

DRUG & ALCOHOL FINDINGS *Research*

analysis

This entry is our analysis of a study considered particularly relevant to improving outcomes from drug or alcohol interventions in the UK. The original study was not published by Findings; click [Title](#) to order a copy. Free reprints may be available from the authors – click [prepared e-mail](#). The summary conveys the findings and views expressed in the study. Below is a commentary from Drug and Alcohol Findings.

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► Cost-effectiveness of strategies to improve delivery of brief interventions for heavy drinking in primary care: results from the ODHIN trial.

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Angus C., Li J., Romero-Rodriguez E. et al.

European Journal of Public Health: 2018, 0(0), p. 1–6.

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Could combinations of three strategies – training and support, financial reimbursement, and the opportunity to refer patients to a website – cost-effectively boost delivery of brief interventions in European primary care? The important aim was to find the best way to narrow the ‘implementation gap’ between the number of patients who could benefit from these interventions and those who receive them.

SUMMARY Screening and brief interventions for heavy drinking are effective (1 2) and cost-effective (3) approaches to reducing alcohol-related harm. Yet delivery rates (eg, only 1 in 20 eligible patients being screened in Europe) remain low.

Using data collected in the [Optimizing Delivery of Health Care Interventions](#) (ODHIN) trial, in combination with the [Sheffield Alcohol Policy Model](#), the featured study aimed to assess the cost-effectiveness of levers to improve the delivery of screening and brief interventions, enabling policymakers to make more informed decisions when allocating potentially scarce resources.

The ODHIN trial

Described more fully [elsewhere](#) in the Effectiveness Bank, the ODHIN trial took place in 120 primary care settings, equally distributed across five European countries: England, the Netherlands, Poland, Catalonia in Spain, and Sweden.

In 2012/2013 the trial tested the effects of three different strategies on the delivery of screening and brief interventions by primary care services:

1. **Training and support:** providers were offered two 1–2-hour, face-to-face educational training sessions on screening and brief interventions, and follow-up telephone support.
2. **Financial reimbursement:** providers were offered financial incentives for the delivery of screening and brief interventions.
3. **Referral to an online brief intervention:** providers were able to refer patients identified as risky drinkers to an online brief intervention.



Key points From summary and commentary

Current delivery of screening and brief interventions in primary care is low across Europe. To address this ‘implementation gap’, the featured study investigated the cost-effectiveness of strategies intended to boost delivery.

In England, the Netherlands and Poland, training and support, financial reimbursement, and the opportunity to refer patients to an online tool were found likely to be cost-effective strategies for increasing rates of delivery.

Several features of the study lead to doubt about the size, persistence and statistical significance of the effects it registered and their benefits for patients and society, and yet more so about the resulting cost-effectiveness of the strategies.



There were eight arms to the trial in total. Primary care practices were randomly allocated to either a **control** group given basic information on national safer drinking guidelines and asked to screen all adult patients, or additionally to one of the three strategies above or combinations of these strategies. The control group of practices was used to estimate the results of not mounting any appreciable programme to increase implementation of screening and brief interventions, providing a benchmark against which to assess the more active implementation options.

Delivery rates were measured during a baseline period before the strategies, during a 12-week implementation period when the strategies were running, and during a four-week follow-up period six months later. For the cost-effectiveness calculations, the measure of effectiveness used was the proportion of all adult consultations with participating clinicians which resulted in a patient screening positive for risky drinking and being given brief advice – what we **have called** the “population intervention rate”.

One of the options **tried** in the **ODHIN** trial was per-patient payments for alcohol screening and advice. In England these payments were €6 per screening and €25 per patient advised, up to a ceiling of €2,200 per practice. Relative to basic information, across the **five nations** payments significantly doubled the screening rate, feeding through to a non-significant doubling in the proportion of patients seen at the practices who were offered advice on their drinking. But still just 1 in 8 attendees were screened leading to about 2% being advised.

When the analysis **assessed** whether among all the combinations of intervention-promoters, certain elements seemed to make a difference when present versus when not, payments emerged as the most important component, one which allied with training and support more than doubled the screening rate leading to a similar increase in the proportion of patients being advised. However, even this combination would across the entire sample have raised the proportion of risky drinkers who received advice from an estimated 3% before to only about **9%** afterwards. Without knowing if there were any impacts on the patients, the most the researchers **could say** was that jurisdictions “could consider” promoting brief alcohol advice in primary care through training and guidance, financial and performance management arrangements, and strategic leadership.

Cost-effectiveness sub-study

The analyses described below estimated the long-term costs and effects of the trialled strategies for three out of the five countries – England, the Netherlands and Poland – over a 10-year period of investment and a 30-year window of health outcomes, to account for time lags between changes in alcohol consumption and the development of alcohol-related harm.

To assess cost-effectiveness the researchers first estimated how many years of life adjusted for the quality of those years (**quality-adjusted life years** or ‘QALYs’) each implementation strategy would save relative to the minimal information and encouragement given to the control group of practices, a measure of the increased health gained by each strategy. Then the costs of each strategy were calculated, again relative to no strategy at all. Costs included the cost of screening and brief intervention and resultant healthcare costs associated with the treatment of alcohol-related health conditions; effective programmes should reduce healthcare costs, potentially more than offsetting the cost of the programme. Dividing net extra costs by QALYs gained yielded an estimate of how much extra each strategy would cost the health service of each country per extra QALY gained. A strategy was considered cost-effective if this figure was lower than what each country (according to official policy) considered a cost they were prepared to pay to gain a quality-adjusted year of life.

A key challenge in estimating the impact of the strategies on delivery was that, while online brief interventions and training and support are essentially ‘one-off’ policies – ie, practitioners are trained or introduced to the online tool at the outset and not subsequently re-trained – financial reimbursement requires continuous investment. To overcome this issue, two different types of analyses were conducted: the first, providing a measure of exactly what was implemented in the trial (ie, financial reimbursement was withdrawn after 12 weeks); and the second, an estimate of what would have happened had payments continued for the full 10 years. When payments were assumed to continue through the 10 years the analysis applied to the entire period the effects on the population intervention rate seen during the 12-week implementation phase; otherwise



the effects were those seen at the follow-up six months after the strategies had been withdrawn.

Main findings

The most effective strategy at increasing the delivery of brief interventions was training and support combined with financial reimbursement, although this had one of the highest costs for each additional brief intervention delivered across all three countries. In contrast, online brief interventions appeared to offer the cheapest way to achieve delivery of additional brief interventions, but was among the least effective strategies at increasing delivery.

In all three countries, training and support plus financial incentives were estimated to yield the greatest health gains, and to do so at a cost below each country's ceiling for cost-effectiveness per extra year of life in perfect health:

- England, €3,257 costs v. €22,918 ceiling;
- The Netherlands, €3,953 v. €20,000;
- Poland, €8,319 v. €14,666.

In England, relative to the minimal control strategy, both financial incentives alone and financial incentives plus training and support generated health gains while actually reducing overall costs. In the Netherlands this was also the case for financial incentives, although the estimated scale of savings was very different between the two countries (€150 million and €7.8 million respectively). Both training and support, and training and support plus financial incentives, incurred a net cost to the healthcare system in Poland, with the most effective strategy (training and support plus financial incentives) costing €6.8 million extra over 30 years compared to the control group. Estimated health gains under training and support plus financial incentives were largest in England at 15,400 QALYs over 30 years compared to 2,400 in the Netherlands and 2,600 in Poland.

When additional analyses were performed based on the assumptions that (1) financial incentives continued to be paid for a full 10-year period, and (2) that, as observed in previous studies, the effect of these on provider behaviour was maintained in the long term, the results were broadly similar. Training and support plus financial incentives was still the optimal strategy in England and Poland, but it was no longer cost-effective in the Netherlands compared to training and support alone. As in the previous analyses, the optimal strategies were estimated to be cost-saving in England and the Netherlands, but not Poland, and the health gains in England were significantly larger than in the other countries.

Based on assumptions that training had to be re-delivered every five or every two years in order to achieve any persistence of effect of other strategies, there were significant increases in the costs associated with any strategy involving training and support. For example, the cost over 10 years of delivering training and support in the Netherlands increased from €8.6 million to €15.9 million with re-training every five years, and €36.9 million with re-training every two years. However, these increased costs made little difference to the overall cost-effectiveness results and the overall conclusions of the analysis. The only significant change was that training and support ceased to be cost-effective in the Netherlands if re-training was required every two years, with referral to online brief interventions becoming the most cost-effective option under this scenario.

When the researchers assumed that the effect of brief interventions on alcohol consumption persisted for less time (three years), cost-effectiveness was reduced for all strategies. While training and support plus financial incentives remained the most cost-effective option for both England and the Netherlands (€21,668 and €13,413 respectively per extra QALY gained), it was no longer cost-effective in Poland, with training and support alone offering the most cost-effective strategy at €2,609.

The authors' conclusions

While delivery rates of screening and brief interventions in European primary care are currently low, several cost-effective strategies exist to increase these rates.




Training and support combined with financial incentives may offer the most

cost-effective strategy for increasing delivery, and subsequently reducing alcohol-related harm and associated costs to society. However, this finding is sensitive to both the characteristics of the country and assumptions around the long-term effects of brief interventions. Furthermore, policymakers may need to be mindful of the potential ethical issues (1 2) associated with offering financial incentives to healthcare practitioners.

FINDINGS COMMENTARY The level of alcohol consumption in Europe is high compared with the rest of the world, and although there is evidence that screening and brief interventions in primary healthcare may offer “a cost-effective policy option for tackling alcohol-related harms, at least in high-income countries”, their level of implementation in routine primary healthcare remains low. The featured study was part of a package of work seeking to address this problem – assessing the cost-effectiveness of levers to improve delivery. However, before accepting that the study has found ways to cost-effectively narrow the ‘implementation gap’ and move towards brief interventions being delivered “widely and well enough” to improve health across the entire population, it is necessary to examine the study’s underlying assumptions, including the assumption that brief interventions remain effective in real-world settings – arguably the ‘Achilles heel’ of the estimates.

Were the strategies really cost-effective?

Cost per QALY (years of life adjusted for the health-related quality of that year) calculations depend on the assumptions and data fed into them and the influences on both cost and quality/length of life taken into account. In the case of the featured study these limitations are substantial enough to cast doubt on the whether the calculations are a reliable guide to policy and practice.

Considerations include an over-estimate of the size of the effect of brief interventions on drinking and in the primary analysis too, how long they last, doubts over whether such research-derived estimates apply to routine practice, and uncertainty over whether continued payments and training or support would sustain screening and brief intervention activity, all magnified by the fact that the practitioners in the study were particularly motivated to respond to drinking. Omitted from the calculations were the costs of checking screening and intervention volume and quality to substantiate eligibility for payments, and the value of what else might have been done with the time devoted to alcohol-related training, screening and intervention. The projected healthcare savings which largely generated the cost-effectiveness findings were not based on reports from the patients themselves but assumed drinking reductions and consequent savings, yet across all relevant studies, increased intervention rates promoted by strategies such as those tested in the study have not been shown to have significantly affected drinking. Findings of raised screening, brief intervention and population intervention rates for some of the strategies would have been aided by the unexplained steep fall in these rates in the control units which provided the benchmark against which the strategies were compared, findings which fed into the cost-effectiveness estimates. Of concern too is that these estimates were based on an outcome (the proportion of all adult consultations with participating clinicians which resulted in a patient screening positive and being given brief advice) which was not specified in advance, opening the door to selecting an outcome which cast the implementation strategies in the best light. These considerations are expanded in the supplementary text: [click to unfold](#) 

 [Close supplementary text](#)

One of the key documents justifying the presumption that patients would benefit from increased screening and brief intervention activity (which fed into the cost-effectiveness estimates) was the 2007 version of a review conducted under the rigorous procedures of the Cochrane Collaboration.



However, this review was [updated in 2018](#). It still concluded that brief interventions in general practice and emergency care settings can reduce drinking in hazardous or harmful drinkers, but its revised findings would have substantially eroded the cost-effectiveness estimates in the featured study. In terms of grams of alcohol, the impact estimate was half that of the earlier Cochrane analysis and in % terms had fallen from [12.7%](#) to [8.2%](#), a cut of just over a third. When the estimate was tracked by date of publication of the study, by 2014–2015 – around the time the featured trial was taking place – a ‘best fit’ graph suggested studies were on average finding zero effect.

What in 2007 was judged to be the most real-world trial included in the review [remained so](#) in the 2018 version. In this [nurse-led brief intervention](#) only a quarter of the practices approached were recruited and just over 1 in 10 contributed data to the analysis, suggesting that the results may not reflect what would happen in a practice less motivated or less well placed to join and complete a brief intervention trial. If this is seen as the trial closest to routine practice, it raises questions over whether the drinking reduction seen across all the review’s trials would be replicated if brief interventions were applied by the general run of clinicians to the general run of patients.

A [simulation study](#) from 2013 calculated the healthcare cost savings and benefits for patients in England of screening and brief advice, the findings of which made it look an ‘unmissable bargain’. However, as with the featured study, this was contingent on the assumption that interventions would be routinely implemented, and that the desired effects would transfer from tightly controlled research studies to routine practice.

Other assumptions which led to the finding that brief interventions were cost-effective in England and elsewhere can also be questioned. On the basis of a [US study](#), the core scenario assumed that the reduction in consumption generated by brief interventions versus control procedures would “decay linearly back to age-adjusted pre-intervention consumption levels over the following seven years”. However, the US study only followed up patients for four years, and by this time there was no statistically significant reduction in drinking attributable to the evaluated brief intervention. The last year there was a significant reduction was the three-year point, making the featured study’s alternative assumption of three years as the decay period the safer one to use. When this was incorporated into the calculations, at €21,668 per extra QALY, in England the most cost-effective strategy – training and support plus financial reimbursement – barely came under the €22,918 ceiling. These calculations were relegated to an appendix and not mentioned in the abstract, yet arguably should have been the primary figures. Moreover, the US study tested a multi-session intervention, not the featured study’s one-off intervention lasting just five minutes in England and ten minutes in the other two countries. In the US trial patients were counselled for 15–20 minutes by their family doctors and were scheduled for a second session a month later. Further reinforcement came in the form of five-minute phone calls from the practice nurse two weeks after each session.

The scenario the assumption of an effect lasting three years was fed into assumed that the boost to intervention rates found at the follow-up would persist *with no further measures to maintain clinicians’ motivation or skills*. Alternative scenarios included continuing the financial incentives for 10 years. This would increase costs but also allowed the analysts to assume that rather than the follow-up results, the much greater boost to the intervention rate seen in the 12 weeks when the incentives were in place would



persist. But even during these 12 weeks, from the first to the last four weeks the effect of financial incentives and training and support **was waning** in absolute terms, as was the boost to the proportion of patients advised relative to control primary care units. In a further stiffening of the strategies, to the extrapolation of continued payments was added the extrapolation of refresher training sessions, on the assumption that one-off training and support might not be enough to sustain clinicians' activity at the projected levels. Interviews with clinicians in the study **suggested** this was a realistic concern. They felt that training and support was just a "temporary stimulus, and that alcohol is just one of the many important themes to discuss. Embedding [screening and brief intervention] in the long term requires a continuous trigger, such as booster sessions." To cater for this concern, the featured study tried costing in repeated training every two or five years. This substantially increased costs without, it was assumed, increasing impacts. Arguably again, these figures should have been the ones used in the "headline" analyses. However, dominated by presumed healthcare cost savings, cost-effectiveness conclusions were affected only for the Netherlands.

Findings of significantly raised screening and brief intervention rates for some of the strategies would have been aided by the steep fall in these rates in the control units which provided the benchmark against which the strategies were compared. Compared to baseline figures, across the 12-week implementation period the screening rate halved and the brief intervention rate fell to 79% of its previous level. Given the population intervention rate **at the follow-up** (again, about half the baseline figure) it seems this reduction was maintained, helping to generate a statistically significant finding in favour of training and support. This rate – the proportion of all adult consultations with participating clinicians which resulted in a patient screening positive and being given brief advice – was the basis for the cost-effectiveness calculations. Without the diminished performance of the control units it would have been harder for these to come in under the ceilings considered cost-effective in each of the countries. Reasons for a halving in the performance of the control units – which even under the minimal control procedures were given information and asked to screen all adult patients – do not seem to have been speculated on in the publications from the study, but without it some findings which were statistically significant may not have been, and estimates of the impact of the evaluated strategies would have been considerably smaller. There are **reasons to believe** that among a set of clinicians motivated to help prevent risky drinking and **looking forward** to training and support and payments for this work, not being offered these generated an artificially low benchmark biased in favour of the other strategies.

Pay-for-performance systems such as those trialled in the study **require auditing** to check that the work has been done and done to the required standard. These costs are not specified among those included in the calculations.

Also not taken into account was the value of what might have been done with the time devoted to training, screening and intervention. Effectively it was assumed that nothing else would have been done instead which would extend or improve the patient's life and/or reduce health service costs beyond



the cost of the clinician's time. Such foregone gains are difficult to estimate, but might be substantial if a diversion to drinking prompted by the study's payments or training meant (for example) that the issue the patient came about was not dealt with as thoroughly as it might have been, or another lifestyle influence on health such as smoking, diet or exercise was left unexplored. If this happened, quality and length of life might be reduced and costs imposed on the health service which could have been reduced, adversely affecting both sides of the cost per QALY ratio. This concern would have been mitigated had the outcomes on which the QALYs were calculated reflected the overall health and welfare of the patients, but in fact they reflected only alcohol-affected conditions. If these really had been counterbalanced by worse health due to other influences, it would not have been reflected in the calculations. Such concerns were not unknown to the clinicians in the trial. [Emerging from interviews](#) with 68 of them was that "the alcohol subject seemed to compete with other lifestyle prevention themes", "inhibiting" their alcohol-related screening and brief intervention activity. One said, "Besides alcohol interventions, interventions on nicotine, obesity, physical activity should be conducted. And I have 10–15 minutes per patient."

It is unclear what adding the assumption of a three-year decay in the impact of brief interventions and that the effects of continued financial reimbursement would wane, plus the extra costs suggested above, would have done to the calculated cost-effectiveness of the scenario in which payments continue and training was repeated. The possibility that it would have tipped it over the level accepted as cost-effective in England could only be excluded by further analysis. Together with the revised Cochrane review estimate downgrading the effectiveness of brief interventions – especially those tested in studies conducted around the time of the featured study – this possibility becomes more plausible. Outside the context of the featured study, in routine practice it becomes yet more plausible because the clinicians in the study [were particularly motivated](#) to work with drinkers.

A methodological limitation is that the projected healthcare savings which largely generated the cost-effectiveness findings were based on estimates from outside the study, not on reports from the patients themselves on their drinking or how often they had been admitted to hospital or received other health services in relation to their drinking. Whether findings from these other studies would apply to patients of the kind and severity of drinking seen in the featured study is an open question. They derived mainly from studies not of implementation strategies such as the featured study, but of brief interventions themselves. Across relevant studies specifically of implementation strategies, increased intervention rates promoted by strategies such as those tested in the featured study [have not been shown](#) to have significantly affected alcohol-related outcomes.

Of concern is that the featured analysis was conducted



on an outcome (the proportion of all adult consultations with participating clinicians which resulted in a patient screening positive and being given brief advice) which was not specified in the [plan](#) for the study, and not clearly if at all in the trial's [registration](#) document. Allowing outcomes to be selected after the results of the study are known also allows the possibility that this selection will be influenced by those results in a way which produces a desired finding, a procedure which would undermine the validity of the finding. However, of the outcomes available, this does seem the most appropriate one for a cost-effectiveness analysis of brief interventions.

 [Close supplementary text](#)

Incentives work – but are they ethical?

Studies [reviewed](#) in the Effectiveness Bank indicate that without material or reputational and possibly career-affecting sanctions/incentives, implementation drives based on educating, persuading and supporting practitioners have reached just a minority of the intended patients. Strong sanctions and incentives *can* generate the desired activity, but may be costly and tempt services and practitioners to short-change quality and 'game' the system.

In the [cost-effectiveness](#) sub-study [ODHIN](#) researchers referred to ethical questions surrounding financial incentives to healthcare practitioners. Writing in the *British Journal of General Practice*, Dr Graham Kramer [expressed](#) the following about the implications of rewarding practices for the delivery of high quality care (in this case under the UK's [Quality and Outcomes Framework](#)):

"I had worried that, by being paid to implement evidence-based guidelines, my work would become a restricted, target-driven exercise that shifted the balance of my consultations to a doctor and disease-centred agenda. I had been concerned that this created conflicts of interest and how that might undermine, not only trust by my patients in me as a doctor, but also the trustworthiness of the profession. I worried that in some domains I was taking money to engage in work that I felt had limited value for my patients, money that could possibly be spent in more useful areas. Was I colluding in a wholesale folly of medical practice and worse still, why wasn't I doing anything about it? Had my mouth been effectively 'stuffed with gold'?"

The [Alcohol Treatment Matrix](#) in the Effectiveness Bank (see [cell E1](#)) discusses incentives, including whether financial incentives divert clinical practice in the intended direction at the risk of distorting record-keeping and practice overall, and confirming



to staff that alcohol screening and brief interventions are not their core business.

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STUDY 2016 [Improving the delivery of brief interventions for heavy drinking in primary health care: outcome results of the Optimizing Delivery of Health Care Intervention \(ODHIN\) five-country cluster randomized factorial trial](#)

STUDY 2014 [The effectiveness of alcohol screening and brief intervention in emergency departments: a multicentre pragmatic cluster randomized controlled trial](#)

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REVIEW 2010 [Alcohol-use disorders: Preventing the development of hazardous and harmful drinking](#)

STUDY 2013 [Modelling the cost-effectiveness of alcohol screening and brief interventions in primary care in England](#)

STUDY 2012 [Alcohol screening and brief intervention in probation](#)

STUDY 2011 [An evaluation to assess the implementation of NHS delivered alcohol brief interventions: final report](#)

HOT TOPIC 2017 ['My GP says I drink too much': screening and brief intervention](#)

