Drug Use in Fatal Collisions in Canada | 2000-2021

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TRAFFIC INJURY RESEARCH FOUNDATION

Key Findings

Data from the **Traffic Injury Research Foundation's (TIRF) National Fatality Database** reveal that 496 persons died in a collision in 2021 where at least one of the drivers involved was positive for drugs (e.g., cannabis, illicit drugs, prescription drugs, over-the-counter drugs), compared to 230 in 2000. In 2021, 37% of fatalities were drug-related compared to 10.7% in 2000. Since 2013, more persons have died in collisions involving drugs than those involving alcohol, distraction, or other factors.

Among drivers who were fatally injured between 2017 and 2021:

- there was little difference in the percentage of males (52.5%) and females (52.1%) who tested positive for drugs
- almost two-thirds of 20-34-year-olds (61.1%) tested positive for drugs compared to those aged 16-19 (44.6%) and 65 and older (45.4%)
- a larger percentage of drug-related fatal collisions occurred during nighttime hours (6 pm to 5:59 am) as opposed to other hours of the day

Introduction

A larger percentage of fatally injured drivers have tested positive for drugs than alcohol in Canada in recent years. While some of this growth may be due to improvements in data collection, drugged driving has become a higher priority in road safety planning (Brown et al. 2022). This is in part due an increased understanding of how different drugs may adversely affect one's driving in distinct ways. For example, drivers under the influence of central nervous system stimulants may exhibit more aggressive and risky behaviour behind the wheel (Valen et al. 2019) while cannabis use may compromise the ability of drivers to stay in their lane and adversely affect reaction time (Alvarez et al. 2021). In addition, the presence of both cannabis and alcohol in drivers is generally considered to be more detrimental to driving performance than either substance on its own (Simmons et al. 2022). However, other studies suggest that the co-use of cannabis does not increase the crash risk of a driver who has already consumed alcohol (White & Burns 2023).

This fact sheet, sponsored by **Desjardins Insurance**, examines the prevalence of drugs in motor vehicle fatalities in Canada from 2000 to 2021 and recent trends using data from TIRF's National Fatality Database. It also explores trends in the role of drug use among fatally injured victims, and more specifically, fatally injured drivers. Other topics examined include characteristics of drug-related collisions resulting in fatalities such as time of day, day of week, season, and the number of vehicle occupants. In addition, drug use in general, and cannabis use in particular, was compared both before and after October 2018, when the recreational use of cannabis was legalized in Canada. At the time of publication, coroner data from British Columbia for 2021 were not yet available hence results for Canada exclude this jurisdiction.

A fatality is defined as drug-related if at least one driver in the collision (either dying or surviving) is considered to be positive for drugs including cannabis, illicit drugs, prescription drugs, and over-the-counter drugs. This is based, in order of importance, upon toxicological data from the coroner or medical examiner, police-reported collision data, and coroner/medical examiner narrative information.

In this fact sheet, TIRF's reporting on the role of driver drug use refers to its presence and does not necessarily mean that drugs were the primary or sole cause of the collision. Nor does the presence of drugs mean that their quantity was at a level known to impair one's driving.

Prevalence of drug-related fatalities

This section describes the prevalence of drug-related fatalities in Canada over 22 years (2000-2021). It should be noted that the testing rate for fatally injured drivers since 2011 has been 81.7% whereas prior to 2010 the testing rate was only 49%.

The number of drug-related fatalities in Canada between 2000 and 2021 is shown in Figure 1. During these 22 years, the number of drug-related fatalities generally increased to a high of 554 in 2018 in comparison to a low of 230 in 2000, but more recently declined to 496 in 2021. As previously noted, the testing rate for drugs among fatally injured drivers was low until 2011. Thus, the number of drug-related fatalities from 2000-2011 should be treated with caution.

Drug-related fatalities from 2000 to 2021 were grouped into three categories to determine who is most often killed in drug-related fatal crashes. These include cases in which:

- The person killed was the driver who was positive for drugs (drug-positive driver);
- The person killed was not the driver who tested positive for drugs (other victim). This includes drivers who collided with a vehicle driven by a drug-positive driver, passengers who died in a collision where at least one of the drivers was drug-positive, or pedestrians who were struck by a drug-positive driver; or,
- It cannot be determined which driver was positive for drugs or which person in the vehicle was the driver (not stated).

Figure 2 presents drug-related fatalities by victim category. As can be seen, most drug-related fatalities were fatally injured drivers who tested positive for drugs. The number of fatally injured drivers that tested positive for drugs increased to a high of 485 in 2018 before falling to 428 in 2021, compared to 178 in 2000. Meanwhile, drug-related fatalities due to the surviving driver peaked at 70 in 2012 before decreasing to 66 in 2021 as compared to 52 fatalities in 2000. Since there were only 11 drug-related fatalities in the not stated category, this group of victims is not included in the figure.

Figure 1 | Drug-related fatalities: Canada, 2000-2021

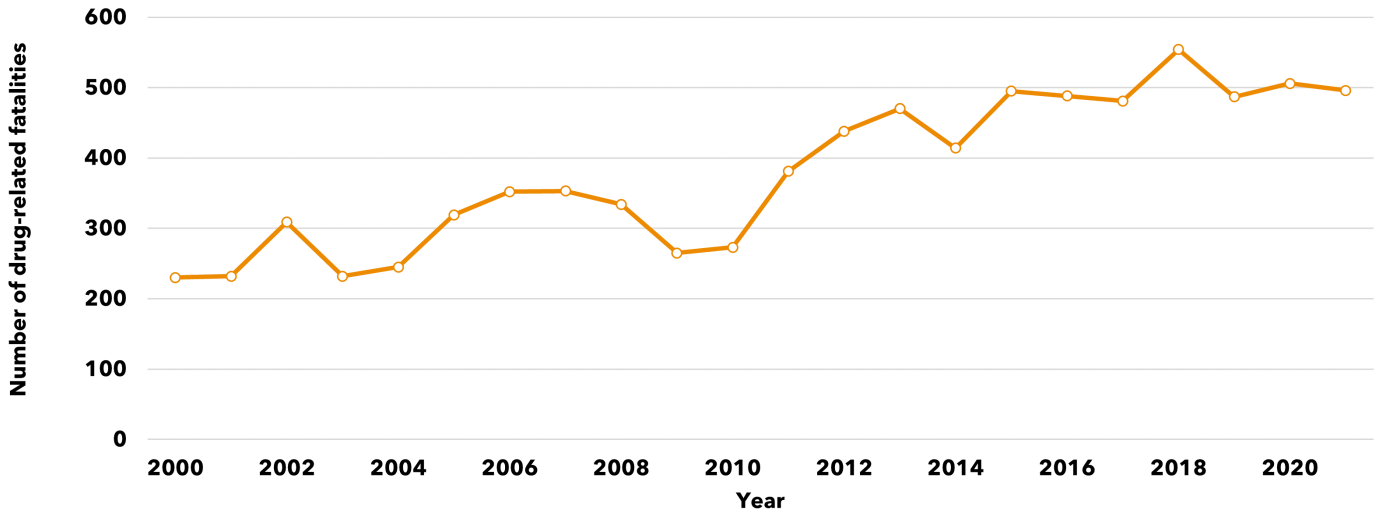
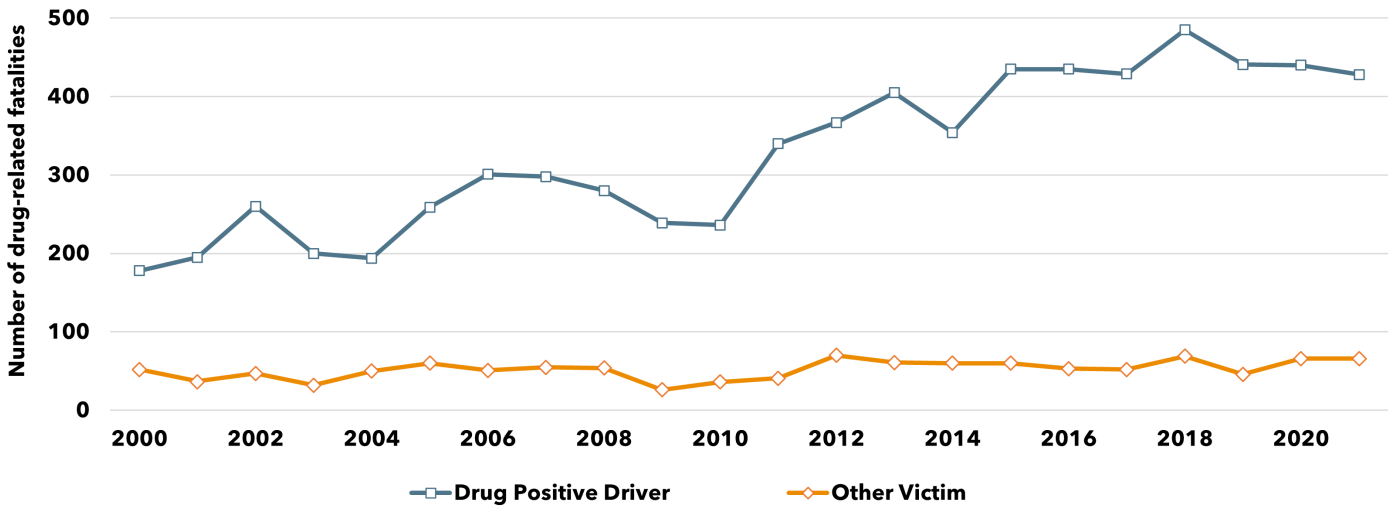
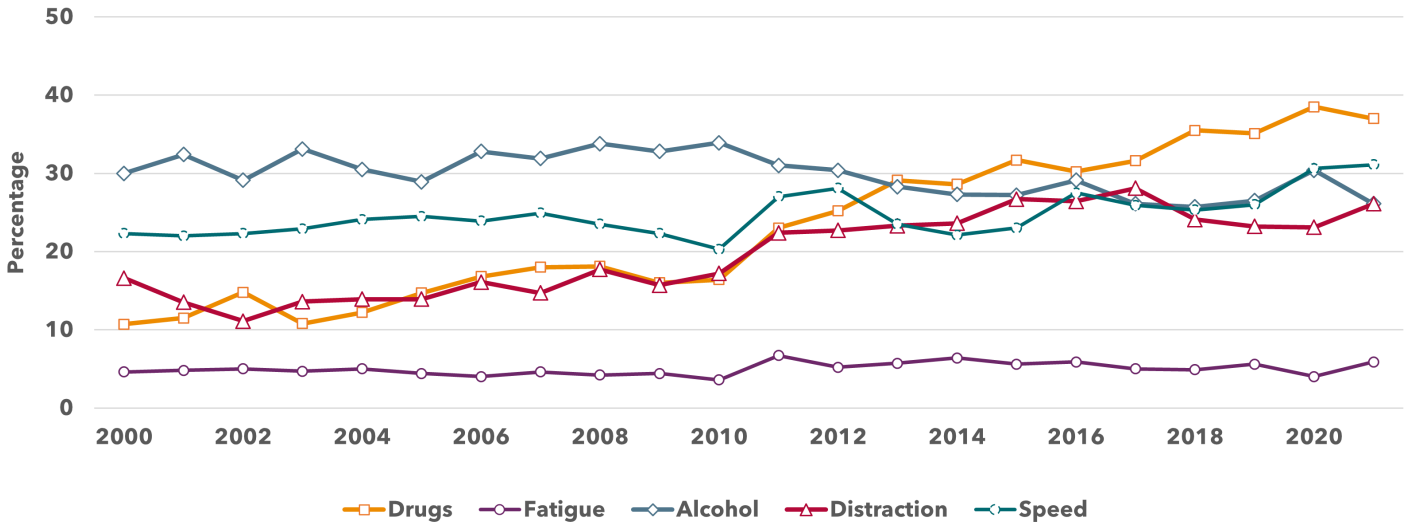


Figure 2 | Number of drug-related fatalities by victim category: Canada, 2000-2021



In Figure 3, trends in drug-related fatalities are compared with other major contributing factors in collisions including alcohol, distraction, speed, and fatigue. The percentage of drug-related fatalities has risen dramatically to 37% in 2021 compared to just 10.7% in 2000. Notably, since 2013, a larger percentage of drug-related fatalities have occurred than other contributing factors. During these 22 years, there have also been noticeable, albeit more modest, increases in distraction-related fatalities up to 26.1% in 2021 compared to 16.6% in 2000; speed-related fatalities also increased to 31.1% up from 22.3%. By comparison, fatigue-related fatalities have remained steady rising slightly to 5.9% in 2021 up from 4.6% in 2000. The percentage of alcohol-related fatalities has been relatively stable in these 22 years (30% in 2000 compared to 26.1% in 2021). Alcohol-related fatalities had been the most prevalent during most of this period but in the past seven years they have been surpassed by drug-related fatalities.

Figure 3 | Percentage of fatalities related to alcohol, distraction, speed, and fatigue: Canada, 2000-2021



Characteristics of fatally injured drivers testing positive for drugs

In order to obtain a more recent picture of the magnitude of the problem of drugs and driving, this section examines the demographic characteristics of fatally injured drivers to gauge any variation in terms of drug use according to driver sex, age group, and vehicle type between 2017-2021.

Figure 4 shows 52.5% of fatally injured male drivers were positive for drugs compared to 52.1% of fatally injured female drivers during this period.

The age of fatally injured drivers has been grouped into the following age categories: 16-19, 20-34, 35-49, 50-64, and 65+ years. The percentage of fatally injured drivers in each age group that tested positive for drugs is presented in Figure 5. Drivers aged 20-34 (61.1%) were the most likely to have tested positive for drugs. Conversely, less than half (44.6%) of fatally injured drivers aged 16-19 and those aged 65 and older (45.4%) tested positive for drugs. Generally speaking, fatally injured drivers aged 65 and older are more likely to test positive for central nervous system (CNS) depressants while drivers aged 16-19 and 20-34 are more likely to test positive for cannabis (Brown et al. 2020).

The prevalence of drug use among fatally injured drivers of different vehicle types is shown in Figure 6. Fatally injured drivers of automobiles (53.8%) and trucks/vans (52.9%) were the most likely to test positive for drugs compared to 50.6% of motorcyclists and only 37.7% of tractor-trailer drivers.

Figure 4 | Fatally injured drug-positive drivers by sex: Canada, 2017-2021

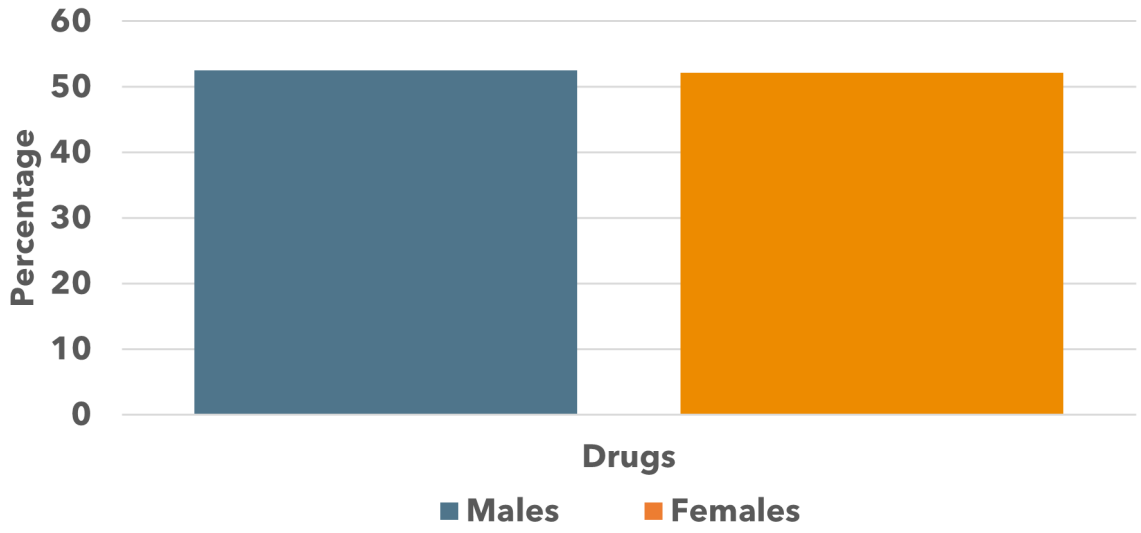


Figure 5 | | Fatally injured drivers testing positive for drugs by age category: Canada, 2017-2021

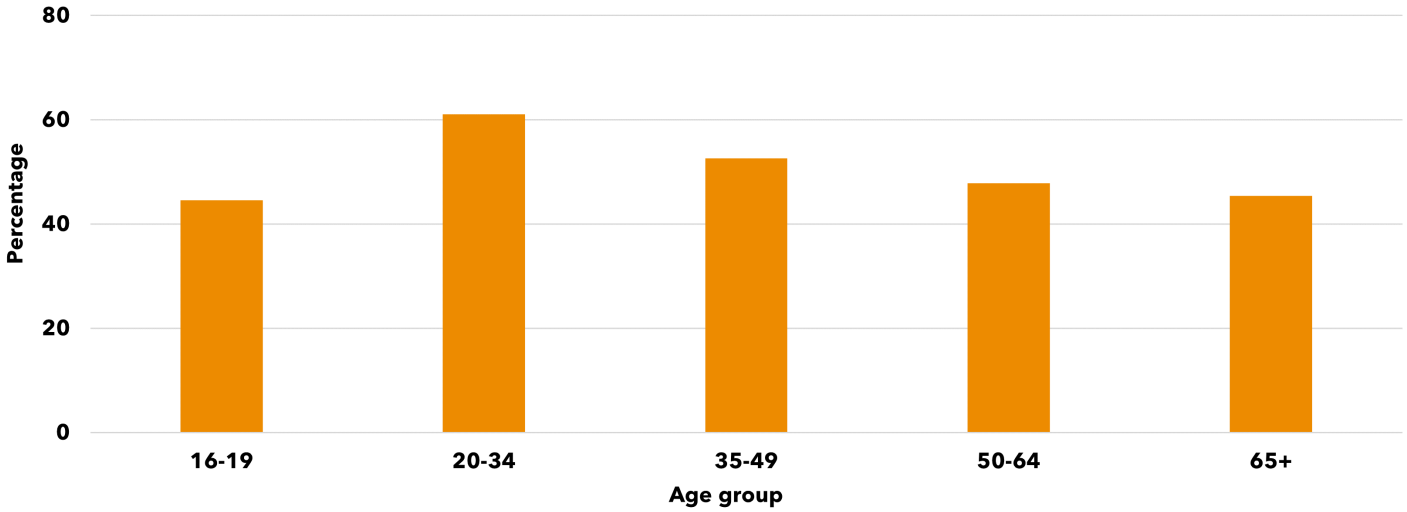
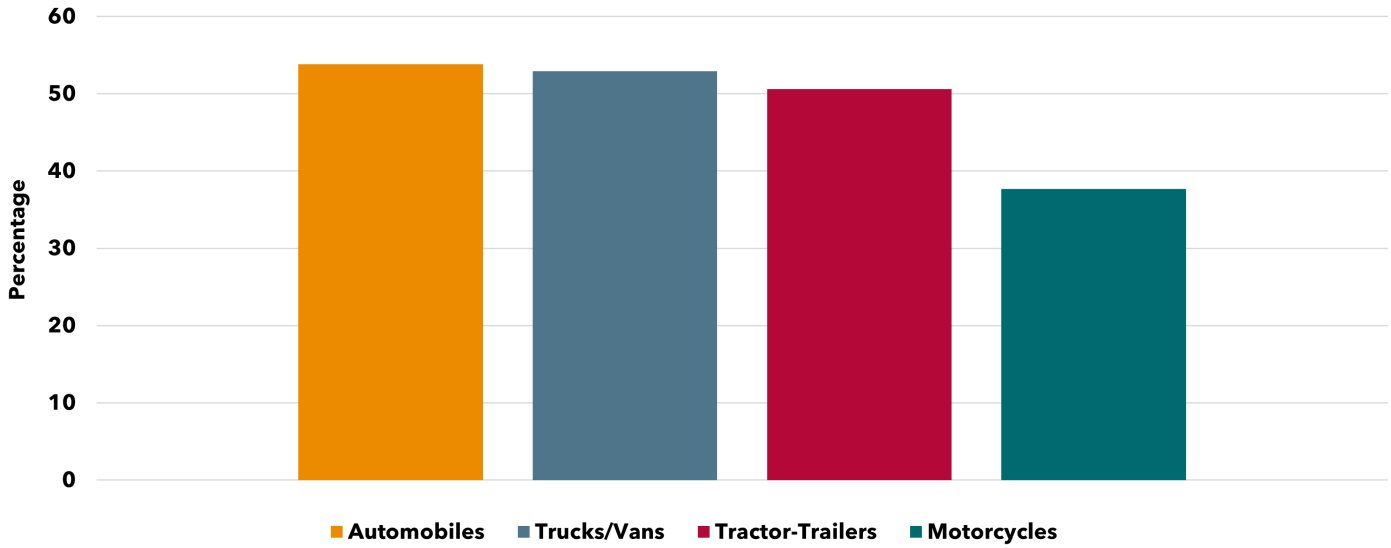


Figure 6 | Fatally injured drivers testing positive for drugs by vehicle type: Canada, 2017-2021



Collision characteristics of drug-related fatalities

This section examines the collision characteristics of drug-related fatalities in terms of time of day, day of week, season, and number of occupants in the vehicle for fatal collisions during the past five years (2017-2021).

The time of day for drug-related fatalities is aggregated into three-hour increments (e.g., midnight to 2:59 am). Figure 7 compares the number of drug-related fatalities by time of day. The largest percentage of drivers testing positive for drugs was among drivers involved in collisions occurring between midnight and 2:59 am (42.3%). There was a gradual decrease in the percentage of drivers testing positive for drugs until after the 9:00 am-11:59 am time slot (32.4%), and a general increase in the percentage of drivers testing positive for drugs later in the day (37.2% in the 9 pm -11:59 pm period).

Drug-related fatalities were also grouped into those which resulted from collisions occurring on the weekend (between 6 p.m. Friday and 5:59 pm on Sunday) as opposed to the weekday (from 6 pm Sunday to 5:59 p.m. on Friday). In Figure 8, 37.7% of fatalities in weekend collisions were drug-related whereas 34.5% of weekday collision fatalities were drug-related.

Figure 7 | Drug-related fatalities by time of day: Canada, 2017-2021

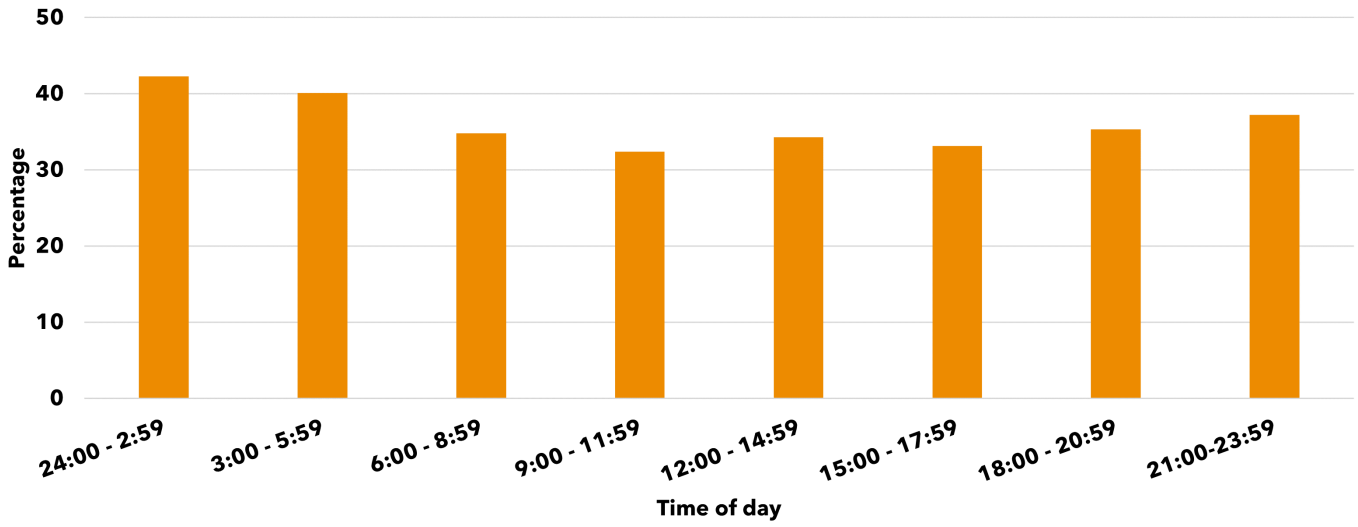
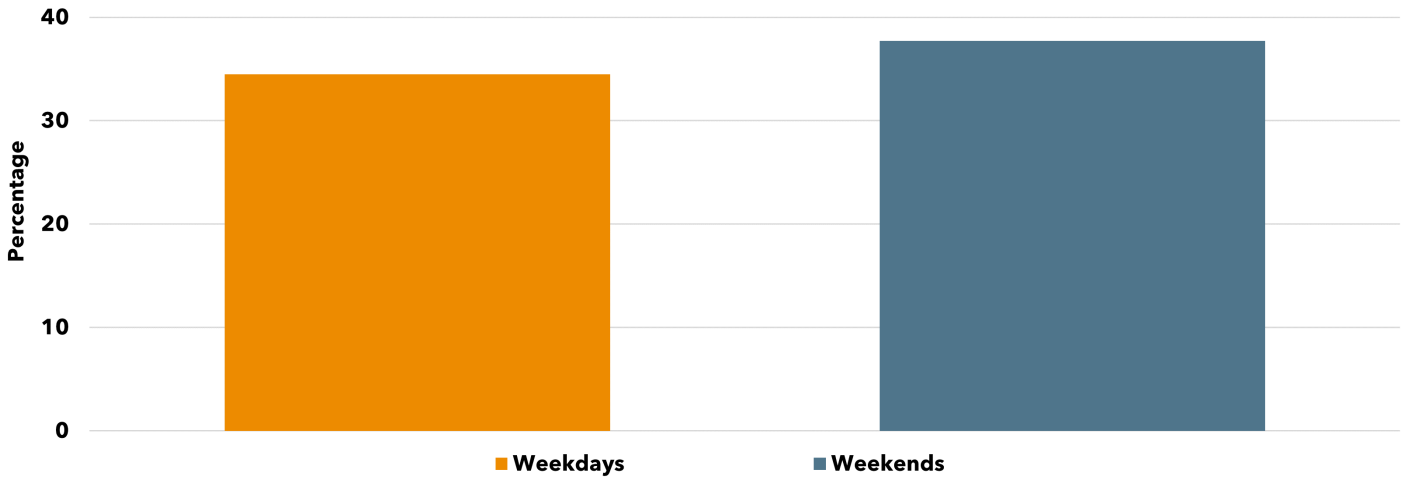


Figure 8 | Drug-related fatalities during weekends and weekdays: Canada, 2017-2021



Collision season is defined in the following manner: spring (March-May), summer (June-August), autumn (September-November), and winter (December-February). Seasonal variations in the percentage of fatalities that are drug-related are presented in Figure 9.

The largest percentage of drug-related fatalities occurred in the summer (37.4%) while the lowest occurred in winter (31.7%).

For the 2017-2021 period, the percentage of drug-related fatalities were compared based upon the number of vehicle occupants. Figure 10 shows the percentage of drug-related fatalities decreased as the number of vehicle occupants increased. For example, almost half (47.5%) of fatalities in collisions with only one occupant in the vehicle were drug-related whereas only 14% involved five or more occupants in the vehicle.

Figure 9 | Drug-related fatalities by season: Canada, 2017-2021

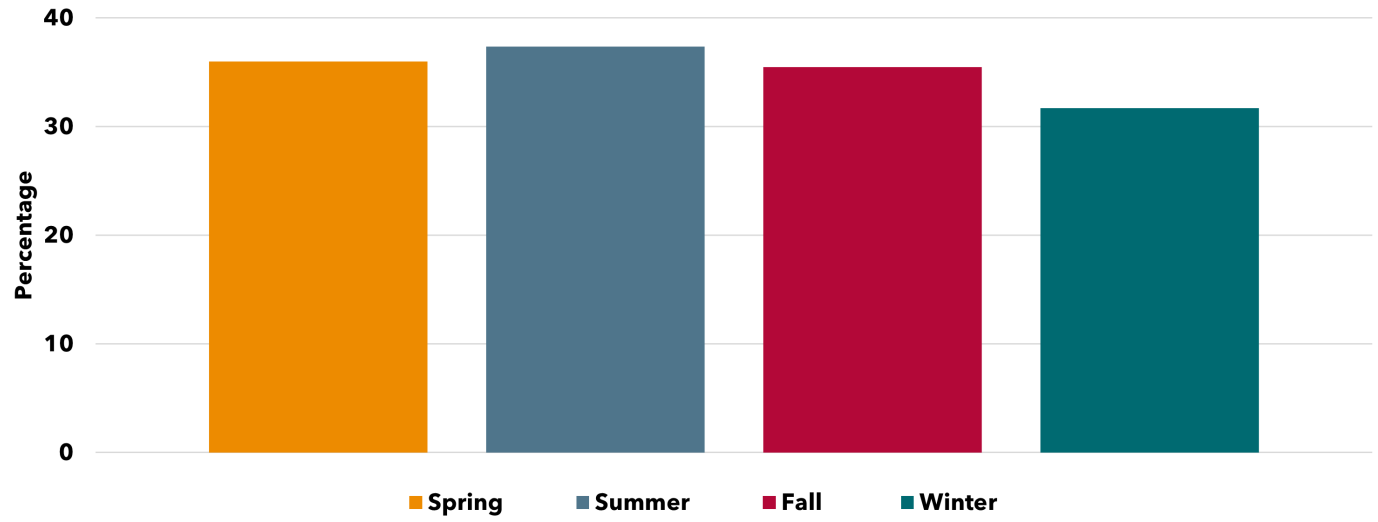
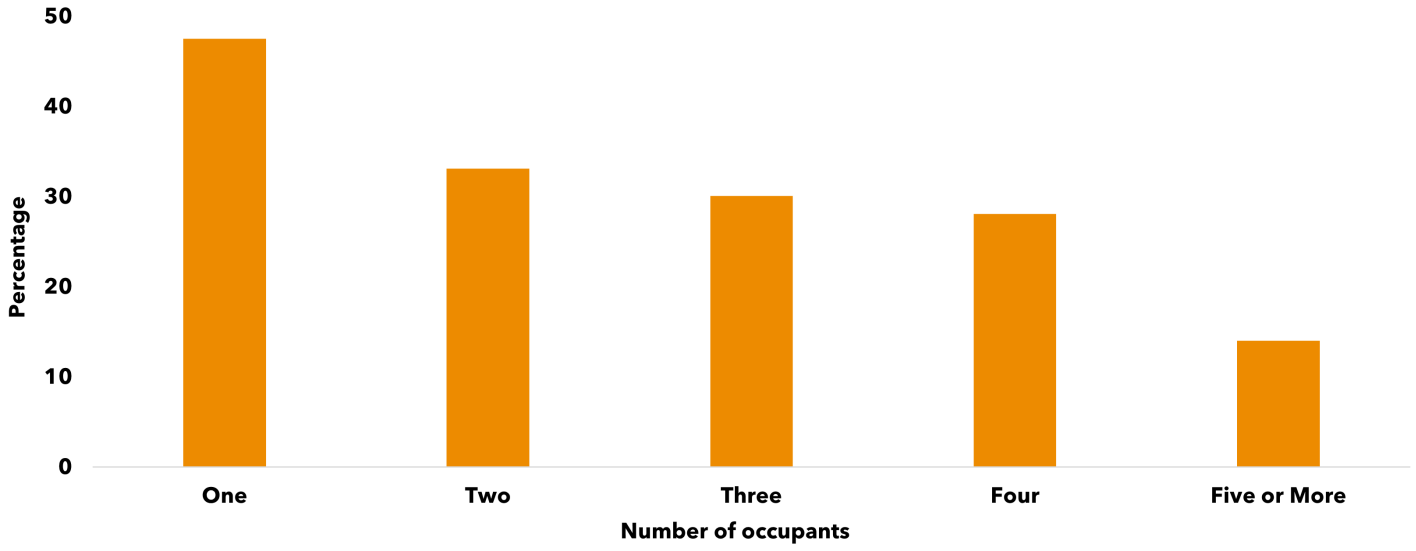


Figure 10 | Drug-related fatalities by number of vehicle occupants: Canada, 2017-2021

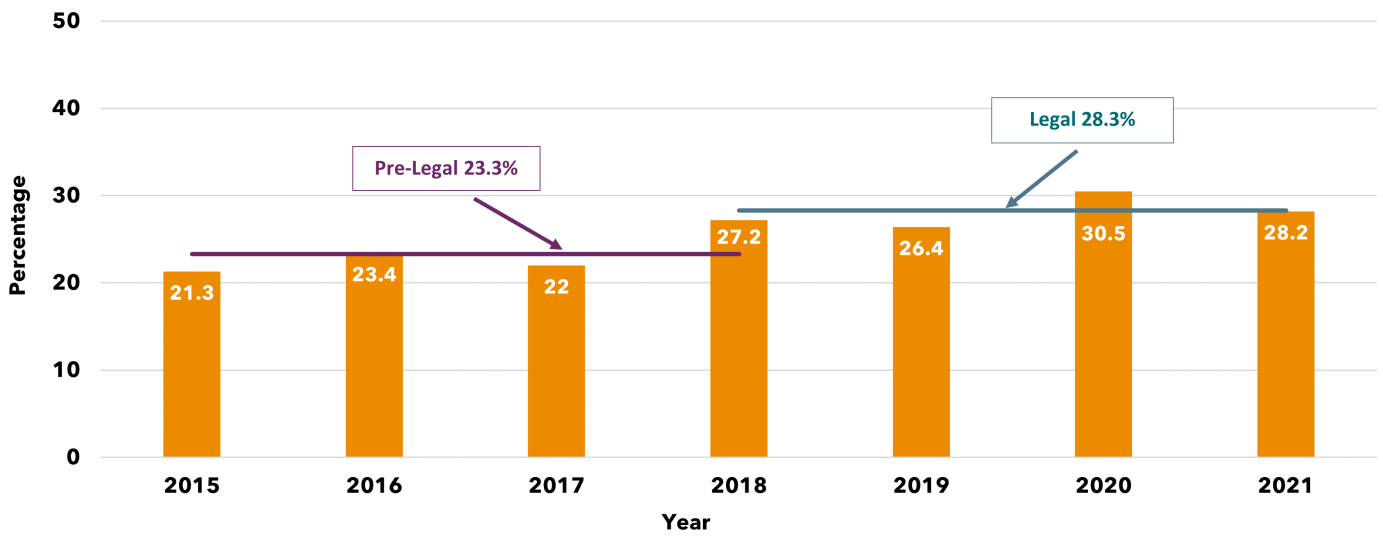


Cannabis use among fatally injured drivers before & after October 2018

On October 16, 2018, recreational cannabis use was legalized by the Government of Canada. In this section, comparisons are made between the percentage of fatally injured drivers who tested positive for cannabis during the three year pre- (January 1, 2015 to October 15, 2018) and post-legalization (October 16, 2018 until the end of 2021). Figure 11 shows the percentage of fatally injured drivers testing positive for cannabis rose from 21.3% in 2015 to 30.5% in 2020, before declining to 28.2% in 2021. There was also an increase (from 23.3% to 28.3%) in average percentage of drivers who tested positive pre- and post-legalization.

Using the same pre- and post-legalization periods for cannabis use among fatally injured drivers, the percentage of fatally injured drivers testing positive for cannabis can be compared across different age groups. Figure 12 shows the percentage of 16–19-year-old fatally injured drivers testing positive declined from 38.3% pre-legalization to 31.1% in the post period. In comparison, the percentage of fatally injured drivers testing positive across all other age groups rose post-legalization, particularly among 20-34-year-old drivers (pre-36.1% to post-45.6%) and drivers aged 65 and older (3.9% to 7.9%).

Figure 11 | Fatally injured drivers testing positive for cannabis pre- and post-legalization: Canada, 2017-2021



The percentage of fatally injured drivers testing positive for cannabis, alcohol, CNS depressants, narcotic analgesics, and CNS stimulants is compared during the two pre- and post-legalization time periods from 2015-2021. Figure 13 presents the percentage of fatally injured drivers who tested positive for any of these substances in each period. As stated earlier, the percentage of fatally injured drivers testing positive for cannabis increased from an average of 23.3% pre-legalization to 28.3% post-legalization. Similarly, the percentage of fatally injured drivers testing positive for CNS stimulants also increased from 15.2% to 19%. By comparison, there was a slight decrease in the percentage of fatally injured drivers testing positive for alcohol, CNS depressants, and narcotic analgesics from the pre- to the post-legalization period. In addition, the percentage of drivers who tested positive for drugs excluding cannabis and alcohol decreased slightly during these same periods from (36%) pre-legalization to (34.9%) post-legalization.

Figure 12 | Fatally injured drivers testing positive for cannabis pre- and post-legalization by age group: Canada, 2017-2021

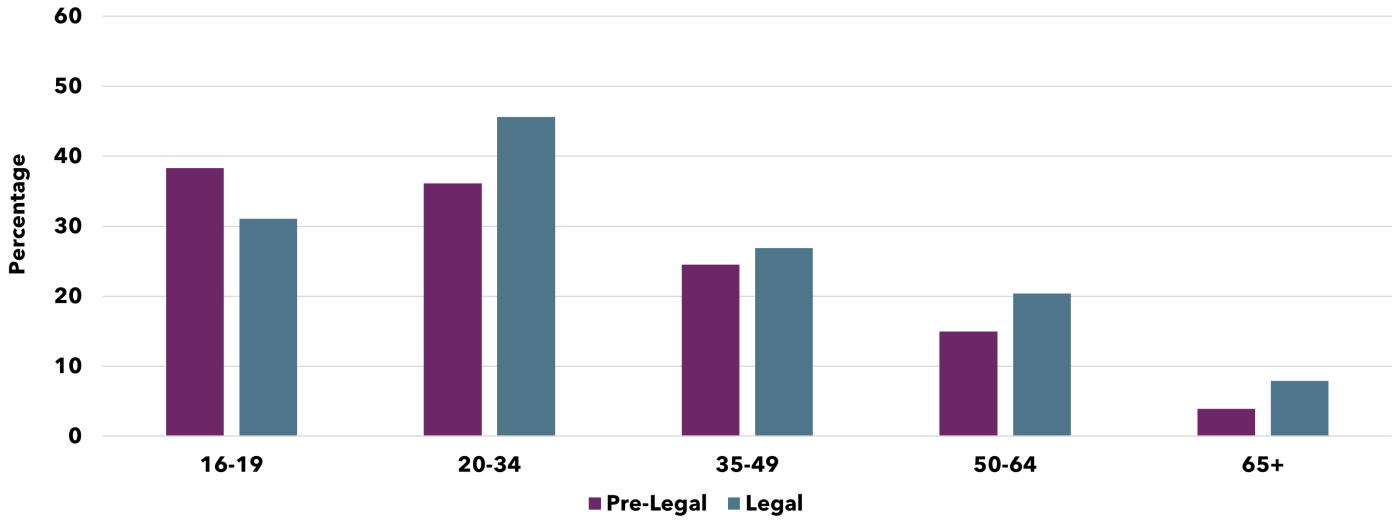
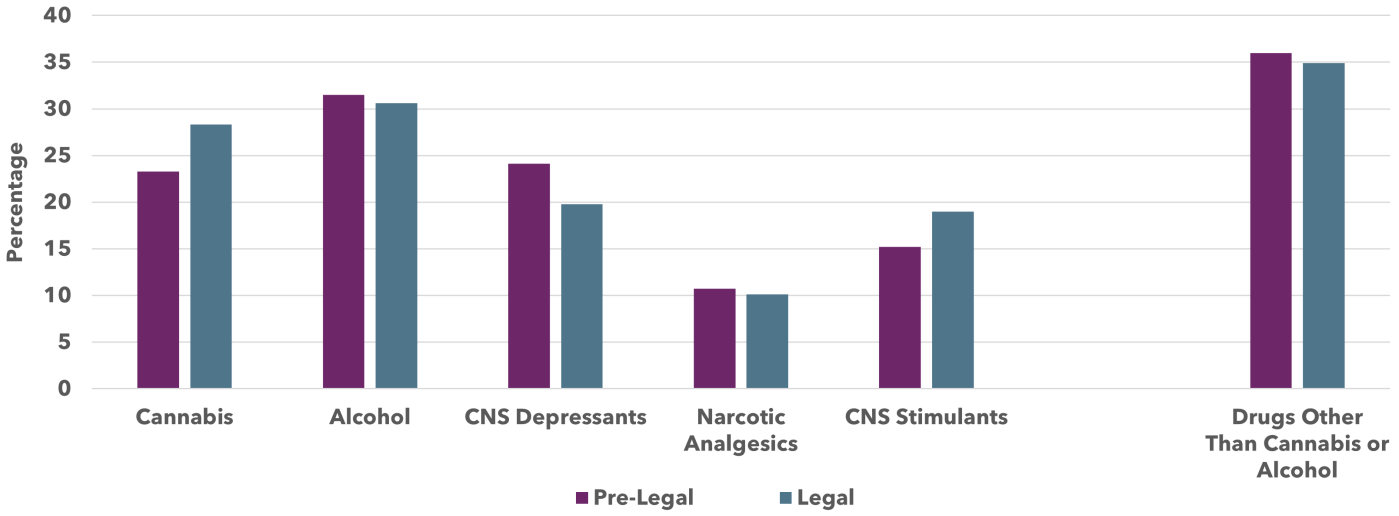


Figure 13 | Fatally injured drivers testing positive for drugs pre- and post-legalization: Canada, 2017-2021



Conclusions

According to TIRF's National Fatality Database, there was an upward trend in the number of drug-related fatalities in Canada between 2000 and 2021. This may be due, in part, to a larger percentage of fatally injured drivers being tested for drugs since 2011. For drug-related collisions, the majority of victims in drug-related collisions were fatally injured drivers testing positive for drugs. This is similar to alcohol-related fatalities in which most victims were the drinking driver.

Among fatally injured drivers, an almost identical percentage of males and females tested positive for drugs, and fatally injured drivers aged 20-34 were the most likely to test positive compared to a progressive decline among older age groups.

From 2015 to 2021, there was a general increase in the percentage of fatally injured drivers testing positive for cannabis. While it may have been anticipated that a larger percentage of fatally injured drivers would test positive for cannabis post-legalization compared to pre-legalization, it should be noted there was also an increase in the percentage of drivers testing positive for CNS stimulants. The same cannot be said for alcohol, CNS depressants, and narcotic analgesics as a smaller percentage of fatally injured drivers tested positive for these substances post-legalization compared to prior to legalization.

Drug-related fatal collisions most frequently occurred between midnight and 6 am. There was little variability in the percentage of persons dying in drug-related collisions on weekdays compared to weekends. Summer was the most common season for drug-related fatal collisions. In general, temporal factors played less of a role in predicting drug-related fatal collisions than alcohol-related fatal collisions.

The percentage of drug-related fatalities was lower in vehicles with multiple occupants than those with a sole occupant. Perhaps drivers carrying passengers felt a greater sense of responsibility. This contrasts with the role of distraction where there appears to be a greater percentage of distraction-related fatalities among vehicles with multiple occupants (Brown et al. 2023). Historically, education campaigns have informed passengers of the dangers of riding with a drinking driver. Efforts should be expanded to inform the public of the perils of riding with a driver under the influence of drugs. Of equal importance, targeted messaging is needed to ensure drivers understand the risks associated with consuming cannabis alone or in combination with alcohol. In particular, highlighting the way that these two substances impair driving that are similar as well as different are needed to combat the misperception that cannabis is 'safer'.

Interpretations of trend data should acknowledge past limitations associated with the reporting of the role of drugs in collisions. Since 2011, testing rates for drug use among fatally injured drivers have increased substantially which is why trends are examined more closely during the 2017 to 2021 period. Police-reported collision data have improved to more routinely report drug use among surviving drivers, and to also include information about the type of drug(s) consumed by drivers. It should also be noted that as more police officers receive drug recognition expert (DRE) training and certification, drug use among surviving drivers may be documented more consistently and accurately.

In conclusion, data show an increase in drug-related fatalities since 2000. In addition, since 2013, the percentage of drug-related fatalities has surpassed fatalities involving alcohol, distraction, and speed in recent years. Drug-related collisions often possess characteristics different from alcohol-related collisions. In addition, the demographic characteristics of drug-positive drivers may be different from those of drinking drivers. Thus, enforcement activities and education initiatives to combat drugs and driving ought to be tailored to the target audience based on these patterns.

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Fatality Database Disclaimer

Data from **TIRF's National Fatality Database** may be subject to change as the closure of cases is ongoing. As such, there may be minor differences in this document compared to previous documents reporting on the same topic.

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