Author accepted main text of manuscript for Lancet (11/16)

A RAPID EVIDENCE REVIEW OF THE EFFECTIVENESS AND COST-EFFECTIVENESS OF ALCOHOL CONTROL POLICIES: AN ENGLISH PERSPECTIVE

Robyn Burton PhD[1], Clive Henn RMN[1*], Don Lavoie MA[1], Rosanna O'Connor BA[1], Clare Perkins MSc[1], Kate Sweeney BSc[1], Felix Greaves PhD[1,2], Brian Ferguson MSc[1,3], Caryl Beynon PhD[1], Annalisa Belloni MSc[1], Virginia Musto[1], John Marsden PhD[1,4 #], Nick Sheron MD[1,5 #]

[1] Public Health England, Wellington House 133-155 Waterloo Road, London, SE1 8UG

[2] Department of Primary Care and Public Health, Imperial College London, Reynolds Building, St. Dunstan's Road, Hammersmith, London W6 6RP

[3] Department of Health Sciences, University of York,

Seebohm Rowntree Building, Heslington, York, YO10 5DD

[4] Addictions Department, Institute of Psychiatry, Psychology & Neuroscience,

King's College London, 4 Windsor Walk,

Denmark Hill, London, SE5 8BB

[5] Faculty of Medicine, University of Southampton, University Road, Southampton, SO17 1BJ

Abstract: 147 words

Main text: 7,464 words

Tables in main text: 1

Figures in main text: 7

Total number of pages in manuscript: 42

---

[*]Corresponding author: PHE, 2nd Floor, Skipton House, 80 London Road, London, UK, SE1 6LH Clive.Henn@phe.gov.uk (+44) 20 3682 0512[#] Joint senior author

ABSTRACT

This paper reviews the evidence for the effectiveness and cost-effectiveness of policies to reduce alcohol-related harm. Policies focus on price, marketing, availability, information and education, the drinking environment, drink-driving and brief interventions and treatment. While there is variability in research design and measured outcomes, the evidence supports the effectiveness and cost-effectiveness of policies that address affordability and marketing. An adequate reduction in temporal availability, particularly late night on-sale availability, is effective and cost effective. Individually-directed interventions delivered to at-risk drinkers and enforced legislative measures are also effective. Providing information and education increases awareness but is not sufficient to produce long-lasting changes in behaviour. At best, interventions enacted in and around the drinking environment lead to small reductions in acute alcohol-related harm. Overall, there is a rich evidence base to support the decisions of policy makers in implementing the most effective and cost-effective policies to reduce alcohol-related harm.

INTRODUCTION

Alcohol-related harm is determined by the volume of alcohol consumed and frequency of drinking occasions, at both the individual and population level. The amount of harm experienced is directly related to the volume and pattern of alcohol consumption,[1,2] influenced by three key drivers: price (affordability), how easy it is to purchase (availability), and social norms (acceptability).[3]

Alcohol sales in England and Wales have increased by approximately 42%, from roughly 400 million litres in the early 1980s, with a peak at 567 million litres in 2008, and a subsequent decline (Figure 1).[4] This increase in sales has been predominantly driven by increased consumption among women, a shift to higher strength products, and increasing affordability of alcohol, particularly through the 1980s and 1990s. [4–6] Alcohol-related mortality has also increased over this period, which is in stark contrast to the trend of liver mortality in much of western Europe.[7]

[FIGURE 1 HERE]

Alcohol is a prominent commodity in the United Kingdom (UK) marketplace, and is widely used in numerous social situations. The majority of people in England drink alcohol,[8] and for many, it is associated with positive aspects of life. However, a significant number of people experience harm from their own, or others' drinking. Combined data from the 2012 to 2014 Health Survey for England indicate that 16·0% of the population are non-drinkers, 58·8% drink at lower-risk levels (defined as <=14 standard units per week [1cl/8g]), 20·8% at increasing-risk levels (>14 to 35 and 50 units per week for women and men respectively), and 3·1% at higher-risk levels (>=35 and 50 to 75 units per week).[4] There is also an important sub-population of people who drink >=75 units per week and have been termed "extreme drinkers".[4] This group comprise 1·3% of the population, and alongside the higher-risk drinkers make up only 4·4% of the population; these two groups (higher-risk/extreme drinkers) consume over one third of all self-reported alcohol (Figure 2). The combination of

increasing-risk, higher-risk, and extreme-risk drinkers accounts for about 25% of the population and over 75% of the total self-reported alcohol consumption.

[FIGURE 2 HERE]

For those aged 15 to 49 years in England, alcohol misuse is the biggest risk factor attributable to early mortality, ill-health and disability, and for all ages it is the fifth most important.[9] Many of the harms related to alcohol consumption are typified by the drinkers' volume and pattern of drinking.[10] Injury is associated with a single bout of heavy drinking[11]; while regular drinking is associated with an increased risk of cancer.[12] Repeated heavy drinking can lead to alcohol dependence [13] and liver cirrhosis.[14]

The relationship between alcohol consumption and harm can also be complex. For example, excessive alcohol consumption can increase the risk of unemployment; but unemployment can also increase alcohol consumption.[15] Furthermore, alcohol can act as a mechanism to cause harm in ways that are both acute and chronic. For example, acute intoxication can increase the propensity to attempt suicide, and long-term consumption increases the likelihood of suicidal ideation.[16]

Individual risk factors moderate the susceptibility to alcohol-related harm. Of these perhaps the most important is genetic, with approximately 60% of the tendency to develop an alcohol-related mental health issue inherited.[17] Other factors include age, gender, and socioeconomic status.[10] People who are less affluent are more likely to die or suffer an alcohol-related disease, despite reporting similar or lower levels of average consumption.[18] Of over one million hospital admissions in 2014/15 where an alcohol-related condition was a feature, 47% occurred in the lowest three socioeconomic deciles.[19] The explanation for this association is not certain, but may reflect lower resilience or compounding health factors in less affluent groups.[18]

The harm arising from alcohol is an internationally-accepted public health challenge, with substantial costs to individual drinkers, to those around them, and to society. The economic

burden of alcohol use is consistently high with UK Government estimates placing the annual cost at over £21 billion,[20] amounting to 1·3% of gross domestic product (GDP). A review of studies of high income countries using comparable methodologies shows the gross economic costs of alcohol to range from 1·4% to 2·7% of GDP.[21] Few studies report costs on the magnitude of harm to people other than the drinker so the economic burden of alcohol consumption is generally underestimated.[22] The financial burden which alcohol-related harm places on society is not reflected in its market price, with the costs to individual consumer being lower than the impact of alcohol on taxpayers.

This review was commissioned by the Department of Health who asked Public Health England (PHE) to provide an overview of alcohol-related harm in England and possible policy solutions. There have been several previous reports on this issue, including an Academy of Medical Sciences report,[23] an expert synthesis,[24] an overview by the World Health Organization (WHO),[25] and most recently, a review by the Organisation for Economic Co-operation and Development (OECD).[26]

The present rapid review offers a broad and rigorous summary of the current evidence for the effectiveness and cost-effectiveness of alcohol control policies. Effectiveness is defined as the degree to which an intervention reduces the public health burden (health, social, and economic) of alcohol. The findings are interpreted within the English context with specific relevance for public health professionals and policymakers in the health and non-health sectors.

A detailed overview of the methodology can be seen in Annex 1. Briefly, electronic databases combined with hand-searching of reference lists and input from an independent expert group was used to identify reviews and primary studies which evaluated the effectiveness and cost-effectiveness of alcohol control policies. Data were extracted using a uniform template, and quality of evidence was assessed using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) criteria.[27,28]

RESULTS

The main findings are outlined in Table 1 following a narrative synthesis of the data by policy area. In this synthesis, contextual information (such as the evidence detailing the mechanisms or prevalence of harm) provides a more detailed description of the effectiveness and cost-effectiveness of each policy. Therefore, additional references to those retrieved by the literature search are used throughout this text. References used as evidence for each policy can be seen in Annex 2

POLICY AREA A: TAXATION AND PRICE REGULATION

Since the affordability of alcohol (a function of price and income) is an important determinant of alcohol consumption and harm,[26,29–36] taxation or price regulation represents an important element of national policy. These policies affect consumer demand by increasing the cost of alcohol relative to alternative spending choices. The demand is also influenced by income levels (income elasticity) and the extent to which real incomes have changed over time. In theory the impact of price increasing policies could be mitigated if real incomes were rising sufficiently fast, but this has not been the case in recent years.

In the UK, the affordability of alcohol has risen steadily with strong alcohols now more affordable than in 1980 (Figure 3).[37] Alcohol-related deaths have also increased over this period. In 2008, a duty escalator was introduced to increase alcohol duties by 2% above inflation each year. This was repealed in 2013 and 2014, for beer then cider and spirits, and there have been further freezes to beer, cider, and spirits duty.[4] Since 2007/08 the affordability of alcohol decreased more than household incomes suggesting that of the multiple economic factors influencing alcohol consumption, the 2% duty escalator may have had a relatively larger effect.

[FIGURE 3 HERE]

Reviews and meta-analyses report that an increase in alcohol price is consistently associated with a decrease in its consumption, with a 10% price increase associated with a

5% decrease in consumption, on average (price elasticity).[26,29–36] Individuals respond less to price changes of beer compared to wine and spirits,[34] however, in the UK off-trade, individuals respond more to price changes of beer.[38] Moderate drinkers may be more sensitive to price changes than heavy drinkers,[34] however in absolute terms the reduction in consumption among heavy drinkers is considerably higher than moderate drinkers. Within the UK, heavy drinkers are more price sensitive than moderate drinkers for most products, though they tend to switch to cheaper products when the price of their preferred product increases (cross-price elasticity).[39]

There has been relatively less research attention to the cross-price elasticity of demand for alcohol. However, one UK study has shown that off-trade wine and cider act as substitutes, such that consumers increase their demand for one product following an increase in the price of the other.[38]

A tax increase can lead to significant improvements in health.[31] A meta-analysis reports that doubling tax rates decreases alcohol-related mortality by an average of 35%, with further reductions in violence, crime, road fatalities, and sexually transmitted infections.[35] Modelling studies all predict that taxation leads to large gains in health and life expectancy, and is a cost-effective approach to prevention and health improvement, despite disparate geographical settings, assumptions and methodological approaches.[26,40–42] In England, a 10% increase in the price of alcohol is estimated to substantially reduce alcohol-related hospital admissions and deaths, amounting to over £22 billion in societal benefits over a 20 year period.[43] According to the UK Treasury, the recent cuts in alcohol duty are projected to have cost taxpayers £3·45 billion over five years.[44–46]

A potential concern regarding tax increases is that they may have a greater financial impact on less affluent people who tend to spend a larger proportion of their income on alcohol. However, on average, less affluent households consume less alcohol than high-income consumers and are more likely to be abstainers. As such, they are less likely to be financially

impacted by changes in taxation. Analyses suggest that an increase in alcohol taxation is progressive when considering all households, but regressive when considering only those who consume alcohol [47,48]. However, to the extent that less affluent groups are more likely to suffer the harms associated with alcohol consumption,[48] increasing the price of alcohol through tax has the potential to reduce health inequalities.[49]

For tax increases to bring about reductions in harm, they need to be passed onto consumers through an increase in the price of the product. Mostly these are passed on,[50] however strategic behaviour of manufacturers and retailers may to moderate the effect. For example, by increasing the price of their cheaper products by less than the tax increase, and the price of more expensive alcohol by more than the tax increase.[51]

To ensure price increases are passed onto the consumer, governments can legislate a minimum price below which alcohol cannot be sold. The evidence for this policy comes from modelling studies in England and Australia and natural experiments in Canada. English modelling estimates the impact of a minimum unit price (MUP) set between 45 and 60 pence (in England, a unit contains 8g alcohol) and demonstrates that MUP reduces alcohol-related deaths and hospital admissions, with high-risk drinkers and the less affluent experiencing the greatest gains in health.[43,52,53] These results are confirmed by Australian modelling showing that a $2 MUP has a greater impact on heavy drinkers and low-income households who consume larger quantities of alcohol.[54] Moderate drinkers are minimally affected by an MUP policy,[43,52,55] so this is a highly targeted measure, which is supported by observational research.[56,57] In England, taxation would need to increase by 28% to achieve the reductions in alcohol-related deaths estimated by a 50 pence MUP.[58]

The minimum price policy implemented in some Canadian provinces confirms the English modelling. In Saskatchewan, a 10% increase in the minimum price of alcohol reduced total alcohol consumption by 8·4% within two years, with greater reductions for beer and spirits and the off-trade.[59] In British Columbia, two to three years after implementation, the same

price increase was associated with reductions in alcohol-related deaths (by around 32%), acute and chronic alcohol-related hospital admissions (by around 9%),traffic violations (around 19%), and crime (around 9%).[60–62]

Taxation and price regulation can be implemented simultaneously. English modelling shows that combining phased duty increases (annual increases in line with inflation + 2%) with a 60 pence MUP would have the greatest impact in reducing alcohol consumption and harm (Figures 4 and 5).[49,63] This is estimated to reduce alcohol-related hospital admissions at the 20th year by about 28,000 compared to about 17,000 for MUP only and about 11,000 for phased duty increases alone. The benefits are mostly accrued by high-risk drinkers and those in the lowest socioeconomic groups.

[FIGURES 4 AND 5 HERE]

Over a period of five years, freezing duty is estimated to cost society over £540 million, while cutting duty would cost £870 million (Figure 6). A 2% phased duty increase (followed by a four-year freeze) is estimated to save £1·2 billion, a 60 pence MUP £3·2 billion, and the two in combination over £4 billion.

[FIGURE 6 HERE]

In 2014, the UK Government implemented a ban on the sale of alcohol below the cost of excise duty and Value Added Tax in England and Wales. Modelling estimated that this reduced consumption by less than 0·1% leading to no reduction in harm while MUP had a 40-50 times greater impact.[64] This arose because the ban affected only 1% of units consumed by harmful compared to 44% of units under a 50 pence MUP policy. This was reiterated by an observational study.[65] In 2011, the Scottish Government introduced a ban on off-trade quantity-based price discounts such as ‘buy one, get one free’. Straightforward discounting such as ‘half-priced wine’ remained permissible. Two studies evaluated the impact of this ban,[66,67] with the higher quality reporting associated reductions of around 3% by 2012, largely driven by reductions in sales of wine, and pre-mixed beverages.[67] Modelling

estimated the impact of a complete ban on off-trade discounting in England and reported small reductions in consumption, largely because these price promotions affect a small proportion of sales.[68] Such restrictions can be easily circumvented by, for example, lowering the price of a product.

Cross-border trade, illicit trade and home production are important phenomena that governments need to take into account when implementing pricing policies. However, there is a lack of data on the changes in alcohol price and tax avoidance and the illicit trade.[69] Another concern is the relationship between alcohol's price and consumption of alternative unhealthy substances such as tobacco or psychoactive drugs, for which there is no robust evidence. Qualitative interviews from Scotland suggest there is little evidence that people substitute alcohol for illicit alcohol or drugs.[70]

POLICY AREA B: REGULATING MARKETING

Marketing is a commercial strategy with the goal of increasing the market size and share for a product. This is achieved by initiating sales from new consumers and those of rival products, and by increasing the frequency of purchase and drive brand preference. Publicly available information on alcohol marketing is scarce and this has hindered research on the effects on consumption and harm. However, the manufacturers *Inbev* and *Diageo* report spending 15% of their global sales on marketing annually, equivalent to US$7 billion and £1·6 billion.[71,72]

Short-term aggregate measures of advertising elasticity report that for each 10% increase in advertising expenditure there is a 0·3% increase in adult consumption.[33,73] Marketing occurs at the brand level where the marginal effect is small, so the loss of variance due to national aggregation leaves little room for correlation with alcohol consumption. Such shortcomings are more pronounced when measuring underage consumption, which tends to be concentrated among a small number of brands.[73]

The strongest evidence for the impact of advertising on alcohol consumption comes from reviews of longitudinal and cohort studies observing children.[74–77] These consistently report that exposure to alcohol advertising is associated with an increased likelihood that children will start to drink, or drink greater quantities if they already do. The effect is not explained by children's previous experiences of drinking or exposure to other non-alcohol-related media. This is an important effect because people who start drinking early are more likely to become binge and problem drinkers, and underage drinking is associated with educational problems, and violent behaviour.[79–82] While the relationship between marketing and child alcohol consumption does not directly provide evidence that limiting marketing will reduce consumption, the evidence is sufficient to support policies that reduce children's exposure to marketing.

There are two main aspects of marketing that governments can regulate: the population exposure and the content of advertising. The industry is governed by codes of practice which are the responsibility of two industry Committees - the Committee of Advertising Practice and the Broadcast Committee of Advertising Practice and are independently administered by the Advertising Standards Authority.

Adverts should not include a range of content, for example they must not encourage irresponsible or unhealthy consumption of alcohol or link alcohol consumption with social or sexual success. They must not be shown during programmes of 'particular appeal' to children, deemed to be one that attracts an audience where ten to 15 years olds are over-represented by 20% in relation to their share of the total TV audience.[83] A study has shown that UK adverts often contain content that could appeal to children, and ten to 15 year olds were 11% more likely to see TV alcohol adverts than adults, increasing to 51% for adverts of alcopops.[84]

Complete marketing bans are rarely implemented, so their evaluation depends mostly on modelling studies. These estimate that advertising bans represent one of the most effective

and cost-effective approaches to prevention and health improvement, with the level of effectiveness decaying as the policy moves from a complete to a partial ban.[26,41,85] Among 11 to 18 year olds, UK modelling estimates that a TV-based advertising ban reduces consumption by 9%.[68]

Contrary to the consistent findings of modelling studies, a review reported that the impact of banning marketing was inconclusive.[86] All four studies included in the review suffered from a high risk of bias. Three studies evaluated bans which were implemented in areas that received a considerable amount of cross-border programming that had no restrictions on alcohol marketing.

A pragmatic alternative to a complete marketing ban is to implement legislation that dictates what advertisers are permitted to do. In 1991, France passed the *Loi Evin*, which stipulated what advertising media can be used and the content of transmitted messages. The legislation permits alcohol advertising in adult media only, and ensures that promotional messages are factual and verifiable. The *Loi Evin* represents a real world framework for marketing regulation that is closed to interpretation, cannot be easily circumvented, and where strict penalties for contravening the law deters inappropriate marketer activity.

Given that more than half of all TV alcohol adverts seen by children in the UK are aired before 9pm,[83] watershed bans have been identified as an appropriate policy.[87] When the Netherlands introduced a watershed ban, commercial operators responded by increasing alcohol advertising shown after 9pm from over 7,500 adverts to over 23,000.[87] Exposure of all ages increased as a result, but whereas exposure of adults increased by 52%, exposure of children aged 12 to 17 years increased by 62%, and exposure of children aged 6 to 11 years increased by only 5%. A subsequent study compared TV alcohol advert incidence rate ratios (IRR) between the UK and Netherlands between December 2010 and May 2011.[88] Dutch children aged six to 12 years had an IRR of 0.7 (adult IRR=1), less than UK children aged four to nine years (IRR 0·8). Whereas older children in both the Netherlands (aged 12

to 19 years, IRR 1·3) and UK (aged ten to 15 years, IRR 1·1) were exposed to more TV alcohol advertising than adults. Watershed bans can protect young children from exposure to TV alcohol advertising, but more effective measures are required to protect teenagers with later bed times.

Given that studies report a positive relationship between exposure to alcohol sports sponsorship and alcohol consumption, amongst adults in sports and schoolchildren,[89] bans on sports sponsorship may represent an important approach to marketing regulation. To date, no research has evaluated the impact of banning sports sponsorship, despite it resulting in a considerable number of children being exposed.[90]

Digital and social media have changed the nature of marketing, with alcohol companies increasingly moving into this area.[91] The potential power and reach of digital marketing is demonstrated by the fact that 86% of the UK adult population has regular access to the internet, increasing to 99% of those aged 16 to 24 years.[92] Little data exist that measure the prevalence of online alcohol marketing, however social media case studies show a considerable media presence of alcohol brands featuring marketer- and user-generated content, blurring the boundaries between advertiser and consumer, and limiting the scope of advertising regulations.[84] Age verification filters request that a viewer of a website confirm they are aged over 18 years, but in their current form are inadequate and easily circumvented.[93] Nonetheless, using similar approaches to online gambling could enable correct verification of 85% of the UK adult population.[94]

The likely impact of comprehensive marketing regulations can be drawn from the experience of tobacco control. Evidence suggests that reduced exposure to tobacco advertising and promotion significantly reduces exposure to pro-tobacco marketing influences,[95] and is expected to benefit prevention and cessation efforts by reducing environmental cues to smoke.[96]

All marketing regulations can be embedded by law (statutory regulation), by industry codes of conduct (self-regulation), or by a combination of both (co-regulation). Three reviews have demonstrated considerable violations of content guidelines within self-regulated alcohol marketing codes, suggesting that the self-regulatory systems that govern alcohol marketing practices are not meeting their intended goal of protecting vulnerable populations.[29,97,98]

POLICY AREA C: REGULATING AVAILABILITY

Policies that regulate the availability of alcohol are based on the theory that easier access to alcohol increases alcohol consumption and harm. Regulation can occur at the retail level, by specifying where and when alcohol can be purchased, and who it can be sold to, and at the production level, by encouraging producers to market lower strength products. In England, the retail availability of alcohol is largely regulated by the *Licensing Act 2003*.

The majority of research reporting the relationship between alcohol outlet density, alcohol consumption and harm is carried out in Australia and North America.[62,99–107] Reviews report mixed results, partly due to heterogeneity in research design. Broadly speaking, the evidence for a relationship between higher outlet density and social disorder is strong; for alcohol consumption the evidence is less clear; and for chronic health harms the evidence is emerging. The causality underpinning these relationships is uncertain. Additional complexities, such as people driving to out-of-town shopping centres or purchasing alcohol online, are largely unaccounted for in the scientific literature to date.

International reviews and studies report that increasing the time and days on which alcohol is sold increases alcohol consumption and harm, particularly road traffic crash and injury,[29,108–110] and a series of robust, well-designed Australian studies demonstrate that reducing late-night hours of on-trade sale substantially reduces rates of violence.[111] Reducing on-trade outlet opening hours targeting the most densely populated areas with simultaneous enforcement is cost-effective.[26] Nonetheless, changes in the *Licensing Act 2003*, which staggered opening hours, presents a more mixed picture. On the whole, a small

body of research reports that the *Act* did not increase total violence, but shifted it later into the night,[112,113] while for most hospitals, admissions relating to alcohol increased.[114–118] Nonetheless, since the mid-20th century, licensing in England has been increasingly viewed as an administrative process in a system primarily defined by market demand.[102] This may have led to the overprovision of availability, explaining the limited changes observed in evaluations of the *Act.*

Using the evidence relating to the availability of alcohol within the constraints of the *Licensing Act 2003* has proved difficult. Legislation requires that all licensing decisions examine evidence about specific outlets or local areas, and consider the licensing objectives. Public health is not a licensing objective, so local authorities may struggle to present a health argument as a counterpoint for a licensing decision. Furthermore, health bodies typically present data at population level and cannot demonstrate causal links between individual outlets and harm. Nonetheless, local areas with more effective licensing strategies have demonstrated a small additional reduction in alcohol-related hospital admissions compared to their less stringent counterparts.[119]

In March 2011, the English Government launched a public-private partnership involving voluntary agreements by businesses and public bodies to make health promoting changes.[120] A specific pledge was to *"remove 1 billion units of alcohol sold through improving consumer choice of lower alcohol products"*. While an initial government evaluation reported that the pledge had been successful,[120] other research questioned the validity of this analysis, arguing that consumer responses and changes in alcohol duty were not adequately accounted for.[121] Further analysis confirmed these concerns, concluding that most industry activity would have happened regardless of the pledge.[122] Most actions related to the launch and promotion of new lower strength products, potentially increasing the total number of alcohol units in the market.

POLICY AREA D: PROVIDING INFORMATION AND EDUCATION

UK health surveys show that while many respondents can correctly identify liver disease as a potential harm caused by alcohol, fewer are able to freely recall other harms, such as cancer.[123] Policies that provide information and education can help to reduce this knowledge deficit, while additionally overcoming the potential barrier of public opinion, as people who are aware that alcohol is a risk factor for cancer are more likely to support alcohol control policies, including increases in taxation and strict marketing regulations.[124] Furthermore, as with other products, consumers have a right to understand the risks associated with alcohol consumption and policies in this area reflect this right. These policies are typically delivered as mass media, social norms or social marketing campaigns, education programmes conducted in school and higher education settings, and by the labelling of alcoholic beverages. Evaluation data for mass media, social marketing and social norms campaigns is often available but not always in a form that meets the standards required for academic publishing. Further, the published evaluations tend to use poor quality designs and lack the detail required to support confident conclusions on effectiveness and cost-effectiveness.[3,26,125–127] However, well-executed campaigns attaining high public exposure are sufficient for raising awareness, particularly for the links between alcohol consumption and cancer.[128] Industry sponsored messages and campaigns are reported to be ineffective.[26,129–131] Emerging research evaluating voluntary, temporary, abstinence-based challenges such as ‘Dry January’ suggested this is associated with change toward healthier drinking.[132]

Alcohol education programmes in schools and higher education settings are a popular intervention, but their effectiveness is poorly supported by the evidence,[3,133–135] so are not cost-effective.[26] Reported beneficial effects tend to be seen only in the short-term, and are often not replicated.

The principles underpinning the effect of information labels on behaviour change have been firmly established for tobacco and food. Health warning messages on tobacco products have

led to lower initiation and increased cessation rates,[136] and nutrition labels on pre-packaged foods guide consumers towards healthier choices.[137] Evaluations of labels on alcoholic beverages report that this information increases consumer awareness but are insufficient to change alcohol consumption.[138–144] Nonetheless, evaluations rely largely on voluntary action by industry, or poorly-implemented mandatory labels in the United States of America (USA). Neither the label content, nor its form, are stipulated sufficiently and these are important aspects of an effective health warning.[145,146]

In England, alcohol labelling is subject to a voluntary agreement between industry and government. In 2011, industry signatories pledged to ensure that 80% of alcohol products would have clear, legible labelling consisting of information on alcohol units, government consumption guidelines and a pregnancy warning. Despite signatories meeting this pledge, only 57% of labels met best practice as defined by the Portman Group.[147] This was mirrored by a previous evaluation of a voluntary agreement in 2007, where there was widespread non-compliance with only 2% of samples using the agreed format.[148] The use of small fonts and small labels with poor tonal contrast, colours and backgrounds may have obscured many messages. Similar circumvention is seen with industry 'drink responsibly' messages,[129,144] and the OECD concludes that *"the delivery of education messages by private sponsors [is found to] have no significant public health effects"*,[26] a view echoed by the British Medical Association,[131] and confirmed by empirical evidence.[130]

Despite alcohol's high calorific value,[149] there are no voluntary or mandated agreements to display nutritional information on alcoholic beverages in the UK. Yet alcohol accounts for nearly 10% of the calorie intake amongst adults who drink.[149] Against a backdrop of increasing liver disease and obesity,[7] and with recognition of the synergistic impact of obesity and alcohol consumption on liver disease,[150] the absence of research literature on nutritional labelling of alcohol is noteworthy.

The overarching finding that providing information and education does not produce sustained behavioural changes may arise from the fact it is delivered in an environment with widespread and unrestricted marketing of alcohol.[125] The alcohol industry attempts to *"reinforce and exaggerate strong pro-alcohol social norms"* [131] which have the power to overshadow health information campaigns.[125]

POLICY AREA E: MANAGING THE DRINKING ENVIRONMENT

The night time economy provides local employment, economic investment and regeneration, but these areas are known to be associated with heavy drinking, and high levels of acute alcohol-related harm.[107,151,152] Excessive drinking damages health, while managing nightlife drunkenness and associated problems places demands on police, local authorities, and health services.[153–155] The prevalence of harm within these areas merits a specific focus for the implementation of relevant interventions. Many of these interventions are viable for local implementation, however may be resource-intensive and few studies carry out health economic evaluations.

Community-based multicomponent programmes typically mobilise communities, increase enforcement activity and improve serving practices and standards of licensed premises, in an attempt to coordinate and strengthen local prevention activity. The existing research literature is characterised by studies with methodological shortcomings[156–159] however, a well-implemented and evaluated programme in Stockholm reports that these programmes can reduce the sale of alcohol to intoxicated customers, and police-recorded violent crime.[160,161] The latter permeated wider to neighbouring areas.[161] The programme was cost-effective, saving €39 for every €1 invested,[162] and a large-scale roll-out was demonstrated suggesting, the intervention is highly feasible.[160] Emerging evaluations of similar approaches in England also report reductions in the propensity to serve alcohol to those who are intoxicated.[163]

Server training educates servers of alcohol about the harms of serving alcohol to those who are under-age or intoxicated, and while based on solid principle, no strong evidence has emerged of their effectiveness.[3,158,164,165] When training increases knowledge and reduces the self-reported propensity to over-serve, the impact is generally small. Larger beneficial effects are reported for server liability, which holds servers legally responsible for harm caused by their customers, yet implementation is expensive and there are issues regarding burden of proof.[166] Increasing policing and enforcement also brings about small reductions in sales to underage or intoxicated customers in the short term,[158] however the cost of these resources is currently overlooked in published evaluations.

In the UK, glassware and bottles can cause injury to customers and staff and represented £4·08 million in victim compensation costs between 1996 and 1998.[167] Replacing glassware with plastic alternatives is a rational response, although empirical evidence does not demonstrate that this substantially reduces violence or police-recorded crime, largely due to the small numbers of observations included in current studies.[168,169] In practice, many establishments use glass alternatives, which is included as an example of good practice in the guidance for UK licensing conditions.[170]

While most interventions in the night time economy are carried out in and around on-licensed premises, some interventions have focused on the harm associated with off-trade alcohol purchases. An example is the voluntary agreement by local retailers to remove the sale of high-strength alcohol products, mostly defined as those that are stronger than 6·5% alcohol by volume (ABV). Over a period of one year in Manchester, removing the sale of high-strength alcohol was associated with greater reductions in alcohol-related crime and antisocial behavior relative to areas that continued to sell high-strength alcohol.[171] The scheme was reliant on the ability to deploy resources from the local neighborhood teams, and its effectiveness may be undermined if alcohol is readily available from nearby areas.

Public drinking bans, operationalised in England as Designated Public Place Orders, are implemented to address crime and disorder in public places that is caused by street drinking, and do not aim to reduce alcohol consumption per se. Low quality evidence shows these spatial restrictions negatively impact on marginalised groups, particularly the homeless, and can result in displacement to more covert and less safe places.[172]

POLICY AREA F: PREVENTING DRINK-DRIVING

There is a direct relationship between the quantity of alcohol consumed and the ability to drive safely,[173] with an increased risk of crash occurring above a dose of about 40mg of alcohol per 100ml of blood[174] (Figure 7). The current English drink-driving limit is 80mg. This level is associated with a risk of fatality 13 times greater than that for zero consumption.[174] Typical legal limits in Europe are 50mg or lower.[175]

[FIGURE 7 HERE]

Policies that aim to prevent drink-driving utilise statutory measures that are rooted in the principles of deterrence and law obedience. Some additional non-statutory approaches have been used, which aim to inform people of the risks of drink-driving and to adopt safer alternatives. Despite these approaches, some drivers continue to reoffend or are involved in further crashes. Specific interventions directed at this group have been developed with the aim of reducing reoffending.

High quality evidence supports setting and enforcing a legal blood alcohol concentration (BAC) limit for drivers and applying a penalty if the law is broken.[173,176–184] Estimates for Great Britain report that lowering the legal BAC limit from 80mg to 50mg would avert about 25 deaths and 100 serious injuries each year,[184] and the beneficial impact of these policies is seen soon after implementation.[173,183] Increasing the punishment for driving over the legal limit by immediately revoking a person's licence upon failing a breath test reduces crashes across all levels of BAC to a greater degree than punishments that are determined by judicial review.[176,179,180] Few health economic evaluations were identified for drink-driving

policies, however a review of the cost-effectiveness of breath testing reports benefit-cost ratios ranging from 2:1 to 57:1.[182]

In some countries, the legal BAC limit is set lower for different population groups such as young or commercial drivers.[177] These lower limits can be implemented alongside other restrictions such as driving curfews, and passenger restrictions.[185] Median reductions of 8-14% among young drivers are observed in graduated driver programmes,[186,187] with a scheme averting as many as 47% of injuries in young drivers in Great Britain, equivalent to savings of up to £849 million per year.[188]

Mass media campaigns are commonly used to inform people of the risks and punishments associated with drink-driving, and in countries with existing drink-driving prevention activities, reduce drink-driving, and alcohol-related road traffic crashes.[189,190] These campaigns can be cost-effective, despite the high costs of development and implementation,[190] and may have additional positive impacts by playing an 'agenda setting' role and influencing public perceptions.[190]

Designated driver programmes can be enacted at the population level, for example a campaign that encourages designated driver use, or can be carried out in drinking establishments where people are given incentives to act as designated drivers. Analysis of self-reported data showed that a population programme increased the propensity to use a designated driver, however did not change the prevalence of people drink-driving or riding with a drink-driver.[191] Mixed effects were reported for incentive programmes and inexplicably, one study showed that at post-test, there were increases in the proportions of customers reporting "always" and "never" having selected a designated driver.

Despite the approaches that are in place in many OECD countries, some drivers with drink-driving convictions continue to drink-drive, and are re-arrested or involved in further crashes. Policies with the specific aim of preventing drink-driving reoffending include alcohol ignition interlocks, and preventive education programmes.

Alcohol ignition interlocks are installed in a vehicle and measure the driver's alcohol consumption using breath testing. In order to start the engine, the driver must provide a valid sample and subsequent samples at the random request of the device. Invalid samples are logged and an alarm is triggered until the engine is switched off. Ignition interlocks reduce reoffending in both first time and repeat offenders, and can be cost-effective.[192–194] If the device is uninstalled, reoffending rates return to those prior to installation.

Preventive education programmes focus on increasing awareness of the impact of alcohol on driving and provide advice for changing behaviour. Some evaluations have demonstrated reductions in drink-driving reoffending associated with these programmes, however it is difficult to ascertain their independent effect as many programmes include additional components.[195]

POLICY AREA G: BRIEF INTERVENTIONS AND TREATMENT

In a diverse range of settings, identification and brief advice (IBA) involves the administration of a screening questionnaire about current drinking patterns, followed by advice and information. Although their exact content varies, core features are that they are delivered by generalist health care workers, target a population of non-treatment seeking drinkers, and aim to reduce alcohol consumption.

Primary health care is the most extensively studied setting for the evaluation of IBA, and reviews and meta-analyses consistently report that IBA reduces hazardous and harmful consumption at six and 12 months.[196–200] Modelling the delivery of IBA to every patient at their next registration with a new general practitioner (GP) in England estimates that over 20 years IBA reduces alcohol-related deaths by almost 2,500, and alcohol-related hospital admissions by almost 125,000.[63] Those in the lowest socioeconomic groups experience the greatest absolute reduction in harm but the lowest relative reduction, because they have a higher baseline level of alcohol-related harm. This delivery is cost-saving with net savings estimated at £282 million,[63] a finding supported by a systematic review.[201]

Similar findings are reported in studies of IBA in the criminal justice setting and electronic IBA studies, however reductions in hazardous and harmful consumption are seen only in the short-term.[202,203] Broadly, reviews report that workplace IBA is effective, however it is not clear for which type of employee IBA may be most beneficial.[204] Furthermore, employees may be anxious about the potentially negative consequences of self-disclosing heavy drinking to their employer. The effectiveness and appropriate screening tool and setting for IBA in adolescents is currently not clear.[205]

Meta-analyses report that IBA in emergency departments is effective at reducing mean weekly alcohol consumption at six and 12 months ,[200,206] however a pragmatic multicentre cluster RCT in England suggested that delivering IBA in a typical emergency department setting might be difficult without significant additional external staff support.[207]

A literature review found little empirical support for the effectiveness of IBA in community pharmacies,[208] mirrored by a pragmatic RCT carried out in England.[209] While there were no methodological concerns with the latter, it is possible that the pharmacists were undertrained in the delivery of IBA. There is also a small evidence base that reports that IBA is not effective or cost-effective within a sexual health setting.[210]

For specialist treatment, the National Institute for Health and Care Excellence (NICE) has published national guidelines for the treatment of harmful and dependent drinking, which includes a review and pooled analysis of treatment effectiveness.[211] The approaches are broadly categorised as pharmacological or psychosocial.

NICE reviewed 12 different psychosocial therapies for effectiveness in reducing harmful and dependent drinking.[211] Broadly, evidence supported the use of couples therapy, cognitive behavioural therapy, social behaviour and network therapy (SBNT), and behavioural therapies over control conditions and other active interventions. NICE identified an Australian study which reported that motivational enhancement therapy (MET) was cost-effective compared to control, confirmed by a UK study that used SBNT as the comparator.

In the UK study, at 12 months, combining costs and QALYs, the MET groups had an incremental cost-effectiveness ratio (ICER) of £18,230 compared to SBNT, and had a 58% probability of being more cost effective than SBNT. A further study reported that MET had the largest potential for healthcare savings over three years, however coping and skills training, a therapy called behavioural self-control training (BSCT), and marital or family therapy all demonstrated net savings ranging from about £274,000 for coping and skills training to about £80,450 for BSCT compared to standard care.

NICE reviewed four pharmacological therapies which aim to prevent relapse back to dependent or heavy drinking.[211,212] Acamprosate, naltrexone, and nalmefene were endorsed, while disulfiram was not due to lower quality research and a greater potential for harm. NICE proposed that pharmacological treatments should be delivered in combination with psychosocial support.

In comparison with standard care, acamprosate resulted in net healthcare savings of about £68,900, mirrored by a German study, while naltrexone and disulfiram resulted in net economic costs of about £83,400 and £153,200 respectively.[211] An Australian study reported conjunctive naltrexone and counselling was cost-effective compared to standard care only, reporting an ICER of about AU$13,000.

Conjunctive nalmefene with a psychosocial intervention averted about 4,900 alcohol-related disease and injuries and 250 deaths per 100,000 patients compared to a psychosocial intervention alone, at five years.[212] A larger gain of QALYs with nalmefene was observed compare to psychosocial interventions alone (0·071 QALYs).

[TABLE 1 HERE]

DISCUSSION

An extensive number of policies exist that seek to mitigate the health, social and, economic harms caused by alcohol. While these policies vary in their effectiveness and cost-

effectiveness, the evidence supports policies that reduce the affordability of alcohol as the most effective and cost-effective approach to prevention and health improvement. Increases in taxation, for example, increase government revenue, and deliver substantial health and social returns.[43,63] The combination of tax increases and setting a MUP are estimated to lead to substantial reductions in harm and increases in government revenue, greater than what can be achieved by a MUP in isolation. Additionally, robust marketing regulations are strongly supported by the evidence base, particularly those which reduce the levels of exposure in children.[29,85,105,111,213,214] Like taxation, marketing regulations return large health benefits, and have the potential to change drinking behaviour at an early age, thus preventing later problems.

Policies that sufficiently reduce the hours during which alcohol is available for sale, particularly late night on-trade sale, can substantially reduce the public health burden of alcohol[111] and are cost-effective when simultaneously enforced and targeted at the most densely populated areas.[26] While there is a clear relationship between the density of alcohol outlets and social disorder, the research is more mixed for other outcomes and causation is unclear.

Other interventions supported by the evidence include health interventions aimed at drinkers who are already at risk such as IBA, and specialist treatment for people with harmful drinking patterns and dependence.[197,198,200] Both show favourable returns on investment, however their success depends on large-scale implementation and dedicated treatment staffing and funding streams, without which they are less effective.

Enforced legislative measures to prevent drink-driving are effective and cost-effective[173,177–179,182] but in England are estimated to lead to minimal public health gains compared to policies such as taxation. Nonetheless, reducing drink-driving is an intrinsically desirable societal goal. Both should be considered complementary components to a wider strategy that aims to influence drinkers to adopt less risky patterns of alcohol consumption.

Although it plays an important role in increasing knowledge and awareness, there is little high quality evidence to suggest that providing information and education is sufficient to lead to substantial and lasting reductions in alcohol-related harm[3,126,127] and education programmes are not cost-effective.[26] However, these policies increase public support for more stringent (and effective) policies.[124] Finally, labels on alcoholic beverages may not change drinking behavior, but consumers have a right to be better informed. These policies should be considered as an important component in any overall policy approach.

At best, interventions enacted in and around the drinking environment lead to small reductions in acute alcohol-related harm. But their implementation is resource intensive and many of their benefits could be achieved by wider environmental policies. Multicomponent community programmes have proven effectiveness and cost-effectiveness,[160–162] and are amenable to local implementation. Other interventions in this policy area, while not firmly supported by the evidence, may be enacted based on solid principle, such as the use of safer glassware alternatives.

The OECD suggests that combining alcohol polices may create a 'critical mass' effect, changing social norms around drinking to increase the impact on alcohol-related harm.[26] A similar notion is demonstrated by USA research where stronger overall policy environments are found to be associated with lower levels of binge drinking and alcohol-related cirrhosis mortality. [215,216] Together, this supports an overall policy approach that is coherent and consistent. For example, warning labels highlighting the risks of alcohol consumption should not be undermined by a unit price that encourages heavy consumption. Such consistency is essential to creating a supportive environment for society, including for those who wish to adopt healthier lifestyles by reducing their alcohol consumption, and for those who drink at hazardous and dependent levels. The challenge for policy makers is implementing the most effective and cost-effective set of policies for the English context. This review provides evidence to identify those policies.

ACKNOWLEDGMENTS

The authors kindly acknowledge Alanna Wolff for administrative support for the review and production of this report. We also thank the members of our expert advisory group for their input and guidance during the various stages of this work. We further thank the contributors to this work who supplied specific input as needed and other colleagues who provided their support throughout as follows: Iain Armstrong, Anne Brice, Qasim Chowdary, Brian Eastwood, Bernie Hannigan, Tim Lowden, Kulvir Randhawa, Matt Walmsley, Helen Willey, Ian Williams, Rebecca Worboys, and Sacha Wyke

REFERENCES

1 Rose G. Sick Individuals and Sick Populations. *Int J Epidemiol* 1985; **14**: 32–8.

2 Rose G, Day S. The population mean predicts the number of deviant individuals. *BMJ* 1990; **301**: 1031–4.

3 Martineau F, Tyner E, Lorenc T, Petticrew M, Lock K. Population-level interventions to reduce alcohol-related harm: an overview of systematic reviews. *Prev Med* 2013; **57**: 278–96.

4 Sheron N, Gilmore I. Effect of policy, economics, and the changing alcohol marketplace on alcohol related deaths in England and Wales. *BMJ* 2016; : 353.

5 Alcohol: First Report of Session 2009-10, Volume 1. House of Commons Health Committee, 2010 http://www.publications.parliament.uk/pa/cm200910/cmselect/cmhealth/151/15102.htm.

6 Meng Y, Holmes J, Hill-McManus D, Brennan A, Meier PS. Trend analysis and modelling of gender-specific age, period and birth cohort effects on alcohol abstention and consumption level for drinkers in Great Britain using the General Lifestyle Survey 1984–2009. *Addiction* 2014; **109**: 206–15.

7 Williams R, Aspinall R, Bellis M, *et al.* Addressing liver disease in the UK: a blueprint for attaining excellence in health care and reducing premature mortality from lifestyle issues of excess consumption of alcohol, obesity, and viral hepatitis. *Lancet* 2014; **384**: 1953–97.

8 Health Survey for England 2014. Chapter 8: Adult alcohol consumption. 2015 http://www.hscic.gov.uk/catalogue/PUB19295/HSE2014-ch8-adult-alc-con.pdf.

9 Forouzanfar MH, Alexander L, Anderson HR, *et al.* Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2015; **386**: 2287–323.

10 Global status report on alcohol and health 2014. World Health Organisation, 2014 http://apps.who.int/iris/bitstream/10665/112736/1/9789240692763_eng.pdf?ua=1.

11 Taylor B, Irving H, Kanteres F, *et al.* The more you drink the harder you fall: a systematic review and meta-analysis of how acute alcohol consumption and injury or collision risk increase together. *Drug Alcohol Depend* 2010; **110**: 108–16.

12 Bagnardi V, Rota M, Botteri E, *et al.* Alcohol consumption and site specific cancer risk: a comprehensive dose-response meta-analysis. *Br J Cancer* 2015; **112**: 580–93.

13 International classification of diseases and related health problems, 10th revision. Geneva: World Health Organization, 2007.

14 Rehm J, Taylor B, Mohapatra S, *et al.* Alcohol as a risk factor for liver cirrhosis: A systematic review and meta-analysis. *Drug Alcohol Rev* 2010; **29**: 437–45.

15 Henkel D. Unemployment and substance use: a review of the literature (1990-2010). *Curr Drug Abuse Rev* 2011; **4**: 4–27.

16 Darvishi N, Farhadi M, Haghtalab T, Poorolajal J. Alcohol-Related Risk of Suicidal Ideation, Suicide Attempt, and Completed Suicide: A Meta-Analysis. *PLoS ONE* 2015; **10**: e0126870.

17 Hrubec Z, Omenn GS. Evidence of genetic predisposition to alcoholic cirrhosis and psychosis: twin concordances for alcoholism and its biological end points by zygosity among male veterans. *Alcohol Clin Exp Res* 1981; **5**: 207–15.

18 Jones L, McCoy E, Bates G, Bellis M, Sumnall H. Understanding the alcohol harm paradox in order to focus the development of interventions | Centre for Public Health. 2015. http://www.cph.org.uk/publication/understanding-the-alcohol-harm-paradox-in-order-to-focus-the-development-of-interventions/ (accessed May 5, 2015).

19 Public Health England. Local Alcohol Profiles for England 2015 user guide. 2015 http://www.lape.org.uk/downloads/LAPE%20User%20Guide_Final.pdf (accessed June 15, 2015).

20 Government's Alcohol Strategy. Third Report of Session 2012–13. Volume I: Report, together with formal minutes and oral and written evidence. House of Commons Health Committee, 2012 http://www.publications.parliament.uk/pa/cm201213/cmselect/cmhealth/132/132.pdf.

21 Rehm J, Mathers C, Popova S, Thavorncharoensap M, Teerawattananon Y, Patra J. Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *The Lancet* 2009; **373**: 2223–33.

22 Navarro H, Doran C, Shakeshaft A. Measuring costs of alcohol harm to others: a review of the literature. *Drug Alcohol Depend* 2011; **114**: 87–99.

23 Calling time: the nation's drinking as a major health issue. The Academy of Medical Sciences, 2004 http://www.acmedsci.ac.uk/policy/policy/calling-time-the-nations-drinking-as-a-major-health-issue/.

24 Babor T, Caetano R, Casswell S, *et al.* Alcohol: no ordinary commodity: research and public policy. Oxford University Press., 2010.

25 First Global Ministerial Conference on Healthy Lifestyles and Noncommunicable Disease Control. Moscow: World Health Organisation, 2011 http://www.who.int/nmh/publications/who_bestbuys_to_prevent_ncds.pdf.

26 Tackling Harmful Alcohol Use. Organisation for Economic Co-operation and Development, 2015 http://www.keepeek.com/Digital-Asset-Management/oecd/social-issues-migration-health/tackling-harmful-alcohol-use_9789264181069-en#page1.

27 Guyatt GH, Oxman AD, Vist GE, *et al.* GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ* 2008; **336**: 924–6.

28 Guyatt GH, Oxman AD, Vist G, *et al.* GRADE guidelines: 4. Rating the quality of evidence--study limitations (risk of bias). *J Clin Epidemiol* 2011; **64**: 407–15.

29 Anderson P, Chisholm D, Fuhr D. Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. *Lancet* 2009; **373**: 2234–46.

30 Dhalwani N. A Review of Alcohol Pricing and its Effects on Alcohol Consumption and Alcohol-Related Harm. *JPMS* 2011; **1**. http://www.jpmsonline.com/jpms-vol1-issue1-pages23-27-ra.html (accessed Feb 18, 2016).

31 Elder RW, Lawrence B, Ferguson A, *et al.* The effectiveness of tax policy interventions for reducing excessive alcohol consumption and related harms. *Am J Prev Med* 2010; **38**: 217–29.

32 Fogarty J. The demand for beer, wine and spirits: insights from a meta-analysis approach. American Association of Wine Economists, 2008 http://www.wine-economics.org/aawe/wp-content/uploads/2012/10/AAWE_WP31.pdf.

33 Gallet C. The demand for alcohol: a meta-analysis of elasticities. *Aust J Agric Resour Econ* 2007; **51**: 121–35.

34 Wagenaar A, Salois M, Komro K. Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies. *Addiction* 2009; **104**: 179–90.

35 Wagenaar A, Tobler A, Komro K. Effects of alcohol tax and price policies on morbidity and mortality: a systematic review. *Am J Public Health* 2010; **100**: 2270–8.

36 Xu X, Chaloupka FJ. The effects of prices on alcohol use and its consequences. *Alcohol Res Health J Natl Inst Alcohol Abuse Alcohol* 2011; **34**: 236–45.

37 Statistics on Alcohol England, 2015. Health & Social Care Information Centre, 2015 http://www.hscic.gov.uk/catalogue/PUB17712/alc-eng-2015-rep.pdf.

38 Meng Y, Brennan A, Purshouse R, *et al.* Estimation of own and cross price elasticities of alcohol demand in the UK-A pseudo-panel approach using the Living Costs and Food Survey 2001-2009. *J Health Econ* 2014; **34**: 96–103.

39 Meier PS, Purshouse R, Brennan A. Policy options for alcohol price regulation: the importance of modelling population heterogeneity. *Addiction* 2010; **105**: 383–93.

40 Ayyagari P, Deb P, Fletcher J, Gallo W, Sindelar JL. Understanding heterogeneity in price elasticities in the demand for alcohol for older individuals. *Health Econ* 2013; **22**: 89–105.

41 Cobiac L, Vos T, Doran C, Wallace A. Cost-effectiveness of interventions to prevent alcohol-related disease and injury in Australia. *Addiction* 2009; **104**: 1646–55.

42 Lhachimi SK, Cole KJ, Nusselder WJ, *et al.* Health impacts of increasing alcohol prices in the European Union: A dynamic projection. *Prev Med* 2012; **55**: 237–43.

43 Angus C, Gillespie D, Ally AK, Brennan A. Modelling the impact of Minimum Unit Price and Identification and Brief Advice policies using the Sheffield Alcohol Policy Model Version 3. 2015. https://www.shef.ac.uk/polopoly_fs/1.661445!/file/Final_mup_iba_report.pdf.

44 Budget 2013: Policy costings. HM Government, 2013 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/221895/budget2013_policy_costings.pdf.

45 Budget 2014: Policy costings. HM Government, 2014 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/295067/PU1638_policy_costings_bud_2014_with_correction_slip.pdf.

46 Budget 2015: Policy costings. HM Government, 2015 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/413895/Policy_Costings_18_00.pdf.

47 Leicester A. Alcohol pricing and taxation policies. IFS Briefing Note BN124. Institute of Fiscal Studies, 2011 http://www.ifs.org.uk/bns/bn124.pdf.

48 Alcohol, Health Inequalities and the Harm Paradox: Why some groups face greater problems despite consuming less alcohol. Institute of Alcohol Studies, 2014 http://www.ias.org.uk/uploads/pdf/IAS%20reports/IAS%20report%20Alcohol%20and%20health%20inequalities%20FULL.pdf (accessed Dec 18, 2014).

49 Meier PS, Holmes J, Angus C, Ally AK, Meng Y, Brennan A. Estimated Effects of Different Alcohol Taxation and Price Policies on Health Inequalities: A Mathematical Modelling Study. *PLoS Med* 2016; **13**. DOI:10.1371/journal.pmed.1001963.

50 Rabinovich L, Staetsky L, Goshev S, Nolte E, Pederson J, Tiefensee C. Further study on the affordability of alcoholic beverages in the EU - A focus on excise duty pass-through, on- and off-trade sales, price promotions and statutory regulations. RAND Corporation, 2012 http://www.rand.org/pubs/technical_reports/TR1203.html.

51 Ally AK, Meng Y, Chakraborty R, *et al.* Alcohol tax pass-through across the product and price range: do retailers treat cheap alcohol differently? *Addiction* 2014; **109**: 1994–2002.

52 Holmes J, Meng Y, Meier PS, *et al.* Effects of minimum unit pricing for alcohol on different income and socioeconomic groups: a modelling study. *Lancet* 2014; **383**: 1655–64.

53 Purshouse RC, Meier PS, Brennan A, Taylor KB, Rafia R. Estimated effect of alcohol pricing policies on health and health economic outcomes in England: an epidemiological model. *Lancet* 2010; **375**: 1355–64.

54 Sharma A, Etilé F, Sinha K. The Effect of Introducing a Minimum Price on the Distribution of Alcohol Purchase: A Counterfactual Analysis. *Health Econ* 2016; **25**: 1182–200.

55 Sharma A, Vandenberg B, Hollingsworth B. Minimum Pricing of Alcohol versus Volumetric Taxation: Which Policy Will Reduce Heavy Consumption without Adversely Affecting Light and Moderate Consumers? *PLoS ONE* 2014; **9**: e80936.

56 Crawford MJ, Parry AMH, Weston ARW, *et al.* Relationship between price paid for off-trade alcohol, alcohol consumption and income in England: a cross-sectional survey. *Alcohol Alcohol* 2012; **47**: 738–42.

57 Forsyth AJM, Ellaway A, Davidson N. How Might the Alcohol Minimum Unit Pricing (MUP) Impact upon Local Off-Sales Shops and the Communities Which They Serve? *Alcohol Alcohol* 2014; **49**: 96–102.

58 Angus C, Holmes J, Pryce R, Meier P, Brennan A. Model-based appraisal of the comparative impact of Minimum Unit Pricing and taxation policies in Scotland. An adaptation of the Sheffield Alcohol Policy Model version 3. University of Sheffield, 2016 https://www.shef.ac.uk/polopoly_fs/1.565373!/file/Scotland_report_2016.pdf.

59 Stockwell T, Zhao J, Giesbrecht N, Macdonald S, Thomas G, Wettlaufer A. The Raising of Minimum Alcohol Prices in Saskatchewan, Canada: Impacts on Consumption and Implications for Public Health. *Am J Public Health* 2012; **102**: e103–10.

60 Stockwell T, Zhao J, Martin G, *et al.* Minimum alcohol prices and outlet densities in British Columbia, Canada: estimated impacts on alcohol-attributable hospital admissions. *Am J Public Health* 2013; **103**: 2014–20.

61 Stockwell T, Zhao J, Marzell M, *et al.* Relationships Between Minimum Alcohol Pricing and Crime During the Partial Privatization of a Canadian Government Alcohol Monopoly. *J Stud Alcohol Drugs* 2015; **76**: 628–34.

62 Zhao J, Stockwell T, Martin G, *et al.* The relationship between minimum alcohol prices, outlet densities and alcohol-attributable deaths in British Columbia, 2002–09. *Addiction* 2013; **108**: 1059–69.

63 Angus C, Ally AK. Modelling the potential impact of duty policies using the Sheffield Alcohol Policy Model Version 3. 2015 https://www.shef.ac.uk/polopoly_fs/1.661443!/file/finaldurymodellingrpt.pdf.

64 Brennan A, Meng Y, Holmes J, Hill-McManus D, Meier P. Potential benefits of minimum unit pricing for alcohol versus a ban on below cost selling in England 2014: modelling study. *Br Med J* 2014; **349**. DOI:10.1136/bmj.g5452.

65 Adams J, Beenstock J. Price Discounts on Alcohol in a City in Northern England. *Alcohol Alcohol* 2012; **47**: 187–90.

66 Nakamura R, Suhrcke M, Pechey R, Morciano M, Roland M, Marteau TM. Impact on alcohol purchasing of a ban on multi-buy promotions: a quasi-experimental evaluation comparing Scotland with England and Wales. *Addict Abingdon Engl* 2013; **109**: 558–67.

67 Robinson M, Geue C, Lewsey J, *et al.* Evaluating the impact of the alcohol act on off-trade alcohol sales: a natural experiment in Scotland. *Addiction* 2014; **109**: 2035–43.

68 Meier P, Brennan A, Purshouse R, Taylor K, Rafia R. Independent Review of the Effects of Alcohol Pricing and Promotion: Part B. Modelling the Potential Impact of Pricing and Promotion Policies for Alcohol in England: Results from the Sheffield Alcohol Policy Model Version 2008(1-1). School of Health and Related Research, 2009 https://www.shef.ac.uk/polopoly_fs/1.95621!/file/PartB.pdf.

69 Sassi F, Belloni A, Capobianco C. The Role of Fiscal Policies in Health Promotion. OECD Health Working Papers, 2013.

70 Chick J, Gill J. Alcohol pricing and purchasing among heavy drinkers in Edinburgh and Glasgow Current trends and implications for pricing policies. Alcohol Research UK, 2015 http://alcoholresearchuk.org/downloads/finalReports/FinalReport_0128.pdf.

71 Financial report: Annual report 2014. Anheuser-Busch InBev, 2014 http://www.ab-inbev.com/content/dam/universaltemplate/abinbev/pdf/investors/annual-and-hy-reports/2014/AB_InBev_AR14_EN_financial.pdf.

72 Diageo: Annual Report 2015. Diageo, 2015 https://www.diageo.com/Lists/Resources/Attachments/2814/Diageo%20Interactive%20AR2015.pdf.

73 Booth A, Meier P, Stockwell T, Sutton A, Wilkinson A, Wong R. Independent review of the effects of alcohol pricing and promotion. Part A: systematic reviews. School of Health and Related Research, 2008 http://www.sheffield.ac.uk/polopoly_fs/1.95617!/file/PartA.pdf (accessed Nov 3, 2014).

74 Anderson P, de Bruijn A, Angus K, Gordon R, Hastings G. Impact of alcohol advertising and media exposure on adolescent alcohol use: a systematic review of longitudinal studies. *Alcohol Alcohol* 2009; : 1–15.

75 Smith L, Foxcroft D. The effect of alcohol advertising, marketing and portrayal on drinking behaviour in young people: systematic review of prospective cohort studies. *Biomed Cent Public Health* 2009; **9**: 51.

76 Jernigan D, Noel J, Landon J, Thornton N, Lobstein T. Alcohol marketing and youth alcohol consumption: a systematic review of longitudinal studies published since 2008. *Addiction* 2016; : n/a-n/a.

77 Lobstein T, Landon J, Thornton N, Jernigan D. The commercial use of digital media to market alcohol products: a narrative review. *Addiction* 2016; : n/a-n/a.

78 Healey C, Rahman A, Faizal M, Kinderman P. Underage drinking in the UK: Changing trends, impact and interventions. A rapid evidence synthesis. *Int J Drug Policy* 2014; **25**: 124–32.

79 Bellis MA, Phillips-Howard PA, Hughes K, *et al.* Teenage drinking, alcohol availability and pricing: a cross-sectional study of risk and protective factors for alcohol-related harms in school children. *BMC Public Health* 2009; **9**: 380.

80 Best D, Manning V, Gossop M, Gross S, Strang J. Excessive drinking and other problem behaviours among 14-16 year old schoolchildren. *Addict Behav* 2006; **31**: 1424–35.

81 Liang W, Chikritzhs T. Age at first use of alcohol predicts the risk of heavy alcohol use in early adulthood: A longitudinal study in the United States. *Int J Drug Policy* 2015; **26**: 131–4.

82 Traeen B, Kvalem IL. Sex under the influence of alcohol among Norwegian adolescents. *Addict Abingdon Engl* 1996; **91**: 995–1006.

83 Children and young people's exposure to alcohol advertising. Ofcom, 2013 http://stakeholders.ofcom.org.uk/market-data-research/other/tv-research/alcohol-advertising/.

84 Winpenny E, Patil S, Elliott M, *et al.* Assessment of young people's exposure to alcohol marketing in audiovisual and online media. RAND Europe, 2012 http://ec.europa.eu/health/alcohol/docs/alcohol_rand_youth_exposure_marketing_en.pdf (accessed Nov 3, 2014).

85 Holm AL, Veerman L, Cobiac L, Ekholm O, Diderichsen F. Cost-Effectiveness of Preventive Interventions to Reduce Alcohol Consumption in Denmark. *PLoS ONE* 2014; **9**: e88041.

86 Siegfried N, Pienaar D, Ataguba J, *et al.* Restricting or banning alcohol advertising to reduce alcohol consumption in adults and adolescents. *Cochrane Database Syst Rev* 2014. DOI:10.1002/14651858.CD010704.pub2.

87 Ross CS, de Bruijn A, Jernigan D. Do time restrictions on alcohol advertising reduce youth exposure? *J Public Aff* 2012; **13**: 123–9.

88 Patil S, Winpenny EM, Elliott MN, Rohr C, Nolte E. Youth exposure to alcohol advertising on television in the UK, the Netherlands and Germany. *Eur J Public Health* 2014; **24**: 561–5.

89 Brown K. Association Between Alcohol Sports Sponsorship and Consumption: A Systematic Review. *Alcohol Alcohol* 2016; : 1–9.

90 Overexposed—alcohol marketing during the World Cup 2010. Alcohol Concern UK, 2010 http://alcoholireland.ie/download/reports/alcohol_marketing/overexposed-e28093-alcohol-marketing-during-the-world-cup-2010-alcohol-concern-2010.pdf.

91 Nicholls J. Everyday, Everywhere: Alcohol Marketing and Social Media—Current Trends. *Alcohol Alcohol* 2012; **47**: 486–93.

92 Internet users: 2015. Office for National Statistics, 2015 http://www.ons.gov.uk/businessindustryandtrade/itandinternetindustry/bulletins/internetusers/2015.

93 Jones SC, Thom JA, Davoren S, Barrie L. Internet filters and entry pages do not protect children from online alcohol marketing. *J Public Health Pol* 2014; **35**: 75–90.

94 Nash V, O'Connell R, Zevenbergen B, Mishkin A. Effective age verification techniques: Lessons to be learnt from the online gambling industry. Final Report December 2012-December 2013. University of Oxford, 2013 http://www.oii.ox.ac.uk/publications/Effective-Age-Verification-Techniques.pdf.

95 Harris F, MacKintosh AM, Anderson S, *et al.* Effects of the 2003 advertising/promotion ban in the United Kingdom on awareness of tobacco marketing: findings from the International Tobacco Control (ITC) Four Country Survey. *Tob Control* 2006; **15**: iii26-iii33.

96 Henriksen L. Comprehensive tobacco marketing restrictions: promotion, packaging, price and place. *Tob Control* 2012; **21**: 147–53.

97 Hastings G. 'They'll drink bucket loads of the stuff': an analysis of internal alcohol industry advertising documents. The Alcohol Education and Research Council, 2009 http://oro.open.ac.uk/22913/1/AERC_FinalReport_0060.pdf.

98 Noel JK, Babor TF, Robaina K. Industry self-regulation of alcohol marketing: a systematic review of content and exposure research. *Addict Abingdon Engl* 2016; published online May 18. DOI:10.1111/add.13410.

99 Gruenewald PJ, Freisthler B, Remer L, Lascala EA, Treno AJ, Ponicki WR. Ecological associations of alcohol outlets with underage and young adult injuries. *Alcohol Clin Exp Res* 2010; **34**: 519–27.

100 Treno AJ, Johnson FW, Remer LG, Gruenewald PJ. The impact of outlet densities on alcohol-related crashes: a spatial panel approach. *Accid Anal Prev* 2007; **39**: 894–901.

101 Gmel G, Holmes J, Studer J. Are alcohol outlet densities strongly associated with alcohol-related outcomes? A critical review of recent evidence. *Drug Alcohol Rev* 2015; : 40–54.

102 Holmes J, Guo Y, Maheswaran R, Nicholls J, Meier PS, Brennan A. The impact of spatial and temporal availability of alcohol on its consumption and related harms: A critical review in the context of UK licensing policies. *Drug Alcohol Rev* 2014; **33**: 515–25.

103 Richardson E, Shortt N, Pearce J, Mitchell R. Alcohol-related illness and death in Scottish neighbourhoods: is there a relationship with the number of alcohol outlets? Alcohol Focus Scotland, 2014 http://www.alcohol-focus-scotland.org.uk/media/65042/Alcohol-outlet-density-and-harm-report.pdf (accessed Nov 19, 2014).

104 Richardson EA, Hill SE, Mitchell R, Pearce J, Shortt NK. Is local alcohol outlet density related to alcohol-related morbidity and mortality in Scottish cities? *Health Place* 2015; **33**: 172–80.

105 Popova S, Giesbrecht N, Bekmuradov D, Patra J. Hours and days of sale and density of alcohol outlets: impacts on alcohol consumption and damage: a systematic review. *Alcohol Alcohol* 2009; **44**: 500–16.

106 Campbell C, Hahn R, Elder R, *et al.* The effectiveness of limiting alcohol outlet density as a means of reducing excessive alcohol consumption and alcohol-related harms. *Am J Prev Med* 2009; **37**: 556–69.

107 Livingston M, Chikritzhs T, Room R. Changing the density of alcohol outlets to reduce alcohol-related problems. *Drug Alcohol Rev* 2007; **26**: 557–66.

108 Middleton J, Hahn R, Kuzara J, *et al.* Effectiveness of policies maintaining or restricting days of alcohol sales on excessive alcohol consumption and related harms. *Am J Prev Med* 2010; **39**: 575–89.

109 Hahn R, Kuzara J, Elder R, *et al.* Effectiveness of policies restricting hours of alcohol sales in preventing excessive alcohol consumption and related harms. *Am J Prev Med* 2010; **39**: 590–604.

110 Kypri K, McElduff P, Miller P. Restrictions in pub closing times and lockouts in Newcastle, Australia five years on. *Drug Alcohol Rev* 2014; **33**: 323–6.

111 Impacts of changes to trading hours of liquor licences on alcohol-related harm: a systematic review 2005–2015. PHRP. http://www.phrp.com.au/issues/september-2016-volume-26-issue-4/impacts-of-changes-to-trading-hours-of-liquor-licenses-on-alcohol-related-harm-a-systematic-review-2005-2015/ (accessed Nov 9, 2016).

112 Humphreys DK, Eisner MP, Wiebe DJ. Evaluating the Impact of Flexible Alcohol Trading Hours on Violence: An Interrupted Time Series Analysis. *PLoS ONE* 2013; **8**: e55581.

113 Humphreys DK, Eisner MP. Do flexible alcohol trading hours reduce violence? A theory-based natural experiment in alcohol policy. *Soc Sci Med* 2014; **102**: 1–9.

114 Newton A, Sarker SJ, Pahal GS, van den Bergh E, Young C. Impact of the new UK licensing law on emergency hospital attendances: a cohort study. *Emerg Med J* 2007; **24**: 532–4.

115 Durnford AJ, Perkins TJ, Perry JM. An evaluation of alcohol attendances to an inner city emergency department before and after the introduction of the UK Licensing Act 2003. *BMC Public Health* 2008; **8**: 379.

116 Peirce BH, Boyle AA. How has the Licensing Act (2003) changed the epidemiology of assaults presenting to a Cambridgeshire emergency department? Before and after study. *Eur J Emerg Med* 2011; **18**: 351–6.

117 El-Maaytah M, Smith SF, Jerjes W, *et al.* The effect of the new '24 hour alcohol licensing law' on the incidence of facial trauma in London. *Br J Oral Maxillofac Surg* 2008; **46**: 460–3.

118 Jones LA, Goodacre S. Effect of 24-h alcohol licensing on emergency departments: the South Yorkshire experience. *Emerg Med J* 2010; **27**: 688–91.

119 de Vocht F, Heron J, Mooney J, *et al.* Estimating the measurable impact of local alcohol licensing policies on population health in England using ecological longitudinal data. *The Lancet* 2015; **386**: S33.

120 Public Health Responsibility Deal: A8(a). Alcohol Unit Reduction. Department of Health, 2011 https://responsibilitydeal.dh.gov.uk/pledges/pledge/?pl=22 (accessed Nov 19, 2016).

121 Holmes J, Angus C, Meier P. UK alcohol industry's 'billion units pledge': interim evaluation flawed. *BMJ* 2015; **350**: h1301.

122 Knai C, Petticrew M, Durand MA, *et al.* The Public Health Responsibility deal: has a public–private partnership brought about action on alcohol reduction? *Addiction* 2015; **110**: 1217–25.

123 Buykx P, Li J, Gavens L, *et al.* An investigation of public knowledge of the link between alcohol and cancer. University of Sheffield and Cancer Research UK, 2016 http://www.cancerresearchuk.org/sites/default/files/an_investigation_of_public_knowledge_of_the_link_between_alcohol_and_cancer_buykx_et_al.pdf (accessed Nov 9, 2016).

124 Buykx P, Gilligan C, Ward B, Kippen R, Chapman K. Public support for alcohol policies associated with knowledge of cancer risk. *Int J Drug Policy* 2015. DOI:10.1016/j.drugpo.2014.08.006.

125 Wakefield MA, Loken B, Hornik RC. Use of mass media campaigns to change health behaviour. *The Lancet* 2010; **376**: 1261–71.

126 Janssen MM, Mathijssen JJ, van Bon–Martens MJ, van Oers HA, Garretsen HF. Effectiveness of alcohol prevention interventions based on the principles of social marketing: a systematic review. *Subst Abuse Treat Prev Policy* 2013; **8**: 18.

127 Foxcroft DR, Moreira MT, Almeida Santimano NM, Smith LA. Social norms information for alcohol misuse in university and college students. In: Cochrane Database of Systematic Reviews. John Wiley & Sons, Ltd, 2015. http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD006748.pub3/abstract (accessed Dec 17, 2015).

128 Dixon HG, Pratt IS, Scully ML, *et al.* Using a mass media campaign to raise women's awareness of the link between alcohol and cancer: cross-sectional pre-intervention and post-intervention evaluation surveys. *BMJ Open* 2015; **5**: e006511.

129 Drink responsibly (but please keep drinking). Alcohol Concern, 2015 http://www.alcoholconcern.org.uk/wp-content/uploads/woocommerce_uploads/2015/04/39434-ACW-Drink-Responsibly-ENG-FINAL.pdf (accessed Nov 9, 2016).

130 Moss AC, Albery IP, Dyer KR, *et al.* The effects of responsible drinking messages on attentional allocation and drinking behaviour. *Addict Behav* 2015; **44**: 94–101.

131 Under the influence. The damaging effect of alcohol marketing on young people. British Medical Association, 2009 http://www.alcohollearningcentre.org.uk/_library/undertheinfluence_tcm41-1900621.pdf (accessed Nov 19, 2016).

132 de Visser RO, Robinson E, Bond R. Voluntary temporary abstinence from alcohol during 'Dry January' and subsequent alcohol use. *Health Psychol* 2016; **35**: 281–9.

133 Strøm HK, Adolfsen F, Fossum S, Kaiser S, Martinussen M. Effectiveness of school-based preventive interventions on adolescent alcohol use: a meta-analysis of randomized controlled trials. *Subst Abuse Treat Prev Policy* 2014; **9**: 48.

134 Foxcroft DR, Tsertsvadze A. Universal school-based prevention programs for alcohol misuse in young people. *Cochrane Database Syst Rev* 2011; : CD009113.

135 Lynch S, Styles B, Poet H, White R, Bradshaw S, Rabiasz A. Randomised trial evaluation of the In:tuition programme. Alcohol Research UK, 2015 http://alcoholresearchuk.org/downloads/finalReports/FinalReport_0123.pdf (accessed Nov 19, 2016).

136 Hammond D. Health warning messages on tobacco products: a review. *Tob Control* 2011; : tc.2010.037630.

137 Campos S, Doxey J, Hammond D. Nutrition labels on pre-packaged foods: a systematic review. *Public Health Nutr* 2011; **14**: 1496–1506.

138 Stockwell T. A review of research into the impacts of alcohol warning labels on attitudes and behaviour. Centre for Addictions Research, 2006 http://www.uvic.ca/research/centres/carbc/assets/docs/report-impacts-alcohol-warning-labels.pdf (accessed Oct 15, 2016).

139 Wilkinson C, Room R. Warnings on alcohol containers and advertisements: international experience and evidence on effects. *Drug Alcohol Rev* 2009; **28**: 426–35.

140 Parackal SM, Parackal MK, Harraway JA. Warning labels on alcohol containers as a source of information on alcohol consumption in pregnancy among New Zealand women. *Int J Drug Policy* 2010; **21**: 302–5.

141 Scholes-Balog KE, Heerde JA, Hemphill SA. Alcohol warning labels: unlikely to affect alcohol-related beliefs and behaviours in adolescents. *Aust N Z J Public Health* 2012; **36**: 524–9.

142 Tam TW, Greenfield TK. Do Alcohol Warning Labels Influence Men's and Women's Attempts to Deter Others from Driving When Intoxicated? *Hum Factors Ergon Manuf* 2010; **20**: 538–46.

143 Jones S, Gregory P. Health warning labels on alcohol products - the views of Australian university students. *Contemp Drug Probl* 2010; **37**: 109–37.

144 Coomber K, Martino F, Barbour IR, Mayshak R, Miller PG. Do consumers 'Get the facts'? A survey of alcohol warning label recognition in Australia. *BMC Public Health* 2015; **15**: 816.

145 Al-hamdani M. The case for stringent alcohol warning labels: lessons from the tobacco control experience. *J Public Health Policy* 2014; **35**: 65–74.

146 Martin-Moreno JM, Harris ME, Breda J, Møller L, Alfonso-Sanchez JL, Gorgojo L. Enhanced labelling on alcoholic drinks: reviewing the evidence to guide alcohol policy. *Eur J Public Health* 2013; **23**: 1082–7.

147 Petticrew M, Douglas N, Knai C, Durand MA, Eastmure E, Mays N. Health information on alcoholic beverage containers: has the alcohol industry's pledge in England to improve labelling been met? *Addiction* 2015; **111**: 51–5.

148 Anderson P. A safe, sensible and social AHRSE: New Labour* and alcohol policy. *Addiction* 2007; **102**: 1515–21.

149 Obesity and alcohol: an overview. National Obesity Observatory, 2012 http://www.noo.org.uk/uploads/doc/vid_14627_Obesity_and_alcohol.pdf (accessed Nov 9, 2016).

150 Hart CL, Morrison DS, Batty GD, Mitchell RJ, Davey Smith G. Effect of body mass index and alcohol consumption on liver disease: analysis of data from two prospective cohort studies. *BMJ* 2010; **340**: c1240–c1240.

151 Wilkinson C. Raising the Bar: Preventing Aggression in and around Bars, Pubs and Clubs. *Drug Alcohol Rev* 2009; **28**: 696–7.

152 Hughes, K, Quigg Z, Bellis M, *et al.* Drunk and disorganised: relationships between bar characteristics and customer intoxication in European drinking environments. *Int J Environ Res* 2012; **9**: 4068–82.

153 Hughes K, Anderson Z, Morleo M, Bellis MA. Alcohol, nightlife and violence: the relative contributions of drinking before and during nights out to negative health and criminal justice outcomes. *Addict Abingdon Engl* 2008; **103**: 60–5.

154 Anderson Z, Hughes K, Bellis M. Exploration of young people's experience and perceptions of violence in Liverpool's nightlife. 2007 http://www.cph.org.uk/wp-content/uploads/2012/08/exploration-of-young-peoples-experience-and-perceptions-of-violence-in-liverpools-nightlife.pdf (accessed Nov 14, 2016).

155 Drummond C, Phillips T, Coulton S, *et al.* National prevalence survey of alcohol-related attendances at accident and emergency departments in England. *Alcohol Clin Exp Res* 2005; **29**: 36A–36A.

156 Warpenius K, Holmila M, Mustonen H. Effects of a community intervention to reduce the serving of alcohol to intoxicated patrons. *Addict Abingdon Engl* 2010; **105**: 1032–40.

157 Miller P, Sønderlund A, Coomber K, *et al.* Do community interventions targeting licensed venues reduce alcohol-related emergency department presentations? *Drug Alcohol Rev* 2011; **30**: 546–53.

158 Jones L, Hughes K, Atkinson AM, Bellis MA. Reducing harm in drinking environments: A systematic review of effective approaches. *Geogr Care* 2011; **17**: 508–18.

159 Moore S, Alam M, Cohen D, *et al.* All-Wales Licensed Premises Intervention (AWLPI): a randomised controlled trial of an intervention to reduce alcohol-related violence. *BMC Public Health* 2015; : 21.

160 Trolldal B, Brännström L, Paschall MJ, Leifman H. Effects of a multi-component responsible beverage service programme on violent assaults in Sweden. *Addict Abingdon Engl* 2013; **108**: 89–96.

161 Brännström L, Trolldal B, Menke M. Spatial spillover effects of a community action programme targeting on-licensed premises on violent assaults: evidence from a natural experiment. *J Epidemiol Community Health* 2015; : jech-2015-206124.

162 Månsdotter AM, Rydberg MK, Wallin E, Lindholm LA, Andréasson S. A cost-effectiveness analysis of alcohol prevention targeting licensed premises. *Eur J Public Health* 2007; **17**: 618–23.

163 Quigg Z, Ford K, McGee C, Grey H, Hardcastle K, Hughes, K. Evaluation of the Liverpool Drink Less Enjoy More intervention. Liverpool John Moores University, 2016 http://www.cph.org.uk/wp-content/uploads/2016/03/Liverpool-Drink-Less-Enjoy-More-intervention-evaluation-report-March-2016.pdf (accessed Nov 14, 2016).

164 Brennan I, Moore S, Byrne E, Murphy S. Interventions for disorder and severe intoxication in and around licensed premises, 1989–2009. *Addiction* 2011; **106**: 706–13.

165 Danaher BG, Dresser J, Shaw T, *et al.* Development and process evaluation of a Web-based responsible beverage service training program. *Subst Abuse Treat Prev Policy* 2012; **7**: 41.

166 Rammohan V, Hahn R, Elder R, *et al.* Effects of dram shop liability and enhanced overservice law enforcement initiatives on excessive alcohol consumption and related harms: Two community guide systematic reviews. *Am J Prev Med* 2011; **41**: 334–43.

167 Coomaraswamy KS, Shepherd JP. Predictors and severity of injury in assaults with barglasses and bottles. *Inj Prev* 2003; **9**: 81–4.

168 Evaluation of the Lancashire Polycarbonate Glass Pilot Project. Liverpool John Moores University, 2009 http://www.cph.org.uk/wp-content/uploads/2012/08/evaluation-of-the-lancashire-polycarbonate-glass-pilot-project.pdf (accessed Oct 29, 2014).

169 Forsyth A. Banning glassware from nightclubs in Glasgow (Scotland): Observed impacts, compliance and patron's views. *Alcohol Alcohol* 2008; **43**: 111–7.

170 Supporting Guidance - Pools of Conditions. Home Office, 2012 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/181056/Pools_of_conditions_-_supporting_guidance.pdf (accessed May 25, 2016).

171 Burns L, Spurgeon P, McIntosh C, Bardsley A, Oakland K, Bradley J. Manchester City Centre 'Reduce the Strength' Pilot Evaluation Report. Manchester Health and Wellbeing Service, 2014 http://www.festivalofpublichealth.co.uk/programme/2014programme/parallelsessions/lt4-healthpromotionandimprovement/.

172 Pennay A, Room R. Prohibiting public drinking in urban public spaces: A review of the evidence. *Drugs Educ Prev Policy* 2012; **19**: 91–101.

173 Tippetts A, Voas R, Fell J, Nichols J. A meta-analysis of 0.08 BAC laws in 19 jurisdictions in the United States. *Accid Anal Prev* 2005; **37**: 149–61.

174 Blomberg RD, Peck RC, Moskowitz H, Burns M, Fiorentino D. Crash Risk of Alcohol Involved Driving: A Case-Control Study. 2005; published online Sept. http://trid.trb.org/view.aspx?id=804190 (accessed Dec 2, 2014).

175 North P. Report of the Review of Drink and Drug Driving Law. Department for Transport, 2010 http://webarchive.nationalarchives.gov.uk/20100921035225/http:/northreview.independent.gov.uk/docs/NorthReview-Report.pdf (accessed Nov 9, 2016).

176 Asbridge M, Mann R, Smart R, *et al.* The effects of Ontario's administrative driver's license suspension law on total driver fatalities: a multiple time series analysis. *Drugs Educ Prev Policy* 2009; **16**: 140–51.

177 Fell J, Voas R. The effectiveness of reducing illegal blood alcohol concentration (BAC) limits for driving: evidence for lowering the limit to .05 BAC. *J Safety Res* 2006; **37**: 233–43.

178 Shults RA, Elder RW, Sleet DA, *et al.* Reviews of evidence regarding interventions to reduce alcohol-impaired driving. *Am J Prev Med* 2001; **21**: 66–88.

179 Wagenaar AC, Maldonado-Molina MM. Effects of Drivers' License Suspension Policies on Alcohol-Related Crash Involvement: Long-Term Follow-Up in Forty-Six States. *Alcohol Clin Exp Res* 2007; **31**: 1399–406.

180 Ma T, Byrne PA, Haya M, Elzohairy Y. Working in tandem: The contribution of remedial programs and roadside licence suspensions to drinking and driving deterrence in Ontario. *Accid Anal Prev* 2015; **85**: 248–56.

181 Erke A, Goldenbeld C, Vaa T. The effect of drink-driving checkpoints on crashes - a meta-analysis. *Accid Anal Prev* 2009; **41**: 914–23.

182 Bergen G, Pitan A, Qu S, *et al.* Publicized Sobriety Checkpoint Programs: A Community Guide Systematic Review. *Am J Prev Med* 2014; **46**: 529–39.

183 Mann RE, Macdonald S, Stoduto G, Bondy S, Jonah B, Shaikh A. The effects of introducing or lowering legal per se blood alcohol limits for driving: an international review. *Accid Anal Prev* 2001; **33**: 569–83.

184 Allsop R. Saving lives by lowering the legal drink-drive limit. RAC Foundation, 2015 http://www.racfoundation.org/assets/rac_foundation/content/downloadables/saving_lives_by_lowering_legal_drink-drive_limit_Allsop_December_2015.pdf (accessed Nov 9, 2016).

185 Foss RD, Evenson KR. Effectiveness of graduated driver licensing in reducing motor vehicle crashes. *Am J Prev Med* 1999; **16**: 47–56.

186 Hartling L, Wiebe N, Russell K, Petruk J, Spinola C, Klassen TP. Graduated driver licensing for reducing motor vehicle crashes among young drivers. *Cochrane Database Syst Rev* 2004; : CD003300.

187 Russell KF, Vandermeer B, Hartling L. Graduated driver licensing for reducing motor vehicle crashes among young drivers. *Cochrane Database Syst Rev* 2011; : CD003300.

188 Jones S, Begg D, Palmer S. Reducing young driver crash casualties in Great Britain - use of routine police crash data to estimate the potential benefits of graduated driver licensing. *Int J Inj Contr Saf Promot* 2013; **20**: 321–30.

189 Yadav R-P, Kobayashi M. A systematic review: effectiveness of mass media campaigns for reducing alcohol-impaired driving and alcohol-related crashes. *BMC Public Health* 2015; **15**: 857.

190 Elder R, Shults R, Sleet D, Nichols J, Thompson R, Warder Rajab M. Effectiveness of mass media campaigns for reducing drinking and driving and alcohol-involved crashes. *Am J Prev Med* 2004; **27**: 57–65.

191 Ditter S, Elder R, Shults, Sleet D, Compton R, Nichols J. Effectiveness of designated driver programs for reducing alcohol-impaired driving. A systematic review. *Am J Prev Med* 2005; **28**: 280–7.

192 Lahausse JA, Fildes BN. Cost-benefit analysis of an alcohol ignition interlock for installation in all newly registered vehicles. *Traffic Inj Prev* 2009; **10**: 528–37.

193 Willis C, Lybrand S, Bellamy N. Alcohol ignition interlock programmes for reducing drink driving recidivism. *Cochrane Database Syst Rev* 2004; : CD004168.

194 Elder R, Voas R, Beirness D, *et al.* Effectiveness of ignition interlocks for preventing alcohol-related crashes: a community guide. *Am J Prev Med* 2011; **40**: 362–76.

195 Miller PG, Curtis A, Sønderlund A, Day A, Droste N. Effectiveness of interventions for convicted DUI offenders in reducing recidivism: a systematic review of the peer-reviewed scientific literature. *Am J Drug Alcohol Abuse* 2015; **41**: 16–29.

196 Álvarez-Bueno C, Rodríguez-Martín B, García-Ortiz L, Gómez-Marcos MÁ, Martínez-Vizcaíno V. Effectiveness of brief interventions in primary health care settings to decrease alcohol

consumption by adult non-dependent drinkers: a systematic review of systematic reviews. *Prev Med*; : S33-8.

197 Kaner E, Bland M, Cassidy P, *et al.* Effectiveness of screening and brief alcohol intervention in primary care (SIPS trial): pragmatic cluster randomised control trial. *Br Med J* 2013; **346**. DOI:10.1136/bmj.e8501.

198 Kaner E, Dickinson H, Beyer F, *et al.* Effectiveness of brief alcohol interventions in primary care populations. *Cochrane Database Syst Rev* 2007; **18**. DOI:CD004148.

199 Jonas DE, Garbutt JC, Amick HR, *et al.* Behavioral Counseling After Screening for Alcohol Misuse in Primary Care: A Systematic Review and Meta-analysis for the U.S. Preventive Services Task Force. *Ann Intern Med* 2012; **157**: 645–54.

200 Elzerbi C, Donoghue K, Drummond C. A comparison of the efficacy of brief interventions to reduce hazardous and harmful alcohol consumption between European and non-European countries: a systematic review and meta-analysis of randomised controlled trials. *Addiction* 2015; **110**: 1082–9.

201 Angus C, Latimer N, Preston L, Li J, Purshouse R. What are the implications for policy makers? A systematic review of the cost-effectiveness of screening and brief interventions for alcohol misuse in primary care. *Front Psychiatry* 2014; **5**: 114.

202 Newbury-Birch D, Coulton S, Bland M, *et al.* Alcohol screening and brief interventions for offenders in the probation setting (SIPS Trial): a pragmatic multicentre cluster randomized controlled trial. *Alcohol Alcohol* 2014; **49**: 540–8.

203 Donoghue K, Patton R, Phillips T, Deluca P, Drummond C. The Effectiveness of Electronic Screening and Brief Intervention for Reducing Levels of Alcohol Consumption: A Systematic Review and Meta-Analysis. *J Med Internet Res* 2014; **16**: e142.

204 Schulte B, O'Donnell AJ, Kastner S, Schmidt CS, Schäfer I, Reimer J. Alcohol screening and brief intervention in workplace settings and social services: a comparison of literature. *Front Psychiatry* 2014; **5**: 131.

205 Patton R, Deluca P, Kaner E, Newbury-Birch D, Phillips T, Drummond C. Alcohol Screening and Brief Intervention for Adolescents: The How, What and Where of Reducing Alcohol Consumption and Related Harm Among Young People. *Alcohol Alcohol* 2014; **49**: 207–12.

206 Schmidt CS, Schulte B, Seo H-N, *et al.* Meta-analysis on the effectiveness of alcohol screening with brief interventions for patients in emergency care settings. *Addict Abingdon Engl* 2015; **111**: 783–94.

207 Drummond C, Deluca P, Coulton S, *et al.* The Effectiveness of Alcohol Screening and Brief Intervention in Emergency Departments: A Multicentre Pragmatic Cluster Randomized Controlled Trial. *PLoS ONE* 2014; **9**: e99463.

208 Watson MC, Blenkinsopp A. The feasibility of providing community pharmacy-based services for alcohol misuse: a literature review. *Int J Pharm Pract* 2009; **17**: 199–205.

209 Dhital R, Norman I, Whittlesea C, Murrells T, McCambridge J. The effectiveness of brief alcohol interventions delivered by community pharmacists: randomized controlled trial. *Addict Abingdon Engl* 2015; **110**: 1586–94.

210 Crawford MJ, Sanatinia R, Barrett B, *et al.* The clinical and cost-effectiveness of brief advice for excessive alcohol consumption among people attending sexual health clinics: a randomised controlled trial. *Sex Transm Infect* 2015; **91**: 37–43.

211 The British Psychological Society, The Royal College of Psychiatrists. Alcohol-use disorders: The NICE guideline on diagnosis, assessment and management of harmful drinking and alcohol

guidance. National Clinical Practice Guideline 115. NICE, 2011 https://www.nice.org.uk/guidance/cg115/evidence/full-guideline-136423405 (accessed Nov 9, 2016).

212 National Institute for Health and Care Excellence. Nalmefene for reducing alcohol consumption in people with alcohol dependence. NICE technology appraisal guidance 325. 2014 https://www.nice.org.uk/guidance/ta325 (accessed Nov 14, 2016).

213 Chisholm D, Rehm J, Van Ommeren M, Monteiro M. Reducing the global burden of hazardous alcohol use: a comparative cost-effectiveness analysis. *J Stud Alcohol* 2004; **65**: 782–93.

214 Hollingworth W, Ebel B, McCarty C, Garrison M, Christakis D, Rivara F. Prevention of Deaths From Harmful Drinking in the United States: The Potential Effects of Tax Increases and Advertising Bans on Young Drinkers. *J Stud Alcohol Drugs* 2006; **67**: 300–8.

215 Hadland SE. Alcohol Policies and Alcoholic Cirrhosis Mortality in the United States. *Prev Chronic Dis* 2015; **12**. DOI:10.5888/pcd12.150200.

216 Naimi TS, Blanchette J, Nelson TF, *et al.* A new scale of the U.S. alcohol policy environment and its relationship to binge drinking. *Am J Prev Med* 2014; **46**: 10–6.