

Injury Insight



Snowmobiling Safety

Background

Snowmobiling is becoming an increasingly popular recreational winter activity. Across Canada, there are approximately 610,000 snowmobiles registered and 121,297 km of organized recreational trails.¹ Although injuries and fatalities related to snowmobiling are declining as new safety regulations are being put into place across Canada, snowmobiling remains the most common cause of winter activity related deaths and the third most common cause of winter activity leading to hospitalization.^{2,3}

Snowmobiles are one of the largest off-road vehicles that do not require a license to operate. They can weigh over 600lbs and reach speeds greater than 120km/hr.⁴ They have the unique capability to be used on regular roadways and highways, on groomed trails, and in the backcountry. Each of these areas comes with its own risk. While many of the trails in Canada have posted speed limits, and new laws are being introduced to regulate speed, helmet use, and snowmobile operators' age, they do not eliminate the potential for severe injury or death.

Snowmobiles are considered a motor vehicle. In Canada, it is illegal to operate a motor vehicle when impaired.

Injuries and Fatalities

Across Canada, snowmobilers aged 16 to 45 years have experienced the highest incidence of serious injury or fatality in a snowmobile related incident.⁵

There were 114 snowmobiling deaths in BC between 2007/08 and 2017/18, averaging 10.4 deaths per year:²

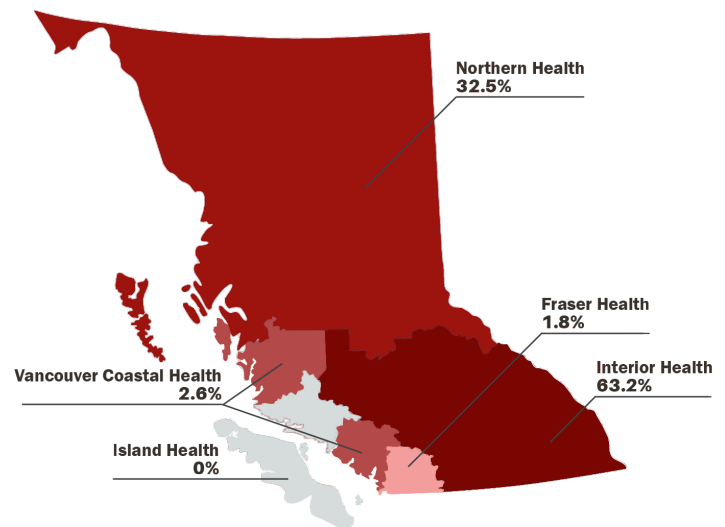
- 89.5% were male
- 57% were 30 to 49 years of age

Incidents resulting in these snowmobiling deaths were:²

- avalanche (57%)
- collisions (20.2%)
- rollover (7.0%)
- fall from height (6.1%)
- being thrown from the snowmobile (4.4%)
- other/unknown (5.2%)

Leading causes of death were: suffocation (60%), multiple blunt injuries (18%), and head injury (11%).²

Figure 1: Snowmobile deaths by health authority (2007/2008-2017/2018)



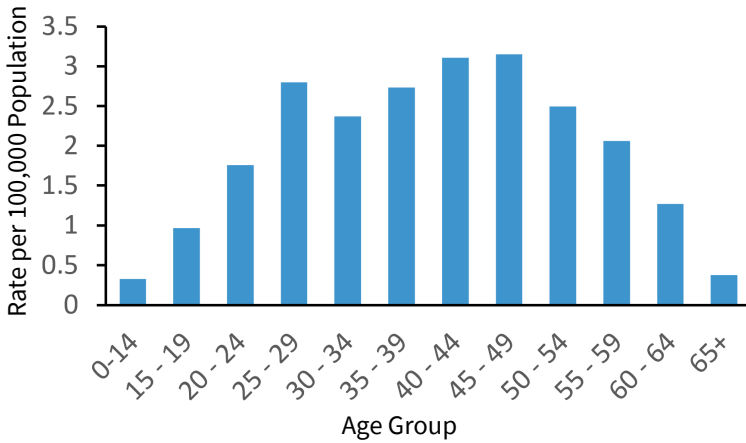
Data source: BC Coroners Service

There were 269 snowmobile-related hospitalizations between 2016/17 and 2018/19, averaging 89.7 hospitalizations per year:⁶

- 37% with serious trauma
- 87% males
- 40 to 49-year-olds experienced the highest hospitalizations rate

- 86% drivers as compared to passengers or unknown
- 69% were fractures
- 71% of 0 to 14-year-olds hospitalized for snowmobile-related injuries were passengers
- 88% of 15 to 19-year-olds hospitalized for snowmobile-related injuries were drivers

Figure 2: Hospitalization Rate per 100,000 by Age Group, Snowmobile Injuries, BC, 2016/17-2018/19



Data source: Discharge Abstract Database, Trauma Cube, Trauma Services BC.

Emergency room visits for snowmobile-related injury in Ontario (2015 – 2016):⁷

- 16 to 24-year-olds experienced the highest rates
- 66.7% of injured riders reported wearing a helmet
- Common mechanisms of injury were: ejection (24.2%), rollover (22.7%), and falling off (21.2%)

71% of 0 to 14-year-olds hospitalized for snowmobile-related injuries were **passengers**

88% of 15 to 19-year-olds hospitalized for snowmobile-related injuries were **drivers**

Risks

Snowmobiling accounted for the majority of deaths among all winter activities, including skiing, snowboarding, ice climbing, snowshoeing, and tobogganing, in BC between 2007/2008 and 2017/2018.²

Snowmobiling-related injuries can be caused by:

- colliding with a vehicle when on roads and highways⁵
- colliding with a stationary object such as a tree when on groomed trails, especially in wooded areas²
- excessive speed^{8,9}
- alcohol impairment⁵

With increasing access to winter resorts and opportunities to explore the untouched snow in the backcountry, snowmobilers encounter a significant risk of injury and death in the form of avalanches. Snowmobiling was the most common winter activity involved in avalanche deaths in BC between 1996 and 2014.¹⁰ The average age of snowmobilers killed in an avalanche was 36 years.¹⁰

Suboptimal lighting conditions during the winter months pose another risk to snowmobilers riding at night. Across Canada, 60% of snowmobiling fatalities occurred between 6:00 at night and 6:00 in the morning.⁸

Legislation in BC⁸ (as of December 30th, 2020)

Helmets are required for snowmobile operators, passengers, and children. Helmets must adhere to standards for off-road vehicle helmets.

Snowmobilers 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 snowmobile has brake lights, they should be illuminated as well.

When snowmobiling on both public and private land, children:

- under the age of 14 may operate an ORV 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 a snowmobile unsupervised
- are not permitted to have passengers unless the passenger is an adult supervisor
- must meet the manufacturer’s recommended minimum age, height, and weight guidelines

Prevention

EDUCATION:

Snowmobilers of all experience levels can benefit from further education. There are numerous resources available that provide snowmobile specific information on safety, avalanche awareness, and snowmobile operation:

- BC Snowmobile Federation: <https://www.bcsf.org/cpages/home>
- International Snowmobile Manufacturers Association: <http://www.snowmobile.org/index.html>
- Safe Riders Snowmobile Safety Awareness Program: <https://www.saferiderssafetyawareness.org/>
- Ontario Ministry of Transport – Snowmobiles: <http://www.mto.gov.on.ca/english/safety/snowmobile-safety.shtml>

ENGINEERING:

Engineering recommendations to reduce the risk of snowmobiling injury include:

- Alcohol ignition interlock devices¹²
- Improvements in headlight illuminance, braking, steering, and stability¹³

ENACTMENT & ENFORCEMENT:

Recommended policies to reduce the risk of snowmobiling injury include:

- Harmonize snowmobiling legislation across Canada
- Require a driver's license/certificate for recreational snowmobilers
- Be at least 16 years to operate a snowmobile for recreational purposes, recommended by the Canadian Pediatric Society and the American Academy of Pediatrics^{13,14}
- Posted speed limits on all groomed trails and roadways
- Maximum 50 km/hr nighttime speed

- Require snowmobilers to participate in safety and avalanche training
- Increase education surrounding snowmobiling laws

Related Resource

Helmets for Winter Sports: <https://www.injuryresearch.bc.ca/wp-content/uploads/2013/02/Helmets-for-winter-sports-FINAL.pdf>

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