SAFETY   RISK

CANNABIS & ROAD SAFETY:
POLICY CHALLENGES

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ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

Drugged driving has been increasingly recognized as a priority in the past decade. Growing discussions among Federal government agencies regarding public safety concerns and the regulatory approach to cannabis has prompted greater attention to drugged driving and strategies to address this problem. Coordinated action across law enforcement, transportation and health sectors at Federal and provincial/territorial levels is needed to keep Canadians safe on our roads. To date, governments have been challenged by competing road safety priorities and the issue of drugged driving has been one of many that demands attention. As such, the recent focus on cannabis provides an important opportunity to review and explore effective strategies to prevent and reduce drugged driving. To this end, several priority issues must be addressed and resolved so that provincial governments and road safety stakeholders are able to implement effective policies and programs with respect to cannabis-impaired driving. These issues include: research, laws and penalties, implementation strategies, public perceptions and education, and metrics and evaluation. Decisions in these areas will influence effectiveness in preventing and reducing cannabis-impaired driving.

The identification of priority strategies, relevant issues, and implementation plans was a central focus of this study, which can serve to inform road safety strategies for drugged driving. A total of 46 individuals consisting of both line staff and managers from 25 agencies that represented Federal and provincial stakeholders in the areas of law enforcement, transportation and health were interviewed to identify cannabis-impaired driving legislative and policy priorities, the types of knowledge that are most relevant to inform decision-making in these areas, and concerns related to implementation.

The results from this study highlighted the priority issues related to cannabis-impaired driving that require attention and coordinated action. These results provided practical insight into the knowledge and tools that are needed to help stakeholders address this issue, and, the remaining barriers that must be overcome to ensure road safety enhancements. The following results highlight the top five areas of consensus:

Research

> To date, research conducted on the effects of cannabis is relatively scarce in comparison to the body of research that has been conducted on alcohol and as a consequence, important questions remain unanswered. Key questions include:

» What is the relationship between cannabis and its impairing effects on driving ability, and how will the THC[1] concentration and method of ingestion affect impairment?

» Will the new regime for cannabis have any effect on impaired-driving fatal and serious injury crashes?

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[1] Tetrahydrocannabinol

» What are the best practices for remedial programs for drivers convicted of cannabis-impaired driving?

Laws & penalties

> Laws and penalties for drug-impaired driving that are in place can be enhanced; however, the strengths and limitations of optional approaches should be carefully considered. The ability of police to reasonably investigate and detect impairment will be shaped by these decisions. They will require the investigative ability and tools to detect all forms of cannabis impairment.

» The impairing effects of cannabis can vary over time in accordance with how the drug was ingested, and therefore the window of time that officers have to investigate should acknowledge these differences.

» What are the skills and qualifications that will be required of officers who utilize oral fluid devices?

Implementation strategies

> Well-planned, operational practices are necessary to ensure legislation is implemented and to provide practitioners with the guidance and tools which are a linchpin to success.

> Time, capacity and resources are essential for jurisdictions to implement drugged driving policy in accordance with regulatory approaches. It could take 18 to 24 months for provincial/territorial governments to put practices into place.

> Lessons learned from other jurisdictions that have undertaken such regulatory changes highlight the need for adequate preparedness, since it has been more difficult to overcome gaps using post hoc strategies.

> Inadequate funding is the most significant barrier to implementation. There are substantial cost implications associated with additional staff, training and certification, roadside devices and test analysis, increased emergency room capabilities, data collection and evaluation, and public education initiatives. Other priorities in terms of practice include:

» Strengthening the number of officers trained to recognize impairment (SFST and DRE trained officers).

» Increasing knowledge of drug-impairment and DRE evidence among court personnel.

» Considering the implementation of oral fluid devices.

» Increasing the capacity for health services to accommodate the rise in emergency room (ER) admissions due to cannabis overdose or accidental ingestion.

» Reviewing the capacity of labs to analyze a growing number of samples and report test results in a timely manner in order to avoid undue delays and to ensure due process protections.

> Many of these initiatives are already underway and continued efforts are needed.

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Public perceptions & education

> The pervasiveness of messages from pro-cannabis groups has made it more challenging for road safety messages to be heard. As such, it is important that road safety stakeholders are equally vocal and convey a message that is widely heard so Canadians can make informed decisions based on more complete knowledge of the issue.

Prevalent misperceptions include:

>> "Cannabis is not harmful." It is often reported that cannabis is perceived as a healthy and organic medicinal and natural herb.

>> "Cannabis does not impair driving ability." It is often reported that users feel they are 'better' driver after using cannabis, and they believe that they drive more cautiously, at slower speeds, and take fewer risks.

>> "Police are unable to detect cannabis-impaired drivers or remove them from the road." The experiences of police officers suggest that a least a proportion of drivers do not know that tools are available to test for cannabis impairment at the roadside.

> Public education campaigns that are delivered in advance of any changes to the regulatory framework, and as often as possible, will ensure that the public has had time to establish a knowledge base on this issue. The delivery of a coordinated and consistent national message can be formed though an inclusive partnership, between government and one or more national road safety stakeholders that can provide access to a large audience of members.

> It will be beneficial for public education campaigns to emphasize the impairing effects and risks associated with cannabis and driving. Messages that are targeted towards youth and high-risk populations will help key lessons resonate with these specific groups. However, it will be important to ensure that messages do not inadvertently encourage persons who may not otherwise use cannabis, and who may be pre-disposed to substance misuse or abuse, to avoid initiating use. Comparisons with alcohol impairment should also be avoided in light of evidence that these drugs have different effects and are metabolized differently.

Metrics & evaluation

> The ability to consistently collect data and track, monitor and evaluate the effects of cannabis on road safety, and the effects of programs and policies to reduce and prevent cannabis-impaired driving will be critical to gauge current and future strategies.

> Improvements in data collection and standardization will help increase knowledge and coordination of activities across sectors, promoting the mobilization of joint strategies to address this issue.

> Improvements in data collection will make it possible to measure progress in order to obtain long-term insight into the effectiveness of cannabis-impaired driving prevention strategies.

> Partnerships between Federal and provincial agencies representing law enforcement, transportation and health will be important to create a national picture on cannabis-impaired driving.

To conclude, cannabis-impaired driving is complex, and it will require a continuum of road safety strategies to complement new legislative changes to cannabis regulation. To realize this, communication and direction from the Federal agencies that reaches through to the level of frontline practitioners would help inform initiatives that are planned or underway. This would be indispensable and would aid the allocation of resources and help avoid duplication. Fortunately, there is avid receptivity from stakeholders and road safety practitioners, and much work is already underway by various governments.

In addition to this, cannabis-impaired driving prevention will require adequate resources in the form of capacity, time and funding to support the necessary large-scale modifications to road safety policies and programs to reinforce the emphasis on safety underscored by the Federal government. In light of the time required to affect policy change and put into practice strategies and programs, it would be beneficial to ensure that sufficient time is made available to assist provinces in realizing these changes.

INTRODUCTION

Drugged driving has been increasingly recognized as a priority in the past decade. Growing discussion among government agencies regarding public safety concerns and the regulatory approach to cannabis has prompted greater attention to drugged driving and strategies to address this problem. Coordinated action across law enforcement, transportation and health sectors at Federal and provincial/territorial levels is needed to keep Canadians safe on our roads. To date, governments have been challenged by competing road safety priorities and the issue of drugged driving has been one of many that demands attention. As such, the recent focus on cannabis provides an important opportunity to review and explore effective strategies to prevent and reduce drugged driving. To this end, several priority issues must be addressed and resolved so that provincial governments and road safety stakeholders are able to implement effective policies and programs with respect to cannabis-impaired driving. These issues include:

> **Research.** The availability and dissemination of existing research in conjunction with new research initiatives to answer important questions across sectors and agencies. This knowledge is essential to inform policy and program decisions.

> **Laws and penalties**. The availability of laws, penalties and police tools to investigate suspected cannabis-impaired drivers and remove them from the road, as well as the effectiveness of cannabis-impaired driving laws in reducing road crashes.

> **Implementation strategies.** The capacity of agencies to implement new policies and programs that reflect new perspectives and thinking about cannabis

> **Public perceptions and education campaigns.** The content and scope of public education campaigns to inform drivers about new laws and penalties, and also to tackle misperceptions about cannabis and driving and the perceived inability of police to enforce such laws.

> **Metrics and evaluation.** The need for uniform and comprehensive strategies to collect data on the prevalence of drug-impaired driving, and to support the evaluation of drug-impaired driving strategies and the effects of proposed changes to cannabis legislation on road safety.

Cannabis-impaired driving is a complex issue that requires coordinated and multi-disciplinary action across law enforcement, transportation, and health agencies. This report describes priority issues that will need to be addressed and resolved to help jurisdictions implement effective policies and programs. Activities are already underway across agencies to gather evidence, experience and knowledge to inform discussions about cannabis and drugged driving approaches. However, knowledge to help guide policy and program decisions must be well-communicated and shared to avoid duplication and efficiently allocate resources.

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Objectives

This study was designed to identify priority strategies, relevant issues, and implementation plans with respect to preparations to manage and address cannabis-impaired driving across Canada. Provincial government stakeholders, including transportation, enforcement, and health agencies from regions across Canada (British Columbia, Alberta, Ontario, Quebec, and the Maritimes), as well as staff representing several Federal Government agencies were interviewed both in-person and by phone to identify cannabis-impaired driving legislative and policy priorities, the types of knowledge that are most relevant to inform decision-making in these areas, and concerns related to implementation. Collectively, the results of these interviews can help to inform the development of tools and resources that can guide efforts to share information as well as the development of programs and policies.

Key informant interview modalities

The interviews consisted of a series of structured questions compiled in a discussion guide. Five priority topics were addressed: research, legislation and penalties, implementation strategies, public education, and metrics and evaluation. TIRF interviewed a total of 46 individuals consisting of both line staff and managers from 25 agencies that represented Federal and provincial stakeholders in the areas of law enforcement, transportation and health in Canada. There was a fairly equal distribution of participants from the three stakeholder groups. Data were collected during July and August 2016, and interview results were aggregated and synthesized. Key areas of consensus that emerged from these interviews are described in this report.

The design and implementation of more effective strategies to prevent and reduce drugged driving is a complex issue that requires coordinated action between Federal and provincial/territorial governments. Implications arising from these proposed changes are far-reaching and cannabis-impaired driving will impact road safety policies, programs and practices across law enforcement, transportation and health sectors. As such, communication between these agencies and stakeholders is paramount to the successful implementation of effective strategies to prevent and reduce cannabis-impaired driving. The sharing of critical information provides a much-needed foundation to not only coordinate activities, but also avoid duplication of efforts at a time when funding resources are finite and scarce.

In addition, agencies require adequate capacity and time to plan and prepare for the implementation of harmonized strategies prior to proposed legislative changes being proclaimed into law. The most compelling lesson that has been learned from jurisdictions that have permitted legal access to cannabis is that failing to plan well and anticipate the increased demands that will be placed on various government services poses incredible challenges in managing the consequences of cannabis-impaired driving in the long-term.

To help inform planning discussions related to the implementation of new legislative approaches to cannabis, this comprehensive report summarizes priority issues related to this topic that require attention and coordinated action. It provides practical insight regarding the knowledge and tools that are needed to help provincial/territorial governments and other road safety stakeholders address the issue of cannabis-impaired driving, and some of the barriers that must be overcome to ensure the safety of Canadians on our roads.

In particular, the report provides an overview of the most pertinent research questions that must be addressed to guide the development of policies and programs. It also provides important insight regarding the laws and penalties that are already available, as well as lessons learned with regard to implementation, and barriers that remain. This report also includes a discussion of current public perceptions that will require careful planning and concerted attention during the development of education campaigns. Finally, this report underscores the need for effective strategies to measure, monitor, and evaluate the effects of proposed changes to cannabis legislation on impaired driving.

Research

To date, the research conducted on the effects of cannabis is relatively scarce in comparison to the body of research that has been conducted on alcohol. This is likely due to administrative and ethical barriers associated with human subjects research that prohibit dosing persons with one or more drugs at levels that are more typical of either recreational use, abuse or addiction. As a consequence, important questions remain unanswered, or answers that are available cannot be generalized to a broader population of drivers. Some of the most pressing and common research questions that have been identified include:

> **How can we better estimate the magnitude of the relationship between THC[2] use and collision risk?** This issue is highly relevant to inform decision-making about the identification of impaired drivers, ways that impairment can be measured, and strategies that jurisdictions will use to remove impaired drivers from the road.

> **How do the impairing effects of cannabis vary in accordance with THC concentration and method of ingestion?** Jurisdictions that have implemented laws that permit the use of cannabis have reported that the uptake of use of edibles and vaping[3], particularly among youth, has resulted in unprecedented increases in hospital emergency room admissions due to psychotic episodes (The Globe and Mail 2016). These products often have much higher concentrations of THC, and impairing effects may not be immediate. The public is generally unaware of these differences, which often prompts users to consume more, with dangerous consequences. In all instances, U.S. jurisdictions were quite unprepared and ill-equipped to manage these unintended negative consequences, which had substantial costs.

> **What are the short-term and long-term effects of cannabis on brain development in youth?** Answers to these questions will profoundly affect the anticipated implications for young driver strategies in particular, as well as demands for health services in the next decade. This information must also be shared through public education strategies to ensure Canadians understand the risks of cannabis use.

> **What are the long-term effects of chronic use on brain functioning?** Very little research has been conducted to investigate the effects of high doses of cannabis, and higher concentrations of THC over an extended period of time. This issue is a key concern for health agencies and will have important ramifications for the long-term planning of health services for persons of all ages, as well as hospital and emergency services.

> **How does increased availability and access to cannabis affect usage rates among youth and adults?** Some research suggests that cannabis is a gateway drug to other illicit substances. It has also been proposed that individuals who are more vulnerable to drug-taking are likely to start with readily available substances like cannabis, tobacco or alcohol, and that subsequent socializing with other substance users may then increase their likelihood of experimenting with other drugs (NIDA 2016). More research is necessary to address these pertinent questions in order to shape policy and practices.

> **Will there be any effect of the new regime for cannabis on impaired-driving fatal and serious injury crashes?** This issue is a source of considerable concern and requires careful monitoring to protect the safety and health of all Canadians.

> **What best practices are available to guide the development of remedial programs for drivers convicted of cannabis-impaired driving?** Jurisdictions have long relied on the administration of remedial programs to educate convicted offenders about the risks and

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[2] Tetrahydrocannabinol
[3] Edibles are cannabis-infused products that are consumed orally. Vaping allows users to inhale active cannabinoids through vaporizers as opposed to the smoking of cannabis in a cigarette.

consequences of alcohol-impaired driving. To date, limited knowledge is available about effective educational tools for offenders, however, research does show that the characteristics of drug-impaired drivers are quite different from alcohol-impaired drivers (Maxwell 2012). This suggests that current strategies to educate alcohol-impaired drivers may not be relevant to drivers who are impaired by cannabis.

More generally, it is imperative that research is conducted to respond to this demand for information, and enable jurisdictions to understand ways that government services and the safety of Canadians may be affected, especially since so little is currently known about the long-term effects of this drug.

In addition, the formulation of research questions using a cross-disciplinary approach involving law enforcement, transportation and health sectors will create much-needed efficiencies and assist jurisdictions in allocating the limited resources that are available for this task. To this end, it will be equally important to also share information about proposed, ongoing, or recently completed studies undertaken by Federal and national bodies to reduce duplication and maximize the quality and scope of research that is undertaken.

Laws and penalties

The development of new provincial road safety legislation and policy to prevent and reduce cannabis-impaired driving will be highly dependent on the approach of the Federal government to a new regime surrounding cannabis accessibility and use. In several jurisdictions, it has been challenging to undertake planning and preparation to develop and implement road safety legislation and policy since there are a multitude of regulatory approaches that the Federal government may consider. For example, the implications for strategy will vary substantially in accordance with a regulatory approach that is more similar to alcohol as opposed to tobacco, and whether or not per se limits for THC are adopted.

To this end, the ability of jurisdictions to take action to address cannabis-impaired driving may be hindered without clear and timely direction from Federal decision-makers regarding approaches that are being contemplated, and that may be more practicable or feasible. The sharing of general parameters related to strategy options that are under consideration would be welcome and provide provincial/territorial governments with a basis to begin more concrete development of their respective strategies.

Drug-impaired driving laws have been implemented in other jurisdictions in one of three ways; impairment-based laws, per se laws, and zero tolerance laws. Each of these approaches is associated with both advantages and disadvantages which are briefly summarized below in the context of Canada.

Impairment-based laws. To date, Canada has utilized an impairment-based approach to drugged-driving laws. Impairment-based laws require police officers to document observed impaired behaviour that is directly linked to drug use. This is usually accomplished through observations of the driver, the use of Standard Field Sobriety Tests (SFST), Drug Recognition Experts (DREs), and confirmatory drug analysis tests. The evidentiary burden is not insubstantial.

There is growing familiarity among law enforcement, and to a lesser extent courts, regarding the use of and the validity and reliability of physiological and behavioural indicators of drug-impairment. However, the science in support of DRE is still not well-recognized or understood among police officers generally or legal professionals. Of note, the acceptance of impairment-based evidence has increased among courts since 2008, however, acceptance has been hard won, and much more concerted efforts are needed in this regard. At present, impairment-based laws remain difficult to enforce without broad court acceptance, as driving impairment must be proven and directly linked to drug use. For example, chronic drug users who are able to compensate for the impairing effects of their drug use may be better able to avoid detection and punishment as compared to infrequent users.

Per se laws. There has been discussion about the use of a per se law that prohibits the operation of a motor vehicle at or above a specific level of THC that is present in a person's system and indicative of impairment. Some jurisdictions have opted to set a limit of 5ng/ml of active THC whereas other jurisdictions have selected a more conservative limit of 2ng/ml. Some of the benefits of this approach include that it is consistent with alcohol-impaired driving laws, and that a specified per se limit would provide a clear cut-off to determine whether a driver was or was not impaired.

However, there has been much debate concerning the validity of a per se limit for cannabis mainly due to a lack of scientific consensus regarding what level of THC in a volume of blood constitutes driving impairment (Kelly et al. 2004). In addition, there is recent research evidence that suggests that the accuracy of DRE evaluations of cannabis impairment is less conclusive at a 5ng/ml per se limit (Logan et al. 2016; Armentano 2013). This means that a per se limit may produce unintended negative consequences for the enforcement of cannabis-impaired driving laws without the widespread reliability of proven roadside testing devices. As a consequence, it is believed that a per se limit would be very vulnerable to legal challenge at this time, particularly as the defence bar becomes more informed about the science of drug impairment and effects on driving.

Of greater concern, it is also unlikely that convincing evidence regarding THC levels and impairment will become available in the short-term in light of ethical barriers associated with dosing human subjects with higher levels of THC consistent with real world use (Helm & Leichtman 2015). To account for this, the legislation in Colorado specifies that there is a permissible inference that defendants were driving under the influence of cannabis, allowing the level of THC in the blood to be considered as evidence of impairment, but alone not constituting impairment (Colorado Revised Statutes 2015). This may present a more viable approach to the implementation of a per se law in Canada, that is consistent with court acceptance of behavioural impairment.

Zero-tolerance laws. Finally, some jurisdictions have opted to implement 'zero-tolerance' laws which are often considered to be a variation of per se laws since the presence of even a small amount of any drug could result in a drug-impaired driving charge; hence the evidentiary burden is quite low. Opponents to this approach often argue that zero-tolerance laws are more about drug-control than road safety because such laws place a focus on detecting all drug users as opposed to drug-impaired drivers. There are also important challenges associated with zero-tolerance laws including the fact that several drugs remain detectable in the body even days after use has ceased, and long after the impairing effects have ended (Cary 2006).

Regardless, zero-tolerance laws are most-often favoured in relation to young and novice drivers, and the age of eligibility to purchase cannabis will have important implications for such laws. All jurisdictions in Canada have Graduated Driver Licensing (GDL) programs for young drivers that include a zero tolerance law for alcohol. Penalties for such violations may include a roadside suspension, licence suspension, fines, or participation in specific programs. Moreover, in at least some jurisdictions such as Ontario and Manitoba, zero-tolerance laws have been extended to all young drivers until age 21.

In sharp contrast, no such laws for cannabis are a component of GDL programs, and it has been argued that young drivers may be more likely to gravitate to cannabis use in lieu of alcohol to avoid penalties. In other words, zero-tolerance laws should be considered for young drivers across Canada, and the age at which young drivers are able to purchase cannabis, and whether there is uniformity in terms of the age of purchase across Canada will greatly influence provincial road safety legislation with regard to young drivers

Window of time for investigation. A related issue associated with the practical enforcement of both impairment-based and per se laws is the window of time that officers will have to conduct an investigation and collect relevant evidence of impairment. A primary concern relates to a potentially smaller window of time at the roadside to gather impairment evidence. Cannabis has a half-life of about two hours and levels of THC in the blood peak about 10 minutes after smoking (Vestraete & Legrand 2014). This means that the timeliness with which SFSTs can be administered and a DRE officer can attend the scene or the detachment to conduct a drug evaluation, or with which a warrant can be obtained and blood evidence can be collected by hospital staff, will be crucial to the successful charging and prosecution of impaired drivers.

Oral fluid testing devices. Oral fluid testing devices to detect THC or other drugs in the saliva of a driver are not expected to become available in the short-term. However, the implementation of legislation to approve such devices and provide officers with the authority to administer such tests is also a topic of debate. This is due, in part, to varied perspectives regarding whether the availability of such a device will improve the enforcement of drug-impaired driving laws, and in part due to the type of qualifications that officers will require to administer oral fluid tests. On one hand, it is perceived that oral fluid testing devices will be used by all patrol officers, similar to the approved screening device (ASD), and that this will reduce demands for trained DRE officers and increase enforcement and the detection of drug-impaired drivers to remove them from the road. In addition, the use of these devices would provide valuable evidence in court to clearly demonstrate that drivers exceeded a per se limit.

Conversely, it has equally been suggested that only officers who are SFST-trained, or DREs will be able to collect oral fluid samples. This is due to the need to establish reasonable suspicion of impairment due to drug, meaning that it may not be possible to administer the oral fluid test without first gathering sufficient evidence of impairment to warrant the demand. To date, evidence of impaired behaviour from DRE officers has been required by courts to proceed with a prosecution. While it may be perceived that oral fluid devices combined with a per se law would be considerably easier to apply in practice, the availability of roadside test results for cannabis still may not preclude the need for DRE evidence of impaired behaviour as a pre-requisite for prosecution. As such, the value of oral fluid results in the absence of a trained officer to collect impairment

evidence may be questionable, regardless of whether the test demonstrates a driver exceeded the THC threshold in a per se law. Moreover, the cost of testing devices may make them prohibitive, particularly for larger agencies that would have to purchase many more devices to outfit each patrol shift.

Investigative powers. Other concerns that have been raised in relation to existing as well as proposed drug-impaired driving laws more generally are associated with the investigative powers that are granted to police officers. At present, officers are unable to administer SFSTs or make a DRE demand based solely on the presence of cannabis in a vehicle. To illustrate, currently officers are unable to stop a driver for testing at a sobriety checkpoint (i.e., RIDE program), even when cannabis is observed in a vehicle, due to the lack of driving evidence. As such, there are concerns among some law enforcement officers that the detection of impaired drivers may become more challenging as a result of the increased availability of cannabis edibles and ingestion through vaping[4] which are odourless. Questions have also been raised regarding whether officers will be able to initiate an investigation based on the presence of cannabis or drug paraphernalia alone, or to seize such devices in much the same way that they would seize open containers of liquor.

Provincial penalties for drug-impaired driving offences. All jurisdictions have implemented a set of provincial penalties associated with alcohol-impaired driving offences to augment Criminal Code sanctions. These may include roadside sanctions, licence suspensions, vehicle impoundment, use of an alcohol interlock and remedial education programs, assessment practices and treatment services to reduce impaired driving. In the same vein, provincial/territorial jurisdictions anticipate some need for a similar administrative framework for drug-impaired driving offences. As such, guidance from the Federal Government regarding potential regulatory approaches to the sale of cannabis, and tools and sanctions to enforce cannabis-impaired driving laws would greatly aid in deliberations by provincial/territorial governments.

Most notably, roadside sanctions are indispensable to enable police officers to remove suspected impaired drivers from the road following an investigation. At present, in a limited number of jurisdictions, roadside sanctions are applicable to all suspected impaired drivers, regardless of whether alcohol or one or more drugs is a suspected source of impairment. However, in most jurisdictions, impairment is specifically associated with alcohol. As a consequence, in many instances when impairment by drug is suspected, but an SFST-trained or DRE officer is unavailable, officers lack tools to remove these drivers from the road. However, nationally, the general lack of administrative tools for law enforcement to deal with drug-impaired drivers seriously undermines the enforcement of drug-impaired driving laws and erodes deterrent effects. Of concern, this is evidenced by anecdotal reports from police that drivers suspected of impairment by cannabis are certainly aware of the low availability of DRE and SFST-trained officers, and the low likelihood of arrest or conviction.

Similarly, some jurisdictions are also re-considering the application of alcohol interlock devices to drug-impaired driving offenders. The rationale behind this approach is that many impaired drivers are polysubstance users, meaning drugs such as cannabis are often used in combination with

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[4] Edibles are cannabis-infused products that are consumed orally. Vaping allows users to inhale active cannabinoids through vaporizers as opposed to the smoking of cannabis in a cigarette.

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alcohol or other substances. Hence, the required use of an alcohol interlock for cannabis-impaired drivers may have potential benefits, and at a minimum, help to avoid higher levels of impairment resulting from the use of cannabis and alcohol, the effects of which are additive.

Perhaps of greatest concern is the lack of knowledge about best practices for remedial programs for drug-impaired drivers, and the current unavailability of these programs. A shared apprehension exists regarding rehabilitation efforts to reduce the risk of recidivism among this population. Jurisdictions are currently ill-equipped to develop or implement such programs, and much more research is needed in this regard.

Summary. The new regime for cannabis that is considered by the Federal government will require careful reflection to balance the potential benefits and limitations of available approaches. Of utmost importance, laws must support the reasonable ability of police to detect and investigate suspected impaired drivers and remove them from the road, as well as provide them with adequate tools for this purpose. At the same time, the evidence gathered by police must stand up to the rigorous evidentiary standards applied by the court, and be based upon valid, reliable, and proven science that is widely accepted, and that will withstand meticulous scrutiny by the defence bar. In this regard, impairment-based laws have gained in recognition and have been established within the courts, although at times this accomplishment has been hard-won. Hence, the continued use of this approach should be encouraged.

Provincial governments equally require clear signals regarding the latest thinking in terms of Federal legislation to inform their own jurisdictional planning efforts. Meaningful communication to advise them of progress regarding the development of legislation, and features of it that are being considered for inclusion, can provide clear guidance about the most effective ways to implement complementary and efficient administrative road safety regimes that strengthen the application of Federal laws.

Implementation strategies

The development of legislation is an important first step of any strategy to improve road safety. However, creating well-planned, informed practices to ensure the fulsome implementation of legislation, and providing frontline practitioners with the requisite authority and tools is a linchpin to success. Taking stock of the status of existing practices to reduce drug-impaired driving must be a priority.

Moreover, capacity, time and resources are three essential elements that are needed by jurisdictions to prepare for the proposed new regime, and to ensure that adverse effects on the safety of Canadians on our roads are prevented. The most concerning lesson learned from other jurisdictions who have undertaken such a proposal is that it is extremely challenging to compensate for a lack of preparedness once the initiative is in place. To illustrate, failures to address public perceptions, insufficient enforcement and emergency room services, and gaps in the legal system have been difficult to overcome using post hoc strategies. In particular, unpreparedness in these areas have ultimately eroded the deterrent effects of drug-impaired driving legislation, and resulted in substantial costs and loss of life.

There are critical implementation issues that must be considered and addressed in order to avoid the anticipated negative outcomes that have the potential to occur without adequate preparation to reinforce road safety strategies.

Increase the number of SFST-trained police officers. Standardized training of all new recruits as well as adequate numbers of in-service officers are much-needed to ensure sufficient enforcement of drug-impaired driving laws. Without SFST training, officers at roadside are unable to consistently detect drug-impaired drivers, gather sufficient evidence to support an arrest, or make a determination to request a DRE officer. Training at an academy level is essential to ensure reasonable numbers of officers are available on every patrol shift, particularly in light of evidence that drug-impaired drivers are present on our roads at all hours. This is in sharp contrast to alcohol-impaired drivers who are most likely to be detected during evenings and early-morning hours or weekend nights.

To illustrate the value of this training, for more than two decades all police officers in the United States have received SFST training at an academy level as well as regular post-certified training for service officers. While there are costs associated with this approach (it takes approximately four days to complete SFST training), a few police services have already made it standard practice including Waterloo Regional Police Service and Ottawa Police Service. However, this approach does require time and funding (re-allocation of existing funding or additional funding) to implement. As evidence of this, it has taken Ottawa Police Service approximately five years to ensure all new recruits receive SFST training and this has had an estimated cost of $100,000.

There are two important caveats regarding the implementation of standardized SFST training for officers. First, it will be challenging at the outset to secure a sufficient number of trained officers who can serve as instructors for academy and in-service training. Second, once training is received, officers must be encouraged to regularly use SFST training, and the use of such tools in daily activity logs must be reinforced so that officers gain confidence and develop experience.

Increase the number of DRE-trained officers. Estimates of the number of active, DRE-trained officers in Canada are wide-ranging. However, common denominators include that there are inadequate numbers of trained officers, particularly outside of urban centres, and that there are high levels of turnover among officers whom are trained. Requests for DRE officers are frequently unmet, and this has reinforced the misperception that drug-impaired drivers cannot be detected. Of greater concern, DRE officers have not consistently been available to attend crash scenes involving victims that are seriously injured or killed, and this has undermined the detection of drug-impaired drivers in the most serious of circumstances. And in rural areas, DRE officers have not had ready access to health care professionals to collect specimens for analysis.

These challenges are in part due to deficiencies in resources, in part due to retention policies of police agencies (although these barriers are being addressed), and in part due to the considerable demands placed on these officers. Course requirements are substantial relative to other types of training that are available. Of note, it has been reported that DRE is among the most challenging of police training programs. In addition, the costs of training (which are estimated to be $5,000 per officer), which are currently absorbed by individual police agencies (RCMP funding has been discontinued) are inordinate. The course requires more than two weeks of classroom training as

well as travel to U.S. locations (i.e., Jacksonville, FL to a methadone clinic or Phoenix, Arizona to a county jail) to conduct exam testing on a population of drug offenders to receive certification from the International Association of Chiefs of Police (IACP). While efforts are underway to secure controlled access to a suitable population of drug users for the purposes of exam testing in Canada, attempts to date have been unsuccessful due to privacy issues and prison union impediments. In Quebec, there is an initiative using trained actors to overcome this barrier, however, the evaluation of this strategy is not complete and it has yet to be determined if the IACP will approve its use.

As such, the possibility of obtaining both training and certification of DRE officers in Canada would do much to reduce costs and time demands on police agencies. In this regard, efforts are underway by Public Safety Canada to determine the feasibility of delivering DRE training through provincial police training institutes, however, the feasibility of this approach is still under discussion, and a significant number of certified DRE instructors would be needed to pursue this strategy.

In the same vein, once trained and certified, DREs need time to gain confidence in the field and perfect their evaluation skills, as well as to prepare court testimony as a competent expert in the science of DRE. Such testimony may last several hours and requires substantial knowledge of the science behind the DRE evidence to withstand evidentiary challenges that are increasingly put forward by defence counsel. To date, success in court has played a critical role in determining whether officers continue their commitment to the DRE program, or become discouraged as a result of negative experiences in court.

In light of the extensive demands that are placed on officers who chose to pursue DRE qualifications, the availability of funding strategies, and the selection of traffic officers who are highly committed to the DRE program are essential pre-requisites to its success in Canada.

Increase DRE educational opportunities for Crown counsel and the judiciary. More concerted and consistent educational opportunities must be provided to Crown counsels and the judiciary. Knowledge of the DRE program and the science that supports it is generally low. Both Crown counsel and the judiciary have been reluctant to review or accept such evidence, and receptivity to DRE testimony has been inconsistent. To this end, police officers have worked closely with Crowns to ensure high-quality cases are presented in court and this has facilitated the development of strong case law, but this is not consistent across Canada.

Time is also required to expand and build understanding and familiarity among Crowns and judges of DRE evidence, as it will become more prevalent with anticipated increases in drug-impaired driving cases going to trial and defence challenges. To date, the DRE program has not been a primary focus for educational programs offered to Crowns and judges. Their opportunities to learn have not been commensurate with the level of education offered to police. This disparity could be resolved with greater efforts to build relationships between DRE officers and Crowns who are able to lay the groundwork to increase judicial knowledge of DRE evidence and its role in court.

Consider implementation options for oral fluid devices. The use of oral fluid devices as a screening measure of THC levels at roadside will certainly help to improve the identification of suspected impaired drivers. The implementation of devices will require careful consideration to maximize their benefits. In particular, consultation with police agencies to determine what types of

training officers may need to utilize these devices is an important feature. For example, devices may be of limited value to officers who are not able to identify suspected impaired drivers using SFSTs, or evidence from the device may not be admissible in court without complementary evidence of impaired behaviour from officers. In this regard, there are competing perspectives regarding whether all officers should have access to a device (comparable to the widespread availability of approved screening devices or ASDs for alcohol), or just SFST-trained and DRE officers will benefit from their availability in light of their capacity to testify about the test results. Decisions will have important implications for the level of enforcement for drug-impaired driving laws.

Ensure licensing authorities have adequate time to develop and deploy administrative road safety regimes to complement Federal legislation. Much work is needed at provincial levels to ensure that adequate road safety policies and programs are put in place to manage cannabis-impaired drivers using escalating roadside sanctions, licensing sanctions, and remedial programs. This will require new legislation that is informed by research, best practice reviews and environmental scans. While Ontario has proclaimed new legislation on administrative sanctions for drug-impaired drivers on October 2nd 2016, many other jurisdictions have not yet completed this task. In particular, regulatory approaches to cannabis will have important implications for the development of administrative regimes. There is also a paucity of research with regard to the effectiveness of curricula for remedial programs for drug-impaired drivers.

Increase capacity of emergency rooms and related health services. Increases in demands for emergency room services are among the most concerning of outcomes of the increased availability of cannabis. At present, hospitals are unprepared to manage influxes in these cases, and many health practitioners lack current knowledge and training about the specific impairing effects of cannabis. To illustrate, emergency room personnel must be prepared to recognize signs of impairment by cannabis and discern the need for testing of THC levels in serious injury and fatal crashes. While the time allocated for continuing education opportunities is quite limited, courses will be needed to ensure health care staff has adequate knowledge to deliver care and services to patients impaired by cannabis, and the development and use of online tools would be greatly beneficial.

In addition, cases involving suspected cannabis-impaired drivers have also increased the use of blood warrants, particularly in relation to serious and fatal injury crashes. At present, police officers are not generally familiar with applications for such warrants due to their infrequent use, and practices to collect such evidence are variable across health care centres. As such, training for both law enforcement and hospital staff regarding appropriate policies to facilitate the collection of blood with a proper warrant would be of considerable value. One example of a strategy to address this issue is the coordinated effort by Sunnybrook Hospital and area police agencies to create an instructional training video. Such initiatives should be encouraged and supported nationally.

Review capacity of labs to analyze drug test results. Larger numbers of SFST-trained and DRE officers will most certainly increase demands on forensic laboratories to analyze saliva and blood samples, as well as drug samples. This means that labs must be adequately prepared with appropriately-trained staff that is able to process these samples and report test results in a timely manner. It will be imperative to avoid delays or backlogs in cases that could negatively impact due process protections of defendants. Public Safety Canada is currently examining this issue, and it will

be important to make accommodations to ensure the timely processing of the results of DRE investigations, and that lab personnel are able to testify in court on an as-needed basis.

Examine the need for additional funding. The cost of additional staff to create capacity within law enforcement, transportation and health agencies to perform essential tasks related to drug-impaired driving strategies cannot be overlooked. Inadequate funding represents the most significant barrier to the implementation of road safety strategies to prevent and reduce drug-impaired driving. Funding is needed to support the following tasks:

> hire additional staff;

> training and certification as well as re-certification of officers;

> purchase of screening devices and costs of test analysis and related equipment;

> increased emergency room admissions;

> data collection and evaluation; and,

> public education initiatives.

Without financial support from the Federal government, it will be impossible for agencies to reasonably undertake these tasks, or the pursuit of them will undermine the performance of others as a result of re-allocation.

Summary. The effectiveness of road safety strategies will ultimately depend on the capacity and commitment of agencies to implement them. Federal leadership to ensure law enforcement, transportation and health agencies are well-equipped to deliver road safety programs is a top priority, and appropriate resources must be devoted to this task. The progress to date in implementing the DRE program is laudable, but important gaps remain that require attention, and concerted efforts are needed to safeguard the future success of the DRE program.

Public perceptions and education campaigns

Proposed changes to the legislative framework for cannabis present a host of public awareness and education issues. Businesses and advocacy groups on all sides of this issue are actively making claims on a wide range of fronts, and most notably, road safety stakeholders are tasked with counteracting the vocal messages from pro-cannabis groups, the majority of which are congruent with public experiences. As a result, the messages from governments and road safety stakeholders will require accurate and fact-based information about not only the impairing effects of cannabis on driving, but also any new legislation and penalties that are imposed in relation to this issue.

Public perceptions. At present, misperceptions about cannabis use and impaired driving are prevalent across the country. There is a pronounced and immediate need to share accurate and relevant information with the public to increase awareness about the risks associated with driving after consuming cannabis. In particular, there are three leading misperceptions that have been consistently observed across the country that must be overcome. These include:

> **'Cannabis is not harmful.'** This is a widespread misperception across Canada that poses a real source of concern. Related misperceptions include;

» Cannabis is harmless or innocuous, and 'safe' for everyone to use.

» Cannabis is healthy and organic.

» Cannabis is medicinal and a "natural herb."

Of concern, the cannabis lobby has been very vocal in touting the health benefits of cannabis, and the general public is largely unaware of the potential risks or negative effects on brain development among youth. There is also limited understanding that the potentially harmful, long-term consequences of use on cognitive or physiological functioning are not well-understood. In essence, because there is no definitive research that quantifies or measures these long-term negative outcomes, there is a strong perception that there are none. Hence, there is little concern about regular or even chronic use of this drug and this may result in significant increases in use among drivers on a daily basis.

> **"Cannabis does not impair driving ability.'** Cannabis is generally perceived to be less impairing than alcohol, and thereby people believe that they are 'safer' driving after using cannabis. It is not uncommon for people to report that they are a 'better' driver after using cannabis, and they believe that they drive more cautiously and at slower speeds, and take fewer risks. This is more often due to impaired perceptions and the inability of impaired drivers to continuously monitor and process all of the information from the road environment. As a result, the public fails to recognize the ways that cannabis impairs driving ability, and believes that the crash risk associated with cannabis and driving is inconsequential.

Similarly, older adults are largely uninformed that the potency of cannabis and THC levels have dramatically increased relative to the cannabis they may have smoked two or three decades earlier. This means that older adults who may be inclined to recommence their use of cannabis fail to appreciate that products that are presently available would in fact much more substantially impair driving ability as compared to their past experiences.

There is equally low awareness that the route of ingestion or consumption (i.e., smoking, vaping, eating) affects both the time required before impairing effects are felt, as well as concentration of THC of the product. In other words, different forms of cannabis have different impairing effects. For example, smoking cannabis produces a rapid high that is short-lasting. Conversely, edibles have much greater potency but it takes longer to feel the impairing effects (Hancock-Allen et al. 2015). This has resulted in striking increases in emergency room admissions in U.S. jurisdictions as users have experienced psychotic episodes due to extreme levels of THC (MacCoun & Mello 2015) from over-consumption. Such delays between consumption and impairing effects may not only lead people to consume dangerous amounts of THC, but also create a serious risk of drivers being adversely affected behind the wheel.

In addition, the availability of medically prescribed cannabis has resulted in the misperception that it is acceptable to use cannabis while driving because it is legally prescribed. Across the country, anecdotal evidence suggests that users do not consistently receive warnings that this drug can make it unsafe to operate a motor vehicle, and this is in sharp contrast to warnings that are associated with other impairing drugs that are

dispensed by pharmacies. As such, there is a misperception that medical cannabis users are exempt from drugged driving laws which is certainly not true.

> **"Police are unable to detect cannabis-impaired drivers or remove them from the road."** Greater public awareness of laws that are in place to detect and penalize drug-impaired driving is much needed to ensure a strong deterrent effect. Not only must the public believe that there is a good chance of being detected and punished for this behaviour; there must equally be a very real chance that this will occur. To date, the experiences of police officers at roadside suggest that a least a proportion of drivers do not know that tools are available to test for cannabis impairment at the roadside. While drivers are keenly aware that alcohol impairment can be measured, they do not consistently recognize that there are also tests that apply to cannabis, or that officers can remove them from the road, which at least in some jurisdictions may indeed be the case.

> Officers report that driver knowledge of the DRE program in Canada is generally low, and drivers are often surprised when officers administer SFSTs or make a DRE demand, although compliance with such demands is generally good. Perhaps most notably, some officers have reported that cannabis-impaired drivers recognize the low likelihood that officers will be SFST-trained, or able to summon a DRE officer in a timely manner. Anecdotal reports from police illustrate that these offenders tend to remark that they have been stopped on suspicion of cannabis-impaired driving several times, however this is the first time that they have performed requisite tests. This situation is a source of concern since it does much to erode the deterrent effects of laws, and may encourage increased levels of drug-impaired driving among potential offenders.

Key features of public education messages. The main misperceptions about cannabis-impaired driving that are described above must be challenged with facts that are relevant, evidence-based, and that clearly describe the risks. It must be underscored that the content, tone and style of messages, as well as their delivery, will play a significant role in terms of whether messages resonate with the experiences of Canadians, and motivate them to change their behaviour accordingly. As such, some important caveats to the delivery of campaigns that have been identified by practitioners across the country are briefly summarized below.

> **Avoid inadvertently encouraging use.** A primary concern associated with the changes to the regulatory framework of cannabis is that it may inadvertently encourage use, particularly among persons who are at risk to develop substance misuse or abuse, especially youth, and who may not have otherwise used cannabis. Health practitioners in particular share concern that more Canadians, including those who are at risk for addiction, will misperceive social norms associated with cannabis use and may be more likely to try it. Of concern, these individuals may not be aware of the risk-factors they possess that make them vulnerable to addiction. This will have long-term negative consequences for the burden on Canada's health care system.

> **Use neutral messages.** There are an estimated 2.3 million Canadians who report they regularly smoke cannabis (Rotermann & Langlois 2015), and cannabis is the most commonly used illegal drug in Canada (Health Canada 2013). In light of the magnitude of

current use, it will be important that messages are neutral or value-free and place a primary emphasis on the risks of cannabis use in terms of effects on driving. Harm reduction approaches are most appropriate as opposed to abstinence-based strategies, and this is consistent with proven treatment modalities. In other words, messages must on one hand concede that a cross-section of Canadians may regularly use cannabis, and on the other hand avoid suggesting that it is normal or acceptable to do so. This will require striking a delicate balance between acknowledging the reality of use without normalizing the behaviour and influencing individuals to use cannabis that would otherwise not.

> **Emphasize the impairing effects of cannabis and avoid comparisons with alcohol.** Campaigns that underscore the impairing effects of cannabis are believed to hold greater promise to educate Canadians. A large proportion of Canadians believe that cannabis is 'safer' than alcohol, and less impairing. There is also a strong desire to compare it to alcohol because practices related to alcohol-impaired driving are well-understood. There is a large, proven body of research to demonstrate that alcohol is dose-dependent and that all persons are similarly impaired or affected at a minimum threshold of alcohol (Howatt et al. 1991) which facilitated the setting of per se limits.

However, the impairing effects of different levels of THC vary across users in relation to age, sex, frequency of use and presence of other impairing substances such as alcohol (Sewell & Sofuoglu 2009). As such, consensus regarding an appropriate per se limit for cannabis that is supported by science will be challenging to achieve, and may not be supported by courts. For these reasons, comparisons with alcohol should be avoided.

In addition, lessons learned from more than three decades of experience with per se limits for alcohol underscored some of the unintended negative effects of this approach. Of most concern, a per se limit for alcohol has suggested to drivers that they are 'safe' as long as they are under the threshold, when in fact they may be too impaired to drive. In other words, today drivers have learned how much they can drink to stay under the per se limit, instead of learning to separate drinking and driving because alcohol, even at low levels, is impairing.

> **Deliver campaigns in advance of a new regime for cannabis.** It is critical that the delivery of public awareness campaigns is timely and such campaigns are disseminated across media in advance of any new legislation, and before habits are formed. The importance of education in advance of legislation is an important lesson learned in jurisdictions that have increased the availability of cannabis. There is also strong support for year-round delivery of campaigns targeting all seasons and all times of day. Unlike alcohol which has recognized seasonal effects on crashes (i.e., spring and summer months, late evenings and weekends) cannabis is prevalent across seasons and peak periods for crashes are less pronounced (Beirness & Beasely 2011).

> **Emphasize prevention messaging for youth.** While education is important for Canadians of all ages, an important concern raised by diverse sectors is the consistent delivery of effective prevention messaging to youth so they understand the risks of cannabis use and driving. It is believed that a similar strategy in relation to drinking and driving two

decades ago had many positive benefits and teens today have a good understanding of the dangers associated with drinking and driving, however beliefs about cannabis and driving are much more ambiguous and this must be addressed.

> **Tailor messages to acknowledge high-risk populations.** Important lessons have been learned from other prevention messages used in the health sector, particularly anti-tobacco campaigns. While these campaigns were quite successful in discouraging tobacco use among Canadians generally, they did have adverse effects on specific populations of high-risk users. Messages associated with these campaigns failed to acknowledge the complexity of life circumstances for marginalized populations and those that were socio-economically disadvantaged. As a consequence, simple messages discouraging use were irrelevant to the experiences of these populations, and were ultimately dismissed. As a consequence, research showed that among these populations, levels of use and harm actually escalated (Brown et al. 2014). Findings from this research suggest that different messages that acknowledge the realities of use among these special populations are essential to avoid further marginalizing a portion of Canadians who are most disadvantaged and at risk for greater harms. This may require a two tiered educational approach to ensure relevant and realistic messages reach both average Canadians as well higher-risk populations.

In addition, health practitioners have reported high levels of concern that very young children will be at risk as passengers in vehicles of adults who use cannabis and drive School-aged children must be equipped with strategies to ensure their safety and well-being. It was also acknowledged that youth talking to adults about the risks of cannabis and driving may be a more powerful way to deliver this message.

Summary. Key themes of campaigns should debunk myths surrounding cannabis and driving, and communicate the crash risks of driving while impaired by cannabis. However, clearly communicating these risks will be challenged by the lack of scientific consensus regarding findings so messages should be carefully crafted with this in mind. To this end, comparisons of cannabis with alcohol may undermine the effectiveness of any campaign and should be avoided to ensure that Canadians understand impairment is the threshold for detection, and not a fixed per se limit. In addition, campaigns must emphasize that officers have tools to detect drivers at roadside, and that drivers will be arrested and prosecuted for cannabis-impaired driving.

Ultimately, Federal and provincial partners, as well as national and community-based road safety stakeholders should be encouraged to devote adequate resources to public education strategies to dispel public misperceptions about cannabis and driving. At the same time, this is a substantial undertaking and consideration should be given to ways to ensure that visible and credible stakeholders are adequately funded to deliver public education messages to large and diverse audiences. Governments must also mobilize quickly and efficiently. Many jurisdictions are receptive to Federal leadership on this particular issue. There are concerns among provincial agencies regarding their capacity to undertake this task in light of other pressing policy and program priorities related to the implementation of cannabis-impaired driving strategies. To this end, mechanisms that facilitate partnerships, sharing of information among road safety partners, and economies of scale to create pervasive and consistent messages could have substantial

benefits. This will be a critical task to prevent cannabis-impaired driving, and efforts to coordinate materials and messages are paramount to success.

Metrics and evaluation

The ability to consistently collect data and track, monitor and evaluate the effects of cannabis on road safety, and progress in reducing cannabis-impaired driving, is perhaps one of the most essential components to enact a new regulatory framework. Data collection is equally instrumental to identify gaps in existing policies and programs, and determine what enhancements or improvements are needed to increase effectiveness over time.

To date, data collection initiatives have been ad hoc, fragmented, and specific to individual organizations. This poses a substantial barrier to understanding the magnitude and characteristics of the drug-impaired driving problem. Moreover, there is a glaring lack of uniformity and harmonization of data sources within and across sectors, including law enforcement, transportation and health, as well as across jurisdictions. Inadequate staff and resources are primary impediments to the collection of robust, usable data and this issue must be rectified as part of Canada's strategy to reduce cannabis-impaired driving. Specific issues that require attention are briefly described below.

Insufficient data collection. The proposal to introduce a new regulatory framework has prompted considerable interest in the availability of baseline data to gauge the current status of cannabis-impaired driving in Canada. At present, the most robust and reliable source of road safety data is the Traffic Injury Research Foundation's National Fatality Database. This database contains detailed information about all fatal crashes in Canada including the results of alcohol and drug tests performed by coroners and medical examiners in every jurisdiction in Canada. Presently, approximately 87% of all fatally-injured drivers are tested for alcohol and 82% are tested for drugs. Of note, these testing rates are generally higher as compared to other countries around the world, and continue to improve. The other robust baseline data source that is available is TIRF's annual public opinion polls (Road Safety Monitor series) about drugs and driving. During the past decade TIRF has used a standardized questionnaire to facilitate the analysis of trends. However, while a variety of other road safety data sources exist, they are generally jurisdiction-specific, agency-specific, suffer from under-reporting, and often cannot be compared to other relevant data sources. Furthermore, there is a need to measure the prevalence of cannabis use by drivers who are not detected by police and who are not involved in a crash. These data would be beneficial to help measure trends but also establish a baseline to estimate the risk associated with cannabis use and driving. While roadside drug and alcohol surveys that involve laboratory analysis of bodily fluid samples are resource intensive, these studies could provide an important source of information. As such, data to create a comprehensive picture of the cannabis-impaired driving problem are unavailable, and there is much about the problem that is unknown.

More positively, plans to increase data collection are underway, although the completion of these initiatives will require staff capacity, time and resources. As an example, since 2008, the Royal Canadian Mounted Police (RCMP) has aimed to collect national data about impaired driving arrests involving a DRE investigation. To this end they annually request that every police agency with DRE officers complete and submit a series of data in a standardized format to a designated DRE

provincial coordinator. These provincial coordinators provide the requested data to the RCMP for tracking and analysis. However, not all agencies are able to report data in light of low staff capacity and limited resources to do so.

In addition, on a more practical level, most patrol officers are not prompted in activity logs to indicate whether they have investigated drivers using SFSTs; in other words it is not possible to determine how frequently officers utilize these tests or the outcomes of them. Moreover, such enforcement activities are not recognized or reinforced among patrol officers, so officers are generally not incentivized to undertake drug-impaired driving enforcement as a component of many competing priorities.

Of note, the RCMP has developed a plan to create a DRE database that will contain variables about the traffic stop and investigation, the DRE officer credentials, the DRE exam and its results, and case outcomes. Unfortunately there have been delays in beginning development and testing of the proposed database due to other competing priorities for the RCMP and funding challenges. It is currently anticipated that the RCMP database may be available in Spring 2017, barring no other delays.

Inability to distinguish between alcohol and other drug types. It is generally not possible to easily distinguish between alcohol and other drugs, or types of drugs in key data sources maintained by police agencies and courts, driver records and crash data report forms, and health records. In many cases, data definitions, and descriptions of variables are not easily determined and this can result in inaccurate comparisons of what appear to be similar data points. For example, crash reports do not consistently distinguish between different types of drugs, impaired driving convictions cannot be analyzed according to alcohol and drugs, and drug types can only be determined in health files by a manual analysis of case narratives. In many cases, data are collected primarily as required by authorities or as measures of process and outcomes to inform the allocation of resources. Similarly case management systems across agencies are also quite diverse and this impedes efforts to compile and merge data to obtain provincial or national statistics related to drugs and driving or to differentiate the role of drug types in these incidents.

There is an initiative underway that involves collaboration between the Canadian Association of Chiefs of Police (CACP) and the Police Information and Statistics (POLIS) Committee at Statistics Canada. The objective of this initiative is to facilitate further analysis of arrest data according to alcohol and drugs since it is not possible to distinguish between alcohol- and drug-impaired driving arrest data collected through Uniform Crime Reports. Again, the ability to accomplish this objective is ultimately a function of staff capacity, time and resources at an agency level.

Lack of coordination to standardize data collection. At present, there is no national strategy, with the exception of the ad hoc RCMP DRE data collection initiative, to standardize the collection of drugged-driving data. In most instances, police agencies have developed data collection strategies to meet internal needs, and individualized sets of metrics are gathered to inform agency priorities and/or demonstrate gaps in resource allocations. Guidance to police agencies regarding the collection of specific drug-impaired driving data can provide a much-needed foundation to inform data collection strategies across the country. This is a critical step to ensure that data are

available to track, analyze and evaluate the effects of new regulatory framework on cannabis-impaired driving and road safety in general.

Road safety data collection also varies across provincial and territorial licensing agencies. This variation is well-recognized and occurs as a function of provincial responsibilities for road safety. Notably, this issue has been discussed often by provincial agencies through the Canadian Council of Motor Transport Administrators, and efforts have been made to increase uniformity and consistency. Moreover, these data have been carefully tracked which has enabled TIRF to merge and compare data from provincial jurisdictions to create a national picture of the problem. However, more work is needed, particularly in relation to the level of detail collected through provincial crash report forms, and to improve testing rates of fatally injured drivers.

Health agency data is perhaps the most concerning gap in data collection. Hospital data collection practices vary widely, often as a function of case management systems selected by individual hospitals or regions. At present, it is unknown whether there will be a means to centralize and standardize the collection of data for persons injured in drug-impaired driving collisions, and this is an important gap that will impede the evaluation of the effect of the new regulatory approach to cannabis on road collisions, and understanding of this population of road users.

Comparability of data is poor. Data collection and case management systems across police, transportation and health sectors are not uniform or comparable. Even among health agencies, Memoranda of Understanding are needed to exchange or share data and this creates barriers to data analysis and research. Hence, this lack of uniformity makes it challenging to compare the magnitude and characteristics of cannabis-impaired driving in different regions of the country. More importantly, this problem will not be quickly or easily resolved in the absence of Federal leadership on this issue.

Summary. There are three top priorities in relation to data collection. First, the development and collection of baseline indicators of the cannabis-impaired driving problem are an essential step to increase understanding of this issue. Efforts are needed to gauge what data are currently collected and what gaps exist so that they can begin to be addressed. Second, a clear and efficient framework for data collection priorities that includes standard definitions and relevant variables is needed in each sector, and across sectors, to facilitate the evaluation of strategies and to determine their effect on driver behaviour and road crashes.

Third, coordination and collaboration must be fostered. This lack of uniformity reduces inter-agency communication, identification of shared priorities, and analyses for research purposes. More concerning, it hinders the coordination of activities across sectors, or mobilization of joint strategies to address this problem. In essence, failure to ensure some degree of standardized, coordinated data collection across Federal and provincial agencies responsible for law enforcement, transportation and health will make it impossible to measure and monitor drug-impaired driving and determine what impact the new regulatory framework has had road safety.

Federal leadership and guidance on this issue can help provinces establish appropriately standardized data collection methods, and thereby help create a national picture on cannabis-impaired driving so that this issue can be continuously addressed. In the absence of leadership to

guide the development of a data collection framework, it may well be the case that in five years, no new knowledge or insight to reduce cannabis-impaired driving will have been gained.

CONCLUSIONS & RECOMMENDATIONS

The implementation of a new regulatory approach to cannabis in a way that improves the safety of Canadians is a challenging task fraught with many competing priorities. It is imperative that complementary road safety strategies to prevent and reduce cannabis-impaired driving are considered and developed in concert with this legislation.

There are two overarching issues that are pressing concerns for road safety stakeholders. First, clear communication and direction from Federal agencies regarding initiatives that are planned or underway would be indispensable to help agencies efficiently address this issue. Much work is being undertaken by the Drugs and Driving Committee, by Health Canada, Public Safety Canada and Departments of Justice and Transportation, among others. This work is highly relevant to inform the activities of individual agencies across provinces, and can assist them in judiciously allocating resources to priority activities and avoiding duplication. Improving communication about the various tasks that are underway, and ensuring that this information is accessible not only to political leaders, but also to managers and frontline staff that are responsible for the implementation of road safety policies and programs would be immensely beneficial.

Second, the importance of adequate resources in the form of staff capacity, time and funding to support the largescale modifications that are needed to tailor road safety programs to be inclusive of cannabis-impaired driving must be underscored. The development and implementation of policies and programs requires careful consideration and planning to ensure effectiveness. In addition, such policies and programs must be integrated with existing practices to avoid gaps in delivery that enable cannabis-impaired drivers to avoid detection and that are barriers to behaviour change.

More specific recommendations that can serve to inform and improve road safety strategies to prevent and reduce cannabis-impaired driving are described below. Key topics include: research, laws and penalties, implementation strategies, public perceptions and education campaigns, and metrics and evaluation.

Research

> Conduct research to increase knowledge and understanding of the impairing effects of different THC levels on different users. A research study is currently underway through the Centre on Mental Health and Addiction (CAMH) with support from the Ministry of Transportation in Ontario, however more research is needed. In the absence of definitive research, the use of per se limits should be approached cautiously to ensure court acceptance of evidence, and to reduce opportunities for defence challenges to the DRE program.

> Conduct research to investigate other priority research questions including the effects of cannabis availability on usage rates, the effects of long-term and chronic use on youth and adults, and any effects of new cannabis laws on impaired driving crashes.

> Undertake research to investigate effective remedial programs for drivers convicted of cannabis-impaired driving. This research is comparable to the work completed previously by Health Canada about rehabilitation programs for alcohol-impaired drivers, and should include a review of existing research, best practice reviews and environmental scans, and evaluation research.

Laws and penalties

> Consider the prudent use of per se limits that are based upon definitive science, and that do not unintentionally undermine the carefully established use of impairment-based laws that have slowly gained acceptance in court proceedings. Lessons learned with per se limits in other countries can provide important insight into optimal usage of these approaches. Work that is underway by the Canadian Society of Forensic Science Drugs and Driving Committee to complete an international review of per se limits for drugs that will assist in this regard.

> Implement a uniform minimum age of purchase for cannabis to reduce access by young drivers who have a much higher crash risk, and avoid opportunities for young drivers to circumvent young driver restrictions by cross-border travel.

> Review existing drug-impaired driving laws in Canada with consideration of police powers that acknowledge the limited window of testing that may be practical in accordance with different routes of ingestion, and the challenges in detecting odourless forms of cannabis such as edibles and vaping. To this end, consideration of police powers regarding the presence of cannabis or drug paraphernalia in a vehicle would be beneficial. It may also be considered to require that a DRE officer attend the scene of serious injury and fatal crashes to determine if impairment by drug was a contributing factor.

Implementation strategies

> Strengthen training opportunities for SFST and DRE officers to ensure a reasonable number of officers are available to consistently enforce drug-impaired driving laws. Provisions to police agencies to support the costs of training of all new recruits and in-service officers are essential to achieve this goal, and agencies equally require sufficient time to secure qualified instructors and deliver training to an appropriate number of officers. Public Safety Canada is developing instructional materials for police training institutes to assist in this regard. In addition, strategies that provide officers with incentives to reinforce the value of SFST investigations, and to complete and maintain DRE certification would be beneficial.

> A more general educational tool to assist all law enforcement officers across Canada is a comprehensive guidebook that informs them about new drug-impaired driving laws and procedures relevant to roadside investigation tools. This may include procedures related to documentation and evidence that should be gathered to support the use of SFST-trained officers, to make requests for DRE officers, to secure a warrant for a blood draw, and to work with hospital staff to obtain fluid samples.

> Establish facilities in Canada that are able to undertake the certification of DRE officers to avoid the time and cost demands associated with U.S. travel for this purpose. Some police agencies, including the Toronto Police Service and the RCMP have already begun to explore options with limited success to date. The Quebec model using trained actors is under evaluation but it is as yet undetermined if this strategy will be approved by the IACP. The presence of accessible Canadian certification centres will have positive benefits and encourage greater investment in the DRE program by police agencies and individual officers.

> Consult with law enforcement agencies regarding the most practicable use of oral fluid testing devices. Although the implementation of such devices is not yet certain, in the event these devices will be permitted, it will be important to prudently consider the qualifications of officers to use this screening tool. These devices can provide additional evidence of impairment in court, and should be considered to complement and bolster DRE evidence which has gained acceptance and is less susceptible to challenge.

> Expedient guidance to provinces regarding potential regulatory frameworks for cannabis would greatly inform the development of complementary administrative regimes to prevent and reduce cannabis-impaired driving.

Public perceptions and education campaigns

> Deliver a relevant and clear national education campaign to challenge public perceptions about the impairing effects of cannabis, and its negative effects on driving. It is imperative that a national campaign is delivered in advance of new cannabis legislation. Messages should acknowledge use but not inadvertently encourage it and avoid comparisons with alcohol impairment since cannabis effects are different. Special attention should be devoted to campaigns that are tailored to youth and to high-risk populations.

Metrics and evaluation

> Establish and collect baseline indicators of the cannabis-impaired driving problem to increase understanding of this issue.

> Created a clear and efficient framework for data collection priorities that includes standard definitions and relevant variables is needed in each sector, and across sectors, to facilitate the evaluation of strategies and to determine their effect on driver behaviour and road crashes.

> Foster national leadership and guidance to encourage data collection and assist jurisdictions in establishing appropriately standardized data collection methods, and thereby help create a national picture on cannabis-impaired driving so that this issue can be addressed in the long-term.

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