

Alcohol-related injuries

1. INTRODUCTION

There is evidence indicating that drinking decreases cognitive performance, even at low levels of consumption (see NHMRC 2009). The acute effects of alcohol increase with the amount consumed, along with the risk of adverse outcomes. Studies into the effect of alcohol on cognitive performance have found that as the blood alcohol level increases, cognitive function and psychomotor performance decrease rapidly; consumption of less than 20g alcohol potentially results in effects that increase risk of injury. Substantial impairment can exist well after alcohol has been metabolised and passed from the body; such temporary impairment, and its attendant risk, is the result of a 'hangover' effect.

This fact sheet describes the risk of alcohol-related injuries and what can be done to reduce them.

2. SINGLE OCCASION CONSUMPTION AND RISK

One way to describe the relationship between the use of alcohol and the risk of an injury is to develop single occasion dose specific relative risks. One meta-analysis has just done that (Taylor et al 2010). The risks of a non motor vehicle accident injury increase by 30% for every 10g of alcohol consumed on an occasion. At 140g alcohol prior to injury, the chance of subsequently having an injury is increased 24 times compared to someone who has not drunk, Figure 1.

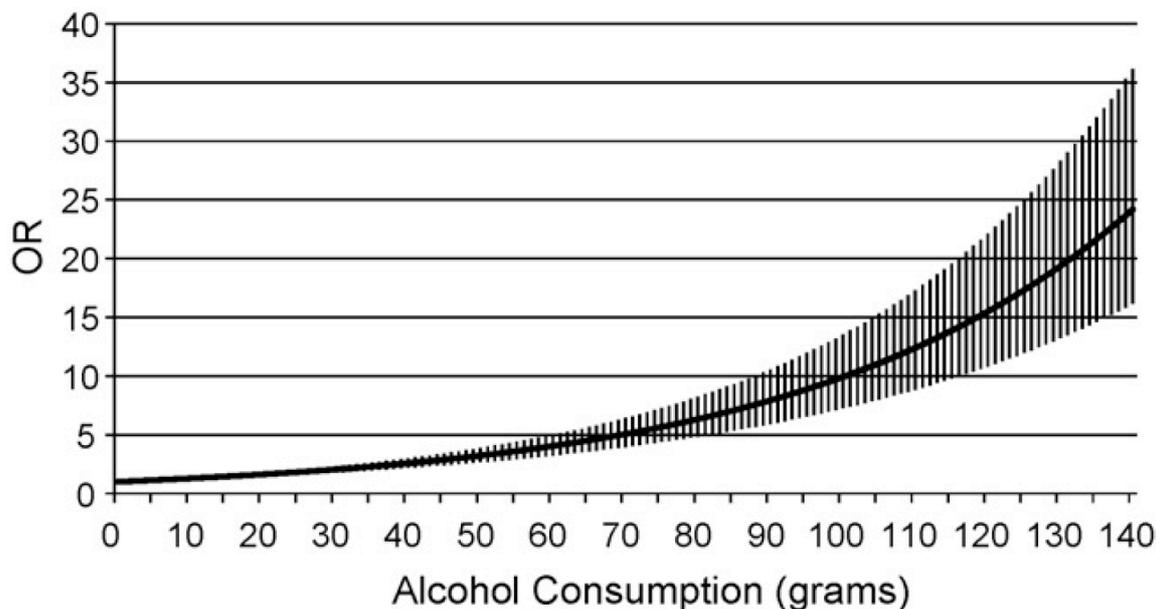


Figure 1 Dose–response curve for the amount of alcohol consumed 3 h prior and the odds of non-motor vehicle accident injury. Source: Taylor et al (2010).

Thus, the risk of injury simply increases with increasing alcohol consumption on a drinking occasion with no safe level of consumption.

3. LIFETIME CONSUMPTION AND RISK

Another way to describe the relationship between alcohol and injury risk is to estimate the lifetime risk of death from an injury related to alcohol use. The estimates for lifetime risk of death for Australian men and women are shown in Figures 2-3 (NHMRC 2009). Estimates for other countries will vary depending on the country-specific consumption and disease burden patterns. For both men and women the risk of death increases with both the frequency of drinking and the number of drinks per occasion. The risks of death for men are higher than those for women at all levels of drinking. A man who drinks 80g alcohol every day has a 1 in 10 lifetime risk of dying from an alcohol-related injury and a woman a 1 in 20 risk. The risk of death from injury remains below 1 in 100 for both men and women if they always drink two drinks (20g alcohol) or less on an occasion, even if the occasions are every day.

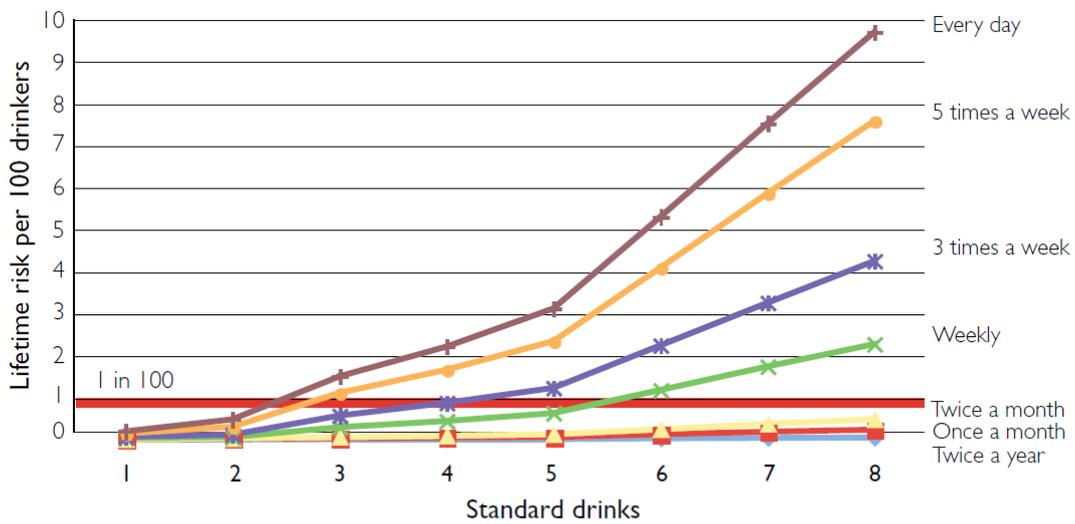


Figure 2 Lifetime risk from alcohol-related injury per 100 male Australian drinkers, by number of standard drinks per occasion (one drink contains 10g alcohol) and frequency of occasions. Source: NHMRC (2009).

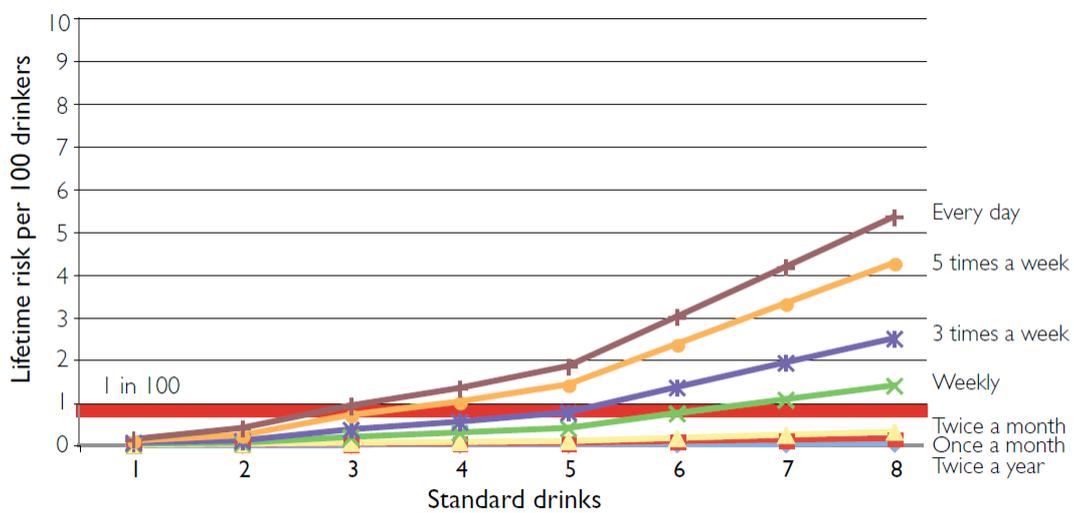


Figure 3 Lifetime risk of death from alcohol-related injury per 100 female Australian drinkers, by number of standard drinks per occasion (one drink contains 10g alcohol) and frequency of occasions. Source: NHMRC (2009).

Thus, the lifetime risk of dying from an alcohol-related injury simple increases with both the frequency of drinking and the amount drunk per occasion, with no safe level of consumption.

4. SOCIETAL BURDEN

Depending on the injury type, and age of death, between one and two fifths of all injury deaths are due to alcohol (NHMRC 2009). This includes over two-fifths of deaths from fires, one third of drowning deaths, one third of deaths from suicide, and over one quarter of all homicides. Some two-fifths of all ill-health and premature death due to alcohol in the European Union results from alcohol-related injuries, including 1 in 4 homicides and about 1 in 5 suicides (Anderson & Baumberg 2006). There is a direct relationship between changes in per capita alcohol consumption and changes in death rates from all accidents, homicides and suicides (Norström et al 2001). About 25% of the difference in life expectancy between western and eastern Europe for men aged 20-64 years in 2002 is due to alcohol, largely from differences in alcohol-related injury rates (Zatonski et al 2008). For Russian men dying between 15 and 54 years during the 1990s, 46% of all deaths were due to accidents and violence, of which 70% were alcohol-related (Zaridze et al 2009). For women dying between 15 and 54 years, 21% of all deaths were due to accidents and violence, of which 58% were alcohol-related.

5. ALCOHOL POLICY AND ALCOHOL-RELATED INJURIES

Increasing the price of alcohol, and restricting the availability of alcohol reduce alcohol consumption, riskier patterns of drinking and alcohol-related injuries (Babor et al 2010). Lower exposure to alcohol marketing is associated with less risky drinking among young people (Anderson et al 2009).

6. DRINKING ENVIRONMENTS

A systematic review of 52 publications found a range of physical factors, including poor ventilation, poor cleanliness, crowding, noise, low lighting, high temperature, shabby decor and low maintenance, have been associated with increased aggression in bars and nightclubs in various countries (Hughes et al 2010). A permissive environment, the availability of cheap alcoholic drinks, and a focus on music and dancing in bars have been associated with higher levels of alcohol use, intoxication and aggression across a range of studies and countries. Venues with friendly or all female staff have been associated with lower levels of patron intoxication, while younger staff have been found to be more likely to serve pseudo-drunk customers. Poor staff control and practice (e.g. ability to handle problems, continuing to serve drunk customers, drinking whilst working) has been associated with increased alcohol consumption, aggression, crime and other harms.

Another systematic review identified 24 four studies which examined interventions designed to reduce harm in drinking environments (Jones et al 2010) found no clear evidence from the seven server training studies to suggest that server training had an impact on responsible serving practices. Of the five studies that examined the effectiveness of interventions aimed at reducing alcohol related harm (consumption levels, injuries and drink driving) in drinking environments, one low quality study that examined a brief intervention utilising personalised risk assessment for patrons suggested that the intervention was of most benefit to heavy drinkers. Three programmes, two of which targeted drink driving through a designated driver and a ride programme respectively, and a third which promoted responsible drinking, had limited impact on patron behaviours. A study that examined the replacement of pint glasses with toughened glassware found that the glassware had lower impact resistance and resulted in more injuries to bar staff.

The three studies which evaluated interventions aimed at reducing alcohol service to underage patrons found no evidence that programmes specifically targeting underage sales of alcohol were effective. Two studies that examined the placement of age verification devices in communities found either no change in ID checking or a decrease. A third study that examined a programme of combined training and police enforcement checks found that the intervention only had a short term impact on underage sales.

The nine enforcement studies found no clear evidence to suggest that police intervention or increased enforcement of licensing laws were effective in reducing alcohol-related incidents. Two studies reported an increase in assaults following police intervention, though this may be due to better detection by police during the intervention phase of these studies. Police campaigns and other approaches to the enforcement of underage sale laws appeared to be largely ineffective.

7. COMMUNITY PROGRAMMES

A systematic review of 30 studies examined multi-component community-based programmes and found some evidence from eight studies for some impact in some contexts in reducing sales to intoxicated and under-age clients and some reductions in alcohol-related violence and aggression (Jones et al). However, results are not consistent or always statistically significant. Community based programmes may be able to expand the role of guardianship, implement situational deterrents and eliminate some precipitators of risky drinking. However, they require extensive resources and long term commitment and enforcement to ensure any chance of success.

8. BRIEF INTERVENTIONS IN EMERGENCY DEPARTMENTS

A systematic review of 13 studies investigated the use of brief motivational counselling in emergency departments (Havard *et al.*, 2008). The review showed that whilst brief interventions delivered in emergency departments did not produce a significant effect on alcohol consumption, a clear reduction in the likelihood of an individual sustaining an alcohol-related injury following intervention could be observed (pooled OR=0.59 (P<0.005)). Another systematic review of 12 studies found that eleven of the 12 studies presented a significant effect of brief intervention on at least one of the following outcomes: alcohol intake, risky drinking practices, alcohol-related negative consequences, or injury frequency (Nilsen *et al.*, 2008).

9. CONCLUSIONS

This fact sheet has shown that the risk of an injury increases linearly with the amount of alcohol consumed during the previous three hours, such that at 60g alcohol consumed during the previous three hours, a drinker is almost five times as likely to have an injury as a non-drinker. The lifetime risk of dying from an alcohol-related injury increases with both the frequency of drinking and the amount drunk per occasion, such that a man who drinks 60g alcohol per day has between a 5% and 6% lifetime chance of dying from an alcohol-related injury.

The factsheet has also shown that, depending on the injury type and the age of death, somewhere between one and two fifths of all injury deaths are due to alcohol, with alcohol-related injuries being responsible for about two fifths of all alcohol related ill-health and premature death facing the European Union. Alcohol-related injuries are also one of the most important explanatory determinants of health inequalities between different parts of the European Union.

Reducing alcohol-related injuries is, in principle, very straightforward: one simply needs to provide incentives for individuals to drink less frequently and less per occasion. Fortunately, the evidence base is also rather clear as to what can and cannot provide such incentives.

Education and persuasion to drink less does not provide such an incentive: they simply do not work in changing alcohol-related harm (Babor et al 2010). On the other hand, providing identification and brief advice programmes in accident and emergency departments seem to have some impact, at least in reducing subsequent alcohol-related injuries. Although much is known about factors in drinking establishments that increase the risk of alcohol-related harm, there is no convincing evidence that interventions designed to reduce harm in drinking environments actually reduce alcohol-related harm. On the other hand, there is some limited evidence that when such measures are implemented as part of multi-component community programmes, alcohol-related harm can be reduced; however, community programmes require extensive resources and long-term commitment and enforcement to ensure any chance of success.

The incentives that really work are those that increase the price of alcohol and make it harder to get through less density of outlets and shorter days and hours of sale, combined with enforced minimum purchase ages. These are also the policy options with the best value for money - they are the most cost-effective in reducing alcohol-related harm (Anderson et al 2009).

10. REFERENCES

Anderson P, de Bruijn A, Angus K, Gordon R, Hastings G. Impact of alcohol advertising and media exposure on adolescent alcohol use: a systematic review of longitudinal studies. *Alcohol Alcohol* 2009; 44: 229–43.

Anderson, P., Chisholm, D., Fuhr, D.C. Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. *Lancet*. 2009 373 2234-2246.

Anderson P., Baumberg B. (2006) Alcohol in Europe – A public health perspective. Report to the European Commission. London: Institute of Alcohol Studies; 2006 June.

National Health and Medical Research Council *Australian guidelines to reduce health risks from drinking alcohol*. Canberra, National Health and Medical Research Council, 2009 (<http://www.nhmrc.gov.au>, accessed 4 July 2009).

Babor T et al. Alcohol: No ordinary commodity. Research and public policy. 2nd edition. Oxford and London: Oxford University Press; 2010.

Havard, A., Shakeshaft, A., & Sanson-Fisher, R. 2008. Systematic review and meta-analyses of strategies targeting alcohol problems in emergency departments: interventions reduce alcohol-related injuries. *Addiction*.103(3):368-76; discussion 377-8.

Jones, L., Amanda Atkinson, Karen Hughes, Gayle Whelan, Mark A Bellis. Reducing harm in drinking environments. A systematic review of effective approaches. Centre for Public Health, Liverpool John Moores University, 2010.

Hughes,K., Zara Anderson, Lindsay Furness, Mark Bellis, Lisa Jones, Amador Calafat, Matej Kosir and Ninette van Hasselt Environmental factors in drinking venues and alcohol-related harm: the evidence-base for European intervention *Addiction* in press.

Nilsen, P., Baird, J., Mello, M., Nirenberg, T., Woolard, R., Bendtsen, P., & Longabaugh, R. A systematic review of emergency care brief alcohol interventions for injury patients. *Journal of Substance Abuse Treatment* 35, 184-201. 2008.

Norström, T., Ö. Hemström, M. Ramstedt, I. Rossow, and O-J. Skog (2001). "Mortality and Population Drinking." *Alcohol in postwar Europe: Consumption, drinking patterns, consequences and policy responses in 15 European countries*, Edited by T. Norström. Stockholm: National Institute of Public Health, European Commission.

Taylor, B., H.M. Irving, F. Kanteres, R. Room, G. Borges, C. Cherpitel, T. Greenfield, J. Rehm The more you drink, the harder you fall: A systematic review and meta-analysis of how acute alcohol consumption and injury or collision risk increase together. *Drug and alcohol dependence* Volume 110, Issue 1, Pages 108-116

Zaridze D, Brennan P, Boreham J, Boroda A, Karpov R, Lazarev A, Konobeevskaya I, Igitov V, Terechova T, Boffetta P, Peto R. Alcohol and cause-specific mortality in Russia: a retrospective case-control study of 48,557 adult deaths *Lancet* 2009; 373: 2201-14.

Zatonski W, Manczuk M, Sulkowska U. HEM Project Team: Closing the health gap in European Union. Warsaw, Poland: Cancer Epidemiology and Prevention Division, the Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology; 2008.

This fact sheet was prepared by Peter Anderson and Sandra Rado Krnel on behalf of the German Centre for Addiction Issues (DHS) as part of the Building Capacity project managed by the Institute of Public Health of the Republic of Slovenia, co-financed by the European Commission.

With the support of



Co-financed by



Generalitat de Catalunya
Departament de Salut