EXECUTIVE SUMMARY

On the heels of several decades of successful efforts to understand and reduce the magnitude of the problems associated with driving after consuming alcohol, driving while impaired by other psychoactive substances has emerged as a road safety issue of its own. There are a wide variety of substances that have the potential to adversely affect the cognitive and behavioural skills required to operate a vehicle safely. The list of substances includes many illegal drugs (*e.g.* cannabis, ecstasy), psychotropic medications (*e.g.* benzodiazepines, opiates), and some over-the-counter preparations (*e.g.* antihistamines, cough and cold remedies). Despite the apparent similarity with the problem of alcohol use and driving, drug-driving[1] presents a whole new array of challenges for research, policy, and programmes.

Efforts to deal effectively with the use of drugs by drivers have been hindered by the incomplete and sometimes inconclusive evidence pertaining to the issue. Whereas drinking and driving countermeasures have been aided by the considerable evidence on the problem that has accumulated over the past fifty years, the state of knowledge on drug-driving pales in comparison. To a large extent, this is because drug-driving is a much more complex issue. Not only are there numerous substances that have the potential to impair driving abilities, detecting and measuring these substances cannot be done using breath samples but require more intrusive methods to gather samples of bodily fluids such as blood, urine, and/or oral fluid. This creates methodological and logistical obstacles to the study of drivers on the road and drivers involved in crashes. In addition, whereas alcohol use is common among most segments of the driving age population, different types of drugs tend to be used by subgroups within the population for a variety of purposes. Each substance presents a new set of challenges.

The Evidence

A complete understanding of the role of drugs in motor vehicle crashes requires evidence from two complementary research approaches – experimental and epidemiological research. The role of experimentation is to document the nature and extent of impairment produced by specific dosages of particular drugs. The role of epidemiological studies is to determine the extent to which drugs contribute to motor vehicle collisions.

A wide variety of psychoactive drugs, whether ingested for legitimate medical reasons, misused, or taken for illicit recreational purposes, cause changes in the brain, which disrupt normal cognitive and psychomotor functioning. They do this through a number of different mechanisms depending on the type of substance. Some affect alertness and perception; others increase impulsiveness; still others slow the speed at which the brain receives processes and responds to environmental information. All of these mechanisms have the same net effect – a decrease in the quality of mental and physiological effort dedicated to the driving task, decreasing performance and increasing the risk of crash involvement.

The use of psychoactive substances for their mood-altering and/or euphoric properties is not uncommon. Recent surveys indicate that about 15% of the population report the use of a psychoactive

substance (excluding alcohol and prescription pharmaceuticals) at least once in the previous year. Given that the vast majority of people in Western countries drive a motor vehicle on a regular basis, it is not surprising that drug use and driving have occasion to occur in close temporal proximity.

Roadside surveys have been used to determine the extent to which drugs are used by drivers. Despite the logistical and technological challenges, roadside surveys of nighttime drivers in North America have determined that psychoactive drugs are found in 10 to 16% of drivers. Based on this evidence, the prevalence of drug use by drivers now rivals or exceeds that of drivers who have been drinking. In Europe, where roadside surveys of drug use among drivers are typically done at all times of day, drug use appears somewhat lower than in North America.

Drivers who have used drugs also tend to become involved in serious crashes. Numerous studies have examined the incidence of drugs among drivers injured or killed in motor vehicle crashes. The majority of studies report the overall incidence of drugs to be in the range of 14% to 17%. Cannabis is the most commonly found substance, followed by benzodiazepines. Estimates vary widely and depend on the type of crash and selection of cases. Nevertheless, the evidence clearly demonstrates that drugs other than alcohol are not uncommon among drivers involved in serious road crashes.

The key issue, however, is not how frequently drugs are detected among drivers, but the extent to which consumption of a particular psychoactive substance contributed to the crash. Analytic epidemiological studies seek to determine the extent to which drugs are disproportionately represented among drivers who become involved in road crashes and to quantify the crash risk associated with the use of various types of drugs. Three approaches have been used to estimate crash risk: case-control studies, crash responsibility/culpability studies, and pharmacoepidemiological studies. These studies face many methodological obstacles and the differences in findings may be attributable, in part, to a variety of factors – *e.g.* approach (case-control, responsibility analysis); severity of crash (*e.g.* injury, fatal); fluid tested (*e.g.* urine, blood); and sample size. Nevertheless, despite these challenges, the overall weight of the evidence reveals an increased risk of crash involvement among drivers who consume various types of substances. Two things are eminently clear. First, the magnitude of the crash risks associated with drug use is typically lower than those associated with alcohol use, particularly those at higher blood alcohol levels. Second, impairing substances pose greater risks when combined with even small amounts of alcohol.

Further studies employing large samples and rigorous methods will enhance our understanding of the extent of the risk posed by the use of drugs by drivers. Some of this research is currently being conducted as part of the DRUID[2] project in various centres across Europe. In addition, in the United States the National Highway Traffic Safety Administration is developing a plan to conduct a large-scale case-control study to examine the risks associated with driving after drug use. The results of these projects will provide valuable information that will be instrumental in furthering our understanding of the issue, establishing public policy, and developing enforcement and prevention programmes.

Legislation, Enforcement, and Prevention

Efforts to deal effectively with drug-driving usually involve a combination of legislative initiatives, enforcement practices, and primary prevention activities. To date, the nature of these efforts have been modelled on the wealth of experience with measures introduced to control the drink-driving problem. A great deal has been learned over the past 30 years about effective ways to reduce drinking and driving and these lessons have guided the development and implementation of measures to control the drug-driving problem.

Despite the obvious parallels between drink- and drug-driving, there are numerous differences that must be taken into account in the adaptation of countermeasure programmes. For example, the term "drugs" encompasses a wide variety of substances. Some are illegal but are widely used for their euphoric effects (*e.g.* cannabis, cocaine); others are prescribed for legitimate medical purposes (*e.g.* benzodiazepines); still others can be purchased directly by consumers to treat minor ailments (*e.g.* antihistamines). In addition, some prescription medications are used inappropriately (*e.g.* wrong dose, with alcohol) or by those for whom they were not prescribed. Each of these situations involves different behaviours, motivations, and subgroups within the population. Any approach must take account of these various situations.

To a large extent, countries have used their drink-driving legislation as a model for their legal approach to drug-driving. Legislation falls into two general categories – behaviour-based (*i.e.* impairment) statutes and *per se* laws. Behaviour-based statutes focus on the degradation of driving skills as a consequence of consuming a psychoactive substance. These types of laws date back to the early part of the twentieth century and were introduced as a means to control "drunk driving" or "driving while intoxicated." Over the years, a more objective standard of "impairment" was introduced and standardised protocols have been implemented to demonstrate the extent to which a driver's ability had been compromised. These standards have been adapted and applied to deal with the drug-driving situation.

Per se laws also have their roots in efforts to deal with drink-driving. Based on the established relationships between blood alcohol concentration (BAC), impairment and crash risk, *per se* laws specify that drivers have committed an offence if their BAC exceeds a specified value. Such laws create a legal "short cut", eliminating the requirement to demonstrate that the driver was adversely affected by the consumption of alcohol. Adapting *per se* laws to the drug-driving situation has proven somewhat more difficult. Whereas research over the past fifty years has clearly established the link between alcohol, impairment and crash risk, similar evidence is not available for every potentially impairing substance.

The alternative used by a number of jurisdictions is to set the *per se* limit for drugs at zero. So-called "zero tolerance" laws specify that any detectable amount of particular substances found in the body of a driver would be considered to constitute an offence. Several countries have zero tolerance laws for illegal drugs and/or specifically named substances. In the absence of definitive research evidence supporting an alternative *per se* limit, zero tolerance laws serve to reinforce existing laws against the possession and/or use of illegal substances.

Whereas zero tolerance laws for illegal substances might be politically acceptable and expeditious, such is not the case for medicinal substances. Establishing a zero tolerance standard for all medicinal psychoactive drugs would disqualify a large number of individuals from operating vehicles, a position that lacks unqualified scientific support. Nevertheless, any approach must acknowledge that many psychoactive pharmaceuticals can cause driver impairment, particularly upon initial use, following a change in dosage, when used inappropriately, or when combined with the use of other drugs and/or alcohol.

To a large extent, enforcement practices are determined by the type of drug-driving legislation in the jurisdiction. Behaviour-based statutes require police officers to collect and document evidence of impaired behaviour and to demonstrate that a psychoactive substance capable of producing the observed behaviour was present in the driver at the time. This often requires police officers to be specially trained to assess impairment and recognise the signs and symptoms of drug use (*e.g.* Drug Evaluation and Classification [DEC] Programme). The officer must also arrange for the collection of a biological specimen from the driver to determine the type of substance present. The enforcement of *per se* statutes

only requires the officer to collect a sample of bodily fluid that will be tested for the presence of psychoactive substances.

Checkpoints or controls have been used extensively in many countries to detect alcohol- and drug-impaired drivers. Although resource intensive, controls have been shown to be effective in identifying drinking drivers and reducing alcohol-impaired driving, most likely by providing a strong deterrent. The impact of controls on drug-driving has yet to be demonstrated.

Jurisdictions differ in terms of circumstances under which drivers may be tested for alcohol or drugs. Some jurisdictions require officers to have a suspicion of alcohol or drug use, or reasonable grounds to believe the driver is impaired, before demanding a specimen for testing. In several jurisdictions in Europe and Australia, however, random alcohol testing, and more recently random drug testing, is permitted. This allows police to demand a bodily fluid sample at any time without cause or suspicion. When implemented on a large scale, this approach increases both the perceived and actual probability of detection, thereby enhancing overall general deterrence.

Primary prevention efforts directed at drug-driving have been relatively superficial. Most programmes have relied heavily on public education/awareness and deterrence through media and enforcement. Admittedly, prevention of drug-driving can be a complex issue. There are numerous types of substances involved and a variety of groups within the population that use different types of substances, each of which most likely requires a distinct and separate approach.

Conclusion

Whereas there may be similarities and parallels between drink-driving and drug-driving, it is important to appreciate the real and substantive differences between the two issues. In this context, it cannot simply be assumed that the same techniques, policies, procedures and countermeasures that were developed for the drink-driving problem can be readily adapted or transferred to deal with the drug-driving issue. Drug-driving is a more complex issue. Many questions remain. At the very least, the approach to drug-driving must acknowledge the variety of different situations in which the behaviour occurs; at the extreme, several different strategies may be required, each with a unique perspective on prevention, enforcement, sanctions, and rehabilitation. Further research is required to help unravel the intricacies of the drug-driving problem and to facilitate the development of new and effective approaches to deal with it.

NOTES

1.   In this report, the term "drug-driving" refers to driving after the use of a psychoactive drug, including, but not limited to, driving while one's ability to do so is impaired by drug use, referred to as "drug-impaired driving". Similarly, the terms "drink-driving" and "driving after drinking" refer to the operation of a vehicle following the consumption of alcohol. This includes, but is not limited to, "alcohol-impaired driving", which refers to driving after consuming sufficient alcohol to impair one's ability to drive safely.

2.   DRUID is the acronym of the European research project "Driving under the Influence of Drugs, Alcohol and Medicines".