1

Why is a drinking and driving programme necessary?

Why is a drinking and driving programme necessary?

This module provides the user with background information on the problem of crashes involving drinking and driving worldwide, as well as the rationale for interventions aimed at reducing such crashes. The information and recommendations provided in this module are important tools for persuading political leaders and the public to support a programme that deals with drinking and driving.

The sections in this module are structured as follows:

- **1.1 Crashes involving drinking and driving worldwide:** The module begins by describing the magnitude of the problem, and how alcohol-related crashes are a leading cause of death and disability.
- **1.2 Why drinking and driving is a problem:** This section describes what alcohol is and how it impacts driving performance. It shows the relationship between alcohol consumption and road traffic crashes. This section also discusses how alcohol affects the assessment, management and rehabilitation of those involved in a motor vehicle collision.
- **1.3 Who is most at risk?** Briefly this section discusses some of the major characteristics and risk factors for drinking and driving. It also highlights the extent and patterns of drinking worldwide.
- **1.4 How can crashes involving drinking and driving be reduced?** The module concludes by looking at the leading interventions for addressing drinking and driving. These include legislation, education and advocacy. Each of these interventions will be discussed in detail in the following modules.

As mentioned in the Introduction, this manual is focused on drinking and driving only, although alcohol plays a significant role in pedestrian collisions as well. However, many of the principles and technical guidance that are provided in this manual apply equally well to vehicle drivers, motorcyclists and bicyclists, as well as pedestrians.

1.1 Crashes involving drinking and driving worldwide

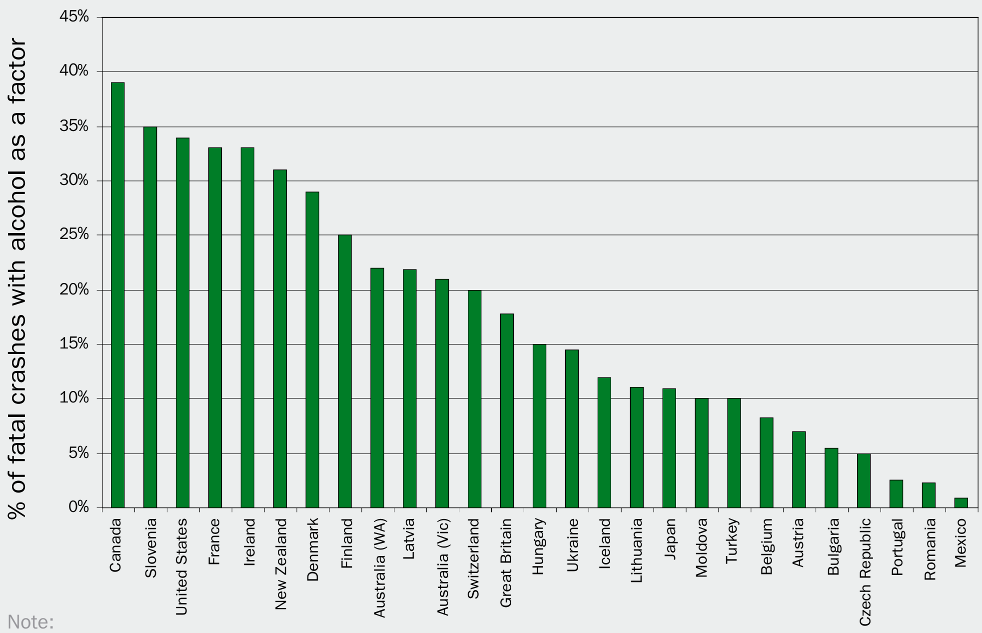
Apart from a few countries where alcohol is prohibited, impairment by alcohol is an important factor influencing both the risk of a road traffic crash as well as the severity and outcome of the injuries that result from it. The frequency of drinking and driving varies between countries, but decades of research have shown that drink-drivers have a significantly higher risk of being involved in a road crash than drivers who have not consumed alcohol.

1.1.1 Variations in crashes involving drinking and driving by country

In most high-income countries about 20% of fatally injured drivers have excess alcohol in their blood *(1)*, i.e. blood alcohol concentration (BAC) in excess of the legal limit. In contrast, studies in low- and middle-income countries have shown that between 33% and 69% of fatally injured drivers and between 8% and 29% of non-fatally injured drivers had consumed alcohol before their crash *(1)*.

Figure 1.1 provides an overview of the role of alcohol in fatal crashes in selected countries.

Figure 1.1 **Drink-drivingas a factor in fatal crashes (2002, 2003 or 2004 data)**



Note:
Austria: the figure (7%) is largely underestimated. This is due to the fact that in Austria it is not allowed to check alcohol on a dead person.
Portugal: data are largely underestimated, since not all drivers are checked.

Source: Unpublished data from: *Working group on achieving ambitious road safety targets: responses to the survey on road safety performance*, Joint OECD/ECMT Transport Research Centre, 2005.

Few countries have sophisticated surveillance systems to monitor the involvement of alcohol in all crashes. In addition, definitions for what constitutes a drink-driving crash might differ between countries, as might the legal BAC limit or requirements for testing crash victims. For these reasons direct comparisons between countries are difficult to make. Bearing in mind some of these complications, studies from a selection of countries indicate that:

- between 26% and 31% of non-fatally injured drivers in South Africa have BAC levels exceeding the country's limit of 0.08 g/100 ml *(2);*
- in Thailand, nearly 44% of traffic injury victims in public hospitals had BAC levels of 0.10g/100ml or more *(3),* while an in-depth study of nearly 1000 motorcycle collisions revealed that alcohol was a factor in 36% of the collisions *(4);*
- in Bangalore, India, 28% of crashes involving males over 15 years were attributable to alcohol *(5);*
- in Colombia, 34% of driver fatalities and 23% of motorcycle fatalities are associated with speed and/or alcohol *(6);*
- in Sunsai and Dharari, Nepal, 17% of 870 road traffic collisions were attributed to alcohol consumption. Of those drinking and driving, 50% were cyclists, 28% were motorcyclists, 17% bullock cart drivers and 5% truck drivers *(7).*
- in the United States of America half a million people are injured and 17 000 killed every year in traffic crashes involving drinking and driving. Almost 40% of all youth road traffic fatalities are directly related to alcohol consumption *(8).*
- in Sweden, the Netherlands and the United Kingdom, the proportion of fatally injured drivers with excess alcohol is around 20%, although the legal limits in these countries differ considerably, being 0.02 g/100 ml, 0.05 g/100 ml and 0.08 g/100 ml, respectively *(9).*

BOX 1.1: **Alcohol-related road traffic deaths in South Africa**

According to the South African national injury mortality surveillance system, there were 25 361 fatal injuries registered at 32 of the state mortuaries in 2001. This represents approximately 35% of all non-natural mortality in South Africa in that year. Transport-related deaths accounted for 27% of all the fatal injuries.

Pedestrians were the group of road users most frequently killed (37.3%), followed by passengers of vehicles (17.4%), drivers (14.0%) and cyclists (3.1%).

Alcohol is a major risk factor for all types of fatal road traffic injury in South Africa. Tests for BAC level were conducted on 2372 (or 34.6%) of the 6859 transport-related deaths. More than half (51.9%) of all transport-related deaths had elevated levels of BAC, and of these positive cases, 91% recorded BAC levels of 0.05 g/100 ml or higher.

Pedestrians, followed by drivers, were most likely to be BAC-positive (see table below).

Blood alcohol concentration (in g/100 ml)

	Zero %	0.01–0.04 %	0.05–0.14 %	0.15–0.24 %	≥ 0.25 %
Pedestrians	37.5	5.4	12.0	20.5	24.7
Passengers	62.6	4.7	14.0	13.7	5.0
Drivers	48.2	5.3	18.2	18.8	9.5
Cyclists	61.3	3.2	15.1	14.0	6.5

Pedestrian fatalities also had the highest mean BAC levels (0.20 g/100 ml). Over 50% of drivers killed had elevated BAC levels and the mean level for drivers – 0.17 g/100 ml – was more than three times South Africa's current legal limit for driving (0.05 g/100 ml).

Source: *(1)*

1.1.2 The economic impact of crashes involving drinking and driving

Very little data is available on the costs of crashes involving drinking and driving. WHO has figures on the cost of chronic alcohol use for many countries *(10),* but the costs of road trauma are not presented separately. In the United States, the total economic cost of motor vehicle crashes in 2000 was estimated at US$ 230.6 billion, with drink-driving crashes accounting for US$ 51.1 billion or 22% of all economic costs *(8)*. However, the United States and developing countries are not directly comparable because of variables including transport infrastructure, differences in safety standards, motorization growth rate and the economic demography of countries.

Applying recent data on the incidence of drink-driving crashes in developing countries to estimates of the total cost of road crashes in those countries (as outlined in *the World report on road traffic injury prevention*) can establish robust estimates *(1)*. For example, in South Africa it has been estimated that alcohol is a factor in 31% of non-fatal crashes. Applying this figure to the estimated hospital costs attributed to road crashes for South Africa in the WHO report of US$ 46.4 million would give a total cost to the health system of around US$ 14 million for crashes involving drinking and driving.

In Thailand, the total cost of road crashes has been estimated at $US 3 billion *(11)*. Recent estimates of alcohol involvement in that country indicate at least 30% of crashes are linked to alcohol, which means alcohol is a factor in costs to Thailand of about $US 1 billion.

1.2 Why is drinking and driving a problem?

Alcohol has many functions in society and bears important cultural, religious and symbolic meanings in most countries. But it is also a drug with many toxic effects and other dangers such as intoxication and dependence.

1.2.1 The effects of alcohol on driving

NOTE

What is alcohol?

The term "alcohol" in its purest sense denotes "ethyl alcohol or ethanol", a liquid which is obtained from the action of yeast on sugar, but in colloquial terms it usually refers to "a drink such as beer, wine and whiskey that can make people drunk".

Source: *Collins English Dictionary*

The immediate effects of alcohol on the brain are either depressing or stimulating in nature, depending on the quantity consumed (see Table 1.1). Either way, alcohol results in impairment which increases the likelihood of a crash since it produces poor judgement, increased reaction time, lower vigilance and decreased visual acuity. Physiologically, alcohol also lowers blood pressure and depresses consciousness and respiration. Alcohol also has analgesic and general anaesthetic properties.

Alcohol can impair judgement and increase crash risk even at relatively low BAC levels. However, the effects become progressively worse as the BAC increases. Not only do judgement and reaction time suffer, but vision also deteriorates. Apart from its direct impact on crash outcomes, alcohol is believed to affect other aspects of driver safety such as seat-belt wearing, helmet use, and speed choice. Although detailed consideration of drugs other than alcohol has been deliberately omitted from this manual, the consumption of alcohol, due partly to its tendency to reduce inhibition, is often associated with the use of other drugs which can impact upon driving performance *(12)*.

1.2.2 The effects of alcohol on risk of a crash

Alcohol impairment has a significant effect on the crash risk of drivers, riders and pedestrians; it is routinely reported as one of the most serious contributing factors to road crashes in motorized countries.

Drivers who have been drinking have a much higher risk of involvement in crashes than those with no alcohol in their blood, and this risk grows rapidly with increasing blood alcohol concentration (see Box 1.1). For motorcyclists, having a BAC over 0.05 g/100 ml has been estimated to increase crash risk by up to 40 times compared to having a zero BAC *(14)*.

Table 1.1 **Effects of BAC on the body and performance**

BAC (g/100ml)	Effects on the body
0.01–0.05	Increase in heart and respiration rates
	Decrease in various brain centre functions
	Inconsistent effects on behavioural task performances
	Decrease in judgment and inhibitions
	Mild sense of elation, relaxation and pleasure
0.06–0.10	Physiological sedation of nearly all systems
	Decreased attention and alertness, slowed reactions, impaired coordination, and reduced muscle strength
	Reduced ability to make rational decisions or exercise good judgment
	Increase in anxiety and depression
	Decrease in patience
0.10–0.15	Dramatic slowing of reactions
	Impairment of balance and movement
	Impairment of some visual functions
	Slurred speech
	Vomiting, especially if this BAC is reached rapidly
0.16–0.29	Severe sensory impairment, including reduced awareness of external stimulation
	Severe motor impairment, e.g. frequently staggering or falling
0.30–0.39	Non-responsive stupor
	Loss of consciousness
	Anaesthesia comparable to that for surgery
	Death (for many)
0.40 & greater	Unconsciousness
	Cessation of breathing
	Death, usually due to respiratory failure

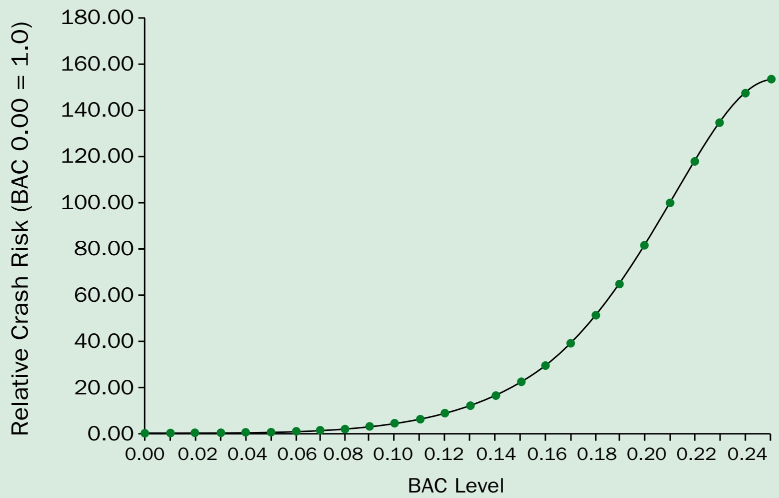
Source: *(13)*

BOX 1.2: **Risk of drink-driver involvement in police-reported crashes**

In 1964 a case-control study was carried out in Michigan in the United States known as the Grand Rapids study *(15)*. It showed that drivers who had consumed alcohol had a much higher risk of involvement in crashes than those with a zero BAC, and that this risk increased rapidly with increasing blood alcohol levels. These results were corroborated and improved upon by studies in the 1980s, 1990s and in 2002 *(16–18)*. These studies provided the basis for setting legal blood alcohol limits and breath content limits in many countries around the world.

The studies found that the relative risk of crash involvement starts to increase significantly at a blood alcohol concentration level of 0.04 g/dl and that at 0.10 g/100 ml the crash risk relative to a zero BAC is approximately 5, while at a BAC of 0.24 g/100 ml the crash risk is more than 140 times the risk relative to a zero BAC (see Figure 1.2).

Figure 1.2: Estimated relative fatality risk for drinking drivers by age and sex in single-vehicle crashes



Source: *(18)*

1.2.3 The effects of alcohol in the post-crash phase

It is clear from the previous section that alcohol compromises driving performance and thus increases the risk of a road traffic collision. But alcohol also has significant effects in the post-crash phase which should be borne in mind. These are summarised in Box 1.3.

BOX 1.3: Why should alcohol levels be determined in road traffic victims?

- Alcohol intoxication complicates the assessment and management of patients.
  - The effects of alcohol can mimic the symptoms of a head injury.
  - Alcohol intoxication predisposes the patient to more severe injuries.
  - Intoxicated patients may not report pain or tenderness.
  - Alcohol may interact with medications, particularly those used for pain relief and sedation.
  - Alcohol intoxication can complicate surgery and can influence the anaesthetist's choice of anaesthetic drug.
- Alcohol exacerbates underlying chronic diseases.
  - Patients with alcohol problems may have underlying medical and/or psychiatric conditions which can complicate their management.
  - Alcoholism intoxication may exacerbate pre-existing conditions such as cardiac disease, impaired blood clotting and infectious diseases.
- Alcohol increases recidivism.
  - Patients who are alcohol positive at the time of their injury are greatly at risk for subsequent re-injury.
  - Among drink-driving offenders, many repeatedly re-offend.
- Alcohol complicates outcome.
  - Intoxicated patients have an increased likelihood of sustaining some type of complication during their recovery phase – most notably an infection such as pneumonia.

1.2.4 How is alcohol measured?

Blood alcohol concentration is central to establishing a link between alcohol and road traffic crashes. Investigations into the role of alcohol in road crashes require that those where alcohol played a causal role be differentiated from those where it didn't. Although it is often difficult to attribute a crash to a particular cause or causes, decisions as to whether or not a crash was alcohol-related are often based on how much, if any, alcohol was present in the bloodstream of the road users involved.

The amount of alcohol that is contained within the bloodstream can be measured by testing a small sample of blood or urine, or through analysis of exhaled breath. The amount of alcohol within the bloodstream is described in terms of BAC. BAC is usually measured as:
- *grams* of alcohol per 100 millilitres of blood (g/100 ml)
- *milligrams* of alcohol per 100 millilitres of blood (mg/100 ml)
- *grams* of alcohol per decilitre (g/dl)
- *milligrams* of alcohol per decilitre (mg/dl)
- or other appropriate measure.

Legal BAC levels for driving vary from country to country, or state to state, throughout the world – ranging from 0.02 g/100 ml to 0.10 g/100 ml (see Table 1.2).

For the remainder of this manual, BAC is described in terms of *grams* of alcohol per 100 millilitres of blood.

Table 1.2 Blood alcohol concentration (BAC) limits for drivers by country or area

Country or area	BAC (g/100 ml)	Country or area	BAC (g/100 ml)
Australia	0.05	Luxembourg	0.05
Austria	0.05	Netherlands	0.05
Belgium	0.05	New Zealand	0.08
Benin	0.08	Norway	0.05
Botswana	0.08	Portugal	0.05
Brazil	0.08	Russian Federation	0.02
Canada	0.08	South Africa	0.05
Côte d'Ivoire	0.08	Spain	0.05
Czech Republic	0.05	Swaziland	0.08
Denmark	0.05	Sweden	0.02
Estonia	0.02	Switzerland	0.08
Finland	0.05	Uganda	0.15
France	0.05	United Kingdom	0.08
Germany	0.05	United Republic of Tanzania	0.08
Greece	0.05	United States of America*	0.10 or 0.08
Hungary	0.05	Zambia	0.08
Ireland	0.08	Zimbabwe	0.08
Italy	0.05		
Japan	0.00		
Lesotho	0.08		

* Depends on state legislation

Source: *(1)*

Breath alcohol concentration (BrAC), in contrast, is expressed as the weight of alcohol, measured in grams, in 210 litres of breath, or, measured in milligrams, in 210 millilitres of breath. There are known relationships between BrAC and BAC, which are used to relate breath alcohol tests to BAC and hence impairment levels.

Alcohol content in blood can be directly measured by a hospital laboratory. More commonly in law enforcement investigations, BAC is estimated from breath alcohol concentration (BrAC) measured with a machine commonly referred to as a breathalyser (note that different machines may have different conversion factors applied to relate BrAC to BAC).

There is accurate correspondence between blood alcohol and breath alcohol levels *(20)*. Because of the ease of administration, breath alcohol is more commonly measured in the road safety context.

Alcohol intoxication may also be assessed by trained medical staff in emergency units using clinical signs and symptoms.

NOTE

Evidence of alcohol involvement determined by level of intoxication

The International Classification of Disease (version 10) classifies the levels of alcohol intoxication as:

- **mild alcohol intoxication** – smell of alcohol on breath, slight behavioural disturbance in functions and responses, or slight difficulty in coordination.
- **moderate alcohol intoxication** – smell of alcohol on breath, moderate behavioral disturbance in functions and responses, or moderate difficulty in coordination.
- **severe alcohol intoxication** – severe disturbance in functions and responses, severe difficulty in coordination, or impaired ability to cooperate.
- **very severe alcohol intoxication** – very severe disturbance in functions and responses, very severe difficulty in coordination, or loss of ability to cooperate.

Source: *(21)*

1.3 Who is most at risk of a crash involving drinking and driving?

Road users, who are either repeat "offenders" or first time "offenders" with a very high BAC, constitute the highest risk groups for drinking and driving. Research on high risk road user groups has typically classified them in terms of their demographic characteristics or attitudinal variables.

1.3.1 Demographic characteristics of drink-drivers

In terms of demographic characteristics, a consistent picture of drink-drivers emerges across a number of studies *(22)*. These drivers are characterised as being:

- male
- aged 18–24 years old
- from a low socio-economic grouping
- single or divorced
- in a blue collar occupation
- of low education and limited literacy
- of low self-esteem.

In comparison, motorcyclists with BAC levels above the legal limit of 0.05 g/100 ml in the state of Victoria in Australia, compared with those below the alcohol limit *(21)* were found to be:

- male
- 26–40 years old
- 10–20 years licence experience
- riding without a helmet
- unlicensed

In the same study, the Australians found that intoxicated pedestrians were more likely to be male and between 31 and 59 years of age *(23)*. No other characteristics appear to differentiate well between intoxicated and non-intoxicated crash-involved pedestrians.

NOTE

Who is most at risk of a drink-drive crash?

Drivers and motorcyclists with any level of blood alcohol content (BAC) greater than zero are at higher risk of a crash than those whose BAC level is zero.

For the general driving population, as the BAC level increases from zero the risk of being involved in a crash starts to rise significantly at a BAC level of 0.04 g/100 ml.

Inexperienced young adults driving with a BAC level of 0.05 g/100 ml have a 2.5 times higher risk of a crash compared with more experienced drivers.

Young adults in the 20–29 years age group were estimated to have three times the risk compared with drivers aged 30 years and above, at all BAC levels.

Teenage drivers had more than five times the risk of a fatal crash compared with drivers aged 30 and above, at all levels of blood-alcohol content.

Teenage drivers with a BAC of 0.03 g/100 ml **carrying two or more passengers** were 34 times more at risk of a crash compared with drivers aged 30 years or more, with no alcohol, driving with one passenger.

Alcohol consumption by drivers puts **pedestrians and riders** of motorized two-wheelers at risk.

Source: adapted from *(1)*

1.3.2 Attitudinal characteristics of drink-drivers

Australian research has found that the population can be divided into four groups based largely on three key factors:

- their fear of being detected driving while impaired by alcohol;
- their fear of crashing;
- their acceptance of the 0.05 g/100ml BAC limit *(24)*.

The four groups were characterised as:

- **"believers"**, who had high fear of being caught or crashing, and who had the highest level of acceptance of a 0.05 BAC and associated countermeasures. They drank least on their last "drinking occasion";
- **"pressured"**, who also had high fear, but had lower acceptance of the 0.05 BAC limit and enforcement. They experienced social pressure to keep up with the group while drinking.
- **"deterred"**, who had lower levels of fear, but accepted the need for the 0.05 BAC limit and countermeasures;
- **"opposers"** who had low levels of fear of detection and of crashing, and low levels of acceptance of the 0.05 BAC and countermeasures. They drank most on the last "drinking occasion", and reported driving while impaired by alcohol more frequently than other groups.

The study concluded that "opposers" may well be the group with the highest risk of being involved in a drink-driving crash and are also likely to be those whose behaviour is most difficult to change.

1.3.3 Patterns of alcohol use worldwide

Patterns of alcohol use and the incidence of drink-driving vary considerably worldwide. In many countries where alcohol is consumed, those who drink also drive. Understanding drinking patterns and preventing hazardous and harmful alcohol consumption is a key component in reducing alcohol-related harm overall, including harm resulting from road crashes. Factors influencing the level of alcohol consumption in a country include environmental, socio-economic, religious, personal and behavioral issues.

The WHO *Global status report on alcohol 2004* examined the rates of abstainers, heavy drinkers and binge drinkers across countries and found considerable variations *(10)*. For example, the proportion of abstainers among the total adult population reported across countries ranged from a low of 2.5% in Luxembourg to a high of 99.5% in Egypt. Heavy drinkers (those who exceed a certain daily volume or quantity per occasion, or who drink every day) ranged from a low of 1.4% in India to a high of 31.8% in Colombia.

Apart from overall levels of consumption, drinking patterns are also relevant to the incidence of drinking and driving. Figure 1.3 shows the difference in drinking patterns in the world, ranging from 1 (least risky) to 4 (most risky). A large portion of risky drinking patterns appear to occur in many low or middle-income countries.

Figure 1.3 Drinking patterns worldwide

Patterns of drinking
- 1.00–2.00
- 2.00–2.50
- 2.50–3.00
- 3.00–4.00

Source: *(25)*

BOX 1.4: **Drinking and driving in Spain**

In a study conducted in Spain the authors analysed drinking patterns among Spanish drivers. Based on self report, over 60% of drivers indicated that they were regular drinkers, and more than 25% drank at a dangerously high level. Respondents who drove regularly were more likely to drink and had a higher alcohol intake. Most drinkers reported driving after drinking and 145 acknowledged having driven "in a drunken state" during the previous year. Those who drank were more likely to have been involved in crashes.

Source: *(26)*

1.3.4 Characteristics of crash victims

Crashes involving drinking and driving often exhibit a number of characteristics.

Single vehicle crashes and high speed – drink-driving crashes often involve high speed and a single vehicle running-off the road. Many of these crashes also result in the vehicle hitting a fixed roadside object. In urban areas these can be signs or electricity poles, while in rural areas it is usually trees, culverts, bridge ends and fence posts.

Night and/or weekend crashes – drink-driving crashes occur more often at night (when more alcohol is consumed) and generally on weekends or periods of high leisure activity.

Increased severity of injury – this is partly because once a crash and the injury-causing impact has occurred, the existence of alcohol in the body of the crash victims works to limit the extent and level of recovery from injury.

NOTE

Alcohol and injury severity in Bangalore, India

The National Institute of Mental Health and Neurosciences, Bangalore [NIMHANS] estimated that 21% of people who sustained brain injuries during a crash were under the influence of alcohol (physician confirmed diagnosis) at the time and 90% had consumed alcohol within three hours prior to the crash. Patients with injuries subsequent to alcohol intoxication sustained a more injuries that were more severe than the non-intoxicated group. Compared to the non-intoxicated group, more of the intoxicated group required surgical interventions (8% and 5% respectively), more died (6.5% and 4% respectively) and more sustained neurological disabilities at discharge from hospital (13% and 9%).

Source: *(27)*

Although much of the research on alcohol-related crashes has focused on car crashes, many of the characteristics of alcohol-related motorcycle crashes are the same. A recent study in Thailand *(4)* indicated that compared to non-drinking riders, drinking riders tended to crash at night, to have more non-intersection crashes and more crashes on curves, were more likely to lose control, run off the road, violate a red signal, be inattentive, and for rider error to be a contributing cause of the crash. Drinking riders were five times more likely to be killed as non-drinking riders.

Compared to collisions involving non-impaired pedestrians, those involving alcohol-impaired pedestrians have been shown to be more likely to occur:

- during hours of darkness
- in business or commercial areas
- on roads of greater than 50 km/h speed limit
- at mid-block locations
- as a result of the pedestrian disobeying traffic laws *(28)*.

1.4 How can crashes involving drinking and driving be reduced?

Over the past few decades many industrialised countries have been successful in reducing the number of crashes caused by drink-drivers (see Box 1.5). Information about these experiences can be used to guide programmes in low and middle-income countries where alcohol is often an important risk factor for road traffic crashes. However, it must be recognised that low and middle-income countries today face additional problems on their roads, meaning that these lessons cannot be simply transferred between countries, but will need to be adapted to suit different contexts.

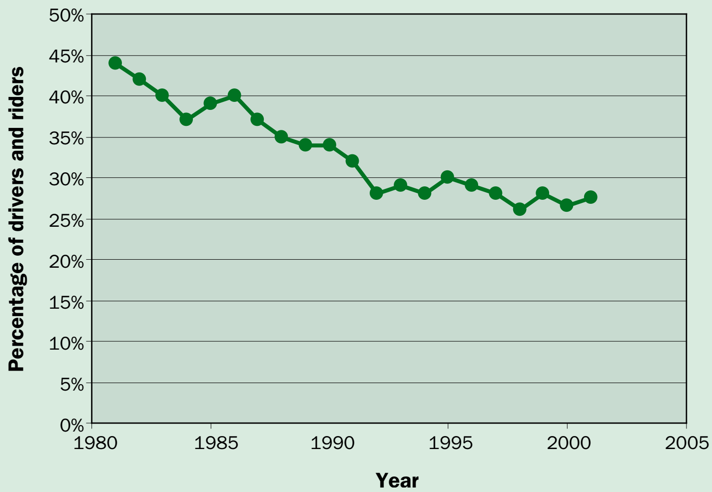
BOX 1.5: **Australia reduces drink-driving**

Australia embarked on a sustained programme to tackle crashes involving drinking and driving from the mid-1970s onwards. Substantial research information on the impairment effects of alcohol was collected, and this led to support for legislation setting out a maximum BAC level for drivers. In Australia the individual states, operating under the federal system of government, are responsible for most road safety issues. Consequently, the legal level adopted was not uniform across all states. Some adopted 0.05 BAC and others adopted 0.08 BAC.

Following the adoption of legal limits, large-scale police enforcement of these limits was undertaken in the 1980s. This was supported by a range of other interventions, including publicity, community announcements, community activity programmes, variations in alcohol licensing and distribution arrangements for alcohol. There was also ongoing monitoring of performance involving blood tests on drivers involved in crashes.

Over this 30-year period, alcohol as a factor in crashes has been almost halved in Australia (see Figure 1.4), and community attitudes to drink-driving have changed substantially so that currently there is a strong community view that such behaviour is socially irresponsible.

Figure 1.4 Percentage of fatally injured drivers and motorcycle riders with a BAC of 0.05 gm/100 ml or greater, Australia 1981–2001



Road crashes involving drinking and driving are a feature of the road-injury profile in many countries, and alcohol consumption appears to be an element of road user behaviour that is very difficult to address. Apart from the adverse influence of alcohol as a contributor to road crashes, the presence of alcohol in the body of a road crash victim adversely affects the diagnosis, management, and treatment of injuries. Countries looking to tackle this problem should consider the experiences of other countries where crashes involving drinking and driving have been reduced substantially. Their success generally rests on six pillars:

- strong political commitment to prevent drink-driving (see Box 1.5);
- legislation that clearly defines illegal (for driving) levels of BAC and penalties for drinking and driving offences;
- implementing "good practice";
- strong and well-publicised enforcement campaigns;
- public education to change attitudes to drinking and driving;
- strict and swiftly enforced penalties for those caught breaking the law.

The public must know why drinking and driving is both unsafe and anti-social, be aware that there are laws in place, perceive a high risk of being caught if they break the law, and know that if they are caught, there will be a heavy price to pay.

BOX 1.6: **Political commitment in France reduces the number of crashes**

In 2002, French President Jacques Chirac declared publicly that road safety would be one of the three major priorities of his presidential mandate. This political leadership is essential if difficulties with new, harsher, legislation are to be overcome. Penalties for driving under the influence of alcohol were increased and new laws were introduced.

France's road safety performance over the period 2002–2004 is spectacular – road deaths decreased by 32%. This is attributed to a combination of measures, but focusing particularly on speeding and alcohol-impaired driving *(27)*. With respect to alcohol-related crashes, measures included reducing the permitted BAC level from 0.08 (set in 1978) to 0.05, and 0.02 for bus drivers. Enforcement was increased – for example breath tests were increased by 15%. Stricter sanctions were introduced, increasing penalty points from 3 to 6 for a BAC between 0.05 and 0.08 (12 points lead to disqualification). As a result, alcohol-impaired driving decreased dramatically – almost 40% fewer incidents in 2004 compared with 2003. One researcher attributes 38% of the lives saved between 2003 and 2004 to improved behavior in terms of alcohol-impaired driving (*29*).

Even where the problem of crashes involving drinking and driving is considered to be relatively minor, for example, where motorization levels are low, countries should be proactive in monitoring the situation so that it can be managed and prevented from escalating.

Summary

- Drink-driving is a major road safety problem in many countries, although the extent of the problem is often unclear – especially in low and middle-income countries.
- Even in quite modest amounts, alcohol impairs the functioning of several processes required for safe road use, including vision and motor skills.
- Alcohol impairment increases the chance that all road user groups, including drivers, riders and pedestrians, will be involved in a crash.
- Research indicates that crashes involving drinking and driving have a number of characteristics, but these may differ considerably between regions.
- Experiences of both Australia and France show that concerted effort to implement effective interventions can have substantial effects on the level of injuries sustained in drink-drive crashes.
- A number of countermeasures to reduce drinking and driving have been systematically evaluated and shown to have a positive effect on reducing the occurrence of drink-driving.

NOTE

What works to reduce drink-driving?

The following practices have been found to act as deterrents for drink-driving.

- Setting BAC limits.
- Enforcement of BAC levels:
  - random and selective breath testing
  - severity of punishment
  - swiftness of punishment.
- Treatment of repeat offenders.
- Restrictions on young or inexperienced drivers:
  - lower BAC limits for younger drivers
  - licensing restrictions, e.g. graduated driver licensing.
- Designated driver and ride service programmes.
- Alcohol ignition interlocks.

Source: *(30)*

References

1. Peden M et al., eds. *World report on road traffic injury prevention.* Geneva, World Health Organization, 2004.
2. Peden M. *The sentinel surveillance of substance abuse and trauma, 1999–2000: final report.* Tygerberg, South Africa, Medical Research Council, 2001 (www.sahealthinfo.org/violence/sentinel.pdf, accessed 16 January 2006).
3. Lapham SC et al. Use of audit for alcohol screening among emergency room patients in Thailand. *Substance Use and Misuse,* 1999, 34:1881–1895.
4. Kasantikul V, Ouellet J, Smith T. The role of alcohol in Thailand motorcycle crashes. *Accident Analysis and Prevention,* 2005, 37:357–366.
5. Gururaj G, and V Benegal. Driving under the influence of alcohol and road traffic injuries in Bangalore (unpublished report) quoted in Cherpitel CJ et al. Multi-level analysis of alcohol-related injury among emergency department patients: a cross-national study, *Addiction*. 2005 Dec;100(12):1840-50..
6. Posada J, Ben-Michael E, Herman A. Death and injury from motor vehicle crashes in Colombia. *Pan American Journal of Public Health,* 2000, 7:88–91.
7. Jha N. Road traffic accident cases at BPKHS, Dharan, Nepal: one year in retrospect. *Journal of Nepal Medical Association,* 1997, 35:241–244.
8. *Traffic safety facts 2000: alcohol.* Washington DC, National Highway Traffic Safety Administration (Report DOT HS 809 3232001).
9. Koornstra M et al. *Sunflower: a comparative study of the development of road safety in Sweden, the United Kingdom and the Netherlands.* Leidschendam, Institute for Road Safety Research, 2002.
10. *Global status report on alcohol 2004.* Geneva, World Health Organization, 2004.
11. *The Cost of Road Traffic Accidents in Thailand.* Accident Costing Report AC9. Asian Development Bank, 2005.
12. Marr JN. *The interrelationship between the use of alcohol and other drugs: overview for drug court practitioners.* Washington DC, Office of Justice Programs, American University, 1999 (www.ncjrs.gov/pdffiles1/bja/178940.pdf, accessed 9 January 2006).
13. Lang A. Alcohol: teenage drinking. In: Synder S, series ed. *Encyclopedia of psychoactive drugs,* 2nd ed. Volume 3:. New York, NY, Chelsea House, 1992.
14. Haworth N, Smith R, Brumen I. *Case–control study of motorcycle crashes.* Canberra, ACT, Australian Transport Safety Bureau, 2002 (Report CR174).
15. Borkenstein RF et al. *The role of the drinking driver in traffic accidents.* Bloomington, IN, Department of Police Administration, Indiana University, 1964.
16. McLean AJ, Holubowycz OT. Alcohol and the risk of accident involvement. In: Goldberg L, ed. *Alcohol, drugs and traffic safety. Proceedings of the 8th International Conference on Alcohol, Drugs and Traffic Safety, Stockholm, 15–19 June 1980.* Stockholm, Almqvist & Wiksell International, 1981:113–123.
17. Hurst PM, Harte D, Frith WJ. The Grand Rapids dip revisited. *Accident Analysis and Prevention,* 1994, 26:647–654.
18. Crompton RP et al. Crash risk of alcohol-impaired driving. In: Mayhew DR, Dussault C, eds. *Proceedings of the 16th International Conference on Alcohol, Drugs and Traffic Safety, Montreal, 4–9 August 2002.* Montreal, Société de l'assurance automobile du Québec, 2002:39–44.
19. ICAP 2002, *Blood alcohol concentration limits worldwide,* ICAP report 11, International Centre for Alcohol Policies, Washington D.C.

20. Gibbs KA et al. Accuracy and usefulness of a breath-alcohol analyzer. Ann Emerg Med 13, 516, 1984.
21. *International Statistical Classification of Diseases and Related Health Problems,* tenth revision. Geneva, World Health Organization, 2006 (www.who.int/classifications/apps/icd/icd10online, accessed 11 December 2006).
22. Ferguson M, Sheehan M, Davey J. *Drink driving rehabilitation, the present context.* Canberra, ACT, Australian Transport Safety Bureau, 1999 (Report CR184).
23. Cameron M. *Accident data analysis to develop target groups for countermeasures. Volume 2: Analysis reports*. Clayton, VIC, Monash University Accident Research Centre, 1992 (Report No.47).
24. Span D. Research and knowledge, attitudes and reported behavior on drink-driving in New South Wales. In: *Proceedings of the International Conference on Alcohol, Drugs and Traffic Safety, Adelaide, SA. Adelaide, SA,* Road Accident Research Unit, University of Adelaide, 1995:153–158.
25. *Alcohol policy in the WHO European Region: Current status and the way forward.* Fact sheet EURO/10/05, World Health Organization Europe, Bucharest, 2005.
26. Alvarez FJ, Del Rio MC, Prada M. Drinking and driving in Spain. *Journal of Studies on Alcohol,* 1995, 56:403–407.
27. Benegal et al. *Alcohol and injury in emergency departments : summary of the report from the WHO collaborative study on alcohol and injuries* (in press). by the WHO Collaborative Study Group on Alcohol and Injuries.
28. Wilson RJ, Fang MR. Alcohol and drug impaired pedestrians killed or injured in motor vehicle collisions. In: Proceedings of the International Conference on Alcohol, Drugs and Traffic Safety, Stockholm, Sweden, 2000, The International Council on Alcohol, Drugs & Traffic Safety (ICADTS) (www.icadts.org/proceedings/2000/icadts2000-086.pdf , accessed 16 January 2006).
29. Gerondeau C. *Road safety in France: reflections on three decades of road safety policy.* London, FIA Foundation for the Automobile and Society, 2005.
30. Barbar T, Caetano R, Casswell S. *Alcohol: no ordinary commodity. Research and public policy.* Oxford, Oxford University Press, 2003.