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# The Characteristics of Youth Passengers of Impaired Drivers

Technical Report

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## **Conflict of Interest**

Douglas Beirness has no conflicts of interest to declare.



## Introduction

Motor vehicles play a prominent role in the lives of most Canadians. Collectively, Canadians annually log over 333 billion kilometres in vehicle travel for work, commuting and pleasure (Statistics Canada, 2010). Given the extent of vehicle use, crashes are an inevitable consequence, often resulting in injuries or deaths. Young Canadians are especially at risk. Motor vehicle incidents are the leading cause of death for young Canadians, accounting for more than a quarter (27.7%) of all deaths among those 15 to 24 years of age (Statistics Canada, 2012). In 2010, 511 young Canadians (aged 15–24) died in motor vehicle crashes and 41,373 sustained injuries (Transport Canada, 2012). Young drivers are at particularly high risk. Although drivers under 25 years of age represent only 12.8% of licensed drivers, they account for 22.3% of all driver deaths and 23.6% of all seriously injured drivers.

As disturbing as these figures are, the situation has improved dramatically over the past 30 years. Technological improvements to vehicles and roadways, enhanced use of occupant restraints, graduated licensing programs, zero tolerance alcohol laws, greater awareness of the risks and promotion of safe practices have all helped to reduce the number of young Canadians who are injured or die in motor vehicle crashes. Nevertheless, the toll remains high and more needs to be done to keep young people safe on our roads.

Among the various behaviours known to increase the risk of crash involvement for young people, the use of alcohol and drugs remains a persistent factor. According to the Traffic Injury Research Foundation (2013), alcohol was involved for 52.8% of young people (aged 16–25) who died as a result of a motor vehicle crash in 2010. Among young fatally injured drivers in this age group, 45.5% tested positive for alcohol; the majority had a blood alcohol concentration (BAC) over 80 mg/dL. A recent examination of drug use among fatally injured drivers aged 16–24 years old found drugs were involved in 35.4% of cases (Beirness, Beasley, & Boase, 2013). Cannabis was the most prevalent substance involved.

Not surprisingly, young people tend to travel together in vehicles with others in their peer group. In the United States, 59% of teenager passengers who died in motor vehicle crashes in 2011 were in a vehicle operated by a teenage driver. Among fatally injured passengers aged 20–24, 53% were in a vehicle operated by a driver in the same age group (Insurance Institute for Highway Safety, 2011). Young drivers aged 16–24 years old who died in alcohol-related crashes have been shown to be most likely to have been carrying passengers and over 90% of the time those passengers were in the same age group as the driver (Isaac, Kennedy, & Graham, 1995).

In general, the presence of young passengers has been shown to be a risk factor for young drivers, either by creating a distraction in the vehicle and/or encouraging risk taking (Preusser, Ferguson, & Williams, 1998; Shope, 2006). Young passengers who have been drinking or using drugs can actually worsen the risk of crash involvement for a driver whose abilities have already been compromised through the use of alcohol or drugs. Hence, the risks of driving after the use of alcohol and drugs are not necessarily restricted to the condition of the person behind the wheel.

Passengers in a vehicle with an impaired driver have not been subject to the same degree of scrutiny or attention as impaired drivers. If the driver has been using alcohol or drugs, there is a good likelihood that the passengers have also been doing so (Isaac, Kennedy, & Graham, 1995). Although researchers have examined the characteristics of drinking drivers and to some extent those who drive after using drugs, those who ride with impaired drivers have been afforded considerably less attention.



## Objective

This report reviews the research on the characteristics of youth who choose to ride with a driver who has been using drugs, alcohol or both. Understanding the demographic, psychosocial and behavioural characteristics of young passengers of impaired drivers is a key step towards developing targeted prevention programs and campaigns for those at highest risk.

Although the primary focus of this review was on passengers of drug-impaired drivers, it was recognized at the outset that there would likely be substantial overlap with the characteristics of passengers of drinking drivers. Hence, it was deemed important to determine the extent of the overlap and the areas where there was a divergence of the characteristics of those who engaged in the two behaviours. This approach was taken to help decide if separate and specific prevention messages should be developed for each of the two behaviours or if they could both be served through a combined approach.

The report begins with an examination of data on the prevalence of riding with a driver who has used alcohol or drugs. The characteristics of people who ride as passengers with an impaired driver are then examined in different types of studies. The report concludes with a discussion of the evidence and the implications for the development of prevention programs.

## Method

The prevalence among youth of riding with a driver who had used alcohol or drugs was determined from an examination of national self-report surveys in Canada and the United States. In Canada, provincial student drug use surveys also provide provincial estimates of the prevalence of the behaviour (Young et al., 2011). In the United States, the Monitoring the Future Survey provides estimates of riding with a driver who has used alcohol or cannabis among high school seniors (O'Malley & Johnston, 2007, 2013).

Literature examining the characteristics of passengers of drivers who had used drugs or alcohol was identified through searches of databases such as Project Cork, PubMed, PsycNet and SafetyLit. The search engines Google and Google Scholar were also used. Search terms included variations on the terms passenger, driving, lift, drunk, impaired, riding, driving under the influence and intoxicated. No time limitations were set.

In addition, personal contacts were made with a number of other researchers who are known to have worked in the area of alcohol, drugs and young drivers to ask their assistance in finding other papers, presentations and reports that might be relevant. This approach helped to identify literature that was not necessarily focussed on riding with a driver who had been drinking or using drugs, but might have included these behaviours as of related interest. In such cases, the article title or keywords might not have reflected passenger behaviour and so would have been missed in the formal search.



## Results

### Prevalence of Riding with an Impaired Driver

Student drug use surveys in various provinces typically include questions about driving after alcohol or drug use, as well as questions about riding with a driver who has been drinking or using cannabis.<sup>1</sup> In a compilation of the results of these provincial student drug use surveys, Young and colleagues (2011) reported that 11.0% to 20.0% of drivers in grade 12 indicated they had driven after drinking and 10.6% to 21.0% had driven after using cannabis during the past year.<sup>2</sup> Among all students in grades 7 through 12, 25.7% to 37.5% reported riding with a drinking driver and 16.9% to 19.8% reported riding with a driver who had consumed “too much” alcohol during the previous 12 months. Overall, 17.7% to 26.2% admitted to riding with a driver who had used cannabis. The prevalence of this latter behaviour increased significantly with grade. Among students in grade 10, 22.9% to 29.7% reported riding with a driver who had used cannabis. Among students in grade 12, 33.2% to 48.8% reported doing so.

Data from the Canadian Alcohol and Drug Use Monitoring Survey (CADUMS), a national telephone survey of Canadian residents aged 15 and over on alcohol and drug use, reveals that, whereas 5.3% of 15 to 24 year olds reported driving after using cannabis in the past 12 months, 15.8% reported riding as a passenger with a driver who had smoked cannabis within the previous two hours (Health Canada, 2012). Similarly, 7.9% of respondents in this age group drove after drinking; 17.9% indicated that they had been a passenger in a vehicle driven by a drinking driver. Clearly, riding with a driver who has been drinking or using cannabis is considerably more common than driving after alcohol or drug use.

In the United States, the Monitoring the Future Survey has collected information from approximately 2,000 high school seniors (aged 16–18) about driving after drinking, driving after using cannabis and riding as a passenger in a vehicle with a driver who has used alcohol or cannabis within the past two weeks (O’Malley & Johnston, 2007; 2013). Over the 11-year period examined, the prevalence of riding with a driver who has used cannabis has changed little, from 21.7% in 2001 to 20.4% in 2011. Riding with a drinking driver, however, has decreased from 23.7% to 15.2%.

These data illustrate that riding with a driver who has used cannabis is common among youth and is comparable to, and in some cases exceeds, the prevalence of riding with a drinking driver. The numbers are, however, quite variable ranging from 16% to almost 50% of students who report engaging in this behaviour. Older students (i.e., those in grades 10 and 12) are more likely than younger students (grades 7 and 9) to report riding with a driver who has used cannabis. The prevalence of the behaviour decreases among young people who are beyond high school age.

The following sections examine the characteristics of those who report riding with a driver who has used cannabis, as well as those who report riding with a drinking driver with a focus on identifying those factors that enhance the risk and those factors that are protective.

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<sup>1</sup> Only one province asks about riding with a driver who has used any type of drug. All others ask specifically about riding with a driver who has used cannabis.

<sup>2</sup> The exact wording of the questions varies somewhat by province.



## Characteristics of Passengers of Drivers Who Have Used Alcohol or Drugs

Three different approaches have been used to examine the characteristics of youth who ride with drivers who have used alcohol or drugs. The first approach involves interviews with drivers who participated in a roadside survey. The second approach involves collecting information from drivers and passengers who have been involved in a crash. The third, most common approach is a public opinion survey asking people to report on their behaviour as a driver and passenger after drinking or using drugs. Each type of study has its strengths and limitations, but together can help provide a comprehensive picture of the circumstances and personal characteristics of those involved.

### *Roadside surveys*

Interest in the relationship between the state of intoxication between drivers and passengers developed partly out of interest in the use of designated driver programs. The designated driver concept is intended to reduce impaired driving by selecting one member of a group to refrain from alcohol and drug use and to serve as the driver, thereby reducing the risk of crash involvement and helping to ensure all members of the group arrive home safely. The very nature of the concept speaks to the crux of the problem: preventing intoxicated passengers from riding with intoxicated drivers.

As part of a roadside survey of alcohol use among drivers in British Columbia, front seat passengers were also asked to provide a breath sample to determine the extent of their alcohol use (Foss & Beirness, 1996). In over half of all vehicles with a driver with a BAC of at least 50 mg/dL, the driver was alone in the vehicle. Where a passenger was present, there was a strong positive relationship between driver and passenger BACs. In only 17% of cases where a driver had a BAC of at least 50 mg/dL was there a passenger with a BAC less than 50 mg/dL. The fact that drinking passengers typically have BACs of the same order of magnitude as their drivers suggests that both drivers and passengers are making poor decisions about their transportation choices. Given the limited information available, it was not possible to determine the extent to which the circumstances and characteristics of the people involved played a role in these decisions.

More recently, Romano, Kelley-Baker and Lacey (2012) examined data from the 2007 US National Roadside survey to determine the extent to which a passenger in the vehicle with an impaired driver might be able to serve as an alternative driver. In 21% of cases where the driver had a BAC of less than 80 mg/dL, the passenger was deemed to have a lower alcohol level; where the driver had a BAC greater than 80 mg/dL, 6% of passengers had a lower BAC. Drinking passengers tended to ride with drinking drivers and it was relatively uncommon for the passenger to be a possible alternative driver. The likelihood of riding with a drinking driver was higher at night, when the trip originated from a drinking establishment or a private home, and when the driver and passenger were both males. The presence of a female passenger with a male driver was determined to be a protective factor for drinking and driving among males.

These two studies were derived from larger projects not designed to examine the role of passengers. They also did not provide any information about driver and passenger drug use. The number of cases available for analysis was relatively small and it was not possible to isolate a group of drivers and passengers in the 15-24 age group. In general, the data show that drinking drivers are most often the sole vehicle occupant. When passengers are present, they are also likely to have been drinking to an extent comparable to that of the driver. Neither drivers nor passengers make appropriate, safe decisions regarding transportation choices. These choices, however, are influenced by situation and circumstances – time of day, trip origin, and the sex of the driver and passenger combination.





## ***Drivers and passengers involved in crashes***

Studies of alcohol and drug use among drivers and passengers injured in motor vehicle crashes have been conducted primarily to examine the extent to which a passenger might have been the better choice as the driver of the vehicle. These studies also provide information about the situations and circumstances surrounding impaired driving incidents in which passengers sustain injuries.

The Fatality Analysis Reporting System (FARS) in the United States includes information on alcohol use by drivers and passengers killed in roadway crashes. An examination of data on 10,277 fatally injured drinking drivers from 29 states with high alcohol testing rates revealed that 30% of males and 34% of females had one or more passengers (Isaac, Kennedy, & Graham, 1995). Drivers aged 16–24 were most likely to be accompanied in the vehicle and approximately 90% of these passengers were within 25% of the driver's age. Over 80% of fatally injured passengers riding with a drinking driver had also been drinking. In about one-third of these cases, the passenger's BAC was substantially lower than that of the driver. Fatally injured male drivers aged 16–19 with a BAC over 80 mg/dL were most likely to be carrying a passenger with a BAC less than 50 mg/dL. Although these data are limited to cases where both the driver and the passengers died in the crash, the study clearly establishes a link between drinking drivers and drinking passengers. Young drinking drivers were most likely to have young drinking passengers, many of whom had BACs considerably below that of the driver.

Soderstrom, Dischinger and Kerns (1996) collected alcohol data on 120 injured driver–passenger pairs admitted to a trauma centre for treatment of injuries sustained in a traffic crash. Overall, alcohol was found in at least one victim in 48% of cases; in 65% of these, the driver had the higher BAC. Just over half of all crashes involved same-sex pairs. Among the five female pairs, no driver had been drinking. In 58% of male pairs, the driver had been drinking; in 26% of these cases, the passenger had a lower BAC. Alcohol was less likely to be involved in male–female pairs (32%). In 62% of male–female pairs, the female passenger had a lower BAC than the male driver or was negative for alcohol; in the other 38%, the male passenger had a lower BAC than the female driver. There was no information presented on the ages of the driver–passenger pairs.

In a five-year follow-up study of drivers and passengers admitted to a trauma centre for treatment of injuries sustained in a motor vehicle crash, Schermer, Qualls, Brown and Apodaca (2001) determined that drivers and passengers admitted with a BAC of at least 80 mg/dL were more than twice as likely as those who had not been drinking to return to the emergency department and be admitted to the hospital on a subsequent occasion. In addition, in the five years following the injury event, intoxicated passengers were found to be at greater risk of dying than non-intoxicated passengers. In another study by the same group (Schermer, Apodaca, Albrecht, Lu, & Demarest, 2001), intoxicated drivers and passengers injured in motor vehicle crashes were found to be equally likely to have been involved in a crash and cited for an impaired driving offence in the two years prior to, and one year following, the index crash. Males and those with higher BACs were more likely to be involved in other crashes and have impaired driving charges.

Together, these studies show that impaired drivers who crash often have impaired passengers accompanying them in the vehicle. This finding is particularly true for young people who tend to travel together after drinking. In at least one-third of cases, there was a passenger in the vehicle who had a lower BAC than the driver. Clearly, passengers do not necessarily make good decisions about the driver they choose to take them home. Male passengers with male drivers are at greatest risk and female–female pairs at lowest risk. The data showing comparable crash and impaired driving charge rates among injured impaired drivers and passengers suggest that these two groups exhibit



very similar risk-taking tendencies and drinking patterns and that their role as either driver or passenger might be more a function of circumstance than design.

### **Questionnaire-based studies**

Roadside and crash-based studies provide information on real-life events involving passengers riding with impaired drivers. These studies offer insight into the situations and circumstances surrounding actual events, but they only begin to suggest that the characteristics of passengers are similar to those of the impaired drivers with whom they choose to drive. More detailed information about the psychosocial characteristics of passengers who choose to ride with impaired drivers requires completion of questionnaires specifically designed to assess social, psychological and demographic traits.

A number of questionnaire-based studies have examined the characteristics of passengers of drivers who have used alcohol or drugs. These studies vary in terms of the population examined, the characteristics examined and the country in which the survey was conducted. Few studies actually distinguish between riding with a drinking driver and riding with a driver who has used cannabis (or other drugs) or limit the age group to youth and young adults or isolate these age groups in the analysis. Therefore, this subsection begins by reviewing studies that focus on young adults who ride with a driver who has been using cannabis, other drugs or alcohol and then discusses other related but less specific studies.

In a survey of 2,594 high school students (50% female) in grades 10 and 12 on Vancouver Island, Leadbeater, Foran and Grove-White (2008) found that 29% of urban students and 37% of rural students report riding with a peer who had used cannabis. Rural or urban residence, however, did not contribute significantly in multivariate models after controlling for other factors. Significant predictors of riding with a driver who had used cannabis were driving after drinking, driving after cannabis use, riding with adults who had used cannabis, riding with peers and adults who had been drinking, as well as more risky attitudes towards both alcohol and cannabis. Similar factors were associated with riding with a drinking driver and driving after using cannabis or alcohol use. The authors highlighted the modeling influences of parents and peers in helping to shape risky driving-related behaviours among youth, including riding with a peer who has been drinking or using cannabis.

The Monitoring the Future Survey collected information about driving after drinking, driving after using cannabis and riding as a passenger in a vehicle with a driver who has used alcohol or cannabis from a large sample of high school seniors across the United States since 2001 (O'Malley & Johnston, 2007; 2013). Demographic and lifestyle factors were compared among those who did and did not report riding with a driver who has used cannabis and driving after using cannabis. After adjustment for other factors, sex, region and degree of urbanization were not associated with these behaviours. Lifestyle factors – lower religious commitment, lower grades in school, truancy, spending more than one night out per week for fun or recreation, working 1–30 hours per week, and driving more than 100 miles per week – were significantly associated with cannabis-involved riding behaviour. Living with neither parent was also identified as a risk factor. A virtually identical set of lifestyle factors was associated with driving after cannabis, driving after heavy drinking and riding with a driver who had been drinking (O'Malley & Johnston, 2013). An earlier study by the same authors also identified the use of cannabis or other drugs and heavy drinking as risk factors. Religious commitment and higher grade point average were protective factors (O'Malley & Johnston, 2007). The overlap of factors associated with driving after substance use and riding as a passenger with a driver who has used alcohol or drugs indicates a commonality among the various risky behaviours surrounding the use of vehicles and substance use.



The Student Drug Use Survey in the Atlantic Provinces included questions that provide information about riding with a drinking driver and the social and demographic characteristics associated with the behaviour (Poulin, Boudreau, & Asbridge, 2006). Among the respondents in grades 9-12, 26.8% reported riding with a drinking driver in the past year. The factors associated with increased risk of riding with a drinking driver included: rural residence, female, lower socioeconomic status, not living with both parents, earlier age of drinking onset, cannabis use, smoking and driving after drinking. Having a driver's licence was found to be modestly protective of riding with a drinking driver, the implication being that having acquired a licence, there was less dependence on others for transportation. There was, however, considerable variability between and within regions in terms of the factors that had an influence on the probability of riding with a drinking driver. The authors concluded that there were a variety of factors both within and outside of an individual's control that influenced decisions to ride with a drinking driver. The personal factors interacted with place, time and circumstances in complex ways to determine the likelihood of the behaviour.

In a national survey of over 9,000 youth aged 12–18 in New Zealand, 36.4% reported riding with a driver who had been drinking (Tin, Ameratunga, & Watson, 2008). After adjusting for age and sex, heavy drinking and drinking away from home were significant risk factors. Drinking with friends increased the risk of riding with a drinking driver whereas drinking with family did not. Those who reported first drinking at aged 12 or younger and considered drinking at their age to be normal were also at greater risk of riding with a drinking driver. Sex was not a significant risk factor.

CADUMS includes questions on riding with a drinking driver and riding with a driver who has used cannabis. Cartwright and Asbridge (2011) examined the socio-demographic, personal and behavioural characteristics (including substance use and driving behaviours) of those who reported riding with a driver who had used alcohol or cannabis. Although the study included respondents of all ages, logistic regression revealed that younger persons were more likely than those over 44 years of age to ride with a driver who had used cannabis. Other predictors included heavy drinking, adverse consequences from drinking, moderate to high level of risk associated with heavy cannabis use, driving after using cannabis and riding with a drinking driver. Sex was not a significant predictor after adjustment for other factors.

There was considerable overlap between the set of factors associated with riding with a drinking driver and those associated with riding with a driver who had used cannabis. The strong association between riding with a drinking driver and riding with a driver who had used cannabis was of considerable interest, not only because one was predictive of the other, but it indicates a similarity between the two behaviours. The risk factors associated with the decision to ride with a driver who has used either alcohol or cannabis are similar. However, to some extent, there was a substance-specific effect. Problem cannabis use and driving after cannabis use were only predictive of riding with a driver who had used cannabis; driving after drinking was only predictive of riding with a drinking driver. Although it is not clear whether substance-related driving or riding occurred first, it would appear that engaging in one has clear implications for engaging in the other.

The Health Behaviour of School-aged Children Survey provides information on riding with a driver who had used alcohol or cannabis among a large sample ( $n = 23,212$ ) of students aged 9–15 from 436 schools across Canada (Pickett et al., 2012). Although the age group of the sample is younger than the target group of the current review, the survey results show that this behaviour is not uncommon at these younger ages. About one in five students reported riding in a car or other vehicle (snowmobile, all-terrain vehicle, dirt bike) with a driver who had been drinking, or using cannabis or another drug. Prevalence of the behaviour was higher among those indicating lower perceived socioeconomic status, those living in rural areas, males and students aged 13 and over. About 14%



of reported injuries were attributable to being a passenger with a driver who had been using alcohol or drugs.

The relevance of this latter study is that it demonstrates riding with a potentially impaired driver, and even operating a vehicle after alcohol or substance use, begins several years before the usual age of driver licensing. These behaviours are more frequently reported among those in rural areas and increase in prevalence between 13 and 15 years of age. The involvement of off-road vehicles was common. The exposure of young Canadians to these risky behaviours at such young ages suggests that these behaviours might be influenced by varying social norms within regions or cultures. Parental influences might also be involved. Given the early onset of these behaviours, it is not surprising that the developmental trajectory continues into and through the young adult years.

Other studies also indicate that early experiences can influence subsequent involvement in driving after alcohol or drug use. For example, an analysis of data from the National Longitudinal Alcohol Epidemiologic Survey found that the earlier the age of initial drug use, the greater the likelihood of driving after drug use (Hingson, Heeren, & Edwards, 2008). The risk of driving after drug use remained elevated for drug use prior to age 21, but was strongest for those who initiated drug use prior to age 15. Early age of drinking onset was also predictive of early drug use.

A recent report for the second year of a nationally representative sample of US students in grade 11 (mean age 17.3 years) examined driving after drinking in the past month and riding with a drinking driver in the past year (Li, Simons-Morton, & Hingson, 2013). Heavy drinking in the past 30 days, illegal drug use in the past year, self-reported risky driving (e.g., speeding, tailgating) and distracted driving were identified as risk factors. The strong association between risky driving, substance use and driving after drinking and riding with a drinking driver suggest that these factors might be part of a constellation of risk-taking behaviours with common determinants.

In a European study of young adults (mean age 21.7) who participated in social nightlife activities and events, Calafat et al. (2009) found that 37% reported riding with a drinking or drugged driver in the previous month. Drinking to excess, use of illegal drugs, impulsivity, anti-social tendencies, being unemployed and having a preference for using private vehicles to get to nightlife venues were identified as risk factors. Whereas most other studies in this area have focused on demographic and behavioural correlates of riding with a drinking or drugged driver, this study demonstrated the influence of more distal factors related to personality traits, which may be associated with the underlying motivations that give rise to the behaviour as opposed to the more immediate circumstances of the situation at hand.

Kim and Kim (2012) also examined the role of personality and psychosocial factors associated with riding with a drinking driver. In a national sample of Korean adults (age 20–66), sensation seeking – defined as the need for novel experiences and the willingness to take physical and social risks to fulfil this need – and perceived pressure, persuasion and approval of peers along with heavy drinking were identified as significant predictors of riding with a drinking driver.

Several authors have explored the notion that driving or riding after drinking or drug use among youth is not an isolated behaviour, but part of a more general pattern of engaging in antisocial and risky behaviours that are subject to social censure or involve danger or risk of harm (e.g., heavy drinking, drug use, delinquency, stealing and traffic violations). The interrelatedness of these behaviours is a central tenet of Problem Behaviour Theory (Jessor, Donovan, & Costa, 1991). The theory states that “problem” behaviour is influenced by elements of personality and the perceived environment and that engaging in one type of problem behaviour increases the likelihood of engaging in others. Personality factors include a propensity towards risk-taking, sensation seeking, impulsivity and aggressiveness. Positive influences – those that serve to inhibit problem behaviour –



include value placed on academic achievement, religiosity, independence and self-esteem. The perceived environment includes parental and peer support for, or controls on, problem behaviour, models of positive and negative behaviours, and perceived normative values and behaviours. Together, personality factors and the perceived environment serve to instigate or inhibit involvement in problem behaviours.

Swisher (1988) was among the first to view driving after drinking or using cannabis and riding with a drinking driver or a driver who has used cannabis as belonging to a cluster of behaviours that are interrelated and reflective of a pattern of behaviour related to risk-taking and impulsivity, rather than isolated instances of particular behaviours. In a test of this hypothesis, Swisher administered a questionnaire to a sample of over 11,000 students in grades 7 through 12 in three states. The questionnaire asked about a wide array of topics including alcohol and drug use, negative behaviours, involvement in extra-curricular activities and academic performance. Negative behaviours included cheating on tests, shoplifting, vandalism and staying out all night. These negative behaviours were the best predictors of driving after drinking or using cannabis and riding as a passenger with a driver who had been drinking or using cannabis. Conversely, time spent in academic activities, extra-curricular activities, sports and religious activities were inversely related, providing a protective effect. The overall pattern of results is consistent with Problem Behaviour Theory, suggesting that driving after drinking or using cannabis and riding with a driver who has been drinking or using cannabis are part of a cluster of negative social behaviours that are related to risk-taking and impulsivity.

Donovan (1993) provided further support for the hypothesis that driving after using drugs or alcohol was part of a pattern of problem behaviours. A sample of 2,300 drivers in Colorado aged 18–25 returned a mail questionnaire that encompassed a wide variety of measures of personality, the perceived environment and behaviour. In addition to problem drinking, drug use and social deviant behaviour, a measure of risky driving behaviour was also found to be related to driving after drinking and drug use. Risky driving behaviour, as assessed by traffic violations, provides another means to identify and target youth at high risk of involvement in impaired driving and riding behaviour.

More recently, Hingson, Heeren, and Edwards (2008) noted that early age of drinking onset and alcohol abuse are developmentally significant predictors of illicit drug use and a variety of other health and social problems such as driving after drinking or drug use and crash involvement. Early alcohol and drug use was considered to affect perceptions of peer and parental involvement and increase the likelihood of involvement in other socially deviant behaviours.



## Summary

The research literature consistently shows that riding with a driver who has used cannabis is strongly correlated with riding with a driver who has been drinking or using drugs. The two behaviours are distinguished primarily by the substance used by the driver and not necessarily the characteristics of those who engage in the behaviour. In addition, driving after alcohol or drug use is highly related to riding with a driver who has been drinking or using drugs. The individual's role as driver or passenger might be more a function of circumstances, such as access to a vehicle, than it is a function of personal and social characteristics. From a theoretical perspective, riding with a driver who has used cannabis or alcohol would appear to be part of a more comprehensive pattern of high-risk or socially inappropriate behaviours that is related to socio-demographic, psychosocial and behavioural factors that either create a propensity towards engaging in problem behaviours or provide controls against it. These risk and protective factors for youth are listed below.

### Socio-demographic Risk Factors

- Younger age (9–15)
- Sex (male)
- Lower socioeconomic status
- Rural residence
- Lower grades in school
- Not living with both parents
- Working part-time

### Psychosocial Risk Factors

- Risk-taking
- Sensation seeking or novel experience seeking
- Impulsivity
- Aggressiveness
- Parental models
- Perceived parental approval
- Peer models
- Perceived peer approval

### Behavioural Risk Factors

- Heavy drinking
- Early age of drinking onset (prior to age 15)
- Drug use
- Risky driving
- Truancy
- Cheating and stealing
- Driving or riding off-road vehicles after using alcohol or drugs

### Protective Factors

- Religiosity
- Involvement in religious activities
- Involvement in academic activities
- Academic performance
- Involvement in extracurricular activities
- Involvement in sports activities



## Discussion

Riding with a driver who has been drinking or using cannabis is a relatively common behaviour among youth, but the practice has received less attention as a high-risk behaviour than driving after drinking. However, the consequences can be equally tragic. To a large extent, the differing levels of attention directed towards driving and riding could be a result of drivers being generally seen as responsible for their behaviour and its outcomes, whereas passengers are generally not held accountable for their actions. Social and legal censure can be imposed upon impaired drivers, but there are few, if any, sanctions for passengers of impaired drivers. In fact, passengers in crashes might actually be perceived as innocent victims of a tragic event.

The reality of the situation is that the presumed innocence of these passengers can in many cases be unwarranted. Research has demonstrated that young passengers in a vehicle can increase the risk of crash involvement for young drivers by causing or creating a distraction and/or actively encouraging risk-taking by the driver. This effect can be exacerbated by the use of alcohol and/or cannabis by young drivers and their passengers.

Keeping the party going on the drive home is inconsistent with the safe operation of a vehicle. Young drivers need to be aware that distraction caused by their passengers can create a high-risk situation. Although passenger restrictions are often part of a comprehensive graduated licensing program, driver education and training programs should devote time to a discussion of the dangers posed by passengers – particularly intoxicated passengers – that persist long after young drivers have passed through all stages of the graduated licensing program.

Studies of crashes involving youth often show that passengers have comparable or lower BACs than drivers. Still, alcohol and drug use by passengers can interfere with their ability to assess the driver's degree of impairment, which can lead to poor decisions about transportation home. To counteract this possibility, prevention programs should encourage youth to make transportation arrangements in advance, prior to the consumption of alcohol or drugs. A small effort, such as arranging before an event for a cab home, would eliminate the need for intoxicated passengers to assess the competence of a peer driver, and could greatly reduce the risk of adverse outcomes for youth as well as other road users.

The literature also reveals extensive overlap between driving after alcohol or drug use and riding as a passenger with a driver who has used alcohol or drugs. Combined with the strong association of these behaviours with heavy drinking, drug use and risky driving, there begins to emerge a pattern of high-risk behaviours surrounding the use of substances and vehicles (Donovan 1993). Whether an individual serves as the driver or rides as a passenger on any given occasion can vary depending on age, sex and access to a vehicle. Roles can change depending on circumstances and situations, but the target behaviours are a consequence of the use of alcohol or drugs and the need for transportation. The poor decisions young people make regarding transportation, particularly after using alcohol or drugs, place them in a high-risk situation regardless of whether they are the driver or a passenger.

The characteristics of those who ride with a driver who has been drinking or using cannabis can be useful in developing programs targeting specific populations of youth who are most likely to engage in the behaviour. These characteristics can be grouped into three broad categories: socio-demographic, psychosocial and behavioural. Within the socio-demographic domain are age, sex, urban or rural residence and socioeconomic status. Certainly the involvement with alcohol and drugs and motor vehicles increases with age. Earlier age of onset of drinking is associated with later heavy use and increased likelihood of adverse consequences (Hingson, Edwards, Heeren, & Rosenbloom,



2009). More frequent and heavier drinking increases exposure to the potential of driving after drinking or riding with a driver who has used alcohol or drugs.

The study by Pickett et al. (2012) also demonstrated that motor vehicle use in combination with alcohol or drug use can have origins in the years prior to driver licensing. Certain subgroups of youth, particularly in rural areas, might not necessarily have access to cars, but might use off-road vehicles for both recreation and transportation, as these vehicles provide younger teens an opportunity to explore their independence. The pattern of motor vehicle use in combination with substances use can begin early. Inexperience with these vehicles and the use of alcohol and drugs creates a high-risk situation that could be the focus of prevention programs in areas where such behaviour is commonplace. Moreover, these findings suggest that prevention messaging should occur long before youth reach the legal driving age to explain the implications of impaired driving and to prevent these dangerous actions from becoming normative and accepted behaviours.

The literature reveals sex to be inconsistent as a risk factor. Several studies show that females are less likely to drive after substance use and ride in a vehicle where the driver has used alcohol or drugs. However, after controlling for the influence of other factors, sex is no longer a significant independent risk factor. It could be that in some situations sex interacts with age and other factors to increase or decrease risk. For example, females tend to be less prone to risk taking (Jessor et al., 1991) and might be in a position to influence the acceptance of safer transportation alternatives. Males can encourage each other to take risks, but might be less likely to drive after alcohol or drug use with female passengers. In any event, sex should not be completely dismissed as a risk factor in that the reasons for riding with an impaired driver might differ according to sex. The influence of sex should be further examined as peers may have a unique ability to encourage each other to make safe decisions.

Rural residence also proved to be an inconsistent risk factor. Although it is often thought that youth who live in rural areas are more likely to drive or ride in a vehicle with someone who has used alcohol or drugs because of the greater reliance on private vehicles for transportation, this is not always the case after the influence of other factors has been controlled. To some extent, the effect of rural residence might be dependent upon the definition of “rural” and “urban.” Studies also usually only examine the frequency with which people engage in the target behaviour and fail to explore the quality of the behaviour. There may well be differences in riding behaviour between urban and rural youth that extend beyond the frequency of their exposure to risk. Rural youth might travel further distances on higher speed and two-lane roadways, factors that can have a profound influence on the risk of crash involvement. Hence, differences in the quality of exposure associated with rural and urban residence should be further explored as a potential risk factor.

Lower socioeconomic status, assessed by level of parental education or respondent perceptions of the extent of their economic comfort, was associated with greater risk of involvement in riding with a driver who had been using alcohol or other drugs. Socioeconomically disadvantaged populations in general have lower health status (Commission on the Social Determinants of Health, 2008). The potential relationship of socioeconomic status with riding after alcohol or drug use and crash involvement is most likely complex and involves the interaction of several other factors. For present purposes, it is sufficient to note that lower socioeconomic status is a factor that is associated with increased risk of involvement in the target behaviours.

Being married or living with a partner was identified as a protective factor. Within the age group of interest (age 15–24), this factor will most likely only come into play among those toward the older end of the distribution. Involvement in a committed relationship represents a major life change and is typically associated with an increase in financial and personal responsibilities, and a reduction in





high-risk activities. On the other end of the scale, not living at home with either parent was identified as a risk factor that could represent a lack of accountability to a disciplinary figure, and suggests that parental guidance can play an important role in preventing this risky behaviour.

Psychosocial factors are those aspects of personality, beliefs, motivations and perceptions of social environment that can influence the propensity to engage in risky behaviours. These factors can include sensation seeking, impulsivity, belief systems and values, as well as the values and opinions of parents and peers. Psychosocial factors have received considerably less attention in studies in this area. These factors typically require a greater investment of time to assess and are often not included in questionnaires that might be seen as too lengthy. From the limited available research, risk-taking, sensation seeking and more risky attitudes towards alcohol and cannabis were identified as risk factors. Peer and parental attitudes, opinions and behaviours about driving after drinking were also associated with increased involvement in riding with a driver who had been drinking or using drugs. Within the psychosocial domain, involvement with religious activities and commitment to academics, sports and extracurricular activities were identified as protective factors. Parents must recognize the importance of modelling safe driving behaviours for their children from an early age; both parents and peers must take the opportunity to challenge risky attitudes, opinions, perceptions and behaviours to help establish the belief that driving after consuming substances is dangerous and unacceptable behaviour.

Behavioural factors are those activities related and possibly antecedent to driving after using alcohol or drugs or riding with a driver who has used alcohol or drugs. Early onset and risky use of alcohol and other drugs are high-risk behaviours strongly correlated with the target behaviours. The literature also reveals extensive overlap between driving after alcohol or drug use and riding as a passenger with a driver who has used alcohol or drugs. The strong association between these behaviours reveals a pattern of high-risk behaviours surrounding the use of substances and vehicles. The poor decisions young people make about transportation often place them in high-risk situations that could be avoided regardless of whether they are the driver or a passenger. Prevention programs should consider all related elements of risk-taking behaviours to identify youth who are at-risk for riding with an impaired driver. Effective messaging might need to be comprehensive and address multiple risky behaviours to change youth engagement in this activity.

Socio-demographic and psychosocial factors are more distal to riding with a driver who has been drinking or using drugs, but contribute to the probability of engaging in the behaviour through experiences, attitudes, perceptions and expectations. Modelling by peers and adults can help influence risky behaviours by providing implicit social approval of, and rewards for, the behaviour. In addition, observing others engage in driving after using alcohol or drugs or riding with a driver who has used alcohol or drugs without adverse consequences creates expectations of efficacy and competence. Perceptions of positive consequences (e.g., getting home without incident, peer approval) far outweigh the likelihood of negative consequences (e.g., crash, injury, parental censure), thereby increasing the probability that the behaviour will occur. Positive role models and constant challenges of risky attitudes, opinions and perceptions are required to help establish appropriate decision making.

Although not examined in any of the studies reviewed, youth perceptions and beliefs about cannabis could also be a factor influencing the decision to drive after using cannabis or ride with a driver who has used cannabis. Focus groups with youth aged 14–19 revealed confusion surrounding the general risks associated with cannabis and in particular the risks associated with the operation of a vehicle (Porath-Waller, Brown, Frigon, & Clark, 2013). Whereas some youth were of the opinion that the use of cannabis by drivers was dangerous, others believed it to be safe and might even make people better drivers by enhancing their concentration. The use of alcohol by drivers was seen as



being more dangerous than cannabis. More consistent and accurate information would at least allow youth to make an informed choice when in the situation of having to determine transportation options.

The characteristics addressed above can help to understand why young people choose to ride with a driver who has used alcohol or drugs. However, further information on the circumstances and situations in which youth make decisions about driving or riding after consuming alcohol and other drugs would aid comprehension of the reasons underlying the decisions they make. Understanding the interaction between the characteristics of those at highest risk and the situations could also facilitate the development of targeted and effective messaging.



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