Optimising Delivery of Health Care Interventions - ODHIN (2011-2014)
Project no. 259268

FINAL PUBLISHABLE SUMMARY REPORT

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1. Executive summary

Over a four year period, 2011-2014, a multidisciplinary team of over 50 scientists from 19 partner institutions located in nine European countries have joint efforts to improve the knowledge base and build capacity for an improved delivery of health care interventions, in particular Identification and Brief Intervention programmes for hazardous and harmful alcohol consumption. The following core findings resulted:

1. Screening and delivering brief advice to patients presenting with hazardous or harmful alcohol consumption in primary health care settings is cost-effective when delivered both at next consultation and at next patient registration. When delivered at next patient registration, screening and brief advice is, in some jurisdictions, cost-saving.

2. Despite the health burden and evidence for effectiveness and cost effectiveness, only 11 per thousand adult patients who consulted their primary health care doctor in Catalonia, England, Netherlands, Poland and Sweden were given brief advice for heavy drinking, an estimated 1 in 30 of those who could have benefited from brief advice.

3. Despite the health burden and evidence for effectiveness and cost effectiveness, in general, health systems across Europe lack the infrastructures to support the delivery of screening and brief advice programmes, with less than half of 23 European countries considering that screening and brief advice programmes were integrated to at least some extent, and hardly any countries able to provide routine data on the extent to which screening and brief advice programmes were actually delivered in primary health care.

4. Primary health care physicians who report having received more training on managing alcohol problems report advising a higher number of heavy drinking patients – as do those who report being either able or inclined to deliver brief advice.

5. Primary health care physicians who hold strong views that doctors have a disease rather than a prevention model, or who believe that patients should be responsible for their own drinking report advising a lower number of heavy drinking patients.

6. A systematic review of 29 studies found that professional oriented strategies, such as delivering education on screening and brief advice programmes to primary health care providers, increases their screening and brief advice activities – a finding consistent with general practitioners' own views. The impact of professional oriented strategies on screening and brief intervention delivery is enhanced when supplemented with patient oriented strategies (e.g., patient education progammes) and when delivered comprehensively to multidisciplinary primary health care teams rather than singly to isolated professional groups.

7. A combination of training and support and financial reimbursement led to a trebling in the number of adult patients consulting their primary health care doctor who were given brief advice for heavy drinking during the three month period in which financial reimbursement was given.

8. The combined provision of training and support and financial reimbursement were found to be highly cost effective in leading to improved health outcomes in four out of the five jurisdictions studied, and, in three out of five jurisdictions studied, would lead to large resource savings of approximately €20 per adult over a 30 year time frame.

9. It is possible to assess the delivery of primary health care based screening and brief advice programmes for heavy drinking at jurisdictional level, although existing measures need to be supplemented with objective monitoring of the number of adult patients actually given a brief advice over a defined time period.

2. Summary description of project content and main objectives

The European Union is the region of the world with the highest levels of per-capita alcohol consumption. There are many drinkers who regularly consume amounts of alcohol that put their health at considerable risk; according to the latest estimates for Europe, this applies to some 15% of the adult population. A vast body of scientific research has found that brief advice in health care settings can reduce the prevalence of hazardous and harmful drinking and their associated problems by up to 20%. Such advice, if extensively delivered is an important tool, among others, in reducing the negative health impacts of alcohol at the population level.

ODHIN has used the implementation of identification and brief intervention programmes (IBI) for hazardous and harmful alcohol consumption (HHAC) in primary health care (PHC) as a case study to better understand how to translate the results of clinical research into every day practice. Systematic reviews investigating the impact of different behavioural, organisational and financial strategies in changing provider behaviour have been undertaken across a range of clinical lifestyle interventions; a baseline measurement of services for managing hazardous drinking in PHC available in European countries has been carried out; a cluster randomised controlled trial has been performed to test the incremental effect of a range of strategies to improve the delivery of screening and brief advice for HHAC in primary health settings; and ODHIN has developed an evidence-based database on effective and cost-effective IBI measures for use in PHC.

The general objective of the project was to improve the delivery of health care interventions by understanding how to better translate the results of clinical research into everyday practice. The ODHIN project aimed to improve screening and brief interventions in primary health care to reduce hazardous drinking.

The **scientific objectives** of ODHIN included the study of a number of aspects relating to the effectiveness and cost-effect of identification and brief interventions for harmful and hazardous alcohol consumption:

- the impact of different behavioural, organizational and financial strategies in changing provider behaviour across a range of clinical lifestyle interventions, explored through a series of systematic reviews;
- potential barriers and facilitators to dissemination and implementation processes for identification and brief intervention programmes for hazardous and harmful alcohol consumption in primary health care within current organisational arrangements;
- modelling studies that tested the impact of different identification and brief intervention approaches on changes in alcohol consumption and the resulting impacts on healthcare costs and health-related quality of life providing evidence for both methodologies and measures to investigate the dissemination and implementation processes;
- A stepped cluster randomised controlled trial methodology was used to test the incremental effect of strategies that raise awareness, insight, acceptance of and performance of IBI programmes, and that improve acceptance, change and maintenance of implementation with financial and organisational strategies, as to spread knowledge and the associated evidence-based interventions, and the adoption and integration of evidence-based health interventions in primary health care settings; and
- the extent of current provision of clinical practice for IBI programmes for hazardous and harmful alcohol consumption in PHC settings has been assessed in order to measure the sustainability of effective dissemination and implementation processes.

ODHIN also aimed at fulfilling the following **technical objectives:**

- Through decision-makers dialogue meetings (one round in the first year of the project, and the second in the final year of the project) to promote dialogue between ODHIN scientists and all relevant stakeholders involved in alcohol and health policy-making.
- Through a web evidence-based database, provide a knowledge base guide for primary health care policy makers and practitioners
- To provide implementation guides for primary health care policy makers and practitioners.

The specific research questions addressed by the project were:

1. What are general practitioners' attitudes and views to delivering screening and brief advice programmes for heavy drinking?
2. What does the published scientific literature tell to us about the best ways to improve the volume of screening and brief advice programmes for heavy drinking delivered in primary health care?
3. Can we increase the volume of screening and brief advice programmes for heavy drinking delivered in primary health care by providing training and support, financial reimbursement and the use of internet-based brief advice programmes for identified heavy drinkers?
4. How cost effective are strategies to encourage primary health care providers to deliver screening and brief advice programmes for heavy drinking?
5. How can we assess screening and brief advice programmes for heavy drinking at the country level?

The project was structured into the following Work packages:
WP1 – Coordination - was in charge of the coordination and management of ODHIN at administrative, financial and scientific levels. Efficient communication channels between the project participants were set up and used frequently, whereas partners met face-to-face in four plenary meetings and seven WP-specific face-to-face meetings.

WP2 – Knowledge base – The overall objective was to add to the knowledge base on how IBI approaches for lifestyle issues can be successfully disseminated and implemented in everyday routine PHC practice. This was achieved through a 3-step review methodology, which found that implementation strategies have a statistically significant effect on the provision of prevention and health promotion activities of care providers, although, only some implementation strategies have proven effects on changing patient lifestyles. Multi-component implementation strategies tailored at identified implementation barriers seem to have positive effects on the healthcare provider as well as on patients, whereas evidence indicates that professional education is effective, but the effect size varies per lifestyle topic. A clear knowledge gap exists concerning the effectiveness of financial oriented implementation strategies.

WP3 - Cost effectiveness –adapted the Sheffield Alcohol Policy Model from the UK context, and modelled the cost-effectiveness of IBI in the Netherlands, Poland and Italy. These adaptations show that national programmes of IBI are estimated to be highly cost-effective in all three countries.

WP4 – Surveys – assessed provider attitudes and the experience of implementation of IBI programmes in nine different European countries, based on the responses of 2,435 European physicians. The findings indicate that education on alcohol, a supportive working environment, and role security (influenced by education and a supportive work environment) were independently related to the number of patients managed for alcohol-related harm. The top two barriers for delivering IBI were lack of time and the lack of a specific training in counselling for reducing alcohol consumption.

WP5 – the five country cluster randomized factorial trial demonstrated that providing training and support to primary health care providers improved IBI rates, an effect still present at least six months after the training and support sessions. Providing financial reimbursement also improved IBI rates, but only for the duration of the financial reimbursement. A combination of training and support with financial reimbursement trebled IBI rates, a combination which, based on cost-effectiveness analyses, would lead to cost savings in all five countries over a 30 year time frame.

WP6 - Assessment tool –The assessment tool developed under the Primary Health Care European Project on Alcohol (PHEPA project) was formalised, operationalised and tested, gathering information from 23 European countries in order to assess the extent of implementation of IBIs for hazardous and harmful alcohol consumption throughout PHC settings.

WP7 - From science to policy – Since the aim of ODHIN was not just to do research, but to have an impact on policy, the project put a strong emphasis on promoting the ODHIN project as a way to draw due attention to this policy area and on sharing the project results as an when they were made available. Over 90 dissemination activities were carried out as of the formal project end date, with a round of national policy dialogues in the first year and two dialogues with decision makers at the European and international levels presenting and discussing ODHIN findings in the final months of the project. 17 scientific papers have been published in peer-reviewed journals; and, another 17 are in preparation. An e-book publication providing guidance for the future governance of IBI programmes for HHAC taking into account ODHIN findings and the most pressing challenges, in addition to 6 accessible factsheets and 2 concise e-manuals providing specific guidance for health care professionals, on one hand, and for commissioners and funders of primary health care, on the other, have been produced to be widespread amongst all relevant stakeholders.

3. Description of the main scientific and technical results

3.1 General Practitioners views on identification and brief interventions (IBI) for alcohol (ODHIN WP4)

Through a survey conducted in 2012 (in England, conducted in 2009), a total of 2345 general practitioners (GPs) from Catalonia, Czech Republic, England, Italy, the Netherlands, Poland, Portugal, and Slovenia[1] were surveyed. The questionnaire included questions on the GP's demographics, reported education and training on alcohol, attitudes and views towards managing alcohol and alcohol problems, and self-reported estimates of numbers of patients managed for alcohol and alcohol problems during the previous year. The aim was to achieve a better understanding of how brief advice activity could be increased[2,3].

The estimated mean number of patients managed for alcohol and alcohol problems during the previous year ranged from 5 to 21 across the eight countries (average, 11). On average, the GPs reported that they had received about ten hours of postgraduate education or training on managing alcohol problems. In general, they felt capable[4] of giving advice to heavy drinkers, but were rather neutral in how inclined[5] they were to actually give such advice.

GPs who reported higher levels of education for alcohol and alcohol problems and GPs who felt both more secure and therapeutically committed in managing patients with such problems reported managing a higher number of patients. GPs who reported that doctors tended to have a disease model of alcohol problems and those who felt that drinking was a personal rather than a medical responsibility reported managing a lower number of patients.

GPs who reported advising a high number of patients for their heavy drinking had three associated characteristics that were statistically significant:

1. GPs who had received more education on managing alcohol problems – for every extra ten hours of education received as part of professional training, two to three more heavy drinking patients were reported as being advised during the previous year, Figure 1.
2. GPs who felt more able to give advice[4] – for every extra point on the ability score, one additional heavy drinking patient was reported as being advised during the previous year, Figure 2.
3. GPs who felt more inclined to give advice[5] – for every extra five points on the inclination score, two additional heavy drinking patients were reported as being advised during the previous year, Figure 3.

1 GPs were also surveyed in Sweden, but sample size problems and technical difficulties in the completion of the survey instrument raised concerns about the validity of the findings, which are thus excluded.
2 Anderson et al. (2014) Managing Alcohol Problems in General Practice in Europe: Results from the European ODHIN Survey of General Practitioners. *Alcohol and Alcoholism* Vol. 49, No. 5, pp. 531–539, 2014
3 Wojnar et al. (2014 Wojnar, M et al. (2014) Survey of attitudes and managing alcohol problems in general practice in Europe – Final report. Deliverable 4.1- Work Package 4. *Odhin Project.* Published online: http://www.odhinproject.eu/resources/documents/doc_download/52-deliverable-4-1-survey-of-attitudes-and-managing-alcohol-problems-in-general-practice-in-europe.html
4 Role security scale from the short form of the Alcohol and Alcohol Problems Perception Questionnaire (Anderson & Clement 1987).
5 Therapeutic commitment scale from the short form of the Alcohol and Alcohol Problems Perception Questionnaire (Anderson & Clement 1987).

Figure 1 *Relationship between reported hours of postgraduate education received and reported number of patients advised for heavy drinking in previous year.*

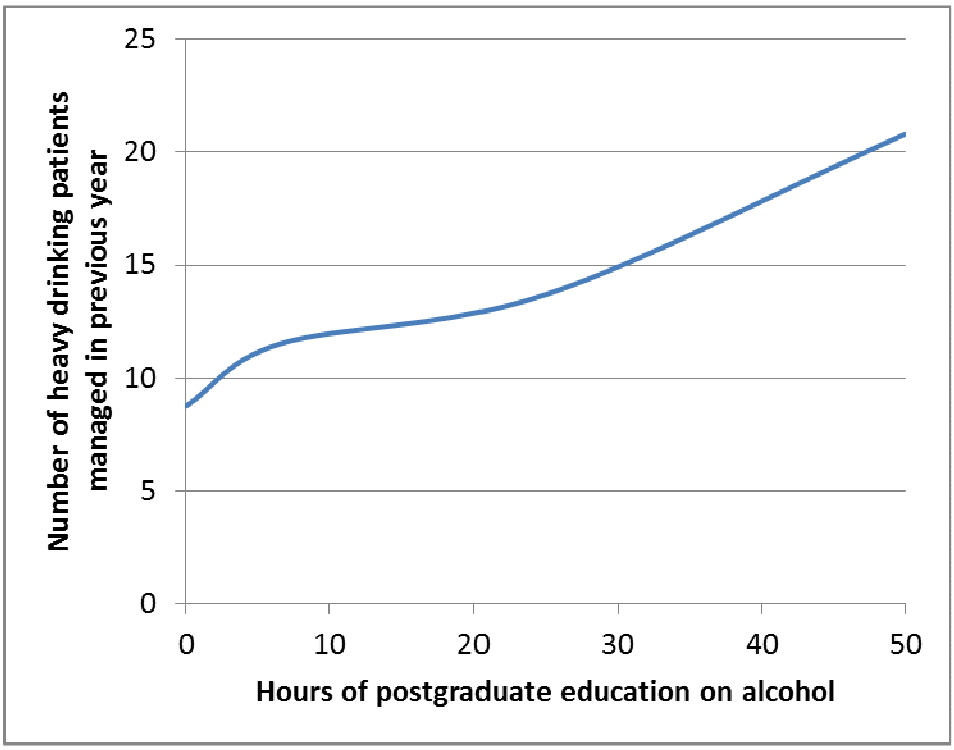


Figure 2 *Relationship between score on ability to deliver brief advice and reported number of patients advised for heavy drinking in previous year.*

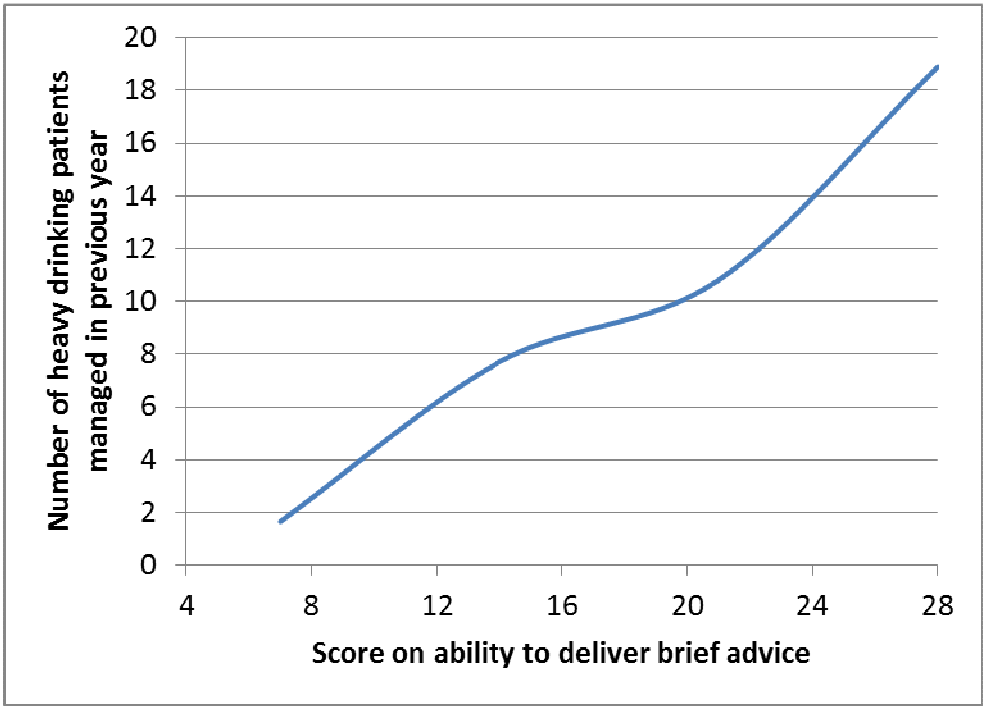
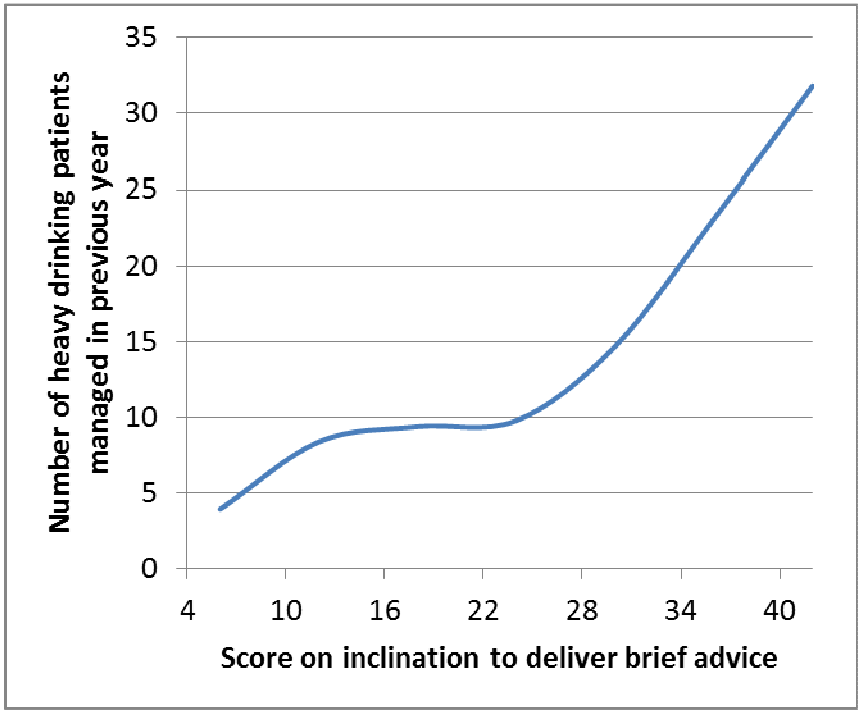


Figure 3 *Relationship between score on inclination to deliver brief advice and reported number of patients advised for heavy drinking in previous year.*



GPs who reported advising few or no patients for their heavy drinking had two associated characteristics that were statistically significant:

1. GPs who were more attuned to a *disease model of medicine* rather than a *preventive model of medicine* when dealing with alcohol, Figure 4.
2. GPs who were more likely to think that individuals should be responsible for managing their own drinking, Figure 5.

Figure 4 *Relationship between strength of views that doctors have a disease rather than a preventive model and reported number of patients advised for heavy drinking in previous year.*

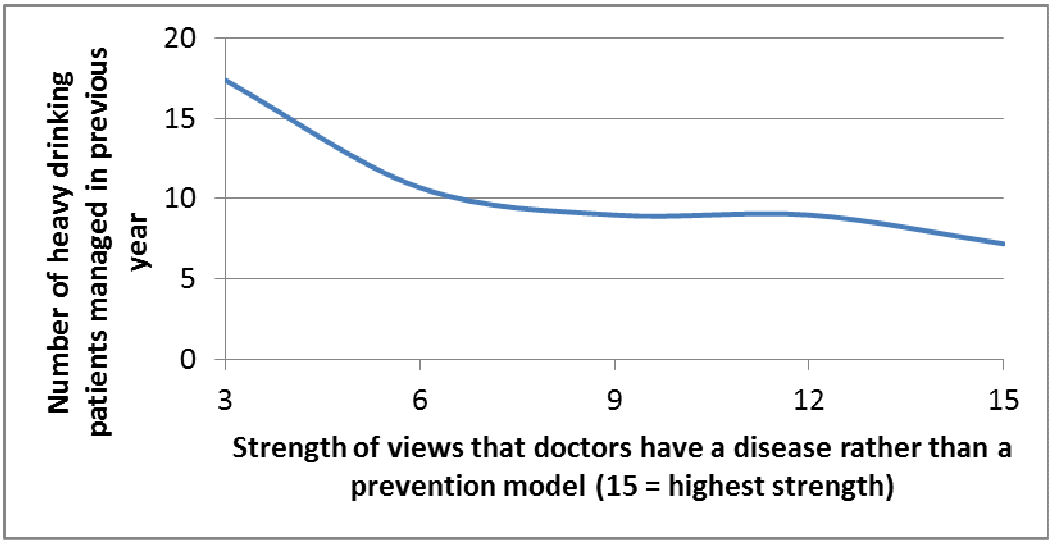
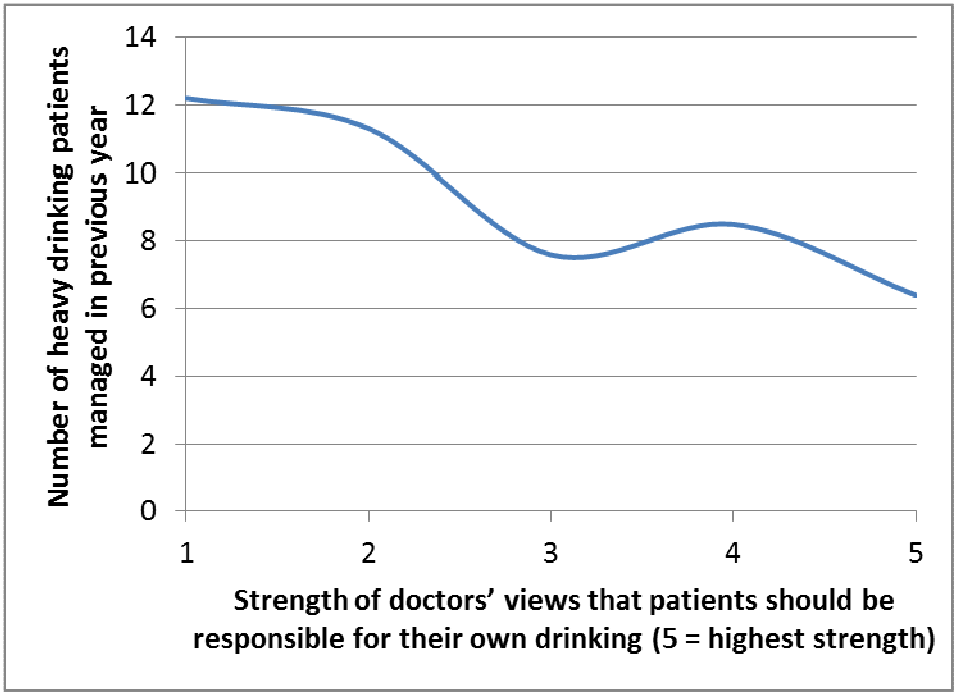


Figure 5 *Relationship between strength of views that patients should be responsible for their own drinking and reported number of patients advised for heavy drinking in previous year.*



GPs who had received more education on alcohol were less likely to adhere to a disease model for alcohol, although not less likely to believe that individuals were responsible themselves for their drinking.

A first conclusion to be drawn is that education seems to be related to increased role security, and each of education and role security were associated with a reported increase in the number of patients managed for heavy drinking. This would suggest the importance of scaled-up education and training for managing heavy drinking patients in primary health care settings. Unfortunately, there is very little information available on the extent, uptake and quality of education on alcohol throughout Europe. A survey of European Union countries undertaken at the end of the year 2010, found that in 14 out of 29 countries, training programmes were available for health professionals in identification and brief interventions (IBI) for alcohol problems. No information was given on the type or length of training, or its uptake[6]. Across 23 European countries, on a scale from 0 (not included) to 10 (fully included), education on managing hazardous and harmful alcohol consumption in the curriculum of professional training at undergraduate, postgraduate, and continuing professional education levels scored 5 in 2012. Again, no information was given on the type or length of training, or its uptake[7].

Training sessions could address knowledge, skills, attitudes and perceived barriers and facilitators for implementing screening and brief advice[8]. Knowledge should include information on the harm done

6 Anderson P, Møller L and Galea G (Eds.) (2012) *Alcohol in the European Union*. Copenhagen, Denmark: World Health Organization, 2012

7 Gandin, C & Scafato, E (2013): ODHIN Assessment tool-report. A description of the available services for the management of hazardous and harmful alcohol consumption. Deliverable D6.1, Work Package 6. *ODHIN Project*. Published online: http://www.odhinproject.eu/resources/documents/doc_download/70-deliverable-6-1-assessment-tool-report.html

8 Keurhorst, M et al. (2013) Knowledge base of successful implementation of screening and brief intervention for lifestyle issues in every day routine primary health care practice. Deliverable 2.1, Work Package 2. *ODHIN*

by alcohol and on the evidence base for screening and brief advice programmes; skills should include the use of screening instruments and brief Intervention methods; discussion of attitudes could be based on the role security and therapeutic commitment scales of the short alcohol and alcohol problems perceptions questionnaire and be embedded in practice based situations; training should include an open discussion of experienced barriers and facilitators, and how barriers can be overcome. Such brief training could be delivered in two one hour face to face events.

Second, doctors believing that having a disease model would impede brief advice activity seemed to impair the respondents own management activity. This might suggest alternative approaches to engaging general practitioners in advising patients with hazardous and harmful alcohol consumption to reduce their alcohol consumption. One option would be to study the extent to which screening and brief advice targeted at comorbid conditions improves delivery. A candidate example here would by high blood pressure. All patients with a documented diagnosis of hypertension, or a clinic blood pressure of more than 160/100, could be screened for their alcohol consummation and offered brief advice in the case of a screen positive. Alternatively, pharmacotherapies could be considered for greater use in primary health care settings. For example, two efficacy studies have evaluated as-needed nalmefene versus placebo in reducing alcohol consumption in out-patients settings with a high risk drinking level (men: >60 g/day; women: >40 g/day) at both screening and randomisation[9,10,11]. The efficacy analyses found significantly superior effects of nalmefene compared to placebo in reducing the number of heavy drinking days [treatment difference: −3.2 days (95% CI: −4.8; −1.6); P < 0.0001] and total alcohol consumption [treatment difference: −14.3 g/day (−20.8; −7.8); P < 0.0001] 6 months after starting treatment. Nalmefene constitutes a new pharmacological treatment paradigm in terms of treatment goal (reduced drinking, rather than abstinence) and dosing regimen (as-needed, rather than at defined intervals).

Third, a belief in individual patient responsibility seemed to impair management activity. This would suggest that patient owned identification and brief advice technologies, that could be explored and developed, might broaden the number of heavy drinkers exposed to actions to reduce their drinking. For example, the widespread use of computers, the Internet, and smartphones has led to the development of electronic systems to deliver screening and brief advice that can potentially address some of the barriers to implementation of traditional face-to-face screening and brief advice. Electronic screening and brief advice has the potential to offer greater flexibility and anonymity for the individual and reach a larger proportion of the in-need population. A systematic review and meta-analysis of 23 studies of the effectiveness of electronic screening and brief intervention (eSBI) over time in non-treatment-seeking hazardous and harmful drinkers found a statistically significant mean difference in grams of ethanol consumed per week between those receiving an eSBI versus controls at up to 3 months (mean difference –32.74, 95% CI –56.80 to –8.68), 3 to less than 6 months (mean difference –17.33, 95% CI –31.82 to –2.84), and from 6 months to less than 12

Project. To be published online: http://www.odhinproject.eu/resources/documents/doc_download/67-deliverable-2-1-literature-review-of-sbi-for-lifestyle-issues.html.

9 Gual A et al. (2013) Randomised, double blind, placebo controlled efficacy study of nalmefene. *Eur Neuropsycho* 10.1016/j.euroneuro.2013.02.006.

10 Mann et al. (2013) Extending the treatment options: a randomized controlled study of as needed nalmefene. *Biological Psychiatry* 73:706–13.

11 Van den Brink, W. et al. (2013) Efficacy of As Needed Nalmefene in Alcohol Dependent Patients with at Least a High Drinking Risk Level: Results from a Subgroup Analysis of Two Randomized Controlled 6 Month Studies *Alcohol and Alcoholism*. doi: 10.1093/alcalc/agt061.

months follow-up (mean difference –14.91, 95% CI –25.56 to –4.26). No statistically significant difference was found at a follow-up period of 12 months or greater[12].

3.2 Increasing provider activity for identification and brief interventions (IBI) for alcohol (ODHIN WP2)

A systematic review and meta-regression analysis of 29 studies of determinants of successful implementation of screening and advice for hazardous and harmful alcohol consumption in primary health care found that professional and patient-oriented implementation strategies could improve screening (standardized effect 0.53;95%-CI 0.28-0.78) and advice (standardized effect 0.64;95%-CI 0.27-1.02) rates[13]. Overall, implementation strategies that included patient outcomes found no impact on patients' alcohol consumption (standardized effect 0.07; 95%-CI -0.02–0.16).

Eleven studies used professional-oriented implementation strategies (for example education programmes and outreach training), three studies reported organisational-oriented strategies (e.g., delivering counselling by telephone), and one study reported a patient-oriented strategy (e.g., educational materials for patients), see Table 1. Six studies reported a combination of professional-oriented and organisational-oriented interventions. The other eight studies reported various combinations of professional-oriented, organisational-oriented, patient-oriented and financial-oriented strategies.

Table 1 *Implementation strategies and their components*

Combinations of implementation strategy components (EPOC sub category)	Nr of studies
Professional oriented implementation strategies	
Audit and feedback	1
Audit and feedback; educational meeting; educational outreach visits	1
Audit and feedback; educational meeting	1
Educational meetings; educational materials	1
Educational meetings; reminders	1
Educational outreach visits	2
Educational meetings; educational outreach visits	1
Educational outreach visits; distribution of educational materials; audit and feedback; educational meetings	1
Patient mediated interventions	1
Reminders	1
Organisational oriented implementation strategies	
Changes to the setting/ site of service delivery	1
Changes in scope and nature of benefits and services	2
Patient oriented implementation strategies	
Printed educational materials for patients	1

12 Donoghue, K., Patton, R., Phillips, T., Deluca, P. & Drummond, C. (2014) The Effectiveness of Electronic Screening and Intervention for Reducing Levels of Alcohol Consumption: A Systematic Review and Meta-Analysis. *J Med Internet Res* 2014;16(6):e142) doi:10.2196/jmir.3193.

13 Keurhorst, M et al. (2013) Knowledge base of successful implementation of screening and brief intervention for lifestyle issues in every day routine primary health care practice. Deliverable 2.1, Work Package 2. *ODHIN Project*. To be published online: http://www.odhinproject.eu/resources/documents/doc_download/67-deliverable-2-1-literature-review-of-sbi-for-lifestyle-issues.html.

Combinations of implementation strategy components (EPOC sub category)	Nr of studies
Professional and organisational oriented implementation strategies	
Educational meetings; changes in medical record system	1
Educational meetings; skill mix changes	2
Educational meetings; formal integration of services	1
Educational meetings; educational materials; changes in medical record system	1
Educational meetings; educational materials; reminders; changes in medical record systems	1
Professional and patient oriented implementation strategies	
Educational outreach visits; Distribution of educational materials; Patient self-management education materials	1
Patient mediated interventions; patient feedback; patient education	1
Organisational and patient oriented implementation strategies	
Changes to the setting/ site of service delivery; patient feedback	3
Professional, organisational and patient oriented implementation strategies	
Distribution of educational materials; educational meetings; reminders; audit and feedback; formal integration of services; educational outreach visits; patient feedback	1
Educational outreach visits; changes to the setting/ site of service delivery; patient feedback	1
Organisational, patient and financial oriented implementation strategies	
Changes to the setting/ service delivery; provider incentives; patient feedback	1
Total	29

Meta-regression showed that applying multiple components of any implementation category and combining professional with patient-oriented implementation strategies were more effective than single strategies implemented alone on alcohol consumption and screening and brief intervention outcomes. Furthermore, targeting implementation strategies at multidisciplinary primary health care teams rather than on solely physicians, increased overall screening rates.

3.3 Cost-effectiveness of brief advice to reduce heavy drinking in primary health care (ODHIN WP3)

In Italy, an example studied in the ODHIN project, the population coverage for a programme of screening at next GP registration is estimated to be 63% of the total adult population, leading to 32% of people receiving a brief intervention during the 10 years of the programme[14]. Coverage is spread relatively evenly across the 10 years, peaking in year 1 with 11% of the population being screened. A programme of screening at next consultation is estimated to capture 97% of the population over 10 years, with 49% of adults receiving an intervention as a result; however this is heavily loaded towards the start of the programme, with 84% of people being screened in the first year. Over the course of 30 years, a programme of screening at next GP registration is estimated to result in 7200 fewer alcohol-attributable deaths, predominantly amongst men (66%) and from chronic (68%), rather than acute causes. The total number of hospitalisations saved by the programme is estimated to be 91,700, also largely amongst men (72%) and for chronic conditions (67%). The cost of delivering the programme over ten years is estimated to be €411 million. This is offset by a total reduction in hospital costs over 30 years of €370 million. The total gain in QALYs is estimated to be

14 Angus C et al (2014): Cost-effectiveness of a programme of screening and brief interventions for alcohol in primary care in Italy. *BMC Family Practice* 2014 15:26. doi:10.1186/1471-2296-15-26

75,200, giving an incremental cost-effectiveness ratio (ICER) of €550/QALY, suggesting that such a programme is close to being cost-neutral. As a large proportion of the health benefits are experienced by men (69% of total QALYs), delivering programmes to men only is estimated to be cost-saving, although the estimated ICER for a female-only programme of €3100/QALY is still well within the recommended Italian threshold of €25000-€40000/QALY. As a programme at next GP consultation has a wider coverage, it is estimated to produce even greater improvements in public health, with 12,400 fewer alcohol-attributable deaths and 153,700 fewer hospital admissions over 30 years. The cost of delivery is also higher, at €687 million, although this is offset by cumulative healthcare savings of €605 million, making the programme around twice as expensive as screening at next registration. Health savings are estimated to be 139,200 additional QALYs, giving an ICER of €590/QALY and suggesting there is little to choose between the two programmes in terms of cost-effectiveness. It should be noted that as the majority of screening and brief advice takes place in the first year of the programme, the bulk of the delivery costs are incurred up front, whilst the health care savings are accrued over a longer time frame. This is in contrast to screening at next registration, where the costs are spread more evenly across the duration of the programme, Figure 6.

Figure 6 *Cumulative net costs of modelled screening programmes (implementation costs less cost savings to healthcare provider) in Italy.*

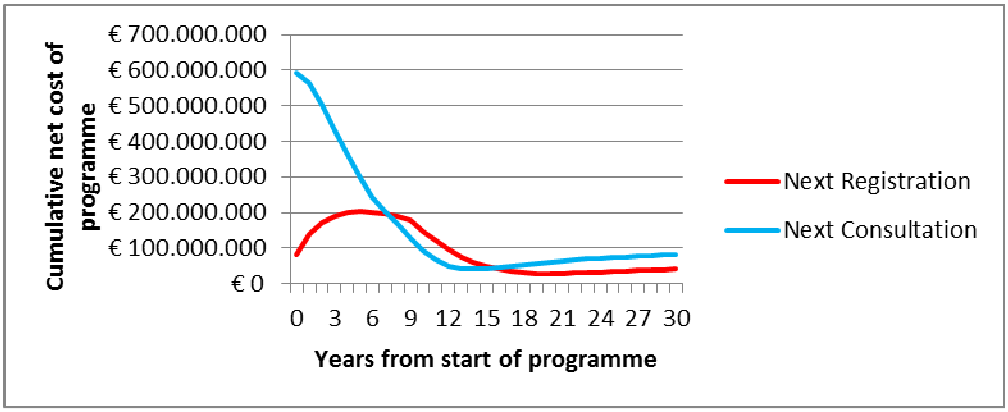
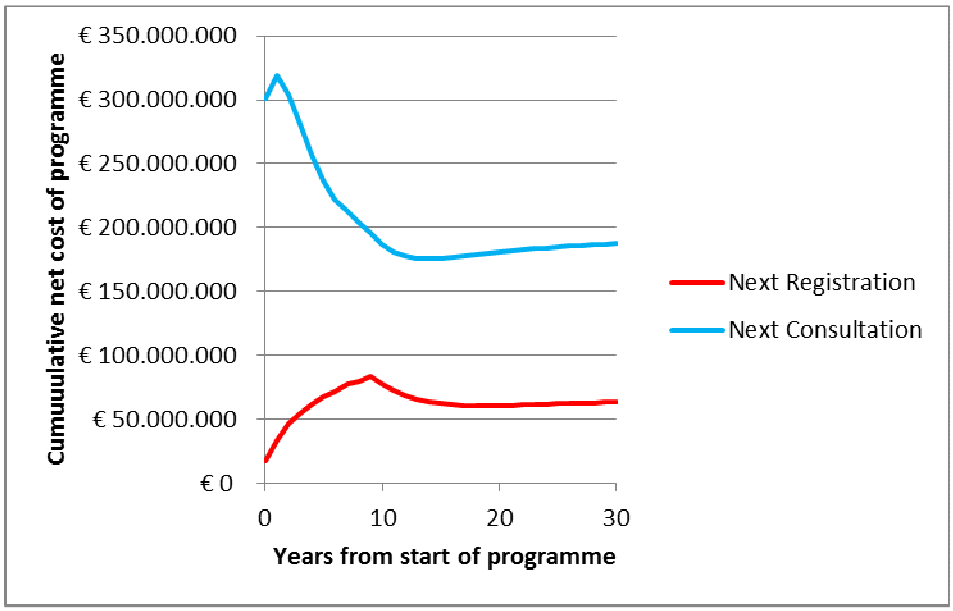


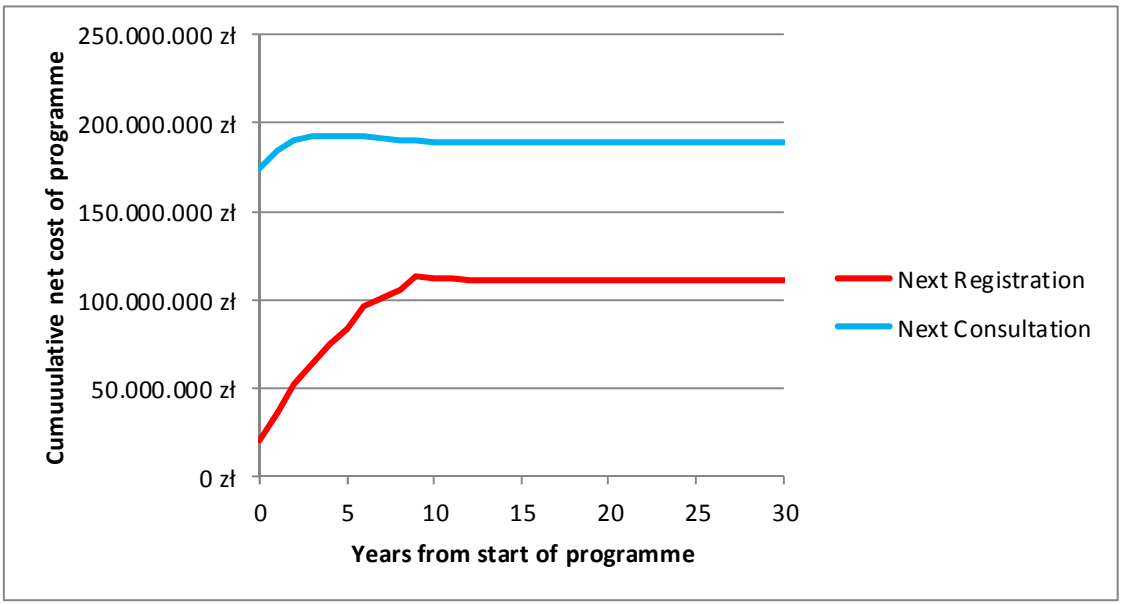
Figure 7 *Cumulative net costs of modelled screening programmes (implementation costs less cost savings to healthcare provider) in Netherlands.*



A programme of screening and brief advice (IBI) at next GP registration or next consultation is also likely to be cost-effective in the Netherlands[15]. The outcome measures observed were the costs of screening, the reduction in costs to the Dutch healthcare system as a result of reduced morbidity and mortality and the improvement in health outcomes measured in QALYs. The resulting incremental cost-effectiveness ratios for all scenarios suggest that either of the modelled programmes would be highly cost-effective when compared with a policy of no programme, under current Dutch guidelines, with a policy of screening and brief advice at next consultation, using the current AUDIT-C 5/4 screening tool bringing the greatest net benefit of all modelled options (at a willingness-to-pay threshold of €20,000/QALY). The cumulative net costs are plotted in Figure 7.

A programme of IBIs at next GP registration or next consultation is also highly likely to be cost-effective in Poland[16]. The outcome measures observed were the costs of screening, the reduction in costs to the Polish healthcare system as a result of reduced morbidity and mortality and the improvement in health outcomes measured in QALYs, in line with standard practice for economic evaluation. The resulting incremental cost-effectiveness ratios for all scenarios suggest that either of the modelled IBI programmes would be highly likely to be considered cost-effective when compared with a policy of no IBI, under current Polish guidelines, with a policy of IBI at next consultation, using the recommended AUDIT-C 5/4 screening tool bringing the greatest net benefit of all modelled options (at a willingness-to-pay threshold of 25000 zł/QALY). The cumulative net costs are plotted in Figure 8.

Figure 8 *Cumulative net costs of modelled screening programmes (implementation costs less cost savings to healthcare provider) in Poland.*



It should be noted that screening and brief advice (IBI) programmes are estimated to be more expensive in countries with higher alcohol-related mortality, where more people will be captured by the programme and with lower alcohol-related morbidity rates[17]. The health impact of screening and brief advice programmes is estimated to be greater in countries where alcohol consumption is greater and where more people are screened.

15 Angus C, Scafato E, Ghirini S et al (2013) Cost-effectiveness-Model report. Deliverable 3.1. *The ODHIN Consortium.* 2013 (published online: http://www.odhinproject.eu/resources/documents/doc_download/66-deliverable-3-1-cost-effectiveness-model-report.html)

16 See previous reference.

17 See reference 15.

3.4 Effectiveness and cost-effectiveness of strategies to increase interventions for heavy drinking in primary health care (ODHIN WP5 and WP3)

3.4.1 ODHIN RCT design[18]

The ODHIN WP5 study was designed to investigate the effects of three different implementation strategies, singly and in combination, to promote brief intervention for heavy drinking in 120 primary health care units (PHCU) across five European jurisdictions (Catalonia, England, the Netherlands, Poland and Sweden). The three strategies were delivering training and support, financial reimbursement, and referral to an internet based method of delivering advice (e-BI):

1. *Training and support (TS):* the TS group were offered two initial 1-2 hours face-to-face educational trainings, and one (10-30 minutes) telephone support call to the lead PHCU contact person during the 12-week implementation period. If necessary one additional face-to-face training of 1-2 hours duration was offered. The training addressed knowledge, skills, attitudes, and perceived barriers and facilitators in implementing screening and advice, combining theory and practical exercises.

2. *Financial reimbursement (FR):* Financial reimbursement groups were paid for screening and advice activities during the 12-week implementation period, with rates based on existing country-specific financial reimbursement for clinical preventive activities. In Catalonia, a maximum ceiling rate of €250 per provider was established, and fees were calculated based on the average individual performance of the 12-week implementation period. A minimum rate had to be met in order to receive any payment, and above this rate, the amount increased proportionally up until the maximum of €250. In England, fees were €6 per screening and €25 per advice, with a maximum ceiling rate of €2200 per PHCU. In the Netherlands, fees were €9 per screening and €13.50 per advice, with a maximum ceiling rate of €1250 per PHCU. In Poland, fees were €1.25 per screening and €10 per advice, with no ceiling rate. In Sweden, fees were €2 per screening and €15 per advice with a maximum ceiling rate of €3300 per PHCU. The type of advice that was reimbursable differed by country. In Catalonia and the Netherlands, reimbursement was given for any of delivering oral advice; giving an advice leaflet; referring to the e-BI programme; or referral to another provider in or outside the PHCU. In Sweden, reimbursement was given for any of delivering oral advice; referring to the e-BI programme; or referral to another provider in or outside the PHCU. In England and Poland, reimbursement was given for either delivering oral advice; or, referring to the e-BI programme.

3. *e-BI:* the e-BI group were asked to refer identified at risk patients with an e-leaflet containing unique log in codes to an approved e-BI specific package, which was country specific, or, for Poland based on the WHO e-SBI programme. The website included: log in facility to allow monitoring of the patient (i.e. patient actually log-in); suitable brief screening tool with ability to calculate score and give feedback (i.e. intervention); appropriate information on lower risk drinking guidelines; information on impact of alcohol on health and wellbeing; and a drink diary facility.

Delivering training and support plus financial reimbursement were chosen as professional oriented interventions for which there is some evidence of impact in changing provider behaviour[19]. E-BI was

18 The ODHIN TRIAL Consortium (2012) RCT Protocol. Deliverable 5.1. *The ODHIN Consortium.* 2012 (published online: http://www.odhinproject.eu/resources/documents/doc_download/26-wp5-deliverable-5-1-rct-protocol.html)

19 Keurhorst, M et al. (2013) Knowledge base of successful implementation of screening and brief intervention for lifestyle issues in every day routine primary health care practice. Deliverable 2.1, Work Package 2. *ODHIN*

chosen, since there is evidence for its impact in reducing alcohol consumption[20]; referral to e-BI might be helpful as an organizational-oriented strategy in reducing the workload of healthcare professionals after identification of patients at risk and thus might increase screening activity of primary health care providers. The study analysed the impact of the different implementation strategies on four different outcomes, defined as:

- **Intervention rate**: number of AUDIT-C positive patients that received one or more of oral advice, an advice leaflet, referral to the e-BI programme, or referral for advice to another provider in or outside the PHCU, divided by the total number of adult consultations of the participating providers per PHCU.
- **Screening rate**: number of patients screened divided by the number of adult consultations of the participating providers per PHCU.
- **AUDIT-C positive rate**: number of patients with an AUDIT-C positive score divided by the number of patients screened per PHCU.
- **Advice rate**: number of AUDIT-C positive patients that received one or more of oral advice, an advice leaflet, referral to the e-BI programme, or referral for advice to another provider in or outside the PHCU, divided by the total number of screen positive patients per PHCU.

3.4.2 PHCU and baseline characteristics

The number of registered patients averaged 10,000 across the 120 PHCUs. There were 1,500 adult (age 18+ years) consultations per PHCU during the 4-week baseline period, mean age 55 years (SD=7), of whom 53% were men. Thus, the PHCUs catered for a population of 1.2 million people, and saw about 180,000 adult patients during a 4-week period. The mean number of full or part-time providers (doctors, nurses and practice assistants) working per PHCU was 15.1 (SD=10.4), of which half were doctors, and two-fifths nurses; of these, 6.2 (SD=3.7) per PHCU (41%) participated in the study, with just over half of the participating providers being doctors (55%), 38% nurses, and 7% practice assistants**.** The mean age of the participating providers was 47 years (SD=5), and 26% were men.

During the 4-week baseline period, intervention rates were 11.1 per thousand (‰) (95%CI=5.2-17.1) per PHCU; screening rates were 5.9% (95%CI=3.4-8.4) per PHCU; AUDIT-C positive rates were 33.3% (95%CI=18.8-47.8) per PHCU; and, advice rates were 73.7% (95%CI=60.6-86.8) per PHCU. The use of electronic records in Catalonia did not appear to affect the rates – excluding Catalonia, the screening rate in the other four countries was 5.6% (95%CI=2.6-8.7).

The baseline screening rate did not vary by the sex of screened patients but was marginally higher amongst older patients (coefficient = 0.0025, p=0.003). The AUDIT-C positive rate was lower the greater the screening rate (coefficient = -1.128, p=<0.001), and marginally lower, the greater the age of the patient (coefficient = -0.0064, p=0.018). The brief advice rates did not differ by screening rate, AUDIT-C positive rate or sex and age of the patient. The intervention rate did not differ by the sex or age of the patient.

The baseline screening and intervention rates were higher the greater the proportion of PHCU providers that were nurses or practice assistants rather than doctors (screening rates, coefficient = 0.087, p<0.001; intervention rates, coefficient = 0.011, p=0.014), but was not related to provider sex or age. Audit-C positive rates and brief advice rates were not related to provider characteristics.

Project. To be published online: http://www.odhinproject.eu/resources/documents/doc_download/67-deliverable-2-1-literature-review-of-sbi-for-lifestyle-issues.html.

20 Donoghue, K., Patton, R., Phillips, T., Deluca, P. & Drummond, C. (2014) The Effectiveness of Electronic Screening and Intervention for Reducing Levels of Alcohol Consumption: A Systematic Review and Meta-Analysis. *J Med Internet Res* 2014;16(6):e142) doi:10.2196/jmir.3193.

3.4.3 Impact of implementation factors during the 12-week implementation period[21]

Of the 120 PHCUs, one dropped out after the baseline measurement period (PHCU from Netherlands in financial reimbursement group) and two PHCUs failed to provide adequate data to calculate outcome rates during the 12-week implementation period (PHCU from England in control group; and, PHCU from Netherlands in training and support and e-BI group). For these PHCUs, the outcome rates during the 12-week implementation period were set as the rates for the baseline measurement period.

Table 2 displays the intervention rates for the baseline, and each of the three four week blocks during the 12 week implementation period when the implementation strategies (factors) were delivered without or with the factors, singly and in combination. Table 3 displays the relative per cent differences (95% CI) in 12-week implementation rates with, as opposed to without the factors, singly and in combination.

- **Training and support**: The trend in drop-off of intervention rates with the factor during the 12-week implementation period was statistically significant, with most of the drop-off occurring between the first and second four-week blocks (Table 2). PHCU that received training and support demonstrated a 69% (95% CI 30 to 119) higher 12-week intervention rate than PHCUs that did not receive training and support (Table 3). Adding screening rates to the model reduced the size of the higher rate to 33.5% (95% CI 8.3 to 64.6), and then adding brief advice rates to the model reduced the size further to 28.1% (95% CI 4.2 to 57.4), indicating that about one half of the higher intervention rate was due to a higher screening rate.
- **Financial reimbursement**: The trend in drop-off of intervention rates with the factor during the 12-week implementation period was statistically significant, with most of the drop-off occurring between the first and second four-week blocks (Table 2). PHCU that received financial reimbursement demonstrated a 125% (95% CI 73 to 193) higher 12-week intervention rate than PHCUs that did not receive financial reimbursement (Table 3). Adding screening rates to the model reduced the size of the higher rate to 49.1% (95% CI 19 to 87), and then adding brief advice rates to the model reduced the size further to 42% (95% CI 14 to 77), indicating that about two-thirds of the higher intervention rate was due to a higher screening rate.
- **E-BI**: The trend in drop-off of intervention rates with the factor during the 12-week implementation period was statistically significant, with most of the drop-off occurring between the first and second four-week blocks (Table 2). Providing PHCU with the referral opportunity to e-BI was not associated with a higher intervention rate (the definition of intervention and advice included a referral to e-BI), Table 3.
- **Training and support plus financial reimbursement**: The trend in drop-off of intervention rates both without and with the combined factors during the 12-week implementation period was statistically significant, with most of the drop-off occurring between the first and second four-week blocks (Table 2). PHCU that received training and support plus financial reimbursement demonstrated a 280% (95% CI 162 to 451) higher 12-week intervention rate than PHCUs that did not receive training and support plus financial reimbursement (Table 3). Adding screening rates to the model reduced the size of the higher rate to 99% (95% CI 45 to 174), and then adding brief advice rates to the model reduced the size further to 81% (95%

21 The ODHIN TRIAL Consortium (2014) Implementation science: a scientific report describing the methods, results and conclusions of the ODHIN randomized controlled trial. Deliverable 5.2. *The ODHIN Consortium.* 2015 (published online: http://www.odhinproject.eu/resources/documents/doc_download/118-deliverable-5-2-implementation-science.html)

CI 32 to 148), indicating that about two-thirds of the higher intervention rate was due to a higher screening rate.

The combination of training and support plus financial reimbursement led to a 165.4% (95% CI 80.8 to 289.6) higher intervention rate than training and support alone (p<0.001) and to a 101.6% (95% CI 41 to 188) higher intervention rate than financial reimbursement alone (p<0.001).

Table 2 *Mean intervention rates[1] per thousand (‰) (95% CI) per PHCU without and with each of the factors, singly and in combination over the measurement periods.*

Factor		Baseline[2]	12 week Implementation period				12 week Implementation period as a whole[4]
			Weeks 1-4	Weeks 5-8	Weeks 9-12	Test for trend; F value[3]	
Training and support	Without factor	12.1 (5.6-18.5)	12.5 (6.1-18.9)	9.5 (5.1-13.9)	9.3 (4.4-14.2)	3.07	10.3 (5.1-15.4)
	With factor	10.2 (4.5-15.9)	22.1 (9.3-34.8)	16.3 (7.7-24.9)	14.2 (6.6-21.7)	4.92*	17.5 (8.2-26.7)
Financial reimbursement	Without factor	12.7 (5.3-20.0)	10.9 (5.5-16.2)	8.7 (4.8-12.5)	8.0 (4.0-12.0)	3.59	9.0 (4.9-13.2)
	With factor	9.6 (5.0-14.3)	23.8 (8.0-39.6)	17.2 (8.4-26.0)	15.4 (6.2-24.7)	5.65*	18.7 (7.8-29.7)
e-BI	Without factor	11.6 (5.8-17.4)	19.4 (8.1-30.8)	16.6 (6.9-26.3)	14.9 (5.0-24.7)	1.39	16.6 (6.6-26.7)
	With factor	10.7 (4.2-17.3)	15.2 (7.3-23.3)	9.3 (6.2-12.3)	8.6 (4.4-12.7)	14.64***	11.1 (6.4-15.8)
Training and support plus financial reimbursement	Without factor	12.0 (5.4 to 18.5)	12.5 (6.4 to 18.7)	9.7 (5.1 to 14.4)	9.3 (4.5 to 14.0)	4.87*	10.3 (5.3 to 15.4)
	With factor	8.7 (4.3 to 13.2)	31.5 (9.5 to 5.4)	22.3 (10.5 to 34.0)	19.2 (8.1 to 30.2)	4.74*	24.5 (10.2 to 38.8)
Training and support plus e-BI	Without factor	12.2 (5.8 to 18.6)	17.1 (7.5 to 26.7)	13.6 (6.6 to 20.6)	12.5 (5.5 to 19.6)	2.92	14.2 (6.5 to 21.9)
	With factor	8.0 (3.2 to 12.8)	18.2 (8.6 to 27.8)	11.1 (7.0 to 15.2)	9.4 (5.2 to 13.5)	8.51**	13.1 (7.7 to 18.5)
Financial reimbursement plus e-BI	Without factor	11.9 (5.6 to 18.2)	16.8 (7.6 to 26.0)	13.9 (6.4 to 21.4)	12.9 (5.8 to 20.0)	2.18	14.3 (6.6 to 22.1)
	With factor	8.9 (3.8 to 14.0)	19.0 (8.6 to 29.4)	10.2 (6.5 to 14.0)	8.2 (5.5 to 10.8)	12.57**	12.7 (8.0 to 17.4)
Financial reimbursement plus training and support plus e-BI	Without factor	11.8 (5.4 to 18.2)	16.3 (7.3 to 25.3)	12.8 (6.2 to 19.4)	12.0 (5.5 to 18.4)	3.60	13.5 (6.3 to 20.7)
	With factor	6.6 (4.1 to 9.1)	24.6 (12.2 to 37.1)	14.2 (8.6 to 19.7)	10.3 (6.7 to 13.9)	7.58**	16.9 (11.5 to 22.3)

[1] Estimated marginal means accounting for PHCU nested within country

[2] Contrast estimates found no differences in mean rates with and without the factor at baseline

[3] Type III tests with time as a fixed independent variable accounting for PHCU nested within country

[4] Calculated as the mean of the three 4-week blocks, with, in the case of missing data from any of the three blocks, the mean calculated from the blocks that contained data

* P<0.05; ** p<0.01; *** p<0.001 (accounting for PHCU nested within country)

- **Training and support plus e-BI**: The trend in drop-off of intervention rates with the combined factors during the 12-week implementation period was statistically significant, with most of the drop-off occurring between the first and second four-week blocks (Table 2).

PHCU that received training and support plus e-BI demonstrated a 48% (95% CI 2 to 113) higher 12-week intervention rate than PHCUs that did not receive training and support plus e-BI (Table 3). The combination of training and support plus e-BI led to a non-significant 28.6% (95% CI -54.8 to 12.6) lower intervention rate than training and support alone.

- **Financial reimbursement plus e-BI** The trend in drop-off of intervention rates with the combined factors during the 12-week implementation period was statistically significant, with most of the drop-off occurring between the first and second four-week blocks (Table 1). The combination of financial reimbursement and referral to e-BI was not associated with a higher intervention rate (the definition of intervention and advice included a referral to e-BI), Table 2.
- **Training and support plus financial reimbursement plus eBI**: The trend in drop-off of intervention rates with the combined factors during the 12-week implementation period was statistically significant, with most of the drop-off occurring between the first and second four-week blocks (Table 2). PHCU that received training and support plus financial reimbursement plus eBI demonstrated a 144% (95% CI 44 to 312) higher 12-week intervention rate than PHCUs that did not receive training and support plus financial reimbursement plus eBI (Table 3). The combination of training and support plus financial reimbursement plus eBI led to a non-significant 34.7% (95% CI -62.4 to 13.5) lower intervention rate than training and support plus financial reimbursement alone.
- **Providers and patients** Neither characteristics of the providers (profession, gender and age) nor characteristics of the patients (number of registered patients, adult consultation rate, age and gender of screened patients) influenced the findings.

Table 3 *Relative per cent difference[1] (95% CI) in 12-week implementation rates with factor as opposed to without factor (controlling for baseline rates and accounting for PHCU nested within country).*

Factor	Intervention rate	Screening rate	AUDIT-C positive rate	Advice rate
Training and support	68.6*** (29.9 to 118.6)	46.0** (12.0 to 90.3)	11.2 (-9.0 to 35.9)	31.1 (-16.0 to 104.5)
Financial reimbursement	125.3*** (73.2 to 193.0)	96.0*** (50.8 to 154.9)	-0.2 (-18.4 to 21.9)	21.4 (-22.2 to 89.6)
e-BI	-12.4 (-32.4 to 13.6)	-18.9 (-37.7 to 5.6)	13.6 (-6.9 to 38.5)	-9.5 (-42.0 to 41.2)
Training and support plus financial reimbursement	279.7*** (161.6 to 451.2)	186.2*** (97.6 to 314.7)	10.9 (-16.5 to 47.3)	59.2 (-14.8 to 197.5)
Training and support plus e-BI	47.7* (2.2 to 113.5)	18.4 (-18.9 to 72.9)	26.3 (-5.3 to 68.3)	18.6 (-37.3 to 124.5)
Financial reimbursement plus e-BI	44.4 (-8.3 to 127.5)	28.5 (-18.7 to 103.0)	5.0 (-25.1 to 47.1)	-7.3 (-56.6 to 98.1)
Financial reimbursement plus training and support plus e-BI	143.5** (43.8 to 312.2)	87.6* (10.0 to 219.9)	16.7 (-21.0 to 72.5)	21.5 (-49.2 to 190.6)

[1] As an example, for the intervention rate for the factor training and support, the 12-week rate was 68.6% higher (95% CI=29.9 to 118.6) with the factor (training and support) as opposed to without the factor (this is not the same as the factor increasing the baseline rate by 68.6%).

* P<0.05; ** p<0.01; *** p<0.001

3.4.4 Sustainability of findings at 6 month follow up

At the end of the 12-week implementation period, a six month gap ensued, during which no implementation strategies were delivered. After the six month no implementation period, a four week follow-up period took place. Eighteen of the 120 PHCUs failed to provide adequate data to calculate intervention rates during this 4-week follow-up period. For these 18 PHCUs, implementation rates during the 4-week follow-up period were set as the rates for the baseline measurement period (intention to treat). Excluding these 18 PHCUs with no data during the 6-month follow-up period did not change the results (per protocol).

Table 4 displays the mean intervention rates per PHCU without and with each of the factors, singly and in combination over the three measurement periods. The right hand columns contrast the intervention rate at 6-months follow-up with the intervention rate during the implementation period and during the baseline period. Table 5 displays the relative per cent difference (95% CI) in follow-up implementation rates with, as opposed to without factor, controlling for baseline rates. One column displays the rates for all 120 PHCU (intention to treat, with, for those 18 PHCUs without follow-up data, implementation rates during the 4-week follow-up period set as the rates for the baseline measurement period), and the other, the rates for the 102 PHCU that had follow-up data (per protocol).

- **Training and support**: the 6-month intervention rate in PHCU without training and support was not statistically different than the 12-week implementation rate, but significantly less than the baseline rate; in contrast, the 6-month rate in PHCU with training and support was statistically less than the 12-week implementation rate, but not significantly different from the baseline rate (Table 4). PHCU that received training and support demonstrated a 41% (95% CI 3 to 93) higher 6-month intervention rate than PHCUs that did not receive training and support (Table 5).
- **Financial reimbursement**: the 6-month intervention rate in PHCU without financial reimbursement was not statistically different than the 12-week implementation rate, but significantly less than the baseline rate; in contrast, the 6-month rate in PHCU with financial reimbursement was statistically less than the 12-week implementation rate, but not significantly different from the baseline rate (Table 4). Providing financial reimbursement during (and only during) the 12-week implementation period was not associated with a higher intervention rate at 6-month follow-up, Table 5.
- **E-BI**: the 6-month intervention rate in PHCU without e-BI was not statistically different than the 12-week implementation rate, but statistically less than the baseline rate; in contrast, the 6-month rate in PHCU with eBI was statistically less than both the 12-week implementation and the baseline rates (Table 4). Providing referral to e-BI was not associated with a higher intervention rate at 6-month follow-up, Table 5.
- **Training and support plus financial reimbursement**: the 6-month intervention rate in PHCU without training and support plus financial reimbursement was not statistically different than the 12-week implementation rate, but significantly less than the baseline rate; in contrast, the 6-month rate in PHCU with training and support plus financial reimbursement was statistically less than the 12-week implementation rate, but not significantly different from the baseline rate (Table 4). PHCU that received training and support plus financial reimbursement demonstrated an 80% (95% CI 15 to 182) higher 6-month intervention rate than PHCUs that did not receive training and support (Table 5). The combination of training and support plus financial reimbursement did not lead to higher intervention rates than either training and support (coefficient=0.20; 95%CI=-0.02 to 0.43) or financial reimbursement (coefficient=0.25; 95%CI=-0.006 to 0.51) alone.

- **Training and support plus e-BI**: the 6-month intervention rate in PHCU without training and support plus e-BI was statistically less than both the 12-week implementation and baseline rates; in contrast, the 6-month rate in PHCU with training and support plus eBI was not statistically different from either the 12-week implementation or the baseline rates (Table 4). Providing training and support plus referral to e-BI was not associated with a higher intervention rate at 6-month follow-up, Table 5.

Table 4 *Mean intervention rates[1] (‰ (95% CI)) per PHCU without and with each of the factors, singly and in combination over the measurement periods.*

Factor		Baseline	12-week implementation period	6 month follow-up	Comparing 6-month follow-up with 12-week implementation period; t-test; df; p value	Comparing 6-month follow-up with baseline; t-test; df; p value
Training and support	Without factor	12.1 (5.6-18.5)	10.3 (5.2-15.3)	7.5 (4.2-10.8)	-1.37; 0.17	-2.57*; 0.012
	With factor	10.2 (4.5-15.9)	17.5 (8.2-26.7)	9.0 (5.3-12.8)	-2.58*; 0.011	-0.45; 0.65
Financial reimbursement	Without factor	12.7 (5.3-20.0)	9.0 (4.9-13.2)	7.4 (3.9-10.8)	-1.05; 0.30	-3.25**; 0.002
	With factor	9.6 (5.0-14.3)	18.7 (7.8-29.7)	9.2 (5.5-12.9)	-2.87**; 0.005	-0.22; 0.82
e-BI	Without factor	11.6 (5.8-17.4)	16.6 (6.6-26.7)	9.0 (5.1-12.9)	-2.0*; 0.048	-1.15; 0.26
	With factor	10.7 (4.2-17.3)	11.1 (6.4-15.8)	7.6 (3.9-11.1)	-2.43*; 0.017	-2.39*; 0.03
Training and support plus financial reimbursement	Without factor	13.6 (5.9-21.3)	5.4 (1.1-9.8)	6.6 (3.5-9.7)	-1.76; .08	-3.02**; 0.003
	With factor	8.7 (4.5-12.9)	22.3 (8.8-35.8)	10.0 (6.1-13.9)	-2.64*; 0.011	0.77; 0.44
Training and support plus e-BI	Without factor	12.5 (6.4-18.6)	13.1 (5.4-20.7)	8.3 (4.0-12.5)	-2.36*; 0.020	-2.51*; 0.013
	With factor	9.8 (3.7-15.8)	14.7 (8.4-21.0)	8.3 (3.9-12.8)	-1.82; 0.075	-0.36; 0.72
Financial reimbursement plus e-BI	Without factor	12.8 (5.3-20.3)	8.5 (4.9-12.2)	6.7 (3.9-9.5)	-2.18*; 0.031	-2.08*; 0.039
	With factor	8.9 (3.8-14.0)	12.7 (8.0-17.4)	7.1 (3.8-10.3	-2.10*; 0.041	-0.75; 0.455
Financial reimbursement plus training and support plus e-BI	Without factor	13.7 (6.3-21.2)	4.9 (2.1-7.8)	5.9 (3.6-8.3)	-2.43*; 0.016	-2.62**; 0.009
	With factor	8.0 (3.3-12.6)	16.3 (9.2-23.3)	7.8 (3.6-12.1)	-1.79; 0.086	-1.06; 0.3

[1] Estimated marginal means accounting for PHCU nested within country

* P<0.05; ** p<0.01; *** p<0.001 (accounting for PHCU nested within country)

- **Financial reimbursement plus e-BI**: the 6-month intervention rate in PHCU without financial reimbursement plus e-BI was statistically less than both the 12-week implementation and

baseline rates; in contrast, the 6-month rate in PHCU with financial reimbursement plus eBI was statistically less than the 12-week implementation rate but not statistically different from the baseline rate (Table 4). Providing training and support plus referral to e-BI was not associated with a higher intervention rate at 6-month follow-up, Table 5.

- **Financial reimbursement plus training and support plus e-BI**: the 6-month intervention rate in PHCU without financial reimbursement plus training and support plus e-BI was statistically less than both the 12-week implementation and baseline rates; in contrast, the 6-month rate in PHCU with financial reimbursement plus training and support plus e-BI was not statistically different from either the 12-week implementation or the baseline rates (Table 4). Providing financial reimbursement plus training and support plus e-BI was not associated with a higher intervention rate at 6-month follow-up, Table 5.

Table 5 *Relative per cent difference[1] (95% CI) in 6-month intervention rates with factor as opposed to without factor (controlling for baseline rates and accounting for PHCU nested within country).*

	Intervention rates	
Factor	**Intention to treat[2]**	**Per protocol[3]**
Training and support	41.1* (3.0 to 93.3)	46.8* (3.5 to 108.1)
Financial reimbursement	27.4 (-7.3 to 75.0)	20.4 (-15.9 to 72.4)
e-BI	-7.0 (-32.1 to 27.3)	-10.2 (-36.7 to 27.3)
Training and support plus financial reimbursement	79.8* (14.6 to 182.1)	76.8* (7.7 to 190.1)
Training and support plus e-BI	31.2 (-16.0 to 104.9	31.8 (-20.1 to 117.3)
Financial reimbursement plus e-BI	-12.4 (-49.4 to 51.8)	-11.7 (-51.4 to 60.3)
Financial reimbursement plus training and support plus e-BI	23.7 (-34.6 to 133.8)	29.6 (-35.1 to 158.8)

[1] As an example, for the intervention rate for the factor training and support, the 12-week rate was 41.1% higher (95% CI=3.0 to 93.3) with the factor (training and support) as opposed to without the factor (this is not the same as the factor increasing the baseline rate by 41.16%).
[2]Rates for all 120 PHCU, with, for those 18 PHCUs without follow-up data, implementation rates during the 4-week follow-up period set as the rates for the baseline measurement period.
[3]Rates for the 102 PHCU that had follow-up data.
* P<0.05; ** p<0.01; *** p<0.001

3.4.5 Cost-effectiveness of implementation strategies

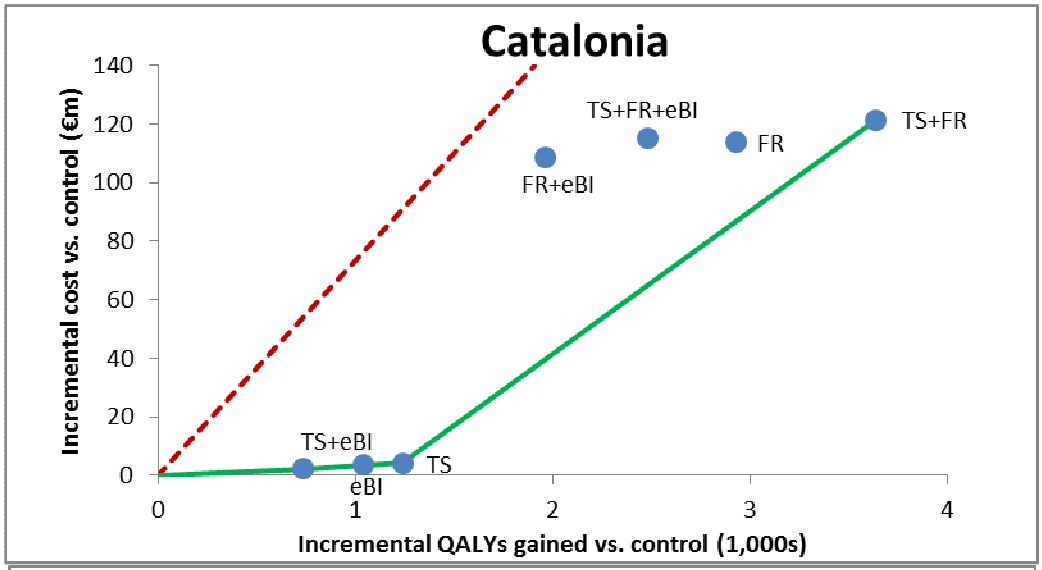
An incremental analysis comparing all strategies to the control arm (i.e., business as usual) in the trial shows that training and support combined with financial reimbursement (TS+FR) is the most cost-effective strategy in Catalonia, England, Poland and Sweden, whilst in the Netherlands the incremental cost-effectiveness ratio (ICER) compared to the next-best option (TS alone) is above the maximum threshold for cost-effectiveness, and therefore TS is the most cost-effective strategy in the Netherlands, Figure 9[22].

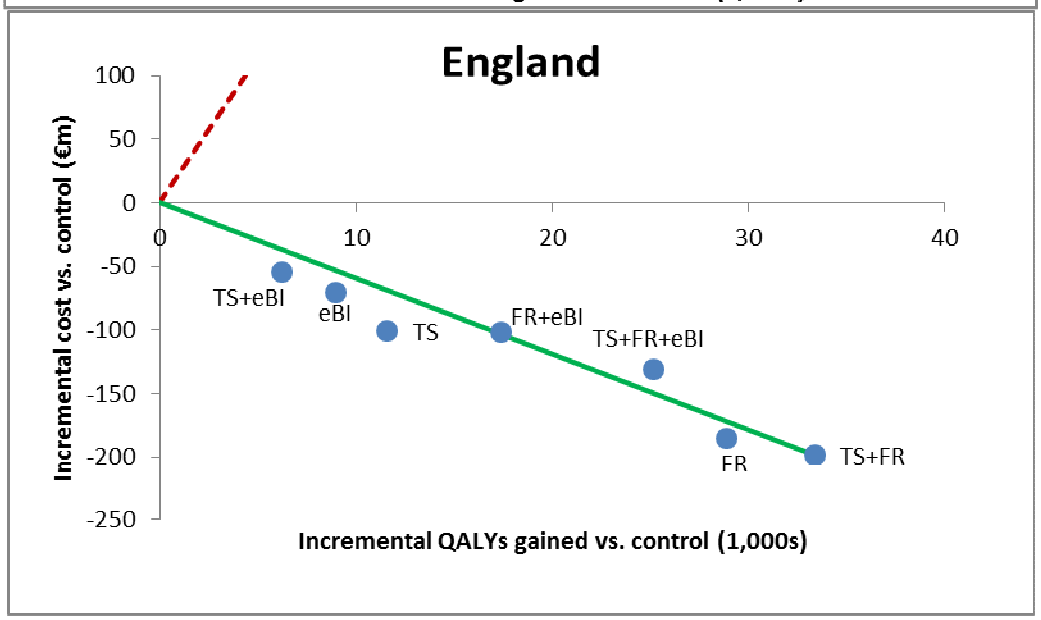
22 Angus C, Li J, Parrott S and Brennan A. (2015) Cost-Effectiveness – Analysis of the WP5 Trial. Addendum to Deliverable D3.1, Work Package 3. *ODHIN Project*. To be published online: http://www.odhinproject.eu/resources/documents/doc_download/119-addendum-to-d3-1-cost-effectiveness-analysis-of-the-wp5-trial.html.

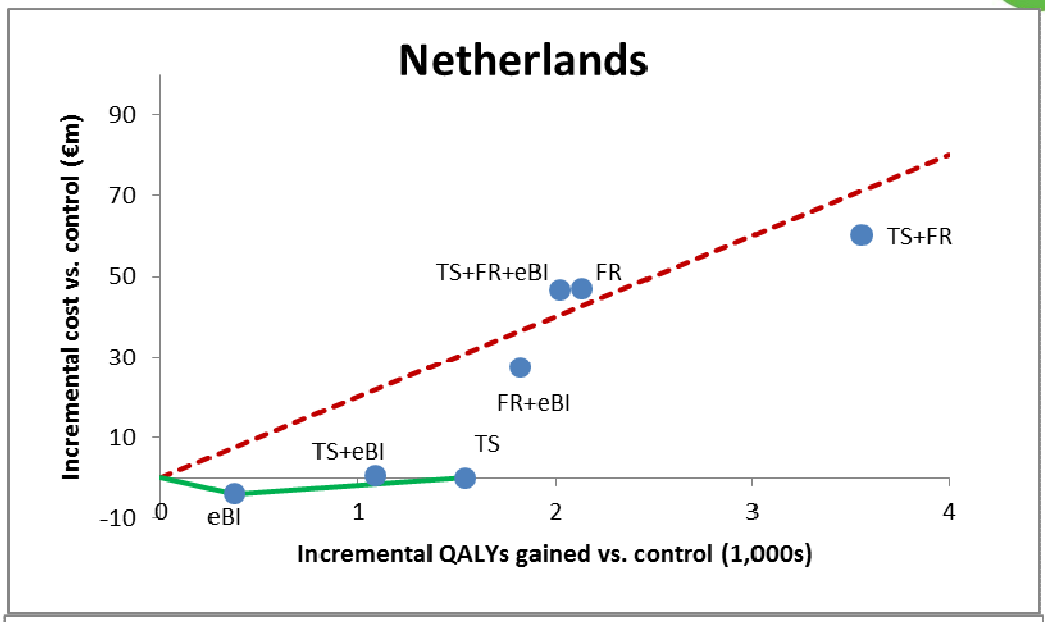
TS+FR is estimated to be cost-saving and health improving in England. TS+FR also has a low ICER of €4,632/QALY in Poland (vs. the next best option of TS alone). TS+FR also has a low ICER of €6,522/QALY (vs. control) in Sweden. In Catalonia the ICER versus the next most cost-effective option (TS alone) is considerably higher at €48,954/QALY, although this is still likely to be considered cost-effective. In the Netherlands where TS is the most cost-effective option, the TS strategy has an ICER of €3,386 compared to the next best option of eBI referral.

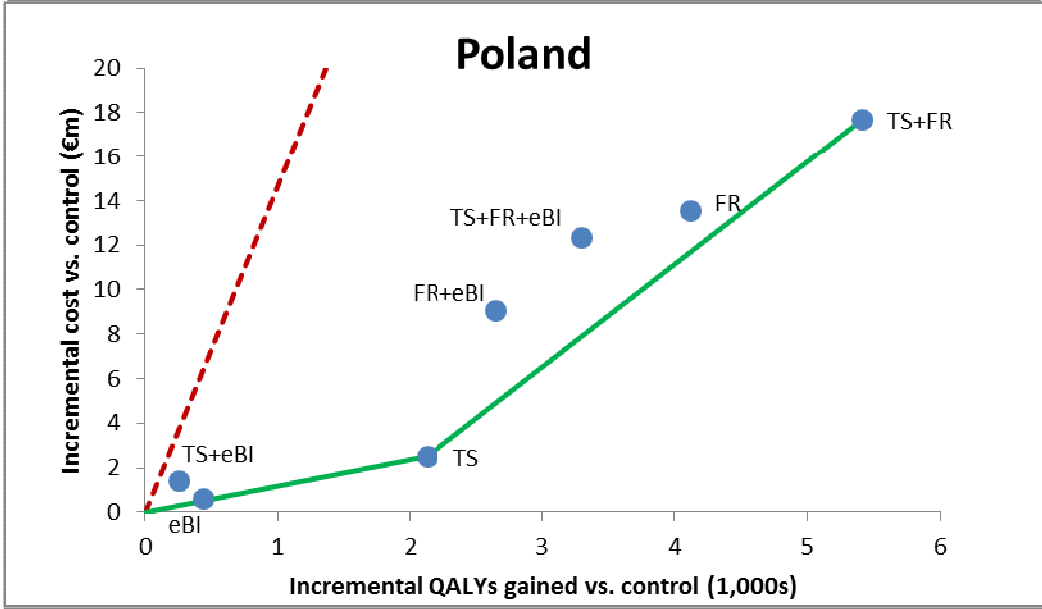
Figure 9 *- Cost-effectiveness diagrams for all strategies in all countries.*

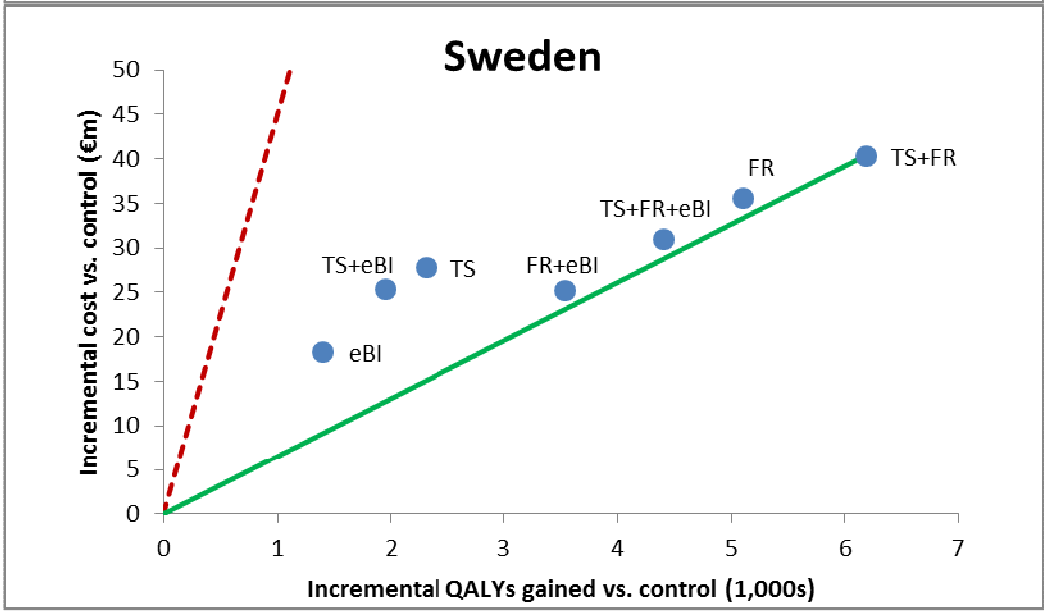
Green lines represent the 'expansion path' – the set of cost-effective strategies ranked in increasing order of effectiveness. Dashed red lines represent the cost-effectiveness threshold for each country – the maximum amount that the country is willing to pay for additional gains in health-related quality of life.






Netherlands
Incremental cost vs. control (€m)
90
70
50
30
10
-10
0
1
2
3
4
TS+FR
TS+FR+eBI
FR
FR+eBI
TS+eBI
TS
eBI
Incremental QALYs gained vs. control (1,000s)

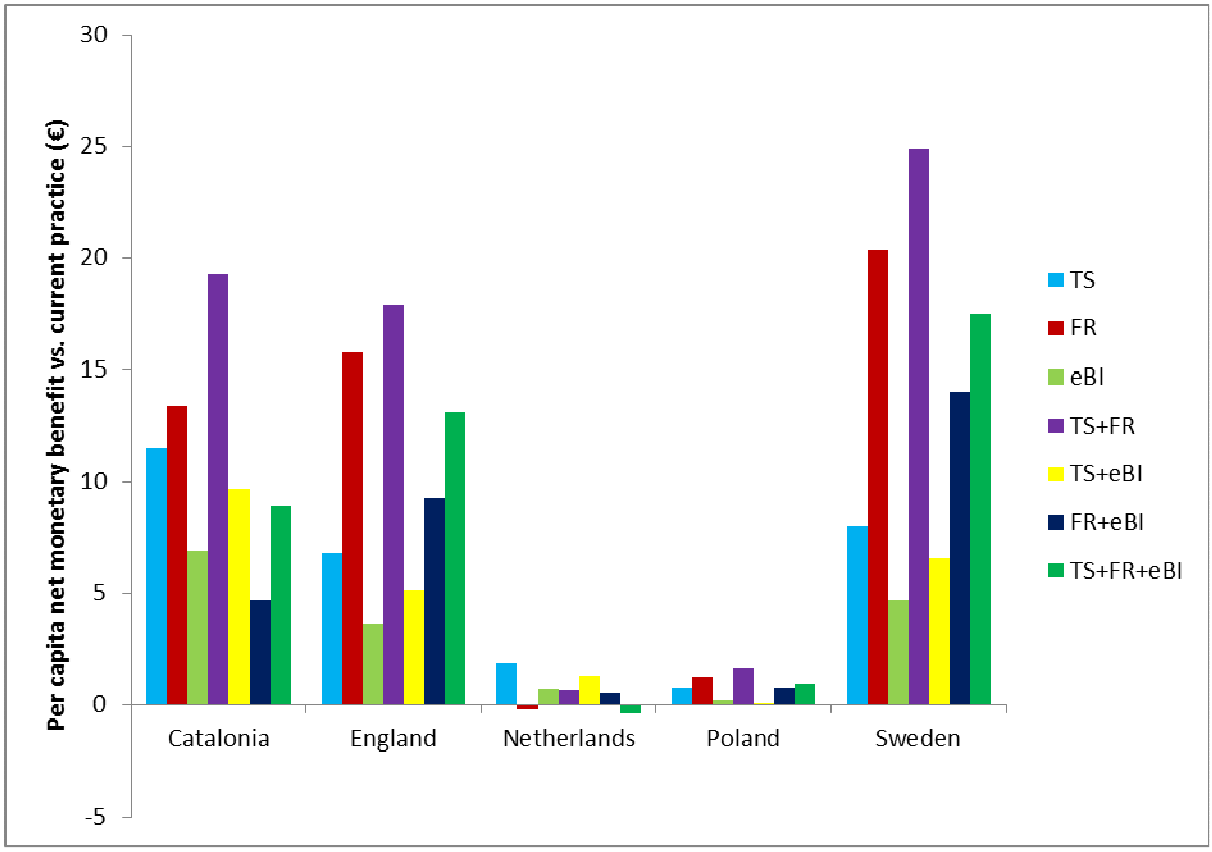

Poland
Incremental cost vs. control (€m)
20
18
16
14
12
10
8
6
4
2
0
0
1
2
3
4
5
6
TS+FR
FR
TS+FR+eBI
FR+eBI
TS+eBI
TS
eBI
Incremental QALYs gained vs. control (1,000s)


Sweden
Incremental cost vs. control (€m)
50
45
40
35
30
25
20
15
10
5
0
0
1
2
3
4
5
6
7
TS+FR
FR
TS+FR+eBI
TS+eBI
TS
FR+eBI
eBI
Incremental QALYs gained vs. control (1,000s)

Across the five countries, whilst the details of the results differ, the broad patterns remain the same. TS+FR is amongst the most expensive strategies to implement (costing in excess of €100m over 10 years in Catalonia and England) but produces the greatest cost savings to healthcare services (e.g. €398m over 30 years in England) and the greatest corresponding health benefits (e.g. 5,480 QALYs over 30 years in Poland). This pattern is illustrated in Figure 10 which shows the per capita net benefit of each strategy over the 30 year time horizon of the model. For example, implementation of TS+FR is estimated to benefit Sweden by the equivalent of €24.90 for every adult over 30 years.

There is substantial variation between countries in terms of the estimated scale and impact of the various strategies. This variation is driven by a huge range of underlying differences between the five countries, in terms of alcohol consumption (both mean levels of consumption and patterns of drinking), frequency of primary care consultations (which is over twice as high on average in the Netherlands as in Sweden, for example), rates of alcohol-related harm and the healthcare costs of treatment and practitioners' time as well as substantial differences in SBI delivery measures at baseline. For example, Catalonia has a markedly lower screen positive rate than the other four countries, while Poland has the lowest screening rate, but the highest conversion rate from positive screens to brief interventions delivered. These differences interact with the different impact of the 8 strategies on each of the three outcomes measures, leading to different changes in population alcohol consumption and consequent changes in alcohol-related hospitalisation and mortality rates and associated healthcare costs. In spite of this heterogeneity, the analysis shows a clear picture across all five countries, suggesting that the conclusions are likely to be applicable to other countries with their own unique drinking and primary care contexts.

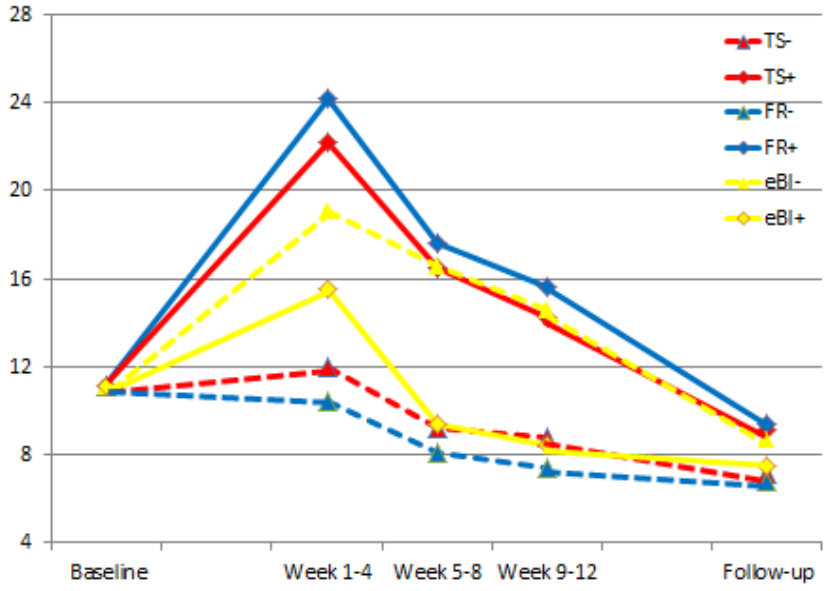
Figure 10 *- Net Monetary Benefit per capita of all strategies vs. current practice*



3.4.6 Conclusions

During a 4-week baseline measurement period, the mean intervention rate was 11.1 per 1,000 adult consultations per PHCU. An AUDIT-C cut-off score of 5 is equivalent to a consumption level of 20 grams of alcohol per day (Rubinsky et al.2013). Amongst EU citizens aged 15-64 years, 230/1,000 women regularly drink 20 grams of alcohol or more per day and 300/1, 000 men regularly drink 40 grams of alcohol or more per day (Rehm et al. 2012). Of those screened in the ODHIN study, 330/1000 were AUDIT-C positive (≥5 in Catalonia and England and ≥5 for men ≥4 for women in Poland, Netherlands and Sweden); given that there was no evidence for selective screening by providers, this suggests that only some 3% of those who might benefit from brief advice were receiving it. The ODHIN trial demonstrates that providing training and support to PHCU providers is associated with higher intervention rates, an effect still present at least six months after the training and support sessions, Figures 11 and 12. Given the modesty of training and support (less than 4 hours face-to face training), it would be expedient to offer training and support in screening and brief advice programmes for heavy drinking to all PHCU providers.

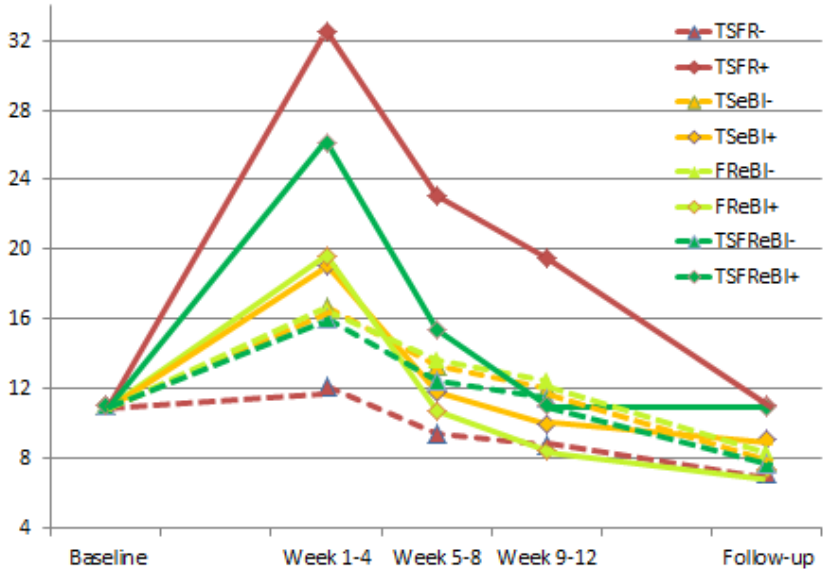
Figure 11 *Mean intervention rates for heavy drinking per 1,000 adult consultations with and without training and support (TS), financial reimbursement (FR) and opportunity to refer identified patients to internet-based advice (eBI) over the 12-week implementation period (weeks 1-12) and at the follow-up period, which occurred six months after the implementation period was completed.*



The ODHIN trial also demonstrates that providing financial reimbursement for screening and advice activity is associated with higher intervention rates for the duration of financial reimbursement. When financial reimbursement is withdrawn, intervention rates drop to their baseline rates. Further, the combination of training and support plus financial reimbursement resulted in higher intervention rates than either training and support or financial reimbursement alone, at least for the duration of financial reimbursement. Thus, it might be expedient to consider implementing and testing a financial reimbursement programme to increase the volume of screening and brief advice activity. If financial reimbursement is to be introduced, it would be expedient to always do this in combination with training and support.

The combined provision of training and support and financial reimbursement is highly cost effective in leading to improved health outcomes in four out of the five jurisdictions studied, and, in three out of five jurisdictions studied, would lead to large resource savings (approximately €20 per adult over a 30 year time frame).

Figure 12 *Mean intervention rates for heavy drinking per 1,000 adult consultations with and without combinations of the interventions over the 12-week implementation period (weeks 1-12) and at the follow-up period, which occurred six months after the implementation period was completed.*



There is little doubt that internet based screening and brief advice programmes have an impact in reducing alcohol consumption amongst those drinkers who use them. The ODHIN trial included the option of referral to an e-BI programme as one of the implementation strategies in the belief that this might encourage high screening rates, as providers did not then have to deliver a brief advice themselves. The failure of this strategy to impact on any of the rates would suggest that providers in this study are not yet ready to refer patients to e-BI programmes. It is not known if this is due the fact that providers do not regard e-BI programmes as effective, if more training was needed, or if they found the referral process too complicated, and thus did not want to engage with it.

3.5 Assessing programme implementation (ODHIN WP6)

The ODHIN "assessment tool" has been completed by 23 European countries[23]. The tool includes 24 questions distributed on the management of hazardous and harmful alcohol consumption (HHAC) across 7 key domains. The main findings for each of these domains are summarised in the following sections[24].

3.5.1 Presence of a country coalition or partnership

In 2012, most countries (78.3%) had a country and/or regional coalition for the management of HHAC.

23 Catalonia-Spain, Czech Republic, Italy, Portugal, Slovenia, England-UK, Poland, Sweden and the Netherlands, Belgium, Cyprus, Croatia, Estonia, Germany, Latvia, Malta, Switzerland, Greece, Finland, Ireland, Iceland, Romania, and FYROM -Ex Macedonia.

24 Gandin C & Scafato E (2013) ODHIN assessment tool – Report: A description of the available services for the management of hazardous and harmful alcohol consumption. Deliverable 6.1. *The ODHIN Consortium.* 2013 (published online: http://www.odhinproject.eu/resources/documents/doc_download/70-deliverable-6-1-assessment-tool-report.html)

3.5.2 Community action and media education

Implemented media education campaigns on alcohol consumption were not widely available, or not reported. The most common available education campaigns were reported on the website followed by newspaper/magazines and radio, and they were generally fully publicly funded and implemented at country level.

3.5.3 Health care services and infrastructure for harmful / hazardous alcohol use management

3.5.3.1 Integrated health care system

According to personal opinions, in most countries, the integration of the management of HHAC in PHC is quite low with great differences between countries. Only 48% of the countries (11 out of 23) scored the integration of the management of HHAC in the PHC system over 5.4 points (mid-point in a scale from 0- no integrated, to 10- fully integrated).

3.5.3.2 Structures for quality of care

Most countries had formal governmental organizations in charge for monitoring health outcomes at the population level for HHAC (78%), for reviewing the safety of pharmacological treatments for managing alcohol dependence (68%) and for providing information on managing HHAC to health care providers (64%). About half of the countries had structures in charge of monitoring the quality of care provided for managing HHAC (57%) and for preparing clinical guidelines (57%). The structures for reviewing the cost effectiveness of interventions for managing HHAC were available in England, Finland, Portugal, Sweden and The Netherlands (23%).

3.5.3.3 Research and knowledge for health

Nearly half the countries had a formal research programme for managing HHAC with specifically allocated funding (44%) during the last 10 years, at least in part, from governmental organizations. There was a lack of formal education on managing HHAC for health care professionals in all the educational levels (particularly for pharmacists and dentists), with great differences among countries. There was a tendency for most professionals (but not for dentists, obstetricians and pharmacists) to have more formal education on the managing of HHAC in the curriculum of postgraduate and continuing professional training compared to the undergraduate curriculum.

3.5.3.4 Health care policies and strategies for dissemination and implementation of the management of HHAC

In 2012, an official written policy on managing HHAC was reported in 83% of countries, mostly as a part of a more general alcohol policy strategy. In the countries where such a policy existed, an intensive support for managing alcohol dependence in specialised treatment facilities was included in all countries, a strategy on training for health professionals in 74%, a strategy to support interventions in primary care in 68%, while a national funded research strategy was included only in nearly half of the policies. In most countries (83%) there was government funding for services for the management of HHAC, usually reviewed from time to time. In almost none of the countries (but not for Switzerland) a proportion of alcohol taxes was specifically earmarked or allocated to fund the costs of services for managing HHAC.

3.5.4 Support for treatment provision

3.5.4.1 Screening, quality assessment, referral and follow-up systems

In 57% of countries, screening instruments to identify risky drinkers were considered available and scored an average of 6.4 points (in a scale from 0 to 10), while only in 30%, a follow up system for monitoring and advice patients was considered available and scored an average of 4.1 points.

3.5.4.2 Protocols and guidelines

Nearly three out of every four countries had already developed, or were developing, multidisciplinary guidelines for managing HHAC (74%). The majority were standalone guidelines as opposed to a part of other clinical guidelines. However, there was a great lack of studies about their adherence and implementation.

3.5.4.3 Reimbursement for health care providers

The most common practice was reimbursement as a part of their normal salary as opposed to "within terms of service".

3.5.4.5 Protocol, policies and training for professionals

In most countries, there were specialized guidelines or protocols for managing HHAC for addiction specialists (82%), general practitioners (65%), psychiatrists (59%), doctors in hospital (55%) and psychologists (50%). Training for managing HHAC within professional vocational training was available in most countries and for different professionals (still uncommon for obstetricians, pharmacists and dentists). The availability of training for managing HHAC within accredited continuing medical education was inferior to the training for managing HHAC within professional vocational training for the majority of the professionals.

3.5.5 Intervention and treatment: availability and accessibility

Patient help for HHAC was considered accessible mainly in addition services, followed by specialist clinics, in general/family practice, in hospital clinics and to a lesser extent, with the lowest percentage, in pharmacies.

3.5.6 Health care providers

3.5.6.1 Clinical accountability

Participants considered that advice for HHAC was part of the routine clinical practice for addiction specialists and psychiatrists, but not for pharmacists and dentists.

3.5.6.2 Treatment provision

Regarding treatment provision in PHC, there are many studies on patients screened about alcohol consumption (in 74% of countries) followed by studies on the use of AUDIT questionnaire, on the attitudes of health care providers in managing HHAC, and on patients with HHAC given advice and on (52%, 50% and 50% respectively), on increasing the involvement of health care providers in managing HHAC (45%), on the effectiveness of interventions for HHAC (37%) and on practice protocols and guidelines followed (28%). Few studies, survey or publications had been carried out on whether advice met quality criteria (16%) and on the cost-effectiveness of interventions for HHAC (11%).

3.5.7 Health care users: knowledge and help seeking behaviour

Studies on people's knowledge that HHAC can be dangerous to their health were mentioned in 38% of countries, while studies on people's knowledge about effective methods to reduce HHAC were not available.

3.5.8 Conclusions

The ODHIN assessment tool has demonstrated to be useful for:

- providing a baseline description of available services and infrastructures for managing hazardous and harmful alcohol consumption, identifying areas where services may require development or strengthening;
- providing a general view on the existing gaps or areas that need further work and strengthening;

- providing a mechanism for future monitoring services provision over time;
- promoting sharing of information and examples of practice; and
- enhancing partnerships and/or national/regional coalition to reach a consensus on a shared view on services for managing hazardous and harmful alcohol consumption.

Nonetheless, some points need further development to increase the validity and the comparability of the results. Since, within countries the knowledge of the available services can vary according to the respondents completing the questionnaire, it could be recommended the setting of a core panel of representatives from the different professional areas that should contribute in a much more comprehensive way to the assessment tool fulfillment. The creation of a formal and stable panel of experts within countries would facilitate reaching best fitting and grounded consensus on those questions that cannot be supported by objective indicators.

The ODHIN assessment tool shows that, in 2012, IBI is still not the norm in daily consultation in PHC and that more resources are needed to overcome the main obstacles. The tool suggests to integrate HHAC management in national and regional health systems:

- the integration of the management of HHAC in the health care system assuring that treatment is offered to those that need it, hopefully widening the availability of existing treatments;
- the implementation of a communication and information strategy about health and social alcohol impact, including a major effort to provide a formal, mandatory continuing training and medical education aimed at integrating IBI in the daily practice of health professionals in the PHC settings with public allocated funding;
- formal educational programs on managing HHAC for health care professionals, being the training levels low in most of the countries and not available for some professionals;
- the availability of a well identified national health plan on alcohol aimed at prevention of alcohol use disorders and alcohol dependence and of a research funded strategy and/or formal research programs on HHAC with targeted allocated funded activities included in a written policies;
- the availability of guidelines and protocols for health professionals for different target groups and settings;
- studies on the adherence and implementation of the clinical guidelines for managing HHAC;
- tools and structures for reviewing the cost effectiveness of interventions for managing HHAC mainly focused in monitoring health care users needs and what health care providers are delivering;
- specific studies to check the quality of the advice and the cost-effectiveness of interventions for HHAC integrated by yearly evaluation surveys and reports on the activities by health care providers aimed at collecting information about the management of HHAC and on the evaluation of the health professionals who receive specific training on HHAC management;
- dissemination of available sources of knowledge, research results and information to health care providers together with the provision of materials and incentive measures aimed at ensuring that prevention, IBI is implemented in PHC and supported by specialist services according to a real networking of the available services and competencies.

4. The potential impact of the ODHIN project, with main dissemination activities and exploitation of results

4.1 Potential impact

Alcohol is a cause of more than 200 diseases and conditions[25], most of which present in primary health care – thus primary health care providers cannot avoid dealing with alcohol in routine clinical practice.

Alcohol increases the risk of dying before the age of 70 years in a more or less dose response relationship[26]. At an intake of 20 grams of alcohol a day (similar to two standard drinks), 1 in 100 people will die before the age of 70 years due their alcohol consumption. Beyond 30 grams of alcohol a day, men are more likely to die than women for any given level of alcohol consumption. Reducing alcohol consumption reduces the subsequent risk of an alcohol caused death.

Brief advice from a primary health care provider is effective in reducing heavy drinking (an average reduction of 38 grams of alcohol per week over and above control conditions from a pre-advice level of 313 grams per week - a 12% reduction)[27].

ODHIN's WP3 has found that screening and delivering brief advice to patients presenting hazardous or harmful alcohol consumption in primary health care settings is cost-effective when delivered both at next consultation and at next patient registration[28]. When delivered at next patient registration, screening and brief advice is, in some jurisdictions, cost-saving.

However, despite the health burden of alcohol and the evidence for effectiveness and cost-effectiveness of IBI for HHAC programmes in PHC, ODHIN's WP5 has found that IBI for heavy drinking is rarely delivered. In the five European jurisdictions participating in ODHIN's trial, only 11 per thousand adult patients who consulted their primary health care doctor were given brief advice for heavy drinking, an estimated 1 in 30 of those who could have benefited from such advice[29].

Moreover, health systems across Europe, in general, lack the infrastructures to support this kind of delivery of screening and brief advice programmes, with less than half of 23 European countries considering that screening and brief advice programmes were integrated to at least some extent,

25 World Health Organization (2014). *Global status report on alcohol and health 2014*. Geneva: World Health Organization.

26 Rehm, J., Lachenmeier, DW, Room R. (2014) Acceptable risk? Why does society accept a higher risk for alcohol than for other voluntary or involuntary risks? *BMC Medicine* 2014. http://www.biomedcentral.com/1741-7015/12/189. Accessed 12 November 2014.

27 O'Donnell, A., Anderson, P., Newbury-Birch, D., Schulte, B., Schmidt, C., Reimer, J. & Kaner, E. (2014) The Impact of Brief Alcohol Interventions in Primary Healthcare: A Systematic Review of Reviews. *Alcohol and Alcoholism* doi: 10.1093/alcalc/agt170

28 Angus C, Scafato E, Ghirini S et al (2013) Cost-effectiveness-Model report. Deliverable 3.1. *The ODHIN Consortium.* 2013 (published online: http://www.odhinproject.eu/resources/documents/doc_download/66-deliverable-3-1-cost-effectiveness-model-report.html)

29 The ODHIN TRIAL Consortium (2014) Implementation science: a scientific report describing the methods, results and conclusions of the ODHIN randomized controlled trial. Deliverable 5.2. *The ODHIN Consortium.* 2015 (published online: http://www.odhinproject.eu/resources/documents/doc_download/118-deliverable-5-2-implementation-science.html)

and hardly any countries able to provide routine data on the extent to which screening and brief advice programmes were actually delivered in primary health care.[30]

The ODHIN project has identified specific opportunities for European health care systems:

- Providing training and support to primary health care providers. Were such an option to be implemented, this would lead to increased screening and brief advice rates both in the short and medium term. Primary health care physicians who report more education on alcohol report that they manage more patients with heavy drinking. A systematic review of 29 published studies found that education programmes increased the likelihood of delivering screening and brief advice programmes. The ODHIN study found that providers who received between two to four hours of education advised over two-thirds more patients than providers who did not receive training and support during the 12-week period in which the training and support programme was delivered. Six to seven months after the training programme, trained providers were still advising two-fifths more patients than non-trained providers.
- Providing financial reimbursement to primary health care providers. If this strategy was adopted, an almost immediate increase of screening and brief advice rates is expected to occur. The ODHIN study found that providers who received modest financial reimbursement advised more than double the number of patients than providers who did not receive financial reimbursement, an effect that only lasted for the duration of the reimbursement. Combining training and support with financial reimbursement trebled the number of patients advised - although the effect did not last, once the financial reimbursement ceased.
- Implementing a combination of training and support with financial reimbursement for improved IBI for HHAC. Although this strategy can be expensive in comparison to providing training and support or financial reimbursement alone, substantial net financial benefits for health care systems can be obtained in the long term. In Catalonia, England and Sweden, for example, the implementation of training and support with financial reimbursement saves the equivalent of some €20 for every adult over a 30 period.

It is possible to estimate the impact, cost and cost-effectiveness of implementing brief advice programmes, compared with other measures, as has been done for reducing disability adjusted life years (DALYs) in European Union countries, Table 6[31]. Were 30% of the at risk heavy drinking population given brief advice, each year, 672 DALYs per million persons would be averted in Eur-A countries, 365 in Eur-B countries and 667 in Eur-C countries (for list of countries, see footnote to Table 6). Whilst the number of DALYs saved is less than what could be achieved through tax increases, the number, nevertheless, compares favourably with other policy options, including restricting retail outlets and banning advertising.

Given that three-fifths of all alcohol-related deaths occur in people who are heavy drinkers or alcohol dependent, it is also possible to model the impact of treatment in reducing alcohol related deaths and this has been done for men and women in Figures 13 and 14[32]. Assuming that 40% of people with alcohol dependence are treated, the model estimates that about 10,000 male deaths

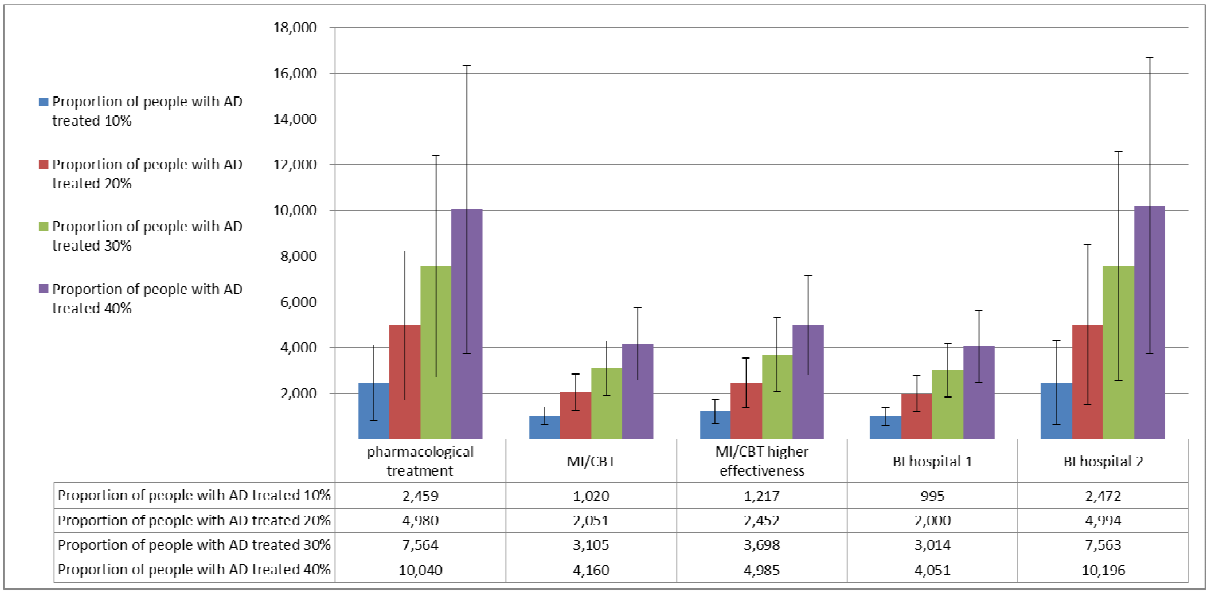
30 Gandin C & Scafato E (2013) ODHIN assessment tool – Report: A description of the available services for the management of hazardous and harmful alcohol consumption. Deliverable 6.1. *The ODHIN Consortium.* 2013 (published online: http://www.odhinproject.eu/resources/documents/doc_download/70-deliverable-6-1-assessment-tool-report.html)

31 Anderson P & Møller L. Overview of effectiveness and cost-effectiveness. In Anderson, P., Møller, L. & Galea, G. (Eds.) Alcohol in the European Union. Copenhagen, Denmark: World Health Organization, 2012.

32 Rehm J, Shield KD, Rehm MX, Gmel G & Frick U.Alcohol consumption, alcohol dependence, and attributable burden of disease in Europe: potential gains from effective interventions for alcohol dependence. Toronto, Canada: Centre for Addiction and Mental Health, 2012.

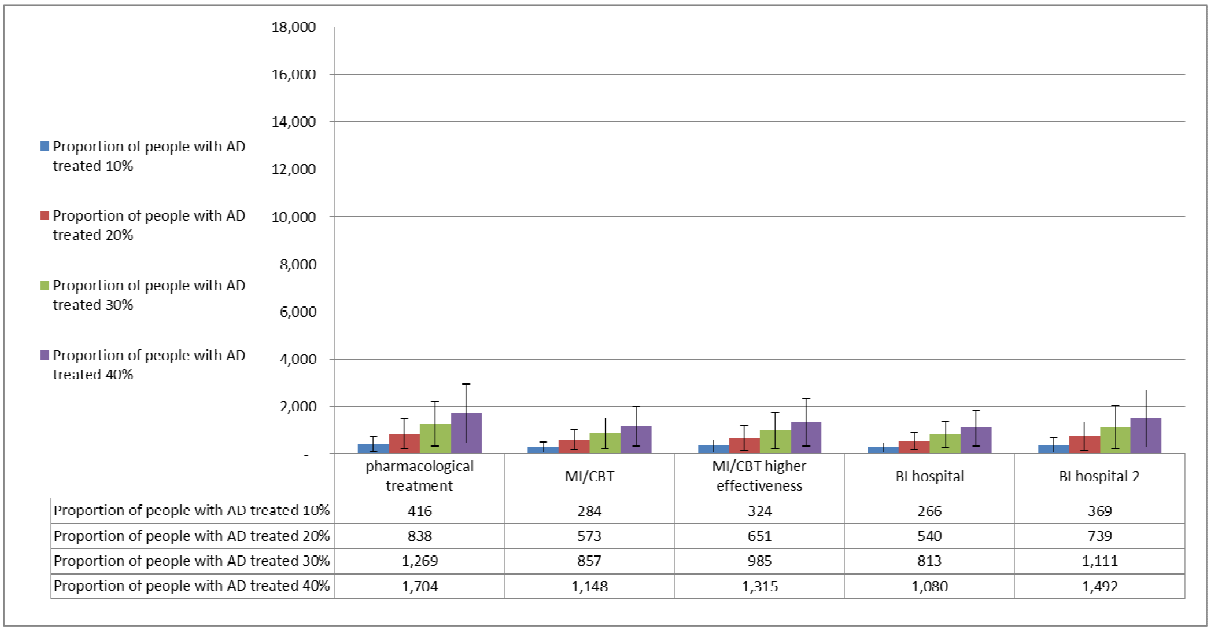
could be avoided with pharmacological treatment, and more than 1,700 female deaths. The difference between the sexes is due to more men being dependent on alcohol than women and the all-cause mortality rate of women being lower than that of men. Brief interventions for heavy drinkers who are also acute-care hospital patients (BI hospital 2) yield almost the same number of deaths avoided, whereas the other two treatments are associated with a considerably smaller numbers of deaths avoided.

Figure 13 *Male deaths avoided over the course of a year in the EU in the age range 15-64 years due to treatment for alcohol use disorders*



	pharmacological treatment	MI/CBT	MI/CBT higher effectiveness	BI hospital 1	BI hospital 2
Proportion of people with AD treated 10%	2,459	1,020	1,217	995	2,472
Proportion of people with AD treated 20%	4,980	2,051	2,452	2,000	4,994
Proportion of people with AD treated 30%	7,564	3,105	3,698	3,014	7,563
Proportion of people with AD treated 40%	10,040	4,160	4,985	4,051	10,196

Figure 14 *Female deaths avoided over the course of a year in the EU in the age range 15-64 years due to treatment for alcohol use disorders*



	pharmacological treatment	MI/CBT	MI/CBT higher effectiveness	BI hospital	BI hospital 2
Proportion of people with AD treated 10%	416	284	324	266	369
Proportion of people with AD treated 20%	838	573	651	540	739
Proportion of people with AD treated 30%	1,269	857	985	813	1,111
Proportion of people with AD treated 40%	1,704	1,148	1,315	1,080	1,492

Table 6 *Costs, impact and cost–effectiveness of different policy options in three subregions of the WHO European Region*

Target area Specific intervention(s)	Coverage (%)	*Eur-A*[a]			*Eur-B*[b]			*Eur-C*[c]		
		Annual cost per million persons (I$ million)[d]	Annual effect per million persons (DALYs saved)	I$ per DALY saved[e]	Annual cost per million persons (I$ million)[d]	Effect per million persons per year (DALYs saved)	I$ per DALY saved[e]	Annual cost per million persons (I$ millions)[d]	Effect per million persons per year (DALYs saved)	I$ per DALY saved[e]
Awareness-raising and political commitment										
School-based education	80	0.84	–	N/A*	0.70	–	N/A*	0.34	–	N/A*
Health sector response										
Brief interventions for heavy drinkers	30	4.20	672	6256	0.77	365	2100	1.78	667	2671
Community action										
Mass media campaigns	80	0.83	–	N/A*	0.95	–	N/A*	0.79	–	N/A*
Drink–driving policies and countermeasures										
Drink–driving legislation and enforcement (via random breath-testing campaigns)	80	0.77	204	3762	0.74	160	4625	0.72	917	781
Availability of alcohol										
Reduced access to retail outlets	80	0.78	316	2475	0.56	414	1360	0.47	828	567
Marketing of alcoholic beverages										
Comprehensive advertising ban	95	0.78	351	2226	0.56	224	2509	0.47	488	961
Pricing policies										
Increased excise taxation by 20%	95	1.09	2301	472	0.92	726	1272	0.67	1759	380
Increased excise taxation by 50%	95	1.09	2692	404	0.92	852	1083	0.67	1995	335
Tax enforcement, 20% less unrecorded	95	1.94	2069	939	1.26	706	1780	0.87	1741	498
Tax enforcement, 50% less unrecorded	95	2.21	2137	1034	1.34	790	1692	0.93	1934	480

* Not available.

[a] *Eur-A (very low adult mortality and very low child mortality):* Andorra, Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Malta, Monaco, Netherlands, Norway, Portugal, San Marino, Slovenia, Spain, Sweden, Switzerland, United Kingdom.

[b] *Eur-B (low adult mortality and low child mortality):* Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Georgia, Kyrgyzstan, Montenegro, Poland, Romania, Serbia, Slovakia, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Uzbekistan.

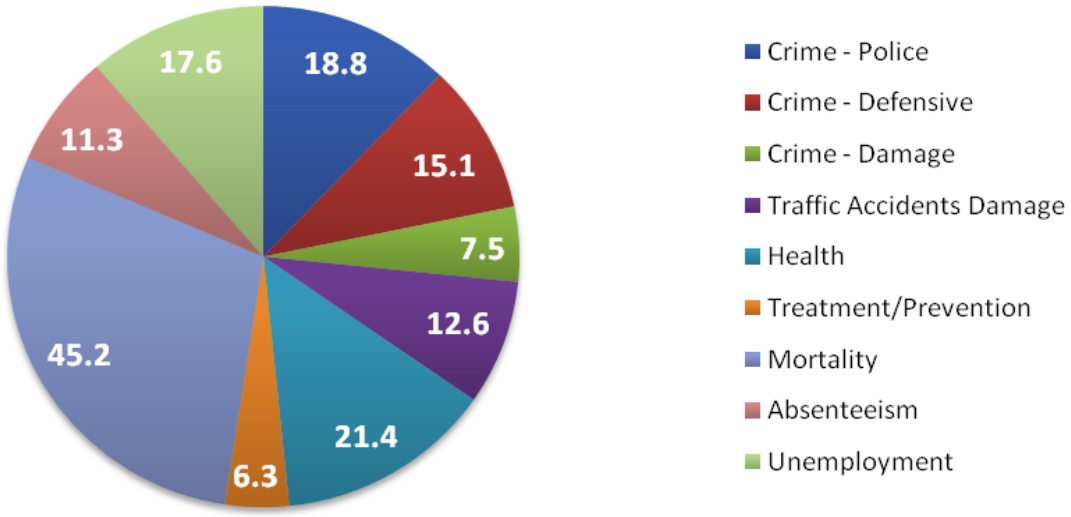
[c] *Eur-C (high adult mortality and low child mortality):* Belarus, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Ukraine.

[d] Implementation cost in 2005 international dollars (I$).

[e] Cost–effectiveness ratio, expressed in terms of international dollars per DALY saved.

But, of course, it is not just health that alcohol impacts on, but also on other areas of individual and societal well-being. As an intoxicant, alcohol impairs personal security and is a causal factor in harm to people other than the drinker, including interpersonal violence, suicide, homicide, crime and drink-driving fatalities, and a casual factor for risky sexual behaviour, sexually transmitted diseases and HIV infection. There is also evidence, although not from all studies that drinking, and in particular heavy drinking, can impair educational attainment and human capital formation, employability and productivity at work. These other harms can be summarized in social costs estimates, as is done in Figure 15 below in €billion, with alcohol costing the EU some €156 billion in the year 2010[33].

Figure 15 *Social costs of alcohol in the European Union, 2010*



Of course, not all of these costs can be averted, but there is evidence that implementation of alcohol policy can lead to reductions in social costs, can improve productivity, and, with tax increases, can generate increased revenue for countries, outcomes sorely needed in times of economic recession.

The ODHIN project has thus expanded the knowledge base on effective and cost-effectiveness of IBI measures, and translated these scientific findings into easily understandable conclusions and guidance for the future implementation of IBI in primary health care settings. ODHIN's findings support an uptake of IBI for heavy drinking in European countries, which, from a societal perspective, would contribute to optimising public health expenditure due to the proven cost-effectiveness of these programmes. Governments can support identification and brief advice programmes in primary health care settings by ensuring: that clinical guidelines for these interventions are widely available; that providers receive the training, the materials and the advice they need to set up such programmes; and that they are adequately reimbursed for the interventions. Primary health care providers find it easier to undertake these interventions when supported by specialist services, with the transition from primary to specialist care seamless.

The ODHIN project, over its four year duration, has also contributed significantly to build capacity, consolidating a critical mass of researchers in this area of expertise, whom have established a

33 Rehm J, Shield KD, Rehm MX, Gmel G & Frick U.Alcohol consumption, alcohol dependence, and attributable burden of disease in Europe: potential gains from effective interventions for alcohol dependence. Toronto, Canada: Centre for Addiction and Mental Health, 2012.

dynamic network including not only relevant scientists, but also health care practitioners, commissioners and funders of health care services and non-for-profit organisations. This multi-stakeholder network has been provided with tailored project outputs with easy-to-understand key findings and concise guidance on how to further implement Identification and Brief Intevention programmes for heavy drinkers.

Were ODHIN's findings and recommendations to be uptaken by European societies in a whole of government approach, involving all relevant stakeholders, in the long term the wider potential societal impact of the project would be an improvement in the health and well-being of European citizens, and a reduction of alcohol-related costs in society (avoidable mortality and disease, loss of productivity, damage to interpersonal relationships, etc.), thanks to an improvement in the delivery of alcohol-related health care interventions.

4.2 Main dissemination activities and exploitation of results

The ODHIN project established a clear strategy for disseminating and exploiting its findings, marketing them to all relevant stakeholders, as well as to the general population, with a set of communication tools that have been developed and used throughout the life of the project:

- Policy makers' dialogues**:** A first round of policy makers' dialogues took place in the first year of the project on a national basis in participating countries. This resulted in the establishment of a forum for on-going discussion around policy to support effective and evidence-based IBIs in PHC settings for hazardous and harmful alcohol consumption. In the final year of the project, in order to promote dialogue between scientists and decision makers, ensuring that the ODHIN project findings and recommendations were made available to relevant stakeholders in a meaningful and appropriate language, two events took place in the final months of the ODHIN project: on 27th November 2014 an open dialogue took place in the frame of the 6th European Alcohol Policy Conference organized by EUROCARE, attended by country officials, academia and representatives of relevant professional or non-for-profit organizations. This meeting was followed by a special session on alcohol organized by the OECD Health Committee in Paris on 8th-9th December, where Antoni Gual, ODHIN's lead scientist, presented and discussed ODHIN findings with the country counterparts in the OECD Health Committee and representatives of both the WHO and the EU.
- An e-Book titled *Guidance for the future governance of delivering screening and brief intervention programmes for heavy drinking in primary health care, based on the findings of the ODHIN Project* has been produced. This e-book draws together the scientific findings of the ODHIN project as to inform relevant stakeholders in strengthened practice to optimise the delivery of health care to European citizens. We chose to produce an e-reader book as this will be open-accessible directly from the ODHIN website, enabling to widely distribute the e-reader to all publics free of charge in a fast and independent way, as the ODHIN Consortium itself is the publisher.
- Ongoing communication of relevant findings and events throughout a Network of IBI implementation researchers: ODHIN researchers are in close touch with relevant researchers in the field of identification and brief interventions for harmful and hazardous alcohol consumption, being involved in the activities of PHEPA, INEBRIA, ESBRA, the Kettyl Bruun society for social and epidemiological research on alcohol, APN and WONCA, amongst others. This has enhanced the dissemination of the project's findings and other relevant news throughout a regular network of researchers and other stakeholders in the area of alcohol policy and treatment.
- Elaboration of 6 factsheets summarising the results of the project: A series of 6 concise and clearly written factsheets have been prepared on ODHIN research findings, following a

common template already agreed upon. These factsheets have been e-published and give information for policy advisors, programme managers and financers of health services on the implementation of screening and brief intervention for heavy drinking in everyday practice. All factsheets are available in an *ad hoc* section of the ODHIN website (http://www.odhinproject.eu/resources/documents/cat_view/3-odhin-project-documents/9-odhin-factsheets.html), and in addition they are linked to from the specific Work Package pages, as to enhance their visibility.

- Two Guidance e-manuals translating science into policy have been elaborated based on all the factsheets and the scientific deliverables of ODHIN. The e-manuals have been developed in close collaboration among all the partners, with them aim of providing easy access and understanding of the projects findings most relevant for the two target audiences these are designed for: commissioners and funders of primary health care, and primary health care providers, and then offering specific guidance for managing and implementing screening and brief intervention programmes for heavy drinking, tailored to the needs of each of these end users.
- Scientific publications, including a special edition of Frontiers in Psychiatry**.** One of the key elements of ODHIN's dissemination strategy are scientific papers deriving from the work packages. Throughout the project, as second line deliverables, these have been produced as and when new scientific results were obtained from the project work, and submitted for publication in peer-reviewed journals. By February 2015 over 15 scientific peer-reviewed papers had been published, in journals such as BMC Family Practice, Alcohol and alcoholism, or Implementation Science, whereas over 15 other publications have either been submitted for publication or are in draft form and expected to be published in 2015. The research performed by the ODHIN partners also contributed towards a special issue in the journal Frontiers in Psychiatry (http://www.frontiersin.org/Psychiatry) on the research topic Brief interventions for risky drinkers**.**
- Review of the evidence-based database on effective and cost-effective IBI measures for use in PHC**:** ODHIN members have taken over the existing evidence-based database of effective practice generated by the PHEPA project, which has now been incorporated into the ODHIN website. The contents of this database have been updated and enriched also including one section on assessment of delivery of briefs interventions for hazardous and harmful alcohol consumption. At present, all new relevant evidence is included and available to scientists and policy makers.
- The ODHIN website: The ODHIN permanent website (www.odhinproject.eu) was launched in December 2011, and developments and updates have continued throughout the whole project, with features and materials added to both the public and private-access only parts of the website. The project website has been fully functional since December 2011 and has been used as an internal communication tool between project partners since then, using the private-access parts for document exchange and storage. Conceived also as a communication tool with the general public, it has been regularly updated with news, events, project outputs, etc. All submitted project deliverables are also available in the relevant WP pages and are highlighted when published. The ODHIN website has had a large amount of traffic during the whole project, with almost 2600 hits to the most visited sites (partner information, project structure and information on the different WPs), whereas several project documents have been downloaded over 1,000 times.
- Web-based self-help/intervention programme. As part of the strategy to promote the adoption of screening and brief interventions into daily practice and making them available to the general population, the ODHIN project has identified and improved local websites offering e-SBI in the five countries participating in WP5. The ODHIN website provides access to these local websites, available in English, Catalan, Dutch, Polish and Swedish, contributing not only to raise awareness among general population about the risks of hazardous and

harmful alcohol consumption but also to deliver information and effective intervention to any individual in need.

- Other dissemination activities, and the end-of-project communication action. ODHIN partners have dedicated special attention to the dissemination of the project's aim and results throughout the entire project, through a wide range of tools. Over 90 dissemination activities have been carried out, such as a press launch of ODHIN to the local and national press in Spain (the country of the project Coordinator), over 40 oral presentations at scientific events such as The European WONCA Conference, the European Alcohol Policy Conference, the INEBRIA Conference, or the Kettil Bruun Society annual conference, and more than 20 workshops, not only aimed at the scientific community, but also at the civil society, in particular involving health care professionals.
- A final communication action for the ODHIN project is currently being prepared as to widespread the projects findings and outputs. By means of the established network, it is expected that all ODHIN products will be marketed to the relevant end users (health care professionals, commissioners and funders of primary health care, academia, non-for profit organizations) on a European scale, as well as made available through the ODHIN website to the general public. Moreover, as a complement of this final dissemination activity, during the final months of the ODHIN project partners were encouraged to translate key ODHIN outputs into their country language, in order to make them more accessible and closer to policy-makers, and practitioners from each of the countries involved in the project.

4.3 Address of project public website and relevant contact details

The ODHIN public website is available at www.odhinproject.eu. Project leaders Dr. Peter Anderson and Dr. Antoni Gual, and members of the Coordinating team can be contacted at the following addresses:

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