

Injury Insight



ATV Safety

Background

All-terrain vehicles (ATVs) are used across Canada for recreation and transportation, particularly in rural and remote communities.¹ Their popularity has been steadily increasing, with ATV registration doubling between 2015 and 2019 in British Columbia (BC), from 17,985 to 35,838 vehicles.² ATV-related deaths have been trending upwards across Canada with an 85.7% increase from 1990-2010.³ This is also the case for serious ATV-related injuries.³



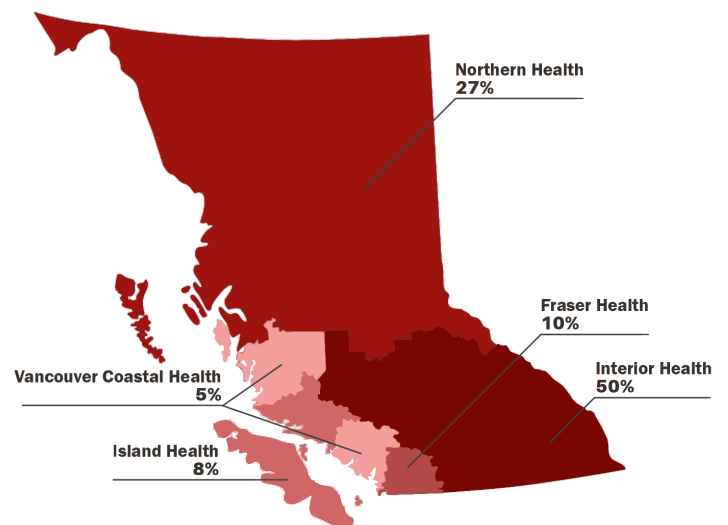
ATVs are large off-road vehicles that can weigh more than 660lbs (300kg) with engine displacements ranging from 500cc up to 700cc,¹ designed to travel on four low-pressure or non-pneumatic tires, having a seat designed to be straddled by the operator and handlebars for steering control. ATVs are subdivided into two types: Type I ATVs are intended by the manufacturer for use by a single operator, while Type II ATVs are intended for use by an operator and a passenger, and are equipped with a designated seating position behind the operator.⁴ ATVs are built with an increased ground clearance to travel across rough terrain, resulting in a high centre of gravity that increases the risk for rollovers. When used on uneven ground, ATV drivers are required to make split second

judgements, frequently shifting their weight to maintain balance.⁵ While ATVs are used for transportation and vocation (e.g., farming), the majority of young people using ATVs do so for recreational purposes.¹

Injuries and Fatalities

Common causes of ATV-related injuries include rollover, falling off the vehicle, collision with an object, and ejection.^{1,6} Rollover commonly occurs on steep slopes due to excessive speed or by overloading the vehicle with passengers or equipment.⁷ Higher vehicle ground clearance and lower driver skill also increase the risk of rollover.⁵

Figure 1: ATV-related deaths in BC by health authority, 2014-2018⁸

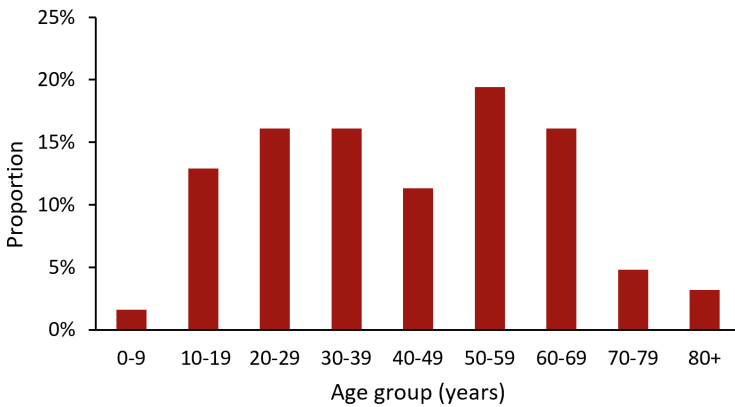


There were 62 ATV-related deaths in BC between 2014 and 2018, averaging 12 deaths per year:⁸

- 84% were male
- 35% were 50-69 years of age
- 39% occurred in the summer, followed by Spring (34%), Fall (19%) and Winter (<10%)

The leading causes of ATV-related deaths were head injury and multiple injuries.⁹

Figure 2: ATV-related deaths in BC by age group, 2014-2018 (n=62)⁸

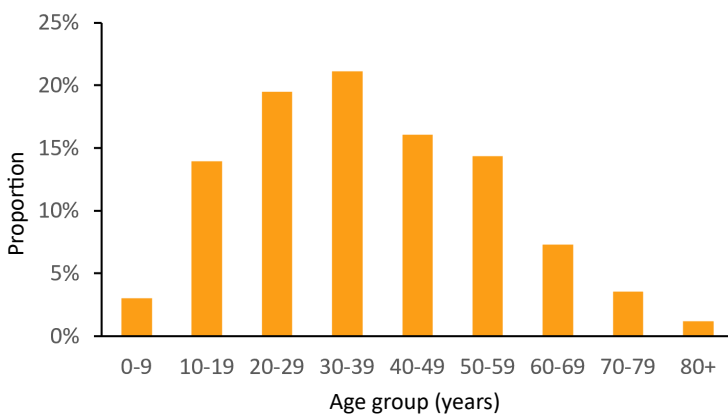


There were 933 ATV-related patients hospitalized in BC between 2016/17 and 2018/19, averaging 311 cases per year:

- 81% were male
- 41% were 20-39 years of age
- 19% were passengers
- 95% occurred in off-road areas¹⁰

The leading types of ATV-related injuries resulting in hospitalization were fracture (63%), intracranial injuries (9%), and other and unspecified intra-thoracic organs (5%).

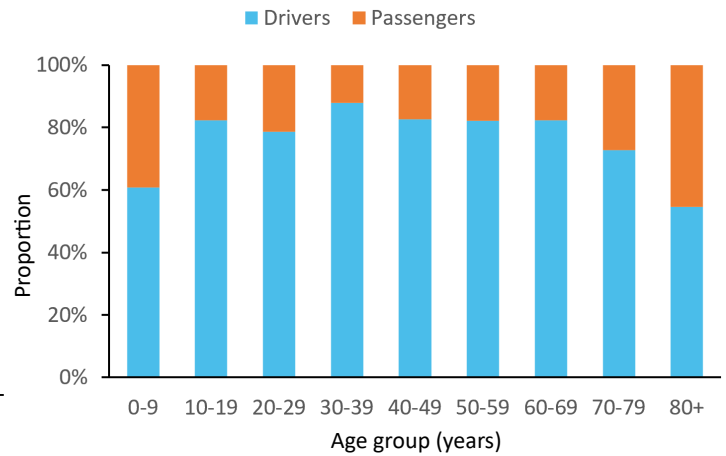
Figure 3: ATV-related patients hospitalized in BC by age group, 2016/17 - 2018/19 (n=933)¹⁰



Passengers accounted for 39% of all ATV-related injuries resulting in hospitalization among children ages 0 to 9 years as well as 45% among older adults ages 80 years and older. They also accounted for 27% of injuries among 70 to 79-year-olds, and less than 20% among all other age groups.¹⁰

Among children and youth, drivers accounted for 61% of 0 to 9-year-olds, 82% of 10-14-year-olds, and 79% of 15 to 19-year-olds hospitalized for ATV-related injuries.¹⁰

Figure 4: Proportion of drivers and passengers hospitalized for ATV-related injuries in BC by age group, 2016/17 - 2018/19¹⁰



Children and Youth ATV Operators

The risk of injury for children and youth operating an ATV is almost double that of an adult.¹

Children and youth are:¹

- Less experienced
- Tend to be smaller and not as strong
- Still developing motor and cognitive skills
- Have a tendency to engage in risk-taking behaviours
- Too often driving ATVs that are too big and too powerful for their age, strength, experience and skill

Youth ATVs¹

- There is a voluntary standard recommended by the Canadian ATV industry surrounding youth size vehicles for different age ranges
- Youth models are available for ages 6 to 14 years and come with a pre-set speed that is age appropriate
- All youth ATVs come with warning labels that state the age limits and supervision requirements for the vehicle, as well as a warning of the consequences for not adhering to these age restrictions: increased “risk of severe injury or death”
- There is little evidence suggesting these smaller models are safer for children, however there is some evidence to indicate that they may reduce the rate of injury by up to 18%

While it is illegal to operate an ATV while under the influence of drugs or alcohol, alcohol was a contributing factor in 16% of all ATV-related severe trauma cases in BC from 2015/16 to 2019/20,¹¹ as well as half of all ATV fatalities between 2009 and 2017.⁸

Legislation in BC¹²

Helmets adhering to standards for off-road vehicle (ORV) use are required for ATV operators and passengers, including children.

Helmet Use

Among the ATV-related severe trauma cases in BC from 2015/16 to 2019/20:¹¹

- 54% wore a helmet
- 29% did not wear a helmet
- 17% use unknown/missing

ATV operators are not permitted to operate between half-an-hour after sunset and half-an-hour before sunrise without illuminated, fixed, or detachable headlights and taillights. If the ATV has brake lights, they should be illuminated as well.

When operating an ATV on both public and private land, children:

- under the age of 14 can operate an ATV only when supervised by an adult with a valid driver's license
- must be at least 14 years of age and have appropriate training and parental consent to operate an ATV unsupervised
- are not permitted to have passengers unless the passenger is an adult supervisor. If the ATV is a Type II machine designed to carry passengers, the adult operator must ensure that the passenger meets the height and weight requirements
- must meet the manufacturer's recommended minimum age, height, and weight guidelines

Prevention

ENGINEERING:

- Alcohol ignition interlock devices
- ATV horsepower

ENACTMENT & ENFORCEMENT:

- Enforcement of legislation using policing services

Rider recommendations

- Take a training course that requires:
 - > Mandatory knowledge and skill testing to pass
 - > Post-course evaluations to assess the effectiveness of the training course
- Always wear a helmet that adheres to standards for off-road vehicle (ORV)
- Always use protective clothing – long sleeves, long pants, gloves, eyewear and over-the-ankle boots¹
- Never carry a passenger on a Type I ATV designed for a single operator
- Never carry more than one passenger on a Type II ATV specifically designed for two people
- Never ride an ATV under the influence of alcohol or drugs
- Never ride an ATV on paved roads except to cross where safe to do so and permitted by law
- Ride an ATV only on designated trails and at a safe speed

Policy recommendations

- Harmonize ATV legislation across all Canadian provinces and territories
- Restrict the operation of ATVs to children and youth 16 years of age and older
- Require the installation of Rollover/Crush Protection Devices (ROPs)
 - > ROPs have been demonstrated to be effective in reducing serious injuries and fatalities in the event of a rollover⁷

Figure 5: Example of Rollover/Crush Protection Device attached to the rear of an ATV



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Related Resources

- Canada Safety Council: The Flip Side of ATVs: <https://canadasafetycouncil.org/the-flip-side-of-atvs/>
- Province of BC: Off-Road Vehicles: <https://www2.gov.bc.ca/gov/content/industry/crown-land-water/crown-land/crown-land-uses/off-road-vehicles>
- Adventure Smart: Off-road Vehicle: <https://www.adventuresmart.ca/off-road-vehicle/>
- Parachute: All-Terrain Vehicles - Safety Tips: <https://www.parachutecanada.org/en/injury-topic/all-terrain-vehicles/>

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