



WINTER ACTIVITY DEATHS IN BRITISH COLUMBIA

2008/2009 – 2017/2018



Coroners Service

This report examines accidental winter activity deaths in British Columbia from the 2007/2008 season to the 2017/2018 season^[1].

Inclusion Criteria: 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.

Caveats: 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, due to differences in data definitions or reporting standards.

Summary

- From the 2007/2008 season to the 2017/2018 season, there were between 13 and 35 deaths each year. The average annual number of deaths was 22.8.
 - 45% were related to snowmobiling.
 - 33% were related to skiing.
 - 13% were related to snowboarding.
 - 8% were related to other activities.
- 84% of individuals were male; 16% of whom were female.
- Individuals aged 19 to 49 accounted for 70% of all deaths.
- 57% of injuries occurred in the Interior Health Authority region, 21% in Northern Health, and 19% in Vancouver Coastal Health.
 - Snowmobiling accounted for the most deaths in the Interior, Northern and Fraser Health regions.
 - Skiing and snowboarding deaths were the majority in the Vancouver Coastal and Island Health regions.
- Overall, 42% of deaths were avalanche-related.
- The most common medical causes of death were as follows:
 - Suffocation/Smothering/Positional Asphyxia (44% of deaths)
 - Blunt Injuries: Multiple (23%)
 - Head Injuries (18%)

General Findings

A. When did people die?

A total of 251 deaths related to winter activities were identified from the 2007/2008 season to the 2017/2018 season. On average, this equates to 22.8 deaths per year.

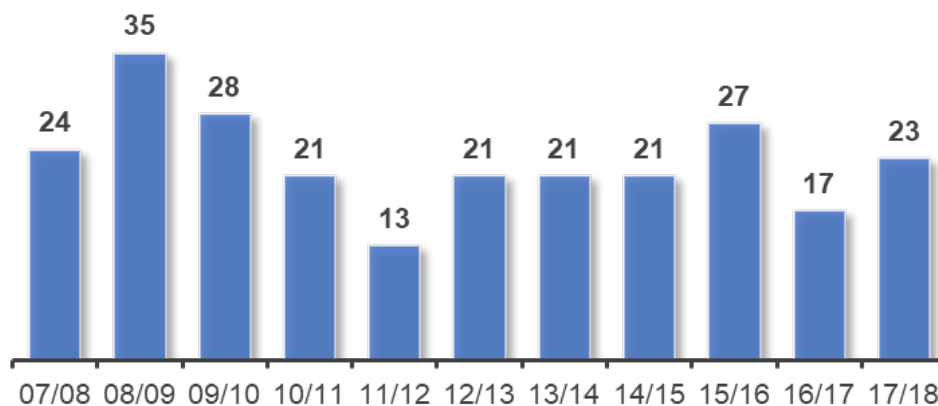


Fig. 1. Winter Activity Deaths by Season, 2007/2008 - 2017/2018

Snowmobiling accounted for the majority of winter activity deaths at 45.4% (n=114) across the seasons. In the 2017/2018 season, there were 11 deaths due to snowmobiling. The next most frequent activities were skiing and snowboarding, which represented 33.1% (n=83) at 13.1% (n=33) of deaths, respectively. Other winter activities such as ice climbing, tobogganing/tubing, and snowshoeing were responsible for a relatively smaller percentage of deaths.

Table 1. Winter Activity Deaths by Season and Activity Type, 2007/2008 - 2017/2018

	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18
Snowmobiling	13	23	12	10	4	6	9	8	16	2	11
Skiing	7	7	12	8	7	9	7	6	7	6	7
Snowboarding	2	3	3	3	1	4	5	2	3	3	4
Ice Climbing	1	-	-	-	-	1	-	4	1	-	-
Snowshoeing	1	-	1	-	-	-	-	-	-	5	-
Tobogganing/ Tubing	-	1	-	-	1	1	-	1	-	-	-
Other	-	1	-	-	-	-	-	-	-	1	1
Total	24	35	28	21	13	21	21	21	27	17	23

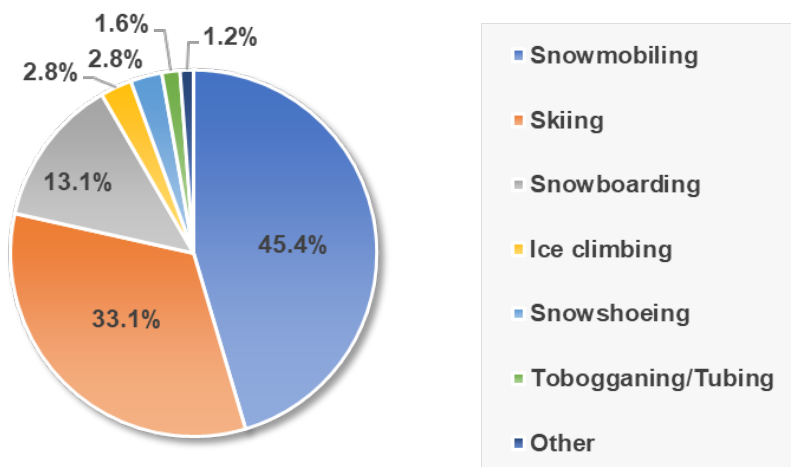


Fig. 2. Winter Activity Deaths by Activity Type as % of Total, 2007/2008 - 2017/2018

B. Who died?

The average age of individuals was 39.8 years. Most individuals were 30 to 49 years of age (n=121; 48.2%), and 83.7% (n=210) were male.

Table 3. Winter Activity Deaths by Age Group, 2007/2008 - 2017/2018

	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18
0-18	-	2	2	-	-	1	2	3	1	2	1
19-29	9	9	4	4	2	7	7	4	1	3	5
30-39	5	11	10	2	6	4	3	5	6	4	6
40-49	6	9	5	9	3	2	5	4	12	1	3
50-59	3	3	2	4	1	5	1	4	6	4	5
60-69	1	1	4	2	1	2	1	-	1	2	2
70+	-	-	1	-	-	-	2	1	-	1	1
Total	24	35	28	21	13	21	21	21	27	17	23

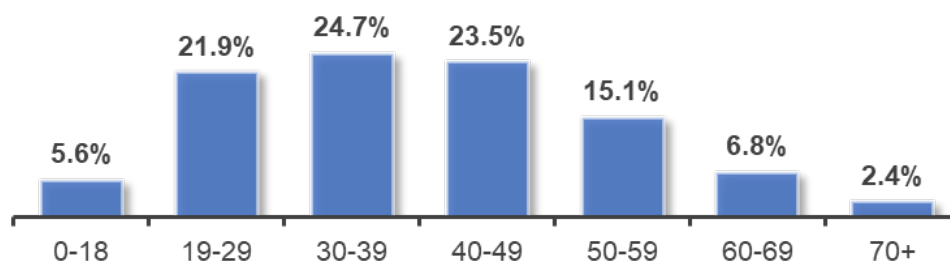
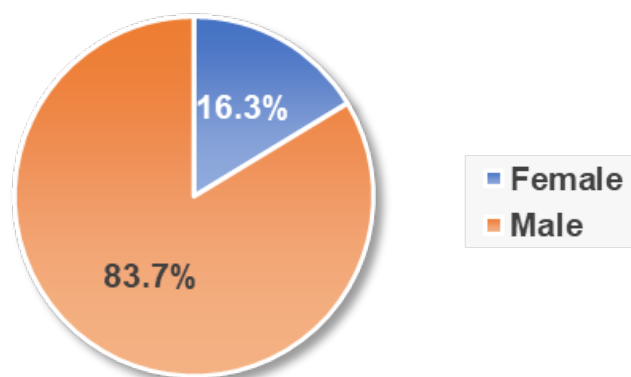


Fig. 3. Winter Activity Deaths by Age Group as % of Total, 2007/2008 - 2017/2018

Table 2. Winter Activity Deaths by Sex, 2007/2008 - 2017/2018

	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18
Female	2	3	5	4	2	3	4	5	5	4	4
Male	22	32	23	17	11	18	17	16	22	13	19
Total	24	35	28	21	13	21	21	21	27	17	23

**Fig. 4.** Winter Activity Deaths by Sex as % of Total, 2007/2008 - 2017/2018

C. Where were people injured?

More than half (n=143; 57.2%) were injured in the Interior Health region, followed by Vancouver Coastal (n=52; 20.8%) and Northern (n=48; 18.2%) Health regions.

Snowmobiling was the predominant activity in the Interior, Northern and Fraser Health regions. In the Vancouver Coastal and Island Health regions, however, skiing and snowboarding activities accounted for the largest percentage of deaths.

Table 4. Winter Activity Deaths by Health Authority of Injury, 2007/2008 - 2017/2018^[2]

	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18
Interior	18	21	17	9	8	13	12	10	12	6	17
Van. Coastal	5	5	5	3	3	5	2	7	6	9	2
Northern	-	8	6	8	2	2	5	4	8	2	3
Island	1	-	-	-	-	-	1	-	1	-	1
Fraser	-	1	-	1	-	1	-	-	-	-	-
Total*	24	35	28	21	13	21	20	21	27	17	23

*1 injury occurring out of province was excluded.

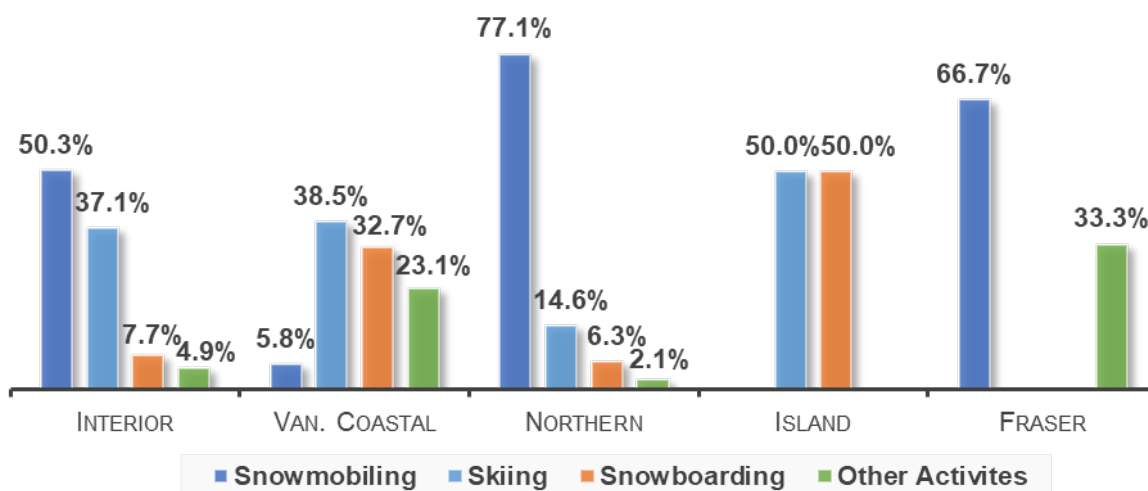


Fig. 5. Winter Activity Deaths by Health Authority of Injury as % of Total, 2007/2008 - 2017/2018^[2]

*1 injury occurring out of province was excluded. Percentages may not sum to 100 due to rounding.

D. How did people die?

The most common medical cause of death given in the Coroner's Report was 'Suffocation/Smothering/Positional Asphyxia' (n=107; 44.2%). 'Blunt Injuries: Multiple' accounted for 23.1% (n=56) of deaths, followed by 'Head Injuries' (n=43; 17.8%).

Table 5. Winter Activity Deaths by Cause of Death, 2007/2008 - 2017/2018

	# of Deaths	% of Deaths
Suffocation / Smothering /Positional Asphyxia	107	44.2
Blunt Injuries: Multiple	56	23.1
Head Injuries	43	17.8
Exposure: Cold	9	3.7
Drowning	8	3.3
Chest Injuries	6	2.5
Neck Injuries	6	2.5
Other	7	2.9
Total*	242	100.0

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

Nearly half (n=105; 41.8%) of all deaths were avalanche-related. An avalanche was found to have contributed to 57.0% (n=65) of snowmobiling deaths, and 42.2% (n=35) of skiing deaths.

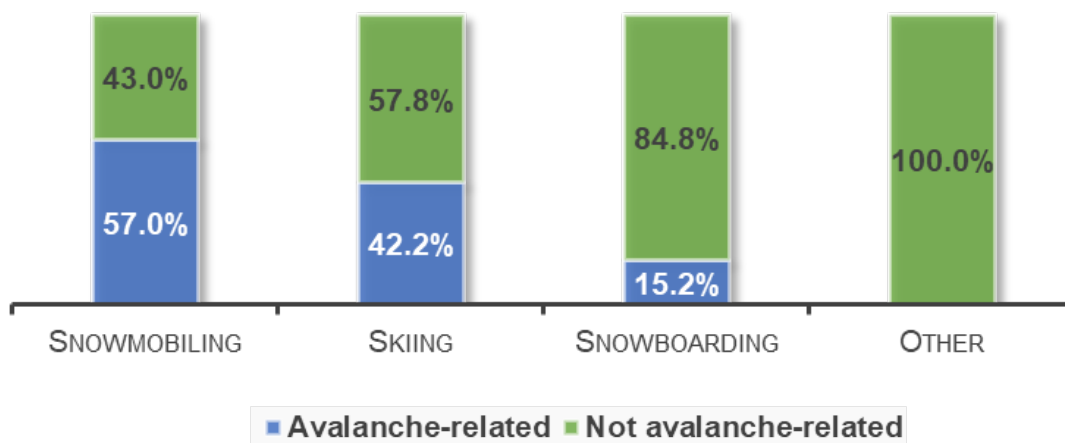


Fig. 6. Avalanche Involvement by Activity Type, 2007/2008 to 2017/2018

A Closer Look at Snowmobiling Deaths

A. Who died?

There were 114 snowmobilers included in this review. Overall, 89.5% (n=102) of snowmobilers were male, and 10.5% (n=12) were females. Over half (n=65; 57.0%) were 30 to 49 years of age.

	Female	Male	Total
0-18	2	1	3
19-29	1	19	20
30-39	4	26	30
40-49	2	33	35
50-59	2	18	20
60-69	1	3	4
70+	-	2	2
Total	12	102	114
% of Total	10.5	89.5	100

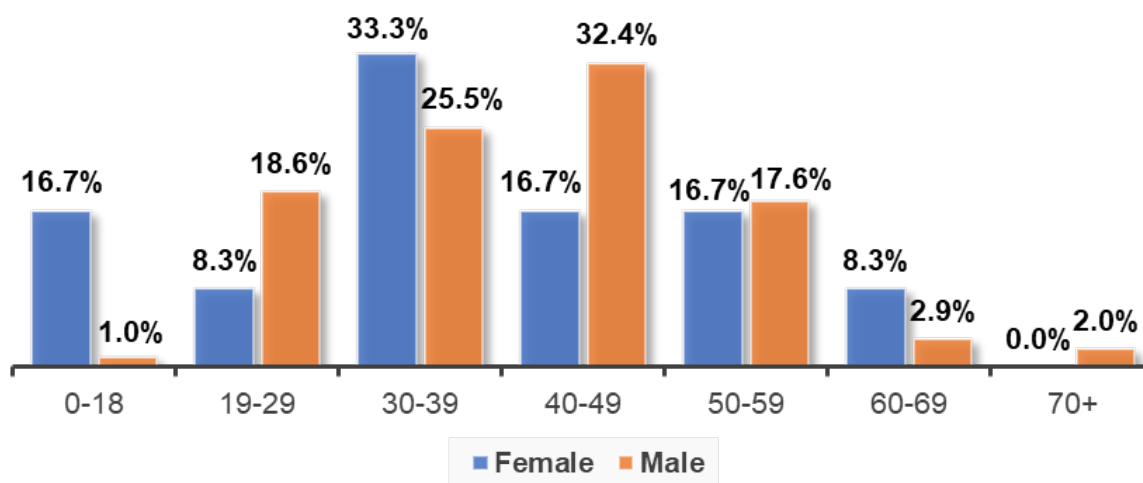


Fig. 7. Snowmobiling Deaths by Sex and Age Group as % of Total, 2007/2008 to 2017/2018

B. Where were people injured?

Nearly two-thirds (n=72; 63.2%) of snowmobiling-related injuries occurred in the Interior Health region. The most common townships of injury included Golden, McBride, Revelstoke and Fernie.

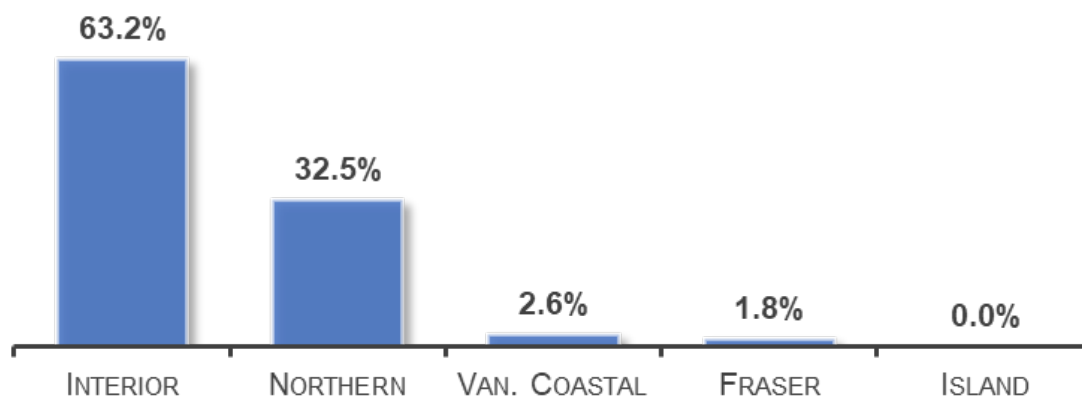


Fig. 8. Snowmobiling Deaths by Health Authority of Injury as % of Total, 2007/2008 to 2017/2018^[2]

*Percentages may not sum to 100 due to rounding.

Table 7. Snowmobiling Deaths by Townships of Injury, 2007/2008 – 2017/2018

	# of Deaths	% of Deaths
Golden	10	8.8
McBride	9	7.9
Revelstoke	9	7.9
Fernie	8	7.0
Blue River	7	6.1
Valemount	7	6.1
<i>Other townships</i>	<i>64</i>	<i>56.1</i>
Total	114	100

* Percentages may not sum to 100 due to rounding.

C. What happened?

Fifty-seven percent (n=65) of snowmobiling deaths were avalanche-related, followed by collision-related incidents (n=23; 20.2%). A variety of incident types accounted for the remaining deaths, including snowmobile rollovers and falls from a height (e.g. a cliff or another sharp precipice).

Table 8. Snowmobiling Deaths by Incident Type, 2007/2008 – 2017/2018		
	# of Deaths	% of Deaths
Avalanche	65	57.0
Collision	23	20.2
Snowmobile Rollover	8	7.0
Fall from Height	7	6.1
Thrown from Snowmobile	5	4.4
Other	3	2.6
Unknown	3	2.6
Total	114	100.0

*Percentages may not sum to 100 due to rounding.

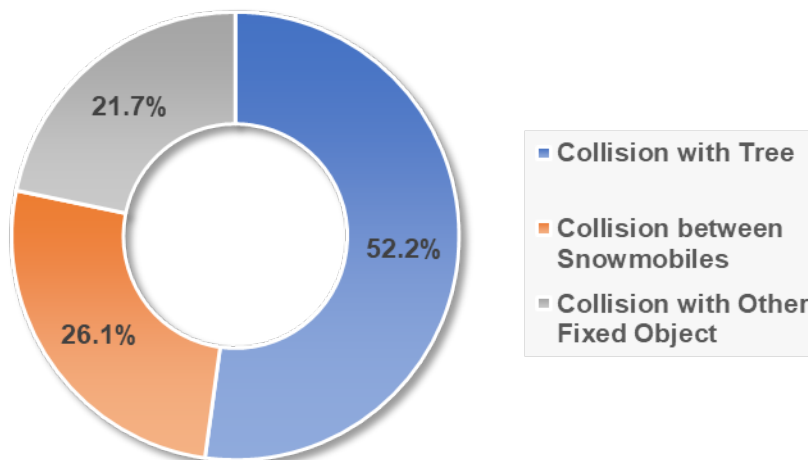


Fig. 9. Snowmobiling Deaths by Type of Collision as % of Total, 2007/2008 to 2017/2018

D. How did people die?

The most common medical cause of death given in the Coroner's Report was 'Suffocation/Smothering/Positional Asphyxia' (n=66; 60.0%), followed by 'Blunt Injuries: Multiple' (n=20; 18.2%) and 'Head Injuries' (n=12; 10.9%).

Table 9. Snowmobiling Deaths by Cause of Death, 2007/2008 - 2017/2018

	# of Deaths	% of Deaths
Suffocation / Smothering /Positional Asphyxia	66	60.0
Blunt Injuries: Multiple	20	18.2
Head Injuries	12	10.9
Chest Injuries	4	3.6
Drowning	3	2.7
Other	5	4.5
Total*	110	100.0

*4 deaths currently under investigation were excluded from this table.

A Closer Look at Skiing Deaths

A. Who died?

Overall, there were a total of 83 deaths involving skiers. Of those, 80.7% (n=67) were male, and 19.3% (n=16) were females. Twenty-three percent (n=19) of skiers were 40 to 49 years of age, followed by the 30 to 39 age group (n=18; 21.7%).

Table 10. Skiing Deaths by Age Group and Sex, 2007/2008 - 2017/2018

	Female	Male	Total
0-18	2	4	6
19-29	2	11	13
30-39	3	15	18
40-49	5	14	19
50-59	3	10	13
60-69	1	9	1
70+	-	4	4
Total	16	67	83
% of Total	19.3	80.7	100.0

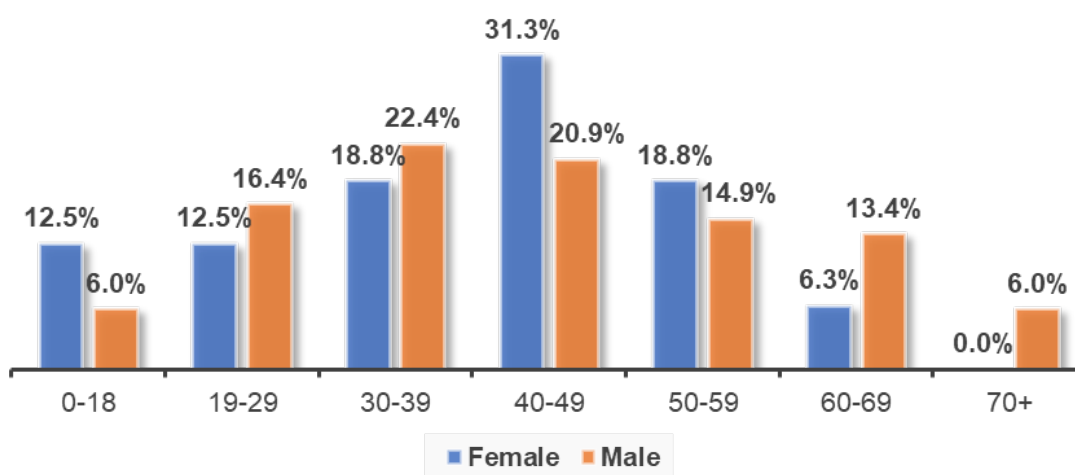


Fig. 10. Skiing Deaths by Sex and Age Group as % of Total, 2007/2008 to 2017/2018

*Percentages may not sum to 100 due to rounding.

B. Where were people injured?

Skiing injuries occurred most often in the Interior Health region (n=53; 64.6%), followed by the Vancouver Coastal Health region (n=20; 24.4%). The top townships of injury were Whistler, Revelstoke and Golden which accounted for 40.2% (n=33) of skiing deaths.

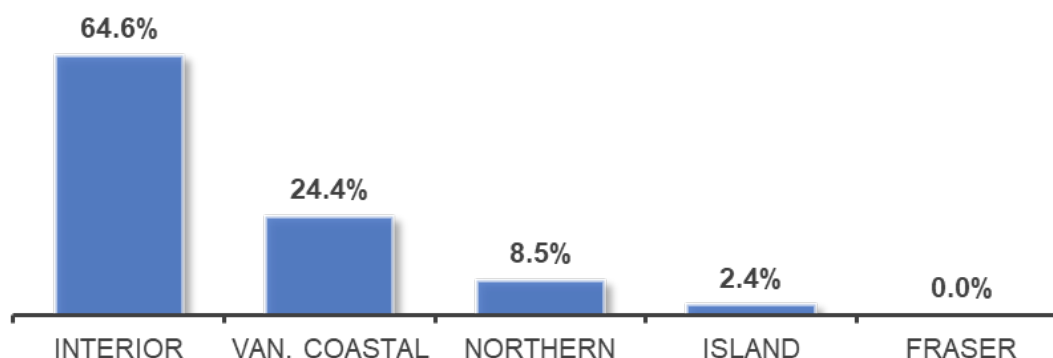


Fig. 11. Skiing Deaths by Health Authority of Injury as % of Total, 2007/2008 to 2017/2018^[2]

*Percentages may not sum to 100 due to rounding.

Table 11. Skiing Deaths by Top Townships of Injury, 2007/2008 – 2017/2018*

	# of Deaths	% of Deaths
Whistler	14	17.1
Revelstoke	11	13.4
Golden	8	9.8
<i>Other townships</i>	<i>49</i>	<i>59.8</i>
Total	82	100.0

*1 death where injury occurred out of province was excluded.

*Percentages may not sum to 100 due to rounding.

C. What happened?

Several types of skiing are represented in this review. The most common was 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. Alpine skiing accounted for 45.8%

(n=38) of deaths. Other types of skiing included backcountry skiing and heli-skiing accounted for 36.1% (n=30) and 14.5% (n=12), respectively.

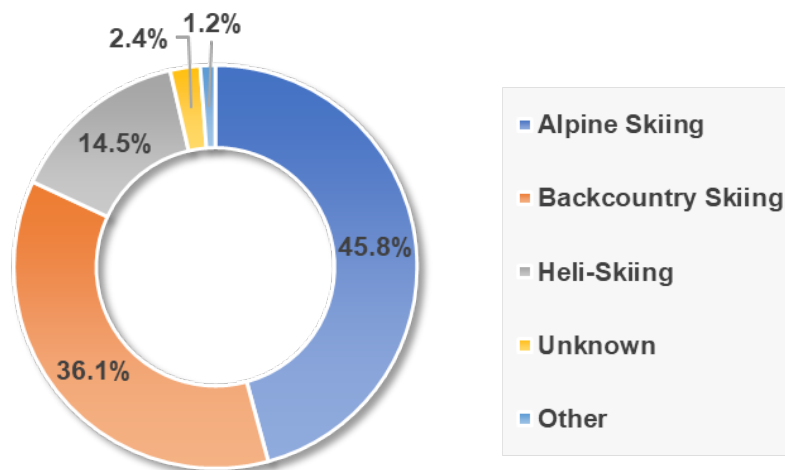


Fig. 12. Skiing Deaths by Type of Skiing as % of Total, 2007/2008 to 2017/2018

Forty-two percent (n=35) of skiing deaths were due to an avalanche-related incident. Skiers engaged in backcountry and heli-skiing activities were more likely to be injured in avalanches than alpine skiing. The next most frequent incident type was falls from height (n=14; 16.9%), followed by collisions with trees (n=10; 12.0%) and falls into tree wells (n=9; 10.8%).

Table 12. Skiing Deaths by Incident Type, 2007/2008 – 2017/2018

	Alpine	Backcountry	Heli-skiing	Other/ Unknown	Total	% of Total
Avalanche	7	19	9	-	35	42.2
Fall from Height	7	6	1	-	14	16.9
Collision with Tree	9	1	-	-	10	12.0
Fall into Tree Well	3	3	2	1	9	10.8
Collision with Ground	6	-	-	2	8	9.6
Collision with Other Snowboarders	2	-	-	-	2	2.4
Immersion in Snowdrift	1	1	-	-	2	2.4
Other/Unknown	3	-	-	-	3	3.6
Total	38	30	12	3	83	100.0

D. How did people die?

Overall, the most common medical cause of death given in the Coroner's Report 'Suffocation/Smothering/Positional Asphyxia' (n=30; 37.5%). However, causes of death differed by skiing type: among alpine skiing deaths, 'Head Injuries' was determined to be the most common cause of death.

Table 13. Skiing Deaths by Cause of Death, 2007/2008 - 2017/2018*

	# of Deaths	% of Deaths
Suffocation / Smothering /Positional Asphyxia	30	37.5
Head Injuries	22	27.5
Blunt Injuries: Multiple	18	22.5
Exposure: Cold	3	3.8
Neck Injuries	2	2.5
Chest Injuries	1	1.3
Drowning	1	1.3
Other	3	3.8
Total	110	100

*3 deaths currently under investigation were excluded.

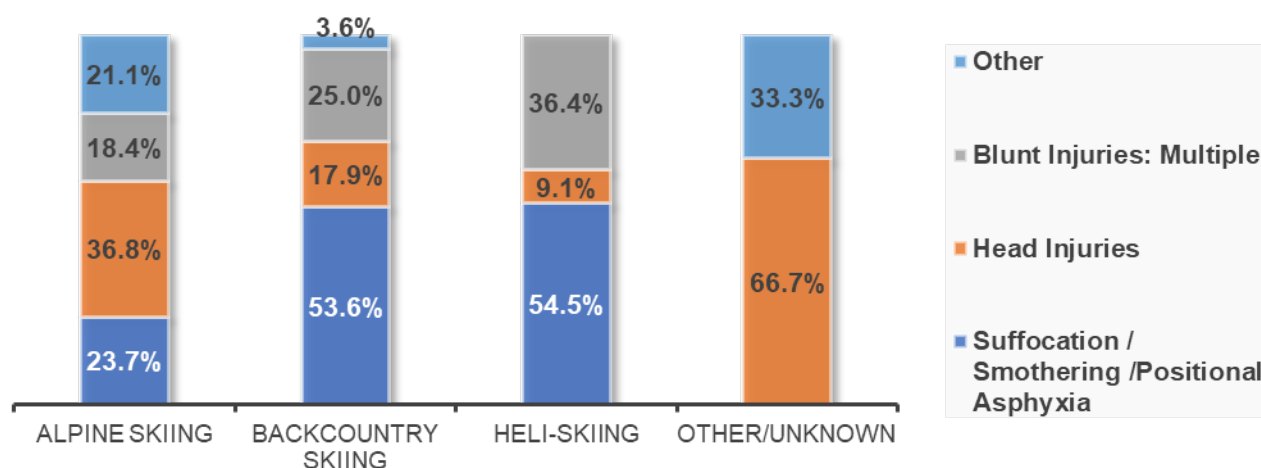


Fig. 13. Skiing Deaths by Type of Skiing and Cause of Death as % of Total, 2007/2008 to 2017/2018*

*3 deaths currently under investigation were excluded.

A Closer Look at Snowboarding Deaths

A. Who died?

There was a total of 33 deaths involving snowboarders. Most snowboarders were under the age of 40 (n=27; 81.8%) and 81.8% (n=27) were males.

	Female	Male	Total
0-18	0	3	3
19-29	4	12	16
30-39	1	7	8
40-49	0	3	3
50-59	1	1	2
60+	0	1	1
Total	6	27	33
% of Total	18.2	81.8	100.0

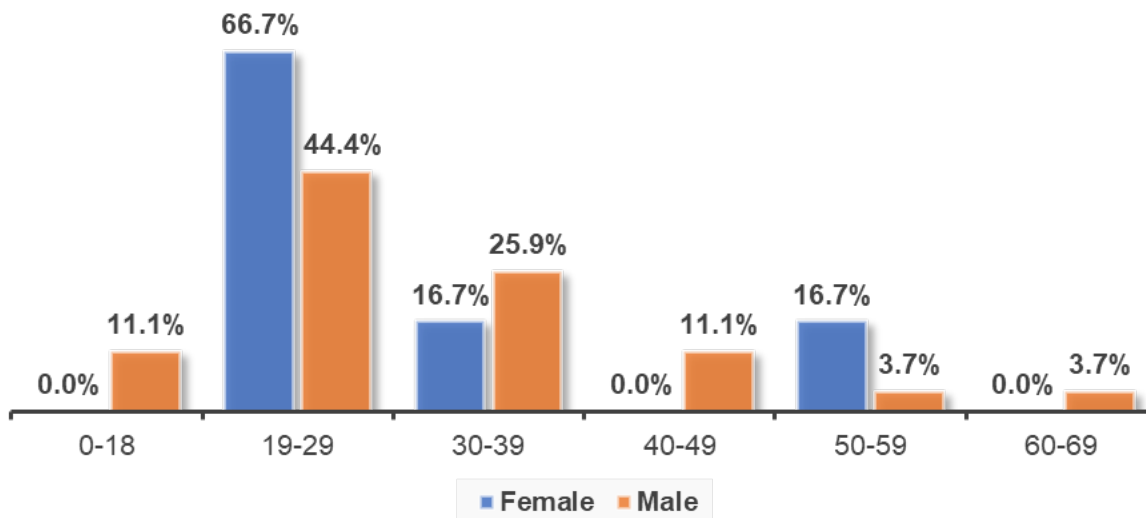


Fig. 14. Snowboarding Deaths by Sex and Age Group as % of Total, 2007/2008 to 2017/2018

B. Where were people injured?

Snowboarders were most likely to have been injured in the Vancouver Coastal Health region, followed by the Interior region. About 40% (n=13) of injuries occurred in the township of Whistler. Golden, the next most common township, accounted for 9.1% (n=3) of deaths. No other township had more than one death.

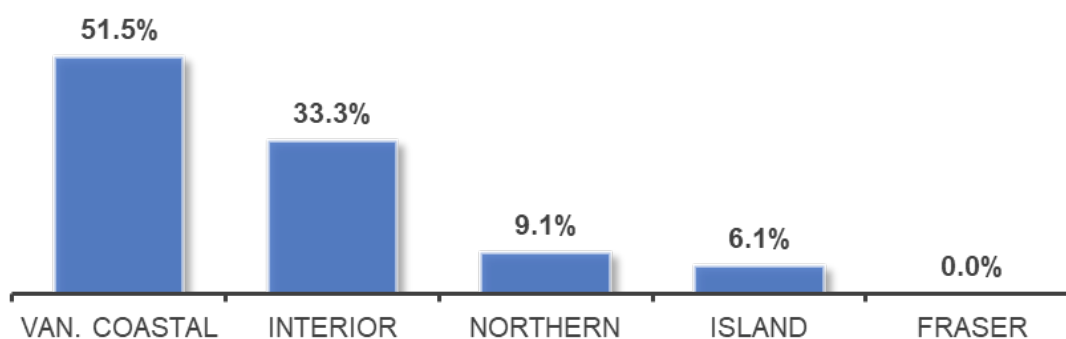


Fig. 15. Snowboarding Deaths by Health Authority of Injury as % of Total, 2007/2008 to 2017/2018^[2]

Table 15. Snowboarding Deaths by Top Townships of Injury, 2007/2008 – 2017/2018*

	# of Deaths	% of Deaths
Whistler	13	39.4
Fernie	3	9.1
<i>Other townships</i>	<i>17</i>	<i>51.5</i>
Total	33	100.0

C. What happened?

Falls into tree well and falls from height accounted for 42.4% (n=14) of snowboarding deaths. The next most common incident types were collisions (n=8; 24.3%) and avalanches (n=5; 15.2%).

Table 16. Snowboarding Deaths by Incident Type, 2007/2008 – 2017/2018

	# of Deaths	% of Deaths
Fall into tree well	7	21.2
Fall from Height	7	21.2
Avalanche	5	15.2
Collision with Other Fixed Object	5	15.2
Collision with Tree	3	9.1
Immersion in Snowdrift	2	6.1
Drowning	2	6.1
Unknown	2	6.1
Total	33	100.0

B. How did people die?

'Suffocation/Smothering/Positional Asphyxia' (n=11; 34.4%) 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' (n=5; 15.6%) and 'Head Injuries' (n=4; 12.5%).

Table 17. Snowboarding Deaths by Cause of Death, 2007/2008 - 2017/2018*

	# of Deaths	% of Deaths
Suffocation / Smothering/Positional Asphyxia	11	34.4
Blunt Injuries: Multiple	5	15.6
Head Injuries	4	12.5
Drowning	3	9.4
Exposure: Cold	3	9.4
Other	6	18.8
Total	32	100.0

*1 death currently under investigation was excluded.

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] Health Region breakdowns can be found at:

<https://www2.gov.bc.ca/gov/content/data/geographic-data-services/landuse/administrative-boundaries/health-boundaries>