (i) epidemiological studies in different societies; (ii) measuring unrecorded consumption; (iii) alcohol policy interventions' effects on different target groups in a wider variety of societies; (iv) cost-effectiveness. Additionally, an Expert Group on Alcohol Policy should be established.
Surveillance and monitoring	While WHO-EURO will continue to collect and analyse data, there is a need for harmonized measures of consumption and risk within a common monitoring system. This should contain measures of social problems experienced by others as well as the drinker. The European Alcohol Information System should be expanded to include information on legislation and marketing practices and to meet these other needs.
Training and capacity-building	This is an important aspect of building a multi-sectoral approach to tackle harm, and WHO-EURO will continue to assist Member States in this. Biennial Collaborative Agreements – providing a platform for national initiatives to support (sub-)regional actions – could be a key tool in implementing this.
Advocacy, networking and policy development	Popular communication is often a weakness for public health advocates, and WHO-EURO will try to strengthen links to improve communication through training and networking activities. The national counterparts for alcohol are expected to build up capacity at the national level, while WHO-EURO will create a European Coalition on Alcohol Policy Development formed of Member States and international organizations / institutions.

The Resolution endorsing the Framework in September 2005 (EUR/RC55/R1) also:

- *Urged Member States:* to (re)formulate national policies and action plans and strengthen international collaboration;
- *Urged International organizations and NGOs:* to work jointly with Member States and WHO-EURO to maximise the impact of the Framework; and
- *Requested the Regional Director:* to mobilize resources and other international organizations in support of the Framework; to assist Member States in their efforts; to revise and improve the European Alcohol Information System; and to organize a report on status and progress every three years.

This triennial report will be accompanied by a triennial high-level forum on alcohol policy within the Region to discuss the outcomes of the report. This will deliberate crucial and challenging issues, and consider cross-border and other issues that are beyond the scope of response of individual Member States.

The European Union and alcohol policy

With a few exceptions,²⁶ the EU cannot pass laws simply to protect human health as Member States have not conferred this power on the European institutions. Much of the EU's action on alcohol has, therefore, come through 'soft law', in the form of non-binding resolutions and recommendations urging Member States to act in a certain way, as well as research and information functions. Nevertheless, it is worth reiterating that there is substantial scope for health concerns to be incorporated within actions to improve the single market (see discussion above).

Non-legislative action on public health is grounded in the second Community public health programme 2003-8, which calls for strategies and measures on lifestyle-related health determinants including alcohol (1786/2002/EC). This may change, however, – the Commission has proposed that the health and consumer protection funding streams are merged from 2007, although the 2007-13 Financial Perspectives (of which this is a part) have not at the end of 2005 been confirmed by the Council and Parliament (COM (2005) 115). For both programmes, the Commission states that the subsidiarity test (see Box 8.3) is met due to the 'transnational character' of these health determinants, while the Council also stressed the need to reduce health differentials between Member States (COM (2000) 285, 2000/C 218/03).

As in the WHO, alcohol is sometimes mentioned in the context of wider health issues, such as in the recent Green Paper on a European Mental Health Strategy (COM (2005) 484). The current proposal aims to create a framework for cooperation, increase the coherence of actions and open up a platform for stakeholders (including civil society), and would focus on preventive efforts, quality of life and the creation of an information system. The Green Paper is currently out for consultation until May 2006, after which the Commission will analyse the responses and (depending on the result) propose a strategy in late 2006.²⁷

²⁶ These exceptions are for blood products, organs, and in the veterinary and phytosanitary fields.

²⁷ http://ec.europa.eu/comm/health/ph_determinants/life_style/mental/green_paper/consultation_en.htm.

Alcohol itself was first mentioned as a public health and social problem by the Council in 1986 (Official Journal C 184/02), and over the next 10 years was gradually legitimized through work in related areas, such as traffic safety, the Television Without Frontiers Directive (discussed above) and the Europe against Cancer programme. Following the Maastricht Treaty, €1.5m was given to health promotion projects in the alcohol field, although much of the effort of Directorate General (DG) V (and also now the Directorate General for Health and Consumer Protection (DG SANCO)) since has concentrated on building European opinion, developing interest groups, and ensuring a high degree of practical competence.

EU road safety policies have also often dealt with alcohol-related driving accidents, in particular the 'Commission Recommendation on the maximum permitted blood alcohol content (BAC) for drivers of motorized vehicles' in Jan 2001 (2001/115/EC).²⁸ This called for all Member States to adopt a BAC of 0.5g/L lowered to 0.2g/L for inexperienced, two-wheel, large vehicle or dangerous goods drivers, and random breath testing so that everyone is checked every 3 years on average. Take-up of the recommendation has since been encouraged by the European Road Safety Action Programme (COM (2003) 311), while the Commission has said that it will propose a Directive if insufficient progress is made towards a 50% reduction in road deaths by 2010 (2004/345/EC). Several other recent moves include efforts to tackle drink-driving, including harmonized penalties and the exchange of best practice (COM (2001) 370; 2004/345/EC).

Increasing action

Although there has been a rising and coordinated response to alcohol since the 1970s, alcohol policy has become more politically prominent in recent years partly driven by the sudden growth of alcopops from 1995. A working group on alcopops was established to move forward at a European level, which – together with the Stockholm Ministerial Conference (see above), a European Parliament declaration and several draft resolutions – led to a broader Council resolution of 5 June 2001 on the Europe-wide problem of drinking by young people, in particular children and adolescents (2001/458/EC).²⁹ This recommended multi-sectoral education and a more robust enforcement of underage drinking laws, as well as asking the alcohol industry not to target young people with their advertising. This view of the industry as a voluntary partner in the solution goes alongside confirmation from the Ministerial Conference that public health policy should be developed without any interference from commercial or economic interests (Sutton and Nylander 1999).

On the same day as the resolution on youth drinking, the Council invited the Commission to produce a strategy on alcohol-related harm in Europe.³⁰ This invitation was repeated in June 2004 when the Council adopted a follow-up conclusion on Alcohol and Young People, with the Council underlining that special attention should be paid to young people within the strategy.³¹ The strategy is currently being drafted and is expected to be published during 2006.

²⁸ The explanatory memorandum to the recommendation notes that although the Commission would ideally propose a directive to harmonize BAC limits, it realizes that there are longstanding objections on grounds on subsidiarity to such a move (dating from when it was previously attempted in 1988).

²⁹ http://ec.europa.eu/eur-lex/pri/en/oj/dat/2001/l_161/l_16120010616en00380041.pdf.

³⁰ http://ec.europa.eu/eur-lex/pri/en/oj/dat/2001/c_175/c_17520010620en00010002.pdf.

³¹ http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/lsa/80729.pdf.

For the years 2004-2006, the Commission has also co-financed an Alcohol Policy Network with representation in all Member States, applicant countries, Norway and Switzerland to inform the Commission in its alcohol related work.³² This is being coordinated by Eurocare,³³ a European non-governmental organization drawing together networks and organizations throughout Europe dedicated to the prevention of the harm done by alcohol since 1990.

CONCLUSION

The European and global dimensions of policy-making are increasingly important for public health policy on alcohol, and those making national health policies should consider three key messages. First, alcohol policies are subject to global and European trade law, which means that policies such as alcohol monopolies or certain tax systems can be ruled illegal. It is not fair to say that health considerations are ignored in this process, given a number of global and particular European cases establishing the primacy of health over trade interests. Nevertheless, health policy-makers should ensure that health policies interfere with trade as little as possible, and should monitor the risks inherent in the process of trade liberalization, especially at the global level.

Second, health concerns can be lost where policies consider alcohol as an economic commodity, despite the substantial health impact of many of these actions. Given that the European Union has a legal commitment to consider health in all its activities, there is a potential to close this gap at the European level.

Finally, it should be remembered throughout that the international level offers opportunities as well as risks for health policy. The World Health Organization and the European Union have made substantial contributions to greater awareness and action on alcohol in Europe in recent years, and, with a suitable level of commitment, there is no reason why international actions cannot make even greater strides towards reducing the harm done by alcohol in the future.

REFERENCES

- Alavaikko, M. and Österberg, E. (2000). "The Influence of Economic Interests on Alcohol Control Policy: a Case Study From Finland." *Addiction*, 95(Supplement 4): S565-S579.
- Anderson, P. (1991). *The Management of Drinking Problems*. WHO Regional Publications, European series No. 32. Copenhagen: World Health Organisation Regional Office for Europe.
- Anderson, P. (1993). *Alcohol and Community - 16 case studies*. Copenhagen: World Health Organisation Regional Office for Europe.
- Anderson, P. (1995). *Young people and alcohol, drugs and tobacco*. WHO Regional Publications. European Series No 66. Copenhagen: WHO Regional Office for Europe.
- Anderson, P. (1996). *Alcohol and primary health care*. WHO Regional Publications. European Series No 64. Copenhagen: WHO Regional Office for Europe.

³² <http://www.eurocare.org/btg/index.html>.

³³ <http://www.eurocare.org>.

- Anderson P. (2004). State of the world's alcohol policy. *Addiction* 99: 1367-1369.
- Anderson, P. and Lehto, J. (1995). *Evaluation and monitoring of action on alcohol*. WHO Regional Publications, European Series, No. 59. Copenhagen: World Health Organization Regional Office for Europe.
- Anderson, P. and Lopez, A. (1995). *Report of a WHO working Group, on Alcohol and Health - Implications for Public Health Policy, held in Oslo, 9-13 October 1995*. Copenhagen: World Health Organization Regional Office for Europe.
- Aroq Ltd. (2004). *WTO and its affect on the global drinks industry: management briefing*. Seneca House, Buntsford Park Road, Bromsgrove, Worcestershire, B60 3DX United Kingdom: Just Drinks.com and Aroq Limited.
- Babor, T. F., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., Grube, J., Gruenewald, P., Hill, L., Holder, H. D., Homel, R., Österberg, E., Rehm, J., and Rossow, I. (2003). *Alcohol: No Ordinary Commodity*, Oxford: Oxford UP.
- Baylis, C. (2005). *How low can you go? [Legal summary on minimum pricing]*. http://test.blplaw.com/news/pdf_files/ClassaskalawyerFeb2005.pdf#search='baylis%20minimum%20pricing'
- Bettcher, D. and Shapiro, I. (2001). "Tobacco Control in an Era of Trade Liberalization." *Tobacco Control*, 10: 68-70.
- Bruun, K., Edwards, G., Lumio, M., Mäkelä, Klaus, Pan, L., Popham, R. E., Room, R., Schmidt, W., Skog, O-J., Sulkunen, P., and Österberg, E. (1975). *Alcohol Control Policies in Public Health Perspective*, Helsinki: Finnish Foundation for Alcohol Studies.
- Callard, C., Chitanondh, H., and Weissman, R. (2001). "Why Trade and Investment Liberalization May Threaten Tobacco Control Efforts." *Tobacco Control*, 10: 68-70.
- Chaloupka, F. J. and Laixuthai, A. (1996). *U.S. Trade Policy and Cigarette Smoking in Asia*. NBER Working Papers 5543. National Bureau of Economic Research. <http://ideas.repec.org/p/nbr/nberwo/5543.html>
- Edwards, G., Anderson, P., Babor, T. F., Casswell, S., Ferrence, R., Giesbrecht, N., Godfrey, C., Holder, H. D., Lemmens, P., Mäkelä, Klaus, Midanik, L. T., Norström, T., Österberg, E., Romelsjö, A., Room, R., Simpura, J., and Skog, O-J. (1994). *Alcohol Policy and the Public Good*, Oxford: Oxford UP.
- Elinder, L. S., Joossens, L., Raw, M., Andréasson, S., and Lang, T. (2003). *Public health aspects of the EU Common Agricultural Policy: developments and recommendations for change in four sectors (fruit and vegetables, dairy, wine and tobacco)*. Sweden: National Institute for Public Health. http://www.fhi.se/upload/PDF/2004/English/eu_inlaga.pdf
- Ferris, J., Room, R., and Giesbrecht, N. (1993). "Public Health Interests in Trade Agreements in Alcoholic Beverages in North America." *Alcohol Health and Research World*, 17: 235-41.
- Fidler, D. P. and Drager, N. (2003). Trade in Health Related Services and GATS: legal review of the General Agreement on Trade in Services (GATS) from a health policy perspective. *Globalization, Trade and Health Working Papers Series*. Geneva: WHO
- Furlani, A. and colleagues (2003). *Ex-post evaluation of the Common Market Organisation for wine*. Tender AGRI / EVALUATION / 2002 / 6. Prepared for European Commission - DG Agriculture. http://ec.europa.eu/comm/agriculture/eval/reports/wine/index_en.htm
- Gould, E. (2004). "Negotiating Under the Influence." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 21(English Supplement): 111-17.
- Gould, E. (2005). "Trade Treaties and Alcohol Advertising Policy." *Journal of Public Health Policy*, 26: 359-76.

Gould, E. and Schacter, N. (2002). "Trade Liberalization and Its Impact on Alcohol Policy." *SAIS Review*, XXII(1 (Winter-Spring)): 119-39.

Grant, M. (1985). *Alcohol Policies*. WHO Regional Publications, European series No. 18. Copenhagen: World Health Organisation Regional Office for Europe.

Grieshaber-Otto, J. and Schacter, N. (2002). "The GATS: Impacts of the International 'Services' Treaty on Health Based Alcohol Regulation." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 19: 50-68. www.stakes.fi/nat/nat01/nr.3/english/gats.htm

Grieshaber-Otto, J., Sinclair, S., and Schacter, N. (2000). "Impacts of International Trade, Services, and Investment Treaties on Alcohol Regulation." *Addiction*, 95(Supplement 4): 491-504.

Hannibal, J. U., van Iwaarden, M. J., Gefou-Madianou, D., Moskalewicz, J., Riston, B., and Rud, M. (1994). *Alcohol and the Community*. Copenhagen: World Health Organisation Regional Office for Europe.

Harkin, A-M., Anderson, P., and Goos, C. (1997). *Smoking, Drinking and Drug Taking in the European Region*, Copenhagen: WHO Regional Office for Europe.

Harkin, A-M., Anderson, P., and Lehto, J. (1995). *Alcohol in Europe – a health perspective*. Copenhagen: WHO Regional Office for Europe.

Hämäläinen, R-M., Koivusalo, M., and Ollila, E. (2004). *EU policies and health*. Themes 1/2004. Helsinki, Finland: National Research and Development Centre for Welfare and Health (STAKES).

Heather, N. (1995). *Treatment approaches to alcohol*. WHO Regional Publications. European Series No 65. Copenhagen: WHO Regional Office for Europe.

Henderson, M., Hutcheson, G., and Davies, J. (1996). *Alcohol and the workplace*. WHO Regional Publications. European Series No 67. Copenhagen: WHO Regional Office for Europe.

Holder, H. D., Kühlhorn, E., Nordlund, S., Österberg, E., Romelsjö, A., and Ugland, T. 1998. *European Integration and Nordic Alcohol Policies: Changes in Alcohol Controls and Consequences in Finland, Norway and Sweden, 1980-1997*, Aldershot: Ashgate.

Honeck, D. (2004). "The GATS and 'Necessity'." http://www.wto.org/english/tratop_e/serv_e/workshop_march04_e/workshop_programme_march04_e.htm

House of Commons Home Affairs Committee (2005). *Anti-Social Behaviour*. Fifth Report of Session 2004-5. London: The Stationery Office.

Howse, R. (2004). "The WHO/WTO Study on Trade and Public Health: a Critical Assessment." *Risk Analysis*, 24(2): 501-7.

ILO (1996). *Management of alcohol- and drug-related issues in the workplace: an ILO code of practice*. Geneva: International Labour Office.

Jernigan, D., Monteiro, M., Room, R., and Saxena, S. (2000). "Towards a Global Alcohol Policy: Alcohol, Public Health and the Role of WHO." *Bulletin of the World Health Organization*, 78(4): 491-99.

Klingemann, H. and Gmel, G. (2001). *Alcohol and Its Social Consequences - the Forgotten Dimension*, Dordrecht, Netherlands: Klumer Academic Publishers on behalf of WHO-EURO.

Kühlhorn, E. and B. Trollidall (2000). "The Process of Change During Sweden's Integration into the European Union." Pp.43-61 in *Sweden and the European Union*, Edited by H. D. Holder. Stockholm: Almqvist & Wiksell International.

Lehto, J. (1995a). *Approaches to alcohol control policy*. WHO Regional Publications. European Series No 60. Copenhagen: WHO Regional Office for Europe.

Lehto, J. (1995b). *The economics of alcohol policy*. WHO Regional Publications, European Series, No. 61. WHO-EURO.

Lock, K. and McKee, M. (2005). "Commentary: Will Europe's Agricultural Policy Damage Progress on Cardiovascular Disease?" *British Medical Journal*, 331: 188-89.
<http://bmj.bmjournals.com/cgi/reprint/331/7510/188>

Lubkin, G. P. (1996). Is Europe's glass half-full or half-empty? The taxation of alcohol and the development of a European identity. *Jean Monnet Working Papers*.
<http://www.jeanmonnetprogram.org/papers/96/9607ind.html>

Mamdouh, H. (2004). "The GATS and Domestic Regulation."
http://www.wto.org/english/tratop_e/serv_e/workshop_march04_e/workshop_programme_march04_e.htm

Mattoo, A. (2004). "Domestic Regulation and Trade in Services: Designing GATS Rules."
http://www.wto.org/english/tratop_e/serv_e/workshop_march04_e/workshop_programme_march04_e.htm

Montonen, M. (1996). *Alcohol and the media*. WHO Regional Publications. European Series No 62. Copenhagen: WHO Regional Office for Europe.

Österberg, E. (1993). "Implications for Monopolies of the European Integration." *Contemporary Drug Problems*, 20: 203-27.

Österberg, E. and T. Karlsson (2002). "Alcohol Policies at the European Union Level." *Alcohol policies in EU Member States and Norway: a collection of country reports*, Edited by E. Österberg and T. Karlsson. Helsinki: STAKES.

Partanen, J. and Montonen, M. (1988). *Alcohol and the mass media*. EURO Reports and Studies 108. Copenhagen: World Health Organization Regional Office for Europe.

Plant, M. (1989). *Alcohol-related problems in high risk groups*. EURO Reports and Studies 109. Copenhagen: World Health Organization Regional Office for Europe.

Pyne, H. H., Claeson, M., and Correia (2002). *Gender dimensions of alcohol consumption and alcohol related problems in Latin America and the Caribbean*. The World Bank.
<http://wbIn0018.worldbank.org/LAC/LAC.nsf/ECADocByUnid/146220DF3DD411E885256C7D006D733E?Opendocument>

Rehn, N., Room, R., and Edwards, G. (2001). *Alcohol in the European Region - Consumption, Harm and Policies*, Copenhagen: WHO Europe.

Ritson, B. (1995). *Community and municipal action on alcohol*. WHO Regional Publications. European Series No 63. Copenhagen: WHO Regional Office for Europe.

Room, R. (2006). International control of alcohol: Alternative paths forward. *Drug and Alcohol Review*. In press.

Room, R. and West, P. (1998). "Alcohol and the US-Canada Border: Trade Disputes and Border Traffic Problems." *Journal of Public Health Policy*, 19: 68-87.

Secretariat of the Pacific Community (2005). *Tobacco and alcohol in the Pacific Island Countries Trade Agreement: impacts on population health*. Noumea, New Caledonia: Secretariat of the Pacific Community.

Sinclair, S. (2000). *GATS: How the World Trade Organization's new "services" negotiations threaten democracy*. Canadian Center for Policy Alternatives

Sinclair, S. and Grieshaber-Otto, J. (2002). *Facing the facts: a guide to the GATS debate*. Ottawa: Canadian Centre for Policy Alternatives

Slotboom, M. M. (2003). "Do Public Health Measures Receive Similar Treatment in EC and WTO Law?" *Journal of World Trade*, 37(3): 553-96.

Solco, IVO, Alcohol Concern, and SIA (2003). *Alcohol and the workplace: a European comparative study on preventive and supportive measures for problem drinkers in their working environment*. European Commission, DG Employment & Social Affairs.

Sutton, C. and Nylander, J. (1999). "Alcohol Policy Strategies and Public Health Policy at an EU-Level. The Case of Alcopops." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 16 (English supplement): 74-91.

The ASPECT Consortium (2004). *Tobacco or health in the European Union: past, present and future*. European Commission.
ec.europa.eu/comm/health/ph_determinants/life_style/Tobacco/Documents/tobacco_exs_en.pdf

United Nations (1976) *Commentary on the Convention on Psychotropic Substances Done at Vienna on 21 February 1971*. New York: United Nations. The Convention's text is at <http://www.incb.org/e/conv/1971/>

Vingilis, E., Lote, R., and Seeley, J. (1998). "Are Trade Agreements and Economic Cooperatives Compatible With Alcohol Control Policies and Injury Prevention?" *Contemporary Drug Problems*, 25(Fall): 579-620.

Wallach, L. (2005). "Testimony of Lori Wallach, Public Citizen's Global Trade Watch. European Union Parliament, Committee on International Trade Hearing on the 'Doha Development Agenda,' 11 October 2005." www.ifg.org/analysis/wto/Wallach&GATS.pdf

Walsh, D. (1982). *Alcohol-related medico social problems and their prevention*. Public Health in Europe reports 17. Copenhagen: World Health Organization Regional Office for Europe.

WHO-EURO (1999). *European alcohol action plan 2000-5*. Copenhagen: European Office of the World Health Organization.

WHO-EURO (2005). *Alcohol policy in the WHO European Region: current status and the way forward*. Copenhagen: World Health Organization Regional Office for Europe.

WHO (2005). *International trade and health: report by the Secretariat*. EB116/4. http://www.who.int/gb/ebwha/pdf_files/EB116/B116_4-en.pdf

WHO and WTO (2002). *WTO agreements and public health: a joint study by the WHO and the WTO Secretariat*. WTO Secretariat.

World Bank Group (2000). *World Bank Group note on alcohol beverages*. <http://www.miga.org/screens/policies/arp/arp.pdf>

World Health Organization (1992). *European Alcohol Action Plan 1992-1999*. Copenhagen: World Health Organization Regional Office for Europe.

World Health Organization (1995). *European Charter on Alcohol*. Copenhagen: World Health Organization Regional Office for Europe.

World Health Organization (2000). *European Alcohol Action Plan 2000-2005*. Copenhagen: World Health Organization Regional Office for Europe.

World Medical Association (2005). *Statement on reducing the global impact of alcohol on health and society*. 56th WMA general assembly, Santiago, Chile 15 October 2005. <http://www.wma.net/e/policy/a22.htm>

WTO Committee on Trade and Environment (2002). *GATT/WTO dispute settlement practice relating to GATT article XX, paragraphs (b), (d) and (g): a note by the Secretariat*. WT/CTE/W/203.

Chapter 9 – Alcohol policy in the countries of Europe

Every country in the European Union (EU) has a number of laws and other policies that set alcohol apart from other goods traded in its territory, often for reasons of public health. These policies take place in a specific cultural setting (see Chapter 2) and are also adopted and enforced in the context of people's views on alcohol policy. These currently seem to be most in favour of controls on advertising and young people's drinking, although evidence is scarce in this area. Where a thorough European investigation has been done, most European drivers have been found to support a complete ban on alcohol use by new drivers, and many are in favour of a ban for all drivers.

Despite the ubiquity of alcohol policies, just under half the EU countries still do not have an action plan or coordinating body for alcohol. Even so, most countries have programmes for one aspect of alcohol policy, of which school-based education programmes are the most common throughout Europe. All countries also have some form of drink-driving restrictions, with everywhere except the UK, Ireland and Luxembourg having a maximum blood alcohol limit for drivers at the level recommended by the European Commission (0.5g/L). However, many European drivers believe that there is only a slim chance of being detected - a third overall believe they will never be breathalysed, although this is lower in countries with Random Breath Testing.

Sales of alcohol are generally subject to restrictions in most EU countries, in a few cases through retail monopolies but more often through licences, while the places that alcohol can be sold are frequently restricted. Over one-third of countries (and some regions) also limit the hours of sale, while restrictions on the days of sale or the density of off-premise retailers exist in a small number of countries. All countries prohibit the sale of alcohol to young people beneath a certain age in bars and pubs, although four countries have no policy on the sale of alcohol to children in shops. The cut-off point for allowing sales to young people also varies across Europe, tending to be 18 years in northern Europe and 16 years in southern Europe.

Alcohol marketing is controlled to different degrees depending on the type of marketing activity. Television beer adverts are subject to legal restrictions (beyond content restrictions) in over half of Europe, including complete bans in five countries; this rises to 14 countries for bans on spirits adverts. Billboards and print media are subject to less regulation though, with one in three countries (mainly in the EU10) having no controls. Sports sponsorship is subject to the weakest restrictions, with only seven countries having any legal restrictions at all.

The taxation of alcoholic beverages is another consistent feature of European countries, although the rates themselves vary considerably between countries. This can be seen clearly for wine, where nearly half the countries have no tax at all, but one in five countries has a tax rate above €1,000, adjusted for purchasing power. In general, the average effective tax rate is highest in northern Europe, and weakest in southern and parts of central and eastern Europe. Four countries have also introduced a targeted tax on alcopops since 2004, which appears to have reduced alcopops consumption since.

When the different policy areas are combined into a single scale, the overall strictness of alcohol policy ranges from 5.5 (Greece) to 17.7 (Norway) out of a possible maximum of 20, with an average of 10.8. The least strict policies are in southern and parts of central and eastern Europe, and the highest in northern Europe – but the scores do not all decrease from north to south, as seen in the high score in France. Most countries with high policy scores also have high

taxation levels, but there are some exceptions such as France (high policy score, low tax), Ireland, and the UK (both low policy score, high tax).

This picture of alcohol policy is very different from the one visible fifty years ago, with the overall levels of policy much closer together, partly due to a weakening of the availability restrictions in the northern European countries. However, the main factor in the policy harmonization is the increased level of policy in many countries, particularly in the area of drink-driving where all countries now have a legal limit. Marketing controls, minimum ages to buy alcohol, and public policy structures to deliver alcohol policy are also much more common in 2005 than in 1950. While European countries are, therefore, ahead of the world in print advertising restrictions and drink-driving limits, they are less likely to have high taxes or controls on availability such as limits on the days and hours of sales, or licences for the retail sale of alcohol.

THE SOCIAL CONTEXT OF ALCOHOL POLICIES

It has already been shown in Chapter 8 that alcohol policies need to be considered within an international setting. In similar fashion, the social and political environment within a country both shapes and is shaped by national alcohol policies. In a broad sense this includes both contemporary culture and epochal cultural change (such as the rise of respectability in the eighteenth century), but, to the extent these can be covered within this report, they are discussed elsewhere (see Chapters 2 and 4). The comparison of alcohol policies in Europe therefore begins by examining the narrower aspect of the public's perception of alcohol policies.

Public attitudes

Popular perceptions of actions and responsibilities relating to alcohol are of an obvious importance for policy-making, with policy-makers both contributing to perceptions as well as responding to them (see Simpura *et al.* 1999 for a discussion of different attitudes in the social elite). Unfortunately European comparative work on public attitudes has been restricted to two areas – drink-driving, and whether people agree that “*the government has a responsibility to minimize how much people drink.*” On the latter question, people in Italy, Sweden, Poland and the Baltic countries (and to a lesser extent France) agreed it was the government's responsibility, while those in Germany and Finland disagreed (Hemström, Leifman, and Ramstedt 2001; Reitan 2003). Respondents in the UK were ambivalent about the government's responsibility to minimize people's drinking, but very strongly agreed in a separate study that the government had a responsibility to reduce “alcohol abuse” (conducted for the Institute of Alcohol Studies by NOP Market Solutions 2000). However, this overall method used only one question with many possible meanings, and there were also some concerns as to the reliability of the Western European results in the ECAS survey (see Chapter 4).

The most reliable comparisons come in the area of drink-driving policy, where a series of large projects part-funded by the European Commission have looked at a number of road safety risks (Sartre 1995; Sartre 1998; Sardi and Evers 2004). The most extensive of these found that an overwhelming majority (82%) of drivers in the EU believed that there should be complete ban on alcohol use in newly-qualified drivers, with support increasing by over ten percentage points since the mid-1990s. Slightly fewer EU15 drivers (40%) believed in a complete ban for all drivers, although the seven EU10 countries covered were in favour of this measure overall, including

clear majorities in the Czech Republic, Hungary and Slovakia where such bans already exist. The Commission's Recommendation of a maximum BAC of 0.5 g/L (see Chapter 8) is also positively viewed, with those countries having this limit seeing it most favourably, but three-quarters of those in countries with a BAC of 0.8 g/L also in favour. Only in Cyprus (where drink-driving is most common; see Chapter 6) and countries with limits already below 0.5g/L did the level of support for this level drop to half the population or below.

Aside from these wide comparisons, there have been a small number of other studies looking at individual countries or small country groups – although it should be remembered that these are often difficult to interpret and some have methodological weaknesses (see discussion in the earlier review by Crawford 1987). More problematically, results from opinion polls or attitude surveys depend on the phrasing of the question, and opinion polls can also show large swings in relatively short time periods. For example, research by the Swedish National Public Health Institute found only 36% of respondents were against any strong beer, wine or spirits being sold in grocery stores – but this doubled to 72% when people were told about the expected increase in alcohol-related violence and teenage alcohol consumption (cited in Mäkelä *et al.* 1999). Bearing this in mind though, it appears that there are some similarities across Europe in public attitudes, particularly towards advertising restrictions and policies focused on young people.

Advertising controls seem to be widely supported in Europe, with at least two-thirds of the respondents in favour of some form of partial restrictions in Ireland, Latvia and Estonia – together with a smaller majority in favour in Poland, and indicative support in a small sample of young people in England (Baltic Data House 2001; Reitan 2003; Strategic Task Force on Alcohol 2004; Hanekom 2004).¹ The stronger measure of a complete prohibition on alcohol advertising is approved by just over 4 in 10 Rotterdam citizens in 1994 and 2 in 10 UK citizens in 2000 (Pendleton, Smith, and Roberts 1990; Bongers 1998; NOP Market Solutions 2000).

Greater restrictions on young people's drinking also tend to be widely supported, including a minimum age to buy alcohol of at least 18 (Rotterdam; UK), a ban on children in pubs after 7pm (Ireland), and greater enforcement of the legal purchase age (in the UK; see Pendleton, Smith, and Roberts 1990; Lancaster and Dudleston 2002; and more recently BBC News Online 2004). No specific policy measure was suggested in the Baltic and Poland comparison, but the wide perception of 'drinking among children and youths' as the most serious alcohol-related problem (67-81% of respondents believing it to be very serious) suggests that a similar targeting of policy would also meet with public approval (Reitan 2003). Similarly, 94% of a sample in Scotland felt there was a problem with underage drinking in their country – a feeling also expressed by a number of respondents who were under the legal age limit themselves (Kara and Hutton 2003).

In other areas the research results are more ambivalent. A desire for increased availability of alcohol (such as alcohol sales outside of monopoly stores) was visible in the late 20th century in Finland, Norway and Sweden, although this has reduced slightly in recent years (Olsson, Nordlund, and Järvinen 2000). In contrast, there is strong support for an alcohol retail monopoly in Poland and the Baltic countries, and a referendum in the Estonian capital of Tallinn came out strongly in favour of a ban

¹ Lithuania respondents slightly disagreed with advertising restrictions, but there are some uncertainties as to the reliability of this data in the light of the very high number of 'don't knows' (Reitan 2003).

on alcohol sales between 11pm and 8am.² Differing views are visible for reducing the number of shops selling alcohol, which is supported in Latvia (see also Koroleva 2005), opposed in Lithuania and the Netherlands (and possibly Denmark too, given their high satisfaction with the existing number of restaurants and cafes; Elmeland and Villumsen 2005), and has split support in Poland and Estonia. In most studies of most policies, the heaviest drinkers were the group most likely to be against a policy measure (Hemström, Leifman, and Ramstedt 2001; Hemström 2002; Reitan 2003; Strategic Task Force on Alcohol 2004; BBC News Online 2004).

In conclusion, there has been little research to date on public attitudes to alcohol policies in Europe. It is conceivable that restrictions on young people's drinking and advertising are more widely supported than other areas, but more research is needed in this area before this can be stated with any degree of confidence. Only in the area of drink-driving is there reliable data, showing that a majority of European Union (EU) drivers support a complete ban on drinking for new drivers.

ALCOHOL POLICY IN THE COUNTRIES OF EUROPE

In a different way, the policies adopted by a country are also a barometer of the response to alcohol, and it is fortunate that much better data on this are available than for opinion polls. This enables a policy-by-policy comparison in a number of key areas, as well as several comparisons of the 'overall level' of alcohol policy in the countries and Europe as a whole (see Figure 9.1 for a guide to these comparisons).

The data for this come from the Global Status Report on Alcohol Policy (WHO 2004), updated by the Alcohol Policy Network which is co-financed by the European Commission.³ However, for some countries these policies are decided on a regional rather than country level, meaning that there is no single 'minimum age to buy alcohol in Spain', for example. In these countries (Austria, Spain and Switzerland in particular), the least strict of the regional policies is used to represent the national situation, as this was felt to reflect better the country response than the most strict region. However, where a more strict policy is much more common, this has been mentioned in the discussion.

The framework for policy

The starting point for dealing with alcohol on a country level is to decide what an alcoholic beverage is. Although there are internationally agreed definitions of alcohol for the purposes of classifying trade (see Chapter 1), most countries go further for the purposes of their own alcohol

Box 9.1: Framework for policy

- Most countries define alcohol as less than 2% absolute volume
- Just under ½ of countries do not have an action plan or coordinating body
- Nearly all countries have 'moderately developed' school programmes

² Information from the Estonian member of the Alcohol Policy Network.

³ Data from the APN was received between Nov 2004 and Feb 2005, and is publicly available at <http://www.eurocare.org/btg/countryreports/index.html>; it was also checked and occasionally supplemented by the WHO-EURO's Alcohol Control Database (<http://data.euro.who.int/alcohol/>). Conflicting data is addressed in the main text wherever it affects the conclusions drawn.

laws. In general, the countries of Europe fall into the World Health Organization's (WHO) 'low' definition band, which defines the maximum level of alcohol for a 'non-alcoholic' drink at 2% alcohol concentration or less. However, several countries (all in Northern Europe) have slightly higher definitions of 2-3%, while Romania and Slovakia do not define alcohol in this way at all. Clearly anomalous in this context is Hungary, whose definition of 5% alcohol concentration – above the level of most beers – is only significantly exceeded by two other countries in the world. In comparison, the EU's definition of alcohol for tax purposes is at least 0.5% (for beer) or 1.2% alcohol concentration (for all other drinks).⁴

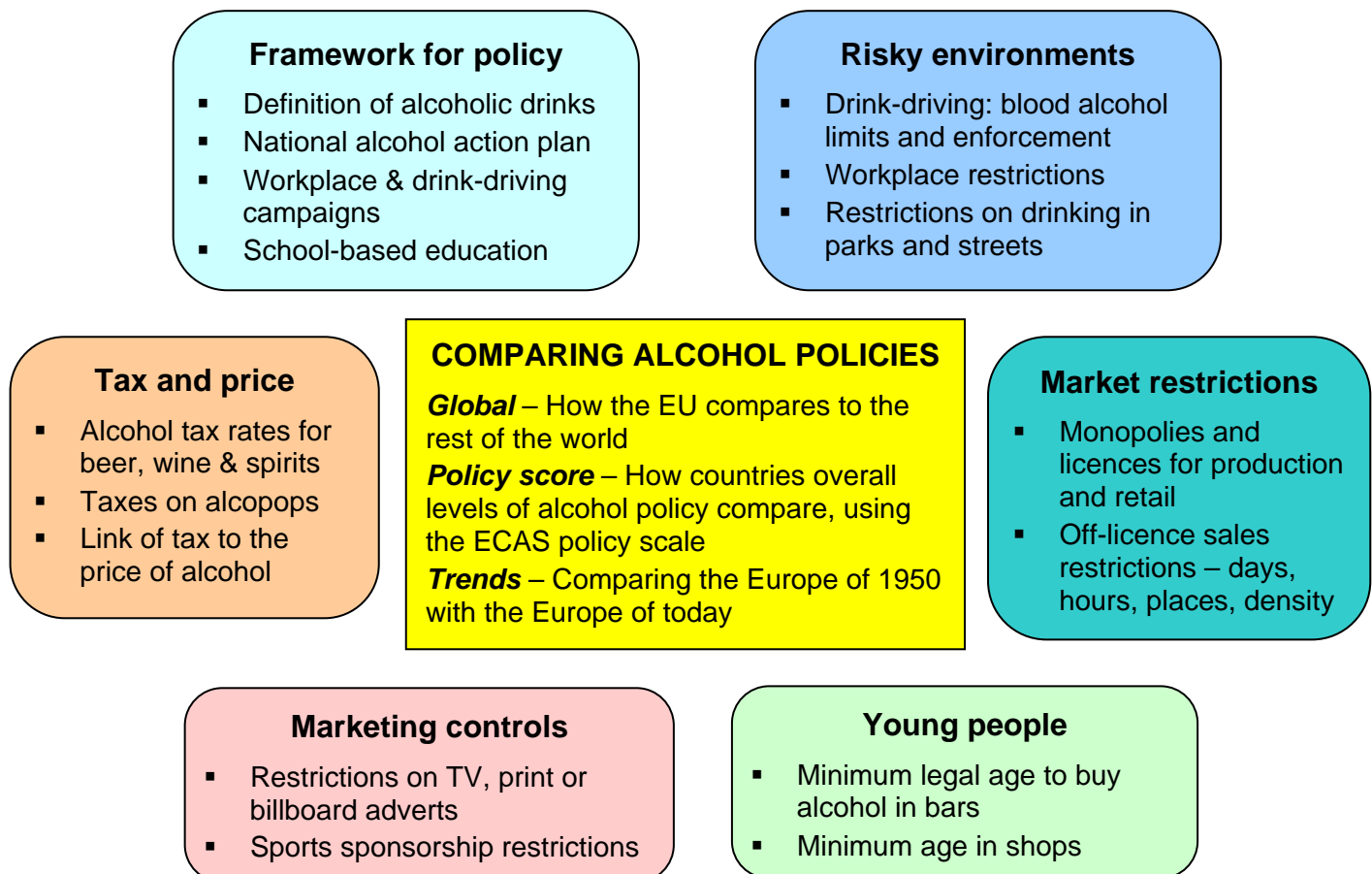


Figure 9.1 A guide to the organization of alcohol policy comparisons in this chapter

The structure of alcohol policy further provides a useful background to the specific laws covered below. In just over half the EU countries this structure involves an action plan and/or a coordinating body, but this still leaves a number of other countries scattered across Europe who leave alcohol policy to the intersection of

⁴ Many countries also have definitions of 'low alcohol' beverages (especially beer) that are subject to fewer restrictions, e.g. only beer below 4.2% alcohol concentration can be sold on trains in the Czech Republic. For tax purposes, the EU definitions of the highest concentration that counts as low-alcohol are 2.8% for beer and 8.5% for wine and intermediate products. Details of both normal and low-strength definitions can be found in 92/83/EC.

more general departments. The Global Status Report also provides the country source's opinion of the status of alcohol awareness programmes in their country – this is a useful indication of how active the government has been, but is only a subjective measure. Bearing this in mind, it seems that EU15 states were more likely to have better developed workplace and drink-driving campaigns than EU10 states. On the other hand, only two countries – Greece and Portugal – do not have 'moderately developed' school-based alcohol programmes, suggesting that the EU10 has well-developed awareness campaigns in some areas despite lagging behind in others.

Risky environments: driving and working

One of the most common forms of alcohol policy is restricting drinking in inappropriate situations, often instigated by organisations with a remit that is broader than alcohol. The most common example of this is for drink-driving, where insurers and road safety organisations have seen alcohol as a major risk factor for driving-related damage and loss of life. In line with the Commission Recommendation discussed in Chapter 8, most of the EU15 countries have a maximum Blood Alcohol Concentration (BAC) of no more than 0.5g/L, although the UK, Ireland and Luxembourg continue to have a higher limit. Limits in the EU10 tend to be even lower, with three countries (Czech Republic, Hungary and Slovak Republic, as well as Romania) prohibiting any alcohol in drivers and three more having levels lower than the majority of the EU15. Outside of the EU, the international community is more likely to have a limit of 0 – yet they are substantially more likely to have BACs above the EU Recommendation as well, with fewer countries lying between the two extremes. Some European countries also have different BACs for different groups, such as the 0.3g/L limit for novice and professional drivers in Spain.

Box 9.2: Risky environments

- Only 3 EU countries have a blood alcohol limit higher than 0.5g/L
- Three-quarters of drivers believe they will be rarely or never be breathalysed. The perceived chances of being tested are higher in countries with RBT.
- Workplace alcohol bans are common in the EU10, but voluntary control is more popular in the EU15

As outlined in Chapter 7, an essential component of an effective drink-driving policy is enforcement, particularly using random breath testing. Data on the perceived chances of being breathalysed are available from the SARTRE project, which has been part-funded by the European Commission (Christ 1998; Sardi and Evers 2004). Across 21 EU countries (and Switzerland), nearly 30% of drivers believe they will never be breathalysed, with a

further 45% believing they will only be breathalysed rarely. This correlates moderately strongly with drivers' own experiences of being breathalysed, with over 70% of drivers saying they have not been checked for alcohol in the last three years.

Although the perceived chances and experience of checks are lower in some countries than others, there appears to be no consistent geographical pattern to this – for example, drivers from Italy, Spain and Greece perceive low chances but so do those from the UK, Poland and Sweden, while those from France, Portugal and Slovenia see the chances as much higher. In contrast to the WHO's analysis of its country informant ratings, there is also no correlation in Europe between the BAC

and perceived levels of enforcement. However, a policy of Random Breath Testing (RBT; see Chapter 7) made a significant difference to drivers' experiences and perceptions of alcohol checks. In the six SARTRE countries where RBT was not allowed (Germany, Ireland, Italy, Poland, the UK and Switzerland⁵), 86% of drivers had not been checked in the past three years compared to only 65% elsewhere. The effect was even stronger for drivers' perceptions – in the countries with RBT only 22% of drivers thought they would never be checked, compared to more than double this figure (46%) in the six countries without RBT.

Another frequently restricted environment is the workplace, probably due to both reduced productivity and a greater risk of workplace accidents with those who have drunk alcohol. In the EU10 these restrictions are nearly always in the form of a complete ban on alcohol use in the workplace, while the preference in the EU15 is for voluntary or local action. Despite the absence of any controls in Greece (as well as Switzerland), the EU is much more likely to have at least a voluntary control on workplace drinking compared to the rest of the world, although as with drink-driving this is substantially less likely to be a complete ban. Similarly, bans on alcohol consumption in educational, healthcare and government establishments are often forbidden, and these follow a near-identical pattern in Europe.

A final area where drinking is often restricted is public spaces such as parks and streets. This tends to be less motivated by preventing harmful alcohol use and more focused on public disorder, nuisance, and anti-social behaviour. As such, it more often has a legal base in countries where there is strong public concern over anti-social behaviour, primarily in eastern and northern Europe (e.g. Belgium, Latvia). Elsewhere there is a roughly equal tendency to either have no restrictions, or to devolve these decisions onto a local level where they can be adapted to the particular situation in a locality. As for workplace restrictions, the EU overall is more likely than the rest of the world to have a policy but less likely to have a complete ban on public drinking (a policy pursued in Europe by Latvia alone).

Market restrictions

Retail monopolies are relatively uncommon within the EU, particularly given the EU-level cases over the past 15 years discussed in Chapter 8 (Österberg and Karlsson 2002) – which has sometimes even induced countries to privatize in anticipation of EU membership talks, as in the case of Turkey in 2003. Only the four northern European countries maintain a retail monopoly adapted to the needs of EU/European Free Trade Association (EFTA) membership, with the majority of countries instead requiring special licences to sell alcohol. A minority of countries do not even require licences for any alcoholic drink, and these are generally situated in a geographically continuous area of central and eastern Europe (Austria, Belgium, Czech Republic, Germany, Slovak Republic, Slovenia, Switzerland; and also Spain).

A similar pattern is visible for off-licence sales restrictions (unfortunately no comparable data are available for on-licences). The most common policy here is to restrict the places at which alcohol can be sold (for example, not within 500m of a school), which is practised in most countries. Eleven of the study countries restrict the hours of sale (for Latvia excluding beer), while six restrict the days of sale and

⁵ Switzerland introduced RBT (as well as a BAC of 0.5g/L and 'cascading' penalties) on 1 January 2005 – see the European Transport Safety Council's Enforcement Newsletter for Dec 2004 (www.etsc.be).

five regulate the density of alcohol retailers (the EU figures are nine, three, and four countries respectively).⁶

Again, a cluster of central and eastern European countries have none of these restrictions (Austria, the Czech Republic, Germany, Luxembourg and Slovakia) together with several southern European countries (Portugal, Italy and Greece; also Spain on a country basis). In contrast, Sweden, Finland and Norway have all types of restrictions (if not for all beverages). Nevertheless, this should not be understood as a simple cultural or geographical divide – for example, France has density and place restrictions that are absent in Denmark and Iceland, while some regions of Spain also strictly control off-licence sales.

Of the 14 countries with information on how these restrictions are enforced, only two (Hungary and Romania) describe rare or nonexistent enforcement. While these country-based opinions should be treated with some caution, they do suggest that enforcement is better in Europe than in the rest of the world with the exception of North America.

Controlling sales to young people

Besides the general restrictions on availability, all of the study countries have

Box 9.3: Young people

- Everywhere has adopted a minimum age of 16-20 years to buy alcohol in bars
- The minimum ages are often lower in southern than northern Europe
- Four countries have no restrictions on alcohol sales to children in shops

decided that only people above a certain age should be able to buy alcohol, Table 9.1. This policy splits Europe cleanly into two – the Nordic countries, Denmark, UK, Ireland and the EU10 have a minimum age of 18 to purchase beer in a bar, while the rest of the EU15 opt for a lower age of 16 (the only partial exceptions are Malta (at 16), Greece (17), $\frac{3}{4}$ of the Spanish regions (18) and Iceland (20)), Figures 9.2 and 9.3. The gap is even more striking for shop sales, with

some southern/central countries sometimes not even having a minimum age, compared to the northern countries that put the limit at 18-20 years as before. This picture changes slightly when buying spirits rather than beer or wine (both on- and off-premise), as this is treated more severely by some of the central European countries leaving only those in the south of Europe with lower ages.

It is also evident that different countries view the different types and places of alcohol differently when it comes to young people. Strikingly, most countries treat spirits more severely than beer or wine, with the exception of the EU10 where the beverages are treated consistently. Equally, a number of countries have a more relaxed policy for off-premise sales than for on-premise, either by reducing the age to buy in shops (Denmark) or simply abandoning the age restriction altogether (Belgium, Greece, Luxembourg, Malta) – although in contrast the minimum age in Sweden is raised from 18 to 20 years for shop sales. Compared to the rest of the world (for beer only, both on- and off-premise), EU states are much more likely to have a minimum age to buy alcohol. However, countries that do have a policy

⁶ The Licensing Act 2003 comes into effect in England & Wales at the end of 2005; the situation as of 1 Jan 2005 has been used for comparison, although the legal change should be borne in mind.

choose an older age than the EU on average; in particular, a legal purchase age of 16 years is virtually unique to the EU.

Table 9.1 The legal purchase age for alcohol in Europe.

<i>B = Beer</i>	Min. Legal Age					Min. Legal Age			
	<i>On-premise</i>		<i>Off-premise</i>			<i>On-premise</i>		<i>Off-premise</i>	
	<i>B&W</i>	<i>S</i>	<i>B&W</i>	<i>S</i>		<i>B&W</i>	<i>S</i>	<i>B&W</i>	<i>S</i>
<i>W = Wine</i>									
<i>S = Spirits</i>									
Austria	16	16-18	16	16-18	Lithuania	18	18	18	18
Belgium	16	18	None	18	Luxembourg	16	16	None	None
Bulgaria	18	18	18	18	Malta	16	16	None	None
Czech Rep.	18	18	18	18	Netherlands	16	18	16	18
Denmark	18	18	16	16	Norway	18	20	18	20
Estonia	18	18	18	18	Poland	18	18	18	18
Finland	18	18	18	20	Portugal	16	16	16	16
France	16	18	16	16	Romania	18	18	18	18
Germany	16	18	16	18	Slovak Rep.	18	18	18	18
Greece	17	17	None	None	Slovenia	18	18	18	18
Hungary	18	18	18	18	Spain	16-18*	16-18*	16-18*	16-18*
Iceland	20	20	20	20	Sweden	18	18	20	20
Ireland	18	18	18	18	Switzerland	16	18	16	18
Italy	16	16	16	16	Turkey	18	18	18	18
Latvia	18	18	18	18	UK	18	18	18	18

* Minimum legal age in Spain is 18 in all but 4 regions. Source: Global Status Report on Alcohol Policy (WHO 2004) and updates from the Alcohol Policy Network co-financed by the European Commission.

While the legal purchase age has been shown to be an effective policy (see Chapter 7), levels of enforcement seem to be highly variable within Europe given the very weak relationship between perceived availability and the statutory minimum age.⁷ Beer is seen as the most available type of drink, and is seen as easily available by over 90% of students in central and eastern Europe (as well as Italy, Greece and Bulgaria) and over 80% of students elsewhere (except France and Turkey). Students feel spirits are much less available, yet over 80% of students still thought they were easy to get hold of in some countries (e.g. Italy, the Czech Republic) – only in the Nordic and Baltic countries (and Turkey) did the figures drop significantly.

⁷ 'Perceived availability' is the self-reports of 15-16 year old students in the ESPAD 2003 study (see Chapter 4).

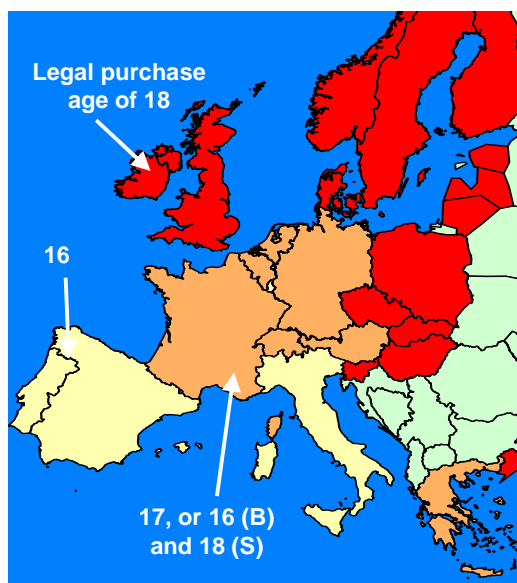


Figure 9.2 Minimum legal purchase age from **bars**
 Source: WHO 2004 and APN

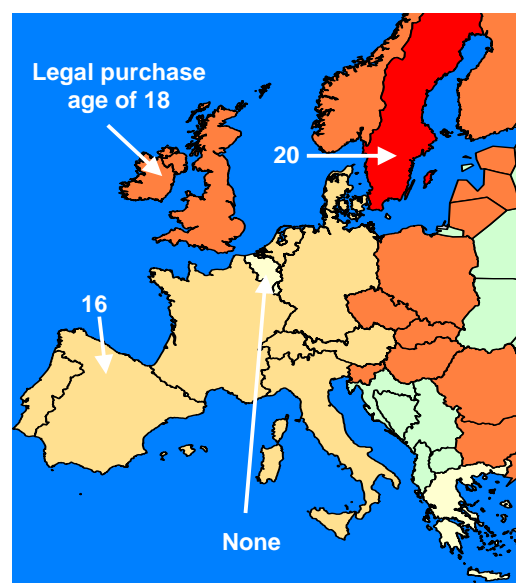


Figure 9.3 Minimum legal purchase age of beer from **shops**
 Source: WHO 2004 and APN

Volume of alcohol marketing

Given the range of media containing alcohol marketing, it was decided to restrict the analysis to three of the more prominent types – national television, print media and billboards – as well as restrictions on sponsoring sports events. For each of these, country informants said whether there were:

- *Voluntary agreements* (also including delegated powers to regions)
- *Partial legislation* (by hours, type of programme/magazine, saturation limits, or place of advertisement, but *not* including content restrictions such as those in the EU-wide Television Without Frontiers Directive (TVWF); see Chapter 8).
- *A complete ban* on that form of alcohol advertising.

Given that the definition used for ‘partial legislation’ does not include content restrictions, and that all EU member states are legally obliged to have content restrictions in line with the TVWF Directive, it should be remembered that the discussion here concentrates on restrictions on the *volume/placement* of marketing rather than its’ content.

Box 9.4: Controls on the volume of marketing

- TV adverts are controlled by law in over ½ of Europe, including complete bans in five countries
- One in three countries (mainly in the EU10) have no controls on print or billboard ads
- Only seven countries have legal restrictions on sports sponsorship

Television adverts for alcohol are subject to legal control in just over half of Europe, although this in the form of a complete ban in only five countries (of which only France and Sweden are in the EU).⁸ Voluntary agreements are relatively common in the EU15, but these are not present in the EU10 where many countries have no controls at all. As with the legal purchase age, EU states – especially those in the EU10 – control spirits advertising more tightly than wine or beer, to the extent that EU states are more likely to have complete bans on spirits than any of partial restrictions, voluntary agreements or no restrictions individually (although not combined). This change between drinks types is also much stronger than the rest of the world, meaning non-EU countries are more likely to have complete bans on beer TV advertising than EU states but less likely to have bans for spirits.

Controlling alcohol advertising in print or on billboards is noticeably less common than for television, with 1 in 3 European states not having any policy on them at all. Most of the uncontrolled advertising environments are found in eastern Europe (the EU10, Bulgaria and Romania); as before, EU15 states often have voluntary agreements with only Greece, Luxembourg and Portugal lacking even these. Internationally the levels of voluntary agreements are only a third of the EU level, although both complete bans and complete deregulation are more frequently used. Raised restrictions for spirits are less common than for TV but are still used in five countries for print advertising and four for billboards – most strikingly, while only Norway has a complete ban on print adverts for alcohol, a further three countries have bans specific to spirits (Finland, Poland and Slovenia).

Sponsorship represents another way for alcohol producers and retailers to link brands to attractive lifestyles (see Chapter 7). However, sponsorship controls have tended to be slightly less widespread than those for television advertising, with only seven countries having any legal restrictions on sports sponsorship together with voluntary restrictions in a further five. Legal controls over youth event sponsorship are even less likely, being adopted only in six countries (Finland, France, Norway, Poland, Latvia, and Switzerland). In both cases, the EU is more likely to have some policy than the rest of the world but less likely to have legal restrictions, particularly complete bans.

TAX AND PRICE

Tax is a particularly hard policy to compare across countries due to the complexity in how it is calculated, as well as the difficulties in comparing monetary values across different contexts. To get around this, three methods have been used:

1. The rates in Euros (€) were calculated for a 'standard' strength of each drink type.⁹ The tax levels shown are for a given amount of alcohol rather than for the original beverage (i.e. for one hectolitre of pure alcohol – *hlpa* – rather than for a bottle of wine) – which enables the tax on alcohol itself to be compared.

⁸ In Denmark there is a complete ban on one of the state channels, but alcohol advertising is unregulated on the other national commercial channels.

⁹ Data from CEPS (the spirits industry body), as of 1 February 2005.

2. These figures were converted to 'purchasing power parity (PPP)' to take into account the different costs in different countries, thereby giving a truer comparison of the impact of the tax on each country's citizens.¹⁰
3. Finally, the WHO report asked country representatives around the world for the alcohol-specific tax expressed as a percentage of the shop retail price. These data are less reliable and only cover 14-19 EU countries (depending on the beverage), but allow an analysis of how the EU relates to the rest of the world.

Comparing tax rates across Europe

Looking at **beer** using the first method, the tax rate can be seen to vary widely within the EU (from €181 in Spain to €1,987 in Ireland) and even further for other study countries (in Norway it is €4,335). This breadth is only slightly reduced when adjusting for purchasing power, with most countries lying between €150-700 after which there is a jump up to the seven countries at €1,250 and beyond. Adjusted for purchasing power, the lowest taxes are found in southern Europe, Romania, and parts of central Europe (e.g. Germany) where taxes are lower than €PPP400 per hectolitre of pure alcohol (hlpa). Other parts of the EU10 and central Europe range from €PPP400-1000, with higher rates in Poland and the Baltic countries (€PPP1000-1500), and the highest values (over €PPP1500) in northern Europe, the UK and Ireland. Compared to the rest of the world (using the third method from WHO data), these tax rates are lower than outside Europe with 1 in 3 EU countries lying in the WHO's 'low' range (less than 10% of price) compared to 1 in 5 elsewhere, and only 1 in 14 EU countries in the 'high' group compared to 1 in 4 globally.

For **wine**, the picture changes substantially – the average of around €800 is the same as for beer, but half of Europe has no tax whatsoever on wine. Even among countries with taxes above zero the range is enormous, with Hungary and France taxing wine less than €PPP60 compared to more than €PPP1,000 in 20% of other countries. The resulting pattern is clear: no country south of Poland has a significant tax on wine (including Germany and Austria), while the highest rates are found in northern Europe, the UK, Ireland, and the Baltic countries. Unsurprisingly then, Europe has very low taxes on wine compared to the rest of the world, with 57% of countries in the 'low' band (compared to 21% elsewhere) and only 11% in the 'high' band (33% elsewhere). More surprising is that the very low PPP tax rate in Hungary converts to a very high percentage of the total price, simply because wine prices are so low there.

Compared to beer and wine, **spirits** are much more heavily taxed: the € and €PPP average rates are both around 2,000, which is around two-and-a-half times that of other beverages. The *lowest* PPP rate for spirits (€PPP650 in Cyprus) is still greater than the wine and beer tax rates for two-thirds of countries, while the highest rate (€PPP6,400 in Iceland) is 50% greater than the highest for other drinks types. Indeed, every EU country has a higher spirits rate than for beer/wine, and this raises the EU taxes to the same average share of price as the global situation. Although the spread of tax rates is much less for spirits, the lowest values are still found in many of the same countries as for beer, i.e. some southern European countries (Bulgaria,

¹⁰ Purchasing power parity (PPP) allows costs to be scaled by the relative prices in different countries, so that the figures would buy the same amount of goods in each country. The resulting values are therefore in purchasing-power adjusted euros, or '€PPP'.

Cyprus, Greece, Italy, Malta, Portugal, Romania, Slovenia), and several central European countries (Germany, Austria, Luxembourg).

'Average tax rates' and the final price

The policy implications of the different tax rates also depend on how important each type of drink is within a country. For example, a low spirits tax is much more important in practical terms when spirits are the most common type of alcoholic drink. Looking, therefore, at the average effective tax rate in each country in Figure 9.5,¹¹ the highest tax rates are found in northern Europe, the Baltic countries, the UK, Ireland and Poland. Conversely, the lowest rates are found in southern and parts of central Europe, with the rest of central and eastern Europe lying in-between.

It should be borne in mind at this point that alcohol-specific taxes do not automatically determine the final price seen by the consumer in each country. Even just within the tax system, all countries also have a general sales tax (VAT) on alcoholic drinks and this can be as low as 7.6% or as high as 25% in the study countries. Fortunately for analytic purposes, VAT within the EU is more consistent (15%-25%) and correlates reasonably well with the excise tax rates – Portugal and Luxembourg even decrease the VAT rate on wine compared to other drinks, just as they decrease their excise tax.

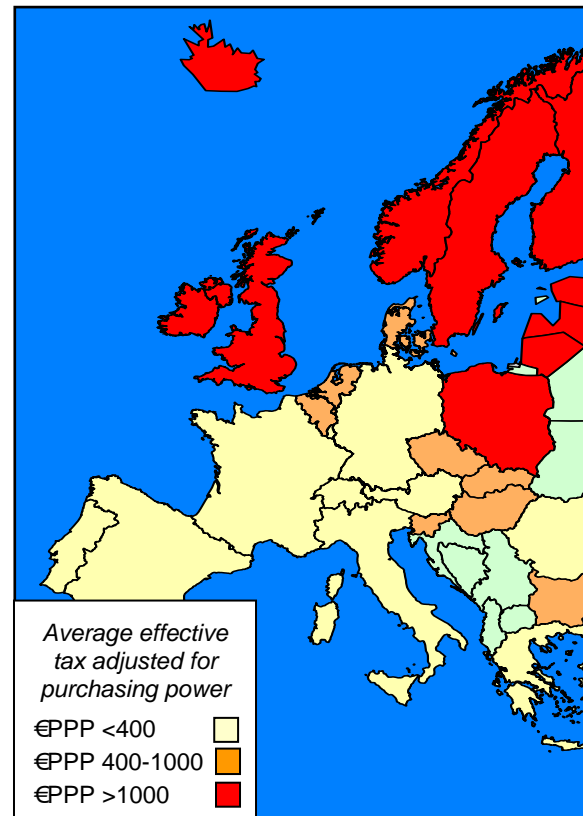


Figure 9.5 Average effective tax rates in EU countries

Beyond this, there are a large number of other potential market and cultural factors that can intervene between the tax rate and the final price. Even just comparing the prices of beer and cola (data from WHO 2004), we find that there is no relationship between alcohol taxes and the ratio of alcohol to soft drink prices. Comparing alcohol prices to that of all other goods,¹² Figure 9.6 shows that a *low* tax rate can coexist with either a high or low relative price of alcohol – but a *high* tax rate tends to produce a high price.

¹¹ The average adjusted tax rate is the effective tax rate on alcoholic drinks as a whole, adjusted for different purchasing powers in different countries (i.e. the beverage-specific tax rate in €PPP multiplied by the proportion of alcohol consumption that occurs from that beverage). Countries where most of the consumption is an untaxed drink (e.g. wine in Italy) therefore have a very low effective tax rate.

¹² Data on Price Level Indices (PLIs) was taken from the Eurostat NewCRONOS database, and is provisional 2003 data. The alcohol PLI shows the difference in retail (off-premise) prices for alcohol across the EU25 – this was then compared to the general goods PLI to show the relative price of alcoholic drinks compared to other goods.

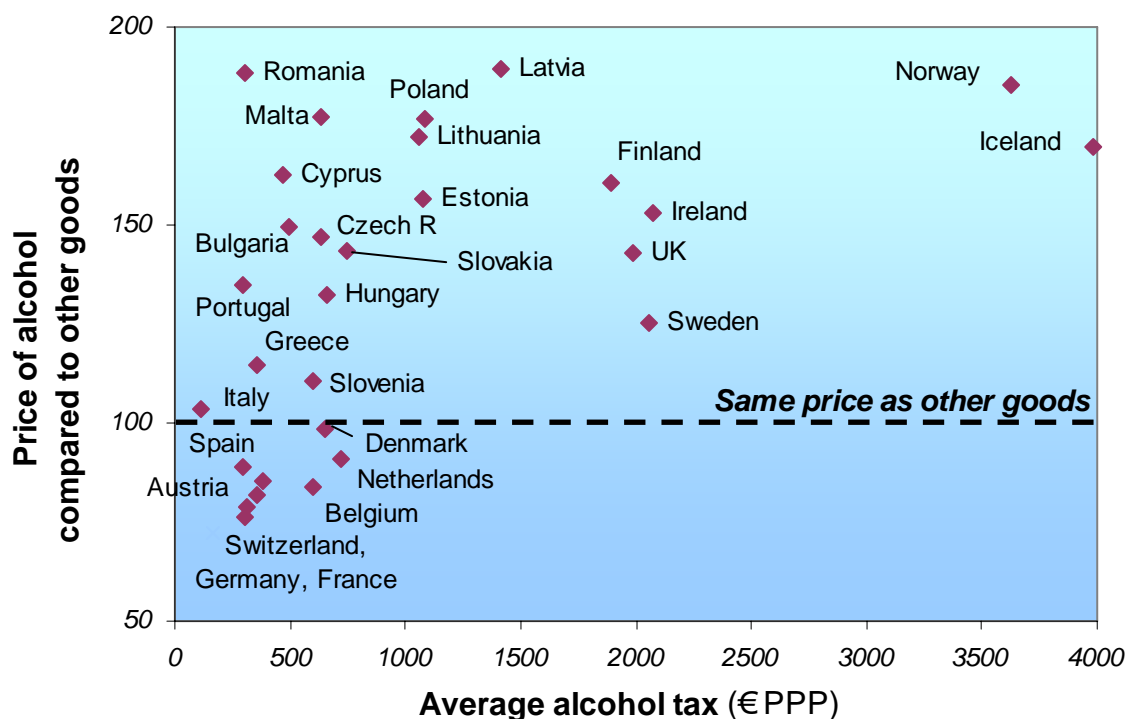


Figure 9.6 Alcohol taxes and the relative price of alcohol. Both measures are the authors' calculations from public data; see footnotes 11 and 12, p385 for details.

In general prices are highest in eastern Europe (except Slovenia), even where the tax rates are relatively low (such as in Bulgaria and Romania). Using 100 to mean that alcohol prices are roughly equivalent to general prices, much of southern and central Europe is less than 90 while virtually the entire eastern area of Europe is between 130 and 190. Of the EU15 countries, only Finland, Ireland and the UK have alcohol prices that would put them in this range (Sweden being just below it).

Box 9.5: Tax and price

- There is a large range in tax rates across Europe, especially for wine where nearly $\frac{1}{2}$ the countries have no tax
- Purchasing-power adjusted taxes are highest in northern Europe, and lowest in southern and parts of central Europe
- Four countries have introduced special taxes on alcopops, which seem to have reduced alcopop consumption

As these prices refer only to alcoholic drinks bought in shops, the price paid by consumers in each country will also be affected by the extent to which alcohol is consumed in on-premises (e.g. bars, restaurants) rather than off-

premises (e.g. wine shops). This means that the price paid by people in the UK and Ireland is likely to be higher than that paid in Italy, for example, given that a much greater amount of consumption occurs in on-premises in these countries (see Chapter 4).

Targeted taxes – the case of alcopops

Special taxes have been introduced in France, Switzerland, Germany and Denmark in response to an increase in young people's drinking of alcopops (see Chapter 4). For example, the tax in Switzerland was changed in February 2004 to be three times

that of the spirits rate, while in Germany an extra €0.83 per 275ml bottle was charged from July 2004. One part of the definition of an 'alcopop' is often the level of sugar – in Switzerland's case the cut-off point is 50g per litre – and this has led to low-sugar versions being produced to avoid the tax. No academic study has evaluated these particular taxes (although see Chapter 7 for the effect of tax and price in other contexts). Nevertheless, official figures show that the introduction of the tax was followed by a sharp drop in alcopop imports in Switzerland (see Figure 9.7).

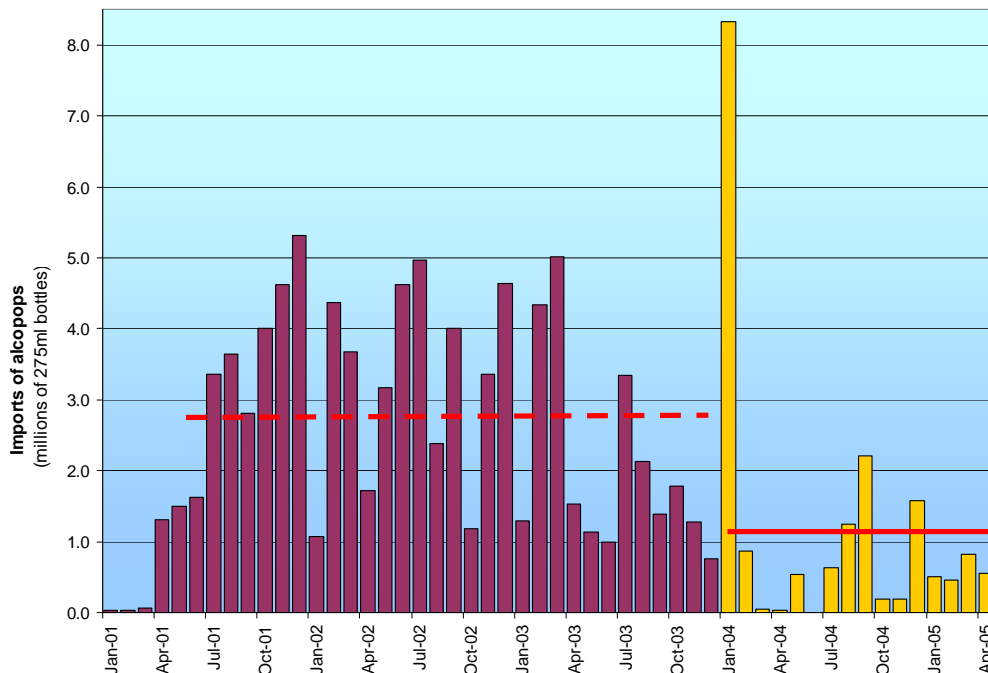


Figure 9.7 The alcopops tax in Switzerland

Official figures (Eidgenössische Alkoholverwaltung [Swiss Alcohol Board] 2005). January 2004 experienced very high imports as retailers collected stock before the tax came into effect in February. Even treating this as post-tax stock, the average Apr 2001 to Dec 2003 (dashed red line) is more than double the average since (solid red line).

The most thorough review of a tax on alcopops comes from the German government, which recently reviewed the alcopop tax introduced the previous year (Bundesministerium der Finanzen [Federal Ministry of Finance] 2005). Based on a survey among 12-17 year olds, this found the consumption of spirits-based alcopops dropped by half between 2004 and 2005 (Bundeszentrale für gesundheitliche Aufklärung [BZgA] 2005), and occurred without a noticeable substitution of other drinks (although there were slight increases in consumption of beer-based alcopops). Official records of sales of spirits-based alcopops also show a decline of 75% following the tax.

The review attributes this fall in consumption primarily to the effects of the tax, citing in particular the 70% of teenagers who reported buying fewer alcopops, among whom the main reason (63%) for buying less was that they had become too expensive (Bundeszentrale für gesundheitliche Aufklärung [BZgA] 2005). Increased awareness and enforcement around young people and alcohol may also have played some part. Market research firms also attribute declining alcopop consumption to the

taxes in Germany and Switzerland, with AC Nielsen reporting that “a massive increase in the price of FABs [in Switzerland] aimed at preventing alcohol misuse by young people led to a sharp decline in sales” (World Drinks Report, 26 May 2005). Similarly, the German association of spirits manufacturers and importers *BSI* has found that the fall in sales of spirit-based alcopops are “the direct result of a new tax on the products” (World Drinks Report, 23 June 2005).

A targeted tax on alcopops has also existed in France since 1999 (and was raised in 2005), but while there are reports that it has been effective in reducing alcopop use there has been no thorough review of its effect. Denmark introduced a tax on alcopops in June 2005, and – according to the official review of the German tax – alcopop taxes are also being considered in the Netherlands and Sweden.

COMPARING COUNTRIES

Europe and the world’s alcohol policies

In comparison to the rest of the world, the countries of Europe are less likely to have a number of policies, especially those based on market restrictions or taxation.

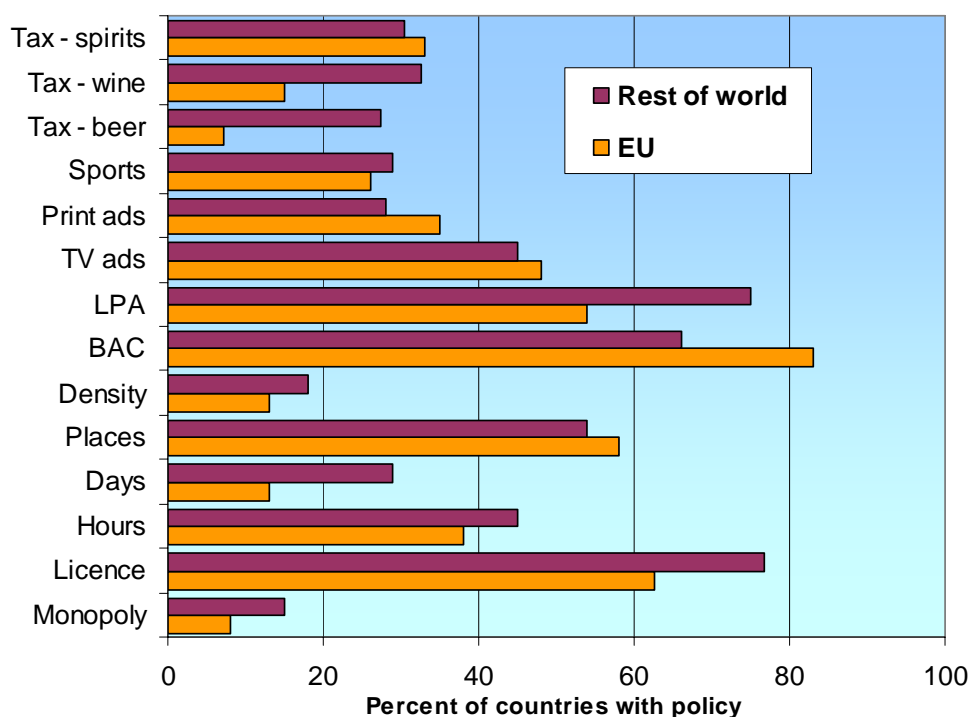


Figure 9.8 Alcohol policies in the EU compared to the rest of the world. **Source:** Data from the Global Status Report on Alcohol Policy (WHO 2004), updated by the Alcohol Policy Network. **Tax** (%WHO ‘high’ tax band (> 30% of retail price for beer and wine; > 50% for spirits)); **Sports / Ads** (% legal restrictions for beer ads / sponsorship of sports events); **LPA** (% on-premise legal purchase age (LPA) of 18+ for beer); **BAC** (% maximum blood alcohol concentration (BAC) of <=0.5g/L); **Density, Places, Days and Hours** (%off-premise restriction for any beverage); **Licence/Monopoly** (%monopoly/licence for retail sales of beer).

Looking at Figure 9.8, it is clear that fewer EU countries have (i) high taxes on wine and beer (as a % of price), (ii) restrictions on the days and hours in which shops can sell beer, (iii) a minimum age to buy beer of 18, or (iv) a licence or monopoly for the retail sale of beer. Conversely, EU countries are more likely to have restrictions on alcohol adverts in print media, and to have a maximum permitted blood alcohol limit of 0.5g/L or less for drivers.

Many of these areas cannot be summarized simply in figures like Figure 9.8, though, because of one more general trend – that the EU countries are more likely to have a policy in each area than the rest of the world, but that they are less likely to have more severe policies. For example, EU countries were *more* likely to have a

minimum age at which people can buy alcohol, but they were *less* likely to have a minimum age of 18 (in fact, the minimum age of 16 is almost unique to Europe). Similarly, EU countries were more likely to have a policy on sports sponsorship, but this was often a voluntary ban and legal restrictions were less common.



An alcohol policy scale for Europe

Going beyond the detail of individual alcohol policies to see the wider picture is more difficult than it may seem, as there is no ‘objective’ way of turning policies into a single measure.

Any way of aggregating the policies will necessarily be selective, and will also omit all elements where there is no good data (e.g. levels of enforcement). Bearing this in mind, it was decided to use the scale from a major Commission-funded project, the ECAS study (Karlsson and Österberg 2001), which itself builds on two earlier proposals (Davies

Figure 9.9 A scale of alcohol policy across the countries of Europe. Slovak Republic and Turkey have an estimated value (using EU average) for one policy area. Source: authors’ calculations using the ECAS scale (Karlsson and Österberg 2001), and data from the Global Status Report on Alcohol Policy (WHO 2004), updated by members of the Alcohol Policy Network (see Chapter 1).

and Walsh 1983; Österberg and Karlsson 2002).¹³ This not only avoids the

¹³ Due to varying data availability the scale in fact differs slightly from the ECAS scale, though the weighting is identical. The main differences are (i) for all questions, policies on each beverage type count for 1/3 of the total points (pts) available (e.g. a sales licence for spirits only is 1/3 pt); (ii) production & wholesale controls are replaced by corresponding data for production alone; (iii) the 1pt originally available for each of ‘sales/days/hours’ and ‘other restrictions’ for each of on- and off-sales has been replaced by 1pt for each of sales, days, hours and density restrictions for off-sales only; (iv) alcohol advertising restrictions were split up into 1pt for TV adverts and 1/2pt each for billboards and print advertising; (v) the 1pt for ‘national education programme or agency’ has been replaced by 1/2pt each for moderately developed education & mass-media campaigns. For most countries the scores are very

contentious process of creating a new scale, but also allows a comparison of present-day policies with those from over half a century ago.

Based on this scale from 0 (no restrictions) to 20 (all restrictions), countries in Europe varied from 5.5 (Greece) to 17.7 (Norway) giving an unweighted average of 10.5 (10.1 in the EU), Figure 9.9. All of the lowest values (below 8) lie in southern Europe (Portugal, Greece, Malta) and a cluster within central and eastern Europe (Austria, Czech Republic, Germany, Luxembourg). Although all values above 15 came from the northern European countries, the policy scores did not simply decrease from North to South, as shown by a high value in France compared to a relatively low value in the UK.¹⁴ Alcohol policy in the EU10 is variable, with some countries (such as Poland and Lithuania) having strict controls and others (the Czech Republic in particular) being much less restrictive.

When these are compared to the average taxation levels (see Figure 9.5 above), we find that most countries with high policy scores also have high taxation levels. However, there are exceptions in both directions – France has a high policy score but a low tax level, in contrast to the UK (and to a lesser extent Ireland) where high alcohol taxes coexist with low policy scores.

Trends in alcohol policy

The changing nature of alcohol policy within Europe is visible from the ECAS historical analysis for the EU15 and Norway, which goes from 1950 to the updated results of the policy scales above (2005).¹⁵ Unfortunately the necessary historical data for the non-ECAS countries in the EU10 are not available – although one earlier comparative study using a different scale found that the policy level in Poland decreased between 1981 and 1991 (Contel 1993).

Some indication of recent policy trends in the EU10 is nevertheless available from historical sources. The most important policy measure for the former-Soviet or Warsaw Pact countries¹⁶ is the anti-alcohol campaign under Gorbachev, where the state severely restricted the availability of alcohol in the late 1980s (Room 2001; Swiatkiewicz and Moskalewicz 2003). Aside from the noticeable effects on public health (see Chapter 6), the mismatch between supply and demand led to a number of more negative side effects, including alcohol rationing and a thriving black market. While the policy itself was abandoned by 1989, it has been suggested that the effects may still be discernible as a lingering resentment against one of the last acts of a centralised bureaucracy (Room 2001). Nevertheless, this does not appear to be true for everyone, with few in the elite groups of the countries bordering the Baltic Sea mentioning the Gorbachev campaign in their discussions on the place of alcohol policy in the late 1990s (Simpura *et al.* 1999).

closely related, although differences of two points or more are found in Belgium (lower), Denmark (higher), Italy (lower), and the UK (lower).

¹⁴ The UK's score is lower here than the original ECAS study due to a combination of data corrections and the adjustments made for sales controls.

¹⁵ The revisions made to the ECAS policy scale due to data availability have the result that the 2005 figures here are lower for both distribution controls and control of marketing compared to the 2000 results. However, the updated scores do not change any of the discussion and are therefore included in the graphs to avoid confusing discrepancies between graphs within this chapter.

¹⁶ All of the EU10 except Cyprus, Malta and Slovenia, plus the other study countries of Bulgaria and Romania.

Trends in the ECAS countries

In the immediate post second world war period there was a large contrast within western Europe on alcohol policy. At one end of the spectrum there was Norway, Sweden and Finland, where physical availability of alcohol was tightly controlled through monopolies, rationing and many other forms. In contrast, alcohol policy barely existed in southern Europe and even where it did it was for trade rather than health purposes (other than in Italy). Countries in-between on the policy scale concentrated mainly on licensing restrictions, but there was still a large gap between the fourth most strict country (the UK on 8) and the third (Finland on 17; see Figure 9.10).

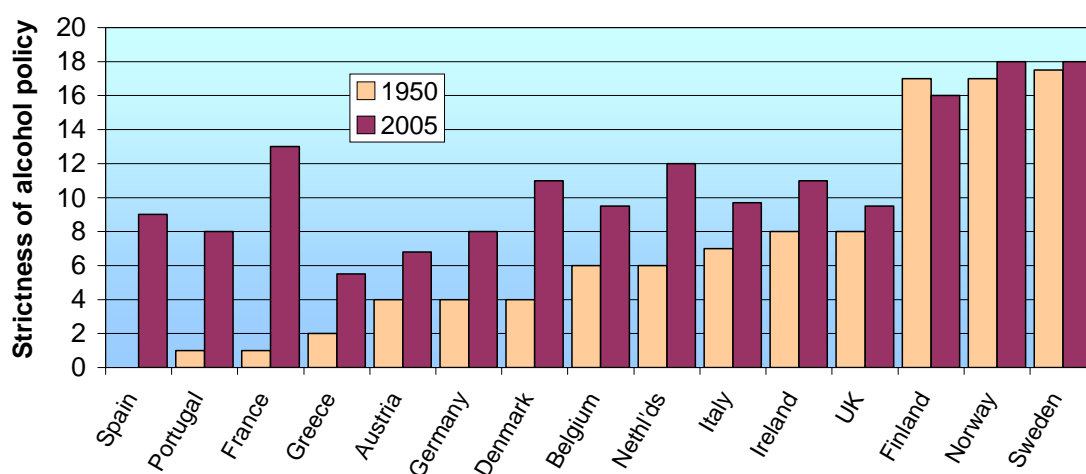


Figure 9.10 Changes in the strictness of alcohol policy in ECAS. *Source: authors' calculations using the ECAS scale (Karlsson and Österberg 2001), and data from the Global Status Report on Alcohol Policy (WHO 2004), updated by members of the Alcohol Policy Network (see Chapter 1).*

By the end of the century a degree of harmonisation was visible. Nearly all countries increased the strength of their alcohol control policies and justified them through health or social aims, with France and Spain seeing the biggest increases. The only exception was Finland (Norway and Sweden also reduced slightly in the original ECAS scale), where much of the monopolies had been abandoned and some other restrictions relaxed. In fact, other countries also avoided these policy areas (the average score for production and distribution controls actually went down 1950-2005, and the limited data also suggests declining tax rates since the 1970s (Österberg 2005)), instead opting for drink-driving and advertising controls as well as setting up prevention or education institutions. The convergence, therefore, not only relates to the blunt score, but also to changing preferences away from 'supply' and towards 'demand' management (see Figure 9.11).

Part of the more recent period is also covered by a WHO-EURO report for the 2001 Stockholm Ministerial conference (Rehn, Room, and Edwards 2001). This found that advertising and point-of sale promotions were the most common areas for policy change 1994/5 to 1998/9, with, in both cases, the trend being for stricter controls (9 of 16 for advertising, 11 of 13 for point-of-sale promotions). Drink-driving policies were also strengthened, particularly blood alcohol limits (in 9 cases decreased and

only once raised, in Bulgaria) but also the introduction of random breath testing (in 5 countries). Only in the area of the availability of alcohol were policies weakened, with monopolies being replaced by licensing in five countries and licensing controls weakened in five other countries (although in four separate cases licensing restrictions were strengthened). This fits with the results from ECAS, where advertising and targeted restrictions became stronger at the same time as availability controls weakened.

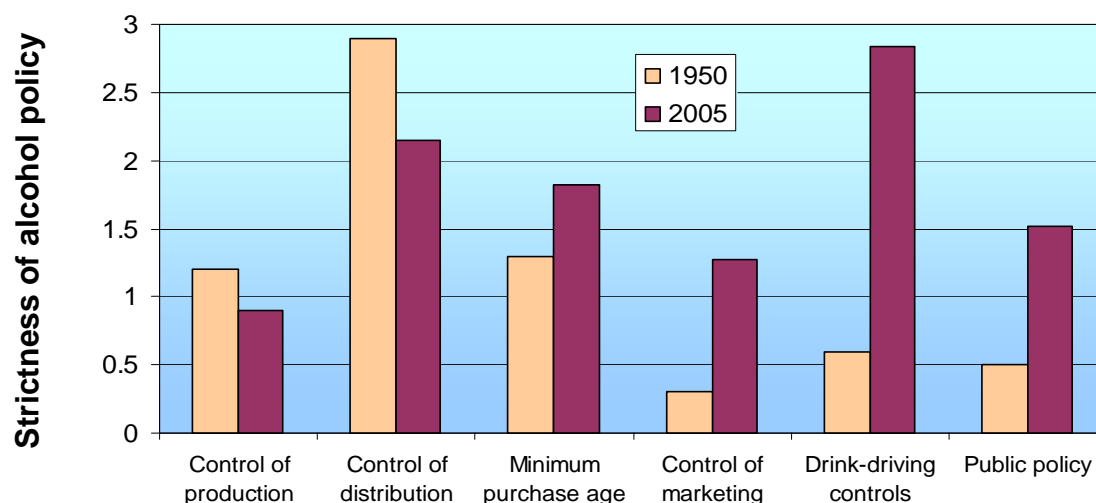


Figure 9.11 Changes in the strictness of different alcohol policy areas in ECAS. *Source: authors' calculations using the ECAS scale (Karlsson and Österberg 2001), and data from the Global Status Report on Alcohol Policy (WHO 2004), updated by members of the Alcohol Policy Network (see Chapter 1).*

CONCLUSION

Alcohol policy in Europe shows some striking similarities between countries – but also a number of continuing differences. For example, while all European countries have a set of policies relating to alcohol, sometimes these are uncoordinated and lacking an overarching strategy. Areas where the countries are relatively similar include blood alcohol limits for drivers, licences for alcohol sales, the existence of a minimum age at which alcohol can be purchased in bars, and some form of alcohol education in schools. In contrast, wide differences can be seen in the enforcement of drink-driving regulations (where large numbers in several countries believe they will never be breathalysed), the exact age at which young people can buy alcohol (particularly in shops), limits on availability, and advertising restrictions. Most of all, the tax rates in different European countries show an enormous variation, with the lowest rates found in southern and parts of central and eastern Europe. Despite this, it should be noted that there is not a simple north-south gradient in the strictness of alcohol policy, as seen by the high score in France and relatively low policy scores in Ireland and the UK.

The analysis and comparison of country-based policies inevitably highlights the gaps in national action – the policies that are more common outside of Europe than within it, the policies that were more common in the past than they are now. Controls on the availability of alcohol have declined over the second half of the 20th century, which some have argued is associated with the growth of consumerism (Lund,

Alavaikko, and Österberg 2000), although the evidence on changing opinions in this particular area does not confirm this of itself (Österberg and Karlsson 2002). Tax levels compared to alcohol prices are also lower in Europe than the rest of the world, a finding that must also be put in the context of the internal market policies discussed in Chapter 8. And while many effective policies to reduce harm (see Chapter 7) are widespread in the EU today, there remain many situations where alcohol-related harm could be clearly reduced through the widespread implementation of policies that are adopted in the majority of the EU Member States (these are reflected in the recommendations in Chapter 10).

However, it is equally important to highlight the positive trend of alcohol policy in Europe overall. Drink-driving controls in particular are now commonplace, in contrast to their relative rarity 50 years ago. To a lesser extent, a number of other policies have also diffused widely within Europe including marketing controls, minimum ages to buy alcohol, and public policy structures to deliver alcohol policy – all of which are possibly partially related to public attitudes to alcohol policy, although more research is needed in this area. And on a collective level, EU Member States are considerably closer in their alcohol policies than they were half a century ago, paralleling the harmonization in drinking levels discussed in Chapter 4. It is within this trend of improvement that the gaps should be seen, and worked upon in a positive light.

REFERENCES

Baltic Data House (2001). *Economic research about the influence of taxes imposed on alcohol and influence of price policy on alcohol consumption; research about accidents caused by alcohol intoxication*. Riga, LV: Market and Social Research Group, Baltic Data House, Baltic Institute of Social Sciences.

BBC News Online (2004). *Public backs alcohol crackdown [posted 8th September]*. <http://news.bbc.co.uk/1/hi/health/3634322.stm>

Bongers, I. M. B. (1998). "Social Climate on Alcohol in Rotterdam: Public Opinion on Drinking Behaviour and Alcohol Control Measures." *Alcohol and Alcoholism*, 32(2): 141-50.

Bundesministerium der Finanzen [Federal Ministry of Finance] (2005). *Bericht der Bundesregierung über die Auswirkungen des Alkopopsteuergesetzes auf den Alkoholkonsum von Jugendlichen unter 18 Jahren sowie die Marktentwicklung von Alkopops und vergleichbaren Getränken [Federal Government report on the effect of the alcopops tax on the consumption of alcohol in young people under the age of 18, as well as market trends in alcopops and comparable beverages]*. <http://www.bmgs.bund.de/downloads/alkopopsteuerbericht.pdf>

Bundeszentrale für gesundheitliche Aufklärung [BZgA] (2005). *Entwicklung des Alkoholkonsums bei Jugendlichen unter besonderer Berücksichtigung der Konsumgewohnheiten von Alkopops (Alkopops-Studie) [Developments in young people's consumption of alcohol, in particular on alcopops (Alcopops study)]*. Köln, Deutschland: Bundeszentrale für gesundheitliche Aufklärung [Federal centre for health education]. http://www.bmgs.bund.de/downloads/bzgakurzbericht_alkopops.pdf

Christ, R. (1998). "Drinking and Drink Driving." *The attitude and behaviour of European car drivers to road safety: Sartre reports - Part 1 - Report on principal results*, Edited by J-P. Cauzard and R. Wittink. project on Social Attitudes to Road Traffic Risk in Europe.

Contel, M. (1993). "L'Approccio Istituzionale e Normativo [Institutional and Normative Approach]." *Alcool: consumi e politiche [Alcohol: consumption and policy]*, Rome: Permanent Observatory on Youth and Alcohol.

Crawford, A. (1987). "Attitudes About Alcohol: a General Review." *Drug and Alcohol Dependence*, 19: 279-311.

Davies, P. and Walsh, D. 1983. *Alcohol Problems and Alcohol Control in Europe*, New York: Gardner Press.

Eidgenössische Alkoholverwaltung [Swiss Alcohol Board] (2005). *Einfuhr von Premix und Alcopops umgerechnet in Flaschen zu 275 ml und einen Alkoholgehalt von 5,6 % Vol [Imports of premix drinks and alcopops assuming bottles of 275ml and an alcoholic strength of 5.6% ABV]*. http://www.eav.admin.ch/d/n_alcopo2.htm

Elmeland, K. and Villumsen, S. (2005). "Opinions on Alcohol Policy in Denmark." *Presentation at Alcohol - use, harms and policy. A research-based Nordic-Baltic seminar, Riga, October 3, 2005 [conference proceeding]*

Hanekom, L. (2004). *Alcohol consultation with young people in England*. Turning Point, the Hungerford and Comic Relief. http://www.turning-point.co.uk/NR/rdonlyres/C5A18354-7FD3-4613-8832-A9C36D74FF28/0/YPAalcohol_consultation_reportdoc.pdf

Hemström, Ö. (2002). "Attitudes to Alcohol Policy in Six EU Countries." *Contemporary Drug Problems*, 29: 605-18.

Hemström, Ö., H. Leifman, and M. Ramstedt (2001). "The ECAS-Survey on Drinking Patterns and Alcohol-Related Problems." *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries*, Edited by T. Norström. Stockholm: National Institute of Public Health, European Commission.

Kara, D. and Hutton, L. (2003). *Omnibus Survey: testing public opinion on licensing laws and alcohol consumption*. Scottish Opinion Ltd on behalf of Scottish Executive Social Research. <http://www.scotland.gov.uk/library5/justice/ostp.pdf>

Karlsson, T. and Österberg, E. (2001). "A Scale of Formal Alcohol Control Policy in 15 European Countries." *Nordisk Alkohol- & Narkotikatidskrift (Nordic Studies on Alcohol and Drugs)*, 18(English Supplement): 117-31.

Koroleva, I. (2005). "Alcohol Consumption and Problems in Latvia: Survey Results on Alcohol Use." *Presentation at Alcohol - use, harms and policy. A research-based Nordic-Baltic seminar, Riga, October 3, 2005 [conference proceeding]*

Lancaster, B. and Dudleston, A. (2002). *Attitudes towards alcohol: views of the general public, problem drinkers, alcohol service users and their families and friends*. <http://www.scotland.gov.uk/cru/kd01/red/atav.pdf>

Lund, I., M. Alavaikko, and E. Österberg (2000). "Deregulating or Re-Regulating the Alcohol Market?" Pp.201-22 in *Broken Spirits. Power and Ideas in Nordic Alcohol Control*, Edited by P. Sulkunen, C. Sutton, C. Tigerstedt, and K. Warpenius. Helsinki: Nordic Council for Alcohol and Drug Research.

Mäkelä, P., Fonager, K., Hibell, B., Nordlund, S., Sabroe, S., and Simpura, J. (1999). *Drinking habits in the Nordic countries*. Oslo: National Institute for Alcohol and Drug Research.

NOP Market Solutions (2000). *Research carried out for the Institute of Alcohol Studies on alcohol [details available from IAS on request]*. NOP/420230. Institute of Alcohol Studies.

Olsson, B., S. Nordlund, and S. Järvinen (2000). "Media Representations and Public Opinion." Pp.223-24- in *Broken spirits: powers and ideas in Nordic alcohol control*, Edited by P. Sulkunen, C. Sutton, C. Tigerstedt, and K. Warpenius. Helsinki, Finland: Nordic Council for Alcohol and Drug Research (NAD).

Österberg, E. (2005). "Taxes and Border Trade." *Presentation at Alcohol - use, harms and policy. A research-based Nordic-Baltic seminar, Riga, October 3, 2005 [conference proceeding]*

Österberg, E. and Karlsson, T. (2002). *Alcohol Policies in EU Member States and Norway: a Collection of Country Reports*, Helsinki: STAKES.

Pendleton, L. L., Smith, C., and Roberts, J. L. (1990). "Public Opinion on Alcohol Policies." *British Journal of Addiction*, 85(1): 125-30.

Rehn, N., Room, R., and Edwards, G. 2001. *Alcohol in the European Region - Consumption, Harm and Policies*, Copenhagen: WHO Europe.

Reitan, T. C. (2003). "Democracy in a Bottle: Attitudes Towards Alcohol Regulation in the Post-Communist Baltic Sea Region." *Journal of Baltic Studies*, 34(2): 131-58.

Room, R. (2001). "New Findings in Alcohol Epidemiology." Pp.35-42 in *Alcohol in the European region - consumption, harm and policies*, Edited by N. Rehn, R. Room, and G. Edwards. Copenhagen: WHO Regional Office for Europe.

Sardi, G. M. and C. Evers (2004). "Drinking and Driving." *European drivers and road risk: part 1 - reports on principal analyses*, Edited by Sartre. Institut National de Recherche sur les Transports et leur Sécurité INRETS.

Sartre (1995). *Social attitudes to traffic risk in Europe*. Orleans, France: Paradigme. <http://sartre.inrets.fr/>

Sartre (1998). *The attitude and behaviour of European car drivers to road safety*. <http://sartre.inrets.fr/>

Simpura, J., Tigerstedt, C., Hanhinen, S., Lagerspetz, M., Leifman, H., Moskalewicz, J., and Torronen, J. (1999). "Alcohol Misuse As a Health and Social Issue in the Baltic Sea Region: A Summary of Findings From the Baltica Study." *Alcohol and Alcoholism*, 34(6): 805-23.

Strategic Task Force on Alcohol (2004). *Strategic Task Force on Alcohol: second report*. Health Promotion Unit, Department of Health and Children, Ireland. www.healthpromotion.ie

Swiatkiewicz, G. and J. Moskalewicz (2003). "Poland." *Alcohol and Temperance in Modern History*, Edited by J. S. Blocker, D. M. Fahey, and I. R. Tyrrell. Oxford, England: ABC Clio.

WHO (2004). *Global status report on alcohol 2004*. Geneva: Department of Mental Health and Substance Abuse, World Health Organization.

Chapter 10: Conclusions and recommendations

INTRODUCTION

At the level of the European Union, there is, as yet, no comprehensive alcohol policy document or strategy. Current Union wide actions on alcohol are based on two Council initiatives adopted in June 2001, the Council Recommendation on the drinking of alcohol by young people, in particular children and adolescents¹ and the Council Conclusions on a Community strategy to reduce alcohol-related harm², with the request for a comprehensive alcohol strategy repeated by the Council in June 2004³.

There are both community and cross border aspects related to alcohol. Union policies influence alcohol production, marketing, trade, consumption and the reduction of harm. Union policy provides subsidies for wine production; policy on television without frontiers regulates alcohol advertising; consumer policy regulates labelling and claims; internal market and taxation policy influence the price structure and therefore consumption; and transport policy influences the law on blood alcohol levels and driving.

The ability of Member States to frame effective alcohol policy can be restrained due, for example, to differences in excise duties on alcoholic beverages, young peoples' changing drinking habits, and cross border marketing. Thus, a comprehensive strategy at the level of the European Union would also support Member States, as well as regions and municipalities in the strengthening and implementation of their own policies.

This final chapter draws together a number of conclusions and recommendations to inform the development and implementation of alcohol policy at the European, Member State and regional and municipal levels. The conclusions and recommendations, which are drawn from the previous chapters, as well as from the Health for All principles of the World Health Organization⁴, are focussed to support the objective of the European Commission's proposals for a comprehensive alcohol strategy to reduce the health and social harm done by alcohol, and thus contribute to higher productivity and a sustainable economic development in the Union in line with the objectives set out in the Lisbon Strategy⁵.

CONCLUSIONS

Fifteen public health conclusions are drawn, stressing that alcohol policy does not need to affect the role that alcohol plays in the economy of Europe; the importance of alcohol as an economic burden to European society and an impediment to the objectives of the Lisbon Strategy; the similarities and differences in drinking across Europe; the importance of alcohol as a health determinant leading to harm to others

¹ http://ec.europa.eu/eur-lex/pri/en/oj/dat/2001/l_161/l_16120010616en00380041.pdf.

² http://ec.europa.eu/eur-lex/pri/en/oj/dat/2001/c_175/c_17520010620en00010002.pdf.

³ http://ue.eu.int/ueDocs/cms_Data/docs/pressData/en/lsa/80729.pdf.

⁴ World Health Organization (1998). Health 21 – The Health For All Policy For The WHO European Region.

⁵ Lisbon strategy: http://ec.europa.eu/comm/lisbon_strategy/index_en.html.

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and health inequalities; the responsibilities and benefits of governments in implementing alcohol policy; and the policy differences across Europe which can impair the ability of countries to set their own alcohol policies.

Alcohol and the Economy of Europe

Conclusion 1 Europe plays a central role in the **global alcohol market**, acting as the source of a quarter of the world's alcohol and over half of the world's wine production. **Trade** is even more centred on Europe, with 70% of alcohol exports and just under half of the world's imports involving the European Union, with the majority of this trade being between Union countries.

Conclusion 1	Evidence (ch: pp) ⁶
The trade in alcohol contributes around €9billion to the goods account balance for the European Union as a whole, with such trade not necessarily affected by European and domestic policy to reduce the harm done by alcohol.	3: 48-52

Conclusion 2 Alcohol excise duties amounted to €25 billion in the older EU15 countries in 2001, excluding sales taxes and other taxes paid within the supply chain – although €1.5 billion is given back to the supply chain through the Common Agricultural Policy. Due to the relative inelasticity of the demand for alcohol, the average tax rates are a much better predictor of a government's **tax revenue** than the level of consumption in a country.

Conclusion 2	Evidence (ch: pp)
Alcohol tax revenues , an important source of government revenue (€25bn in 2001 in the older EU15 countries), are more closely related to tax rates than to the overall level of alcohol consumption.	3: 54-55

Conclusion 3 Alcohol is also associated with a **number of jobs**, including over an estimated three-quarters of a million in drinks production (mainly wine). Additional jobs are related to alcohol elsewhere in the supply chain, e.g. in pubs or shops. However, the size of the industry is not necessarily a good guide to the economic impact of alcohol policies – for example, trends in alcohol consumption show no crude correlation with trends in the number of jobs in associated areas such as the hotels, restaurants, and catering sector, suggesting that the effect of changes in consumption may be relatively weak. A reduction in spending on alcohol would also be expected to free consumer funds to be spent on other areas, with the economic impact depending on exactly what this new expenditure is. Current evidence from alcohol and other sectors suggests that declining consumption does not necessarily lead to job losses in the economy as a whole.

⁶ ch=chapter; pp=page number

Conclusion 3	Evidence (ch: pp)
Declining consumption will not necessarily lead to job losses in the economy as a whole, and may not even lead to large changes in employment in some sectors linked to alcohol such as restaurants and bars.	3: 57-58

The social costs of alcohol

Conclusion 4 Alcohol-attributable disease, injury and violence is an **economic burden to society** in the health, welfare, employment and criminal justice sectors, with a total calculated tangible cost of €125bn ((and a range of €79-220bn) in 2003, equivalent to 1.3% of GDP. €59bn of these tangible costs due to alcohol result from **lost production** (absenteeism, unemployment and lost working years through premature mortality), and can be an impediment to the competitiveness of Europe as envisaged by the Lisbon strategy.

Conclusion 4	Evidence (ch: pp)
The tangible costs of alcohol to the European Union were estimated to be €125bn in 2003, including €59bn worth of lost productivity through absenteeism, unemployment and lost working years through premature death.	3: 59-69 6: 197-204

Conclusion 5 The **intangible costs** show the value people place on pain, suffering and lost life that occurs due to the criminal, social and health harms caused by alcohol. In 2003 these were estimated to be €270bn, with other ways of valuing the same harms producing estimates between €150bn and €760bn.

Conclusion 5	Evidence (ch: pp)
The intangible costs of alcohol (which describe the value people place on suffering and lost life) to the European Union were estimated to be €270bn in 2003.	3: 65-68 6: 197-204

The use of alcohol in Europe

Conclusion 6 Although many differences between countries remain, there have been several examples of convergence in drinking across Europe, in terms of the amount drunk, drinking patterns and styles, and beverage choices (sometimes within the whole EU and sometimes between different regions). North-south gradients can still be seen for many aspects of drinking, such as more binge drinking in the north and more drinking with meals in the south, but these are less apparent than previously described and obscure increasing exceptions to this general pattern. Most countries have seen a rise in binge-drinking for both boys and girls in the 1990s followed by mixed trends since, resulting in a narrower gap in binge drinking between the newer EU10 countries and the older EU15 countries.

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Conclusion 6	Evidence (ch: pp)
While differences between countries in the levels and patterns of drinking are still evident, they are smaller than they were 40 years ago, and many aspects of drinking are much more similar across Europe than commonly believed. Adolescent binge drinking has increased in most countries in the 1990s, followed by mixed trends in the past few years.	4: 83-85 4: 108-110

Conclusion 7 Although the prevalence of drunkenness and its consequences differs across Europe, problems arising from intoxication (such as intentional and unintentional injuries) are also important in southern Europe. Some of the perceived differences arise because some Europeans believe more in a link between alcohol and violent injuries than other Europeans, although this appears to show no clear pattern across Europe. The reality is that, for example, changes in alcohol consumption have a significant effect on male homicide rates in all regions of Europe, with some estimates even suggesting that the role of alcohol as a cause of homicides may be similar in southern Europe (61% of all homicides) and northern Europe (50% of all homicides).

Conclusion 7	Evidence (ch: pp)
Drunkenness is an important cause of injuries – including violent injuries – across all of Europe, including in southern Europe.	6: 196-205 6: 210-213

Conclusion 8 Hippocrates, writing 2500 years ago, advised anyone coming to a new city to enquire whether it was likely to be a healthy or unhealthy place to live, depending on its geography and the behaviour of its inhabitants (“whether they are fond of excessive drinking”). This is equally true today. Although there has been a convergence in drinking behaviour and drinking styles, a European citizen is more likely to have a problem from alcohol **if they live** in a country, region or municipality with a higher relative alcohol consumption or a more detrimental pattern of drinking.

Conclusion 8	Evidence (ch: pp)
Where you live in Europe remains a major determinant of the harm done by alcohol.	6: 211-230

Alcohol and Health

Conclusion 9 Alcohol is a key **health determinant**, being a cause of some 60 diseases and conditions. Alcohol is responsible for 7.4% of all ill-health and premature death in the European Union, being the third leading risk factor after high blood pressure and tobacco, and a cause of over 25% of male deaths in the age group 15-29 years. Both the overall amount of alcohol consumed and the amount consumed on any one drinking occasion are important determinants of health and social harm. Fifty-five million adults drink to hazardous levels and some 100 million Europeans binge-drink at least once a month. Although in low doses, alcohol reduces the risk of coronary heart disease, the current estimate of 160,000 deaths delayed in old age is likely to be an overestimate.

Conclusion 9	Evidence (ch: pp)
Alcohol is a health determinant , responsible for 7.4% of all disability and premature death in the European Union.	5: 141-165 6: 205-219

Conclusion 10 Alcohol is a key cause of harm to **people other than the drinker** including, crime, violence and injuries, and harm to the unborn child.

Conclusion 10	Evidence (ch: pp)
Alcohol is a cause of harm to others than the drinker , including some 60,000 underweight births, 5-9 million children living in families adversely affected by alcohol and 10,000 traffic deaths to people other than the driver in the European Union each year.	5: 136-141 6: 222-223

Conclusion 11 Alcohol contributes to **health inequalities** between and within Member States. The alcohol disease burden is highest in some of the new Member States, and alcohol related harm is one factor behind the difference in life expectancy between the older EU15 countries and the newer EU10 countries. In England, men aged 25–69 years in the lowest socio-economic status category have a 15-fold higher risk of alcohol-related mortality than professionals in the highest category.

Conclusion 11	Evidence (ch: pp)
Alcohol is a cause of health inequalities both between and within Member States, causing an estimated 90 extra deaths per 100,000 men and 60 extra deaths per 100,000 women in the newer EU10 countries, compared to the older EU15 countries.	6: 220-222

Alcohol and government policy

Conclusion 12 Governments have a **responsibility** for alcohol policy, and government action, which includes taxes, service provision, regulation and information, also brings in **benefits**, including reduced costs and increased income due to taxes.

Conclusion 12	Evidence (ch: pp)
Governments have a responsibility to intervene in the market, and benefit from doing so, with, for example, a 10% increase in the price of alcohol across the older EU15 Member States estimated to bring in approximately €13bn in extra alcohol taxes in the first year.	7: 262-263

Conclusion 13 The most robust evidence for effectiveness in reducing the harm done by alcohol results from those measures that regulate the marketing of alcohol, including price and taxation, managing the availability of alcohol and regulating commercial communications. Educational type preventive interventions show little evidence of effectiveness across authoritative reviews and are not an alternative to regulating the marketing of alcohol.

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Conclusion 13	Evidence (ch: pp)
Educational interventions , which show little effectiveness in reducing the harm done by alcohol, are not an alternative to measures that regulate the alcohol market , which have the greatest impact in reducing harm, including amongst heavier and younger drinkers.	7: 251-258 7: 258-287

Alcohol and European policy

Conclusion 14 Although alcohol policies have converged in Europe over the last 50 years, substantial differences in alcohol taxes that result in cross-border shopping impede the ability of many countries to implement effective policies.

Conclusion 14	Evidence (ch: pp)
Continuing differences in alcohol policy across Europe, such as tax rates, impair the ability of countries to implement effective policies.	8: 349-359

Conclusion 15 Despite the differences in policies between Member States, the European Court of Justice has increasingly ruled in favour of different alcohol policies for **health reasons**. An example of this is when the French Government was taken to the European Court, alleging that its Loi Evin, by prohibiting alcohol advertising on hoardings visible during the retransmission of bi-national sporting events on TV, entailed restrictions on the freedom to provide advertising services and television broadcasting services. The Court ruled in favour of the Loi Evin by stating: it is in fact undeniable that advertising acts as an encouragement to consumption; the French rules on television advertising are appropriate to ensure their aim of protecting public health; they do not go beyond what is necessary to achieve such an objective.

Conclusion 15	Evidence (ch: pp)
Different policies between Member States are sometimes ruled as legitimate to protect public health , such as the European Court's 2004 ruling in favour of the French advertising law.	8: 351-352

RECOMMENDATIONS

In this section, 18 general recommendations are made for supporting alcohol policy based on previous chapters as well as on the Health for All policy principles of the World Health Organization⁷, in the four areas of: (i) defining an alcoholic beverage; (ii) creating the evidence base; (iii) preparing and implementing resourced strategies and plans; and (iv) assessing the impact of other policy areas and increasing cross border support.

These general recommendations are followed by 34 specific alcohol policy recommendations in six areas derived from Chapter 7: (v) policies that reduce drinking and driving; (vi) policies that support education, communication, training and public awareness; (vii) policies that provide consumer information; (viii) policies that regulate the alcohol market; (ix) policies that support the reduction of harm in drinking and surrounding environments; and (x) policies that support interventions for individuals.

General Recommendations

I. Defining an alcoholic beverage

Although the EU has a definition of alcohol for tax purposes (0.5% alcohol concentration for beer and 1.2% alcohol concentration for all other drinks), considerable differences remain across countries in the definition of an alcoholic beverage for public policy purposes (see Chapter 9). This is compounded by the difficulty of classifying many mixed drinks that have been produced in recent years (see Chapter 3, 4 and 7), and the varied definitions of 'low alcohol' beverages that are subject to fewer restrictions (e.g. only beer below 4.2% alcohol concentration can be sold on trains in the Czech Republic).

Defining an alcoholic beverage	Relevant actor	Evidence (ch:pp)
I.1. Public policies need to define alcoholic beverages in a uniform way across the European Union. A starting point could be the lowest definition for tax purposes (0.5% alcohol by volume).	(I) European institutions	9: 377

II. Creating the evidence base

Research A firm research base is a pre-requisite for alcohol policies and actions. A clear finding of this report is that Europe, and particularly southern and eastern Europe, lag behind other parts of the world in undertaking and publishing research on alcohol and alcohol policy. The scientific community should be involved in developing scientifically sound, socially relevant and feasible bases for alcohol policy decisions. Research is not value-free, in the sense that the framing and choice of topics

⁷ World Health Organization (1998). Health 21 – The Health For All Policy For The WHO European Region.

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inevitably reflects judgments and choices between competing priorities. The duty of the scientific community is to be faithful to the research evidence, which means that the findings of research may contradict current policies and programmes. There is good reason, then, for there to be some distance between the public health scientific community and both governments and the beverage alcohol industry.

However, there must be a much better match between the needs for alcohol policy research as perceived by decision-makers and planners on the one hand, and the research priorities set by the research community on the other. And to be useful, research evidence has to be communicated simply and given meaning by making it relevant to current issues. Such sustained contributions may only be possible in the context of a long-term, publicly-funded research programme designed to engage members of the scientific community in each country in the collection, evaluation, and interpretation of research data that is relevant to a country's alcohol policy needs.

Research and development efforts cannot be implemented without building the appropriate capacity. Effective alcohol policy needs competent and well-informed personnel working in settings aimed to support their efforts. Therefore, investments must be made in both institutional and human capacity research development.

Responsibility for translating scientific research into effective policy is distributed across a wide variety of government agencies and public interest groups. In addition, there need to be systematic mechanisms for ensuring that new evidence from research is actually introduced into policy and programme practice. If all existing knowledge about which alcohol policy approaches work and which do not were fully applied, this could have a major impact in improving public health.

Recommendations for research	Relevant actor	Evidence (ch:pp)
II.1. European infrastructures should be established and financed to undertake collaborative cross country alcohol research (see Box 10.1).	(I) European institutions (II) Member States and regions	All report
II.2. European infrastructures should be created and financed to review and disseminate all major research outcomes in alcohol policy through, for example, registries and databases; the evidence base should be translated into easily understood policies and practices through practical toolkits and guidelines	(I) European institutions (II) Member States and regions	All report
II.3. Long-term publicly-funded alcohol research programmes should be established and financed (see Box 10.1).	(I) European institutions (II) Member States and regions	All report
II.4. Research capacity in alcohol policy should be developed through professional development programmes.	(I) European institutions (II) Member States and regions	All report

Information systems are a key component in making knowledge more widely available. Intelligence is broader than information. It implies identifying and interpreting essential knowledge for making decisions from a range of formal and informal sources. Intelligence should include: current and future trends and system performance (e.g. levels, trends and inequalities in areas of alcohol consumption and alcohol-related harm); risk factors for harm; vulnerable groups; organizational or institutional challenges in implementing policy; governance; important contextual factors and actors (the political, economic and institutional context); the roles and motivation of different actors; user and consumer preferences; opportunities and constraints for change; and events and reforms in other sectors with implications for alcohol policy. This information should be available on electronic media and be published regularly in a publicly accessible form, so as to promote an informed and open debate among politicians, professionals and the public concerning outcomes and determinants, and future priorities for action and investment.

Recommendations for information	Relevant actor	Evidence (ch:pp)
II.5.A European Alcohol Monitoring Centre (EAMC), with country based counterparts, should be established and financed.	(I) European institutions (II) Member States and regions	All report
II.6. The importance of including alcohol-related indicators dealing with consumption, harm and policy and programme responses within the European Community Health Indicators short-list should be stressed to the EU Working Party on Health Indicators.	(I) European institutions	All report
II.7. Alcohol surveillance programmes should be established so that data are comparable and analysable across Europe (see Box 10.1).	(I) European institutions (II) Member States and regions	All report
II.8. A European database of laws and regulations and of effective policies and programmes at European, Member State and municipal level should be established and maintained.	(I) European institutions (II) Member States and regions (III) Municipal	9: 376-394

Box 10.1 – Improving Information and research on Alcohol

Throughout this report, there have been areas of public health relevance where there was insufficient comparative information to make robust conclusions. Although a detailed list of research recommendations is beyond the scope of this report (see instead the ECAS II study), the following areas strike the present authors as key gaps to be addressed:

Making data comparable

1. Given substantial problems in the comparability and robustness of certain data, a new European Alcohol Monitoring Centre (EAMC; see Recommendation II.6) should be a source of best practice for Member States and others. This should include expertise in the interpretation and context of questions on drinking, and how these vary across Europe. It could also act as a repository for datasets.
2. This infrastructure should provide a set of flexible but standardised definitions for alcohol data. These should cover both the use of alcohol (e.g. cut-off levels for episodic heavy drinking and binge-drinking) and alcohol-related harm (e.g. definitions of a 'drink-driving death').

Economic evaluations

3. The social and external cost of alcohol should be assessed using a standardised methodology in all Member States.
4. While the WHO's CHOICE project represents an important first step in cost-benefit analyses of alcohol policies, there is a need for further European research to estimate the costs and benefits of potential policy options and to evaluate the economic impact of policies that have recently been adopted.
5. Robust, transparent economic evaluation should also be conducted on (i) the number of jobs linked to alcohol; (ii) what happens to consumer spending if less money is spent on alcohol; and the effect of changing alcohol consumption on (iii) areas of the economy closely linked to alcohol and (iv) the wider economy.

Use of alcohol

6. Further repeated and comparative surveys are required – particularly in the EU10 – for abstinence, heavy drinking, episodic heavy drinking (binge-drinking), drunkenness, context of drinking (with meals, in public), alcohol dependence, and unrecorded consumption (smuggling, cross-border shopping). While these areas (apart from unrecorded consumption) were mentioned within the European Community Health Indicators (ECHI) project,¹ they were not selected for the short-list and represent potential areas of future research only. Their importance should therefore be stressed to the EU Working Party on Health Indicators.
7. Measures of binge-drinking and drunkenness (and their link to outcomes) should be investigated further to determine their cross-cultural validity, and also to provide robust information on 'drunken comportment' within Europe. Policymakers should also consider whether 'heavy episodic drinking' is a sufficiently meaningful term to replace the more stigmatizing 'binge-drinking' within public debate.
8. A more detailed investigation of young people's drinking would be valuable for understanding contemporary trends, in particular including research on why young people drink as they do, e.g. motivations for drinking (and how they link to outcomes) and the wider risk factors for youth drinking. This could also include an analysis of the developmentally important 18-25 age group, as well as the more conventional focus on younger ages.

Social harms

9. There is a clear need for greater research in nearly all aspects of the social harms related to alcohol, including within the family, at the workplace, criminal behaviour, sexual behaviour and less serious but more common harms.

¹ See points 2.3.5, 2.3.17, 3.1.2, 3.2.2 in the original (Feb 2004) ECHI long list, available from http://ec.europa.eu/comm/health/ph_information/indicators/docs/longlist_en.pdf

Box 10.1 – Improving Information and research on Alcohol [Con.]

Social harms (con.)

10. New research should focus, in particular, on the harm to others from a person's drinking, as well as:
 - i. Crime: both aggregate- and individual-level methods are needed to allow a comparison of the crime caused by alcohol across Europe.
 - ii. Workplace: the possibility of attaching questions on alcohol and the workplace to the existing Labour Force Survey should be investigated.
11. The methodology underlying research on social harms also needs attention, in particular, relating to the validity of the survey measures used. Further work should be undertaken on how problems are attributed to alcohol, including the extent to which this varies across Europe. For example, surveys could ask about non-alcohol-attributed levels of harm before asking about attributions to alcohol, so that risk ratios and varying attributions can be identified.

Health harms

12. While the WHO's Global Burden of Disease study is a major advance on previous work, it would be useful if future versions could also:
 - Investigate a further counterfactual scenario (i.e. the total burden of disease compared to light (or lowest-risk) drinking).
 - Provide a mechanism by which the impact of changes in drinking levels/patterns could be estimated and linked to cost-benefit analyses.
13. The EU institutions should also consider funding an in-depth analysis of the role of alcohol in the health gap between the EU10 and the EU15.

Alcohol policy

14. Collaborative comparative studies should be undertaken to look into the impact of different alcohol policy options within Europe. They should also investigate what happens when alcohol policies change in Member States.
15. A review should be undertaken of evidence of the effect of general risk-reduction programmes (rather than alcohol-specific ones) to impact on patterns of use and harm.
16. Analyses should be undertaken of the price and income elasticities of alcoholic beverages in the different Member States, including cross-product elasticities, the impact of tax changes on different age and socio-economic groups, and estimates of government revenue from different alcohol tax regimes.
17. Analyses should be undertaken of the impact of differential taxes on alcoholic beverages and liberalised personal allowances on cross border purchases.
18. Public attitudes to alcohol policy across Europe should be investigated, looking at the differences between groups within countries as well as across EU Member States. This research should take account of the need for informed decision-making (which, in a situation of low knowledge, may include methodologies such as deliberative workshops).

III. Preparing and implementing resourced strategies and plans

Alcohol policy is shaped by strategies and action plans that are developed at the European, country and regional and municipal levels. At the European level, the Commission is preparing a comprehensive strategy to support Member States to reduce the health and social harm done by alcohol, and thus contribute to higher productivity and a sustainable economic development in the Union in line with the

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objectives set out in the Lisbon Strategy. The World Health Organization has also provided a framework for action for European Member States⁸.

At the country level, it is ultimately a government's responsibility to define and be accountable for a clear alcohol policy for the whole country and region within a country. Many different decision-making authorities are involved in the formulation and implementation of alcohol policy, such as the health ministry, the transportation authority or the taxation agency. Governments need to establish effective and permanent coordination machinery, such as a national alcohol council, comprising senior representatives of many ministries and other partners, to ensure that a coherent approach is taken to alcohol policies and that policy objectives are properly balanced in both political and technical forms.

Targets make policy objectives more specific, allow progress towards them to be monitored and inspire many partners actively to support alcohol policy developments. Targets require an assessment of the present situation and help to determine priorities; they can focus discussion on what it had been hoped to achieve and why, and whether or not this was successful, and why; they provide a powerful communication tool, taking policy-making out of bureaucratic confines and making it a clearly understood public issue; they give all partners a clearer understanding of the scope of the policy; they strengthen accountability for health; and they motivate people for action.

Accountability for the health impact of alcohol policies and programmes rests with all sectors of society, as well as government officials who create policy, allocate resources and initiate legislation. Mechanisms such as alcohol policy audits, litigation for health damages and public access to reports on impact assessments can ensure that both the public sector and private industry are publicly accountable for the health effects of their alcohol policies and actions. Accountability can be achieved through mechanisms for coordinating, monitoring and evaluating progress in policy implementation and through procedures for reporting to elected bodies, as well as through the mass media.

One method of financing programmes to reduce the harm done by alcohol is an earmarked alcohol tax. This means that a proportion of tax revenue collected from alcohol is devoted to a specific activity, such as policy implementation or healthcare.

Many alcohol policies and programmes are devolved to jurisdictions within countries, including local government authorities and municipalities. Within a framework of such devolvement, it is vital that country or regional-based legislation enables rather than restricts the ability of local government authorities and municipalities to act.

⁸ http://www.euro.who.int/Governance/RC/RC55/20050920_1.

Recommendations for strategies and action plans	Relevant actor	Evidence (ch:pp)
III.1. A European mechanism and focal point for alcohol policy should be strengthened within the European Commission with adequate staff and financial resources to oversee the development of European alcohol policy and the implementation of the Commission's strategy on alcohol.	(I) European institutions	8: 365-367
III.2. Coordinating mechanisms and focal points for alcohol policy should be established or reinforced at all levels of action and adequately financed.	(I) European institutions (II) Member States and regions (III) Municipal	9: 377
III.3. Action plans on alcohol with clear objectives, strategies and targets should be formulated and implemented.	(I) European institutions (II) Member States and regions (III) Municipal	9: 377
III.4. A predictable funding system should be set in place for organizations, programmes and human resources involved in reducing the harm done by alcohol. Analyses should be undertaken of the practicality and desirability of earmarking a proportion of alcohol taxes (hypothecated tax) to fund these.	(I) European institutions (II) Member States and regions (III) Municipal	9: 377
III.5. Support for alcohol policy measures amongst civil and political society should be promoted through awareness-raising campaigns and initiatives.	(I) European institutions (II) Member States and regions (III) Municipal	7: 252
III.6. Regular reports on alcohol should be prepared and made accessible to a wide public audience.	(I) European institutions (II) Member States and regions (III) Municipal	All report

IV. Other policies and actions and cross border support

Alcohol consumption, the harm done by alcohol policy, and alcohol policy itself are influenced to a great extent by **other sectors and other Directorates-General**, including the trade law of the European Union (EU). Where a product like alcohol is both traded and relevant for health then it becomes important to recognise the Treaty's obligation that "a high level of human health protection shall be ensured in the definition and implementation of all Community policies and activities." This means there is substantial scope for health concerns to be incorporated within

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policies of other Directorates-General and within actions to improve the single market.

Global and European trade law can constrain alcohol policies, despite the existence of certain exemptions on public health grounds. This is particularly true when legislation treats alcohol only as an economic commodity, without considering the substantial health impact of many of these laws. Given that the European Union has a legal commitment to consider health in all its activities, there is a potential to close this gap at the European level. **Governments** should be mindful of when alcohol policy is best implemented at the local and municipal level, when respect of the laws of different countries in relation to alcohol policy should be upheld (comity), and when collective action at both the European and global level is more appropriate.

Recommendations for impact assessment and collective action	Relevant actor	Evidence (ch: pp)
IV.1. Health policy-makers and advisers should monitor the risks inherent in the process of trade liberalization and should ensure that health concerns are accounted for in trade negotiations at both the global and European levels.	(I) European institutions (II) Member States and regions	8: 344-359
IV.2. Analytical and feasibility studies should be undertaken to determine when collective action on alcohol policy at both the European and global level is more appropriate and how comity of countries in relation to alcohol policy can be strengthened	(I) European institutions (II) Member States and regions	8: 348-362
IV.3. Increased resources should be provided to undertake thorough assessments of the impact of European community policies and activities (including agricultural policy) on the harms and costs associated with alcohol.	(I) European institutions	8: 348-360

Specific alcohol policy recommendations

Chapter 1 suggested that the central purpose of alcohol policies is to serve the interests of public health and social well-being through their impact on health and social determinants, such as drinking patterns, the drinking environment, and the health services available to treat problem drinkers. There is a wealth of evidence to advise which alcohol policies and programmes work and which do not work in protecting young people, protecting third parties, and in reducing the harm done by alcohol to adults. Although a large part of the scientific evidence originates outside Europe, its robustness is strengthened by a consistency of evidence over time and in different jurisdictions, countries and cultures.

The most robust evidence for effectiveness in reducing the harm done by alcohol results from (i) drink-driving countermeasures; (ii) pricing and taxation; (iii) restrictions on the availability of alcohol, including a minimum purchasing age; (iv) restrictions on commercial communications; (v) managing drinking environments; and (vi) providing brief interventions and treatment in primary health care and accident and emergency departments.

Education type programmes and policies, such as educational programmes to promote designated drivers and school-based educational programmes are the least effective. On the other hand, mass media programmes have a particular role to play in reinforcing community awareness of the problems created by alcohol use and to prepare the ground for specific interventions.

What is also clear is that both enforcement and comprehensive approaches are important. For example, the impact of responsible beverage service is much enhanced when there is active enforcement and the support of community based prevention programmes. Such policies should also be supported by improved awareness and information of the risks connected to the consumption of alcoholic beverages, and by campaigns among citizens on the implementation of policy initiatives.

Non-governmental organizations are essential partners for all elements of alcohol policy. They are a vital component of a modern civil society, raising people's awareness of issues and their concerns, advocating change and creating a dialogue on policy. Of particular importance are those organizations which deal with families, civil, cultural, economic, political, and social rights, including those that deal with the rights of children and young people. Their role in alcohol policy should be strengthened to include (i) monitoring implementation of existing laws, codes and practices of the public and private sectors; (ii) translating the evidence base into easily understood policies and practices to reduce the harm done by alcohol; (iii) safeguarding and representing civil society in the implementation of such policies and practices; and (iv) collecting and disseminating information and knowledge to mobilize civil society to support the implementation of evidence-based policy.

The beverage alcohol and related industries have a particular role to play in the implementation of alcohol policies and programmes. This can include (i) providing server training and monitoring to all involved in the alcohol sales chain to ensure responsibility in adhering to the law, and in reducing the risk of subsequent harmful consequences of intoxication, harmful patterns of drinking and the risk of drinking and driving; (ii) ensuring that the full marketing process (product development, pricing, market segmentation and targeting, advertising and promotion campaigns, and physical availability) does not promote an alcoholic product by any means that directly appeals to minors; (iii) undertaking impact assessments on the health and social environment of their actions; and (iv) providing public statements and reports on how all of the above have been implemented.

V. Reducing drinking and driving

The European Union itself has set a target of halving the number of people killed annually in road traffic accidents between 2000 and 2010 through harmonization of penalties, and the promotion of new technologies to improve road safety. The drinking-driving policies that are highly effective include lowered blood alcohol concentration (BAC) levels, unrestricted (random) breath testing, administrative license suspension, and lower BAC levels and graduated licenses for young drivers. Whilst alcolocks can be used as a preventive measure, their use for drink driving offenders lasts for only as long as the device is fitted. There is no evidence for an effective impact from designated driver and safe drive programmes or from school based education courses. To be effective drink driving laws must be publicized; if the public is unaware of a change in the law or an increase in its enforcement, it is unlikely that it will affect their drinking and driving. When incorporated as part of

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community programmes, drink-driving measures appear to have increased effectiveness.

Recommendations for drinking and driving	Relevant actor	Evidence (ch: pp)
V.1.A maximum blood alcohol concentration limit of 0.5g/L should be introduced throughout Europe; countries with existing lower levels should not increase them.	(I) European institutions (II) Member States and regions	7: 243
V.2.A lower limit of 0.2g/L should be introduced for young drivers and drivers of public service and heavy goods vehicles; countries with existing lower levels should not increase them.	(I) European institutions (II) Member States and regions	7: 246
V.3.Unrestricted powers to breath test, using breathalysers of equivalent and agreed standard, should be implemented throughout Europe.	(I) European institutions (II) Member States and regions	7: 244
V.4.Common penalties with clarity and swiftness of punishment, with penalties graded depending at least on the BAC level should be implemented throughout Europe.	(I) European institutions (II) Member States and regions	7: 244-245
V.5.Driver education, rehabilitation and treatment schemes, linked to penalties, and based on agreed evidence-based guidelines and protocols should be implemented throughout Europe.	(I) European institutions (II) Member States and regions	7: 244-245
V.6.Action to reduce drinking and driving should be supported by a Europe-wide campaign.	(I) European institutions	7: 250
V.7.Existing designated driver campaigns should be evaluated for their impact in reducing drink-driving accidents and fatalities before financing and implementing any new campaigns.	(I) European institutions (II) Member States and regions	7: 247-248
V.8.Effective and appropriate training for the hospitality industry and servers of alcohol should be implemented to reduce the risk of drinking and driving.	(III) Municipal	7: 246-247
V.9.Comprehensive community-based educational and mobilization programmes, including urban planning and public transport initiatives, should be implemented to reduce drinking and driving.	(III) Municipal	7: 249

VI. Supporting education, communication, training and public awareness

Public service announcements, public education campaigns, and particularly those that focus on low risk drinking guidelines have limited evidence for effectiveness, although media advocacy approaches are important to gain public support for policy changes. Although there are individual examples of the beneficial impact of school-based education, systematic reviews and meta-analyses find that the majority of well-evaluated studies show no impact even in the short-term. There is considerable experience of what might be best practice in school-based education programmes, but currently unconvincing evidence for their effectiveness. This is not to imply that education programmes should not be delivered, since all people do need to be informed about the use of alcohol and the harm done by it, but school-based education should not be seen as the answer to reduce the harm done by alcohol, and is not an alternative to more effective alcohol policy measures.

Recommendations for education and public awareness	Relevant actor	Evidence (ch: pp)
VI.1. Educational programmes should not be implemented in isolation as an alcohol policy measure, or with the sole purpose of reducing the harm done by alcohol, but rather as a measure to reinforce awareness of the problems created by alcohol and to prepare the ground for specific interventions and policy changes.	(II) Member States and regions (III) Municipal	7: 253-258
VI.2. Funding should be provided to evaluate the design and impact of individual-based programmes that may show some promise.	(II) Member States and regions (III) Municipal	7: 253-259
VI.3. Broad educational programmes, beginning in early childhood, should be implemented to inform young people of the consequences of alcohol consumption on health, family and society and of the effective measures that can be taken to prevent or minimize harm.	(II) Member States and regions (III) Municipal	7: 253-258
VI.4. Educational-type programmes imported from another country or culture should first be evaluated in the new setting before being widely implemented.	(II) Member States and regions (III) Municipal	7: 253-258
VI.5. Media campaigns should be used to inform and raise awareness among citizens on implementation of policy initiatives.	(I) European Institutions (II) Member States and regions (III) Municipal	7: 251-252

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VII. Consumer labelling

Although there is limited evidence for the impact of warning labels on alcoholic products in reducing the harm done by alcohol, European consumers can benefit from receiving accurate and consistent information on alcohol in order to help them make informed choices. Packaging and labelling should not be misleading to consumers, nor designed for direct appeal to children and adolescents.

Recommendations on labelling	Relevant actor	Evidence (ch: pp)
VII.1. Containers of alcoholic products should carry warnings determined by health bodies, describing the harmful effects of alcohol when driving or operating machinery, and during pregnancy, or other messages as appropriate.	(I) European institutions (II) Member States and regions	7: 252-253
VII.2. Alcohol product packaging and labelling should not promote an alcoholic product by any means that are likely to create an erroneous impression about its characteristics or health effects, or that directly or indirectly appeals to minors.	(I) European institutions (II) Member States and regions	7: 252-253

VIII. Policies that regulate the alcohol market

Price and tax measures Taxes are an effective policy option in reducing the harm done by alcohol, with a greater impact on younger and heavier drinkers and a particular impact in reducing the harm done by alcohol to people other than the drinker. Alcohol taxes generate direct revenue for governments, and – due to the relative inelasticity of the demand for alcohol – are generally much more closely related to average tax rates than levels of consumption, thus allowing considerable scope in most countries for raising taxes before the maximum revenue is achieved.

There is an enormous discrepancy in the current tax rates between countries, even when adjusting for purchasing power, and one half of countries still have no tax on wine. Standardized excise duties are a longstanding goal of the European Union mainly because the combination of a single market, together with wide excise variations, leads to serious market distortions and lost tax revenue. Further, there is a continued need to increase the minimum rates in line with inflation (24%) so that taxes do not become meaningless.

The consequences of differential taxes between countries are compounded by the high and increasingly liberal limits of the amount of alcohol that individuals can transfer between countries.

Recommendations for tax, cross border purchases and smuggling	Relevant actor	Evidence (ch: pp)
VIII.1. Minimum tax rates for all alcoholic beverages should be increased in line with inflation; should be at least proportional to the alcoholic content of all beverages that contain alcohol; and should at least cover the external costs of alcohol as determined by an agreed and standardized methodology.	(I) European institutions (II) Member States and regions	7: 258-263
VIII.2. Member States should retain the flexibility to use taxes to deal with specific problems that may arise with specific alcoholic beverages, such as those that prove to be appealing to young people.	(II) Member States and regions	9: 386-388
VIII.3. Alcoholic products should be marked to determine their origin and movement in trade, to enable estimates to be made of the value of the amount of alcohol smuggling into and within the EU.	(I) European institutions (II) Member States and regions	3: 52-53
VIII.4. Member States should have the flexibility to limit individual cross-border purchases so as not to diminish the impact of their current tax policies.	(I) European institutions (II) Member States and regions	3: 53-54

Restrictions on the availability of alcohol There is very strong evidence for the effectiveness of policies that manage the physical availability of alcohol (raising the minimum purchase age and managing days and hours of sale). The evidence shows that, if opening hours for the sale of alcohol are extended, then more violent harm is likely to result. Policies that manage the availability of alcohol are largely devolved to the municipal level. They can only be effective if any national and regional legislation is enabling rather than restrictive, and if the policies are adequately enforced.

Recommendations for minimum purchase age and availability	Relevant actor	Evidence (ch: pp)
VIII.5. A minimum system of licensing for the sale of alcoholic products should be implemented throughout Europe, respecting existing licensing systems, where these are stronger.	(I) European institutions (II) Member States and regions (III) Municipal	7: 265
VIII.6. The sales of alcoholic products to persons under the age set by domestic law, national law or eighteen years, whichever is the higher, should be prohibited and enforced.	(II) Member States and regions	7: 264-265

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VIII.7. Jurisdictions that manage outlets through number and density, location and hours and days of sale should consider not relaxing their regulations; jurisdictions without such regulations or with very limited regulations should analyze the impact of introducing or strengthening them.	(II) Member States and regions (III) Municipal	7: 266-269
VIII.8. A range of increasingly severe penalties against sellers and distributors, such as withdrawal of license or temporary and permanent closures, should be implemented in order to ensure compliance with relevant measures.	(III) Municipal	7: 287-291

Alcohol advertising, promotion and sponsorship There is evidence that the new products developed by the alcoholic drinks industry are attractive to and readily consumed by underage drinkers. Price promotions increase binge drinking and exposure to point of purchase advertising predicts onset of youth drinking. There is evidence for targeting of alcohol advertisements to underage drinkers, and consistent evidence that exposure to television, music videos and sponsorship which contain alcohol advertisements predicts onset of youth drinking and increased drinking. Consumer studies have shown that alcohol advertisements lead to positive expectancies and attitudes about alcohol. Consumer studies also show that exposure to tobacco advertising increases smoking initiation amongst young people, exposure to food advertising changes children's food consumption behaviour, and there is increasing evidence that exposure to alcohol advertisements increase initiation of alcohol use amongst adolescents. Despite the difficulties of population-based studies, there is a range of evidence with some econometric studies finding a relationship between the volume of advertising and drinking behaviour and outcomes, and others not. Since advertisements have a particular impact in promoting a more positive attitude to drinking amongst young people it is likely that restricting the content of advertisements will reduce harm, although this has not been specifically evaluated. To date, self-regulation of commercial communications by the beverage alcohol industry does not have a consistent record for being effective.

Recommendations for commercial communications	Relevant actor	Evidence (ch: pp)
VIII.9. A level playing field for commercial communications should be implemented across Europe, building on existing regulations in Member States, with an incremental long-term development of no advertising on TV and cinema, no sponsorship, and limitation of messages and images only referring to the quality of the product.	(I) European institutions (II) Member States and regions	7: 276-283
VIII.10. Article 15 of the Television Without Frontiers Directive should be strengthened in terms of both content and volume, and an analysis of its adherence across Member States should be commissioned.	(I) European institutions (II) Member States and regions	7: 272-275 8: 358-359

VIII.11. Where self-regulatory approaches adopted by the beverage alcohol industry or marketing industry are in place, they should be monitored by a body that is independent of the alcohol and marketing industries.	(I) European institutions (II) Member States and regions	7: 283-286
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IX Reducing harm in drinking and surrounding environments

Strategies that alter the drinking context have the potential to reduce the harm done by alcohol, being primarily applicable to drinking in bars and restaurants, with effectiveness relying on adequate enforcement. Such strategies are also more effective when backed up by municipal and community-based prevention programmes.

Recommendations for drinking and surrounding environments	Relevant actor	Evidence (ch: pp)
IX.1. Urban planning, community strategies, licensing regulations and restrictions, transport policies and management of the drinking and surrounding environments should work to minimize the negative effects that result from alcohol intoxication, particularly for local residents.	(III) Municipal	7: 287-293
IX.2. Effective and appropriate training should be implemented for the hospitality industry and servers of alcohol to reduce the harmful consequences of intoxication and harmful patterns of drinking.	Alcohol industry	7: 287-290
IX.3. Adequate policing and enforcement of alcohol sales and licensing laws should be implemented, targeted at premises associated with a higher level of harm.	(III) Municipal	7: 288-289
IX.4. Well-resourced community mobilization and intervention projects, involving different sectors and partners, should be implemented to create safer drinking environments and to reduce the harm done by alcohol.	(III) Municipal	7: 291-294

X. Advice for hazardous and harmful alcohol consumption and alcohol dependence

There is extensive evidence for the impact and cost-effectiveness of brief advice, delivered through a number of different settings, in reducing harmful alcohol consumption. They are not only an efficient use of scarce resources, but, if implemented widely, can have a large population impact in reducing the harm done by alcohol. There is further evidence that primary care providers can be engaged in delivering early identification and brief advice programmes.

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Recommendations for advice	Relevant actor	Evidence (ch: pp)
X.1. Integrated evidence-based guidelines for brief advice for hazardous and harmful alcohol consumption should be developed and implemented in different settings upwardly to harmonize the quality and accessibility of care.	(II) Member States and regions (III) Municipal	7: 295-298
X.2. Training and support programmes to deliver brief advice for hazardous and harmful alcohol consumption should be developed and implemented in different settings upwardly to harmonize the skills of primary care providers.	(II) Member States and regions (III) Municipal	7: 295-298
X.3. Resources should be made available to ensure the widespread availability and accessibility of identification and advice programmes for hazardous and harmful alcohol consumption and alcohol dependence.	(II) Member States and regions (III) Municipal	7: 295-298

Annexe 1 Glossary of terms (Used in alcohol policy and related public health fields)

Absolute alcohol - Ethanol containing not more than 1% by mass of water. See *also*: alcohol. (World Health Organization 2005)

Abstinence - Refraining from drinking alcoholic beverages, whether as a matter of principle or for other reasons. Those who practise abstinence from alcohol are termed "abstainers", "total abstainers", or-in a more old-fashioned formulation-"teetotallers". The term "current abstainer", often used in population surveys, is usually defined as a person who has not drunk an alcoholic beverage in the preceding 12 months; this definition does not necessarily coincide with a respondent's self-description as an abstainer. (World Health Organization 2005)

Abuse - A group of terms in wide use but of varying meaning. It is a residual category, with dependence taking precedence when applicable. The term "abuse" is sometimes used disapprovingly to refer to any use at all, particularly of illicit drugs. Because of its ambiguity, the term is not used in ICD-10 (except in the case of non-dependence-producing substances-see below); harmful use and hazardous use are the equivalent terms. (World Health Organization 2005)

Acceding country - This is a candidate country that has met the Copenhagen criteria and has completed negotiations for joining the European Union. (European Commission 2005)

Access to alcohol - The means by which alcohol is obtained. Access to alcohol differs by community, ranging from no access (where alcohol is prohibited) through systems of rationing and state retail monopolies to private retail outlets which can be controlled in terms of density, days and hours of sale, and minimum legal age of purchase. (Hvalkof and Anderson 1995)

Accountability - The result of the process which ensures that decision-makers at all levels actually carry out what they are obliged to do, and that they are made answerable for their actions. The process of setting explicit objectives and targets for health and defining the means of monitoring progress towards them has facilitated the attempt to achieve greater accountability through public disclosure or "transparency". (World Health Organization 1998)

Acquis communautaire - This is a French term meaning, essentially, "the EU as it is" – in other words, the rights and obligations that EU countries share. The "acquis" includes all the EU's treaties and laws, declarations and resolutions, international agreements on EU affairs and the judgments given by the Court of Justice. (European Commission 2005)

Addiction - Repeated use of a psychoactive substance or substances, to the extent that the user (referred to as an addict) is periodically or chronically intoxicated, shows a compulsion to take the preferred substance (or substances), has great difficulty in voluntarily ceasing or modifying substance use, and exhibits determination to obtain psychoactive substances by almost any means. (World Health Organization 2005)

Administrative license suspension - Drivers license is suspended administratively, without the need of a judicial process, in the event of drinking-driving. (Babor *et al.* 2003)

Advertising ban - A total or partial legal prohibition of advertising for alcoholic beverages. Partial bans may relate to a particular type of alcoholic beverage, or a type of media, or may limit broadcast advertising to certain hours of the day. (Babor *et al.* 2003)

Advertising codes - Self-regulation of advertising standards by the alcohol and/or other industries, usually by specifying the content of alcohol advertisements, and the populations exposed to it. (Babor *et al.* 2003)

Alcohol - In chemical terminology, alcohols are a large group of organic compounds derived from hydrocarbons and containing one or more hydroxyl (-OH) groups. Ethanol (C₂H₅OH,

ethyl alcohol) is one of this class of compounds, and is the main psychoactive ingredient in alcoholic beverages. By extension the term "alcohol" is also used to refer to alcoholic beverages. (World Health Organization 2005)

Alcohol availability - The overall availability of alcohol, often divided into wholesale availability and retail availability. (Hvalkof and Anderson 1995)

Alcohol control - Any government measure that relates to the purchase, production, or trade in alcoholic beverages, regardless of the aims of such measures. (Babor *et al.* 2003)

Alcohol control policy - A set of regulations and other measures restricting or otherwise controlling the production and sale of alcoholic beverages, often administered by specific government agencies. Policy related to interventions by the state authorities in the production, trade and purchase of alcoholic beverages (alcohol controls), with particular reference to controls on availability and price. (Hvalkof and Anderson 1995)

Alcohol education programs - Programs implemented in school settings with the aim of teaching students about the dangers of alcohol and ultimately preventing underage drinking. (Babor *et al.* 2003)

Alcohol intoxication - A more or less short-term state of functional impairment in psychological and psychomotor performance induced by the presence of alcohol in the body. (World Health Organization 1992)

Alcohol monopoly - A monopoly which eliminates competition in the alcohol market-place, thereby removing the profit motive. (Hvalkof and Anderson 1995)

Alcohol policy - Measures designed to control the supply of and/or affect the demand for alcoholic beverages in a population, including education and treatment programs, alcohol control, and harm-reduction strategies. The term originated in the Scandinavian countries implying the need for a coordination of governmental efforts from a public health and/or public order perspective. (Babor *et al.* 2003)

Alcohol taxes - The part of the total cost of an alcoholic beverage paid by consumers that goes to one or another level of government. (Babor *et al.* 2003)

Alcohol use disorders - A shortened version of the term used in ICD-10—Mental and behavioural disorders associated with alcohol use. The term encompasses acute intoxication (F1x.0), harmful use (F1x.1), dependence syndrome (F1x.2), withdrawal state (F1x.3), withdrawal state with delirium (F1x.4), psychotic disorder (F1x.5) and amnesic syndrome (F1x.6). (World Health Organization 1992)

Alcoholic beverage - Liquid that contains alcohol (ethanol) and is intended for drinking. (World Health Organization 2005)

Alcoholism - A term of long-standing use and variable meaning, generally taken to refer to chronic continual drinking or periodic consumption of alcohol which is characterized by impaired control over drinking, frequent episodes of intoxication, and preoccupation with alcohol and the use of alcohol despite adverse consequences. The inexactness of the term led a 1979 WHO Expert Committee* to disfavour it, preferring the narrower formulation of alcohol dependence syndrome as one among a wide range of alcohol-related problems. Alcoholism is not included as a diagnostic entity in ICD-10 (see dependence syndrome). (World Health Organization 2005)

* Problems related to alcohol consumption. Report of a WHO Expert Committee. Geneva. World Health Organization, 1980 (WHO Technical Report Series, No.650).

Alcohol-related disabilities - All problems, illnesses and other consequences secondary to alcohol use, intoxication, or dependence that diminish an individual's capacity for physical, social, or economic activity. See *also*: alcohol-related problem. (World Health Organization 2005)

Alcohol-related harm - Any of the range of adverse effects of drinking alcohol experienced by the drinker or by other people. Synonymous with alcohol-related problem, alcohol problem, drinking problem. (Hvalkof and Anderson 1995)

Alcohol-related problem - Any of the range of adverse accompaniments of drinking alcohol. It is important to note that "related" does not necessarily imply causality. Use of the term can relate either to an individual drinker or to society, and was endorsed by a 1979 WHO Expert Committee* A 1977 WHO report had used alcohol-related disability as an equivalent term at the individual level** Alcohol problem is often used as an equivalent term. (World Health Organization 2005)

* Problems related to alcohol consumption. Report of a WHO Expert Committee. Geneva, World Health Organization, 1980 (WHO technical Report Series, No.650).

**Edwards G *et al.*. Alcohol-related disabilities. Geneva, World Health Organization, 1977 (WHO Offset publication, No.32).

Alcopops - A form of alcoholic beverage characterized by carbonation, artificial colouring, sweetness, and sale by the 300 ml bottle. More formal names for alcopops are 'pre-mixed spirits', 'flavoured alcoholic beverages', and 'designer drinks'. (Babor *et al.* 2003)

All-cause mortality - Number of deaths in the population resulting from all possible causes. (Babor *et al.* 2003)

Applicant country - This means a country that has applied to join the European Union. Once its application has been officially accepted, it becomes a candidate country (see below). (European Commission 2005)

BAC/BAL - Abbreviation for blood alcohol concentration, sometimes called BAL (blood alcohol level). This is the concentration of alcohol present in blood. (World Health Organization 2005)

Benchmarking - This means measuring how well one country, business, industry, etc. is performing compared to other countries, businesses, industries, and so on. The "benchmark" is the standard by which performance will be judged. Benchmarking is one of the techniques used in the "Lisbon process" (see below). (European Commission 2005)

Binge drinking - A pattern of heavy drinking that occurs in an extended period set aside for the purpose. In population surveys, the period is usually defined as more than one day of drinking at a time. The terms "bout drinking" and "spree drinking" are also used for the activity, and "drinking bout" for the occasion. A binge drinker or bout drinker is one who drinks predominantly in this fashion, often with intervening periods of abstinence. (World Health Organization 2005)

Bratt rationing system - A system of liquor control (named after a Swedish physician) incorporated into Swedish law in 1917, designed to discourage misuse of spirits by establishing individual alcohol rations for adult citizens. The system was abolished in 1955. (Babor *et al.* 2003)

Brief intervention - A treatment strategy in which structured therapy of short duration (typically 5-30 minutes) is offered with the aim of assisting an individual to cease or reduce the use of a psychoactive substance or (less commonly) to deal with other life issues. It is designed in particular for general practitioners and other primary health care workers. (World Health Organization 2005)

Candidate country - This means a country that has applied to join the European Union and whose application has been officially accepted. Before a candidate country can join the EU it must meet the "Copenhagen criteria". (European Commission 2005)

Civil society - This is the collective name for all kinds of organizations and associations that are not part of government but that represent professions, interest groups or sections of

society. It includes (for example) trade unions, employers' associations, environmental lobbies and groups representing women, farmers, people with disabilities and so on. Since these organizations have a lot of expertise in particular areas and are involved in implementing and monitoring European Union policies, the EU regularly consults civil society and wants it to become more involved in European policymaking. (European Commission 2005)

Community action - Specifically, action which aims to reduce alcohol-related harm by a combined approach influencing not only personal health behaviour but also the general health environment. (Hvalkof and Anderson 1995)

Community action for health - Community action for health refers to collective efforts by communities which are directed towards increasing community control over the determinants of health, and thereby improving health. (World Health Organization 1998)

Community mobilization - Increasing public awareness of a particular problem and public support for policies directed at preventing the problem. (Babor *et al.* 2003)

Community participation - The active involvement of people living together in some form of social organization and cohesion in the planning, operation and control of primary health care, using local, national and other resources. (World Health Organization 1998)

Competencies - "Powers and responsibilities". Often used in political discussions about what powers and responsibilities should be given to EU institutions and what should be left to national, regional and local authorities. (European Commission 2005)

Confounding factors - Specifically, other factors that could influence the relationship between a risk factor, alcohol and an outcome measure, i.e. alcohol-related harm. Relevant confounding factors need to be taken into account when analysing the relationship between alcohol consumption and harm. For example, when analysing the relationship between alcohol consumption and breast cancer, the effect of body mass index needs to be checked. (Last 2001; modified)

Control of production - Specifically, controls or regulations on the actual production of alcoholic beverages. (Hvalkof and Anderson 1995)

Conventions, international drug - International treaties concerned with the control of production and distribution of psychoactive drugs. Early treaties (General Brussels Act, 1889-90, and St Germain-en-Laye Convention of 1912) controlled liquor traffic in Africa in the colonial era. The first treaty dealing with currently-controlled substances was the Hague Convention of 1912: its provisions and those of succeeding agreements were consolidated in the Single Convention on Narcotic Drugs (1961; amended by a 1972 Protocol). To this have been added the 1971 Convention on Psychotropic Substances and the 1988 Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances. (World Health Organization 2005)

Copenhagen criteria - In June 1993, EU leaders meeting in Copenhagen set three criteria that any candidate country (see above) must meet before it can join the European Union. First, it must have stable institutions guaranteeing democracy, the rule of law, human rights and respect for minorities. Second, it must have a functioning market economy. Third, it must take on board all the *acquis* (see above) and support the various aims of the European Union. The EU reserves the right to decide when a candidate country has met these criteria and when the EU is ready to accept the new member. (European Commission 2005)

Council of Europe - This is not an EU institution. It is an intergovernmental organization based in Strasbourg and it aims (amongst other things) to protect human rights, to promote Europe's cultural diversity and to combat social problems such as xenophobia and intolerance. The Council of Europe was set up in 1949 and one of its early achievements was to draw up the European Convention on Human Rights. To enable citizens to exercise their

rights under that Convention it set up the European Court of Human Rights. (European Commission 2005)

Council of the European Union - Formerly known as the Council of Ministers, this institution consists of government ministers from all the EU countries. The Council meets regularly to take detailed decisions and to pass European laws. (European Commission 2005)

Counter-advertising - Actions involving the use of advertising-styled messages about the risks and negative consequences of drinking. Counter-advertising is used to balance the effects of alcohol advertising on alcohol consumption. Such measures can take the form of print or broadcast advertisements (e.g., public service announcements) as well as product warning labels. (Babor *et al.* 2003)

Density of alcohol outlets - Number of outlets for sale of alcoholic beverages per head of population. (Hvalkof and Anderson 1995)

Dependence - As a general term, the state of needing or depending on something or someone for support or to function or survive. As applied to alcohol and other drugs, the term implies a need for repeated doses of the drug to feel good or to avoid feeling bad. In unqualified form, dependence refers to both physical and psychological elements. Psychological or psychic dependence refers to the experience of impaired control over drinking or drug use, while physiological or physical dependence refers to tolerance and withdrawal symptoms. (World Health Organization 1992)

Determinants of health - The range of personal, social, economic and environmental factors which determine the health status of individuals or populations. The factors which influence health are multiple and interactive. Health promotion is fundamentally concerned with action and advocacy to address the full range of potentially modifiable determinants of health – not only those which are related to the actions of individuals, such as health behaviours and lifestyles, but also factors such as income and social status, education, employment and working conditions, access to appropriate health services, and the physical environments. These, in combination, create different living conditions which impact on health. Achieving change in these lifestyles and living conditions, which determine health status, are considered to be intermediate health outcomes. (World Health Organization 1998)

DG - The staff of the main EU institutions (Commission, Council and Parliament) are organized into a number of distinct departments, known as "Directorates-General" (DGs), each of which is responsible for specific tasks or policy areas. The administrative head of a DG is known as the "Director-General" (a term sometimes also abbreviated to "DG"). (European Commission 2005)

Disability - In the context of health experience ... any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being. (World Health Organization 1998)

Disability adjusted life years (DALYs) - A composite health summary measure that combines years of life lost to premature death with years of life lost due to disability. (Last 2001; modified)

Disorder, psychoactive substance use - A generic term used to denote mental, physical, and behavioural conditions of clinical relevance and associated with the use of psychoactive substances. The full ICD-10 term is "mental and behavioural disorders due to psychoactive substance use", covered by codes F10-F19; the third character in the code specifies the class of substances involved. The disorders include acute intoxication, harmful use, dependence syndrome, withdrawal syndrome, (with and without delirium), psychotic disorders, and amnesic syndrome. (World Health Organization 1992)

Dose-response relationship - Specifically, the relationship between alcohol consumption and a range of positive and negative consequences for the individual and society, including physical illnesses, accidents, violence and mortality. (Last 2001; modified)

Drinking-driving - The generally favoured term for the criminal action of driving a vehicle with a blood alcohol level over a specified limit. (World Health Organization 2005)

Early intervention - A therapeutic strategy that combines early detection of hazardous or harmful substance use and treatment of those involved. (World Health Organization 2005)

EC - This acronym refers either to the "European Community" or to the "European Commission". (European Commission 2005)

Ecological measures - Specifically, measures which influence physical access to alcohol, including enactment of a minimum legal drinking age, restrictions on hours or days of sale, and restrictions on the number, type or location of sales outlets. (Hvalkof and Anderson 1995)

Econometric methods - Statistical methods used by economists to investigate the association between economic factors and alcohol use or alcohol-related problems. (Babor *et al.* 2003)

EEA - This acronym refers to the **European Economic Area** – which consists of the European Union and all the EFTA countries (see below) except Switzerland. The EEA Agreement, which entered into force on 1 January 1994, enables Iceland, Liechtenstein and Norway to enjoy the benefits of the EU's single market without the full privileges and responsibilities of EU membership. (European Commission 2005)

EFTA - this is the acronym for the **European Free Trade Association** – an organization founded in 1960 to promote free trade in goods amongst its member states. There were originally seven EFTA countries: Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom (UK). Finland joined in 1961, Iceland in 1970, and Liechtenstein in 1991. In 1973, the UK and Denmark left EFTA and joined the EEC (see above). They were followed by Portugal in 1986, and by Austria, Finland and Sweden in 1995. Today the EFTA members are Iceland, Liechtenstein, Norway and Switzerland. (European Commission 2005)

Eurobarometer – A Commission service, set up in 1973, which measures and analyses trends in public opinion in all the member states (old and new) and in the candidate countries. Knowing what the general public thinks is important in helping the European Commission draft its legislative proposals, take decisions and evaluate its work. Eurobarometer uses both opinion polls and focus groups. Its surveys lead to the publication of around 100 reports every year. For further information, see: http://ec.europa.eu/comm/public_opinion/index_en.htm. (European Commission 2005)

European Commission - The politically independent institution that represents and upholds the interests of the European Union as a whole. It proposes legislation, policies and programmes of action and it is responsible for implementing the decisions of Parliament and the Council. (European Commission 2005)

European Community - The present name for what was originally called the "European Economic Community" (EEC): see below. (European Commission 2005)

European Council The meeting of heads of State and government (i.e. presidents and/or prime ministers) of all the EU countries, plus the President of the European Commission. The European Council meets, in principle, four times a year to agree overall EU policy and to review progress. It is the highest-level policy-making body in the European Union, which is why its meetings are often called "summits". (European Commission 2005)

Excessive drinking - Currently a non-preferred term for a pattern of drinking considered to exceed some standard of moderate drinking or acceptability. Hazardous drinking is a rough equivalent in current use. (World Health Organization 2005)

Goal - A general aim towards which to strive. Within the health sector WHO has defined the goal of health for all by the year 2000, which means that "as a minimum all people in all

countries should have at least such a level of health that they are capable of working productively and participating actively in the social life of the country in which they live". (World Health Organization 1998)

Governance - The system through which society organizes and manages the affairs of diverse sectors and partners in order to achieve its goals. (World Health Organization 1998)

Graduated licensing - Process by which drivers' licenses are issued with initial limitations on driving privileges. (Babor *et al.* 2003)

Harm reduction - In the context of alcohol or other drugs, describes policies or programmes that focus directly on reducing the harm resulting from the use of alcohol or drugs. The term is used particularly of policies or programmes that aim to reduce the harm without necessarily affecting the underlying drug use; examples includes needle/syringe exchanges to counteract needle-sharing among heroin users, and self-inflating airbags in automobiles to reduce injury in accidents, especially as a result of drinking-driving. Harm reduction strategies thus cover a wider range than the dichotomy of supply reduction and demand reduction. (World Health Organization 2005)

Harmful use - A pattern of psychoactive substance use that is causing damage to health. The damage may be physical (e.g. hepatitis following injection of drugs) or mental (e.g. depressive episodes secondary to heavy alcohol intake). Harmful use commonly, but not invariably, has adverse social consequences; social consequences in themselves, however, are not sufficient to justify a diagnosis of harmful use. (World Health Organization 1992)

Harmonisation - This may mean bringing national laws into line with one another, very often in order to remove national barriers that obstruct the free movement of workers, goods, services and capital. In other words, harmonisation means making sure that, on any particular issue for which the EU has responsibility, the rules laid down by the different EU countries impose similar obligations on citizens of all those countries and that they impose certain minimum obligations in each country. Harmonisation can also mean co-ordinating national technical rules so that products and services can be traded freely throughout the EU. Contrary to popular myth, this does not mean pointlessly standardising everything from the curvature of cucumbers to the colour of carrots. Often it simply means that EU countries recognise one another's safety rules. (European Commission 2005)

Hazardous use - A pattern of substance use that increases the risk of harmful consequences for the user. Some would limit the consequences to physical and mental health (as in harmful use); some would also include social consequences. In contrast to harmful use, hazardous use refers to patterns of use that are of public health significance despite the absence of any current disorder in the individual user. The term is used currently by WHO but is not a diagnostic term in ICD-10. (World Health Organization 2005)

Health - 1. A state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity. 2. The reduction in mortality, morbidity and disability due to detectable disease or disorder, and an increase in the perceived level of health. The first definition, that of the WHO Constitution, expresses an ideal, which should be the goal of all health development activities. It does not, however, lend itself to objective measurement, and for working purposes a narrower definition is required. The second definition is usually used for this purpose (e.g. in health statistics). (World Health Organization 1998)

Health competence - Individual competence to influence factors determining health. (World Health Organization 1998)

Health development - The process of continuous, progressive improvement of the health status of a population. (World Health Organization 1998)

Health education - Consciously constructed opportunities for learning which are designed to facilitate changes in behaviour. (World Health Organization 1998)

Health expectancy - Health expectancy is a population-based measure of the proportion of expected lifespan estimated to be healthful and fulfilling, or free of illness, disease and disability according to social norms and perceptions and professional standards. Examples of health expectancy indicators currently in use are disability-free life years (DFLY) and quality-adjusted life years (QALY). They focus primarily on the extent to which individuals experience a lifespan free of disability, disorders and/or chronic disease. (World Health Organization 1998)

Health gain - An increase in the measured health of an individual or population, including length and quality of life. (World Health Organization 1998)

Health impact assessment - An estimation of the total, direct and indirect, effects of a policy, programme, service or institution on health status and overall health and socioeconomic development. (World Health Organization 1998)

Health policy - A set of decisions or commitments to pursue courses of action aimed at achieving defined goals and targets for improving health. (World Health Organization 1998)

Health potential - The fullest degree of health that an individual can achieve. Health potential is determined by caring for oneself and others, by being able to make decisions and take control over one's life, and by ensuring that the society in which one lives creates conditions that allow the attainment of health by all its members. (World Health Organization 1998)

Health promotion - The process of enabling individuals and communities to increase control over the determinants of health and thereby improve their health. An evolving concept that encompasses fostering lifestyles and other social, economic, environmental and personal factors conducive to health. (World Health Organization 1998)

Health sector - The health sector consists of organized public and private health services (including health promotion, disease prevention, diagnostic, treatment and care services), the policies and activities of health departments and ministries, health-related nongovernmental organizations and community groups, and professional associations. (World Health Organization 1998)

Health service - Any service which can contribute to improved health or the diagnosis, treatment and rehabilitation of sick people and not necessarily limited to medical or health care services. Also, a formally organized system of established institutions and organizations, the multi-purpose objective of which is to cope with the various health needs and demands of the population. (World Health Organization 1998)

Health status - A general term for the state of health of an individual, group or population measured against defined standards. The WHO health indicators provide internationally accepted standards for various aspects of health status. (World Health Organization 1998)

Health system - A formal structure for a defined population, whose finance, management, scope and content is defined in law and regulations, which provides for services to be delivered to people contributing to their health and health care, delivered in defined settings such as in homes, educational institutions, workplaces, public places, communities, hospitals and clinics and which may affect the physical and psychosocial environment. (World Health Organization 1998)

Healthy public policy - An explicit concern for health and equity in all areas of policy and an accountability for health impact. The main aim ... is to create a supportive environment to enable people to lead healthy lives. (World Health Organization 1998)

Heavy drinking - A pattern of drinking that exceeds some standard of moderate drinking or—more equivocally—social drinking. Heavy drinking is often defined in terms of exceeding a certain daily volume (e.g. three drinks a day) or quantity per occasion (e.g. five drinks on an occasion, at least once a week). (World Health Organization 2005)

High-risk approach - Usually refers to policies concerned with responses targeted at specific high-risk contexts or behaviours. (Hvalkof and Anderson 1995)

Hours and days of sale - Days of the week and hours of the day in which it is legal to sell alcoholic beverages for consumption on or off premises. (Babor *et al.* 2003)

House rules/policies - Policies and procedures that are adopted by individual drinking establishments to guide their staff in dealing with such matters as intoxicated patrons and alcohol related problems. (Babor *et al.* 2003)

Indicators - Variables that help to measure [changes in the health situation] directly or indirectly and to assess the extent to which the objectives and targets of a programme are being attained. For the regional HFA targets, both quantitative and qualitative indicators are used. (World Health Organization 1998)

Informal control - Usually refers to controls on drinking or drinking behaviour made by family members, friends, colleagues or others in non-professional or non-institutional settings. They often reflect cultural or societal values. (Hvalkof and Anderson 1995)

Intergovernmental organization - An organization which is established by intergovernmental agreement. Examples: WHO, Council of Europe, OECD, other specialized agencies of the United Nations system. (World Health Organization 1998)

International classification of diseases and related health problems (ICD) - The standard system used to classify, define, and report disease conditions and related health problems within health systems throughout the world. Published and revised periodically by the World Health Organization. (Babor *et al.* 2003)

International classification of function, disability, and health (ICF) - A standard system intended for use in classifying and recording different types of disability within health systems throughout the world. (Babor *et al.* 2003)

Intersectoral action - Action in which the health sector and other relevant sectors collaborate for the achievement of a common goal, the contributions of the different sectors being closely coordinated. (World Health Organization 1998)

Intoxication - A condition that follows the administration of a psychoactive substance and results in disturbances in the level of consciousness, cognition, perception, judgement, affect, or behaviour, or other psychophysiological functions and responses. The disturbances are related to the acute pharmacological effects of, and learned responses to, the substance and resolve with time, with complete recovery, except where tissue damage or other complications have arisen. The term is most commonly used with regard to alcohol use: its equivalent in everyday speech is "drunkenness". Alcohol intoxication is manifested by such signs as facial flushing, slurred speech, unsteady gait, euphoria, increased activity, volubility, disorderly conduct, slowed reactions, impaired judgement and motor incoordination, insensibility, or stupefaction. Frequently, a drug is taken in order to achieve a desired degree of intoxication. The behavioural expression of a given level of intoxication is strongly influenced by cultural and personal expectations about the effects of the drug. (World Health Organization 2005)

Investment for health - Investment for health refers to resources which are explicitly dedicated to the production of health and health gain. They may be invested by public and private agencies, as well as by people as individuals and groups. Investment for health strategies are based on knowledge about the determinants of health and seek to gain political commitment to healthy public policies. (World Health Organization 1998)

Legal purchase age - The age below which people are prohibited by law from purchasing alcohol. (Hvalkof and Anderson 1995)

Liberalization - Usually refers to a process whereby environmental or ecological controls are reduced or eliminated (e.g. reductions in taxation or elimination of restrictions on availability), while expecting greater responsibility in terms of individual choice and behaviour. (Hvalkof and Anderson 1995)

Licensed premises - A house or building equipped with a legal permit from the governing authority for the retail sale and consumption of alcoholic beverages. (Babor *et al.* 2003)

Licensing of outlets - Licensing of outlets authorized to sell alcoholic beverages and legal provisions setting the days and hours when sale is permitted. Some countries have divided the term into licensing for consumption on-premises or off-premises. (Hvalkof and Anderson 1995)

Lifeskills - Those personal, social, cognitive and physical skills which enable people to control and direct their lives and to develop the capacity to live with and produce change in their environment. (World Health Organization 1998)

Lisbon strategy - To compete with other major world players, the EU needs a modern efficient economy. Meeting in Lisbon in March 2000, the EU's political leaders set it a new goal: to become, within a decade, "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable growth with more and better jobs and greater social cohesion." The EU's leaders also agreed on a detailed strategy for achieving this goal. The "Lisbon strategy" covers such matters as research, education, training, Internet access and on-line business. It also covers reform of Europe's social protection systems, which must be made sustainable so that their benefits can be enjoyed by future generations. Every spring the European Council meets to review progress in implementing the Lisbon strategy. (European Commission 2005)

Marketing of alcohol - Promotion of the sale of alcohol using a variety of strategies, such as advertising on television and radio and in newspapers and journals, advertising directly to some consumer groups, sponsorship of sports and cultural activities, and giving greater visibility to alcohol in television programmes and popular songs. (Hvalkof and Anderson 1995)

Media advocacy - Strategic use of the mass media to advance a social or public policy initiative. (Hvalkof and Anderson 1995)

Mediator - An intervening or intermediate factor (e.g., intoxication) that occurs in a causal pathway from a risk factor (e.g., alcohol consumption) and a health (or social) problem (e.g., an accidental injury). It causes variation in the problem indicator, and variation within itself is caused by the risk factor. (Last 2001; modified)

Member State - The countries that belong to an international organization are its "member states". The term is also often used to mean the governments of those countries. From 1 May 2004, the member states of the European Union are Belgium, the Czech Republic, Denmark, Germany, Estonia, Greece, Spain, France, Ireland, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Slovenia, Slovakia, Finland, Sweden and the United Kingdom. (European Commission 2005)

Meta-analysis - Statistical analyses in which data from several different studies are culled and re-analysed together; the approach is particularly useful when there is a specific question to answer and at least a few relatively strong studies that come to different conclusions. (Last 2001; modified)

Minimum alcohol purchasing age - The minimum age at which it becomes legal for someone to purchase alcoholic beverages. Depending on the country, it usually ranges from 16 to 21 years old. In some countries, there are different minimum ages for different beverages or circumstances of drinking. (Babor *et al.* 2003)

Misuse, drug or alcohol - Use of a substance for a purpose not consistent with legal or medical guidelines, as in the non-medical use of prescription medications. The term is

preferred by some to abuse in the belief that it is less judgmental. (World Health Organization 2005)

Moderate drinking - An inexact term for a pattern of drinking that is by implication contrasted with heavy drinking. It denotes drinking that is moderate in amount and does not cause problems. Sometimes, moderate drinking is also contrasted with light drinking. (World Health Organization 2005)

Multisectoral action - For practical purposes it is synonymous with intersectoral action, but emphasizing the contribution and accountability of a number of sectors. (World Health Organization 1998)

Natural experiments - The investigation of change within and in relation to its naturally occurring context, as when a policy is implemented in one community but not in a comparable community. Implies that the researcher had no influence on the occurrence of the change. (Babor *et al.* 2003)

Nongovernmental organization - A national or internationally-based organizational entity such as a citizens' group, an association, a church group or a foundation, that provides an independent and flexible counterbalance to government and the for-profit business sector. (World Health Organization 1998)

Normative education - Classroom lectures, discussions, and exercises designed to provide objective information (often obtained from school surveys) about the extent of alcohol and drug use in the school-age population. The extent of substance use is generally over-estimated by students. This information is thought to reduce the pressure to imitate or conform to the perceived norm. (Babor *et al.* 2003)

Number of outlets - The number of establishments selling alcoholic beverages. (Babor *et al.* 2003)

Outcome - In the field of health, the result or impact of policy measures or health interventions in terms of a change in health status or health behaviour. (World Health Organization 1998)

Pattern of drinking - Implies attention both to the number of drinks consumed per occasion and to the frequency, timing, and context of drinking occasions. (Babor *et al.* 2003)

Per capita consumption - The average amount of pure alcohol (usually estimated in litres) consumed during a given time period (e.g. one year), calculated by dividing the total amount of pure alcohol consumed during that time by the total number of people in the population, including children and abstainers. Adult *per capita* consumption (or per adult consumption) is the total amount of alcohol consumed divided by the number of adults, sometimes defined as persons over the age of 15. (Babor *et al.* 2003)

Polluter pays principle - The principle incorporated in laws of some countries that those producers who are responsible for pollution should pay the costs of compensation for damage and the cost of "cleaning up" the pollution afterwards. (World Health Organization 1998)

Population-based approach - Specifically, measures or strategies which bear on overall alcohol consumption with the aim of reducing the occurrence of alcohol-related problems. The aim is to create an environment which helps people make healthy choices and renders unhealthy choices more difficult or expensive. (Hvalkof and Anderson 1995)

Population distribution of alcohol consumption - The way in which alcohol consumption is distributed throughout the population. Empirical studies demonstrate that distributions of alcohol consumption are strongly skewed with a long tail towards high consumption levels. The distribution is unimodal and there is no cut-off point to distinguish between lighter and heavier drinkers. (Hvalkof and Anderson 1995)

Price elastic - The per cent change in the amount of alcohol consumed (or quantity demanded) is greater than the percent change in price. (Babor *et al.* 2003)

Price elasticity of demand - The term 'elasticity' is used by economists to describe the responsiveness of one variable to changes in another variable. Price elasticity of demand measures the responsiveness of demand for alcoholic beverages to changes in price. It involves comparing the proportional changes in price with the proportional changes in the quantity demanded. The relationship is expressed in the form of a ratio or coefficient. (Babor *et al.* 2003)

Price inelastic - The per cent change in price is more than the per cent change in the amount of alcohol consumed (or quantity demanded). (Babor *et al.* 2003)

Primary care - The first level of care, generally provided in an ambulatory setting (as opposed to secondary and tertiary care which would normally be hospital-based). (World Health Organization 1998)

Primary health care - Primary health care is the central function and main focus of a country's health system, the principal vehicle for the delivery of health care, the most peripheral level in a health system stretching from the periphery to the centre, and an integral part of the social and economic development of a country. (Hvalkof and Anderson 1995)

Problem drinking - Drinking that results in problems, individual or collective, health or social. A problem drinker is a person whose drinking has resulted in health or social problems. Formulations that avoid the labelling inherent in the term include "drinking-related problems" and "drinking problems". (World Health Organization 2005)

Prohibition - Policy under which the cultivation, manufacture, and/or sale (and sometimes the use) of a psychoactive drug are forbidden (although pharmaceutical sales are usually permitted). The term applies particularly to alcohol, notably (as Prohibition) in relation to the period of national interdiction of alcohol sales in the USA, 1919-1933, and in various other countries between the two World Wars. (World Health Organization 2005)

Public good - Good resulting from an act devoted or directed to promotion of the general welfare of the people or community as a whole. (Hvalkof and Anderson 1995)

Public health - The science and art of preventing disease, prolonging life and promoting mental and physical health and efficiency through organized community efforts. Public health may be considered as the structures and processes by which the health of populations is understood, safeguarded and promoted through the organized efforts of society. (Last 2001; modified)

Public health advocacy - The actions of health professionals and others with perceived authority in health to influence the decisions and actions of communities and governments which have some control over the resources which influence health. (Hvalkof and Anderson 1995)

Random breath testing - A system whereby a random sample of drivers are stopped and given breath tests, thereby ensuring that those who are over the limit but show no immediate evidence of impaired driving will be detected, as well as those who show signs of impairment. (Hvalkof and Anderson 1995)

Randomized clinical trial - A study design in which research participants are randomly allocated to one or more intervention conditions to determine which one would be of greatest benefit. Randomization is done to eliminate error from self-selection or other kinds of systematic bias. (Last 2001; modified)

Rationing - The sale of alcoholic beverages is limited to a certain amount (usually determined by government authorities) per person. The most notable example of rationing as

a way to discourage alcohol misuse is the Bratt system, a form of legal control over alcohol availability in Sweden between 1917 and 1955. (Babor *et al.* 2003)

Recorded alcohol consumption - The level of national consumption shown by records of tax and excise on alcoholic beverages and routinely collected statistics covering production, trade and consumption. (Hvalkof and Anderson 1995)

Responsible beverage service (RBS) - An education program that trains managers of alcohol outlets and alcohol servers or sellers how to avoid illegally selling alcohol to intoxicated or underage patrons. (Babor *et al.* 2003)

Responsible drinking - A term used by some governments for the drinking of alcoholic beverages in moderation; drinking that does not lead to loss of health or other harm to the drinker or to others. (Babor *et al.* 2003)

Retail availability - Specifically, the availability of alcohol through retail outlets. (Hvalkof and Anderson 1995)

Risk factor - Social, economic or biological status, behaviours or environments which are associated with or cause increased susceptibility to a specific disease, ill health, or injury. (World Health Organization 1998)

Risk function - Specifically, the relationship between the quantity of alcohol drunk and a range of physical and social consequences of drinking. (Hvalkof and Anderson 1995)

Self-regulation - Specifically, a mechanism by which an entity, usually the alcohol beverage industry, sets codes of practice concerning the content or location of advertisements for alcohol. (Hvalkof and Anderson 1995)

Server liability - The concept of making servers of alcoholic beverages legally liable for resulting harm. (Hvalkof and Anderson 1995)

Server training - Training for staff of licensed establishments that sell alcoholic beverages, as a mechanism to reduce intoxication. (Hvalkof and Anderson 1995)

Social costs of alcohol - The overall costs to any society resulting from the consumption, production and distribution of alcohol and embracing such sectors as health and welfare, industry, road traffic, law enforcement and the penal system. (Hvalkof and Anderson 1995)

Social drinking - (1) Literally, drinking in company, as opposed to solitary drinking. (2) Often used loosely to mean a drinking pattern that is not problem drinking. (3) More prescriptively, the use of alcoholic beverages in compliance with social custom, primarily in the company of others, and then only for socially acceptable reasons and in socially acceptable ways. Social drinking is not necessarily moderate drinking. In certain South American societies, for example, individuals engage in communally approved "fiesta" drinking, often to the point of intoxication. (World Health Organization 2005)

Social marketing - An approach to health communications that applies standard marketing principles to 'sell' ideas, attitudes, and health behaviours. Social marketing seeks to influence social behaviours in the target audience and the general society. (Babor *et al.* 2003)

Stakeholder - Any person or organization with an interest in or affected by EU legislation and policymaking is a "stakeholder" in that process. The European Commission makes a point of consulting as wide a range of stakeholders as possible before proposing new legislation or new policy initiatives. (European Commission 2005)

Standard drink - A volume of beverage alcohol (e.g. a glass of wine, a can of beer, or a mixed drink containing distilled spirits) that contains approximately the same amounts (in grams) of ethanol regardless of the type of beverage. (World Health Organization 2005)

Strategy - A long-term considered and comprehensive course of action that provides the framework for individual activities and events. (World Health Organization 1998)

Subsidiarity - The “subsidiarity principle” means that EU decisions must be taken as closely as possible to the citizen. In other words, the Union does not take action (except on matters for which it alone is responsible) unless EU action is more effective than action taken at national, regional or local level. (European Commission 2005)

Supply reduction - Specifically, policies or programmes aimed at reducing or preventing the production and distribution of alcohol. (Hvalkof and Anderson 1995)

Temperance - A term of varying usage concerning alcohol and other drugs; originally meaning a commitment to moderation in personal drinking habits (e.g. by abstaining from drinking spirits), but after the 1840s usually meaning a personal commitment to total abstinence (the temperance pledge). After the 1850s it often implied a commitment to local, national, or global alcohol control, usually with the aim of eventual prohibition of the sale of alcoholic beverages (hence prohibitionist). (World Health Organization 2005)

Time-series analysis - A statistical procedure that allows inferences to be drawn from two series of repeated measurements made on the same individuals or organization over time. Where the emphasis is on understanding causal relations, the key question is how a change on one series correlates with a change on the other (with other factors controlled). (Last 2001; modified)

Total ban on sales - A law or regulation making the sale of all or a specific type of alcoholic beverage illegal. (Babor *et al.* 2003)

Unit price elastic - The per cent change in price is equal to the per cent change in alcohol consumed (or quantity demanded). (Babor *et al.* 2003)

Universal strategy - A prevention strategy directed at the entire population, rather than high risk drinkers. (Babor *et al.* 2003)

Unrecorded alcohol consumption - Alcohol consumption which is not reflected in official statistics on alcohol consumption. (Hvalkof and Anderson 1995)

Warning labels - Messages printed on alcoholic beverage containers warning drinkers about the harmful effects of alcohol on health. (Babor *et al.* 2003)

Sources

Babor TF, Caetano R, Casswell S, Edwards G, Giesbrecht N, Graham K, Grube JW, Gruenewald PJ, Hill L, Holder HD, Homel R, Österberg E, Rehm J, Room R & Rossow I (2003). Alcohol: No Ordinary Commodity. Research and Public Policy. Oxford, Oxford Medical Publication, Oxford University Press.

European Commission (2005) Eurojargon. http://ec.europa.eu/abc/eurojargon/index_en.htm

Hvalkof, S. and Anderson, P. (1995). Terminology for alcohol policy. Copenhagen, WHO Regional Office for Europe.

Last, J. (2001). A dictionary of epidemiology. (Fourth edition ed.) Oxford: Oxford University Press.

World Health Organization (1992) The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines. Geneva: World Health Organization.

World Health Organization (1998). Health 21 – health for all in the 21st century. Copenhagen: World Health Organization Regional Office for Europe.

World Health Organization (2005) Lexicon of alcohol and drug terms published by the World Health Organization http://www.who.int/substance_abuse/terminology/who_lexicon/en/.

