



SECTION 2

LEGISLATION AND ROAD USER BEHAVIOUR

Many countries need to strengthen road safety legislation

In the last three years
17 countries
representing
409 million people
have amended their laws on one or more key risk factors for road traffic injuries to bring them into line with best practice.

Road safety laws improve road user behaviour – a critical factor in road safety – to reduce road traffic crashes, injuries and deaths. A number of countries have achieved sustained reductions in traffic-related injuries and fatalities through effective road safety programmes that have included legislative change (2,9). The most positive changes to road user behaviour happen when road safety legislation is supported by strong and sustained enforcement, and where the public is made aware of the reasons behind the new law and the consequences of noncompliance.

This section reports on an assessment of countries' current legislation to meet five key behavioural risk factors for road traffic injuries: speed, drink-driving, failure to use motorcycle helmets, seat-belts and child restraints¹. There is a strong evidence base showing the positive impacts that legislation on each of these risk factors can have on reducing crashes, injuries and deaths (2).

Best practice in drafting and implementing good road safety laws can be used by countries embarking on road safety legislative reform, though it should be recognized that road safety legislation is a dynamic field and that best practice evolves over time. This means that even high-performing countries constantly need to review their legislation, revising and updating it to meet the latest evidence base (this report explores two strong examples of this – drug-driving and mobile phone use while driving – where strong evidence bases have yet to be developed). Additionally, while the

evidence base may act as a “blueprint” for laws relating to many risk factors for road traffic injuries,² countries must take account of their local legislative context, the traffic situation, and a number of other country-specific factors that may all impact road safety legislation and the manner and speed at which legislative reform should be pursued (9).

This report highlights the progress that has been made in road safety legislation. It shows that between 2011 and 2014 there were 17 countries that made legislative revisions to laws relating to one or more of the five key behavioural risk factors. This represents 409 million people or 5.7% of the world's population. Figure 8 shows the number of countries that have made changes to their laws, by risk factor, and the population represented by these changes.

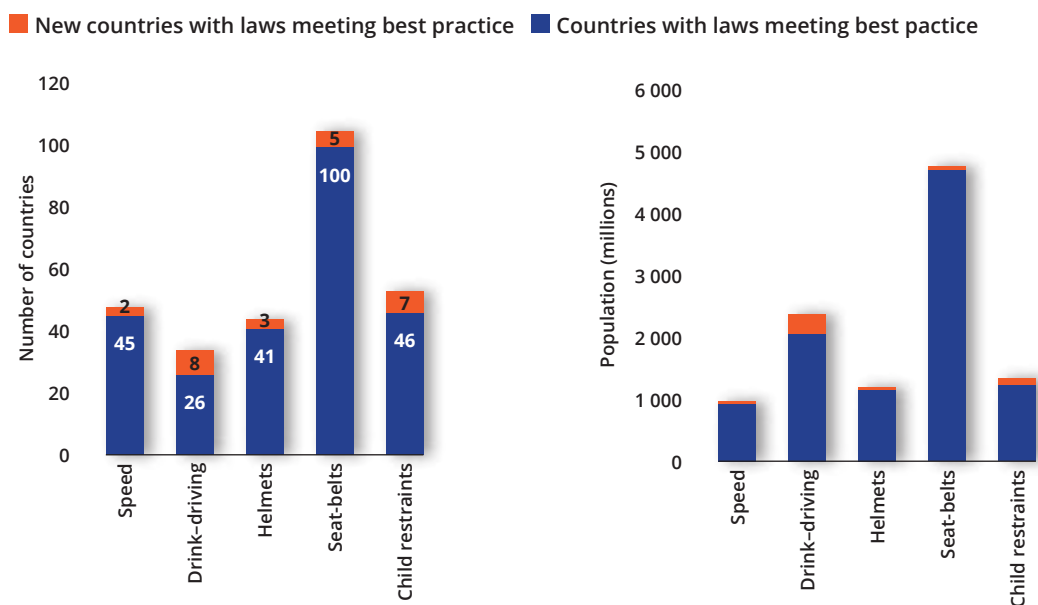
Enforcement is vital to the success of road safety laws

While there is clear evidence that enforcement is critical to the success of laws, the levels of enforcement required for maximum impact are often less readily available and depend on factors such as political will, available resources and competing priorities at a national level. In countries where legislation has not previously been accompanied by enforcement, particularly visible and high levels of enforcement may be needed to persuade the public that breaking the law in future may well result in a penalty. Furthermore, while some countries have dedicated traffic

¹ Legislation is also reported on an additional 2 risk factors (drug-driving and the use of mobile phones) but for which evidence on best practice is still being developed.

² See relevant sections on the five key behavioural risk factors.

FIGURE 8
Changes in legislation on behavioural risk factors 2011–2014 (number of countries and population represented)



police, in many countries the cadre of police officers who are in charge of enforcing road safety laws have many other responsibilities, and their focus on traffic law enforcement can quickly slip down the priority list when faced with other pressing concerns, such as national security.

Poor enforcement of traffic laws and regulations can also result from inadequate resources, administrative problems and corruption, all of which can restrict good laws in achieving their potential (17,18).

In such situations, advocacy efforts are critical to keep road safety high on the government and public agenda. Public awareness campaigns can be an effective way to do this, increasing understanding and support for enforcement measures and helping sustain a high perception of enforcement, which can itself work as an effective incentive for compliance (9,19).



Reducing speed

Speed is a critical risk factor for road traffic injuries

As average traffic speed increases, so too does the likelihood of a crash (20). If a crash does happen, the risk of death and serious injury is greater at higher speeds (21), especially for pedestrians, cyclists and motorcyclists (22). Male and young drivers are more likely to speed, while other factors likely to influence speed include alcohol, road layout, traffic density and weather conditions.

Ease of mobility must not be at the expense of safety

Easy, quick and relatively low-cost travel is important for people's work and personal lives, and at a national level it is important for economic growth. Safety must lie at the heart of speed management (bringing road users to a safe speed using an integrated set of measures), yet governments and those involved in speed management at local level face challenges when balancing mobility and safety. However, shifting the emphasis towards safety is at the heart of the "Safe System" approach (see Box 5) – a system that underpins successful speed management in high-performing road safety countries such as Sweden.

Within this framework, the speed limit on a section of road takes account of safety, mobility and environmental considerations, as well as the impact of the speed on the quality of life for people living along the road. Where motorized traffic mixes with pedestrians, cyclists, and moped riders, the speed limit must be under 30 km/h. This is due to the vulnerability of these road users at increasing speed: an adult pedestrian has less than a 20% chance of dying if struck by a car at less than 50 km/h but almost a 60% risk of dying if hit at 80 km/h (22). The type of crash that is likely in a particular situation is also an indicator for determining a safe speed. For example, on roads where front impacts with other road users are possible (such as on non-divided rural roads) a "safe speed" will be lower than on motorways, where head on collisions crashes are unlikely.

National speed limits are crucial for effective speed management

Setting and enforcing national speed limits is an important step in reducing speed. Most countries set a limited number of general national speed limits, for example for motorways, urban, and rural roads, with some providing further divisions (for

An adult pedestrian has less than a 20% chance of dying if struck by a car at less than 50 km/h but almost a 60% risk of dying if hit at 80 km/h.

BOX 5

The Safe System approach: accommodating human error

The Safe System approach to road safety ensures that, in a crash, impact energy remains below the threshold likely to result in death or serious injury. It goes beyond establishing speed limits to managing interactions between the environment, infrastructure and physical vulnerability. Within this approach, speed limits are a complementary intervention to creating safer roads, roadsides and vehicles that together work to accommodate driver error. All parts of the system need to be strengthened – roads, roadsides, speed restrictions and vehicles – so that if one part of the system fails, other parts will still protect people involved (24,25,26).

47 countries, representing approximately 950 million people, have urban speed laws that meet best practice.

example between “urban residential” and “urban industrial” areas). Of the 180 participating countries, 97 set maximum urban speed limits of less than or equal to 50 km/h, in line with best practice¹. Although the definition of urban may vary between countries, given that these areas usually involve a high concentration of pedestrians and cyclists, speeds above 50 km/h would be unsafe. Many countries that set an urban speed limit of 50 km/h have exceptions to allow this speed to be increased in specific circumstances – for example on urban ring roads.

Enforcement of speed limits is essential to make them truly effective (23). Indeed, where countries have changed their national speed limits but have taken little supporting action to enforce them, there have been very limited benefits. This assessment found that only 27 countries (15% of participating countries) rate their enforcement of speed laws as “good” (8 or above on a scale of 0 to 10), suggesting that without ongoing and visible enforcement of speed limit legislation, the potential impact of speed legislation to save lives globally remains vastly unattained.

Local authorities need legislative power to reduce national speed limits where necessary

A safe speed is one tailored to fit the road’s function and traffic composition

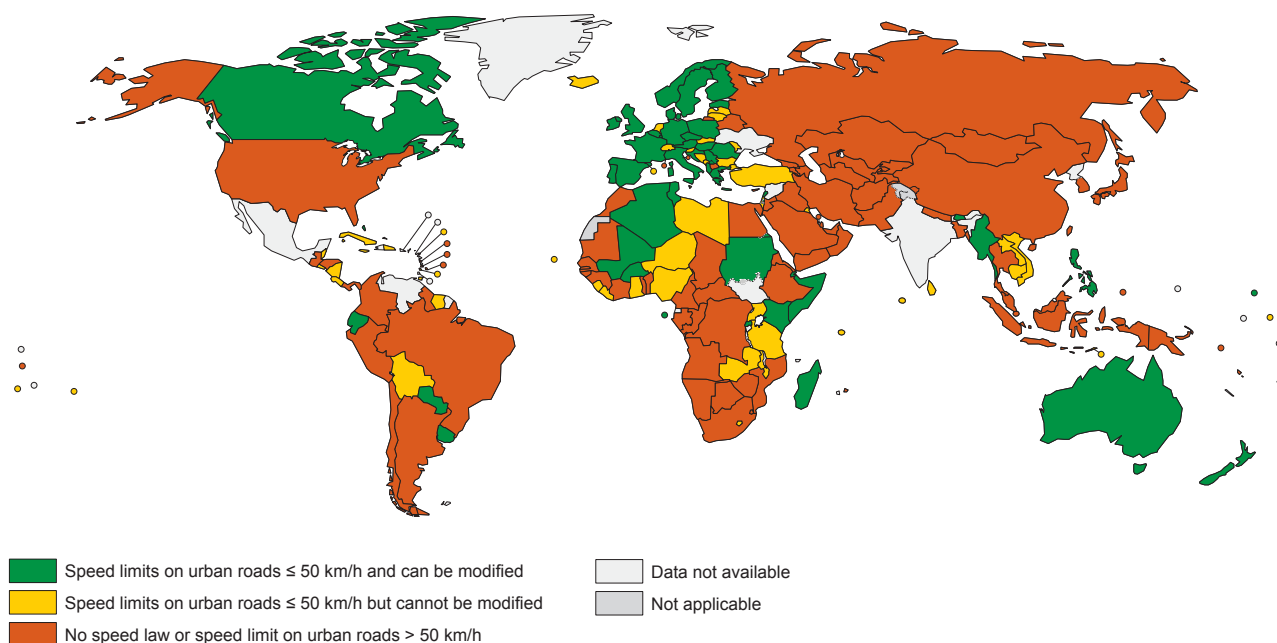
¹ Countries where legislation on risk factors is set at a subnational level were analysed according to whether or not a threshold level of subnational jurisdictions met specific criteria. For more information on this see Explanatory Note 1.

and is particularly important on roads with no median barrier and more mixing of traffic and road user types. So, while a country may set a national rural speed limit of 90 km/h, local authorities may need to reduce this on a particular stretch of road that is dangerously curved, or cuts through a residential community.

It is important that local authorities not only have the legal authority to reduce national limits, but also to manage local speeds according to particular road situations and in conjunction with other traffic calming or speed management policies. Such legal authority may be spelled out within the road traffic act itself, or in regulations, decrees or other legal documents beyond those relating to road traffic. However, this survey shows that only 88 of the 180 participating countries allow local authorities to reduce national speed limits.

Additionally, only 47 countries, representing approximately 950 million people, meet both legislative criteria for best practice on urban speed management – a national urban maximum speed limit of 50 km/h, *and* local authority power to reduce this limit to ensure safe speeds locally. Of these 47 countries, 24 are high-income, suggesting that speed management has a long way to go in the countries where it is most needed.

FIGURE 9
Urban speed laws, by country/area



BOX 6

Local authorities take the lead on speed

Giving local authorities the legal power to reduce national speed limits in their jurisdictions could produce a variety of results, as local authorities may have different views as to what constitutes an appropriate limit. The United Kingdom's Department for Transport addressed this challenge in 2006 by issuing *Setting local speed limits*, a publication aimed at local authorities.³

This publication includes the most important considerations and principles in establishing speed limits, and is a good example of how to harmonize the setting of local speed limits within a country.

³ See <http://www.dft.gov.uk/pgr/roadsafety/speedmanagement/dftcircular106>.



Increasing motorcycle helmet use

Preventing motorcyclist head injuries is becoming increasingly urgent as motorcycle use rises

Data collected for this report shows that between 2010 and 2013 there was a 27% growth in the number of motorized two-wheelers globally. Motorcycles form a high proportion of vehicle fleets in many low- and middle-income countries, and motorcyclists comprise a large proportion of those injured or killed on the roads. While in high-income countries motorcycle deaths typically comprise about 12% of overall traffic deaths, in middle-income countries this more than doubles to 26%. There are also important regional differences: the South-East Asian and Western Pacific Regions have the highest proportions of motorcyclists killed (34% in each), while the African Region has the lowest (7%¹).

Motorcyclists are at an increased risk because they often share the traffic space with fast-moving cars, buses and trucks, and because they are less visible. In addition, their lack of physical protection makes them vulnerable to injury.

Injuries to the head and neck are the main cause of death, severe injury and disability among motorcyclists. The social costs of head injuries for survivors, their families and communities are high, in part because they frequently require specialized or long-term care (27). Head injuries also result in much higher medical costs than any other type of injury, meaning

these injuries can exert a high toll on a country's health care costs and its economy.

Wearing a motorcycle helmet can reduce the risk of death by almost 40% and the risk of severe injury by approximately 70%. Effective enforcement of motorcycle helmet laws can increase helmet-wearing rates and thereby reduce head injuries (28).

Helmet laws should cover all riders and specify a helmet quality standard

While 169 countries (94%) have a national law requiring the use of helmets among motorcyclists, there are a large number of countries where loopholes in these laws potentially limit their effectiveness. For example, of the 169 countries that have a helmet law, only 151 stipulate that the law applies to drivers and passengers, all road types and all engine types. Furthermore, only 74 of the 169 countries (41% of countries responding to the survey) explicitly state that the helmet needs to be correctly worn (i.e. properly fastened with the chin strap) in order to meet the law. While most countries have well-defined (and limited) exemptions to their laws, others contain exemptions that are open to interpretation and therefore harder to enforce: for example, some countries require helmets to be worn only "in built-up areas" or only on roads "where vehicles may be driven at a speed higher than the normal limit". Only 70 countries have national helmet laws that apply to all drivers and passengers, all road types and all engine types, and require the helmet to be properly fastened.

¹ This may be influenced by the relatively low proportion of countries in the region that provide data on deaths by road user

Helmets must be of good quality to be effective

The effectiveness of national helmet legislation in reducing injuries also depends on the quality of helmets worn. While there is a high quality international helmet standard (UN ECE regulation 22)¹, concerns with its accessibility and affordability in some low- and middle-income countries have led to some countries developing their own standard. These national standards may be more appropriate to local conditions, more affordable and more readily available, but the quality of helmets meeting these standards varies. Governments developing their own national standards must ensure that the standard meets minimum quality criteria, and that crash-testing facilities are available to test helmets produced to this standard.

Timing the introduction of a helmet standard can also affect its success, as newly set standards cannot be met if there are not enough helmets on the market that meet them (see

Box 7). Similarly, new regulations and standards should be rolled out carefully and in coordination with civil society, to help make them as widely accepted as possible. However, many countries (despite having a helmet law) still have no standard at all, or have legislation that is vague about the standard to which it refers. A study in nine low- and middle-income countries found that about half the helmets being used were non-standard helmets, limiting the potential gains of helmet use programmes (29).

Few countries meet best practice when it comes to helmet laws and helmet standards

This report found that only 44 countries, representing 1.2 billion people, have laws that: apply to all drivers and passengers, all roads and engine types, require the helmet to be fastened, and make reference to a particular helmet standard. Those that do are disproportionately high-income

¹ See <http://www.bbc.com/news/world-africa-31815807>

BOX 7

Setting helmet standards in Kenya: a stepwise process

The Kenyan Road Traffic Act requires motorcycle drivers and their passengers to wear helmets that meet a national standard.

Rather than articulating the standard itself, the law makes reference to a standard set out in a separate legal text by the Kenyan Board of Standards (KEBS), established in 1974 as the body in charge of testing, approving, stamping and monitoring a variety of products. So while the helmet legislation in the Road Traffic Act may remain constant over the years, the way it is written allows the standard to be modified and updated without the need to change the legislation. Indeed, in 2012 the Kenya Board of Standards/Vehicles Technical Committee (TC122) finalized a revision to the national helmet standard (KS77).

Although the law is in place and the standard approved, in order for the helmet standard to be put into effect the standard needs to be “published” by regulation and gazetted by the Minister of Transport. However, a 2014 study commissioned through the Bloomberg Initiative for Global Road Safety in Kenya into the availability and access to helmets meeting the new standard found that such helmets were largely unavailable on the Kenyan market. Thus, to date, the new standard has yet to be gazetted by the Ministry of Transport, allowing implementation of the standard and enforcement of the related law to be delayed until standard helmets are more widely available.

countries from the European Region (see Figure 10). This is particularly worrying as South-East Asia Region and the Western Pacific Region are known to have a high proportion of motorcycle deaths, while in the Region of the Americas the proportion of road traffic deaths among motorcyclists is on the rise – increasing from 15% to 20% between 2010 and 2013. The low number of countries meeting best practice on helmet laws in these regions suggests that much stronger laws are needed in most parts of the world.

Enforcement of helmet laws is critical to their effectiveness, yet only 68 countries rate the enforcement of their helmet laws as “good” (8 or above on a scale of 0 to 10). This shows that the issue of ensuring helmets are up to standard and properly worn needs urgent attention.

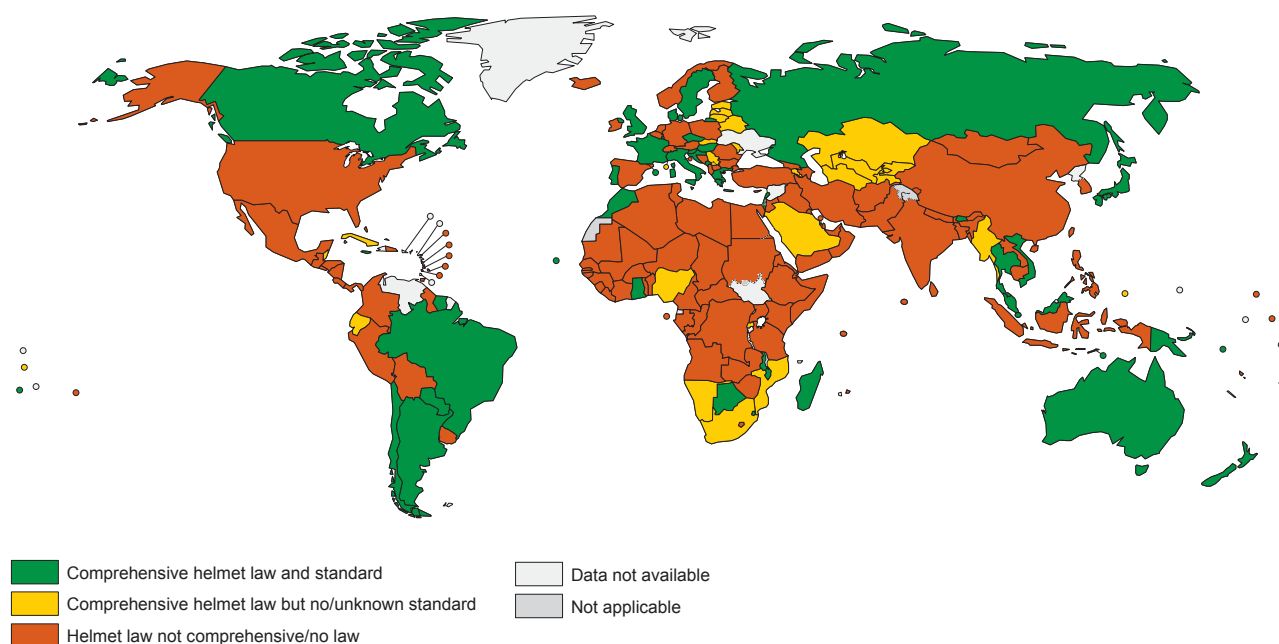
Children legally allowed as motorcycle passengers must be required to wear a helmet

In 46 countries, motorcycle helmet laws specify a minimum age at which children can ride as passengers, ranging from 3 to 14 years old. Other countries do not specify a minimum age in their law, but require that children on motorcycles are tall enough for their feet to reach the foot rests. Generally, children who are legally permitted to ride as passengers are also subject to the country’s laws on helmet use and standards¹. For example, an 8-year-old child in Australia is legally allowed to ride as a motorcycle passenger and is required to wear a helmet meeting the national standard. However, the

Only 44 countries, representing 1.2 billion people, have helmet laws that meet best practice and apply a helmet standard.

¹ UN Regulation 22 on motorcycle helmets also contains provision for child helmets.

FIGURE 10
Motorcycle helmet laws and helmet standards, by country/area



situation becomes more complicated in situations where no minimum age is prescribed or where children aged just 2 or 3 years are legally allowed as motorcycle passengers: providing protective headwear for young children is difficult for several reasons, including the fact that the size and shape of the human head evolves rapidly during the first four years of life (30). Nonetheless, some countries in South-East Asia (notably Viet Nam and Malaysia, where motorcycles are frequently the family vehicle) have set national child helmet standards and other countries in the region continue to explore how to address this issue.

More effort is needed to collect data on helmet-wearing rates

In order to assess the effectiveness of efforts to increase helmet wearing, countries need to collect regular data on helmet-wearing rates. However, less than half (41%) of all participating

countries have these data available, and in many that do, the data has been gathered using differing methodologies. This often makes comparisons over time and between regions impossible.

Other promising strategies that protect motorcyclists

While this report only addresses helmets as a critical factor to the safety of motorcyclists, there is an increasing body of evidence that relates to other measures that can enhance safety among this group. For example, mandating advanced braking systems (ABS) for all motorcycles, as recently introduced in the European Union, has shown to mitigate injuries and be cost effective; creating lanes exclusive to motorcycle use and requiring daytime running lights that increase motorcyclist visibility are both effective injury reduction strategies, while the use of protective clothing is considered a promising strategy.



Reducing drink-driving

Laws based on blood alcohol concentration (BAC) limits can reduce road traffic crashes

Drink-driving increases the chance of a road traffic crash, as well as the likelihood that death or serious injury will result (21). The risk of impairment starts at very low levels of alcohol consumption and rises exponentially with alcohol intake. Drivers with a BAC of between 0.02 g/dl and 0.05 g/dl have at least a three times greater risk of dying in a vehicle crash. This risk increases to at least six times with a BAC between 0.05 g/dl and 0.08 g/dl, and rises exponentially above 0.08 g/dl (31). Drinking and driving is also associated with other high-risk road use behaviours such as speeding or not using seat-belts (32).

Drink-driving legislation, accompanied by visible and rapid enforcement following enactment, is an effective means of reducing alcohol-related crashes. Of those assessed for this report, 176 countries (98%) have a national drink-driving law in place, but only 134 of these are based on BAC limits (or equivalent breath alcohol concentrations). Eighty-four countries (47%) have a drink-driving law based on BAC with a limit of less than or equal to 0.05 g/dl for the general population, in line with best practice. Such laws are much more likely among high-income countries (73%) than middle- or low-income countries (43% and 13% respectively).

This means that 47% of all countries have yet to implement drink-driving laws for the general population that are based on best practice. Even in the 18 countries where alcohol consumption is legally prohibited, a drink-driving law

based on BAC of less than or equal to 0.05 g/dl is recommended and in place in some countries, such as in Morocco¹.

Young and novice drivers at increased risk

Young and novice drivers are at a much-increased risk of road traffic crashes when under the influence of alcohol compared to older and more experienced drivers (31). This increased risk has led many countries to implement lower BAC limits for this group. Laws that establish lower BAC limits (≤ 0.02 g/dl) for young and novice drivers can lead to reductions in the number of crashes involving young people of up to 24% while graduated licensing schemes (which may include lower BAC limits or zero tolerance limits for this group) are also effective at reducing alcohol-related injuries and deaths (31,32). Thirty-five countries (19%) apply limits less than or equal to 0.02 g/dl for this high-risk group.

Taken together these data show that only 34 countries, representing 2.1 billion people, have national drink-driving laws with a BAC limit of less than or equal to 0.05 g/dl as well as lower limits of less than or equal to 0.02 g/dl for young and novice drivers (see Figure 11). Twenty-one of these countries are in the European Region, suggesting the need to extend good practice globally. Nonetheless, progress has been made since 2011, during which time eight countries (representing 287 million people) have brought their drink-driving laws into line with best practice.

¹ Enforcing a zero alcohol law can be challenging. In addition some countries where alcohol consumption is legally prohibited do allow limited consumption among non-nationals. A drink-driving law based on BAC is therefore optimal, even in countries where alcohol consumption is legally prohibited.

Only 34 countries, representing 2.1 billion people, have drink-driving laws in line with best practice.

BOX 8

Reforming drink–driving legislation in Jalisco, Mexico

In 2008, as part of the Bloomberg Philanthropies Global Road Safety Programme, a new road safety initiative was piloted in four locations in Mexico, including the state of Jalisco. One focus of the initiative was to help the government identify gaps in legislation relating to key risk factors and provide support to facilitate improvements to these laws. To this end, a review of road safety laws in Jalisco identified the need to strengthen the law on drink–driving, including reducing the existing BAC limit, which was above recommended best practice.

Strong relationships were established with different stakeholders, including federal and state authorities, local legislators and civil society in order to advocate for legislative change. These efforts included: open forums with civil society and media; expert meetings and informative sessions; and sessions with local authorities and legislators from the main political parties.

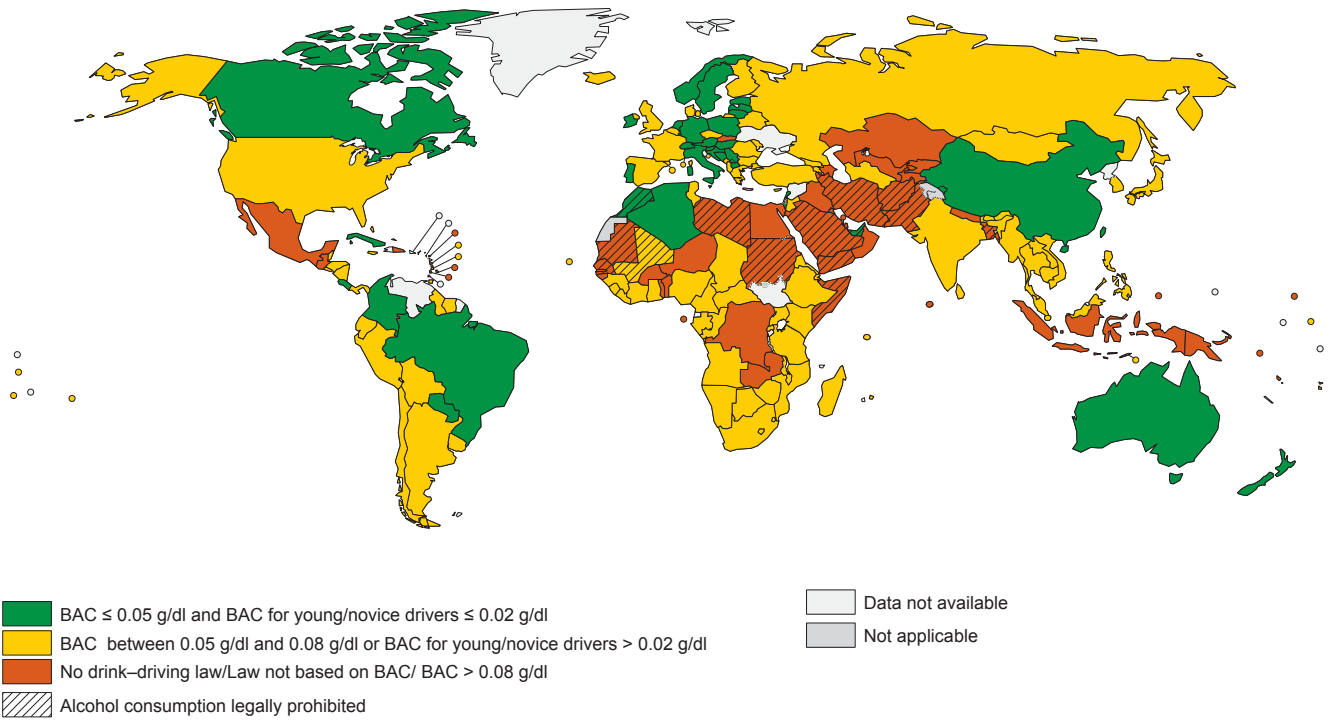
After extensive consultation among local, national and international stakeholders, legislative recommendations were drafted. In November 2010 the new state law, locally known as the “Ley Salvavidas” (“Lifeguard/life-saving law”), was amended to incorporate these provisions, which included lowering the blood alcohol concentration limit from 0.15 g/dl to 0.05 g/dl (in line with international best practice) and stiffer penalties for transgressing this law. Continued monitoring of the law’s implementation resulted in findings that it was not having the intended impact because of enforcement challenges. Notably the 2010 law specifically did not provide for the establishment of random alcohol checkpoints, shown to be effective at reducing drink–driving. Between 2010 and 2012, civil society and international road safety organizations engaged with policy-makers to advocate for regulations that would allow for random breath testing, a process which culminated in 2013, when the Jalisco state government adopted an amendment to the 2010 law that formally provided for the establishment of random alcohol checkpoints and a protocol for their implementation. The occasion of amending the law was also used to further increase penalties related to drink–driving.

The law amendment was accompanied by a hard-hitting social marketing campaign^a that supported dissemination of the new regulations and penalties, and communicated the risk of drink–driving. Alongside this legislative reform process and its dissemination, major capacity building efforts also took place to train and support police in effectively running random alcohol checkpoints.

The effects of the initiative are being monitored. Short-term results have shown significant changes in the proportion of alcohol-related deaths and collision rates in Jalisco following the implementation of the Global Road Safety Programme (33).

^a See <https://www.youtube.com/watch?v=boxRNvH5WEo&index=29&list=PL9S6xGsoqIBWAhPnNtIDoxP3OcrYqaQa0>.

FIGURE 11
Drink-driving laws, by country/area



121 countries use random breath testing at checkpoints at specific times.

Commercial drivers involved in drink-driving have more serious outcomes

Commercial drivers are another important group in relation to drink-driving: while drink-driving does not appear to be more prevalent in commercial than private transport, alcohol-related road crashes in commercial transport may result in more serious outcomes because of the greater size and mass of many commercial vehicles, notably those operated by public transport companies (34). Forty-six countries have set legal BAC limits for commercial drivers at less than or equal to 0.02 g/dl.

make potential offenders feel more likely they will be caught, leading to a swift fall in the number of offenders. Random breath testing and police sobriety checkpoints are enforcement mechanisms that have been shown to lead to significant reductions in alcohol-related crashes (31,35)¹. One hundred and one countries report using breath testing at checkpoints at specific times (e.g. holiday periods, when drink-driving prevalence is expected to be higher) while 121 countries use random breath testing, which is more effective at reducing drink-driving. However, only 46 countries rate their enforcement of drink-driving laws as “good”.

Enforcement of drink-driving legislation is critical to its effectiveness

Strong enforcement of drink-driving laws improves both their effectiveness and longevity (21,31). Enforcement is also more effective when supported by public awareness campaigns that

Other effective strategies to reduce drink-driving

Other mechanisms have strong evidence of effectiveness at reducing

¹ Random breath testing (RBT) requires stopping drivers and random, testing all who are stopped. Sobriety checks involve setting up particular checkpoints or road blocks and only testing those suspected of alcohol impairment. While RBT is most effective, both approaches are shown to reduce alcohol-related crashes.

drink-driving. Graduated driver licensing systems are initiatives that allow for a controlled and supervised phasing-in of many driver privileges over a period of time for new, young drivers. Evaluations of these systems have reported significant reductions in crashes and fatalities, with estimates of effectiveness varying from 4% to up to 60% (21). The purpose is to protect beginners while they are learning, allowing and encouraging them to obtain driving experience on the road under conditions of low risk.

Alcohol ignition interlocks (or alcolocks), are automatic control systems designed to prevent driving with excess alcohol. They require the driver to blow into an in-car breathalyser before starting the ignition. If the device detects alcohol in excess of the threshold value (which can be set at different levels), the vehicle will not start. Alcolocks have been shown to be effective in preventing recidivism for both first time and repeat offenders and can play an important role in rehabilitation programmes (36,37).

More work is needed collecting data on drink-driving

Measuring the contribution of drink-driving to road traffic crashes helps countries evaluate the impact of efforts to prevent it. Only 95 countries have any data on the proportion of road traffic deaths attributable to alcohol, ranging from less than 1% of deaths in Costa Rica and Oman, up to 58% in South Africa¹. In some countries these data may be available from police crash reports. Police data are likely to be an underestimation of the problem, however, as police test only a small proportion of drivers involved in a crash for alcohol consumption. In other countries, all drivers who are involved in a fatal crash are routinely tested for alcohol. Although considered good practice, this happens in just 53 countries (31%).

¹ This does not include countries with very small populations and small numbers of road traffic deaths, where up to 100% of deaths may be attributable to alcohol.

Only 53 countries test all drivers who die in a crash for alcohol use.

Increasing seat-belt use

Seat-belts limit the movement of vehicle occupants in the event of a crash, dispersing the force of the restraint to reduce the likelihood of serious or fatal injury. They work as part of the wider occupant restraint system that includes airbags, seats, head rests and the vehicle structure itself (see Section 3).

Wearing a seat-belt reduces the risk of a fatality among drivers and front-seat occupants by 45–50%, and the risk of minor and serious injuries by 20% and 45% respectively. Among rear-seat occupants seat-belts reduce fatal and serious injuries by 25% and minor injuries by up to 75% (21). Wearing a seat-belt also significantly decreases the risk of being thrown from the vehicle in the event of a crash.

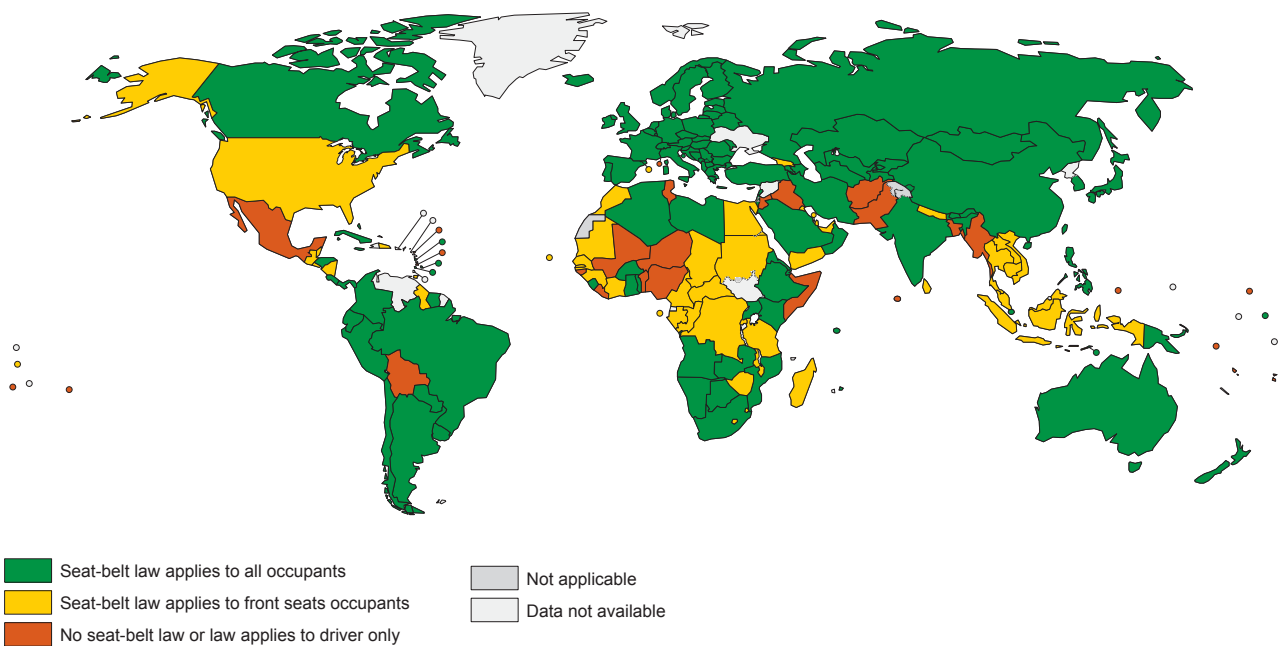
There are factors that can reduce seat-belt wearing rates – for example

where there are more passengers than available seating positions in a car, or where there are no anchorage points, or where these have been tampered with – but seat-belt legislation, when combined with strong and sustained enforcement, is an effective mechanism for increasing seat-belt wearing rates (38). Requiring standards for vehicles to ensure seat-belt anchorage points is also an important strategy to maximize the success of seat-belt wearing initiatives.

Just over half of all countries have enacted good seat-belt laws

The report shows that some progress has been made in countries modifying their seat-belt laws. Specifically, five countries, representing 36 million people, have brought their seat-

FIGURE 12
Seat-belt laws, by country/area



belt laws into line with best practice since 2011. While 161 countries have national seat-belt laws, only 105 countries, representing 4.8 billion people, meet best practice by including rear-seat occupants as well as front-seat occupants (see Figure 12). Other countries have seat-belt laws that, while they might apply to all passengers, have exclusions that weaken the law: for example, some countries apply a seat-belt law only on roads where vehicles may be driven at a speed higher than the normal limit, and others require seat-belt use only inside or outside cities. Such clauses dilute the impact of seat-belt law and create challenges for police tasked with implementing it.

In a number of high-income countries, seat-belt wearing rates are high among both front and rear-seat occupants. For example, France has a seat-belt wearing rate of 99% among front-seat occupants and 87% among rear-seat

passengers. Enforcement is key to achieving such high-compliance with legislation, but only 52 countries rate their enforcement of laws as “good” (8 or above on a scale of 0 to 10).

Almost half of all countries collect seat-belt wearing data

To assess the impact of interventions to promote seat-belt wearing, countries need to collect regular, robust data on seat-belt wearing rates. Such data are important as an intermediate indicator of the broader goal of reducing injuries and fatalities, and can help sustain political and public support for these efforts. Only 84 countries have any data on seat-belt wearing rates, with this number disproportionately higher in high-income countries (77%) than in low- and middle-income countries (7% and 43% respectively).

105 countries, representing 4.8 billion people, have seat-belt laws that cover both front and rear-seat occupants.



Increasing child restraint use

Protecting children requires properly fitting restraints

Seat-belts are not designed for children and do not offer the protection they give adults, but restraining them with adult seat-belts is preferable to letting them travel unrestrained. However, the best solution is to use age-appropriate child restraints. Children in an appropriate restraint are significantly less likely to be killed or injured than unrestrained children, and are also less likely to be killed or injured than children using adult seat-belts (21).

The effectiveness of child restraints in reducing injury or death varies by type of restraint. Rear-facing restraints for babies and infants (under 1 year) have been shown to reduce the risk of death or injury by 90% compared to being unrestrained (39). Forward-facing child restraints reduce the risk of serious injury by almost 80% compared to children restrained only by seat-belts. Children in booster seats, generally aged 4 to 10 years, have a 77% reduced risk of being injured in a crash compared to unrestrained children (39).

Additionally, children are safer seated in the rear of a vehicle than in the

front (21,39). Eighty-four countries have enacted laws preventing children sitting in the front of the vehicle – most such laws restrict children from sitting in the front if they are under a certain age (usually between 10 and 12 years) or under a specific height (usually between 135 and 150 cm).

Legislation mandating the use of child restraints can be an effective way to increase the use of restraints and reduce injuries (21). While 96 countries have a child restraint law of some type, only 85 countries base this law on age, weight or height – an important factor in achieving effectiveness. Most high-income countries have such a law while only a third of low- and middle-income countries base their child restraint law on one or more of these criteria.

Child restraint laws are notably lacking in some regions of the world: only one country in the South-East Asia Region – Timor Leste – and countries/areas in the Eastern Mediterranean Region (Lebanon, Saudi Arabia and the West Bank and Gaza Strip) have child restraints laws.

In this report, two criteria were considered necessary to meet best practice on child restraint legislation:

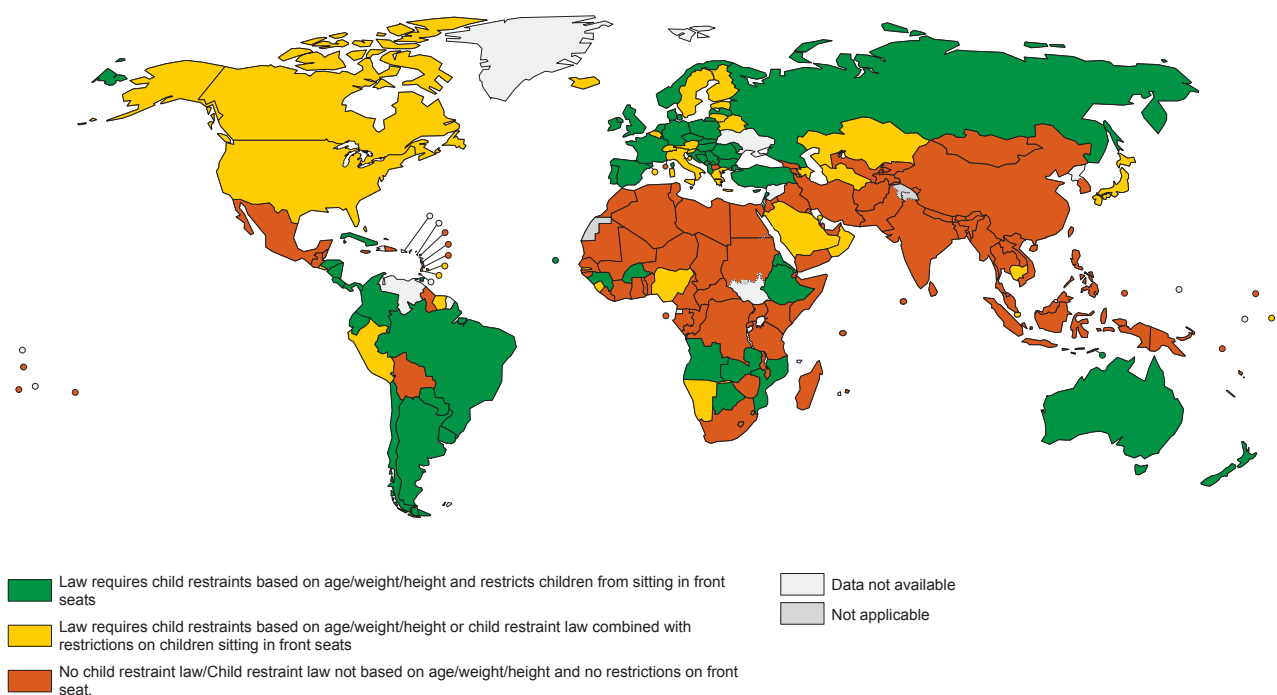
BOX 9

Meeting the child restraint challenge: ISOFIX

A 2011 EU study found that the average rate of misuse of child restraints was about 65%, confirming that many children are still incorrectly secured in cars (40). The ISOFIX system was developed to reduce misuse of child restraints and make them more effective. However, further progress in 2013 was made with the adoption of a new UN Regulation on “i-size” child restraints, which should further simplify child restraint use while simultaneously increasing safety. Until such a system is universally used, however, some countries have “car seat check” systems at local levels that provide free advice on correct installation.

See <http://www.unece.org/fileadmin/DAM/trans/doc/2014/wp29grsp/GRSP-56-27e.pdf>

FIGURE 13
Countries meeting best practice criteria on child restraint laws



the existence of a law that applies an age, weight or height restriction on children sitting in the front seat, and a national child restraint law based on age, height or weight. When taken together, the report shows that only 53 countries meet both these criteria, representing just 17% of the world's population (see Figure 13). Nonetheless, progress is being made: seven of these countries, representing 101 million people, have brought their child restraint laws into line with best practice in the past three years.

Compliance with child restraint laws is low

Even though legislation has an important role in increasing child restraint use, achieving compliance with child restraint laws is challenging, even in high-income countries. For example, in the United Kingdom, 75% of children aged 1–4 years were using an appropriate child car restraint but this rate is much lower for children aged 5–9 years (41). Studies

in a number of high-income countries have shown that in a large proportion of vehicles, child restraints are not fitted into the car nor used correctly. Incorrect fitment and use seriously compromises the effectiveness of the restraint system. The cost of child restraints can also be prohibitive to many families and may be a challenge to the effectiveness of legislation. While enforcement of child restraint laws is frequently weak- this report found that only 22 countries rate their enforcement of child restraint laws as 'good' (8 or above on a scale of 0 to 10).

Increasing compliance requires additional efforts that address these challenges – facilitating access-distribution of restraints, supporting correct usage, and addressing issues of access and cost (42,43). Community-based education and distribution schemes, maternity hospital loan schemes, voucher programmes to encourage subsidized purchase of restraints, and checking programmes that verify correct fitting are many of the strategies that have had promising

53 countries, representing 1.2 billion people, have a child restraint law that meets best practice.

results in many high-income countries (43,44). Enforcement of child restraint laws remains critical to their success, but it is also important (as more low- and middle-income countries adopt child restraint laws in line with good practice) that learnings from high-income countries on boosting child restraint use are applied, helping laws

achieve their maximum potential more quickly.

Assessing the impact of child restraint laws is further complicated by the low number of countries with data on child restraint use by age group. Only 25 countries have any data at all on child restraint rates.

BOX 10

Weak laws in the world's 10 most populous countries put 4.2 billion lives at risk

The world's 10 most populous countries account for almost 4.2 billion people and 56% of the world's road traffic deaths (703 000). None of these countries has laws on all five risk factors, in line with best practice.^a If these countries were all to bring their road safety laws in line with best practice, and adequately enforce them, there would be huge potential to save lives and reduce injuries resulting from road traffic crashes. Furthermore, this would go a long way towards reaching the target reduction in road traffic deaths identified in the Sustainable Development Goals.

An analysis of legislation of these countries (see Figure 14) shows that:

- none of the 10 countries meets best practice criteria across all 5 risk factors;
- no country meets best practice legislation for speed;
- only two countries meet best practice criteria on drinking and driving, representing 1.6 billion people;
- three countries, representing 470 million people, have laws meeting best practice on helmets;
- five countries have seat-belt laws that meet best practice, representing 3.1 billion people;
- only two out of 10 countries have child restraint laws meeting best practice, representing 340 million people.

^a Countries where legislation on risk factors is set at a subnational level were analysed according to whether or not a threshold level of subnational jurisdictions met specific criteria. For more information on this see Explanatory Note 1.

FIGURE 14

Ten most populous countries and best practice legislation

	Speed	Drink-driving	Helmets	Seat-belts	Child restraints
China		✓		✓	
India				✓	
USA					
Indonesia					
Brazil		✓	✓	✓	✓
Pakistan					
Nigeria					
Bangladesh					
Russian Federation			✓	✓	✓
Japan			✓	✓	



Reducing drug-driving

Drug-driving is an emerging road safety issue

While a considerable amount is known about the magnitude of problems associated with drink-driving and the effectiveness of related countermeasures, much less is known about driving when impaired by other psychoactive substances. To date, there are no global estimates of deaths resulting from drug-driving, nor is the prevalence of drug-driving known, either at global or regional levels. However, growing recognition of the problem of drug-driving has led to increased focus on this area among road safety policy-makers and researchers (45).

There are a wide variety of psychoactive substances that have the potential to adversely affect driver behaviour. These include:

- many illicit drugs (e.g. cannabis, cocaine)

- psychoactive¹ and analgesic prescription medicines (such as benzodiazepines, opioids)
- new psychoactive substances coming on the market.²

The effects of such substances on driver behaviour and crash risk vary considerably depending on the substance itself. A meta-analysis that compiled information from 66 studies showed an increase in risk of a crash for 11 different drugs tested (46).

The difficulties of addressing drug-driving

Efforts to reduce drug-driving are, to a large degree, influenced by the wealth of experience gained in

¹ A psychoactive drug is any chemical substance that changes brain function and results in alterations in perception, mood, or consciousness.

² New psychoactive substances that are on the global drugs market are substances that are not under international control, but mimic the effects of controlled substances. These substances also have the potential to pose serious risks to public health and safety (45).



BOX 11

Drug-driving legislation in the United Kingdom

In 2012, the UK government announced a new offence in relation to driving with specific controlled drugs in the body above the drugs accepted limit. The aim was to reduce expense, effort and time wasted from prosecutions that fail because of difficulties proving a particular drug impaired a driver.

Following a report from a panel of experts and a drug-driving consultation the government decided to take:

- a zero tolerance approach to eight drugs most associated with illegal use – for example, cocaine;
- a road safety risk based approach to eight drugs most associated with medical uses, such as methadone;
- a separate approach to amphetamine that balances its legitimate use for medical purposes against its abuse.

On 2 March 2015, eight general prescription and eight illicit drugs were added into new regulations that came into force in England and Wales. Regulations on amphetamines came into force on 14 April 2015.

See <https://www.gov.uk/government/collections/drug-driving#table-of-drugs-and-limits>

relation to drink-driving and usually involve a combination of laws, enforcement and primary prevention (45,47). However, the situation is more complex in relation to drug-driving for the following reasons.

- The term “drugs” encompasses a wide variety of substances – some illegal but widely used; others prescribed, legally purchased and taken; others bought over the counter.
- Detecting and measuring levels of psychoactive substances is more complicated than detecting alcohol in breath, and requires samples of blood, urine or saliva. It also requires sophisticated levels of expertise among police to recognize impairment and carry out tests.
- Crash risk for drugs is more complicated to ascertain than for alcohol and depends on the drug concerned. Since different types of drugs stay in the bloodstream for different lengths of time, this can complicate the ability to link a positive drug presence with crash risk.

- Lack of scientific evidence on the links between drug levels, impairment and crash risk for many drugs makes it difficult to set threshold limits for each substance.

Countries are enacting drug-driving legislation based on evolving evidence

As a result of these complicating factors, objective measures akin to BAC limits are largely lacking in most countries’ laws on drug-driving. While 159 countries (93% of those assessed) have national legislation prohibiting drug-driving, most of these laws do not define what substances are considered to be drugs. Some countries get around citing specific substances in their drug-driving laws by applying “zero tolerance”, which simply reinforces laws relating to the illegal possession and consumption of drugs. A handful of countries, however, include a list of drugs in their road traffic laws. For example, Luxembourg prohibits

159 countries address drug-driving in their road safety legislation but in most cases these laws are too vague to be effective.

driving under the influence of cannabis (tetrahydrocannabinol, or THC), amphetamine, methamphetamine, morphine and cocaine. Other countries have moved towards specifying limits of drugs where threshold levels for crash risk have been established (see Box 11). This strategy is in accordance with recommendations of the meta-analysis already referred to which recommend: establishing threshold levels for certain drugs where there is a solid science base linking consumption levels with crash risk; a standardized approach to testing for specific drugs; and for consensus to be articulated on optimal enforcement procedures relating to specific drug-driving laws (46).

Training police to recognize and test for drug-driving

Where a threshold level has been articulated in legislation, enforcement

officers must be trained to collect samples of bodily fluid for testing. However, for drugs that as yet have no set threshold, enforcement officers must be trained to recognize signs and symptoms of drug use; assess impairment, and take samples to determine the type and level of substance present.

Random checkpoints are a widely used and effective way to reduce drink-driving, but the same body of evidence around checkpoints for drug-driving does not yet exist. Some countries allow random drug testing, while others allow it but only if another offence (e.g. speeding or dangerous driving) seems to have been underway at the time. What is clear is that investing in enforcement of drug-driving at the expense of drink-driving programmes is not effective since drink-driving remains a higher priority for most countries' road safety.

Reducing distracted driving

Distracted driving is a serious and growing threat to road safety

While there are different types of driver distraction¹, the rapid growth in possession and use of mobile phones – as well as other in-vehicle technologies – is an area of great concern to policy-makers involved in improving road safety.

Mobile phone use creates various types of distraction: visual, auditory, manual and cognitive (48,49,50). Texting involves cognitive distraction, as well as longer periods of both manual and visual distraction.

Evidence shows that the distraction caused by talking on mobile phones can impair driving performance in a number of ways, e.g. longer reaction times (notably braking reaction time), impaired ability to keep in the correct lane, and shorter following distances. Texting also results in considerably reduced driving performance, with young drivers at particular risk (51).

Four-fold increase in crash risk when talking on a mobile phone while driving

One study found that 69% of drivers in the United States of America (USA) had used their mobile phone while driving within the previous 30 days – a percentage higher than in Europe, where it ranged from 21% in the United Kingdom to 59% in Portugal (52). The contribution of mobile phone use to

crashes, however, is unknown in many countries, as data on mobile phone use is not routinely collected when a crash occurs: only 47 countries collect data as part of regular police crash reports, while another 19 carry out regular observational studies to obtain such data. An overview of available data suggests that drivers talking on a mobile phone are approximately four times more likely to be involved in a crash than those who are not. Hands-free phones appear to have no significant advantage over hand-held phones – most likely because the most dangerous type of distraction (cognitive) applies equally to both.

Although most of the research carried out in this area relates to driver of four-wheeled vehicles, the role of mobile phone use in motorcycle crashes is also becoming an increasing concern. As motorcycle fleets increase in many parts of the world, monitoring the prevalence of mobile phone use among drivers of two-wheelers and estimating the contribution of this behaviour to road traffic injuries will become increasingly important (53).

Evidence on effective ways to reduce mobile phone use while driving is still evolving

To date, there is little information on the effectiveness of interventions to reduce mobile phone use while driving (48,54). As a result, a number of countries are following an approach that has been known to be successful in addressing other key risk factors for road traffic injuries. Legislation prohibiting the use of hand-held mobile phones while driving exists

Legislation prohibiting the use of hand-held phones while driving exists in 139 countries, while a further 31 countries prohibit both hand-held and hands-free phones.

¹ These include “internal” distractions, including behaviour in the vehicle that may be distracting (e.g. smoking, eating), as well as external distractions, such as the visual distraction associated with looking at billboards and other roadside advertising.



in 138 countries, and a further 31 countries prohibit both hand-held and hands-free phones. However, due perhaps to difficulties enforcing this legislation, there remains little evidence of the effectiveness of such measures: in the Netherlands, mobile phone use has been banned since 2002 but there is mixed evidence about the impact of this measure (55).

Other measures also being considered and implemented at a subnational level to reduce mobile phone use include:

- phone apps that divert calls to an answerphone while driving above 10 km/h;¹

- in-car features that warn the driver of sudden lane departures;
- employer action – many companies now address distracted driving among employees by limiting or prohibiting the use of mobile phones while driving.

Such measures need better evaluation but given the current challenges with enforcing legislation on mobile phone use in cars, they may serve as effective additional strategies to reducing the prevalence of distracted driving and the injuries that result.

¹ An example is the 'Auto Reply App' introduced by the Dutch Traffic Safety Association. This app prevents the phone from ringing at speeds higher than 10 km/h. At the same time a message is sent to the person who is calling which says that the driver is presently not available as he or she is behind the wheel (55).