NHS

Health Development Agency

Prevention and reduction of alcohol misuse

Evidence briefing

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This review updates the first edition published in June 2004

This document is also published on the
Health Development Agency website at:
www.hda.nhs.uk/evidence

Foreword

Since 2000, the Health Development Agency (HDA) has carried out the task of mapping and synthesising the evidence for the effectiveness of interventions to improve health and reduce health inequalities. Wanless (2004) highlighted the need for appraising the effectiveness of public health interventions, not only to reduce inequalities but also to maximise cost effectiveness. The government's public health white paper similarly reiterates the importance of building and maintaining an evidence base for public health (Department of Health, 2004).

The HDA has developed a number of ways of taking a systematic approach to compiling the evidence, identifying gaps and making the evidence base accessible. The evidence briefing series is one of the ways in which the HDA Evidence Base is disseminated (full details of the process of developing the HDA Evidence Base and the associated methodological activities can be found in Swann et al., 2002; Kelly et al., 2002, 2003, 2004; Killoran and Kelly, 2004; Graham and Kelly, 2004). From April 2005, the HDA's Evidence Base work will continue under the auspices of the National Institute for Health and Clinical Excellence (NICE).

This second edition evidence briefing is a review of reviews about the effectiveness of public health interventions for preventing and reducing alcohol misuse. The necessity for reviewing reviews, or tertiary-level research, stems from the proliferation over the last decade or more of systematic and other types of review in medicine and public health. The HDA has published other evidence briefings that cover:

- Teenage pregnancy and parenthood
- HIV prevention
- Prevention of sexually transmitted infections
- Management of obesity and overweight
- Prevention of low birth weight
- Breastfeeding
- Accidental injuries in children and older people
- Public health interventions for increasing physical activity among adults
- Smoking and public health
- Drug misuse
- Youth suicide prevention
- Health impact assessment.

Taken together these briefings provide a comprehensive synthesis of the evidence drawn from systematic and other kinds of reviews. They are available on the HDA's website – www.hda.nhs.uk/evidence – and the electronic versions are updated on a regular basis as new evidence becomes available.

The first and second editions of these evidence briefings have been based on evidence drawn from systematic and other kinds of reviews. This means that the type of evidence that does not traditionally find its way into reviews has not been considered in detail for these documents. In another HDA Evidence Base series, called evidence reviews, the scope of the coverage is extended to primary research and other kinds of evidence and types of study. Evidence reviews on transport, maternal and child nutrition, drug misuse prevention, accidental injury prevention for children, and chronic illness management are currently in preparation.

The construction of the HDA Evidence Base has involved collaboration with a number of partners who have interests and expertise in practical and methodological matters concerning the drawing together of evidence and its dissemination. In particular the HDA would like to acknowledge the following: the Centre for Reviews and Dissemination at the University of York; the EPPI-Centre at the Institute of Education at the University of London; Health Evidence Bulletins Wales; the ESRC UK Centre for

Evidence Based Policy and Practice at Queen Mary College, University of London and its nodes at the City University London and the MRC Public Health Sciences Unit at the University of Glasgow; members of the Cochrane and Campbell collaborations; the United Kingdom and Ireland Public Health Evidence Group and the members of the Public Health Evidence Steering Group. This latter organisation acts as the overall guide for the HDA's evidence-building project. The cooperation of colleagues in these institutions and organisations has been of significant help in the general work in preparing the framework for how we assess the evidence. The HDA is, however, responsible for the presentation and organisation of the material in the briefings.

Every effort has been made to be as accurate and up to date as possible in the preparation of this briefing. However, we would be very pleased to hear from readers who would like to comment on the content or on any matters relating to the accuracy of the briefing. We will make every effort to correct any matters of fact in subsequent editions. Comments can be made by using our website, www.hda.nhs.uk/evidence

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

Graham, H. and Kelly, M. P. (2004). *Health inequalities: concepts, frameworks and policy*. London: Health Development Agency.

Kelly, M. P., Swann, C., Morgan, A., Killoran, A., Naidoo, B. and Barnett-Paige, E. (2002). *Methodological problems in constructing the evidence base in public health*. London: Health Development Agency. www.hda.nhs.uk/evidence

Kelly, M. P., Chambers, J., Huntley, J. and Millward, L. (2003). *Method 1 for the production of effective action briefings and related materials*. London: Health Development Agency. www.hda.nhs.uk/evidence/EIP_Protocol_july03.pdf

Kelly, M. P., Speller, V. and Meyrick, J. (2004). *Getting evidence into practice in public health*. London: Health Development Agency. www.hda.nhs.uk/documents/getting_eip_pubhealth.pdf

Killoran, A. and Kelly, M. P. (2004). Towards an evidence-based approach to tackling health inequalities: the English experience. *Health Education Journal* 63: 7-14.

Swann, C., Falce, C., Morgan, A. and Kelly, M. P. (2002). *HDA Evidence Base: process and quality standards manual for evidence briefings*. London: Health Development Agency. www. hda.nhs.uk/evidence

Wanless, D. (2004). *Securing good health for the whole population. Final report.* London: H. M. Treasury.

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Contents

Summary

Introduction

This briefing presents an update of the evidence from selected systematic reviews, meta-analyses and other reviews about the effectiveness of public health interventions to prevent and reduce alcohol misuse.

The aims of this briefing are to:

- Update the first edition of the alcohol briefing
- Identify all relevant systematic reviews, syntheses, meta-analyses and review-level papers published since the first edition (June 2002)
- Review all papers and highlight 'what works' to prevent and reduce alcohol misuse for all population groups, as well as for hazardous/risky/harmful drinkers, but with particular reference to disadvantaged and vulnerable groups, before the onset of dependence
- Identify studies on the cost effectiveness of interventions for the prevention and reduction of alcohol misuse
- Highlight any gaps in the evidence and provide recommendations for research commissioners.

This briefing does not cover interventions aimed at the treatment of alcohol dependence; prevention of relapse for previously known alcohol dependents; screening for alcohol problems or misuse; or interventions which aim to minimise the harm associated with drinking alcohol (either to the individual or society). It does, however, include interventions that aim to prevent and reduce alcohol misuse for hazardous/risky drinkers before the onset of dependence as well as interventions that combine screening for alcohol problems with an intervention to prevent or reduce alcohol misuse (for example provision of advice).

Alcohol consumption and trends

Alcohol plays an important role in our society; over 90% of adults in the UK population – nearly 40 million people – consume alcohol and it is widely associated with pleasure and relaxation, and drinking in moderation can confer some health benefits (Cabinet Office Strategy Unit, 2003). It also makes a substantial contribution to the UK economy with the drinks market generating approximately one million jobs and excise duties on alcohol raising about £7 billion per year in Exchequer revenues (Cabinet Office Strategy Unit, 2003).

Over half the adult population drinks fewer than 14/21 units (men and women respectively) a week. Average weekly consumption in the last 12 months for men increased from 15.7 in 1992 to 17.0 units in 2002 (DH, 2004a). The increase for women was from 5.5 to 7.6 units during the same period. This indicates an increase in alcohol consumption for both men and women, but a more substantial one for women.

In 2002, 27% of men and 17% of women aged 16 and over drank on average more than 21 and 14 units respectively. Drinking at these levels among men has remained stable at about 27% since 1992; for women it has risen from 12% to 17% in the same period (DH, 2004a). Further alcohol consumption data is presented below and in the table overleaf.

Binge drinking in the UK accounts for 40% of all drinking occasions by men and 22% by women. Young people (aged 16-24 years) are more likely to binge drink (Cabinet Office Strategy Unit, 2003).

Alcohol use among younger children (11-15 years) has been rising steadily in England from 21% in 1992 to 27% in 1996 and it has since fluctuated within this

Percentage of men and women who drank in excess of recommended sensible drinking levels in 2002 (DH, 2004a)

Daily harmful consumption	Men	Women
Over 4 units (men) and 3 units (women), aged 16 and over on at least one day in the previous week	37%	22%
Over 8 units (men) and 6 units (women), aged 16 and over on at least one day in the previous week	21%	9%
Over 4 units (men) and 3 units (women), aged 16-24 years on at least one day in the previous week	48%	40%
Over 8 units (men) and 6 units (women), aged 16-24 years on at least one day in the previous week	34%	26%
Over 4 units (men) and 3 units (women), aged 65 and over on at least one day in the previous week	15%	5%

range, showing no clear pattern over recent years (DH, 2004a). In 2003, 25% of 11 to 15 year olds had drunk alcohol in the week prior to interview, and the proportions drinking alcohol in this age group increased sharply with age – only 6% of pupils aged 11 compared with 49% of those aged 15.

National statistics and research studies indicate that – as well as sex and age – socio-economic status, ethnicity and geographical area of residence are among the factors linked to levels and patterns of harmful alcohol consumption (ONS, 2000).

Alcohol misuse

Alcohol is causally related to cancers of the oral cavity and pharynx, larynx, oesophagus and liver, while there is suggestive but inconclusive data for a causal role in rectal and breast cancer (Seitz and Homann, 2001; Royal College of Physicians, 2001). Alcohol misuse can be directly linked to deaths from liver cirrhosis (DH, 2004a).

In addition, between 15,000 and 22,000 deaths each year are associated with alcohol misuse, mainly resulting from stroke, cancer, liver disease, accidental injury or suicide (Cabinet Office Strategy Unit, 2003).

Linked to this is the accumulating body of knowledge of the individual and social harms associated with alcohol consumption and misuse as follows (Cabinet Office Strategy Unit, 2003 – figures indicative of current position):

Crime and disorder

- In 1999, an estimated 1.2 million violent incidents (half of all violent crimes) were alcohol related
- There are about 360,000 alcohol-related incidents of domestic violence
- There are 85,000 cases of drink driving

Health

- Alcohol-related disease accounts for 1 in 26 NHS bed days
- Up to 35% of all A&E attendance and ambulance costs, £500 million, are estimated to be alcohol related
- 40% of all A&E admissions are alcohol-related
- Up to 150,000 hospital admissions are related to alcohol misuse
- Alcohol is associated with up to 1,000 suicides per year

Workplace

- Up to 17 million days are lost annually due to alcohol-related absence

Family/social networks

- Between 0.78-1.3 million children are affected by alcohol misuse in the family
- Around a third of incidents of domestic violence are linked to alcohol misuse
- There are up to 20,000 street drinkers in the UK.

In terms of financial burden, it is estimated that the costs of alcohol misuse are around £20 billion a year (Cabinet Office Strategy Unit, 2003). These costs cover alcohol-related health disorders and disease, crime and anti-social behaviour, loss of productivity in the workplace, and problems for both those who misuse alcohol and for their families, including domestic violence.

Methods

An extensive and systematic search of the literature was conducted by the HDA's Health Intelligence team to update the previous search undertaken in the first edition. A total of 253 citation titles and abstracts were independently assessed for relevance. An additional 10 papers were identified as potentially relevant by the peer reviewers and through checking reference lists, and these were also retrieved.

A total of 44 papers identified were critically appraised. The critical appraisal process identified the extent to which the papers met the following HDA criteria: systematicity, transparency, quality and relevance.

The process of critical appraisal identified 15 papers for inclusion in the Findings section. All the accepted papers (now referred to as HDA Evidence Base papers) were compared and collated, and a narrative synthesis was produced by the HDA reviewers under the following core themes:

- Interventions to reduce alcohol-impaired driving
- Healthcare settings
- Children and young people.

A number of evidence statements about whether certain interventions were effective, based on the evidence from the included HDA Evidence Base papers are also made within each theme. Each summary statement categorises the evidence as follows:

- **Evidence of effectiveness:** derived from the review-level literature where the results were all in agreement, using the review authors' own words
- **Currently, a lack of evidence of effectiveness:** applied to interventions in the review-level literature which showed no current impact on outcomes
- **Conflicting evidence:** derived from the review-level literature (or primary studies within a review) where the interpretation and conclusions of the papers were not in agreement.

A key remit of this briefing was to scrutinise the reviews for details on the effect on inequalities in health and on the cost effectiveness of the interventions.

Findings

A total of 15 systematic reviews or meta-analyses met the criteria outlined above and were included onto the HDA Evidence Base.

Interventions to reduce alcohol-impaired driving

Blood alcohol concentration (BAC) laws

- There is review-level evidence that 80mg/100ml (80mg of alcohol in 100ml of blood) blood alcohol concentration (BAC) laws are effective in reducing alcohol-related crash fatalities (Shults et al., 2001).

Lower BAC laws for young or inexperienced drivers

- There is review-level evidence that lower BAC laws are effective in reducing alcohol-impaired crash fatalities among young or inexperienced drivers (Shults et al., 2001; Zwerling and Jones, 1999).

Minimum legal drinking age laws

- There is review-level evidence that minimum drinking age laws, particularly those that set the minimum drinking legal age at age 21, are effective in preventing alcohol-related crashes and associated injuries (Shults et al., 2001).

Sobriety checkpoints

- There is review-level evidence that selective breath testing, sobriety checkpoints and random breath testing are effective in preventing alcohol-impaired driving, alcohol-related crashes, and associated fatal and non-fatal injuries (Shults et al., 2001; Peek-Asa, 1999).

Ignition interlock devices

- There is review-level evidence for the effectiveness of ignition interlock devices in reducing recidivist intoxicated driving (ie habitual relapses in offending or criminal behaviour) (Coben and Larkin, 1999).

Server training programmes

- There is review-level evidence to suggest that intensive, high quality, face-to-face server training, when accompanied by strong and active management support, is effective in reducing intoxication levels in customers (Shults et al., 2001).

Healthcare settings

GP-based lifestyle interventions

- There is conflicting review-level evidence for the effectiveness of GP-based lifestyle advice interventions to reduce heavy drinking (Ashenden et al., 1997)

Psychosocial interventions delivered by GPs

- There is review-level evidence to suggest that a cognitive behavioural intervention by a GP is no more effective than a cognitive behavioural intervention by a nurse practitioner or brief advice (Huibers et al., 2003).
- There is also review-level evidence to suggest that a behavioural change programme is no more effective than brief advice, assessment of drinking behaviour only, or follow-up measurement only, on alcohol consumption or alcohol-related problems (Huibers et al., 2003).

Brief interventions

- There is review-level evidence to suggest that heavy drinkers receiving brief interventions are twice as likely to moderate their drinking six to 12 months after an intervention when compared with drinkers receiving no intervention (Wilk et al., 1997).
- There is review-level evidence to show that brief interventions (especially multi-contact interventions) can reduce net weekly drinking by 13% to 34%, resulting in 2.9 to 8.7 fewer mean drinks per week and a significant effect on recommended or safe alcohol use (Whitlock et al., 2004).
- There is currently a lack of review-level evidence for the effectiveness of very brief and extended interventions in decreasing alcohol intake in both men and women (Poikolainen, 1999).
- There is currently a lack of review-level evidence for the effectiveness of very brief interventions in decreasing alcohol intake in both men and women (Poikolainen, 1999; Whitlock et al., 2004).
- There is review-level evidence for the effectiveness of extended brief interventions (several visits) in primary healthcare settings for women. Extended brief interventions decreased alcohol intake in women by, on average, 51g per week (Poikolainen, 1999).
- There is currently a lack of review-level evidence for the effectiveness of extended brief interventions (several visits) in primary healthcare settings for men (Poikolainen, 1999).
- There is review-level evidence to suggest that brief interventions are equally effective in men and women for hazardous alcohol consumption in primary care settings (Ballesteros et al., 2004a; Whitlock et al., 2004).
- There is review-level evidence to suggest that brief interventions are effective in opportunistic (non-treatment-seeking) samples and as typically delivered by healthcare professionals (Moyer et al., 2002).
- There is review-level evidence to support the moderate efficacy of brief interventions for hazardous drinkers in the primary care setting (Ballesteros et al., 2004b).
- There is a lack of evidence for a dose-effect relationship linking the intensity of brief interventions with outcome (Ballesteros et al., 2004b).

Interventions to increase rates of screening and giving advice by GPs

- There is review-level evidence to suggest that it may be possible to increase the engagement of GPs in screening and giving advice for hazardous and harmful alcohol consumption (Anderson et al., 2004a).

The use of bibliotherapy (self-help materials)

- There is review-level evidence to suggest that the use of bibliotherapy is effective in decreasing at-risk and harmful drinking, particularly with those seeking help for their drinking and to a lesser extent with drinkers identified through screening as at-risk (Apodaca and Miller, 2003).

Children and young people

- There is currently a lack of review-level evidence for the effectiveness of interventions in reducing alcohol misuse in young people (Foxcroft et al., 2002).

Gaps in the evidence base and recommendations for research

Based on the findings of this briefing there is a general lack of research evidence on a wide range of topic areas relating to the prevention and reduction of alcohol misuse. We have compiled a list of recommendations, presented in no particular order. These are based on our own recommendations plus those made by the authors of the HDA Evidence Base papers, which are referenced. It is important to note that we have not systematically searched for gaps in the primary research, although some of the recommendations will impact on primary research.

Inequalities and vulnerable groups

From the systematic review and meta-analytic literature, there is a complete lack of evidence on the effectiveness of interventions targeting specific socio-economic, ethnic or vulnerable groups. Furthermore, the interventions identified did not address the differential effectiveness of interventions among these groups, or how the different components affected them.

Recommendations include:

- Primary research is needed to carry out brief interventions to reduce alcohol misuse and evaluate their effectiveness among minority ethnic groups, particularly among Asians and African-Caribbeans, as well as religious ethnic groups such as Sikhs, Hindus and Muslims
- There is a need to carry out adequate evaluation of interventions aimed at young people targeting hard to reach and vulnerable groups.

Cost effectiveness

- Some evidence was found from studies conducted in the US (Shults et al., 2001) regarding the cost effectiveness of interventions to reduce alcohol-impaired driving. However, there is still an urgent need for primary research that examines the cost effectiveness of interventions to prevent alcohol misuse in both the general population and disadvantaged and vulnerable groups.

Intervention design

- The problems of evaluating community approaches should be reviewed with a view to testing different approaches (possibly innovative methods) to evaluation (eg using qualitative approaches as well as quantitative).
- When undertaking evaluations of interventions, there is a need to include a process evaluative approach and to collect qualitative data where possible. This should include those who have dropped out of interventions. This data will allow an assessment of how the intervention can be transferred from the research setting to clinical practice, enable the easy identification of features of effective interventions, and show how the intervention can be replicated on a wider scale.
- Researchers and policy makers should consider the advantages of agreeing and implementing standard alcohol consumption measures and definitions (Poikolainen, 1999).
- The methodology of evaluations needs to be improved. Large-scale randomised controlled trials (RCTs) are possible and preferable for rigorous scientific evaluation of discrete interventions, but appropriate statistical analysis needs to be undertaken to take account of the intra-class correlation coefficient. For large community interventions where RCTs are not practical, a comparative interrupted time series design with sufficient pre-and post-intervention measurement time points should be considered (Foxcroft et al., 2002).
- All researchers should clearly describe attrition rates, how they vary between different treatment and control groups, and how attrition is dealt with in any statistical analysis, for example through an intention-to-treat analysis (Foxcroft et al., 2002).
- Culturally focused interventions require further development and rigorous evaluation, including cost-effectiveness assessment (Foxcroft et al., 2002).
- There is a need to look at the long-term effects of interventions on healthcare utilisation. Interventions should also investigate other outcomes such as work performance, family relationships and overall quality of life (Wilk et al., 1997).

Interventions to reduce alcohol-impaired driving

Shults et al., (2001) highlighted a number of issues that require further research:

- What effects do these interventions have on long-term changes in social norms about drinking and driving?
- What are the independent effects of publicity on the effectiveness of laws to reduce alcohol-impaired driving?
- Does targeting publicity efforts to specific subpopulations (eg young drivers, ethnic minorities, men) improve the effectiveness of interventions to reduce alcohol-impaired driving?
- Does public compliance with new laws change in a predictable manner over time?
- Are server intervention training programmes delivered community wide effective at decreasing alcohol-impaired driving and alcohol-related crashes?
- What is the long-term effect of server intervention training programmes? Are 'booster sessions' required to maintain effectiveness?

Peek-Asa (1999) and Zwerling and Jones (1999) also recommended:

- Multivariate research controlling for confounding variables, such as other ongoing prevention programmes, needs to be conducted to determine the proportion of crashes reduced specifically by random screening programmes. Cost-benefit analyses are also needed (Peek-Asa, 1999)
- Future research should address the enforcement of zero tolerance laws. Studies should look at process measures such as arrest and conviction rates as well as outcome measures (Zwerling and Jones, 1999).

Healthcare settings

- Considerable work is needed to implement screening combined with brief interventions for risky/harmful alcohol use as part of routine practice, and more research is needed on effective strategies and support for adoption of these services by physicians and health plans. Future research is also needed to establish the possible cost savings or cost effectiveness of these interventions (Whitlock et al., 2004).
- There is a pressing need for more implementation research. Future studies may reveal why some interventions work and others do not (Anderson et al., 2004a).
- Further research of higher quality is needed particularly with a specific focus on multi-component alcohol programmes (Anderson et al., 2004a).
- Additional studies are also needed to determine the relative impact of outreach as opposed to non-outreach programmes and the relative impact of educational and office-based interventions (Anderson et al., 2004a).
- A systematic review is needed for the effectiveness of brief alcohol interventions carried out in hospital settings in the UK. There are individual studies conducted in accident and emergency departments in the UK, but to date no systematic review has been undertaken.

Children and young people

- Research into the important outcome variables needs to be undertaken. There is no single outcome measure of youth drinking behaviour that is used in evaluation studies, and no clear understanding of which outcome measures are important predictors of alcohol misuse, morbidity and mortality in later life (Foxcroft et al., 2002).
- The US-based Strengthening Families Programme needs to be piloted in the UK and evaluated on a larger scale and in different settings to confirm the current results and the transferability of the programme to the UK. Cost-effectiveness analyses would be useful (Foxcroft et al., 2002).
- There is an urgent need to fill the current evidence gap in interventions to reduce alcohol misuse in young people.

Pregnancy

- There is a need to undertake a systematic review on interventions to reduce alcohol consumption in pregnancy as none have been undertaken since 1996.

Workplace

- The workplace is a major location that 'captures' many people in the heavier drinking groups (eg 16-24 year olds, employed professional women, people in occupational groups with a higher risk of developing alcohol problems). It is also the context within which occupational and professional socialisation takes place. It is, therefore, an important context within which to tackle attitudes and drinking behaviours. The development and evaluation of workplace policies should be encouraged.

Other gaps identified

- The impact of policies and initiatives such as fiscal measures, legislation other than drink driving, safer drinking environment, education and mass media, on the prevention of both alcohol misuse and related harm is worthy of further investigation.
- This evidence briefing has investigated the effectiveness of interventions in reducing alcohol misuse. However, the effect of interventions in reducing alcohol-related harm, for example harm to the individual, families or society, is also of great importance and should be considered.

Introduction

Background

Decisions about policy and practice in the public sector are increasingly driven by consideration of the best available evidence. The process of drawing together, analysing and synthesising evidence from research is a central principle of evidence-based practice. Typically, the process of reviewing an area of practice or intervention will include the production of a systematic review of effectiveness, a meta-analysis or some other review-level synthesis and interpretation of evidence from research.

However, as more reviews and meta-analyses are carried out across the spectrum of public health there is an increasing need to map the areas that they cover, assess their quality and pull together any common findings about what works in particular areas to improve health and reduce health inequalities.

From 2000-2005 the Health Development Agency (HDA) undertook the task of mapping and synthesising the evidence for the effectiveness of interventions to improve health and reduce health inequalities, across priority areas of public health. Since the HDA's establishment, Wanless (2004) has further highlighted the need for appraising the effectiveness of public health interventions, not only to reduce inequalities but also to maximise cost effectiveness. The government's recent white paper *Choosing Health* (DH, 2004b) similarly reiterates the importance of building and maintaining an evidence base for public health. From April 2005, the HDA's Evidence Base work will continue under the auspices of the National Institute for Health and Clinical Excellence (NICE)

The HDA's process for building the public health evidence base is underpinned by a two-tier structure:

- A Public Health Evidence Steering Group (PHESG) with membership drawn from universities, public health and research and development divisions of the Department of Health, other government departments, public health practitioners, representatives of research funding bodies, the Centre for Reviews and Dissemination, Cochrane and Campbell collaborations, the EPPI-Centre, and other UK and World Health Organization representatives. The group is chaired by a high-ranking official from the Department of Health on behalf of the Chief Medical Officer for England. This overarching group advises on the broad strategic direction of the evidence base and has a remit to assure the quality of processes developed by the HDA to construct the evidence base
- For each topic area covered (eg accidental injuries, low birth weight), there is a reference group. These report to the PHESG and consist of key academics, practitioners and officials with expertise in the area. Reference groups advise on the content of the evidence base and guide the production of evidence briefings.

One of the core outputs produced by the HDA's Evidence Base project are 'evidence briefings'. These are essentially reviews of reviews that synthesise the best available review-level evidence for a topic area, analyse the strengths and weaknesses of the topic's evidence base, identify gaps in the evidence, analyse future primary and secondary research needs.

Both a full-length publication and a free-standing summary are produced for each topic area covered and these are also published on and supported by the HDA website (www.hda.nhs.uk/evidence).

Aims of this briefing

This particular briefing provides an update of the evidence about the effectiveness of public health interventions to prevent and reduce alcohol misuse. The aims of this briefing are to:

- Update the first edition of the alcohol briefing (published June 2002)
- Identify all relevant systematic reviews, syntheses, meta-analyses and review-level papers published since the first edition
- Review all papers (including those retrieved for the first edition) and highlight 'what works' to prevent and reduce alcohol misuse for all population groups, as well as for hazardous/risky/harmful drinkers, but with particular reference to disadvantaged and vulnerable groups, before the onset of dependence
- Identify studies on the cost effectiveness of interventions for the prevention and reduction of alcohol misuse
- Highlight any gaps in the evidence and provide recommendations for research commissioners.

Who is this briefing for?

This briefing is intended to inform policy and decision makers, NHS providers, public health physicians and other public health practitioners in the widest sense.

It is designed to be accessed by a variety of users including those simply looking for headline findings, those wanting complete and detailed syntheses, and those who need to track back to the original primary and secondary sources. However, because this briefing does not draw on many other sources of evidence available it should not be used to provide specific advice for practice.

Alcohol consumption and misuse

Alcohol plays an important role in our society; over 90% of adults in the UK population – nearly 40 million people – consume alcohol and it is widely associated with pleasure and relaxation, and drinking in moderation can confer some health benefits (Cabinet Office Strategy Unit, 2003). It also makes a substantial contribution to the UK economy with the drinks market generating approximately one million jobs and excise duties on alcohol raising about £7 billion a year in Exchequer revenues (Cabinet Office Strategy Unit, 2003).

Over half the adult population drinks less than 14/21 units (women and men respectively) a week. Average weekly consumption in the last 12 months for men increased from 15.7 in 1992 to 17 units in 2002 (DH, 2004a). The increase for women was from 5.5 to 7.6 units during the same period. This indicates an increase in alcohol consumption for both men and women, but a more substantial one for women. For a definition of a 'unit' of alcohol and 'recommended levels' see Appendix 1, Glossary.

In 2002, 27% of men and 17% of women aged 16 and over drank on average more than 21 and 14 units respectively. Drinking at these levels among men has remained stable at about 27% since 1992; for women it has risen from 12% to 17% in the same period (DH, 2004a). Further alcohol consumption data is presented below.

Table 1: Percentage of men and women who drank in excess of recommended sensible drinking levels in 2002 (DH, 2004a)

Daily harmful consumption	Men	Women
Over 4 units (men) and 3 units (women), aged 16 and over on at least one day in the previous week	37%	22%
Over 8 units (men) and 6 units (women), aged 16 and over on at least one day in the previous week	21%	9%
Over 4 units (men) and 3 units (women), aged 16-24 years on at least one day in the previous week	48%	40%
Over 8 units (men) and 6 units (women), aged 16-24 years on at least one day in the previous week	34%	26%
Over 4 units (men) and 3 units (women), aged 65 and over on at least one day in the previous week	15%	5%

Binge drinking in the UK also accounts for 40% of all drinking occasions by men and 22% by women. Young people (aged 16-24 years) are also more likely to binge drink (Cabinet Office Strategy Unit, 2003). For a definition of binge drinking see Appendix 1, Glossary. Alcohol use

among younger children (11-15 years) has been rising steadily in England from 21% in 1992 to 27% in 1996 and it has since fluctuated within this range, showing no clear pattern over recent years (DH, 2004a). In 2003, 25% of 11 to 15 year olds had drunk alcohol in the week prior to interview, and the proportions drinking alcohol in this age group increased sharply with age – only 6% of pupils aged 11 compared with 49% of those aged 15.

Apart from sex and age, national statistics and research studies indicate that socio-economic status, ethnicity and geographical area of residence are among the factors linked to levels and patterns of harmful alcohol consumption (ONS, 2000). For example, research by Purser et al. (2001) in the West Midlands has identified black males as a group at risk of drinking more than recommended levels and of experiencing alcohol-related harm; consumption levels are higher among men in the north and north-west regions of England compared to other regional areas and among people with higher incomes (ONS, 2000).

There is a clear link between socio-economic factors and alcohol consumption. Figures from the General Household Survey indicated that both men and women in non-manual households drink on more occasions during the week than men and women in manual households (ONS, 2000). However, similar proportions of individuals in manual and non-manual groups had exceeded recommended daily levels or had drunk heavily on at least one day in the previous week. Only 15% of men in professional households had drunk heavily compared to 19-24% of other men.

Differences between socio-economic groups also emerged when average weekly consumption was taken into account, with people from manual households who had consumed over the weekly recommended levels drinking more heavily on at least one day in the previous week (ONS, 2000). The importance of the relationship between socio-economic status and alcohol consumption is underlined in research on inequalities in health that has demonstrated a link between alcohol consumption, morbidity and mortality and with deaths from accidents (Drever et al., 1997, cited in ONS, 2000; Marmot and Feeney, 1999).

Individual and social harms associated with alcohol consumption and misuse

Alcohol is causally related to cancers of the oral cavity and pharynx, larynx, oesophagus and liver, while there is suggestive but inconclusive data for a causal role in rectal and breast cancer (Seitz and Homann, 2001; Royal College of Physicians, 2001). Studies have demonstrated that those who drink alcohol are at increased risk of these cancers compared to non-drinkers, the risk rising with increasing levels of alcohol intake (Single, 2000). Alcohol misuse is thought to be a major cause in about 3% of all cancers in England and is highlighted as an area for preventive activity in the *NHS Cancer Plan* (DH, 2000). Alcohol misuse can be directly linked to deaths from liver cirrhosis (DH, 2004a).

Various studies have demonstrated a U- or J-shaped association whereby a moderate intake of alcohol is associated with reduced risk of various types of ischemic illnesses, including myocardial infarction and stroke – and abstinence, low or high intake of alcohol is associated with increased risk (DH, 1999).

In addition, between 15,000 and 22,000 deaths each year are associated with alcohol misuse, mainly resulting from stroke, cancer, liver disease, accidental injury or suicide (Cabinet Office Strategy Unit, 2003).

Linked to this is the accumulating body of knowledge of the individual and social harms associated with alcohol consumption and misuse as follows (Cabinet Office Strategy Unit, 2003 – figures indicative of current position):

Crime and disorder

- In 1999, an estimated 1.2 million violent incidents (half of all violent crimes) were alcohol related
- There are about 360,000 alcohol-related incidents of domestic violence
- There are 85,000 cases of drink driving

Health

- Alcohol-related disease accounts for 1 in 26 NHS bed days
- Up to 35% of all accident and emergency (A&E) attendance and ambulance costs, £500 million, are estimated to be alcohol related

- 40% of all A&E admissions are alcohol related
- Up to 150,000 hospital admissions are related to alcohol misuse
- Alcohol is associated with up to 1,000 suicides per year

Workplace

- Up to 17 million days are lost annually due to alcohol-related absence

Family/social networks

- Between 0.78-1.3 million children are affected by alcohol misuse in the family
- Around a third of incidents of domestic violence are linked to alcohol misuse
- There are up to 20,000 street drinkers in the UK.

In terms of financial burden, it is estimated that the costs of alcohol misuse are around £20 billion a year (Cabinet Office Strategy Unit, 2003). These costs cover alcohol-related health disorders and disease, crime and anti-social behaviour, loss of productivity in the workplace, and problems for both those who misuse alcohol and their families, including domestic violence.

Policy context – England

Following a consultation process, the *Alcohol Harm Reduction Strategy for England* was published in 2004 by the Cabinet Office Strategy Unit. The main recommendations of the strategy are as follows:

- Better education and communication – to achieve a long-term change in attitudes to irresponsible drinking and behaviour by making the 'sensible drinking' message easier to understand and apply; targeting messages at those most at risk including binge and chronic drinkers (see Appendix 1, Glossary, for definitions of binge and chronic drinkers); providing alcohol education in schools that can change attitudes and behaviour; providing more support and advice for employers; and reviewing the code of practice for TV advertising to ensure that it does not target young drinkers or glamorise irresponsible behaviour
- Improving health and treatment services – to improve early identification and treatment of alcohol problems. These measures include improved training of staff to increase awareness of likely signs of alcohol misuse, and pilot schemes to test how best to use a variety of models of targeted screening and brief interventions in primary and secondary healthcare settings. Also, help is recommended for the most vulnerable, such as homeless people, drug addicts, the mentally ill and young people
- Combating alcohol-related crime and disorder – to address the problems of town and city centres that are affected by alcohol misuse at weekends. This includes greater use of exclusion orders to ban those causing trouble from pubs and clubs or entire town centres, greater use of the new fixed-penalty fines for anti-social behaviour and working with licensees to ensure better enforcement of existing rules on under-age drinking and serving people who are already drunk
- Working with the alcohol industry – to build on the good practice of some existing initiatives, such as the Manchester Citysafe Scheme, and involve the alcohol industry in new initiatives at both national level (drinks producers) and at local level (retailers, pubs and clubs).

The strategy also recommends research to review the evidence base for the effectiveness of interventions on alcohol prevention for children and young people both inside and outside the school setting. Implementation of the strategy will be a shared responsibility spread across government departments, with the Home Office and the Department of Health as the lead departments.

The government's recent white paper *Choosing Health* (DH, 2004b) has also made a number of commitments to tackle alcohol misuse and treatment which will build on the *Alcohol Harm Reduction Strategy for England*. These include:

- A binge drinking information campaign
- Joint working with the industry to develop a voluntary social responsibility scheme for alcohol producers and retailers to protect young people.
- Guidance and training to identify alcohol problems early
- Piloting screening approaches and brief interventions both within primary care and hospital settings
- Developing an improvement programme for alcohol treatment services, based on the findings of an audit of demand and provision of alcohol treatment in England and the Models of Care Framework for alcohol treatment, being developed by the National Treatment Agency.

Strategies and interventions to prevent alcohol misuse and alcohol-related harm

In addition to the above, a number of strategies and interventions aimed at the prevention of alcohol misuse and alcohol-related harm can be identified in the alcohol literature:

- **Reducing per capita consumption of alcohol in the population** – strategies for reducing per capita consumption of alcohol aim to reduce average consumption and, in the case of binge drinking, the modal level of consumption. Studies have demonstrated that reduction of harm at the population level is best achieved among moderate drinkers rather than risky or heavy drinkers; this is the 'alcohol preventive paradox' which was put forward by Kreitman (1986). Kreitman's preventive paradox aims to reduce the incidence of harmful drinking by reducing per capita consumption; therefore, from a population health viewpoint, this policy would bring about a modest reduction among those in the larger category rather than target the much smaller number of heavy drinkers. Strategies to control per capita consumption include the use of taxation to raise the price of alcohol, restrictions on distribution outlets, restrictions on advertising, law enforcement (eg on underage purchasing of alcohol), and national and local media campaigns to provide awareness of recommended drinking levels and of the harms associated with alcohol misuse (Lemmens, 2001)
- **Targeting the consumption and drinking patterns of 'high risk' or 'vulnerable groups'** – approaches are aimed at individuals and groups (eg professional women, young people, young black males, 'binge' drinkers) rather than at the population as a whole. This also includes using targeted brief interventions to reduce the amount of alcohol consumed or to tackle harmful drinking patterns and drinking contexts, such as intoxication, drinking while working with machinery or drink driving; or media campaigns with messages specifically tailored to the target group or target behaviour, introducing school education programmes and workplace policies (Heather, 2001)
- **Reduction of alcohol-related harms** – these strategies aim to address the harm associated with alcohol use, for example alcohol-associated domestic violence or fights and incidents around drinking venues, homelessness, family disruption, child neglect and sexual abuse, loss of workplace productivity or the risks to health. Harm reduction rather than a reduction in the amount of alcohol consumed is often the objective of such interventions. Examples include the introduction of shatterproof glasses in public houses, training of professionals to identify and respond to alcohol-related health and social problems (eg nurses, social workers, doctors), training of those who serve in public houses or entertainment venues to identify and refuse intoxicated customers, placing a ban on street drinking and enforcing the law on underage purchasing (Plant et al., 1997).

However, such strategies and interventions are not mutually exclusive. For instance, action to reduce alcohol-related harms by restricting underage purchasing, targeting drink driving or by raising awareness of the risks of binge drinking have the potential to lower per capita consumption of alcohol. Equally, lowering per capita consumption may be expected to achieve a reduction in alcohol-associated health and social harms (Edwards et al., 1994; Raistrick et al., 1999).

It is also important to link interventions at the national level – for instance, the control of price, advertising, or legislation to control the distribution and sale of alcohol – with action at local level, for instance through local licensing regulations, local policing and local awareness campaigns. Furthermore, there are a number of ways in which action at the local level may be targeted. Interventions may be single projects, eg a local server training scheme or a youth project, or they may be a group of projects all targeted at the same problem within a local area, eg drink driving may be tackled by a media campaign; police action to enforce existing laws more rigorously; a 'designated driver' scheme; and training bar staff to refuse serving intoxicated customers.

Methodological issues

The following methodological issues have been identified as pertinent to all the HDA evidence briefings.

The term 'effectiveness' is typically used in evidence briefings to describe demonstrable, intended effects, usually on quantitative outcomes. At present, the systematic review is probably the most robust and reliable marker of effectiveness, closely followed by a well-designed meta-analysis. They are used heavily in clinical sciences to inform practice, and are generally

well regarded when used appropriately. While this briefing pulls together evidence from systematic reviews of effectiveness, meta-analyses and narrative or literature reviews, defining effectiveness in this way and relying on this type and level of evidence to inform our conclusions, this evidence has some limitations. It is important to consider these when making decisions about policy or practice.

Definitions of what constitutes 'good' quality evidence in mainstream public health have been inherited from medical and scientific paradigms, where the experimental evaluation of clinical efficacy is commonplace and often appropriate. Although there is an increasing use of approaches that rely on traditional evidence hierarchies, they may not always be the most appropriate methods of assessing the impact of interventions to improve public health, nor in particular to assess the impact of interventions on health inequalities.

At review (rather than single study) level, meta-analyses and systematic reviews of effectiveness can be very powerful tools for demonstrating the impact (or lack of it) of an intervention. However, they rely heavily on controlled evaluation studies and statistically measurable outcome variables. In contrast, the prevention and reduction of alcohol misuse is highly complex and relational, almost impossible to capture in terms of quantitative outcomes alone and often does not 'fit' easily into these types of study designs.

Within the field of public health interventions, randomised controlled trials (RCTs) can be difficult to design and may not be appropriate for the chosen intervention. This is particularly the case for 'upstream interventions' that try to influence national/regional strategies or policies, or the wider environment. It should be acknowledged that evidence can be collected using a wide range of methods. As Brunner et al. (2001) comment: 'What is important is that the evidence is collated systematically, with transparent inclusion and exclusion criteria, with attention paid to the methodological quality of the work, and without prior assumptions about the findings being allowed to influence what evidence is considered.'

A second issue is that, while meta-analyses and systematic reviews (and sometimes, to a lesser extent, literature reviews) are well placed to make judgements about the strength of impact of an intervention, and the quality of the evaluation design, they tend not to examine the appropriateness or quality of an intervention itself, and certainly not in any robust or systematic manner. This can be a source of bias – an inappropriate intervention might have a strong impact on one quantifiable outcome measure, and therefore influence review conclusions, even though that outcome measure might not be the most appropriate or useful. In other words, there is a risk that inappropriate or ill-designed interventions can be given more weight than more suitable (and often more complex or long-term) interventions because they may be simpler and quicker to evaluate, or because they can prove some effect relatively easily.

However, in spite of these limitations systematic reviews are still a powerful tool in certain circumstances, based as they are on principles of finding good and effective interventions, eliminating harmful ones and promoting public accountability of funds spent on interventions – principles that are important cornerstones to building the public health evidence base.

A third issue is that reviews tend to rely on data from certain types of evaluation design – most often experimental and quasi-experimental trials – thus excluding a substantive amount of literature from their consideration. The appraisal system that we have used (see the critical appraisal form, Appendix 3) favours reviews that have a transparent and replicable data search, methodology and analysis. This means that systematic reviews of effectiveness and meta-analyses are more likely to pass the critical threshold (if they are well conducted) because of their clear methodology and analysis relative to literature or other types of reviews. This is not to say that literature or narrative reviews cannot be counted as review-level evidence – where review rationale, methodology and analytic techniques are clear, they would pass the critical appraisal threshold.

Linked to this it is important to note that if this evidence briefing has uncovered no evidence to support a certain intervention or programme it does not mean there is absolutely no evidence out there, just that currently we have found no evidence included in reviews that met our criteria. Also, sometimes when studies find an intervention has not been effective, this does not necessarily lead to a conclusion that the intervention, per se, is ineffective. For example, the study may not have had adequate power to detect a small positive difference,

but ruling the intervention as ineffective is too judgemental, as future studies using the intervention, perhaps delivered by different individuals, may turn out to be effective. Certainly, 'closing doors' on interventions and labelling them as ineffective simply because of the small numbers of studies does not seem useful. In such situations in our briefings we would produce an evidence statement outlining that there is currently a lack of review-level literature rather than classifying an intervention as 'ineffective'.

There is also a recognised methodological problem when undertaking a review of reviews – that different reviews frequently include some of the same primary evidence. This would bias findings in favour of study results which occur more often in the individual reviews.

Another issue to consider is the methodology of the systematic reviews on which this briefing is based. A number of authors have appraised systematic review methodology and have questioned many of its underlying assumptions (Hammersley, 2001). One common criticism is publication bias:

- Papers that demonstrate effective outcomes are more likely to be submitted to journals
- Negative impacts may be omitted from papers
- Positive papers are more likely to be published by journal editors
- Positive papers are more likely to appear in systematic reviews
- Such papers are, therefore, more likely to appear in reviews of reviews.

At present, there are problems in trying to incorporate other types of evidence into our evidence briefings. In some areas, such as qualitative research, the thresholds as to what constitutes 'good' quality work are contested by different researchers. As yet there is no agreed method for systematically synthesising or reviewing such work, although there are a number of projects underway nationally and internationally to develop an appropriate methodology. Nor is there any clear or agreed method for combining non-traditional forms of evidence – such as that from qualitative research, action research, expert opinion and so on – with evidence from more traditional types of study to provide a more comprehensive assessment of the effectiveness of different interventions. For the time being, the HDA has taken a first step to pull together evidence from systematic reviews, meta-analyses and good quality narrative reviews, with an acknowledgement that this limits our data pool and may provide only partial answers to our research questions.

A final issue is that of time lag. Inevitably, if one relies on review-level data to gather information about effectiveness, some time – usually one or more years – will elapse between the publication of single studies, the subsequent examination of these single studies by reviewers and the publication of their reviews. Because of the processes involved in carrying out meaningful, high quality research, this is to some extent inevitable, and it can be argued that the procedures that cause this delay – the need for publications to be peer-reviewed, the need for a body of work to build up before it can be reviewed and examined – help avoid publication or positive bias in review findings. It means that the reviews considered by this briefing will take into account single studies with a cut-off date of at least one year before the most recent review. If one single study has been published in the meantime that alters common conceptions or consensus about the prevention of alcohol misuse it will take a while for the findings of that single study to filter into this forum.

In summary, the data presented in this evidence briefing – data from reviews – are only a partial answer to 'what works' with respect to the prevention of alcohol misuse. In using this briefing to inform practice or policy making, there are a number of other sources of information and evidence that could usefully be taken into account. These include:

- Information from practice studies (eg practice databases, 'promising practice' case studies)
- Research studies that are often or usually excluded from systematic reviews and meta-analyses (eg definitive studies, non-controlled case studies, action research)
- Local data and project evaluations (local to your context and area)
- Expert and practitioner opinion
- Client opinion and experience.

Methods

The methods used for this second edition, which are in line with the HDA's Evidence Base methodology (Swann et al., 2003), are described in detail below.

Literature search

An extensive and systematic search of the literature was conducted by the HDA's Health Intelligence team to update the previous search carried out for the first edition (January 1996 to December 2001). The same search strategy, devised in collaboration with the Centre for Evidence-Based Mental Health (CEBMH), and search terms (including general and alcohol specific terms, population groups, settings and interventions) were used. A full list of these search terms and strategy is shown in Appendix 2.

The following electronic databases and websites were searched from January 2002 to April 2004:

Electronic databases

AMED
Best Evidence
CINAHL
Cochrane Library
DARE database
DH Research Findings Electronic Register
EMBASE
Health Technology Assessment database
MEDLINE
National Coordinating Centre for Health Technology Assessment
National Guideline Clearinghouse
National Research Register
PSYCINFO
Sociological Abstracts
TRIP

Websites

Best Evidence
Clinical Evidence
Health Evidence Bulletins Wales
HSTAT
NICE web page
ScHARR Lock's Guide to the Evidence
SIGN Guidelines

All citations were imported directly into Reference Manager software and duplicates were removed. Reference lists were checked and the Alcohol Misuse Reference Group was consulted to identify any potential relevant citations.

Inclusion/exclusion criteria

A total of 253 citation titles and abstracts were identified by the search and independently assessed for relevance by two of three reviewers (C. Mulvihill, L. Taylor and S. Waller).

The following inclusion/exclusion criteria were used:

- January 2002 to April 2004
- English language only
- Systematic reviews, meta-analyses, syntheses and review-level papers which followed a systematic methodology
- Reviews on interventions for adults and children to prevent or reduce alcohol misuse for all population groups, as well as for hazardous/risky/harmful drinkers. Particular reference was made to disadvantaged and vulnerable groups, before the onset of dependence.

We used the study authors' own definitions for hazardous/risky/harmful and/or alcoholic/alcohol

dependent to determine if an abstract or full paper met the inclusion criteria.

Interventions aimed at the treatment of alcohol dependence – ie alcoholics with a dependence on alcohol or prevention of relapse for previously known alcohol dependents – were excluded. Screening for alcohol problems or misuse and interventions that aim to prevent or minimise the harm associated with drinking alcohol, either to the individual or society, were also not included within the scope of this evidence briefing. However, interventions that combined screening for alcohol problems with an intervention to prevent or reduce alcohol misuse, for example provision of advice, were within the remit of this briefing.

Abstracts and papers were also rejected if they had a pharmacological component. Abstracts and papers were also rejected if they reported interventions aimed at the treatment of alcohol dependence; aggregated alcohol outcomes with other outcomes (for example smoking); aggregated alcohol dependence with non-alcohol dependence; or covered screening interventions aimed at identifying individuals for further treatment or interventions.

A joint decision was made between two reviewers as to whether the full paper would be retrieved for critical appraisal. If the two reviewers disagreed, or no clear decision could be made on the basis of the title or abstract, the full paper was requested for retrieval. A total of 34 papers identified were requested for retrieval by the reviewers.

An additional 10 papers were identified as potentially relevant by the peer reviewers and through checking reference lists, and these were also retrieved.

Critical appraisal process

Combining those papers identified by the search strategy with those identified by the peer reviewers produced a total of 44 papers that were requested for retrieval; 42 papers were retrieved within the timeframe allocated for this briefing.

As the HDA's methodology for the production of evidence briefings, in particular the critical appraisal process, had developed significantly since the publication of the first edition of this alcohol evidence briefing, the reviewers decided that it would be useful to critically appraise again all of the papers retrieved for the first edition as well as the 42 retrieved papers identified for consideration. Each paper was critically assessed by two of the three reviewers (C. Mulvihill, L. Taylor and S. Waller).

The critical appraisal process sought to identify the extent to which the papers met the following criteria:

- Systematicity – does the review apply a consistent and comprehensive approach?
- Transparency – is the review clear about the processes involved?
- Quality – are the appropriate methods and analysis undertaken?
- Relevance – is the review relevant in terms of focus (ie populations, interventions and settings)?

There was no blinding of authorship of critically appraised papers. A critical appraisal tool (see Appendix 3) was completed by each reviewer and a joint decision was made about whether the paper was suitable to be accepted as an evidence base paper and used in the findings section or be discarded. Disagreements were resolved through discussion or, if necessary, by recourse to a third reviewer.

Presentation of findings

The process of critical appraisal identified 15 papers for inclusion in the Findings section. A summary of the critical appraisal findings of those papers that failed the process is shown in Appendix 4. All the accepted papers (now referred to as HDA Evidence Base papers) were compared and collated, and a narrative synthesis was produced by the HDA reviewers under the following core themes (these mirror the key themes identified in the first edition of the briefing):

- Interventions to reduce alcohol-impaired driving
- Healthcare settings
- Children and young people.

The selected papers are listed and summarised (Table 2) in the following section, 'HDA Evidence Base papers'. Then, under each theme in the Findings section, a detailed description of the relevant papers is provided.

A number of **evidence statements** about the effectiveness of interventions were derived from the findings of the HDA Evidence Base papers. It should be stressed that the evidence statements are not those of the review authors but are derived from our interpretation of their findings, and have been referenced accordingly. Each summary statement categorises the evidence as follows:

- **Evidence of effectiveness:** derived from the review-level literature where the results were all in agreement, using the review authors' own words
- **Currently, a lack of evidence of effectiveness:** applied to interventions in the review-level literature which showed no current impact on outcomes
- **Conflicting evidence:** derived from the review-level literature where the interpretation and/or conclusions of review papers and/or primary studies within the review papers were not in agreement.

A key remit of this briefing was to scrutinise the reviews for details on the effect on inequalities in health and on the cost effectiveness of the interventions. Where this information is available it has been described under the relevant themes and is also reflected in the evidence statements.

A number of gaps in the review-level evidence and associated research recommendations were also identified and these are presented in 'Gaps in the evidence base and recommendations for research' (p40) of this briefing.

Peer review

A first draft of this briefing was sent to two peer reviewers and circulated to the members of Reference Group in October 2004 for comment. A small number of changes were made in light of the feedback received.

HDA Evidence Base papers

The following 15 review-level papers met the criteria outlined previously and were included onto the HDA Evidence Base, which can be viewed at www.hda.nhs.uk/evidence. Characteristics of the studies included in the HDA Evidence Base papers are shown in Table 2.

Anderson, P., Laurant, M., Kaner, E., Wensing, M. and Grol, R. (2004a). Engaging general practitioners in the management of hazardous and harmful alcohol consumption: results of a meta-analysis. *Journal of Studies on Alcohol* 65: 191-9.

Apodaca, T. R. and Miller, W. R. (2003). A meta-analysis of the effectiveness of bibliotherapy for alcohol problems. *Journal of Clinical Psychology* 59 (3): 289-304.

Ashenden, R., Silagy, C. and Weller, D. (1997). A systematic review of the effectiveness of promoting lifestyle change in general practice. *Family Practice* 14 (2): 160-76.

Ballesteros, J., Gonzalez-Pinto, A., Querejeta, I. and Arino, J. (2004a). Brief interventions for hazardous drinkers delivered in primary care are equally effective in men and women. *Addiction* 99: 103-8.

Ballesteros, J., Duffy, J. C., Querejeta, I., Arino, J. and Gonzalez-Pinto, A. (2004b). Efficacy of brief interventions for hazardous drinkers in primary care: systematic review and meta-analyses. *Alcoholism: Clinical and Experimental Research* 28 (4): 608-18.

Coben, J. H. and Larkin, G. L. (1999). Effectiveness of ignition interlock devices in reducing drunk driving recidivism. *American Journal of Preventive Medicine* 16 (1S): 81-7.

Foxcroft, D. R., Ireland, D., Lister-Sharp, D. J., Lowe, G. and Breen, R. (2002). Primary prevention for alcohol misuse in young people. *The Cochrane Database of Systematic Reviews,* Issue 3. (Update of Foxcroft, D. R., Lister-Sharp, D. and Lowe, G. (1997). Alcohol misuse prevention for young people: a systematic review reveals methodological concerns and lack of reliable evidence of effectiveness. *Addiction* 92: 531-7.)

Huibers, M. J. H., Beurskens, A. J. H. M., Bleijenberg, G. and Van Schayck, C. P. (2003). The effectiveness of psychological interventions delivered by general practitioners. *The Cochrane Database of Systematic Reviews,* Issue 2.

Moyer, A., Finney, J. W., Swearingen, C. E. and Vergun, P. (2002). Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. *Addiction* 97: 279-92.

Peek-Asa, C. (1999). The effect of random alcohol screening in reducing motor vehicle crash injuries. *American Journal of Preventive Medicine* 16 (1S): 57-67.

Poikolainen, K. (1999). Effectiveness of brief interventions to reduce alcohol intake in primary health care populations: a meta-analysis. *Preventive Medicine* 28: 503-9.

Shults, R., Elder, R., Sleet, D., Nichols, J., Alas, M., Grande-Kulis, V., Zaza, S., Sosin, D. and Thompson, R. (2001). Reviews of evidence regarding interventions to reduce alcohol-impaired driving. *American Journal of Preventive Medicine* 21 (4S): 66-88.

Whitlock, E. P., Polen, M. R., Green, C. A., Orleans, T and Klein, J. (2004). Behavioral counselling interventions in primary care to reduce risky/harmful alcohol use by adults: a summary of the evidence for the US Preventative Services Task Force. *Annals of Internal Medicine* 140 (7): 557-68.

Wilk, A. I., Jensen, N. M. and Havighurst, T. C. (1997). Meta-analysis of randomized control trials addressing brief interventions in heavy alcohol drinkers. *Journal of General Internal Medicine* 12 (5): 274-83.

Zwerling, C. and Jones, M. P. (1999). Evaluation of the effectiveness of low blood alcohol concentration laws for younger drivers. *American Journal of Preventive Medicine* 16 (1S): 76-80.

Table 2: Characteristics of the review-level evidence of interventions to prevent or reduce alcohol misuse

Author and year	Objective	Number and type of studies included	Setting	Participants	Intervention	Findings
Anderson et al. (2004a)	A systematic review of studies that test the effectiveness of different strategies used to increase general practitioners' rates of screening for, and giving advice about, hazardous and harmful alcohol consumption.	12 studies included. Of these, nine contained one programme and three contained two programmes resulting in 15 programmes. Inclusion criteria were RCTs, controlled clinical trials, controlled before and after studies and interrupted time series studies. Databases searched from 1966 to 2001.	All studies were based in primary healthcare. Studies were conducted in the UK, Canada, Spain, Belgium, New Zealand, the US and Australia.	125,741 participants, adults aged 18 years and older. Studies addressed hazardous and harmful alcohol consumption, but not alcohol dependence.	Studies included single component and multi-component educational visit and office-based provider-orientated programmes. All the providers were general practitioners, or family practice physicians, with the exception of one study in which the providers were family medicine residents.	Although caution should be used in the interpretation of the results because the number of programmes studied is small, the interventions reviewed had an impact in engaging general practitioners in screening and giving advice for hazardous and harmful alcohol consumption, leading to an absolute increase in providers' screening and advice behaviour of between 8% and 18% over the performance of the comparison group. Programmes that were alcohol specific and that were multi-component seemed the most promising.
Apodaca and Miller (2003)	The effectiveness and cost effectiveness of bibliotherapy (self-help materials) in decreasing at risk and harmful drinking.	22 studies were identified and were rated as methodologically high.	No information provided.	4,198 participants. The effectiveness of self-help materials was investigated in two groups: those who had self-referred and seeking help for alcohol problems and those who were screened as being at-risk drinkers but had not been seeking help for their drinking.	Bibliotherapy was defined as any therapeutic intervention that was presented in a written form, designed to be read and implemented by the client. The materials ranged from brochures only a few pages long to self-help manuals and books several hundred pages in length.	The findings provide support for the cost effective use of bibliotherapy with problem drinkers seeking help to reduce their consumption, and to a lesser extent with drinkers who are identified through screening as at risk.

Table 2: Characteristics of the review-level evidence of interventions to prevent or reduce alcohol misuse (cont.)

Author and year	Objective	Number and type of studies included	Setting	Participants	Intervention	Findings
Ashenden et al. (1997)	To examine how effective lifestyle advice provided by GPs is in changing patient behaviour.	Six trials were identified which investigated the effectiveness of advice to reduce alcohol consumption. Studies were included where it was established that subjects were randomly allocated to experimental groups and where a comparison was made between either a 'no intervention' or 'usual care' control group, or between advice of differing intensities. Databases searched up to May 1995.	UK (four studies) US and Sweden. General practice setting.	3,560 participants, aged 17-69 years. In all the studies subjects recruited consumed alcohol at above the recommended safe levels (not more than two standard drinks a day for women or four for men). One trial included only female subjects and one had a male study population.	Three trials compared brief advice (within the confines of a single consultation) to a control. Two trials compared brief versus intensive advice (involving more than one consultation) and another trial examined intensive advice versus a control. Subjects in five of the trials were provided with written material in addition to verbal advice and in all studies the advice was provided by a GP. In all but one trial, subjects were followed up after one year.	Three of the six studies found that a significantly higher proportion of subjects who were given advice reduced their consumption compared with those subjects who were not advised to moderate their alcohol use. The remaining studies found no significant difference between intervention and control groups. None of the trials which measured the degree of alcohol-related morbidity found significant differences. The results do not provide conclusive evidence that providing advice to reduce alcohol consumption is effective.
Ballesteros et al. (2004a)	To update the evidence on the efficacy of brief interventions in the primary healthcare setting and address limitations present in previous analyses.	Thirteen studies (randomised trials) were included for a dose-effect analysis and 12 of these provided data for a comparison of brief interventions with reference categories. Databases searched up to March 2003 and no language restriction was imposed.	The studies were conducted in primary healthcare settings. Four were from the UK, five from the US, one from Australia and three from Spain.	A total of 4,353 men and women took part in the trials. Four studies included only men and 1 study included only women. Six studies included heavy drinkers and 7 included moderate drinkers. Only 3 studies were conducted on non-treatment seekers.	Types of intervention included: 1) Control group – no specific advice was given on alcohol consumption to participants (CTRL) 2) Minimal intervention (MI) consisting of a unique session of general advice on alcohol consumption lasting 3-5 minutes but without stressing strategies to decrease consumption 3) Brief intervention (BI) which was a specific intervention lasting 10-15 minutes in one session concerning alcohol consumption, health risks, and strategies to decrease alcohol intake, with possible reinforcing visits through follow-up of 3-5 minutes each 4) Extended brief interventions (EBI) that had the characteristics of BIs but also included several specific reinforcement sessions through follow-up, 10-15 minutes each. Length of follow-up was reported at 6 months and 12 months.	The results support the moderate efficacy of brief interventions and indicate that that there is no clear evidence of a dose-effect relationship in the primary care setting.

Table 2: Characteristics of the review-level evidence of interventions to prevent or reduce alcohol misuse (cont.)

Author and year	Objective	Number and type of studies included	Setting	Participants	Intervention	Findings
Ballesteros et al. (2004b)	To update former evidence on differential gender effectiveness of brief interventions for harmful alcohol consumption.	Seven studies were identified which gave six independent pairs of gender comparisons. Five out of seven studies used individual randomisation and two used cluster randomisation. Databases searched up to December 2001.	The studies were conducted in primary care practices in the UK (two studies), Australia (one study) and the US (three studies).	Men and women (total 2,981), aged 17-70 years. On average, a third of participants in each study were women. Study population were men and women who drank excessively, including hazardous drinkers beyond safe limits and harmful drinkers (those who have already incurred alcohol-related damage but do not have a diagnosis of alcohol dependence).	Interventions varied in intensity from a minimal intervention giving advice on safe limits and recommendations to reduce drinking lasting 3-5 minutes to extended brief interventions with several follow-up visits. All studies had a follow-up time of 6-12 months to assess the impact of the interventions.	Results support the equality of outcomes among men and women achieved by brief interventions for hazardous alcohol consumption in primary care settings.
Coben and Larkin (1999)	To determine if ignition interlock devices reduce recidivist driving while intoxicated (habitual relapses in offending or criminal behaviour).	Six studies met the criteria for review and analysis. Only one was an RCT and the randomisation procedure was inadequately described. All of the studies relied on re-arrest rates. Databases searched up to 1997.	All studies conducted within states in the US and Canada (California, North Carolina, Ohio, Oregon, Alberta and Maryland).	Participants included drivers who had at least one prior conviction for driving while intoxicated. In several studies, participants were drivers who had multiple prior convictions. Total sample was 12,512.	Alcohol ignition interlocks require the driver to provide a breath sample every time the individual attempts to start the automobile. If the driver has measured blood alcohol content above a specific threshold value, the ignition is locked, therefore preventing operation of the vehicle. The outcome of interest was re-arrest rate for driving while intoxicated during the time where the interlock device was installed in the car. One study also examined re-arrest rates following removal of the interlock.	Five of the six studies found interlocks were effective in reducing recidivist driving while intoxicated when the interlock was installed in the car.

Table 2: Characteristics of the review-level evidence of interventions to prevent or reduce alcohol misuse (cont.)

Author and year	Objective	Number and type of studies included	Setting	Participants	Intervention	Findings
Foxcroft et al. (1997, 2002) Updated in 2002; findings of 2002 update presented	To identify and summarise rigorous evaluations of psychosocial and educational interventions aimed at the primary prevention of alcohol misuse by young people. To assess the effectiveness of primary prevention interventions over the longer term (>3 years).	1997 – 33 studies included; 24 were RCTs. 2002 – 56 studies included, 41 were RCTs, 14 were non-randomised control group designs with before and after measures and there was one interrupted time series design. No time limits on databases searched but searches were conducted February to June 2002.	The majority (84%) of the evaluations took place in the US. Of the others, three were Canadian, two British, one Swedish, one Norwegian, one Australian and one was an international study. All the studies were conducted in schools, except for four carried out in the community, two in a secure setting for young offenders and one was conducted in an accident and emergency department.	Young people (children, adolescents and young adults) up to 25 years old.	Thirty-two interventions were generic drug (including alcohol) education programmes, where alcohol baseline and outcome measures were clearly reported. The remaining 24 studies reported interventions targeted specifically at alcohol. Included studies have evaluated psychosocial or educational interventions aimed at preventing the onset of alcohol use or alcohol misuse by young people. Follow-up periods were split into three groups: short term (one year or less); medium term (from one to three years); and long term (over three years).	There was substantial heterogeneity of settings, design of studies, source and format of interventions, outcomes measured and target group. Twenty of the 56 studies included showed evidence of ineffectiveness. No firm conclusions about the effectiveness of prevention interventions in the short and medium term were possible. Over the longer term, the Strengthening Families Programme showed promise as an effective prevention intervention.
Huibers et al. (2003)	To investigate the effectiveness of psychosocial interventions by general practitioners through assessing the clinical outcomes and the methodological quality of selected studies.	Eight studies were included. RCTs, controlled clinical trials (CCTs) and controlled patient preference trials. Two studies concerned behavioural interventions to reduce alcohol consumption, one RCT and one CCT. Databases searched up to January 2002.	General practice setting. One study conducted in Canada and the other in Australia.	537 patients with high alcohol consumption (aged 15-70 years).	The RCT administered a two session cognitive behavioural intervention (basic information, help with understanding the function of alcohol, plan of action, moderation strategies, use of daily drinking records and self-help manual) by a research GP and nurse practitioner and one session of brief advice by a regular GP. Follow-up was at 12 months. The CCT involved: (1) a five session behavioural change programme (use of self-help manual and diary, education, counselling, advice on changing drinking behaviour, supporting new drinking habits) with a GP compared to (2) a one session brief advice to stop drinking and (3) an assessment of drinking behaviour only and follow-up measurement only.	There is limited evidence that a cognitive behavioural intervention by a GP is no more effective than a cognitive intervention by a nurse practitioner or brief advice. There is also limited evidence that a behavioural change programme is no more effective than brief advice, assessment of drinking behaviour only or follow-up measurement only.

Table 2: Characteristics of the review-level evidence of interventions to prevent or reduce alcohol misuse (cont.)

Author and year	Objective	Number and type of studies included	Setting	Participants	Intervention	Findings
Moyer et al. (2002)	A meta-analytic review that considered studies comparing brief interventions with control treatment conditions. The effect sizes were calculated for multiple drinking-related outcomes at multiple follow-up points and took into account the critical distinction between treatment-seeking and non-treatment-seeking samples.	Fifty-six studies included. These consisted of studies comparing brief interventions to control conditions in treatment-seeking samples (two studies) and non-treatment-seeking samples (34 studies). Databases searched from 1970-1998.	Primary care and healthcare settings.	Non-treatment-seeking samples were identified opportunistically (in settings where individuals attended for reasons unconnected with drinking problems). Treatment-seeking samples attended specialist treatment settings where individuals presented themselves or are mandated to seek help for drinking problems. In the interventions for non-treatment-seeking populations, the majority (79%) excluded individuals with severe alcohol problems.	The majority of brief interventions involved one session of between 5-30 minutes duration which included feedback, advice and a brochure/self-help booklet. Some provided a motivational interview and in one study a home study course. Interventions delivered by health advisers, GPs/primary care physicians and nurses.	Overall, this review provides further positive evidence for brief interventions compared to control conditions in opportunistic samples and as typically delivered by healthcare professionals. For non-treatment-seeking samples, significant, largely homogenous, small-to-medium aggregate effect sizes were found. Effect sizes were largest at the earliest follow-up points, suggesting reduction in intervention effects over time.
Peek-Asa (1999)	To synthesise results of studies evaluating random screening programmes in order to understand their role in decreasing motor vehicle-related deaths and injuries and alcohol-related deaths.	Fourteen studies were included. All used an ecologic design comparing locations with random screening to either a period previous to implementation of a programme or to a comparable population without a checkpoint programme. Databases searched from 1966-1997.	US (New Jersey, California, North Carolina, Maryland and Delaware, Tennessee) and Australia (New South Wales and Melbourne).	All members of communities where random alcohol screening had been implemented. No restrictions for inclusion based on age, gender or type of vehicle.	The two types of random screening programmes included were random breath testing and sobriety checkpoints.	Random screening appears to be effective in a wide range of both US and Australian populations. Although there are many limitations to the studies reviewed, the weight of the evidence indicates that random screening reduces fatalities and injuries. Several studies of the cost of implementing random breath testing concluded that costs are not prohibitive and that the costs associated with the programmes was far offset by crash injury reductions.

Table 2: Characteristics of the review-level evidence of interventions to prevent or reduce alcohol misuse (cont.)

Author and year	Objective	Number and type of studies included	Setting	Participants	Intervention	Findings
Poikolainen (1999)	To find out how much brief interventions decrease alcohol intake in primary healthcare populations.	Seven studies with random allocation of subjects to intervention and control groups, no intervention for the control group. Follow-up variables reported and follow-up time 6-12 months. Databases searched from 1966 to 1997.	Studies were sampled either from the general population or from family or general practitioner practices.	2,546 participants, males and females, aged 17-70 years. Meta-analysis examined brief and extended interventions. Six data sets pertained to very brief interventions (314 subjects) and eight datasets for extended brief interventions (2,082 subjects). Subjects had either evidence of an alcohol-related problem, reported excessive alcohol intake or elevated gamma-glutamyltransferase activity.	Very brief interventions which last 5-20 minutes and extended interventions which typically require several visits. Studies provided brief or very brief advice (5-15 mins) that included feedback on alcohol intake, an alcohol diary, explanation of the risks of excessive drinking and advice on reducing future drinking. Subjects received between 1-5 sessions.	After combining all the available data sets for both men and women, the point estimates showed a decrease in alcohol intake for both very brief and extended brief interventions. Although the 95% confidence intervals showed a significant effect, lack of statistical homogeneity implied that no pooled estimate of the effect would be meaningful. Extended brief interventions were effective among women. Other brief interventions seem to be effective sometimes, but not always, and the average effect cannot be reliably estimated.
Shults et al. (2001)	To assess the effectiveness of a number of laws and other community based interventions in reducing alcohol-impaired driving and alcohol-related motor vehicle crash fatalities.	76 studies included time-series studies with and without concurrent group, before-after studies with concurrent comparison and a non-randomised group trial. Databases searched from the originating dates of the database to June 2000.	Of the 76 studies, 55 (72%) were conducted in the US. Other studies were conducted in Australia, Canada, New Zealand, France and the Netherlands.	Individuals in the community. No details on participants available.	Focused on interventions for which the primary goal was to reduce alcohol-impaired driving. These included 80mg/100ml blood alcohol concentration (BAC) laws (nine studies), lower BAC laws for young and inexperienced drivers (eight studies), minimum legal drinking age laws (33 studies), sobriety checkpoints (13 studies – selective, 12 studies – random) and intervention training programmes for servers of alcoholic beverages (five studies).	'Strong evidence' was found for the effectiveness of 80mg/100ml blood alcohol concentration laws, minimum legal drinking age laws, and sobriety checkpoints. 'Sufficient evidence' was found for the effectiveness of lower blood alcohol concentration laws for young and inexperienced drivers and of intervention training programmes for servers of alcoholic beverages. Little economic evaluation information was available.

Table 2: Characteristics of the review-level evidence of interventions to prevent or reduce alcohol misuse (cont.)

Author and year	Objective	Number and type of studies included	Setting	Participants	Intervention	Findings
Whitlock et al. (2004)	To systematically review evidence for the efficacy of brief behavioural counselling in primary care settings to reduce risky and harmful alcohol consumption.	12 trials, all RCTs. Seven trials were judged good quality and the rest fair quality. The studies examined drinking outcomes after at least 12 months of follow-up, except for one with 6 month results and another with at least nine months of follow-up. Databases searched from 1994 to April 2002.	All trials were conducted in multiple primary care practices (ranging from three to 47 practices per study) except for one controlled clinical trial. Studies were carried out in Australia, the US, UK and Norway.	Risky/hazardous/ harmful drinkers aged 17 years and over who received a primary care behavioural counselling intervention primarily to reduce alcohol intake. Total of 5,996 participants; all but three trials involved more than 300 participants. About one third of study participants were women.	Two studies evaluated very brief interventions (one session, up to five minutes long), six evaluated brief interventions (one session, up to 15 minutes long) and seven evaluated brief multi-contact interventions (initial session up to 15 minutes long, plus follow-up contacts). Twelve of the 15 interventions were delivered all or in part by the patient's usual primary care physician. Four of these 15 used physicians to deliver initial and repeated intervention contacts, whereas others used health educators and counsellors or clinic nurses for some contacts.	Behavioural counselling interventions for risky/harmful alcohol use among adult primary care patients could provide effective components of a public health approach to reducing risky/harmful alcohol use. Future research should focus on implementation strategies to facilitate adoption of these practices into routine healthcare.
Wilk et al. (1997)	To assess the effectiveness of brief interventions in heavy drinkers by analysing the outcome data and methodological quality.	Twelve studies included, all with a randomised study design and a control group that received no alcohol-related treatment or intervention. Databases searched from 1966 to 1995.	Outpatient practices (seven studies), hypertension clinic, residents of Tromso and Malmö, Norway and inpatients (two studies). No information on the countries where the studies were conducted but the majority were conducted outside the US.	A total of 3,948 heavy or problem drinkers aged 19-65 years (five studies investigated males only n=950 and one study females only n=72). Nine studies included patients who were drinking more than 20 to 35 drinks per week.	Brief advice or counselling (10-15 mins) that included feedback and education in the harm of heavy drinking and advice to moderate drinking to low-risk, problem-free levels. All but five studies included follow-up sessions, which varied from 1-4 sessions.	Heavy drinkers who received a brief intervention were twice as likely to moderate their drinking 6 to 12 months after an intervention when compared with heavy drinkers who received no intervention. Brief intervention is a low-cost, effective preventive measure for heavy drinkers in outpatient settings.
Zwerling and Jones (1999)	A systematic review to determine whether low blood alcohol concentration (BAC) laws among younger drivers reduce motor vehicle injuries.	Six studies included. All were ecological designs: two interrupted time series and four pre/post studies. Databases searched 1966-1997.	Australia (Western Australia, Queensland, South Australia and Victoria) and US (Maine, Massachusetts and Maryland).	Participants were drivers subject to relevant laws. Young drivers aged from 15 to 25 years	The interventions examined were laws limiting the blood alcohol concentration permitted in younger drivers. Interventions included zero BAC, 20mg/100ml BAC and 50mg/100ml BAC.	All six studies showed a reduction in injuries or crashes after the implementation of the law, although for three studies these reductions were not statistically significant. Despite the methodological difficulties of ecologic studies, the six studies reviewed represent accumulating evidence in support of the effectiveness of these laws.

Findings

Interventions to reduce alcohol-impaired driving

- 80mg/100ml blood alcohol concentration (BAC) laws
- Lower BAC laws for young or inexperienced drivers
- Minimum legal drinking age laws
- Sobriety checkpoints
- Ignition interlock devices in reducing drunk driving recidivism
- Training programmes for servers of alcoholic beverages

Healthcare settings

- GP-based lifestyle interventions
- Psychosocial interventions delivered by GPs
- Brief interventions:
  - Very brief and extended brief interventions
  - Very brief interventions
  - Extended brief interventions
  - Comparing the effectiveness of brief interventions for hazardous drinking in men and women
  - Controlled brief interventions with non-treatment-seeking populations
  - Efficacy of brief interventions for hazardous drinkers in primary care: dose-effect relationship
- Interventions to increase rates of screening and giving advice by GPs
- The use of bibliotherapy (self-help materials)

Children and young people

Interventions to reduce alcohol-impaired driving

Three systematic reviews examined interventions to reduce alcohol-impaired driving. The largest and most up-to-date systematic review is by Shults et al. (2001) and their findings are presented first in each section below. The findings from earlier systematic reviews by Zwerling and Jones (1999) and Peek-Asa (1999) are also reported.

80mg/100ml BAC laws

Shults et al. (2001) investigated the effectiveness of a number of laws and other community based interventions in reducing alcohol-impaired driving and alcohol-related motor vehicle crash fatalities. A total of 76 studies covering five themes (80mg/100ml [80mg alcohol in 100ml blood] BAC laws, lower BAC laws for young or inexperienced drivers, minimum legal drinking age laws, sobriety checkpoints and training programmes for servers of alcoholic beverages) were identified and met the authors' inclusion criteria. A detailed methodology for this paper is provided in Zaza et al. (2001) and additional data are presented on the website www.thecommunityguide.org

Findings related specifically to 80mg/100ml BAC laws were based on nine studies judged to be of sufficient

design quality and execution. All nine studies were US-based and analysed data from police incident reports. The years the data were collected ranged from 1976 to 1998, with follow-up times ranging from one to 14 years, with a median of five years.

The main findings by Shults et al. (2001) were:

- The median post-law decrease in alcohol-related motor vehicle fatalities was 7%
- The number of lives that could be saved if all US states enact 80mg/100ml BAC laws (estimated from three of the studies) ranged from 400 to 600 lives per year.

Only one of the nine studies showed an increase in fatalities after enactment of the 80mg/100ml BAC law. However, this was explained as an imprecise comparison made as a result of the small number of alcohol-related motor vehicle fatalities recorded in a three year time period.

The authors also note that because all of the studies analysed data from the state-wide police incident reports of fatal crashes, the evidence of effectiveness should be applicable to all drivers affected by 80mg/100ml BAC laws. However, none of the studies provided data to assess differences in effectiveness for various sub-groups of the driving population. Furthermore, no economic studies on this topic met the authors' inclusion requirements.

The authors concluded that the 'available studies provide strong evidence that 80mg/100ml BAC laws are effective in reducing alcohol-related crash fatalities'.

There is review-level evidence that 80mg/100ml blood alcohol concentration (BAC) laws are effective in reducing alcohol-related crash fatalities (Shults et al., 2001).

Lower BAC laws for young or inexperienced drivers

Findings in relation to the effectiveness of introducing lower BAC laws for young or inexperienced drivers rather than older or more experienced drivers were based on six studies judged to be of sufficient design quality and execution (Shults et al., 2001). Four of the six studies were conducted in the US and two in Australia. All six studies analysed data from police incident reports, with post-law follow-up times ranging from less than one year to 15 years, with a median of 22 months.

The main findings from the six qualifying studies were:

- Each study reported a post-law reduction in crashes
- Three studies examined fatal crash outcomes and reported declines of 24%, 17%, and 9% respectively
- Two studies examined fatal and non-fatal injury crashes and reported declines of 17% and 4%
- The one study that examined crashes where the police believed that the driver had been drinking alcohol reported a decline of 11%.

The authors also noted that because all of the studies analysed data from the state-wide files of police-reported crashes, evidence of effectiveness should be applicable to all drivers affected by these lower BAC laws. However, none of the studies provided data to assess differences in effectiveness for sub-groups of the affected population. One economic study in the US met Shults et al.'s inclusion criteria. The study used previously published cost-effectiveness data and assumed a 20% reduction in young drivers' alcohol-related crashes. The estimated benefit-to-cost ratio was $11 per dollar invested when violators received a six month licence suspension.

The authors concluded that there was 'sufficient evidence that lower BAC laws are effective in reducing alcohol-related crashes among young or inexperienced drivers'.

An earlier systematic review by Zwerling and Jones (1999) reported similar findings – lower BAC laws for younger drivers resulted in a reduction in injuries or crashes after the implementation of the law, although for three studies these reductions were not statistically significant. Despite this, 'the studies reviewed represent accumulating evidence in support of the effectiveness of these laws'. Six studies were identified (four from Australia and two from the US, all with ecological designs – interrupted time series and pre/post-studies). Furthermore, one US study evaluated laws with differing levels of BAC and found a dose-response effect. There was the greatest reduction, 22%, in night-time single vehicle fatalities in those states with zero BAC laws. In states with 20mg/100ml BAC laws, the reduction averaged 17% and in states with 40mg/100ml to 60mg/100ml BAC laws, the reduction was only 7%.

There is review-level evidence that lower BAC laws are effective in reducing alcohol-related crash fatalities among young or inexperienced drivers (Shults et al., 2001; Zwerling and Jones, 1999).

Minimum legal drinking age laws

Findings in relation to minimum legal drinking age (MLDA) laws, which specify an age below which the purchase or public consumption of alcoholic beverages is illegal, were based on 33 studies judged to be of sufficient design quality and execution (Shults et al., 2001). Of the 33 studies, 27 were conducted in the US, one in the US and Canada, and the remainder in Australia or Canada. Most studies assessed the change in MLDA from 18 to 21 years, or vice versa, and the follow-up period ranged from seven to 108 months.

The main findings from the qualifying studies were:

- Changes in MLDA result in changes to aggregated alcohol-related crash outcomes of roughly 10%-19%, decreasing when the MLDA is raised and increasing when lowered
- Fifteen studies with perfect overlap between the age group targeted by the law and the age group analysed found a median change in crashes of 19%
- In the 14 studies investigating the effects of raising the MLDA, motor vehicle crash-related outcomes declined a median of 16% for the targeted age groups
- In the nine studies investigating the effects of lowering the MLDA, motor vehicle crash-related outcomes increased by a median of 10% within the targeted age groups.

The authors note that generalising these findings to other countries may be limited by differences in patterns of alcohol consumption and driving among 18-20 year olds.

The authors concluded that there is 'strong evidence that MLDA laws, particularly those that set the minimum drinking legal age at age 21, are effective in preventing alcohol-related crashes and associated injuries'.

There is review-level evidence that minimum legal drinking age laws, particularly those that set the minimum legal drinking age at age 21, are effective in preventing alcohol-related crashes and associated injuries (Shults et al., 2001).

Sobriety checkpoints

Findings in relation to sobriety checkpoints, where law enforcement officers systematically stop drivers to assess their degree of alcohol impairment, were based on 23 studies judged to be of sufficient design quality and execution (Shults et al., 2001). Eleven studies were on selective breath testing (SBT) – where law enforcement officers must have reason to suspect the driver stopped at a checkpoint has been drinking before a breath test can be demanded. The remaining 12 studies were on random breath testing (RBT) – at a checkpoint all drivers stopped are given a breath test.

For SBT, nine of the 11 studies were in the US and the remaining two in Canada. For RBT, 11 of the 12 studies were based in Australia and one in France. The follow-up period ranged from one to 120 months with a median of 14 months.

The main findings from the qualifying 23 studies were:

- Both SBT and RBT checkpoints consistently resulted in decreased alcohol-related motor vehicle crashes
- Motor vehicle crashes thought to involve alcohol dropped a median of 18% for RBT checkpoints and 20% for SBT checkpoints
- Fatal motor vehicle crashes thought to involve alcohol dropped a median of 22% for RBT checkpoints and 23% for SBT checkpoints
- Regardless of the follow-up time motor vehicle crashes declined a median of 18% for follow-up times of less than one year and 17% for follow-up times of more than one year
- RBT resulted in a 13% decline in the proportion of drivers with a detectable BAC and a 24% decline in the proportion of drivers with BAC levels above 80mg/100ml, although these results were only based on one study.

Two SBT and two RBT studies met the reviewers' inclusion criteria for economic evaluation and were classified as being of satisfactory or good quality. For SBT, a benefit-to-cost ratio ranging from US$6 to US$23 per dollar invested was calculated, and for RBT the benefit-to-cost ratio was US$2 per dollar invested.

The authors conclude that there is strong evidence that SBT and RBT sobriety checkpoints are effective in preventing alcohol-impaired driving, alcohol-related crashes and associated fatal and non-fatal injuries.

An earlier systematic review by Peek-Asa (1999) investigated the effect of random screening in reducing motor vehicle crash injuries. Only interventions in which drivers were randomly stopped for alcohol screening regardless of suspicion or use were included. Two types of random screening programmes were examined – random breath testing and sobriety checkpoints. Fourteen studies met the inclusion criteria, but no randomised controlled studies were available. These studies included a wide variation of population sizes and time periods, ranging from entire countries to small communities, and from multiple year follow-up to single weekend evaluations.

All but one of the evaluations indicated a reduction in injuries and/or crashes. Studies measuring overall fatalities before and after implementation of random screening programmes found decreases ranging from 16.2% to 29%. Five studies measured decreases in total injuries or crashes with a range of 10% to 28%. The studies were conducted in Australia and the US. Decreases in all outcomes were generally higher for Australia, which uses random breath testing, than for the US, which uses sobriety checkpoints.

Three studies included follow-up periods of over one year to determine the sustained effect of random screening. Two of these studies found sustained effects for several years after the study, but they did not control for the presence of other programmes to reduce drinking and driving. Furthermore, two studies examined the cost effectiveness of random screening and concluded that the costs were not prohibitive and that costs related to lost lives and injuries far exceeded the costs of the programme. One study concluded that random screening saved between US$1 million and US$3.5 million a year.

Therefore the review by Peek-Asa (1999) is in agreement with Shults et al. (2001), and concludes that 'there appears to be enough evidence to support the implementation of random screening programmes to deter drunk driving and related motor vehicle crashes'.

There is review-level evidence that selective breath testing, sobriety checkpoints and random breath testing are effective in preventing alcohol-impaired driving, alcohol-related crashes and associated fatal and non-fatal injuries (Shults et al., 2001; Peek-Asa, 1999).

Ignition interlock devices in reducing drunk driving recidivism

One systematic review (Coben and Larkin, 1999) investigated the effectiveness of ignition interlock devices in reducing recidivist driving while intoxicated (ie habitual relapses in offending or criminal behaviour). Alcohol ignition interlocks require the driver to provide a breath sample every time the individual attempts to start the car. If the driver has a measured blood alcohol concentration above a specific threshold value the ignition is locked, preventing operation of the vehicle. Six studies were identified, all carried out within states in the US and Canada with drivers who had at least one prior conviction for driving while intoxicated. In several studies, participants were drivers who had multiple prior convictions.

Five of the six studies identified in the systematic review found interlocks were effective in reducing drunk driving recidivism while the interlock was installed in the car. In the five studies demonstrating a significant effect participants in the interlock programs were 15%-69% less likely than controls to be re-arrested for driving while intoxicated. The only reported RCT demonstrated a 65% reduction in re-arrests in the interlock group compared with the control group over a one year period. The authors concluded that ignition interlock programmes are effective in reducing recidivist intoxicated driving among repeat offenders, but there is limited evidence of effectiveness beyond the period where the interlock is physically applied to the car.

In addition to these findings Coben and Larkin (1999) reported some methodological limitations. In all but one study, judicial discretion may have created selection bias. Judges are commonly unwilling to give up their discretion, making RCTs difficult to execute. In non-RCTs, judges may have been more likely to assign lower risk offenders to interlock programmes. In some studies, offenders were given the opportunity to opt out of the interlock programme and one study noted that many offenders assigned to ignition interlocks never had them installed. Finally, all of the studies relied on the re-arrest rate, which is an indirect measure of recidivist intoxicated driving. Future studies should examine crash rates, alcohol-related crash rates, and deaths and injuries as additional outcomes.

There is review-level evidence for the effectiveness of ignition interlock devices in reducing recidivist intoxicated driving (ie habitual relapses in offending or criminal behaviour) (Coben and Larkin, 1999).

Training programmes for servers of alcoholic beverages

Findings were based on five studies judged to be of sufficient design quality and execution (Shults et al., 2001). Three of the studies were conducted in the US, one in Canada and one in Australia. The authors identify that server intervention training programmes provide education and training to servers of alcoholic beverages with the goal of altering their serving practices to prevent patron intoxication and alcohol-impaired driving. These practices may include offering customers food with drinks, delaying service to rapid drinkers, refusing service to intoxicated or underage drinkers and discouraging intoxicated customers from driving.

Two studies found significant improvements in the observed server behaviours after a relatively intensive (4.5-6 hours) training programme. Another three studies found that server training was associated with decreases in patron intoxication (assessed by BAC levels) ranging from 17% to 100%, with a median of 33%. Finally, one study assessing a state-wide one day mandatory server training programme resulted in an estimated net 23% decrease in single-vehicle night time injury crashes.

Only one of the five identified studies evaluated outcomes beyond a three month follow-up period and the authors noted that this leaves the long-term effect of this intervention open to question. The programmes evaluated varied in training method and content, and in all but one study all of the participating drinking establishments volunteered to have their servers attend the training.

Therefore it is not clear to what extent these findings might generalise to larger-scale community programmes, to programmes with substantially different training methods or content, or to programmes that do not recruit well-motivated managers.

The authors concluded that there is 'sufficient' evidence for intensive, high quality, face-to-face server training to reduce the levels of intoxication in customers, particularly when accompanied by strong and active management support.

There is review-level evidence to suggest that intensive, high quality, face-to-face server training, when accompanied by strong and active management support, is effective in reducing intoxication levels in customers (Shults et al., 2001).

Healthcare settings

Three systematic reviews (Ashenden et al., 1997; Huibers et al., 2003; Whitlock et al., 2004) and seven meta-analyses (Anderson et al., 2004a; Apodaca and Miller, 2003; Ballesteros et al., 2004a, 2004b; Moyer et al., 2002; Poikolainen, 1999; Wilk et al., 1997) have investigated the effectiveness of interventions within a healthcare setting. The findings are categorised as:

- GP-based lifestyle advice interventions
- Psychosocial interventions delivered by GPs
- Brief interventions
  - Very brief and extended brief interventions
  - Very brief interventions
  - Extended brief interventions
  - Comparing the effectiveness of brief interventions for hazardous drinking in men and women
  - Controlled brief interventions with non-treatment seeking populations
  - Interventions for hazardous drinkers in primary care: dose-effect relationship
- Interventions to increase rates of screening and giving advice by GPs
- The use of bibliotherapy (self-help materials).

GP-based lifestyle advice interventions

Ashenden et al. (1997) selected 37 trials in their systematic review examining the effectiveness of lifestyle advice provided by GPs. Four areas of behaviour were examined: smoking, alcohol consumption, diet and exercise. Of the 37 trials identified, six investigated the effectiveness of advice to reduce alcohol consumption. In all the studies, subjects consumed alcohol at above the recommended safe levels and both brief and intensive advice (more than one consultation) were investigated.

The review found that three of the six studies reported that a significantly higher proportion of subjects who were given advice reduced their alcohol consumption compared to those who did not receive advice. The trial which demonstrated the greatest difference provided intensive rather than brief advice. The remaining studies found no significant difference between intervention and control or comparison groups. Five trials measured changes in biochemical levels (gamma-glutamyl transpeptidase (GGT), with two reporting significantly lower levels in some intervention group subjects. However, the authors of these trials did doubt the usefulness of this data because of questionable

reliability of this biochemical test as a measure of alcohol consumption levels.

Ashenden and colleagues (1997) concluded that 'while half of the studies found that consumption was significantly reduced when advice was provided, the results of these trials do not provide conclusive evidence that providing advice to reduce alcohol consumption is effective. The efficacy of providing advice can therefore not be rejected'. The authors suggest that publication bias is a possibility but this is unlikely to fully explain these results.

There is conflicting review-level evidence for the effectiveness of GP-based lifestyle advice interventions to reduce heavy drinking (Ashenden et al., 1997).

Psychosocial interventions delivered by GPs

A Cochrane systematic review by Huibers et al. (2003) examined the effectiveness of psychosocial interventions by GPs by assessing the clinical outcomes and the methodological quality of these studies. The review states that the reported prevalence of psychological or psychosocial disorders in primary care ranges from 30% to 70% of all patients with a growing responsibility for managing them falling to GPs. There is therefore a need to investigate the effectiveness of psychosocial interventions within a primary care setting.

Eight studies were included in the Cochrane review but only two concerned behavioural interventions to reduce alcohol consumption. One study was a high quality RCT and the other a lower-quality controlled clinical trial, with both trials targeting patients with high alcohol consumption. In the RCT, the effects of a two-session cognitive behavioural intervention (CBI) administered by one research GP were compared to a CBI by a nurse practitioner and one session brief advice by one of 12 regular GPs. At 12 month follow-up there were no differences between the groups in alcohol consumption (quantity and frequency) or alcohol-related problems, although there was an overall reduction in these outcomes in all groups.

In the controlled clinical trial, the effects of a five-session behavioural change programme (Alcoholscreen) administered by one of 119 GPs were compared to one-session brief advice to stop drinking, assessment of drinking behaviour only and follow-up measurement only. At 12 month follow-up there were no differences between the groups in alcohol consumption (percentage of patients drinking above a predefined consumption level) or alcohol-related problems, although Alcoholscreen was superior to other treatment conditions if only those patients who had attended two sessions or more were analysed.

The authors concluded that 'there is limited evidence that a cognitive behavioural intervention by a GP is no more effective than a cognitive behavioural intervention by a nurse practitioner or brief advice on alcohol consumption or alcohol-related problems. Furthermore, there is limited evidence that a behavioural change programme is no more effective than brief advice, assessment of drinking behaviour only or follow-up measurement only on alcohol consumption or alcohol-related problems' (Huibers et al., 2003).

There is review-level evidence to suggest that a cognitive behavioural intervention by a GP is no more effective than a cognitive behavioural intervention by a nurse practitioner or brief advice (Huibers et al., 2003).

There is also review-level evidence to suggest that a behavioural change programme is no more effective than brief advice, assessment of drinking behaviour only or follow-up measurement only on alcohol consumption or alcohol-related problems (Huibers et al., 2003).

Brief interventions

One meta-analysis (Wilk et al., 1997) and one systematic review (Whitlock et al., 2004) have investigated the overall effectiveness of brief interventions. Wilk et al. (1997) examined heavy or problem drinkers, with nine studies that included patients who were drinking more than 20 to 35 drinks per week. Whitlock et al. (2004) looked at risky, hazardous or harmful drinkers defined as those at risk from consumption that exceeds daily, weekly or per-occasion thresholds (which includes binge drinkers) or those who experience physical, social or psychological harm from their above-threshold alcohol use without meeting criteria for dependence.

Twelve RCTs were identified by Wilk and colleagues (1997) which examined the effectiveness of brief interventions or counselling of 10-15 minutes duration

that included feedback and education about the harm of heavy drinking. All but five of the studies included follow-up sessions which varied from one to four sessions. Study samples reflected three distinct populations including outpatients, inpatients and the general population.

Eight of the 12 RCTs reported outcome data that allowed calculation of individual odds ratios (OR). A pooled OR of these RCTs showed that heavy drinkers who received brief motivational interventions were close to two times more likely to decrease and moderate their drinking compared to those who did not receive the intervention (OR 1.95; 95% confidence interval (CI): 1.66-2.30). Despite the inclusion of low quality RCTs in the pooled OR, no significant heterogeneity was detected. A sub-analysis of the six high quality RCTs revealed little difference in the summary OR (1.91; 95% CI: 1.61-2.27) and still no heterogeneity.

Furthermore, calculated ORs suggest a greater likelihood of alcohol moderation with greater intensity of intervention (OR 2.12 for more than one session compared with OR 1.83 for one session), female gender (OR 2.42 for women compared with OR 1.90 for men), and the intervention in the inpatient setting (OR 2.41 for inpatient compared with OR 1.91 for outpatient), although none of these comparisons were significant.

The authors concluded that 'brief intervention is a low-cost, effective preventive measure for heavy drinkers in outpatient settings' (Wilk et al., 1997).

The more recent systematic review by Whitlock et al. (2004) also examined 12 studies, all RCTs. However, unlike the work by Wilk et al. (1997), Whitlock and colleagues did not undertake a quantitative synthesis of alcohol outcomes because of the lack of a clearly superior measure among the three alcohol use outcomes available:

1 Mean drinks per week or the reduction in mean drinks per week (follow-up minus baseline)
2 Percentage of participants without binge drinking (usually defined as greater or equal to five drinks per occasion)
3 Percentage of participants achieving recommended drinking levels or patterns (as defined by the study).

Instead, a qualitative analysis would include the most informative outcomes. Whitlock et al. (2004) also classified brief interventions into three levels of intensity:

1 Very brief interventions comprising one session up to five minutes long
2 Brief interventions defined as one session up to 15 minutes long
3 Brief multi-contact interventions, which involve an initial session up to 15 minutes long, plus follow-up contacts.

The studies examined drinking outcomes after at least 12 months follow-up, except for one with six month results and another with at least nine months of follow-up. From their qualitative analysis, Whitlock et al. (2004) found four trials (brief multi-contact interventions) reported a 13% to 34% net reduction in weekly drinking in the intervention group compared to controls, resulting in 2.9 to 8.7 fewer mean drinks per week at follow-up. Five trials (brief multi-contact interventions) found significant effects on recommended or safe alcohol use, resulting in 10% to 19% more intervention participants reporting recommended or safe drinking patterns. Two trials also reported significant reduced binge drinking.

Whitlock et al. (2004) also investigated the effective elements of interventions. They found that all interventions that showed statistically significant improvements in alcohol outcomes of any intensity included at least two of three key elements – feedback, advice and goal setting. The most effective interventions were multi-contact ones, as these also provided further assistance and follow-up.

The findings from Whitlock et al. (2004) are in agreement with Wilk et al. (1997) in suggesting that brief interventions can be effective in reducing heavy, risky, hazardous or harmful drinking.

There is review-level evidence to suggest that heavy drinkers receiving brief interventions are twice as likely to moderate their drinking six to 12 months after an intervention when compared with drinkers receiving no intervention (Wilk et al., 1997).

There is review-level evidence to show that brief intervention trials (especially multi-contact) can reduce net weekly drinking by 13% to 34%, resulting in 2.9 to 8.7 fewer mean drinks per week and a significant effect on recommended or safe alcohol use (Whitlock et al., 2004).

Very brief and extended brief interventions

A meta-analysis by Poikolainen (1999) also investigated the effectiveness of brief interventions, but unlike earlier meta-analyses a distinction was made between very brief (5-20 minute duration) and extended (several visits) brief interventions. Only samples from primary healthcare populations were studied. Poikolainen (1999) found that after combining all the data sets for both men and women the point estimates showed a decrease in alcohol intake for both very brief and extended brief interventions. Although the 95% confidence intervals showed a significant effect (men and women – very brief interventions 95% CI: -40 to -99, extended brief interventions 95% CI: -51 to -79), lack of statistical homogeneity implied that no pooled estimate of the effect would be meaningful for both very brief and extended brief interventions. An explanation for this lack of homogeneity cannot solely be explained by differences between men and women, as the extended intervention effect estimates were of the same magnitude for both sexes. It implies instead that there are large differences between the intervention projects included. Poikolainen (1999) reported great variation between the results of the individual studies in the magnitude and even in the direction of change after intervention. A recommendation is made to analyse the content of interventions.

There is currently a lack of review-level evidence for the effectiveness of very brief compared to extended interventions in decreasing alcohol intake in both men and women (Poikolainen, 1999).

Very brief interventions

Poikolainen (1999), using the six data sets for very brief interventions, found that for both men and women the homogeneity condition was met but the decrease in alcohol intake was not significant. The systematic review by Whitlock et al. (2004) also examined very brief interventions, which were defined as one session up to five minutes long. Two trials were found which reported mean drinks per week or average daily consumption outcomes. Statistically significant results were limited to only one of the very brief interventions and the results favoured intervention groups over control groups.

There is currently a lack of review-level evidence for the effectiveness of very brief interventions in decreasing alcohol intake in men and women (Poikolainen, 1999; Whitlock et al., 2004).

Extended brief interventions

Poikolainen (1999) pooled eight data sets for extended brief interventions.and found that the decrease in alcohol intake was significant with the studies being statistically homogenous among women. The summary effect estimate of change was -51g of alcohol per week (95% CI: -29 to -74) among women. This equals approximately four drinks, each containing 12g of alcohol. Due to a lack of statistical homogeneity, no significant change could be concluded for men.

There is review-level evidence for the effectiveness of extended brief interventions (several visits) in primary healthcare settings for women. Extended brief interventions decreased alcohol intake in women by on average 51g per week (Poikolainen, 1999).

There is currently a lack of review-level evidence for the effectiveness of extended brief interventions (several visits) in primary healthcare settings for men (Poikolainen, 1999).

Comparing the effectiveness of brief interventions for hazardous drinking in men and women

A recent meta-analysis by Ballesteros et al. (2004a) examined the effectiveness of brief interventions for hazardous drinking in men and women with the aim of updating the former report by Poikolainen (1999) on gender differences in effectiveness. All subjects were recruited from a population of primary care practices, with a follow-up time of six to 12 months to assess the impact of the interventions. Interventions varied in intensity from a minimal intervention giving advice on safe limits and recommendations to reduce drinking lasting three to five minutes, to extended brief interventions with several follow-up visits. Two outcomes were considered: the quantity of typical alcohol consumption during a specified period of time and the number of subjects whose drinking was below hazardous levels as reported in the original papers.

Ballesteros et al. (2004a) identified seven studies giving six independent pairs of gender comparisons, as one study reported the results for men and women in two separate papers. Five out of seven studies used individual randomisation and two used cluster randomisation. The overall results of the heterogeneity statistic was non-significant (Q = 16.63 on 11df; p = 0.12), as were the

heterogeneity within men (Q_{WM} = 7.38 on 5df; p = 0.19) and within women (Q_{WF} = 9.25 on 5df; p = 0.10). The heterogeneity by gender was negligible (Q_B = 0.00 on 1df; P = 0.95). Contrary to the results of Poikolainen (1999) (as discussed in the 'Very brief and extended brief interventions' section), this meta-analysis has not found significant heterogeneity among the effect sizes estimated for gender. The authors stated that the results of their meta-analysis supported the equality of outcomes among men and women achieved by brief interventions for hazardous alcohol consumption in primary care settings.

The authors suggested that dissimilarities between their meta-analysis and previous ones need to be considered when trying to reconcile the results. They argued that, first, this study has updated the evidence by including new studies not formerly available; and second, sampling was restricted in this meta-analysis to studies which reported separately for men and women, therefore excluding a larger number of studies which were combined in other meta-analyses.

However, it should be pointed out that no assessment of the quality of the studies was reported and there was no indication of the number of assessors involved. In addition, the authors had reviewed other meta-analyses for following up references and identifying the grey literature.

Finally, the findings of Whitlock et al. (2004) are in agreement. They reported no consistent differences between men and women in the effectiveness of the brief interventions (particularly multi-contact) analysed in their systematic review.

There is review-level evidence to suggest that brief interventions are equally effective in men and women for hazardous alcohol consumption in primary care settings (Ballesteros et al., 2004a; Whitlock et al., 2004).

Controlled brief interventions with non-treatment-seeking populations

Another meta-analysis (Moyer et al., 2002) investigated brief interventions, but a broader view was taken by considering comparisons with control conditions. The authors also took into account the critical distinction between non-treatment-seeking samples, identified opportunistically (in settings where individuals attend for reasons unconnected with drinking problems), and treatment-seeking samples who attend specialist treatment (in settings where individuals present themselves or are mandated to seek help for drinking problems). As this evidence briefing does not cover interventions aimed at the treatment of alcohol dependence, the findings from the non-treatment-seeking sample alone are presented here.

The authors identified 34 studies comparing brief interventions to control conditions. All interventions took place in healthcare settings, including primary care. The comparison of brief intervention versus control conditions found the effect sizes were significantly different from zero at the ≤3 month, >3-6 month and >6-12 month follow-up points for both the composite of all drinking-related outcomes and for alcohol consumption. The aggregate effect size at each of the three points indicated superior outcomes for brief intervention conditions. These effect sizes ranged from 0.14 to 0.67, with the largest effect occurring for alcohol consumption at the earliest (≤3 month) follow-up point. With the exception of alcohol consumption at the >3-6 and >6-12 month follow-up points, all effect sizes were statistically homogenous, indicating that variation did not exceed what would be expected from sampling error alone. There was therefore no variation on which to investigate the effects of difference study features.

For the two follow-up points with significant heterogeneity in alcohol consumption effect sizes, the exclusion of more alcohol dependent individuals in some studies was tested to help explain this variability. However, the results found that only for the >3-6 month follow-up point was the effect of brief interventions compared to control conditions significantly larger when individuals with more severe alcohol problems were excluded (0.211, 95% CI: 0.136-0.268) than when they were not excluded (0.046, 95% CI: -0.066-0.158).

These findings offer additional positive evidence for brief interventions – effect sizes were in the small-to-medium range. Effect sizes were also largest at the earliest follow-up points, suggesting decay in intervention effects over time. As only five of the 34 studies had follow-ups greater than one year, little is known of the long-term effects of these brief interventions.

In addition, Moyer et al. (2002) concluded that the findings are applicable only to similar kinds of brief interventions administered to similar populations. As the individuals were not seeking treatment for alcohol-related

problems (the majority (79%) excluded individuals with severe alcohol problems), they were often detected due to a health problem such as trauma or an elevated physiological index that can be linked to excessive alcohol consumption. The linkage of drinking to health problems, coupled with advice provided by a physician or nurse, may account (at least partially) for the positive effects of brief interventions in non-treatment-seeking populations.

There is review-level evidence to suggest that brief interventions are effective in opportunistic (non-treatment-seeking) samples and as typically delivered by healthcare professionals (Moyer et al., 2002).

Efficacy of brief interventions for hazardous drinkers in primary care: dose-effect relationship

Ballesteros et al. (2004b) updated the evidence on the efficacy of brief interventions in the primary care setting in a recent systematic review and meta-analysis by addressing limitations in previous analyses. The issue of the dose-effect trend by intensity of brief interventions, previously suggested by Poikolainen (1999) and Wilk et al. (1997), had not been formally tested. Thirteen randomised trials were included for a dose-effect analysis and 12 of these provided data for comparisons of brief interventions with reference categories. All the selected studies provided frequency data to allow assessment of the efficacy of brief interventions on an intention-to-treat basis. Four studies were from the UK, five from the US, one from Australia and three from Spain. Both random effects and fixed effect models were applied.

Types of intervention included:

- A control group (CTRL) with no specific advice given on alcohol consumption to participants
- Minimal intervention (MI), with a session of general advice on alcohol consumption lasting three to five minutes but without stressing strategies to decrease consumption
- Brief intervention (BI), a specific intervention lasting 10-15 minutes in one session concerning alcohol consumption, health risks and strategies to decrease alcohol intake, with possible reinforcing visits through follow-up of three to five minutes each
- Extended brief interventions (EBI), which had the characteristics of a BI but also included several specific reinforcement sessions through follow-up lasting 10-15 minutes each.

BIs outperformed MIs and usual care (random effects model odds ratio (OR): 1.55, 95% confidence interval (CI): 1.27-1.90; risk difference (RD): 0.11, 95% CI: 0.06-0.16; number needed to treat (NTT): 10, 95% CI: 7-17). When two influential studies were removed, similar results were obtained (fixed effect model OR: 1.57, 95% CI: 1.32-1,87; RD: 0.11, 95% CI: 0.07-0.15; NNT: 9, 95% CI: 7-15). Minimal intervention was not better than usual care. As heavy versus moderate hazardous drinkers were included as well as treatment seekers versus non-treatment seekers, heterogeneity between individual estimates was accounted for.

The results support the moderate efficacy of brief interventions for hazardous drinkers in the primary care setting and indicate that there is no clear evidence of a dose-effect relationship linking the intensity of brief interventions (BIs) with outcome. The authors suggest that as there are few studies including extended brief interventions (EBIs), further research is needed to establish whether EBIs differ in efficacy from BIs.

There is review-level evidence to support the moderate efficacy of brief interventions for hazardous drinkers in the primary care setting (Ballesteros et al., 2004b).

There is a lack of evidence of a dose-effect relationship linking the intensity of brief interventions with outcome (Ballesteros et al., 2004b).

Interventions to increase rates of screening and giving advice by GPs

A recent meta-analysis by Anderson et al. (2004a) examined the effectiveness of interventions to increase general practitioners' rates of screening and giving advice about hazardous and harmful alcohol consumption. Twelve studies fit the inclusion criteria. Of these trials, nine contained one programme and three contained two programmes each, resulting in 15 programmes. Interventions included single component and multi-component educational visits, and office-based provider-oriented programmes. All providers were GPs or family practice physicians with the exception of one study in which the providers were family medicine residents.

The outcomes used were screening and advice-giving rates. Screening rates for providers were usually a

measure of the proportion of providers who had screened a specified proportion of patients attending the healthcare facility. For patients, however, screening rates were usually the proportion of patients screened for alcohol consumption or who had a report of alcohol consumption in their medical records. Advice-giving rates for providers were usually a measure of providers who had advised a specified proportion of patients who were at risk of hazardous and harmful alcohol consumption. Advice-giving rates for patients were usually the proportion of patients who had been advised, or who had a report of an advice notice, in their medical records.

A random effects model was used in this meta-analysis and weighted mean effect sizes were calculated. Screening rates for the intervention groups were 46% (95% CI: 23%-69%) and advice-giving rates were 44% (95% CI: 14%-74%), while the comparison groups resulted in screening rates of 35% (95% CI: 13%-58%), and advice-giving rates of 27% (95% CI: -01%-55%). There was no significant difference in effect sizes between the programmes with a control or usual care comparison group. Through a regression analysis to explain heterogeneity, a significant effect was found for alcohol-specific programmes compared with general prevention programmes in which alcohol was included, and for multi-component programmes compared with single component programmes. No significant differences were found between educational-based and office-based interventions.

Anderson et al. (2004a) suggested that the results of this meta-analysis should be interpreted with caution as the number of studies were small, but they also stated that the results suggest that it is possible to increase the engagement of GPs in screening and giving advice for hazardous and harmful alcohol consumption. Besides the authors' cautionary advice, it should also be noted that the quality of the studies was not assessed in this meta-analysis.

There is review-level evidence to suggest that it may be possible to increase the engagement of GPs in screening and giving advice for hazardous and harmful alcohol consumption (Anderson et al., 2004a).

The use of bibliotherapy (self-help materials)

A meta-analysis by Apodaca and Miller (2003) examined the effectiveness and cost-effectiveness of bibliotherapy (self-help materials) in decreasing at-risk and harmful drinking. Bibliotherapy was defined as any therapeutic intervention that was presented in a written form, designed to be read and implemented by the client. The materials ranged from brochures a few pages long to self-help manuals and books several hundred pages in length. Twenty-two studies were identified and were rated as being methodologically high quality.

The effectiveness of self-help materials was investigated in relation to two groups: those who had self-referred and sought help for alcohol problems and those who were screened as being at-risk drinkers but had not been seeking help for their drinking. The follow-up periods ranged from three months to two years. Between-group comparisons of bibliotherapy with no intervention controls showed a small to medium effect with a weighted mean effect size of .31 with self-referred drinkers; effect size was more variable in opportunistic interventions based on health screening.

Apodaca and Miller (2003) concluded that modest support was found for the effectiveness of self-help materials in decreasing at-risk and harmful drinking. The weighted mean pre/post-effect size for bibliotherapy was .80 with self-referred individuals seeking help for alcohol problems, and .65 for individuals identified as being at-risk through screening. Studies included in the meta-analysis comparing bibliotherapy alone and bibliotherapy supplemented by offered consultation have often found no additive effect of consultation, perhaps in part because most bibliotherapy recipients decline the offer of further help.

Further to the effectiveness of the use of bibliotherapy, the cost effectiveness of such help in decreasing at-risk and harmful drinking was also examined by Apodaca and Miller (2003). The authors of this meta-analysis suggest that the use of bibliotherapy for at-risk and harmful drinkers seeking help to reduce their alcohol consumption is cost effective, and to a lesser extent for drinkers who are identified through screening as at-risk.

There is review-level evidence to suggest that the use of bibliotherapy is effective in decreasing at-risk and harmful drinking, particularly with those seeking help for their drinking, and to a lesser extent with drinkers identified through screening as at-risk (Apodaca and Miller, 2003).

Children and young people

One systematic review (Foxcroft et al., 2002) examined the effectiveness of interventions in young people (children, adolescents and young adults). This looked specifically at psychosocial and educational interventions in young people where alcohol outcomes were reported and assessed for their effectiveness over the longer term. Neither review reported findings of interventions that explicitly targeted alcohol alone.

The Cochrane review by Foxcroft et al. (2002) is an update of their earlier systematic review (Foxcroft et al., 1997). Fifty-six studies were included, an increase of 23 compared to the previous systematic review, with young people up to 25 years old. All except seven studies were conducted in schools. Thirty-two interventions were generic drug (including alcohol) education programmes where alcohol baseline and outcome measures were clearly reported. The remaining 24 studies reported interventions targeted specifically at alcohol. The included studies evaluated psychosocial or educational interventions aimed at preventing the onset of alcohol misuse by young people.

From their findings, Foxcroft et al. (2002) reported that 'as the heterogeneity of settings, design of studies, source and format of interventions, outcomes measured and target group was substantial, an overall estimate of effect has little practical meaning'. However, they did find that 20 of the 56 studies (both generic drug education and alcohol specific interventions) showed evidence of ineffectiveness. Of the short-term follow-up studies (up to one year), 15 reported partially effective findings. Furthermore, four studies appeared to increase drinking behaviour. Of the 12 medium-term follow-up interventions (from one to three years), few were effective and most were marred by methodological shortcomings. Two studies were found to increase drinking behaviour. Finally, three studies reported effective longer-term interventions (over three years).

Further rigorous intention-to-treat analysis of studies reporting longer-term outcomes found that the number needed to treat was nine. This indicates that for every nine individuals who receive the intervention there will be one fewer person reporting that they have ever used alcohol, used alcohol without permission, or ever been drunk, four years later.

Therefore, no firm conclusions about the effectiveness of prevention interventions in the short-and medium-term were possible. The authors did report that in the longer term, the Strengthening Families Program, conducted in the US, showed promise as an effective prevention intervention and that further evaluation is needed. Another study also highlighted the potential value of culturally focused skills training over the longer term. Three large-scale community based interventions were identified and these need to be considered by policy makers as the potential benefit goes beyond youth. Instead of different interventions for different groups, a single community intervention that covers all groups may be more cost effective.

There is currently a lack of review-level evidence for the effectiveness of interventions in reducing alcohol misuse in young people (Foxcroft et al., 2002).

Discussion

Table 3 summarises the effectiveness of interventions for the prevention and reduction of alcohol misuse.

During the course of preparing this evidence briefing, a number of methodological issues were encountered, in addition to those raised in the Introduction (p11), and need to be considered.

Although the HDA values the full range of evidence to inform knowledge about the effectiveness of an intervention or approach, for pragmatic reasons the decision was made to limit the type of evidence to review-level evidence, and the extent of the search strategy to post-1996 and to English language papers only.

The nature of the critical appraisal process also needs highlighting. Many of the reviews initially identified for critical appraisal appeared to have useful insights but we were unable to accept them as HDA Evidence Base papers simply because they did not provide enough detail about their methodological approach. It is conceivable that they applied a systematic methodology but it was not possible to tell from the way they were reported.

While systematic reviews, meta-analyses and other reviews of effectiveness have the advantage of aggregating large amounts of primary data that can be evaluated and summarised (Elliott et al., 2004), there are associated limitations. It is acknowledged that such traditional processes tend to identify, select and appraise reviews which favour a relatively narrow spectrum of potential evidence – mostly drawn from randomised controlled trials. Other types of methodological approaches, for example qualitative work, tend to be under-represented in this type of evidence (Kelly et al., 2002). Also, systematic reviews, meta-analyses and other reviews of effectiveness tend to rely on published evidence and publication policies may exclude articles with inconclusive or negative findings.

Parameters for inclusion and exclusion were also established. For example, studies that primarily examined the effectiveness of screening strategies for alcohol problems or alcohol misuse were excluded. While it is acknowledged that screening is an important exercise within alcohol misuse prevention, and is often a prerequisite to giving a brief alcohol intervention or other types of intervention or treatment, the focus of this briefing is on the effectiveness of interventions to prevent and reduce alcohol misuse. Therefore papers reporting on types of screening tools used for identification of hazardous or dependent drinkers and on types of screening such as universal or selective/targeted screening have been excluded. However, any papers which combined screening with a public health related intervention were included.

The explicit aim of this briefing was to examine the effectiveness of interventions to prevent and reduce alcohol misuse for all population groups. Interventions targeting 'hazardous' and 'risky' drinkers before the onset of 'dependence' were included, but interventions aimed at treatment of alcohol dependence were excluded (see Appendix 1, Glossary, for definitions of these terms).

There is a lack of consensus within the alcohol literature regarding these definitions. For example, in the US definitional thresholds for problem drinker, risky drinker and dependent drinker are not the same as those used in the UK. A pragmatic decision was made to use the definitions of the review authors to determine if they corresponded with the identified inclusion and exclusion criteria. A potential consequence is that we may have excluded papers and therefore evidence that is relevant and/or equates to the drinking thresholds used in the UK – however, the decision to use the authors' own definitions enabled the project to be manageable.

A number of studies in the papers that passed the critical appraisal criteria and were used in the Findings section originated from non-UK settings. A potential consequence of drawing on evidence from other countries is lack of relevance. Furthermore, the definitions used by the authors for the setting of the intervention may not correspond to what is traditionally used in the UK. For example, primary care may not always refer to a GP setting (as generally used in the UK) – it may well refer to any setting such as a school where an intervention can be delivered. Where this may apply we have explicitly stated the country setting for the study and used the authors' own definitions when collating and presenting the findings.

Another problematic issue encountered was aggregation of data, both in terms of outcomes of alcohol with other misuse substances, eg smoking and drugs, and in terms of study participants, eg dependent, binge and risky drinkers. While it is recognised that review-level material tends to aggregate outcomes, population groups and settings to increase sample size, this is not always useful to practitioners, policy makers or others who are interested in a specific topic area and its associated effective interventions. On the basis that this briefing was only interested in interventions with an effective alcohol outcome a number of papers failed the critical appraisal process due to the presentation of aggregated data (for example, smoking, drugs and alcohol), therefore making it impossible to examine the effectiveness of the intervention on alcohol outcomes alone.

Finally, during the preparation of this evidence briefing, we critically appraised the meta-analysis by Beich et al. (2003), which examined the effectiveness of screening in general practice for excessive alcohol use and providing brief interventions. Beich et al. (2003) concluded that 'although even brief advice can reduce excessive drinking, screening in general practice does not seem to be an effective precursor to brief interventions targeting excessive alcohol use. This meta analysis raises questions about the feasibility of screening in general practice for excessive use of alcohol.'

To aid our critical appraisal, the HDA also commissioned further analysis of Beich et al. (2003) by two independent reviewers. One found the numerical findings of the meta-analysis should be accepted (White, 2003) with an over-zealous application of intention-to-treat analysis being the only criticism of the meta-analytic process itself (ie the meta-analysis was carried out correctly). The other reviewer concluded that that these findings should be interpreted with caution (Wu and Knill-Jones, 2003), as the studies included in the meta-analysis were inappropriate. Beich et al. (2003) searched and retrieved RCTs on brief interventions and not on screening interventions per se. Therefore the meta-analysis did not include studies found in previous reviews on screening interventions. Wu and Knill Jones (2003) conclude: 'We feel that the Beich review should not be accepted as evidence of the effectiveness of screening, and furthermore since their meta-analysis of brief interventions in general practice is incomplete, their conclusions add little to current literature.'

Similarly, this particular review has also been criticised elsewhere (Whitlock, 2003). However, we wished to acknowledge its consideration for this evidence briefing.

Table 3: Effectiveness of interventions for the prevention and reduction of alcohol misuse

Intervention	Review-level evidence of effectiveness	Conflicting review-level evidence	Lack of review-level evidence
To reduce alcohol-impaired driving	80mg/100ml blood alcohol concentration laws are effective in reducing alcohol-related crash fatalities Lower blood alcohol concentration laws are effective in reducing alcohol-related crash fatalities among young or inexperienced drivers Minimum legal drinking age laws, particularly those that set the minimum legal drinking age at 21 years, are effective in preventing alcohol-related crashes and associated injuries Both selective breath testing, sobriety checkpoints and random breath testing are effective in preventing alcohol-impaired driving, alcohol-related crashes and associated fatal and non-fatal injuries Ignition interlock devices are effective in reducing recidivist intoxicated driving (ie habitual relapses in offending or criminal behaviour) Intensive, high quality, face-to-face server training, when accompanied by strong and active management support, are effective in reducing intoxication levels in customers		
Healthcare settings	A cognitive behavioural intervention by a GP is no more effective than a cognitive behavioural intervention by a nurse practitioner or brief advice A behavioural change programme is no more effective than brief advice, assessment of drinking behaviour only or follow-up measurement only, on alcohol consumption or alcohol-related problems Heavy drinkers receiving brief interventions were twice as likely to moderate their drinking six to 12 months after an intervention when compared with drinkers receiving no intervention Brief interventions, especially multi-contact, can reduce net weekly drinking by 13% to 34%, resulting in 2.9 to 8.7 fewer mean drinks per week and a significant effect on recommended or safe alcohol use Extended brief interventions (several visits) in primary healthcare settings are effective for women. Extended brief interventions decreased alcohol intake in women by on average 51g per week Brief interventions are equally effective in men and women for hazardous alcohol consumption in primary care settings Brief interventions are effective in opportunistic (non-treatment-seeking) samples and as typically delivered by healthcare professionals There is moderate efficacy of brief interventions for hazardous drinkers in the primary care setting It may be possible to increase the engagement of GPs in screening and giving advice for hazardous and harmful alcohol consumption The use of bibliotherapy is effective in decreasing at-risk and harmful drinking, particularly with those seeking help for their drinking and to a lesser extent with drinkers identified through screening as at-risk	GP-based lifestyle advice interventions to reduce heavy drinking	Very brief and extended interventions in decreasing alcohol intake in both men and women Very brief interventions in decreasing alcohol intake in both men and women Extended brief interventions (several visits) in primary healthcare settings for men A dose-effect relationship linking the intensity of brief interventions with outcome for hazardous drinkers
Young people			Interventions for reducing alcohol misuse in young people

Gaps in the evidence base and recommendations for research

Based on the findings of this briefing there is a general lack of research evidence in a wide range of topic areas relating to the prevention and reduction of alcohol misuse. We have compiled a list of recommendations, presented in no particular order. These are based on our own recommendations plus those made by the authors of the HDA Evidence Base papers, which are referenced. It is important to note that we have not systematically searched for gaps in the primary research, although some of the recommendations will impact on primary research.

Inequalities and vulnerable groups

From the systematic review and meta-analytic literature there is a complete lack of evidence regarding the effectiveness of interventions targeting specific socio-economic, ethnic or vulnerable groups. Furthermore, the interventions identified did not address the differential effectiveness of interventions among these groups, or how the different components affected them.

There is therefore a need to re-analyse those studies included in the HDA Evidence Base papers with the aim of including disadvantaged and vulnerable groups and assessing the differential impacts. If insufficient data exist to allow such analysis, then primary data needs to be undertaken to address this important gap in the evidence base.

Specific recommendations include:

- Primary research is needed to carry out brief interventions to reduce alcohol misuse and evaluate their effectiveness among minority ethnic groups, particularly among Asians and African-Caribbeans, as well as religious ethnic groups such as Sikh, Hindu and Muslim groups
- There is a need to carry out adequate evaluation of interventions aimed at young people that target hard to reach groups and vulnerable groups.

Cost effectiveness

Some evidence was found from studies conducted in the US (Peek-Asa, 1999; Shults et al., 2001) regarding the cost effectiveness of interventions to reduce alcohol-impaired driving. However, there is still an urgent need for primary research to be undertaken to examine the cost effectiveness of interventions to prevent alcohol misuse in both the general population and disadvantaged and vulnerable groups.

Intervention design

- The problems of evaluating community approaches should be reviewed with a view to testing different approaches (possibly innovative methods) to evaluation (eg using qualitative approaches as well as quantitative).
- When undertaking evaluations of interventions there is a need to include a process evaluative approach and to collect qualitative data where possible. This should include those who have dropped out of interventions. This data will allow an assessment of how the intervention can be transferred from the research setting to clinical practice, enable features of effective interventions to be easily identified and show how the intervention can be replicated on a wider scale.
- Researchers and policy makers should consider the advantages of agreeing and implementing standard alcohol consumption measures and definitions (Poikolainen, 1999).

- The methodology of evaluations needs to be improved. Large-scale RCTs are possible and preferable for rigorous scientific evaluation of discrete interventions, but appropriate statistical analysis needs to be undertaken to take account of the intra-class correlation coefficient. For large community interventions where RCTs are not practical, a comparative interrupted time series design with sufficient pre-and post-intervention measurement time points should be considered (Foxcroft et al., 2002).
- All researchers should clearly describe attrition rates, how they varied between different treatment and control groups, and how attrition was dealt with in any statistical analysis, for example through an intention-to-treat analysis (Foxcroft et al., 2002).
- Culturally focused interventions require further development and rigorous evaluation, including cost-effectiveness assessment (Foxcroft et al., 2002).
- There is a need to look at the long-term effects of interventions on the use of healthcare. Interventions should also investigate other outcomes such as work performance, family relationships and overall quality of life (Wilk et al., 1997).

Interventions to reduce alcohol-impaired driving

Shults et al. (2001) highlighted a number of issues that require further research:

- What effects do these interventions have on long-term changes in social norms about drinking and driving?
- What are the independent effects of publicity on the effectiveness of laws to reduce alcohol-impaired driving?
- Does targeting publicity efforts at specific sub-populations (eg young drivers, ethnic minorities, men) improve the effectiveness of interventions to reduce alcohol-impaired driving?
- Does public compliance with new laws change in a predictable manner over time?
- Are server intervention training programmes delivered community wide effective at decreasing alcohol-impaired driving and alcohol-related crashes?
- What is the long-term effect of server intervention training programmes? Are 'booster sessions' required to maintain effectiveness?

Peek-Asa (1999) and Zwerling and Jones (1999) also recommended:

- Multivariate research controlling for confounding variables, such as other ongoing prevention programmes, needs to be conducted to determine the proportion of crashes reduced specifically by random screening programmes. Cost-benefit analyses are also needed (Peek-Asa, 1999)
- Future research should address the enforcement of zero-tolerance laws. Studies should look at process measures such as arrest and conviction rates as well as outcome measures (Zwerling and Jones, 1999).

Healthcare settings

- Considerable work is needed to implement screening combined with brief interventions for risky/harmful alcohol use as part of routine practice, and more research is needed on effective strategies and support for adoption of these services by physicians and health plans. Future research is also needed to establish the possible cost savings or cost effectiveness of these interventions (Whitlock et al., 2004).
- There is a pressing need for more implementation research. Future studies may reveal why some interventions work and others do not (Anderson et al., 2004a).
- Further research of higher quality is needed, particularly with a specific focus on multi-component alcohol programmes (Anderson et al., 2004a).
- Additional studies are also needed to determine the relative impact of outreach as opposed to non-outreach programmes and the relative impact of educational and office-based interventions (Anderson et al., 2004a).
- A systematic review is needed for the effectiveness of brief alcohol interventions carried out in hospital settings in the UK. There are individual studies conducted in accident and emergency departments in the UK but to date no systematic review has been undertaken.

Children and young people

- Research into the important outcome variables needs to be undertaken. There is no single outcome measure of youth drinking behaviour that is used in evaluation

studies and no clear understanding of which outcome measures are important predictors of alcohol misuse, morbidity and mortality in later life (Foxcroft et al., 2002).
- The US Strengthening Families Programme needs to be piloted in the UK and to be evaluated on a larger scale and in different settings to confirm the current results and the transferability of the programme to the UK. Cost-effectiveness analyses would be useful (Foxcroft et al., 2002).
- There is an urgent need to fill the current gap in the evidence base regarding interventions to reduce alcohol misuse in young people.

Pregnancy

- There is a need to undertake a systematic review on interventions to reduce alcohol consumption in pregnancy as none has been undertaken since 1996.

Workplace

- The workplace is a major location that 'captures' many people in the heavier drinking groups (eg 16-24 year olds, employed professional women, people in occupational groups with a higher risk of developing alcohol problems). It is also the context within which occupational and professional socialisation takes place. It is, therefore, an important context within which to tackle attitudes and drinking behaviours. The development and evaluation of workplace policies should be encouraged.

Other gaps identified

- The impact of policies and initiatives such as fiscal measures, legislation other than drink driving, safer drinking environments, education and mass media, on the prevention of both alcohol misuse and related harm is worthy of further investigation.
- This evidence briefing has investigated the effectiveness of interventions in reducing alcohol misuse. However, the effect of interventions in reducing alcohol-related harm, for example harm to the individual, families or society, is also of great importance and should be considered.

Conclusion

The results presented in this briefing show that there is clear evidence to support interventions to reduce alcohol-impaired driving such as lower blood alcohol concentration laws, minimum legal drinking age laws, breath testing and sobriety checkpoints, and server training. Furthermore, there is also evidence endorsing the effectiveness of brief interventions and the use of bibliotherapy in healthcare settings.

However, there is a lack of or conflicting evidence on the effectiveness of very brief interventions in adult men and women and, more importantly, of interventions to reduce alcohol misuse in young people. This gap is of particular concern considering the long-term health consequences of alcohol misuse in this age group. This finding was also highlighted in the recent *Alcohol Harm Reduction Strategy for England* (Cabinet Office Strategy Unit, 2004).

The reported rising levels of alcohol misuse among the general population are of concern to the UK government with its established effects both on individual health and society as a whole. The evidence base for the prevention of alcohol misuse is still lacking in some important areas and population groups, for example alcohol-related harm, black and minority ethnic groups, and young people. There is also a lack of evidence for the effectiveness of interventions targeting disadvantaged and vulnerable groups with the aim of reducing inequalities. There is an urgent need to address these issues – as well as the social and economic costs of alcohol misuse and alcohol-related harm – to tackle the ill effects and problems caused by alcohol misuse in the UK.

APPENDIX 1

Glossary

This glossary is not intended to be comprehensive but it indicates the type of terms used in the general alcohol literature and terms used in this briefing.

Recommended levels

Since the mid-1980s, alcohol use, and problem alcohol use or alcohol misuse, is commonly measured in terms of 'units' of alcohol and 'sensible' drinking is defined in terms of the number of units consumed weekly or daily.

A 'unit' of alcohol: the alcohol content of a given beverage is calculated from its percentage alcohol content by volume (%ABV). A 'unit' of alcohol is the amount contained in half a pint (284ml) of beer, a single glass (125ml) of table wine, a single glass (50ml) of fortified wine, for example sherry, or a single measure (25ml) of spirits. A 'unit' approximates to 10ml or 8g of absolute alcohol. (Note: there are reasons to think that this may be an underestimate of the pure alcohol contained in a standard unit.)

Guidelines for 'sensible' drinking: until 1995, assessment of alcohol-related risk was based on a measure of weekly intake of alcohol. For men, drinking <21 units a week and for women <14 units a week was considered to carry a low risk of incurring alcohol-associated harm. Intakes between 22-50 units (men) and 15-35 units (women) were described as hazardous drinking and associated with 'intermediate risk'. Intakes of >50 (men) and >35 (women) were 'high risk'. A couple of alcohol-free days per week were recommended.

In 1995, the Department of Health issued new guidelines based on daily intake. In brief, it was stated that regular consumption of three to four units a day (men) and two to three units a day (women) would not accrue a significant health risk. Drinking consistently more would be associated with progressive risks to health. The guidelines recommend 48 alcohol-free hours after any occasion on which a person drinks more than the daily benchmarks (DH, 1995).

Descriptive terms

The alcohol literature contains a large number of terms used to describe alcohol use that is considered to be harmful or unacceptable – terms such as alcohol misuse, hazardous drinking, risky drinking, binge drinking, problem drinking, alcohol dependence and so on.

Definitions of what constitutes alcohol 'misuse' or 'harmful' drinking, 'hazardous drinking' and 'binge' drinking vary. Below we provide examples of definitions from several sources.

The General Household Survey

The following definitions of terms are related to the categories of alcohol consumption used in the General Household Survey (ONS, 2000) and are based on the 'sensible' drinking guidelines noted above:

- Light/moderate drinker – men drinking below 21 units a week and women drinking below 14 units a week
- Heavy drinker – a man who drinks 22-50 units a week, or a woman who drinks 15-35 units a week
- Very heavy drinker – a man who drinks 51 or more units a week, or a woman who drinks 36 or more units a week.

The Royal College of Physicians

A report of the Royal College of Physicians (2001) defines the following terms:

- Sensible drinker – a man who drinks 21 or fewer units per week, or a woman who drinks 14 or fewer units per week
- Hazardous drinker (also called an at-risk drinker): very heavy drinkers and binge drinkers who have drinking patterns that pose a considerable risk to their own and others' health. (Note: other sources define 'hazardous drinkers' in terms of the units of alcohol consumed; those drinking above the recommended weekly levels, ie men drinking above 21 units and women drinking above 14 units per week.)

- Harmful drinker (also called a problem drinker) – a harmful or problem drinker is one where there is clear evidence that alcohol use is responsible for (or substantially contributes to) physical or psychological harm, including impaired judgement or dysfunctional behaviour, which may lead to disability or have adverse consequences for interpersonal relationships. (Definition from ICD 10 Mental and behavioural disorders diagnostic criteria.) This includes those whose drinking is causing harm to the physical, mental or social wellbeing of others. (Note: other sources define 'harmful drinkers' as men drinking above 50 units per week and women drinking above 35 units per week.)
- Binge drinker (sometimes referred to as 'risky single occasion drinking' (RSOD), or 'heavy episodic drinking') – the introduction of guidelines on daily consumption of alcohol has emphasised the importance of examining the harmful effects of binge drinking or heavy episodic drinking. The Royal College of Physicians (2001) define it as 'a man who regularly drinks 10 or more units in a single session, or a woman who regularly drinks seven or more units in a single session'. However, there is considerable diversity in the way binge drinking is defined and measured.

Binge drinkers – other definitions

Studies use different cut-off points to measure binge drinking. A survey of adults commissioned by the Health Education Authority defined a heavy drinking occasion as eight or more units in a single session for men and six or more for women (Rowlands, 1998, cited in Newburn and Shiner, 2001). In North America and Australia 'binge drinking' is often measured as five or more drinks in a row for men and four for women. (Newburn and Shiner, 2001; Murgraff et al., 1999).

The lack of consensus on the definition of 'binge drinking' is even greater in relation to young people (Murgraff et al., 1999), although studies frequently use the same cut-off points as for adults; eg a European survey of young people aged 15-16 years old defined 'binge drinking' as having consumed at least five drinks in a row on at least three occasions during the previous 30 days (Hibell et al., 2000).

Most researchers do not provide empirical support for the chosen cut-off point and, according to Murgraff et al. (1999), the lack of a unified definition for risky single occasion drinking highlights the lack of knowledge about what constitutes 'safe or RSOD'.

Binge drinkers and chronic drinkers as defined by the Cabinet Office Strategy Unit

Two patterns of drinking are described in the *National Alcohol Harm Reduction Strategy* (Cabinet Office Strategy Unit, 2004) as those that are particularly likely to raise the risk of harm:

- Binge drinkers – those who drink to get drunk and are likely to be under 25 years of age. They are more likely to be men and are at increased risk of accidents and alcohol poisoning; they are more likely to be victims of violence and to commit violent offences; and the impacts on society are visible in high levels of attendance related to alcohol at A&E departments. The cut-off points are as follows: men drinking more than eight units daily, twice the daily sensible drinking guidelines; women drinking more than six units daily, twice the daily guidelines.
- Chronic drinkers – chronic drinkers are those likely to be aged over 30 and two-thirds are men. They are at increased risk of a variety of alcohol-related harms such as cirrhosis, cancer, haemorrhagic stroke, premature death and suicide. They are more likely to commit offences of domestic violence and drink-driving. The impacts on society are less visible but are reflected in effects on their families, lost productivity and costs to the health service. The cut-off point is consuming more than twice the former recommended weekly guidelines, which were 21 units a week for men and 14 units for women.

Other terms found in the literature include 'alcoholic', used by those who believe that the inability to control alcohol consumption is a disease. The term is widely used in the US and among people who attend Alcoholics Anonymous (AA) but is no longer extensively used clinically in the UK. The term 'alcohol dependence syndrome' is well defined in the literature. The characteristics of the syndrome include a narrowing of the drinking repertoire, increased importance of drinking to the drinker, increased tolerance of alcohol, repeat withdrawal symptoms, drinking to avoid withdrawal symptoms, subjective compulsion to drink and reinstatement after abstinence (Royal College of Physicians, 2001).

APPENDIX 2

Search strategy

1. meta?analy$.mp.
2. meta analys$.mp.
3. (predetermined and criteri$).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
4. inclusion criteri$.mp.
5. exclusion criteri$.mp.
6. (systematic and review$).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
7. (systematically and review$).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
8. (review$ and literature).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
9. (review$ and guideline$).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
10. (review$ and publication$).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
11. (review$ and published).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
12. (review$ and unpublished).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
13. case report.ti.
14. editorial.pt.
15. letter.pt.
16. or/1-12
17. or/13-15
18. 16 not 17
19. Alcohol Deterrents/
20. Alcohol Drinking/
21. Alcohol Withdrawal Delirium/
22. Alcohol Withdrawal Seizures/
23. Alcohol-Induced Disorders/
24. exp Alcohol-Related Disorders/
25. Alcoholic Intoxication/
26. ALCOHOLISM/
27. Alcoholic Beverages/
28. (beer or wine or absinthe).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
29. (spirits or alco pops).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
30. intoxicat$.mp.
31. (inebriant or inebriate$).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
32. alcoholi$.mp.
33. (driving and drink).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
34. (driving and drunk).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
35. (drink$ and (misuse or abuse)).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
36. (drink$ and (risky or hazard$ or harm$)).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
37. (drink$ and (binge or excessive or heavy)).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
38. (drinking and alcohol$).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
39. (alcohol$ and (misuse or abuse)).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
40. (alcohol$ and (dependen$ or addicti$)).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
41. or/19-40
42. prevent$.mp.
43. SCHOOLS/
44. Delivery of Health Care/
45. Health Education/
46. Health Promotion/
47. Preventive Health Services/
48. "Early Intervention (Education)"/
49. Peer Group/
50. school health.mp.
51. student health.mp.
52. community health.mp.
53. Urban Health/
54. Rural Health/
55. Suburban Health/
56. Family Health/
57. Public Health/
58. Occupational Health/
59. Community Networks/
60. community safety.mp.
61. brief intervention.mp.
62. taxation.mp.
63. pricing.mp.
64. licensing.mp.
65. (drink$ and sensible).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
66. (drink$ and responsible).mp. [mp=title, original title, abstract, name of substance, mesh subject heading]
67. sponsorship.mp.
68. ADVERTISING/
69. exp Communications Media/
70. or/42-69
71. 18 and 41 and 70

APPENDIX 3

HDA Evidence Base – critical appraisal tool

Authors: _____

Title: _____

Source: _____

Relevance to topic			
Does this paper address your topic area? Circle the type of paper: • Systematic review • Meta-analysis • Synthesis • Literature review • Other review (please specify) Does it address (circle as appropriate)? • Effectiveness (interventions and treatments) • Causation • Monitoring and surveillance trends • Cost • Other (please specify)	Yes	No	Unsure
Transparency			
Does the paper have a clearly focused aim or research question?	Yes	No	Unsure
Consider whether the following are discussed:			
• The population studied	Yes	No	Unsure
• The interventions given	Yes	No	Unsure
• The outcomes considered	Yes	No	Unsure
• Inequalities	Yes	No	Unsure
Systematicity			
Do the reviewers try to identify all relevant English language studies?	Yes	No	Unsure
Consider whether details are given for:			
• Databases searched	Yes	No	Unsure
• Years searched	Yes	No	Unsure
• References followed up	Yes	No	Unsure
• Experts consulted	Yes	No	Unsure
• Grey literature searched	Yes	No	Unsure
• Search terms specified	Yes	No	Unsure
• Inclusion criteria described	Yes	No	Unsure
Is it worth continuing? **Why/why not?**	Yes	No	

Quality			
Do the authors address the quality (rigour) of the included studies?	Yes	No	Unsure
Consider whether the following are used:			
• A rating system	Yes	No	Unsure
• More than one assessor	Yes	No	Unsure
If study results have been combined, was it reasonable to do so?	Yes	No	Unsure
Consider whether the following are true:			
• Are the results of included studies clearly displayed?	Yes	No	Unsure
• Are the studies addressing similar research questions?	Yes	No	Unsure
• Are the studies sufficiently similar in design?	Yes	No	Unsure
• Are the results similar from study to study (test of heterogeneity)?	Yes	No	Unsure
• Are the reasons for any variation in the results discussed?	Yes	No	Unsure
What is the overall finding of the review? Consider: • How the results are expressed (numeric – relative risks, etc) • Whether the results could be due to chance (*p*-values and confidence intervals)			
Are sufficient data from individual studies included to mediate between data and interpretation/conclusions?	Yes	No	Unsure
Does this paper cover all appropriate interventions and approaches for this field (within the aims of the study)? If no, what?	Yes	No	Unsure
Relevance to UK			
Can the results be applied/are generalisable to a UK population/population group?	Yes	No	Unsure
• Are there cultural differences from the UK?	Yes	No	Unsure
• Are there differences in healthcare provision with the UK?	Yes	No	Unsure
• Is the paper focused on a particular target group (age, sex, population sub-group etc)?	Yes	No	Unsure
Accept for inclusion onto HDA Evidence Base?	Yes	No	Refer to third party
Additional comments			

Appendix 4: Summary of critical appraisal findings of papers that failed the critical appraisal process

Author and date	Stage one					Stage two			
	Specifies clear and relevant aim or research question	Identifies appropriate range of source databases	Undertakes additional search strategies	Specifies search terms	Specifies inclusion/ exclusion criteria	Rigour of individual studies assessed	Individual studies' findings presented clearly and consistently	Individual studies' findings analysed clearly and consistently	Conclusions presented relate to individual studies' findings
Allard-Hendren (2000)	✗ (not a systematic review)	✗	✗	✗	✗	–	–	–	–
Anderson (2003)	✗ (not a systematic review)	✗	✗	✗	✗	–	–	–	–
Anderson et al. (2003)	✗ (primary study)	✗	✗	✗	✗	–	–	–	–
Anderson et al. (2004b)	✗ (primary study)	✗	✗	✗	✗	–	–	–	–
Beich et al. (2003)	✗ (studies included in the meta-analysis were inappropriate)	✓	✓	✓	✓	✓	✓	✓	✓
Bennett et al. (2002)	✗ (no alcohol outcomes alone – aggregated outcomes)	✓	✓	✗	✓	✗	✓	✓	✓
Chang (2002)	✗ (not a systematic review)	✗	✗	✗	✗	–	–	–	–
Dinh-Zarr et al. (2002)	✗ (examines effect on alcohol-related injuries and not misuse)	✗	✗	✗	✗	–	–	–	–
D'Onofrio and Degutis (2002)	✗ (aggregated findings by setting)	✗	✗	✗	✗	–	–	–	–
Dunn et al. (2001)	✗ (does not investigate effect on alcohol misuse)	✗	✗	✗	✗	–	–	–	–
Dunn (2003)	✗ (not a systematic review)	✗	✗	✗	✗	–	–	–	–
Elliot et al. (2004)	✗ (not relevant to research question)	✗	✗	✗	✗	–	–	–	–
Emmen et al. (2004)	✗ (investigates problem drinkers with alcohol dependency)	✗	✗	✗	✗	–	–	–	–

Appendix 4: Summary of critical appraisal findings of papers that failed the critical appraisal process (cont.)

Author and date	Stage one					Stage two			
	Specifies clear and relevant aim or research question	Identifies appropriate range of source databases	Undertakes additional search strategies	Specifies search terms	Specifies inclusion/ exclusion criteria	Rigour of individual studies assessed	Individual studies' findings presented clearly and consistently	Individual studies' findings analysed clearly and consistently	Conclusions presented relate to individual studies' findings
Fiellin et al. (2000)	✗ (evaluates accuracy of screening tools)	✗	✗	✗	✗	–	–	–	–
Ham and Hope (2003)	✗ (not a systematic review)	✗	✗	✗	✗	–	–	–	–
McArthur and Kraus (1999)	✓	✓	✗	✓	✓	✗	✓	✗	✗
Plant et al. (1999)	✗ (not a systematic review, covers causation)	✗	✗	✗	✗	–	–	–	–
Room et al. (2003)	✗ (not a systematic review)	✗	✗	✗	✗	–	–	–	–
Saunders et al. (2004)	✗ (not a systematic review)	✗	✗	✗	✗	–	–	–	–
Sims and Iphofen (2003)	✗ (not a systematic review)	✗	✗	✗	✗	–	–	–	–
Skara and Sussman (2003)	✗ (no alcohol outcomes alone – aggregated outcomes)	✓	✓	✓	✓	✓	✓	✓	✓
Thomas et al. (1999)	✗ (no alcohol outcomes alone-aggregated outcomes)	✓	✗	✓	✓	–	–	–	–
Tobler and Stratton (1997)	✗ (drug outcomes only)	✗	✓	✗	✓	–	–	–	–
Wilson (2000)	✗ (methodology paper – focus on treatment)	✗	✗	✗	✗	–	–	–	–
Zilberman et al. (2003)	✗ (focus on progression to dependence, not interventions)	✓	✗	✓	✗	–	–	–	–

References

Allard-Hendren, R. (2000). Alcohol use and adolescent pregnancy. *American Journal of Maternal/Child Nursing* 2: 159-62.

Anderson, P. (2003). The beverage alcohol industry's social aspects organizations: a public health warning. *Adicciones* 15: 103-14. (Spanish/English journal)

Anderson, P., Kaner, E., Wutzke, S., Wensing, M., Grol, R., Heather, N. and Saunders, J. (2003). Attitudes and management of alcohol problems in general practice: descriptive analysis based on findings of a World Health Organization international collaborative study. *Alcohol and Alcoholism* 38: 597-601.

Anderson, P., Laurant, M., Kaner, E., Wensing, M. and Grol, R. (2004a). Engaging general practitioners in the management of hazardous and harmful alcohol consumption: results of a meta-analysis. *Journal of Studies on Alcohol* 65: 191-9.

Anderson, P., Kaner, E., Wutzke, S., Funk, M., Heather, N., Wensing, M., Grol, R., Gual, A. and Pas, L. (2004b). Attitudes and managing alcohol problems in general practice: an interaction analysis based on findings from a WHO collaborative study. *Alcohol and Alcoholism* 39: 351-6.

Apodaca, T. R. and Miller, W. R. (2003). A meta-analysis of the effectiveness of bibliotherapy for alcohol problems. *Journal of Clinical Psychology* 59 (3): 289-304.

Ashenden, R., Silagy, C. and Weller, D. (1997). A systematic review of the effectiveness of promoting lifestyle change in general practice. *Family Practice* 14 (2): 160-76.

Ballesteros, J., Gonzalez-Pinto, A., Querejeta, I. and Arino, J. (2004a). Brief interventions for hazardous drinkers delivered in primary care are equally effective in men and women. *Addiction* 99: 103-8.

Ballesteros, J., Duffy, J. C., Querejeta, I. Arino, J. and Gonzalez-Pinto, A. (2004b). Efficacy of brief interventions for hazardous drinkers in primary care: systematic review and meta-analyses. *Alcoholism: Clinical and Experimental Research* 28 (4): 608-18.

Beich, A., Thorsen, T. and Rollnick, S. (2003). Screening in brief intervention trials targeting excessive drinkers in general practice: systematic review and meta-analysis. *British Medical Journal* 327: 536-42.

Bennett, J. B., Reynolds, G. S. and Lehman, W. E. K. (2002). Understanding employee alcohol and other drug use: toward a multilevel approach. In: Bennett, J. B. and Lehman, W. E. K. (eds) *Preventing workplace substance abuse: beyond drug testing to wellness*. Washington DC: American Psychological Association.

Brunner, E., Rayner, M., Thorogood, M., Margetts, B., Hooper, L., Summerbell, C., Dowler, E., Hewitt, G., Robertson, A. and Wiseman, M. (2001). Making public health nutrition relevant to evidence-based action. *Public Health Nutrition* 4 (6):1297-9.

Cabinet Office Strategy Unit (2003). *Alcohol misuse: interim analytical report*. London: Cabinet Office.

Cabinet Office Strategy Unit (2004). *Alcohol harm reduction strategy for England*. London: Cabinet Office.

Chang, G. (2002). Brief interventions for problem drinking and women. *Journal of Substance Abuse Treatment* 23: 1-7.

Coben, J. H. and Larkin, G. L. (1999). Effectiveness of ignition interlock devices in reducing drunk driving recidivism. *American Journal of Preventive Medicine* 16 (1S): 81-7.

DH (Department of Health) (1995). *Sensible drinking: the report of an inter-departmental group*. London: Department of Health.

DH (Department of Health) (2000). *The NHS Plan. A plan for investment. A plan for reform*. London: Department of Health.

DH (Department of Health) (2001). *Smoking, drinking and drug use among young people in England in 2000*. London: Stationery Office.

DH (Department of Health) (2003). *Statistics on alcohol: England, 2003*. Statistical bulletin. London: Department of Health.

DH (Department of Health) (2004a). *Statistics on alcohol: England, 2004*. Statistical bulletin. London: Department of Health.

DH (Department of Health) (2004b). *Choosing Health. Making healthy choices easier*. London: TSO.

Dinh-Zarr, T., Goss, C., Heitman, E., Roberts, I. and DiGuiseppi, C. (2002). Interventions for preventing injuries in problem drinkers. *The Cochrane Database of Systematic Reviews* 2004, Issue 3. (Review was updated April 2004.)

D'Onofrio, G. D. and Degutis, L. C. (2002). Preventive care in the emergency department: screening and brief intervention for alcohol problems in the emergency department: a systematic review. *Academic Emergency Medicine* 9: 627-38.

Dunn, C., Deroo, L. and Rivara, F. P. (2001). The use of brief interventions adapted from motivational interviewing across behavioral domains: a systematic review. *Addiction* 96: 1725-42.

Dunn, C. (2003). Brief motivational interviewing interventions targeting substance abuse in the acute care medical setting. *Seminars in Clinical Neuropsychiatry* 8: 188-96.

Edwards, G., Anderson, P., Babor, T. F., Casswell, S., Ferrence, R., Giesbrecht, N., Godfrey, C., Holder, H. D., Lemmens, P., Mäkelä, K., Midanik, L. T., Norström, T., Österberg, E., Romelsjö, A., Room, R., Simpura, J. and Skog, O.-J. (1994). *Alcohol policy and the public good*. Oxford: Oxford University Press.

Elliott, L., Crombie, I. K., Irvine, L., Cantrell, J. and Taylor, J. (2004). The effectiveness of public health nursing: the problems and solutions in carrying out a review of systematic reviews. *Journal of Advanced Nursing* 45: 117-25.

Emmen, M. J., Schippers, G. M., Bleijenberg, G. and Wollersheim, H. (2004). Effectiveness of opportunistic brief interventions for problem drinking in a general hospital setting: systematic review. *British Medical Journal* 328 (7435): 318.

Fiellin, D. A., Reid, C. and O'Connor, P. G. (2000). Screening for alcohol problems in primary care. *Archives of Internal Medicine* 160: 1977-89.

Foxcroft, D. R., Lister-Sharp, D. and Lowe, G. (1997). Alcohol misuse prevention for young people: a systematic review reveals methodological concerns and lack of reliable evidence of effectiveness. *Addiction* 92 (5): 531-7.

Foxcroft, D. R., Ireland, D., Lister-Sharp, D. J., Lowe, D. J. and Breen, R. (2002). Primary prevention for alcohol misuse in young people. *The Cochrane Database of Systematic Reviews*, Issue 3.

Ham, L. S. and Hope, D. A. (2003). College students and problematic drinking. A review of the literature. *Clinical Psychology Review* 23: 719-59.

Hammersley, M. (2001). On 'systematic' reviews of research literatures: a 'narrative' response to Evans & Benefield. *British Educational Research Journal* 27 (12): 543-54.

Heather, N. (2001). Brief interventions. In: Heather, N., Peters, T. J. and Stockwell, T. (eds) *International handbook of alcohol dependence and problems*. Chichester: Wiley.

Hibell, B., Andersson, B., Ahlstrom, S., Balakireva, O., Bjarnason, T., Kokkevi, A. and Morgan, M. (2000). *The 1999 ESPAD Report*. The European School Survey Project on Alcohol and Other Drugs, Stockholm. Swedish Council for Information on Alcohol and Other Drugs.

Huibers, M. J. H., Beurskens, A. J. H. M., Bleijenberg, G. and Van Schayck, C. P. (2003). The effectiveness of psychological interventions delivered by general practitioners. *The Cochrane Database of Systematic Reviews*, Issue 2.

Kelly, M. P., Swann, C., Killoran, A., Naidoo, B., Barnett-Paige, E. and Morgan, A. (2002). *Methodological problems in constructing the evidence base for public health: starter paper.* London: Health Development Agency. www.hda.nhs.uk/evidence

Kreitman, N. (1986). Alcohol consumption and the preventive paradox. *British Journal of Addiction* 81: 353-63.

Lemmens, P. (2001). Relationship of alcohol consumption and alcohol problems at the population level. In: Heather, N., Peters, T. J. and Stockwell, T. (eds) *International handbook of alcohol dependence and problems*. Chichester: Wiley.

Marmot, M. and Feeney, A. (1999). Inequality, alcohol and alcohol-associated harm. In: Waller S., Crosier A. and McVey D. (eds) *Inequalities in health*. A series of seminars held by the Health Education Authority, London.

McArthur, D. L. and Kraus, J. F. (1999). The specific deterrence of administrative per se laws in reducing drunk driving recidivism. *American Journal of Preventive Medicine* 16: 68-75.

Moyer, A., Finney, J. W., Swearingen, C. E. and Vergun, P. (2002). Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. *Addiction* 97: 279-92.

Murgraff, V., Parrott, A. and Bennett, P. (1999). Risky single-occasion drinking amongst young people – definition, correlates, policy, and intervention: a broad overview of research findings. *Alcohol and Alcoholism* 34 (1): 3-14.

Newburn, T. and Shiner, M. (2001). Teenage kicks? *Young people and alcohol: a review of the literature*. York: Joseph Rowntree Foundation.

Office for National Statistics (ONS) (2000). *General Household Survey*. London: ONS.

Peek-Asa, C. (1999). The effect of random alcohol screening in reducing motor vehicle crash injuries. *American Journal of Preventive Medicine* 16 (1S): 57-67.

Plant, M., Single, E. and Stockwell, T. (eds) (1997). *Alcohol: minimising the harm, what works?* London: Free Association Books.

Plant, M. L., Abel, E. L. and Guerri, C. (1999). Alcohol and pregnancy. In: MacDonald, I. (ed) *Health issues related to alcohol consumption, 2nd edition*. Oxford: Blackwell.

Poikolainen, K. (1999). Effectiveness of brief interventions to reduce alcohol intake in primary health care populations: a meta-analysis. *Preventive Medicine* 28: 503-9.

Purser, B., Davis, P., Johnson, M. R. D. and Orford, J. (2001). *Drinking in second and subsequent generation black and Asian communities in the English Midlands*. Alcohol Concern. London: Chameleon Press.

Raistrick, D., Hodgson, R. and Ritson, B. (eds) (1999). *Tackling alcohol together*. London: Free Association Books.

Room, R., Graham, K., Rehm, J., Jernigan, D. and Monteiro, M. (2003). Drinking and its burden in a global perspective: policy considerations and options. *European Addiction Research* 9: 165-75.

Royal College of Physicians (2001). *Alcohol – can the NHS afford it?* A report of a working party of the Royal College of Physicians, London.

Saunders, J. B., Kypi, K., Walters, S. T., Laforge, R. G. and Larimer, M. E. (2004). Approaches to brief intervention for hazardous drinking in young people. *Alcoholism: Clinical and Experimental* Research 28: 322-9.

Seitz, H. K. and Homann, N. (2001). Effect of alcohol on the orogastrointestinal tract, the pancreas and the liver, In: Heather, N., Peters, T. J. and Stockwell, T. (eds) *International handbook of alcohol dependence and problems*. Chichester: Wiley.

Shults, R., Elder, R., Sleet, D., Nichols, J., Alas, M., Grande-Kulis, V., Zaza, S., Sosin, D. and Thompson, R. (2001). Reviews of evidence regarding interventions to reduce alcohol-impaired driving. *American Journal of Preventive Medicine* 21 (4S): 66-88.

Sims, J. and Iphofen, R. (2003). Primary care assessment of hazardous and harmful drinkers: a literature review. *Journal of Substance Use* 8: 176-81.

Single, E., Rehm, J., Robson, L. and Van Truong, M. (2000). The relative risks and etiologic fractions of different causes of death and disease attributable to alcohol, tobacco and illicit drug use in Canada. *Canadian Medical Association Journal* 162: 1669-75.

Skara, S. and Sussman, S. (2003). A review of 25 long-term adolescent tobacco and other drug use prevention program evaluations. *Preventive Medicine* 37: 451-74.

Swann, C. J., Falce, C., Morgan, A., Kelly, M. P. and Powell, G. (2003). *HDA Evidence Base: process and quality standards manual for evidence briefings*. London: Health Development Agency.

Thomas, H., Siracusa, L., Ross, G. et al. (1999). *Effectiveness of school-based interventions in reducing adolescent risk behaviour: a systematic review of reviews.* Ontario: Effective Public Health Practice Project, Public Health Research Education and Development Program.

Tobler, N. S. and Stratton, H. H. (1997). Effectiveness of school-based drug prevention programs: a meta analysis of the research. *Journal of Primary Prevention* 18: 71-128.

Wanless, D. (2004). *Securing good health for the whole population. Final report.* London: H. M. Treasury.

White, I. R. (2003). Intention-to-treat analysis was over-zealous – but this does not affect findings. Letter to BMJ.com, 9 December 2003.

Whitlock, E. P. (2003). Alcohol screening in primary care. *British Medical Journal USA* 3: 579-80.

Whitlock, E. P., Polen, M. R., Green, C. A., Orleans, T. and Klein, J. (2004). Behavioral counselling interventions in primary care to reduce risky/harmful alcohol use by adults: a summary of the evidence for the US Preventative Services Task Force. *Annals of Internal Medicine* 140 (7): 557-68.

Wilk, A. I., Jensen, N. M. and Havighurst, T. C. (1997). Meta-analysis of randomized control trials addressing brief interventions in heavy alcohol drinkers. *Journal of General Internal Medicine* 12 (5): 274-83.

Wilson, D. B. (2000). Meta analysis in alcohol and other drug abuse treatment research. *Addiction* 95 (suppl 3): S419-S438.

Wu, O. and Knill-Jones, R. (2003). Does Beich et al. add to the existing evidence? Letter to BMJ.com, 17 December 2003.

Zaza, S., Carande-Kulis, V., Sleet, D., Sosin, D. M., Elder, R. W., Shults, R. A., Dinh-Zarr, T. B., Nichols, J. L., Thompson, R. S. and the Task Force on Community Preventive Services (2001). Methods for conducting systematic reviews of the evidence of effectiveness and economic efficiency of interventions to reduce injuries to motor vehicle occupants. *American Journal of Preventive Medicine* 21 (4S): 23-30.

Zilberman, M., Tavares, H. and el-Guebaly, N. (2001). Gender similarities and differences: the prevalence and course of alcohol- and other substance-related disorders. *Journal of Addictive Diseases* 22: 61-74.

Zwerling, C. and Jones, M. P. (1999). Evaluation of the effectiveness of low blood alcohol concentration laws for younger drivers. *American Journal of Preventive Medicine* 16 (1S): 76-80.