A policy brief

Drug use and road safety

World Health Organization

Psychoactive substance use affects the functioning of the brain and leads to impaired driving

Drug use and road safety: a policy brief.

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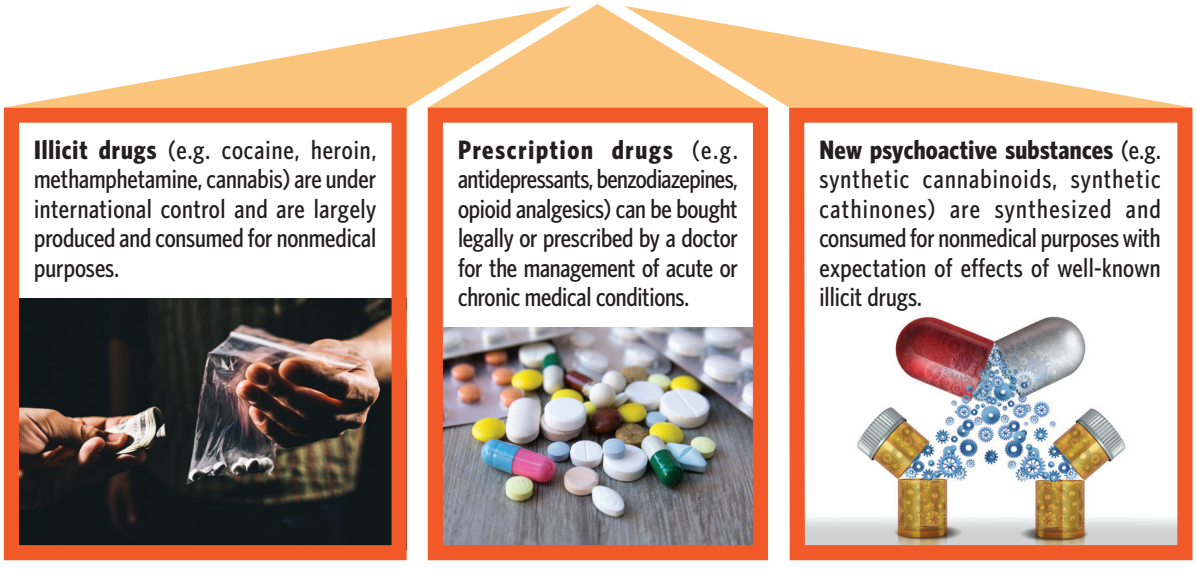
A growing concern

There is growing concern around the world about drug use and road safety. Drinking alcohol and driving is a well studied risk factor for road traffic crashes, injuries and deaths but drug-induced impairment of driving is causing increasing concern in many countries around the world. For many years there have been several gaps in our knowledge, particularly about the global extent of the problem, the relationship between drug concentrations and crash risk, appropriate threshold limits in blood, legislation and enforcement of effective measures to prevent drug-driving. However, these knowledge gaps are progressively being filled by a growing body of evidence on drug use and road safety, including effective ways to reduce drug-induced road traffic crashes and injuries *(1-8)*.

For the purpose of this document the term "drug" is used as an equivalent of "psychoactive drug", which refers to a substance that has the ability to affect mental processes such as an individual's consciousness, mood or thinking. The term "drug" in this document does not include alcohol and nicotine which are covered by the term "psychoactive substance".

The purpose of the document is to provide up-to-date information on drug use and road safety to support informed decisions on road safety and drug policies in WHO Member States. This document focuses on drug-driving and not on drink-driving. Drawing on the growth in knowledge in this area over recent decades, the document describes the impact of drug use on road safety and suggests what can be done to reduce drug-related crashes, injuries and deaths on the roads. Three categories of psychoactive drug are relevant to the risk of road traffic injury (Figure 1).

Figure 1
Psychoactive drugs relevant to road traffic injury risk



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How do psychoactive drugs impair driving?

Psychoactive drugs affect the functioning of the brain and may lead to impaired driving (e.g. by delaying reaction time and information processing, reducing perceptual-motor coordination and motor performance, as well as attention, road tracking and vehicle control). The ways in which different drugs affect brain functioning are summarized in Table 1.

Table 1
Ways in which different drugs affect brain functioning

Drug class	Drug	Impairment						
		Drowsiness	Cognitive functions	Motor functions	Mood	Lateral vehicle control	Time estimation	Balance
Illicit drugs	Cannabis	●	●	●	●	●	●	●
	Cocaine	—	●	●	●	—	—	—
	Amphetamines	—	●	●	●	—	●	●
	MDMA[a]	—	●	—	●	—	—	●
	Hallucinogens	—	●	●	●	—	●	●
Prescription drugs	Benzodiazepines	●	●	●	—	●	—	●
	Opioids	●	●	●	●	●	—	●
	Other depressants	●	●	●	●	●	—	●
New psychoactive substances	Synthetic cannabinoids	●	●	●	●	●	●	●
	Synthetic cathinones	—	●	●	●	—	—	—

Source: Based upon reference *(9)*.
●: the drug has an impairment effect.
–: the drug has no impairment effect.
[a] Methylenedioxymethamphetamine.

The risk of getting involved in a road traffic crash is increased to varying degrees depending on the psychoactive drug used (Table 2). For example, the risk of a fatal crash occurring among those who have used amphetamines is about five times higher than among persons who have not used them.

Table 2

Summary estimates of relative risk of road traffic crash associated with the use of various drugs

Drug	Crash severity	Best estimate of relative risk adjusted for publication bias	95% confidence interval
Amphetamine	Fatal	**5.17**	(2.56, 10.42)
	Injury	**6.19**	(3.46, 11.06)
	Property damage	**8.67**	(3.23, 23.32)
Analgesics	Injury	1.02	(0.89, 1.16)
Anti-asthmatics	Injury	**1.31**	(1.07, 1.59)
Anti-depressives	Injury	**1.35**	(1.11, 1.65)
	Property damage	1.28	(0.90, 1.80)
Anti-histamines	Injury	**1.12**	(1.02, 1.22)
Benzodiazepines	Fatal	**2.30**	(1.59, 3.32)
	Injury	**1.17**	(1.08, 1.28)
	Property damage	**1.35**	(1.04, 1.76)
Cannabis	Fatal	1.26	(0.88, 1.81)
	Injury	1.10	(0.88, 1.39)
	Property damage	**1.26**	(1.10, 1.44)
Cocaine	Fatal	**2.96**	(1.18, 7.38)
	Injury	1.66	(0.91, 3.02)
	Property damage	1.44	(0.93, 2.23)
Opiates	Fatal	**1.68**	(1.01, 2.81)
	Injury	**1.91**	(1.48, 2.45)
	Property damage	**4.76**	(2.10, 10.80)
Penicillin	Injury	1.12	(0.91, 1.39)
Zopiclone	Fatal	2.60	(0.89, 7.56)
	Injury	1.42	(0.87, 2.31)
	Property damage	**4.00**	(1.31, 12.21)

Source: Based upon reference *(6)*.

Notes: Estimates shown in bold are statistically significant at the 5% level.

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Epidemiology of drug use and road traffic injuries

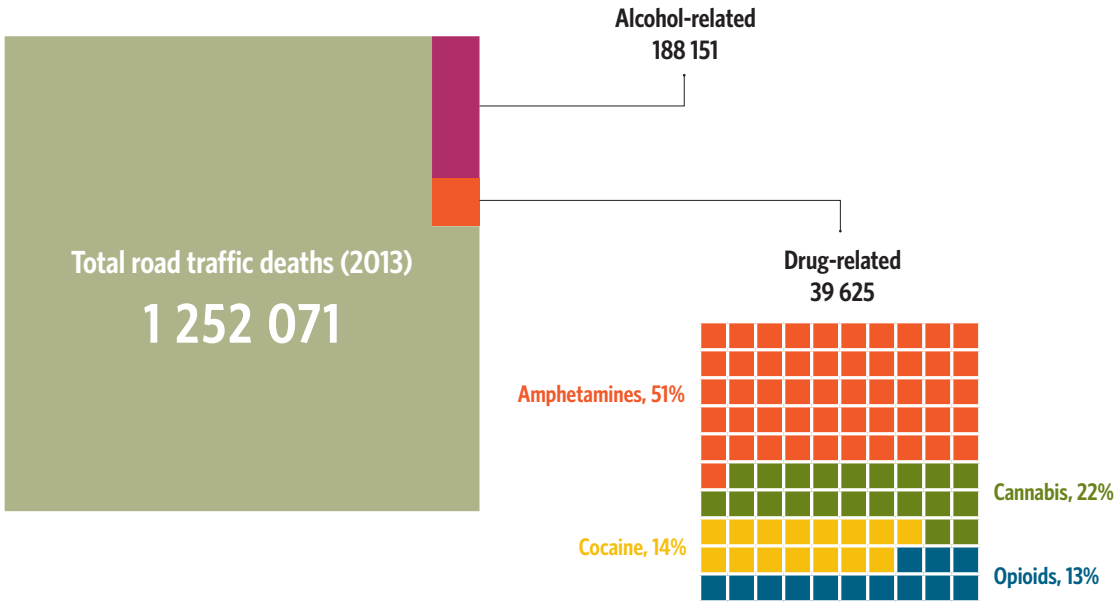
Surveys and laboratory tests from various countries show that psychoactive drug use is reported frequently by drivers or detected in the biological fluids of injured or killed drivers. For instance:

- Roadside surveys show that the prevalence of any psychoactive drug among drivers ranges from 3.9% to 20.0% *(10, 11)*.
- Population surveys show that self-reported driving after using psychoactive drugs (mostly cannabis) varies in different countries between 3.8% and 29.9% *(12, 13)*.
- Prevalence of drug use (such as amphetamines, benzodiazepines, cannabis and cocaine) among fatally injured persons in a road traffic crash ranges from 8.8% to 33.5% *(10, 14)*.

In 2013, illicit drug use was estimated to be responsible for just over 39 600 road traffic deaths worldwide *(15)*. Amphetamine use was estimated to cause around half of these deaths while cannabis was estimated to cause one fifth of them (Figure 2). Although there were more deaths due to drink-driving worldwide in the same year (just over 188 000), the risk of death from drug-driving remains high.

Figure 2

Proportion of drug-related road traffic deaths



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Prevention and early interventions

Measures that need to be in place and implemented in a comprehensive manner cover five essential areas: legislation, testing, enforcement, awareness-raising, and counselling and treatment.

Establishing drug-driving laws and regulations

The type of legal framework varies according to the social, legal and economic characteristics of a particular jurisdiction, as well as the historical context of the development of laws designed to improve road user safety.

- **Zero tolerance laws** make it unlawful to drive with any amount of specified drugs in the body.
- **Impairment laws** make it unlawful to drive when the ability to drive has become impaired following drug use, often described as being "under the influence" or in similar terms.
- **Per se laws** make it unlawful to drive with amounts of specified drugs that exceed the maximum set concentration. The specific link between drug concentration, impairment and the risk of a crash still needs more research. To date, a few countries, including the United Kingdom, have adopted per se laws (Box 1).

A total of 159 countries around the world have national legislation prohibiting drug-driving but most of these laws do not define what is considered to be a "drug", nor do they specify a threshold *(7)*. It will be difficult to enforce drug-driving laws in countries that have neither defined what is considered to be a "drug" nor specified a threshold.

Box 1
Drug-driving legislation in the United Kingdom

In 2012, the government of the United Kingdom announced a new offence in relation to driving with specific controlled drugs in the body above the limit specified in regulations. The Crime and Courts Act inserted a new section 5A in the Road Traffic Act 1988 *(16,17)*. Thus, on 2 March 2015, new regulations came into force in England and Wales, addressing eight general prescription drugs and eight illicit drugs. Regulations on amphetamines came into force on 14 April 2015.

EXCERPTS FROM ROAD TRAFFIC ACT 1988

Section 4. Driving, or being in charge, when under influence of drink or drugs.

(1) A person who, when driving or attempting to drive a mechanically propelled vehicle on a road or other public place, is unfit to drive through drink or drugs is guilty of an offence.

(2) Without prejudice to subsection (1) above, a person who, when in charge of a mechanically propelled vehicle which is on a road or other public place, is unfit to drive through drink or drugs is guilty of an offence.

(...)

Section 5A. Driving or being in charge of a motor vehicle with concentration of specified controlled drug above specified limit

(1) This section applies where a person ("D")—

(a) drives or attempts to drive a motor vehicle on a road or other public place, or

(b) is in charge of a motor vehicle on a road or other public place, and there is in D's body a specified controlled drug.

(2) D is guilty of an offence if the proportion of the drug in D's blood or urine exceeds the specified limit for that drug.

(...)

Specified controlled drugs and specified limits in England and Wales based on the Drug-Driving (specified limits) (England and Wales) Regulations 2014 and the Drug-Driving (specified limits) (England and Wales) Amendments regulations 2015

Controlled drug	Limit (microgrammes per litre of blood)
Amphetamine	250
Benzoylecgonine	50
Clonazepam	50
Cocaine	10
Delta-9-Tetrahydrocannabinol	2
Diazepam	550
Flunitrazepam	300
Ketamine	20
Lorazepam	100
Lysergic Acid Diethylamide	1
Methadone	500
Methylamphetamine	10
Methylenedioxymethamphetamine	10
6-Monoacetylmorphine	5
Morphine	80
Oxazepam	300
Temazepam	1000