Reducing Harm in Drinking Environments

Background

The European Union has the highest rate of alcohol consumption in the world. While drinking patterns vary widely between countries, the last decade has seen growing levels of hazardous and harmful alcohol use among young people in many Member States.¹ Young Europeans typically consume greater quantities per drinking occasion than older drinkers² and often drink to drunkenness.³ Risky alcohol use in young people is a major public health concern; across Europe young people are disproportionately burdened by alcohol-related harm. Over 25% of deaths in 15-29 year old males, and over 10% in females, are associated with alcohol use, largely through violence, road traffic crashes and unintentional injuries.¹ Much alcohol use and related harm in young Europeans takes place in public drinking environments, such as pubs, bars and nightclubs.⁴ Reducing harm in drinking environments is consequently a critical issue for protecting public health in Europe.



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EU priorities

In 2006 the Commission adopted an EU strategy to support Member States in reducing alcoholrelated harm. The Commission identified five priority themes, which are relevant to all Member States and for which Community action as a complement to national policies has an added value:

- Protect young people, children and the unborn child;
- Reduce injuries and death from alcohol-related road accidents;
- Prevent alcohol-related harm among adults and reduce the negative impact on the workplace;
- Inform, educate and raise awareness on the impact of harmful and hazardous alcohol consumption, and on appropriate consumption patterns;
- Develop and maintain a common evidence base at EU level.

Drinking environments see high levels of alcohol use and related harm in young people

Millions of people across the EU work in drinking environments

Measures to address risky drinking in pubs, bars and nightclubs and create safer drinking environments are important in meeting all of these priorities. Much risky alcohol consumption and related-harm, particularly in young people, occurs when people are in or travelling home from drinking environments. In addition to health and social harm, this can impact on the workplace through absenteeism or poor performance following a night out. Drinking environments are also important workplace settings for millions of individuals across Europe, including bar staff and managers, door supervisors, police, transport workers, food vendors, and street cleaners. Such individuals can be the victims of other people's drinking through, for example, violence, and this can spill out to other workplaces including Emergency departments.⁵ Further, bar staff work in settings where alcohol is readily available and have shown high levels of personal alcohol consumption and related harm.⁶ Thus drinking environments are critical locations for addressing harmful and hazardous alcohol consumption. Further, with very little information available across Europe on the extent of alcohol use and related harm in drinking environments, or the effectiveness of interventions to reduce harm in these settings, developing this evidence base at EU level should be a key priority.

Key Facts

Drinking environments and alcohol-related harm

- High densities of alcohol outlets have been associated with increased binge drinking and harm including violence, road traffic injuries and sexually transmitted infections.⁷
- Studies often show that a large proportion of alcoholrelated harm in nightlife environments is concentrated in and around a small number of problematic venues.⁸
- Specific characteristics of drinking environments have been linked to higher alcohol use and related harm, including: a permissive atmosphere, crowding, low levels of comfort, cheap drinks promotions, poorly trained staff and inadequate public transport.⁹



Studies in Europe highlight the links between drinking environments, alcohol use and a range of health and social harms

Alcohol use

- A study of young nightlife users in nine European countries by the IREFREA research group found seven in ten had been drunk in the last four weeks.¹⁰
- Among young Danish tourists in a Bulgarian resort, 98% of those approached had drank alcohol the previous night, 85% had drank over 8 units, and 46% had some form of memory loss the next day.¹¹
- Research in England found that young people's typical alcohol consumption on a night out in a city drinking environment exceeded the UK recommended limits for an entire week.¹²

Violence

- One in five European nightlife users surveyed by IREFREA had been involved in violence in the last 12 months.¹⁸
- In England and Wales, one in five of all incidents of violence occurs in or around pubs, bars and nightclubs.¹⁹
- An emergency department study in Norway found most assault victims were young men, typically assaulted at weekend nights by strangers in public locations, and whilst under the influence of alcohol.²⁰

Road traffic injuries

- 18% of European nightlife users had driven when drunk in the last four weeks, and 37% had taken a lift from a driver who was drunk or drugged.¹³
- In Switzerland, increases in alcohol-related road traffic casualties at weekend nights correlate with risky single occasion drinking outside of the home.¹⁴
- Italian emergency department studies show alcohol-related traffic injuries peak in young people at weekend nights.^{15,16}
- In England, 63% of drivers and 80% of pedestrians killed on the road at weekend nights have been drinking.¹⁷

Sexual health

- Meeting sexual partners is a major reason for young Europeans using pubs, bars and nightclubs.²¹
- 29% of drinkers in the European nightlife study used alcohol specifically to facilitate sexual encounters.¹⁰
- Alcohol intoxication is associated with regretted sex, unprotected sex and sexual assault. For example 60% of victims reporting drug facilitated sexual assault in the UK had alcohol concentrations above 150mg%.²²

What can be done?

Regulatory measures

The sale of alcohol in most, but not all, EU countries is regulated by governments, often through alcohol licensing systems. This enables authorities to manage where, when and how alcohol can be sold. Regulatory measures to control the density of drinking venues, the times they can sell alcohol and the price of alcohol can play a major role in preventing alcohol-related harm in drinking environments.

Several EU countries have no formal system for licensing alcohol sales

Controlling the density of licensed premises

Higher densities of alcohol outlets are linked to higher levels of alcohol-related harm.⁷ In drinking environments, increases in the density of pubs, bars and nightclubs in an area can create a raft of problems. For example, competition between venues for customers can encourage cheap drinks promotions, less stringent admission policies and lower management standards, while at the end of a night's entertainment, large crowds of intoxicated revellers can gather on streets, often with limited public transport available. These issues can create environments susceptible to drunkenness, underage drinking, anti-social behaviour, violence and drink driving, for example. Commercial interests can prevent numbers of venues from being reduced once established; thus ensuring the density of licensed premises in drinking environments does not increase beyond a manageable level is an important step in preventing risky drinking environments from developing.

Controlling alcohol service times

The times at which alcohol is allowed to be sold can impact on alcohol use and related harm. Restrictions on alcohol sales times have commonly been used in the past to reduce the availability of alcohol and associated harm.²³ However in recent years several countries have extended alcohol service times, often in attempts to stagger the departure of drinkers from areas with high densities of pubs, bars and nightclubs. In Australia, extended alcohol service times have been linked to increased violence in venues staying open later.²⁴ In England and Wales, extended alcohol sales times have not been linked to increased violence, but rather to a shift in the timing of violence to later in the night.^{25,26} Elsewhere, restrictions on alcohol service times have helped reduce alcohol-related harm. In Diadema, Brazil, for example, a law preventing the sale of alcohol after I Ipm has been associated with large reductions in homicide.²⁷

Controlling alcohol prices

Alcohol prices influence consumption levels, particularly in young people, and increasing prices can reduce levels of alcohol-related harm. In pubs, bars and nightclubs, cheap drinks promotions, used to attract and retain customers, have been linked to higher levels of alcohol use.²⁸ However, measures to prevent cheap drinks promotions in drinking environments, such as voluntary agreements between venues or use of licensing legislation to ban cheap sales, are often hampered by poor compliance or trade regulations.²⁹ Large discrepancies in the price of alcohol sold in on-and off-licenses^a can pose additional problems. Cheaper alcohol prices in off-licensed venues can encourage drinkers to pre-load (consume alcohol at home before going out), which has been linked to higher alcohol use and greater risks of violence.¹¹ Thus efforts to prevent cheap alcohol sales must cover both on- and off-licensed retailers. In England, it has been estimated that setting a minimum alcohol price of 50p per unit for all retailers would reduce violent crime by 2.1%, work absenteeism by 3.1% and hospital admissions by 7.4% (in the first year alone).³⁰

^a On licensed premises are those that sell alcohol for consumption on the premises (e.g. bars); off-licensed premises are those that sell alcohol for consumption elsewhere (e.g. shops)

Interventions in drinking environments

In addition to regulatory measures, there are a wide range of interventions that can be implemented at local level to reduce harm in drinking environments. This section outlines evidence behind a number of these types of interventions, covering staff training programmes, enforcement activity, programmes to reduce drink driving, environmental measures, and community-based programmes. Such interventions can be important in managing alcohol access and preventing harm in drinking environments. However, they should be adopted as part of broader, comprehensive strategies to prevent harmful and hazardous alcohol use developing in young people and reduce their propensity to other harmful behaviours such as violence.³¹

• Staff training programmes

Responsible beverage service (RBS) training aims to improve servers' knowledge of alcohol issues and equip them with skills to prevent alcohol-related harm, including sales of alcohol to underage or drunk customers. RBS has shown benefits in improving staff knowledge and practice; in the US mandated RBS has been associated with reduced night time crashes.³² In Sweden, RBS has been a major component of the STAD project (see *community interventions*). A two-day training programme was developed including: the effects of alcohol and other drugs; alcohol legislation; service refusal skills; crimes related to licensed premises and conflict management. Local authorities strongly recommended that all staff working in late night venues were trained in RBS. A study used actors portraying drunk people to test service refusal rates in licensed premises in the project area. At baseline (1996), just 5% of attempted purchases were refused. By 1999 this had increased to 47% and by 2001, to 70%.³³

In Canada, the Safer Bars programme develops staff skills in managing aggressive behaviour. The three-hour training programme can be delivered to all staff in licensed premises, and is complemented by a risk assessment workbook for bar owners, and a pamphlet informing staff of their legal responsibilities. A study of the programme found it reduced aggression in bars, yet effects were moderated by a high turnover of staff.³⁴ This shows the need for training to be sustained. In the UK, door supervisor training has been made mandatory, with all individuals employed as door supervisors required to be vetted, registered and to have completed a recognised training course. However its impacts on reducing alcohol-related harm have yet to be measured.



Enforcement activity

Enforcement activity is a major feature of interventions to reduce harm in drinking environments. To prevent underage alcohol sales, test purchasing operations use individuals at or below the minimum purchase age to attempt to buy alcohol, enabling authorities to identify retailers who do not check age and refuse service where appropriate. In the UK, test purchasing is used as part of routine practice by Trading Standards and police. Operations can be implemented randomly, but are often targeted at alcohol retailers based on local intelligence. A high-profile national Tackling Underage Sales Campaign that increased test purchasing operations over ten weeks in 2007 found underage sales reduced over the course of the intervention; 32.5% of test purchases in on-licensed premises resulted in underage sales in the first week of the campaign, compared with 18.5% in the last week.³⁵ International studies have reported mixed results from test purchasing. In the US, they produced immediate reductions in underage sales in venues where enforcement checks took place, yet these benefits were short-lived, stressing the need for ongoing enforcement.³⁶

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Police also target enforcement activity in drinking venues to check adherence to licensing conditions and other legislation and to deter irresponsible behaviour. Police enforcement activities appear to be most effective in reducing alcohol-related harm when they are targeted at highrisk venues. In Cardiff, UK, the TASC (Tackling Alcohol-Related Street Crime) project used a range of enforcement techniques to target venues associated with violence. Intensive operations, including regular police inspections, training and monitoring of door supervisors, and high profile policing outside the venue, were associated with reductions in violence both in and around the targeted premises.³⁷ However, enforcement operations focusing on whole streets associated with alcohol-related disorder were less successful. The involvement of Emergency



Department staff in venue-focused police enforcement appeared to contribute to its success.³⁸

In New South Wales, Australia, the Alcohol Linking Program has developed a system to enable police to identify and target enforcement at high-risk drinking venues as part of routine practice. Police record whether individuals involved in crimes have drank alcohol prior to the incident, and where they consumed their last drink. In an evaluation study, managers of drinking venues identified as 'last drink' locations were provided with a report detailing the number and characteristics of alcohol-related crimes associated with their premises. Police visited each venue and conducted an audit of management and alcohol server practice, providing recommendations for improvement and inviting managers to a workshop on responsible premises management. The study found greater reductions in alcohol-related incidents and assaults than seen through standard police practice.³⁹

Programmes to reduce drink driving

Police enforcement of drink driving legislation using driver breath testing can reduce alcohol-related crashes.⁴⁰ In Australia, random breath testing is permitted, whereby police can stop any driver and require them to take a breath test. This has been found to be twice as effective as selective testing, where police only stop drivers that they have reason to believe have been drinking.⁴¹ Random breath testing is not allowed in many countries, yet experimental use in the Netherlands also showed positive effects.⁴⁰ High visibility enforcement can be a strong deterrent to drink driving, and can be targeted at nightlife users. In the US, sobriety checkpoints were used at the US/Mexico border to reduce the number of young people crossing the border to drink alcohol in Mexico (where the legal drinking age is lower). The programme was associated with reductions in alcohol-related road traffic crashes in 16-20 year olds.⁴²



Within drinking environments, designated driver schemes are commonly promoted to encourage safer driver behaviour. These ask groups of individuals to designate a person to abstain or limit their alcohol use during a night out in order to drive the group home at the end of the night, and often involve incentives such as free soft drinks or admission for designated drivers. However, there is no evidence to suggest that designated driver schemes are effective in reducing alcohol-related harm. While some studies have found designated drivers to have lower BACs than passengers or other drivers,⁴³ they still often have BACs above the legal driving limit.⁴⁴ Further, some studies have found that alcohol use increases in passengers when a designated driver is present.¹

Other programmes to reduce drink driving include those providing transport to take drinkers to and from nightlife areas. In the US, a study of the Road Crew programme that provided local communities with transport to, between and home from bars found it reduced drink driving without increasing alcohol use.⁴⁵

Environmental measures

Environmental factors in drinking environments can contribute to alcohol-related harm. In pubs, bars and nightclubs, factors such as crowding, noise, low comfort, poor cleanliness, cheap alcohol and permissive atmospheres (e.g. towards drunkenness) have been linked to higher levels of aggression.⁹ Identifying and improving these factors through, for example, risk assessment, training and codes of practice, can help create safer drinking environments (see *community interventions*). The use of safer drinking vessels can also help prevent injuries caused by broken glassware; both unintentional injuries and violent injuries caused by the use of glassware as a weapon.^{46,47}



In the wider nightlife setting, good street lighting can improve safety and deter crime, while closed circuit television is also used to deter and detect crime. Late night public transport is particularly important in enabling drinkers to return home quickly and safely.⁴⁸ The availability of public transport has been identified as a key factor in reducing aggression in drinking environments.⁴⁹ However late night transport points such as taxi ranks are often hotspots for violence. In Manchester, UK, the use of marshals at taxi ranks, to manage queues and provide a visible security presence, increased perceptions of safety among both taxi drivers and customers, and was associated with a 50% reduction in recorded crime.⁵⁰

Community interventions in drinking environments

Community-based interventions in drinking environments typically involve the development of multi-agency partnerships to implement a range of co-ordinated measures to manage drinking environments. In Sweden, the STAD (Stockholm Prevents Alcohol and Drug Problems) project developed a multi-agency partnership including police, licensing authorities, health services, the council and representatives from licensed premises to address alcohol-related problems. Regular partnership meetings were organised to raise awareness of key issues and gain strategic support for preventive interventions. Measures implemented through the project included responsible service training for bar staff and door supervisors, house policies for licensed premises and increased enforcement of licensing legislation. An evaluation of the intervention found that violent crimes had decreased by 29% during the intervention period.⁵¹ Cost effectiveness analysis estimated that the programme saved 39 euros for every one euro invested.⁵² The success of the STAD project has been attributed to factors including its long-term, sustainable approach, effective partnership working, continued media work and ongoing evaluation.⁹

In Australia, the Queensland Safety Action Projects sought to address alcohol-related problems in drinking environments through a range of interventions including community mobilisation, codes of practice for licensed premises, increased enforcement of licensing laws and environmental safety measures (e.g. lighting and public transport). The measures were associated with reductions in arguments, verbal abuse and threats in drinking premises over the course of the intervention. Further analyses found that a number of key changes within



drinking environments brought about by the project had contributed to reductions in aggression. These included improved comfort (e.g. availability of seating) in drinking premises, less overt sexual activity and fewer highly drunk men (attained through improved alcohol serving policies and customer behaviour standards in licensed premises), and increased public transport.⁴⁹ However, unlike the STAD project, the Safety Action Projects did not receive long term funding and the benefits achieved were not sustained.

Questions for Consideration by Policy Makers

• How can we increase understanding of drinking behaviours and alcohol-related harm in European drinking environments?

There is a major gap in understanding of drinking behaviours in young adults in Europe, with no consistent data available on this high risk group and few studies conducted even at country level. Further, there is very little information on alcohol-related harm occurring in European drinking environments and the costs this imposes on public services, communities and the alcohol industry. Developing this knowledge would greatly facilitate the creation of safer drinking settings in Europe.

How can we increase the European evidence base on what works in preventing harm in drinking environments?

Although there are many interventions underway across Europe to create safer drinking environments, few of these are rigorously evaluated. Consequently there is very little information available on their effectiveness in reducing alcohol-related harm, and on their cost-effectiveness. Developing and sharing this information is critical to protect health in drinking environments.

How can we ensure effective interventions are implemented and sustained?

A major limitation of many interventions in drinking environments is their short-term approach, with the benefits of measures introduced through one-off funding often being short-lived. Support is needed to enable national and local agencies to build effective measures into routine practice. Measuring the economic benefits of interventions to health and criminal justice services, as well as the night time economy itself, is an important factor in sustaining effective practice.

How can we support the development of safer drinking environments?

Developing understanding of the extent of, and risk factors for alcohol-related harm in drinking environments, and of effective prevention measures, is critical. However drinking environments vary widely across Europe and there is currently no common understanding of what a 'safe' drinking environment is. In many countries, development of drinking environments has neglected public health in favour of commercial interests, resulting in increasing alcohol-related harm. Preventing this from occurring should be a key consideration in growing nightlife areas. In any drinking setting, interventions should not focus solely on preventing harm, but also on reducing the drinking behaviours and other behavioural, environmental and cultural factors that contribute to such harm.

How would interventions in drinking environments support other strategies?

Effective interventions that reduce harm in drinking environments would support a wide range of other strategies, including those covering health improvement, crime prevention, education, employment, healthy workplaces, tourism, and town and city centre regeneration.

How will industry be affected?

Reducing harm in drinking environments should create a range of benefits to industry. A night time environment which is safe and secure is a place where all ages can go out, while individuals working in drinking environments would themselves be protected from alcohol-related harm.

How will governments be affected?

Effective management of drinking environments can reduce costs to health services, criminal justice agencies and a range of other public services. This requires commitment to public health and investment in structures to implement and sustain effective interventions, yet the benefits of this can extend far beyond public health. Importantly, drinking environments are valued by many young adults yet often complained about by older individuals. Consequently work to create safer drinking environments can satisfy the concerns of a large proportion of the adult population.

References

I. Anderson P, Baumberg B. Alcohol in Europe: a public health perspective. London: Institute of Alcohol Studies, 2006.

Makela P et al. Drinking patterns and their gender differences in Europe. Alcohol and Alcoholism 2006; 41(S1): i8-i18.
 Hibell B et al. The 2007 ESPAD report: substance use among students in 35 European countries. Stockholm: The Swedish Council for Information on Alcohol and Other Drugs, 2009.

4. Leifman H. A comparative analysis of drinking patterns in 6 EU countries in the year 2000. Contemporary Drug Problems 2002; 29: 501-48.

5. Ferns T, Cork A. Managing alcohol related aggression in the emergency department (Part I). International Emergency Nursing 2008; 16: 43-47.

6. Romeri E et al. Alcohol-related deaths by occupation, England and Wales, 2001–05. Health Statistics Quarterly 35. London: Office for National Statistics, 2007.

7. Livingston M et al. Changing the density of alcohol outlets to reduce alcohol-related harm. Drug and Alcohol Review 2007, 26:557-566.

8. Briscoe S, Donnelly N. Problematic licensed premises for assault in inner Sydney, Newcastle and Wollongong. Aust N Z J Criminol 2003;36:18-33.

9. Graham K, Homel R. Raising the bar: preventing aggression in and around bars, pubs and clubs. Portland: Willan Publishing, 2008.

10. Bellis MA et al. Sexual uses of alcohol and drugs and the associated health risks: a cross sectional study of young people in nine European cities. BMC Public Health 2008; 8: 155.

11. Hesse M, Tutenges S. Evening experiences versus drinking indicators as predictors of hangover on a summer holiday. American Journal on Addictions 2009; 18: 130-134.

12. Hughes K et al. Alcohol, nightlife and violence: the relative contributions of drinking before and during nights out to negative health and criminal justice outcomes. Addiction 2008; 103: 60-65.

13. Calafat A et al. Traffic risk behaviors at nightlife: drinking, taking drugs, driving, and use of public transport by young people. Traffic Inj Prev 2009; 10: 162-9.

14. Gmel G et al. Drinking patterns and traffic casualties in Switzerland: matching survey data and police records to design preventive action. Public Health 2005; 119: 426-436.

15. Fabbri A et al. Positive blood alcohol concentration and road accidents. A prospective study in an Italian emergency department. Emergency Medical Journal 2002; 19: 210-214.

16. Ricci G et al. Prevalence of alcohol and drugs in urine of patients involved in road accidents. Journal of Preventive Medical Hygiene 2008; 49: 89-95.

TRL Limited. Blood alcohol levels in road accident fatalities for 2006 in Great Britain. Crowthorne: TRL Limited, 2008.
 Schnitzer S et al Nightlife violence – a gender specific view on risk factors for violence in nightlife settings; a cross sectional study in nine European countries. Journal of Interpersonal Violence, in press.

19. Kershaw C et al. Crime in England and Wales 2007/08. Findings from the British Crime Survey and police recorded crime. London: Home Office, 2008.

20. Steen K, Hunskaar S. Violence in an urban community from the persective of an accident and emergency department: a two-year prospective study. Med Sci Monitor 2004; 10: CR75-79.

21. Calafat A et al. Enjoying the nightlife in Europe. The role of moderation. Valencia: IREFREA, 2003.

22. Scott-Ham M, Burton FC. A study of blood and urine alcohol concentrations in cases of alleged drug-facilitated sexual assault in the United Kingdom over a 3-year period. J Clin Forensic Med 2006; 13: 107-111.

23. Babor T et al. Alcohol: no ordinary commodity. Oxford: Oxford University Press, 2003.

24. Chikritzhs T, Stockwell T. The impact of later trading hours for Australian public houses (hotels) on levels of violence. Journal of Studies on Alcohol, 2002, 63:591-599.

25. Evaluation of the impact of the Licensing Act 2003. London, Department for Culture, Media and Sport, 2008.

26. Hough M et al. The impact of the Licensing Act 2003 on levels of crime and disorder: an evaluation. London, Home Office, 2008.

27. Duailibi S et al. The effect of restricting opening hours on alcohol-related violence. American Journal of Public Health, 2007, 97:2276-2280.

28. Kuo M et al. The marketing of alcohol to college students: the role of low prices and special promotions. American Journal of Preventative Medicine 2003; 25: 204-11.

29. Hughes K, Bellis MA. Use of environmental harm to tackle alcohol-related harm in nightlife environments: the UK experience. Lisbon: European Monitoring Centre of Drugs and Drug Addiction, 2007.

30. Meier P et al. Independent review of the effects of alcohol pricing and promotion: part B. Modelling the potential impact of pricing and promotion policies for alcohol in England: results from the Sheffield Alcohol Policy Model. Sheffield, University of Sheffield, 2008.

Bellis MA, Hughes K. Comprehensive strategies to prevent alcohol-related violence. IPC Review 2008; 2: 137-168.
 Holder HD, Wagenaar AC. Mandated server training and reduced alcohol-involved traffic crashes: a time series analysis of the Oregon experience. Accid Anal and Prev 1994; 26: 89-97.

33. Wallin E et al. Overserving at licensed premises in Stockholm: effects of a community action program. Journal of Studies on Alcohol 2005; 66: 806-814.

34. Graham K et al. The effect of the Safer Bars programme on physical aggression in bars: results of a randomized controlled trial. Drug and Alcohol Review 2004; 23: 31-41.

35. Home Office. Tackling Underage Sales Campaign (TUSAC).

http://www.crimereduction.homeoffice.gov.uk/tvcp/tvcp01tusaccampaign.doc

36. Wagenaar AC et al. Preventing youth access to alcohol: outcomes from a multi-community time-series trial. Addiction 2005; 100: 335-345.

37. Maguire N, Nettleton H. Reducing alcohol-related violence and disorder: an evaluation of the 'TASC' project. London: Home Office, 2003.

38. Warburton AL, Shepherd JP. Tackling alcohol related violence in city centres: effect of emergency medicine and police intervention. Emergency Medicine Journal, 2006, 23:12-7.

39. Wiggers J et al. Strategies and outcomes in translating alcohol harm reduction research into practice: the Alcohol Linking Program. Drug and Alcohol Review, 2004, 23:355-364.

40. Shults RA. Reviews of evidence regarding interventions to reduce alcohol-impaired driving. Am J Prev Med 2001; 21: 66-88.

41. Henstridge J et al. The long-term effects of random breath testing in four Australian states: a time series analysis. Canberra, Australia: Federal Office of Road Safety, 1997.

42. Voas RB et al. Operation safe crossing: using science within a community intervention. Addiction 2002; 97: 1205-14.
43. Ditter SM et al. Effectiveness of designated driver programs for reducing alcohol-impaired driving. Am J Prev Med 2005; 28: 280-287.

44. Timmerman M et al. Do the designated drivers of college students stay sober? J Safety Res 2003; 34:127-33.

45. Rothschild ML et al. Reducing alcohol-impaired driving crashes through the use of social marketing. Accident Analysis & Prevention 2006; 38: 1218-30.

46. Anderson Z et al. Evaluation of the Lancashire Polycarbonate Glass pilot project. Liverpool: Liverpool John Moores University, in press.

47. Warburton AL, Shepherd JP. Effectiveness of toughened glassware in terms of reducing injury in bars: a randomised controlled trial. Inj Prev 2000; 6: 36-40.

48. Hughes K et al. Violence prevention alliance working group on youth violence, alcohol and nightlife fact sheet 3: late night transport. Liverpool: Liverpool John Moores University, 2007.

49. Homel R et al. Making licensed venues safer for patrons: what environmental factors should be the focus of interventions? Drug and Alcohol Review, 2004, 23:19-29.

50. Wheater P et al. TaxiSafe scheme: evaluation of taxi wardens pilot scheme 2004-2005. Manchester: Manchester Metropolitan University, 2005.

51. Wallin E et al. Alcohol prevention targeting licensed premises: a study of effects on violence. Journal of Studies on Alcohol, 2003, 64:270-277.

52. Månsdotter AM et al. A cost-effectiveness analysis of alcohol prevention targeting licensed premises. European Journal of Public Health, 2007, 17:618-623.

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