



WINTER ACTIVITY DEATHS IN BRITISH COLUMBIA

2007/2008 to 2015/2016

Introduction

This report examines accidental winter activity deaths in British Columbia from the 2007/2008 season to the 2015/2016 season.^{[1], [2]} Cases were included if the death was related to one or more of the following activities:

- Snowmobiling
- Skiing
- Snowboarding
- Ice climbing
- Tobogganing/tubing
- Snowshoeing

Four deaths resulting from injuries incurred >10 years prior to death were excluded.

Summary

- From the 2007/2008 season to the 2015/2016 season, there were between 13 and 35 deaths each year. The average annual number of deaths was 23.3.
 - 48% were related to snowmobiling.
 - 33% were related to skiing.
 - 12% were related to snowboarding.
 - 6% were related to other activities.
- 84% of decedents were male.
- The median age was 39 years. Individuals aged 19 to 49 accounted for 73% of all deaths.
- 57% of injuries occurred in the Interior Health Authority region, 21% in Northern Health, and 20% in Vancouver Coastal Health.
 - Within Interior Health and Northern Health, most injuries were related to snowmobiling or skiing.
 - Within Vancouver Coastal Health, skiing and snowboarding accounted for the most injuries.
- 88% of injuries occurred on mountains.
- 45% of deaths were avalanche-related.
- The most common medical causes of death were as follows:
 - Suffocation/Smothering/Positional Asphyxia (44% of deaths)
 - Head Injuries (23%)
 - Blunt Injuries: Multiple (19%)

General Statistics

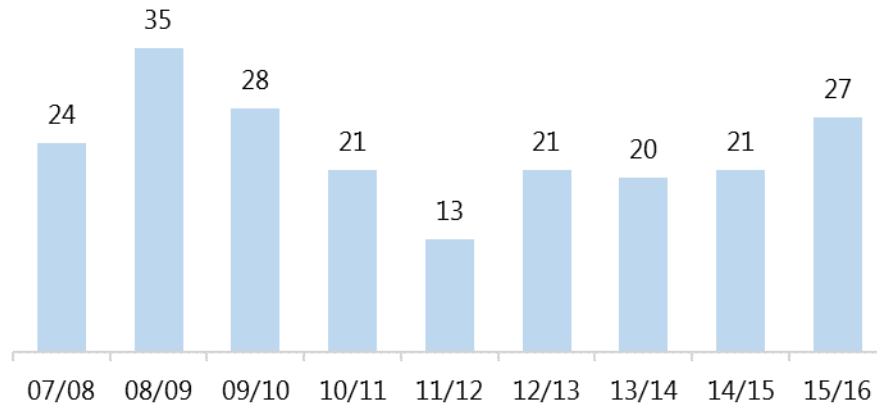
A. When did people die?

From the 2007/2008 season to the 2015/2016 season, there were 23.3 deaths per year on average. The annual number of deaths varied from 13 to 35, but did not show a clear upward or downward trend over the time period studied.

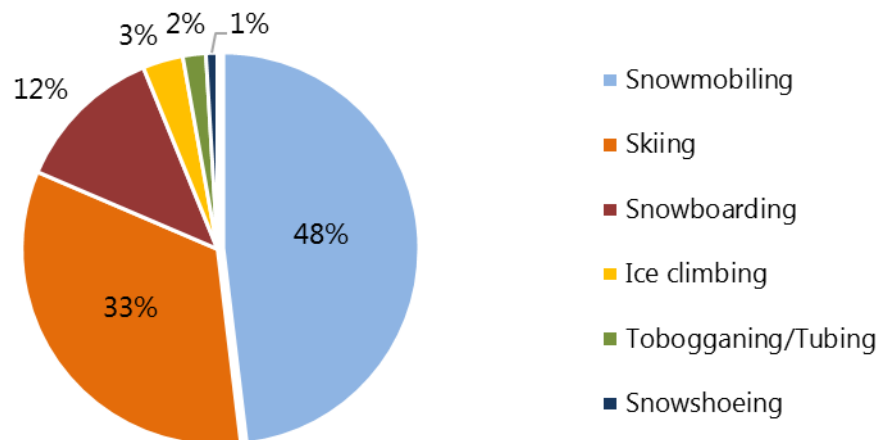
Snowmobilers accounted for just under half of all winter activity deaths. After snowmobiling, the winter activities most likely to be related to death were skiing (33% of deaths) and snowboarding (12%). Ice climbing, tobogganing/tubing, and snowshoeing were responsible for a relatively small percentage of deaths.

Winter Activity Deaths by Season, 2007/2008 – 2015/2016

Activity	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	Annual Avg.	Total
Snowmobiling	13	23	12	10	4	6	9	8	16	11.2	101
Skiing	7	8	12	8	7	9	6	6	7	7.8	70
Snowboarding	2	3	3	3	1	4	5	2	3	2.9	26
Ice Climbing	1	-	-	-	-	1	-	4	1	1.8	7
Tobogganing/ Tubing	-	1	-	-	1	1	-	1	-	1.0	4
Snowshoeing	1	-	1	-	-	-	-	-	-	1.0	2
Total	24	35	28	21	13	21	20	21	27	23.3	210



Winter Activity Deaths by Season, 2007/2008 to 2015/2016



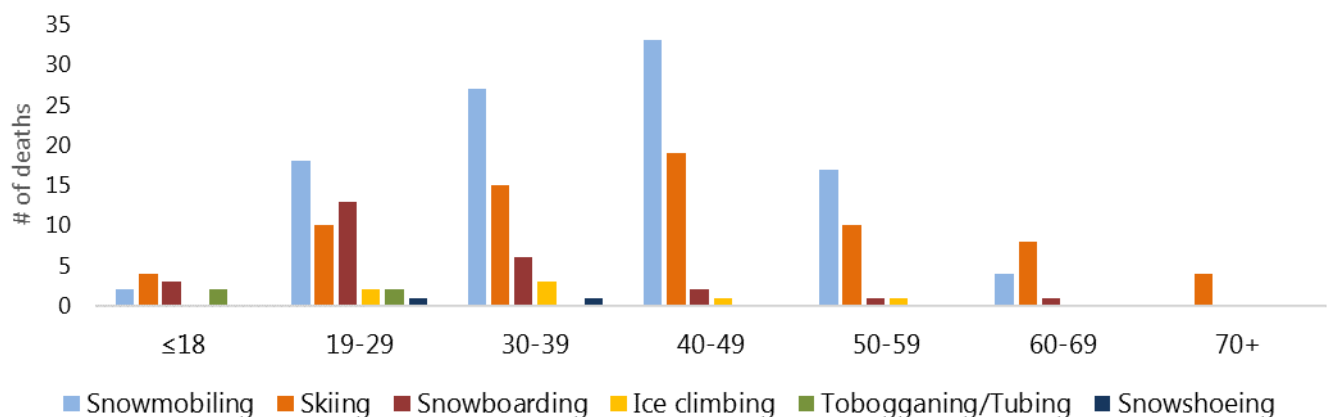
Winter Activity Deaths by Activity Type as % of Total, 2007/2008 to 2015/2016

B. Who died?

Most decedents (84%) were male. This was true of participants within each of the winter activity types examined in this report, with the exception of tobogganing/tubing. The median age was 38.7 years, although snowboarders skewed younger (median age 26.8 years) and skiers and snowmobilers slightly older (44.8 and 41.9 years, respectively).

Winter Activity Deaths by Age Group and Sex, 2007/2008 – 2015/2016

Age Group	Female	Male	Total
≤18	4	7	11
19-29	7	39	46
30-39	7	45	52
40-49	7	48	55
50-59	6	23	29
60-69	2	11	13
70+	-	4	4
Total	33	177	210
Total as %	15.7%	84.3%	100%



Winter Activity Deaths by Age Range and Activity Type, 2007/2008 to 2015/2016

C. Where were people injured?

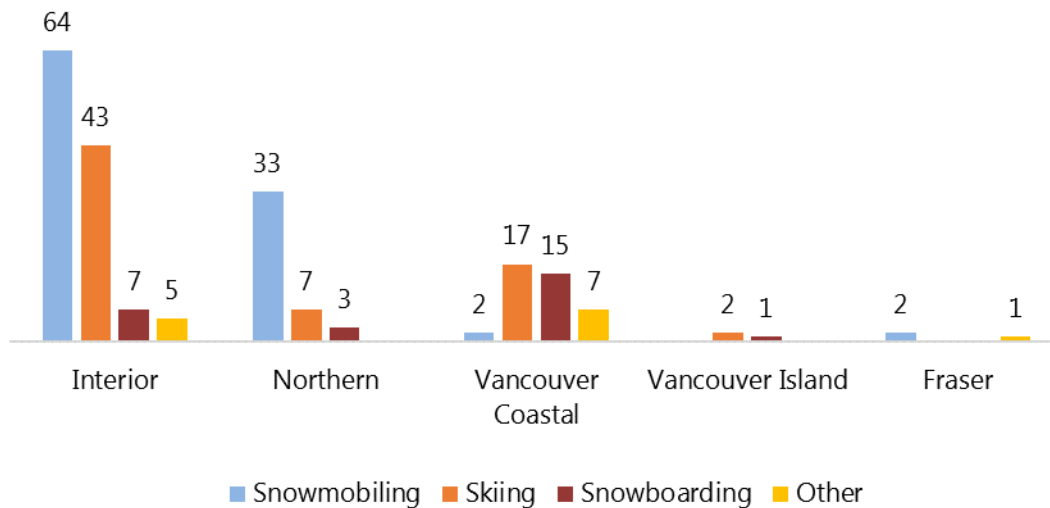
Slightly over half of all decedents were injured in the Interior Health Authority region.

Northern Health and Vancouver Coastal Health each accounted for roughly 20% of injuries. In both Northern and Interior Health, snowmobiling was the predominant activity, followed by skiing. In Vancouver Coastal Health, however, the winter activities most likely to be related to death were skiing and snowboarding.

A large majority of incidents, including virtually all skiing and snowboarding injuries, occurred on mountains.

Winter Activity Deaths by Health Authority of Injury, 2007/2008 – 2015/2016						
Activity	Interior	Northern	Vancouver Coastal	Fraser	Vancouver Island	Total
Snowmobiling	64	33	2	-	2	101
Skiing	43	7	17	2	-	69
Snowboarding	7	3	15	1	-	26
Ice Climbing	2	-	5	-	-	7
Tobogganing/ Tubing	3	-	-	-	1	4
Snowshoeing	-	-	2	-	-	2
Total	119	43	41	3	3	209*
Total as %	56.9%	20.6%	19.6%	1.4%	1.4%	100.0%

*One injury occurred out of province and is excluded from this table.



Winter Activity Deaths by Health Authority of Injury, 2007/2008 to 2015/2016*
*One injury occurred out of province and is excluded from this table.

Winter Activity Deaths by Injury Location, 2007/2008 – 2015/2016						
Activity	Mountain	Wooded Area/Trail	Road	Lake/Pond	River/Creek	Total
Snowmobiling	78	9	8	5	1	101
Skiing	69	1	-	-	-	70
Snowboarding	26	-	-	-	-	26
Ice Climbing	7	-	-	-	-	7
Tobogganing/ Tubing	3	-	1	-	-	4
Snowshoeing	1	-	-	-	1	2
Total	184	10	9	5	2	210
Total as %	87.6%	4.8%	4.3%	2.4%	1.0%	100.0%

D. How did people die?

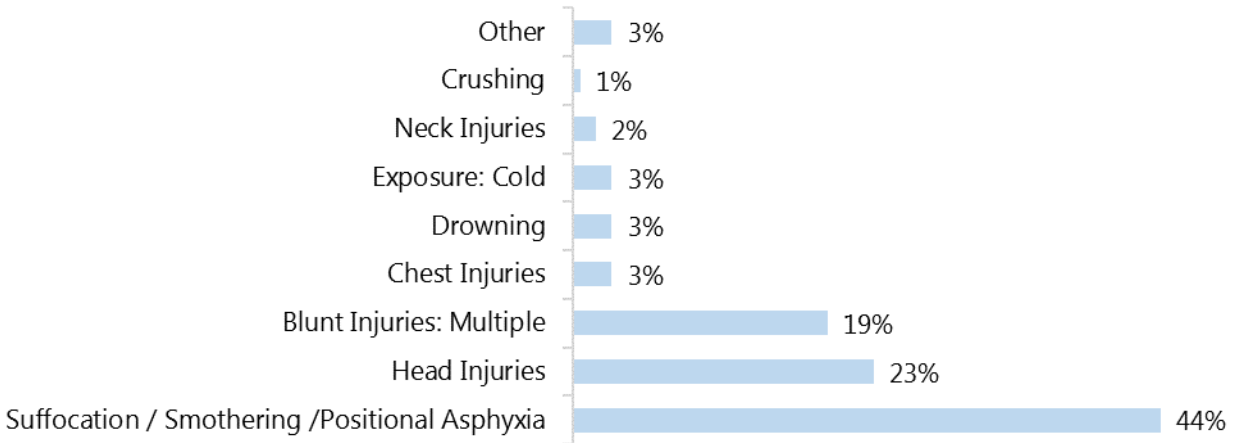
The most common medical cause of death given in the Coroner's Report was 'Suffocation/Smothering/Positional Asphyxia' (44% of deaths). The second most common cause was 'Head Injuries', followed by 'Blunt Injuries: Multiple'.

Nearly half of all incidents were avalanche-related. The snowmobilers and skiers in this review were more likely to have died as the results of an avalanche than participants in other winter activities.

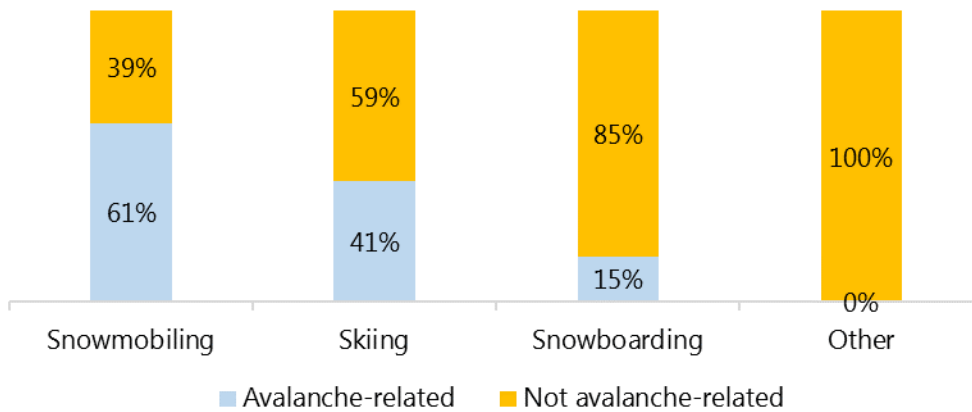
Winter Activity Deaths by Cause of Death, 2007/2008 – 2015/2016

Activity	# of Deaths	% of Deaths
Suffocation / Smothering /Positional Asphyxia	76	44%
Head Injuries	39	23%
Blunt Injuries: Multiple	33	19%
Chest Injuries	5	3%
Drowning	5	3%
Exposure: Cold	5	3%
Neck Injuries	3	2%
Crushing	1	1%
Other	5	3%
Total	172*	100%

*38 deaths were still under investigation at the time of this report and are excluded from this table.



Winter Activity Deaths by Cause of Death, 2007/2008 to 2015/2016*
*38 deaths were still under investigation at the time of this report and are excluded from this table.



Avalanche Involvement by Activity Type, 2007/2008 to 2015/2016

A Closer Look at Snowmobiling Deaths

A. Who died?

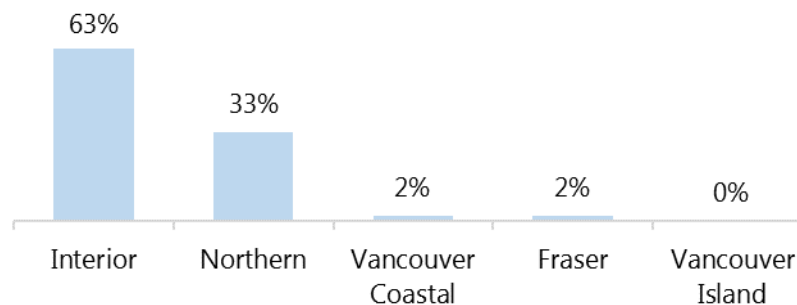
Snowmobilers were predominantly male (90%), and had a median age of 41.9 years.

Snowmobiling Deaths by Age Group and Sex, 2007/2008 – 2015/2016

Age Group	Female	Male	Total
≤18	1	1	2
19-29	1	17	18
30-39	3	24	27
40-49	2	31	33
50-59	2	15	17
60-69	1	3	4
Total	10	91	101
Total as %	9.9%	90.1%	100.0%

B. Where were people injured?

Most snowmobilers were injured in the Interior Health Authority Region. The most common townships of injury included McBride, Revelstoke, Fernie, Blue River, and Golden.



Snowmobiling Deaths by Health Authority of Injury, 2007/2008 to 2015/2016

Snowmobiling Deaths: Top Townships of Injury, 2007/2008 – 2015/2016

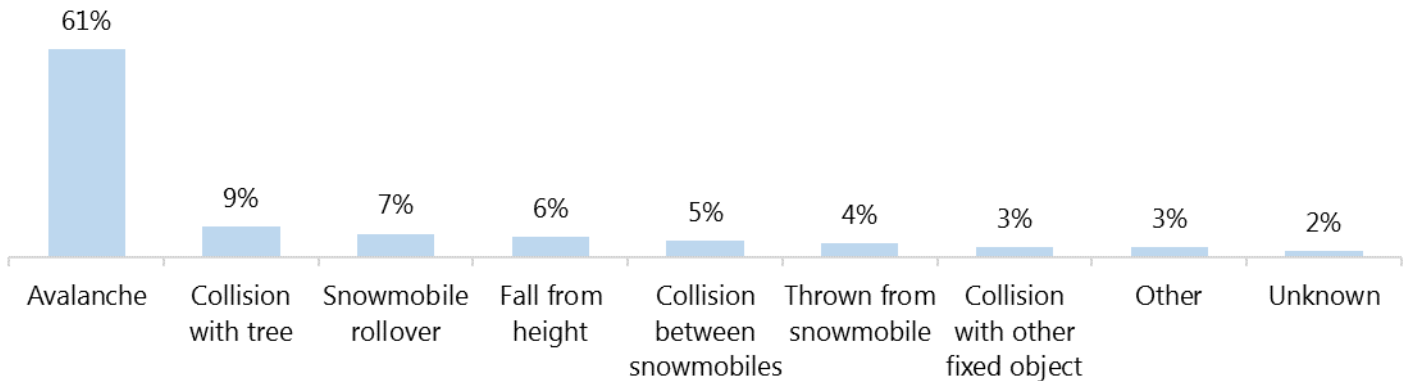
Township of Injury	# of Deaths	% of Deaths
McBride	9	8.9%
Revelstoke	8	7.9%
Fernie	8	7.9%
Blue River	7	6.9%
Golden	7	6.9%
Valemount	5	5.0%
Tumbler Ridge	4	4.0%
<i>Other townships</i>	53	52.5%
Total	101	100.0%

C. What happened?

Over 60% of snowmobiling deaths were avalanche-related. A variety of incident types accounted for the remaining deaths, including collisions with trees, snowmobile rollovers, falls from a height (e.g. a cliff or another sharp precipice), and collisions between snowmobiles.

Snowmobiling Deaths by Incident Type, 2007/2008 – 2015/2016

Incident Type	# of Deaths	% of Deaths
Avalanche	62	61.4%
Collision with tree	9	8.9%
Snowmobile rollover	7	6.9%
Fall from height	6	5.9%
Collision between snowmobiles	5	5.0%
Thrown from snowmobile	4	4.0%
Collision with other fixed object	3	3.0%
Other	3	3.0%
Unknown	2	2.0%
Total	101	100.0%



Snowmobiling Deaths by Incident Type, 2007/2008 to 2015/2016

D. How did people die?

The most common medical cause of death given in the Coroner's Report was 'Suffocation/Smothering/Positional Asphyxia', followed by 'Blunt Injuries: Multiple' and 'Head Injuries'.

Snowmobiling Deaths by Cause of Death, 2007/2008 – 2015/2016

Cause of Death	# of Deaths	% of Deaths
Suffocation/ Smothering/ Positional Asphyxia	49	59.0%
Blunt Injuries: Multiple	15	18.1%
Head Injuries	12	14.5%
Chest Injuries	4	4.8%
Other	3	3.6%
Total	83*	100.0%

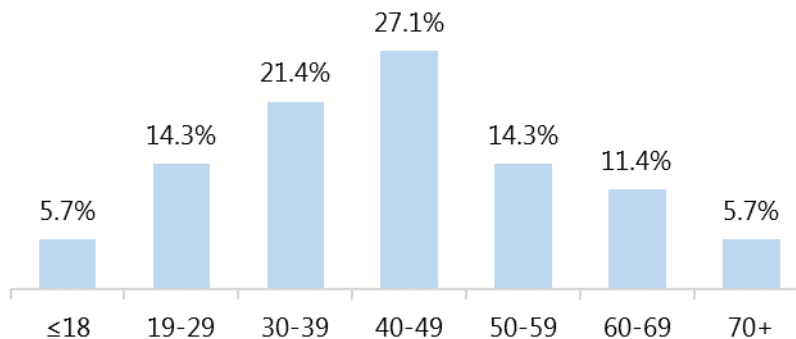
*Eighteen cases were still under investigation at the time of this report and are not included in this table.

A Closer Look at Skiing Deaths

A. Who died?

Roughly 80% of skiers were male, and 20% female. The median age was 44.8 years old, and slightly under half of all decedents fell into the 30-49 year old age bracket. However, skiers spanned a wide age range: 6% were under 19, and 6% were over 70.

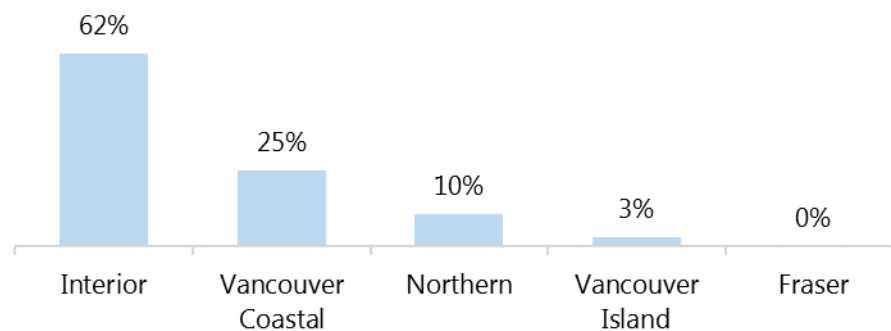
Skiing Deaths by Age Group and Sex, 2007/2008 – 2015/2016			
Age Group	Female	Male	Total
≤18	1	3	4
19-29	2	8	10
30-39	1	14	15
40-49	5	14	19
50-59	3	7	10
60-69	1	7	8
70+	-	4	4
Total	13	57	70
Total as %	18.6%	81.4%	100.0%



Skiing Deaths by Age Range, 2007/2008 to 2015/2016

B. Where were people injured?

Skiers in this review were most likely to have been injured in the Interior Health Authority region, followed by the Vancouver Coastal Health region. The top townships of injury were Whistler, Golden, and Revelstoke. Approximately 39% of injuries occurred in one of these three areas.



Skiing Deaths by Health Authority of Injury, 2007/2008 to 2015/2016*

*One injury occurred out of province and is excluded from this figure.

Skiing Deaths: Top Townships of Injury, 2007/2008 – 2015/2016

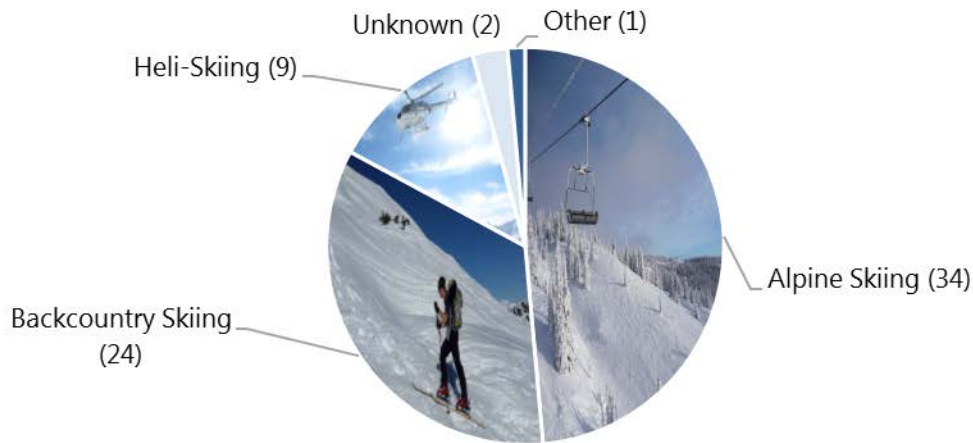
Township of Injury	# of Deaths	% of Deaths
Whistler	10	14.3%
Golden	9	12.9%
Revelstoke	8	11.4%
<i>Other townships</i>	43	61.4%
Total	69	100.0%

C. What happened?

Several types of skiing are represented in this review. Roughly half of skiers were injured in the course of alpine skiing: skiing with fixed bindings, typically at a resort where a lift or another form of assistance was used to reach the top of the hill. Thirty percent of decedents were involved in backcountry skiing, and 13% were heli-skiing.

Just over 40% of deaths were avalanche-related. Backcountry skiers and heli-skiers were more likely to be injured in avalanches than alpine skiers. The next most frequent incident type was a fall from a height, followed by collisions with the ground, collisions with trees, and falls into tree wells.

Skiing Deaths by Incident Type, 2007/2008 – 2015/2016						
Incident Type	Alpine Skiing	Backcountry Skiing	Heli-Skiing	Unknown & Other	Total	Total as %
Avalanche	7	15	7	-	29	41.4%
Fall from height	5	6	1	-	12	17.1%
Collision with ground	6	-	-	2	8	11.4%
Collision with tree	7	1	-	-	8	11.4%
Fall into tree well	3	1	1	1	6	8.6%
Collision with snowboarder	2	-	-	-	2	2.9%
Immersion in snowdrift	1	1	-	-	2	2.9%
Other	1	-	-	-	1	1.4%
Unknown	2	-	-	-	2	2.9%
Total	34	24	9	3	70	100.0%



Skiing Deaths by Type of Skiing, 2007/2008 to 2015/2016

D. How did people die?

Overall, the most common medical cause of death given in the Coroner's Report was 'Head Injuries', followed by 'Suffocation/Smothering/Positional Asphyxia' and 'Blunt Injuries: Multiple'. However, causes of death differed by skiing type: among backcountry and heli-skiers, 'Suffocation/Smothering/Positional Asphyxia' was the most common cause of death.

Skiing Deaths by Cause of Death, 2007/2008 – 2015/2016

Cause of Death	Alpine Skiing	Backcountry Skiing	Heli-Skiing	Unknown & Other	Total	Total as %
Head Injuries	13	4	1	2	20	34.5%
Suffocation / Smothering/ Positional Asphyxia	7	8	3	-	18	31.0%
Blunt Injuries: Multiple	5	4	3	-	12	20.7%
Exposure: Cold	1	1	-	-	2	3.4%
Drowning: other	-	-	-	1	1	1.7%
Chest Injuries	1	-	-	-	1	1.7%
Neck Injuries	1	-	-	-	1	1.7%
Other	3	-	-	-	3	5.2%
Total	31	17	7	3	58*	100.0%

A Closer Look at Snowboarder Deaths

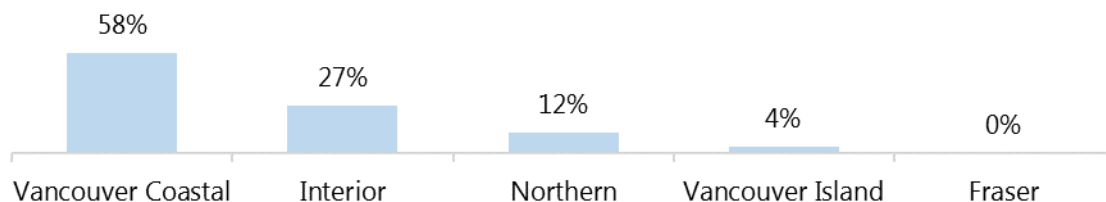
A. Who died?

Most snowboarders were male. The median age was 26.8 years, and 85% were under 40.

Snowboarding Deaths by Age Group and Sex, 2007/2008 – 2015/2016			
Age Group	Female	Male	Total
≤18	-	3	3
19-29	4	9	13
30-39	1	5	6
40-49	-	2	2
50-59	1	-	1
60-69	-	1	1
Total	6	20	26
Total as %	23.1%	76.9%	100.0%

B. Where were people injured?

Snowboarders in this review were most likely to have been injured in the Vancouver Coastal Health region, followed by the Interior region. Over 40% of injuries occurred in the township of Whistler. Golden, the next most common township, accounted for just 8% of deaths. No other township had more than one death.



Snowboarding Injuries by Health Authority, 2007/2008 to 2015/2016

Snowboarding Deaths: Top Townships of Injury, 2007/2008 – 2015/2016

Township of Injury	# of Deaths	% of Deaths
Whistler	11	42.3%
Golden	2	7.7%
<i>Other townships</i>	12	46.2%
Total	26	100%

C. What happened?

One in five snowboarders died as a result of falling into a tree well. The next most common incident types were avalanches and falls from a height, each of which accounted for 15% of deaths.

Snowboarding Deaths by Incident Type, 2007/2008 – 2015/2016

Incident Type	# of Deaths	% of Deaths
Fall into tree well	5	19.2%
Avalanche	4	15.4%
Fall from height	4	15.4%
Collision with ground	2	7.7%
Immersion in snowdrift	2	7.7%
Fall into creek	2	7.7%
Other	2	7.7%
Unknown	5	19.2%
Total	26	100.0%

D. How did people die?

'Suffocation/Smothering/Positional Asphyxia' was the medical cause of death most often listed on the Coroner's Report for snowboarders included in this review. The next most common causes were 'Blunt Injuries: Multiple' and 'Head Injuries'.

Snowboarding Deaths by Cause of Death, 2007/2008 – 2015/2016

Cause of Death	# of Deaths	% of Deaths
Suffocation/ Smothering/ Positional Asphyxia	9	39.1%
Blunt Injuries: Multiple	3	13.0%
Head Injuries	3	13.0%
Exposure: Cold	2	8.7%
Drowning	2	8.7%
Neck Injuries	2	8.7%
Other	2	8.7%
Total	23*	100.0%

*Three deaths were still under investigation at the time of this report and are not shown in this table.



BC Coroners Service Winter Activity Deaths 2007/2008 – 2015/2016

Notes

[1] Cases were grouped by winter season. Deaths occurring out of season – i.e., between March and November – were counted towards the closest season. The 2007-2008 season, for instance, includes deaths occurring from June 1, 2007, to May 31, 2008.

[2] As the BCCS operates in a live database environment, the data are considered preliminary and subject to change. These data were compiled by date of death, which may differ from the date of injury. In some cases, the death may occur months or years subsequent to injury. These statistics may vary from those reported by other agencies because of differences in data definitions or reporting standards.