

# Alcohol and injuries

## Background

Injuries caused by both unintentional and intentional violence are a public health threat with almost 800 000 lives lost annually in the 53 Member States of the European Region World Health Organization (WHO) (World Health Organization, 2008a). In particular they are the leading causes of death in young people aged 5 to 44 years. For each death there are 30 hospital admissions and 300 emergency department attendances, and thousands who seek help from general practitioners (GPs) or self treat (Sethi et al., 2006a, Sethi et al., 2006b). The costs to health systems and to society as a whole are enormous. For road traffic injuries alone societal costs are estimated to be 2% of the national gross domestic product (GDP) of the European countries (Peden et al., 2004). Whereas they have traditionally been regarded as unavoidable occurrences of daily life, recent thinking employing the public health approach shows that they are preventable. It is estimated that there is a potential to save nearly half a million lives in Europe, if all countries had the same injury death rates or were as safe as the safest countries (Sethi, D et al., 2006a, Sethi, D et al., 2006b). Evidence shows that there are many cost effective interventions which could be used to turn back the unnecessary daily loss of life and human suffering (Krug, Dahlberg & Mercy, 2002, Peden et al., 2008, Peden et al., 2004, Sethi & Butchart, 2008, Sethi, Racioppi & Mitis, 2007).

The public health approach is a science based approach with 4 steps: identifying the size of the burden, understanding the risk factors, demonstrating what works for prevention, and implementing this on a wider scale. Using this approach, evidence shows that alcohol is a major risk factor which is cross-cutting for both unintentional injuries and violence. It is estimated that almost half of all injury deaths in the European Region are attributed to alcohol (*European Alcohol Action Plan 2000–2005*, 2000). The reduction of injuries and violence must necessarily engage this major risk factor, and the harmful use and misuse of alcohol needs to be controlled to prevent alcohol-related harm.

## Aims

The purpose of this policy briefing is to highlight the role of alcohol as a risk factor for injuries and violence and suggest public health initiatives to prevent alcohol-related injuries and violence.

## Policy priority

The prevention of injuries and violence in Europe is a policy priority. Both the WHO Regional Committee for Europe resolution EUR/RC55/R9 on prevention of injuries (WHO Regional Office for Europe, 2005b) and the European Union Council Recommendation on the prevention of injury and the promotion of safety (European Council, 2007) emphasise that public health action needs to be taken to tackle this leading cause of death and disability. The *WHO European Alcohol Action Plan 2000–2005* and the *Framework for alcohol policy in the WHO European Region* emphasise that injuries and violence are the gravest health outcome of alcohol-related harm with far-reaching social consequences (Rehm, Room & Monteiro, 2004). They propose a strategic approach to tackling the problem (*European Alcohol Action Plan 2000–2005*, 2000, *Framework for alcohol policy in the WHO European Region*, 2006). The European Commission adopted the first Alcohol Harm Reduction Strategy (European Commission, 2006), which identified good practices leading to positive results and highlighted areas where further progress should be made (Commission of the European Communities, 2006). The European Parliament has called upon the Commission to formulate “ambitious general objectives for the Member States with a view to curbing hazardous and harmful alcohol consumption” (European Parliament, 2007).

This greater attention to alcohol has also resonated at the global level with the recent World Health Assembly resolutions *WHA58.26 on Public-health problems caused by harmful use of alcohol* (World Health Organization, 2005c) and *WHA 61.4 on Strategies to reduce the harmful use of alcohol* (World Health Organization, 2008b) which call on Member States to develop, implement and evaluate effective strategies and programmes for reducing the negative health and social consequences of harmful use of alcohol. It has been proposed that WHO should develop a draft global strategy to control the harmful use of alcohol and that this should be presented to Member States in 2010. This should be evidence-based and would complement public health policies in Member States, with a special emphasis on an integrated approach to protect at-risk populations, young people and those affected by harmful drinking of others.



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## Alcohol drinking patterns

Alcohol consumption both through *volume* and *patterns of drinking* is a strong risk factor for increased injury burden and mortality (Rehm, Room & Monteiro, 2004). In this respect binge drinking is strongly associated with unintentional injuries and violence as well as sudden death from acute alcohol poisoning. The type of alcohol consumed, in addition to pattern, and volume, will also have an important bearing on risk; for example binge drinking of spirits is relatively common in youth in many countries and is strongly associated with violence and injuries (Sethi et al., 2006a)

The European Region has the highest per capita alcohol consumption in the world. Most countries exceed the safe limit of intake which has been set at 2 litres per year. Table 1 shows annual per capita alcohol consumption derived from official figures (European Alcohol Database [web database], 2008). The shading represents tertiles. These official figures are uncorrected for unrecorded consumption due to illicit liquor sales and local production. Unrecorded consumption is high in the following countries: Belarus, Estonia, Hungary, Latvia, Lithuania, Republic of Moldova, Russian Federation, Slovenia, the former Yugoslav Republic of Macedonia, and Ukraine. This would suggest that these countries are also high consumption countries (Rehm, Room & Edwards, 2001). Based on this some patterns emerge. Most countries from the central Asian republics have the lowest consumption, Mediterranean countries (except for Portugal and France) and Nordic countries seem to be in the middle range. Western European, Baltic and eastern European countries have the highest rates.

Many countries have strong drinking traditions and this will influence drinking patterns. Most information on alcohol patterns comes from self-reported behaviour provided by surveys and in epidemiological studies; there are methodological problems in valid and reliable cross-country comparisons. Nevertheless some generalizations can be made. In western Europe there is a north-south divide. There is greater binge drinking in the north with frequent heavy-drinking sessions and these are associated with greater rates of violence (both self-directed and interpersonal) and unintentional injuries (WHO Regional Office for Europe, 2006). Such patterns of drinking are also reported in many countries of eastern Europe (Shkolnikov, McKee & Leon, 2001). Some of these countries in transition have low social capital and traditionally high levels of alcohol consumption, and have seen large increases in harmful alcohol drinking in those people who are the weakest in terms of social support and occupational status (Sethi et al., 2006a). Recent reports show alarming trends of non-beverage alcohol (e.g. aftershave) consumption associated with increased mortality in the Russian Federation (Leon et al., 2007).

These substantial differences in volume consumed and drinking patterns have implications for health and disease. First, the level of consumption is an important determinant of ill health. Second, the patterns of drinking will influence the levels of ill health for a given change in amount of drinking. In this respect binge drinking is associated with more harmful effects, than gradual drinking.

Young people in the European Union (EU) are particularly at risk, as over 10% of female mortality and around 25% of male mortality in the 15–29 age group is related to hazardous alcohol consumption (*European Alcohol Action Plan 2000–2005*, 2000). The harmful and hazardous consumption of alcohol has effects not only on those who drink, but also on others and on society. Harmful effects of alcohol tend to be greater in less advantaged social groups, and therefore contribute to inequalities in health.

The Health Behaviour in School-aged Children (HBSC) survey conducted at regular intervals indicates that there is an increase in regular alcohol use and episodes of drunkenness are increasing in adolescents in many European countries, both in western and eastern European countries (Currie et al., 2004). Although boys are affected more than girls, there is an alarming increase in the latter as well. These findings have implications not only for the incidence of injuries and violence, but also for later health. Young people who start drinking before or at 14 years are more likely to develop alcohol dependence, and suffer from injuries such as those due to road traffic. These changing patterns of drinking have been attributed to a combination of aggressive marketing strategies, especially linked to sport and leisure environments, the increased availability of alcohol both as a result of increased trade, deregulation, weak regulatory capacity, increasing social tolerance, a relative fall in price and illegal cross-border flows and production.

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1. Binge drinking is defined as the consumption of 5 units or more of alcohol in males or 4 units or more in females in 2 hours or less.



**Table 1. Annual per capita alcohol consumption in the European Region**

Country	Year	Alcohol consumption in litres per capita
Tajikistan	2003	0.25
Turkmenistan	2003	0.72
Turkey	2003	0.96
Uzbekistan	2003	1
Armenia	2003	1.05
Georgia	2003	1.29
Israel	2003	1.65
Albania	2003	1.66
The former Yugoslav Republic of Macedonia	2002	1.92
Kazakhstan	2003	2.24
Kyrgyzstan	2003	2.43
Azerbaijan	2003	3.12
Belarus	2003	4.8
Norway	2003	4.82
Bulgaria	2003	5.04
Ukraine	2003	5.15
Malta	2003	5.36
Iceland	2003	5.47
Sweden	2003	5.62
Poland	2003	6.68
Romania	2003	7.39
Italy	2003	7.61
Greece	2003	7.68
Netherlands	2003	7.79
Finland	2005	8.23
Bosnia and Herzegovina	2003	8.32
Latvia	2003	8.36
Lithuania	2003	8.56
Slovenia	2005	8.83
Russian Federation	2003	8.87
Belgium	2003	8.93
Cyprus	2003	9.04
United Kingdom	2003	9.29
Portugal	2003	9.38
Switzerland	2003	9.41
Slovakia	2003	9.48
Denmark	2003	9.84
France	2003	9.95
Spain	2003	9.99
Republic of Moldova	2002	10.2
Croatia	2003	10.31
Austria	2003	10.51
Ireland	2005	10.61
Germany	2003	10.71
Hungary	2003	11.6
Estonia	2004	13.4
Czech Republic	2003	13.67
Luxembourg	2003	14.61

Source: European alcohol database



## Burden of injuries associated with alcohol

Alcohol is a risk factor for all unintentional injuries and violence. Some of the key facts on alcohol and injuries are summarized in Box 1.

### Box 1. Key facts on alcohol in the European Region

- Between 40% and 60% of all deaths from injury and violence are due to alcohol consumption.
- Alcohol is a cross-cutting risk factor for both unintentional injuries and violence and therefore needs to be addressed by concerted policies and actions.
- Many countries have strong drinking traditions, but new lifestyles such as binge drinking are of great concern.
- Much of the excess adult mortality in the Commonwealth of Independent States (CIS) and eastern European countries has been attributed to alcohol.
- Aggressive marketing strategies, the lack of regulatory control of alcohol production and smuggling have resulted in unprecedented levels of unintentional injuries and violence, above all in the CIS and eastern European countries.
- Many cost-effective strategies exist and need to be incorporated into national injury and violence prevention plans.

### *Injuries and alcohol related harm*

Whereas this policy briefing is concerned specifically with the problem of injuries and violence prevention, it is important to note that alcohol-related harm causes a range of severe disorders affecting the brain, nerves, heart and liver. Research indicates causal relationships between average volume of alcohol consumption and more than 60 causes of death, ranging from chronic diseases, such as malignant neoplasm and cardiovascular diseases, to more acute events, such as intentional and unintentional injuries (Rehm, Room & Monteiro, 2004). Therefore the controlling of alcohol-related injuries and violence will have other health benefits, such as decreasing mortality from cardiovascular diseases and cirrhosis (Powles et al., 2005) and vice versa. *The world health report 2002*, indicated that 4% of the global burden of disease and 3.2% of all deaths globally were attributed to alcohol (World Health Organization, 2002). Further there is an obvious association between intoxication with alcohol and high-risk behaviours, including the use of other psychoactive substances which can potentiate the risk of injury and violence.

Of the total number of alcohol-attributable deaths, 32% are from unintentional injury and 13.7% are from violence (World Health Organization, 2007). With respect to the European Region, alcoholic beverages are thought to contribute 9% of the total disease burden. Estimates suggest that 40–60% of all deaths due to injuries and violence are attributable to alcohol consumption. 1–3% of societal GDP loss is put down to alcohol-related harm (Rehm, Room & Edwards, 2001). A lot of the excess adult mortality in the eastern European states has been attributed to alcohol use. Harmful alcohol use is influenced by socioeconomic factors.

The WHO collaborative study on alcohol and injuries (World Health Organization, 2007) found that overall alcohol consumption prior to an injury presenting to emergency departments ranged from 6% to 45% (average 20%). For participating European countries this was: Czech Republic 8%, Sweden 15% and Belarus 28%. The majority of patients injured under the influence of alcohol were young (under 35 years), male, of lower socioeconomic status and had been the victim of violent assault by a friend or acquaintance who had also been drinking. In some countries half were likely to have consumed alcohol 30 minutes before the injury, which would have occurred in a public place.



## ***Road traffic injuries (RTIs)***

Alcohol impairs psychomotor performance as well as judgement (Peden et al., 2004). There is no safe lower limit as driving skills are affected at very low levels of consumption. There is strong evidence that large reductions in traffic crashes and fatalities have been achieved when legal blood-alcohol concentrations (BAC) are reduced. The effectiveness of lowering BACs depends on enforcement. Younger drivers are more susceptible to crashing under the effects of alcohol than older drivers (Sethi, Racioppi & Mitis, 2007).

## ***Workplace injuries***

Most workplaces are dependent on employees' ability to make judgements and perform qualified tasks. Alcohol-impaired employees therefore represent a danger to themselves, other workers and the public. This hazard has the greatest consequence in the transport sector (*European Alcohol Action Plan 2000–2005*, 2000).

## ***Drowning***

There is a body of evidence showing increased risks of drowning under the influence of alcohol with some studies putting this as high as 25–50% of drowning fatalities in adolescents and adults (Smith & Kraus, 1988), with higher rates observed in males (Lunetta, Penttilä & Sarna, 1998). Alcohol consumption is a risk factor particularly for drowning in young males (Sethi et al., 2006b).

## ***Falls***

Older people are susceptible to the effects of alcohol because of their relative smaller body mass. Though an under-researched area, alcohol consumption is regarded as an important risk factor for falls, above all in elderly people (Cawthon et al., 2006, Kool et al., 2008, Kurzthaler et al., 2005). There is a potentiation of the effects of alcohol with drugs and medicaments putting people on psychoactive medication at greater risk (Sheahan et al., 1995).

## ***Fires/ burns***

There is an increased association with deaths from house fires due to alcohol intoxication where cigarette smoking is an associated risk factor (Sethi et al., 2006b).

## ***Violence and alcohol***

Alcohol is a precipitant to violent behaviour and associated with both victims and perpetrators (Krug, Dahlberg & Mercy, 2002, Sethi et al., 2006b, World Health Organization, 2005a). Alcohol is implicated in up to 40% of violent attacks, though this may vary by setting. Experiencing or witnessing violence can in turn lead to the harmful use of alcohol. Partner violence is a large problem in all countries in Europe, and as many as 45 % of women have experienced serious abuse by their partners in the course of their lifetime (McVeigh et al., 2005). Over half the female homicides are committed by an intimate partner. Many of these attacks are precipitated in association with the use of alcohol. Harmful drinking is among the foremost underlying causes of violence – especially domestic violence against women, children and older people (Sethi & Butchart, 2008).

## ***Alcohol poisoning in the Region***

Poisoning causes about 117 000 deaths in the Region and the risks for low- and middle-income countries (LMICs) are 17 times higher than high-income countries (HICs). Although figures are not widely available for all countries it is estimated that alcohol is responsible for 60–70% of the deaths from poisoning in some eastern European countries and Baltic states (Sethi et al., 2006b).





## Reducing the availability and misuse of alcohol with evidence based actions

Alcohol is a modifiable risk factor that requires special consideration, given the large burden of injuries attributable to it, particularly in LMIC (*European Alcohol Action Plan 2000–2005*, 2000, Shkolnikov, McKee & Leon, 2001, Watt et al., 2004, World Bank, 2005). Cost-effective strategies at the population level include legislation, taxation, and restricting or banning advertising (Foxcroft et al., 2002, Rehm, Room & Monteiro, 2004, Room, Babor & Rehm, 2005). Brief advice by physicians in primary care setting or emergency departments is cost-effective for individuals at risk (Foxcroft et al., 2002, Rehm, Room & Monteiro, 2004). In addition community-based programmes which employ a range of interventions such as school and public education, media advocacy, heightened enforcement and medical screening and advocacy are also effective.

With specific regard to RTIs, enforcement of laws for a BAC of 0.05 g/dl or below and zero levels for young and novice drivers have been shown to be effective in reducing crash incidence, severity and fatality (Peden et al., 2004, Sethi, Racioppi & Mitis, 2007). Random breath-testing with sobriety check points have also been effective as have programmes employing the use of breath alcohol interlock devices. The provision of alternative transport programmes associated with media campaigns and enforcement is also effective.

This was demonstrated by the anti-alcohol campaign in the Russian Federation. After its introduction in 1985, a decrease of state retail outlet alcohol sales of 63%, although offset by an increase in private production, led to an overall fall in alcohol consumption of 25% over a three-year period. This resulted in a 33% fall in alcohol-associated violent deaths and an increase in male life expectancy of 3 years (McKee, 1999, Nemtsov, 1998).

## Conclusion and way forward

The overall economic loss to society resulting from harmful alcohol consumption, including costs to the health, social welfare and criminal justice systems, lost productivity, and reduced economic development is enormous. The European health and social burdens attributable to alcohol disproportionately affect LMICs and are a major cause of health inequity. In HICs the relative price of alcohol has fallen, the strength of alcoholic beverages has increased, and intensive marketing campaigns have targeted younger people. It has been suggested that international regulation, with measures such as the taxation of alcohol and restricted advertising of alcohol, is needed to protect public health from globalization of the alcohol trade (Room et al., 2008).

This policy briefing has provided a measure of the enormity of the injury burden attributable to alcohol and highlighted that many evidence-based measures exist. A multisectoral response is required to work with stakeholders from the health, justice, transport, leisure, education and retail sectors as well as nongovernmental organizations in order to develop a coordinated response to this important risk factor. The health sector has much to offer, ranging from surveillance of alcohol-related injuries and violence, advocacy and interventions by physicians, such as individual counselling of at-risk patients and those injured. Alcohol-related harm needs to be addressed in national injury and violence prevention plans and policy-makers are called upon to prioritize this area of public health.



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