

All-Terrain Vehicle (ATV) Injury-Related Morbidity in the North Bay Parry Sound District Health Unit Region

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Key Highlights

- In 2013/14, about one of every four individuals aged 12 years or older in the Health Unit reported riding an all-terrain vehicle (ATV), more than double the Ontario percentage.
- In 2017, the age-standardized ATV injury-related emergency department (ED) visit rate was almost three times higher in the Health Unit region compared to Ontario. Between 2013 and 2017, the ATV injury-related ED visit rate was highest among residents of in West Parry Sound, West Nipissing, and East Nipissing and North East Parry Sound.
- Between 2013 and 2017, approximately 75% of ATV injury-related ED visits and hospitalizations in the Health Unit region were males.
- Between 2013 and 2017, the ATV injury-related ED visit rate was highest among children aged 12 to 15 years old, and over double the Ontario rate for children in the same age group. ATV injury-related hospitalizations were six times higher among children aged 11 years or younger compared to children of the same age in Ontario.

Self-Reported ATV Use and Risky Behaviour

In 2013/14, an estimated 26% of the North Bay Parry Sound District Health Unit (Health Unit) population aged 12 years or older reported riding an all-terrain vehicle (ATV) within the last year, which is 2.5 times higher compared to Ontario (Table 1).

For the 2009/10 and 2013/14 years combined, nearly 9.7% of the population reported driving a snowmobile, motor boat, seadoo or ATV after having two or more drinks in the hour before driving. Caution should be applied when interpreting this statistics however, as more than 5% of responses were missing.

Table 1. Age-Standardized Percentage (95% CI) of Individuals Aged 12 Years or Older, by Indicators of Interest Relating to ATV Use, By Region, 2013/14

Indicator	Health Unit Region	Ontario
Driver/passenger – ATV (all-terrain vehicle) in past 12 months	26.0* (21.0, 31.6)	9.8 (9.4, 10.3)
Rarely or never wear a helmet when on an ATV	18.6 ^E (12.8, 26.4)	24.6 (22.6, 26.6)
Drove a snowmobile, motor boat, seadoo or ATV after having two or more drinks in the hour before driving	9.7 [§] (6.0, 15.5)	7.2 [§] (6.2, 8.3)

Note: Data for indicators marked with (◊) are for the 2009/10 and 2013/14 CCHS combined.

*Estimate is significantly different from provincial estimate

^E Interpret with caution; the estimate is associated with high sampling variability

[§] More than 5% of responses were missing

Trends over Time

Between 2005 and 2017, the age-standardized ATV injury-related emergency department (ED) visit rate was generally two to over three times higher in the Health Unit region compared to Ontario (Figure 1; Table 2). Between 2005 and 2017, the age-standardized ATV injury-related hospitalization rate was generally almost three times higher in the Health Unit region compared to Ontario (Figure 2; Table 3).

Figure 1. Age-standardized Rate per 100,000 Population of ATV Injury-Related ED Visits, By Health Region, 2005 to 2017

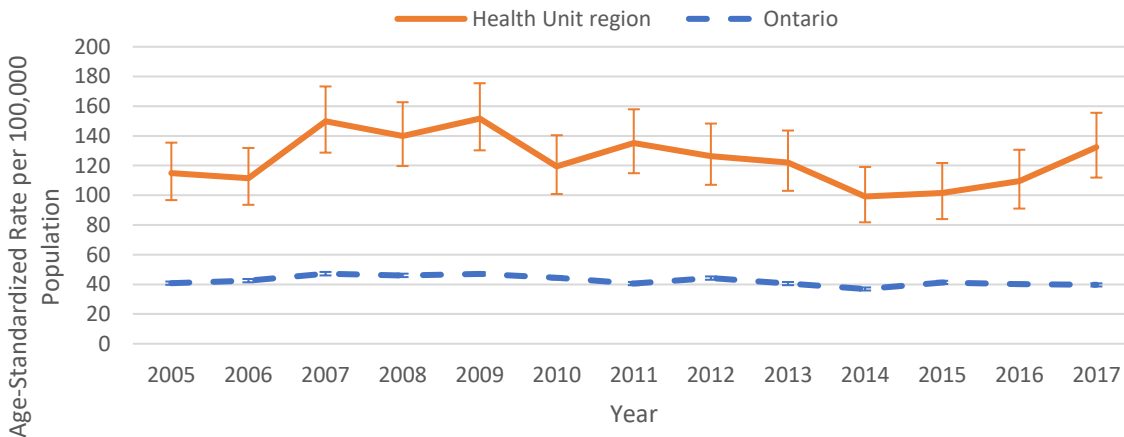


Table 2. Age-standardized Rate per 100,000 Population of ATV Injury-Related ED Visits, By Year and Health Region, 2005 to 2017

Year	Number of ED Visits	Health Unit rate (95% CI)	Ontario rate (95% CI)
2005	145	114.9* (96.8, 135.4)	40.8 (39.7, 41.9)
2006	139	111.5* (93.6, 131.9)	42.5 (41.4, 43.6)
2007	184	149.8* (128.7, 173.3)	47.2 (46.0, 48.4)
2008	172	140.0* (119.7, 162.7)	46.0 (44.9, 47.2)
2009	183	151.6* (130.3, 175.5)	47.0 (45.9, 48.2)
2010	148	119.4* (100.8, 140.5)	44.4 (43.2, 45.5)
2011	160	135.2* (114.9, 157.9)	40.5 (39.5, 41.6)
2012	153	126.5* (107.0, 148.3)	44.2 (43.1, 45.4)
2013	149	122.1* (103.0, 143.6)	40.5 (39.4, 41.6)
2014	117	99.2* (81.8, 119.1)	36.9 (35.9, 37.9)
2015	120	101.6* (84.0, 121.7)	41.3 (40.2, 42.4)
2016	126	109.6* (91.0, 130.7)	40.2 (39.1, 41.3)
2017	152	132.5* (111.9, 155.5)	39.6 (38.6, 40.7)

*Age-standardized rate (ASR) for the Health Unit region is significantly higher compared to Ontario rate during the corresponding calendar year

Figure 2. Age-standardized Rate per 100,000 Population of ATV Injury-Related Hospitalizations, By Health Region, 2005 to 2017

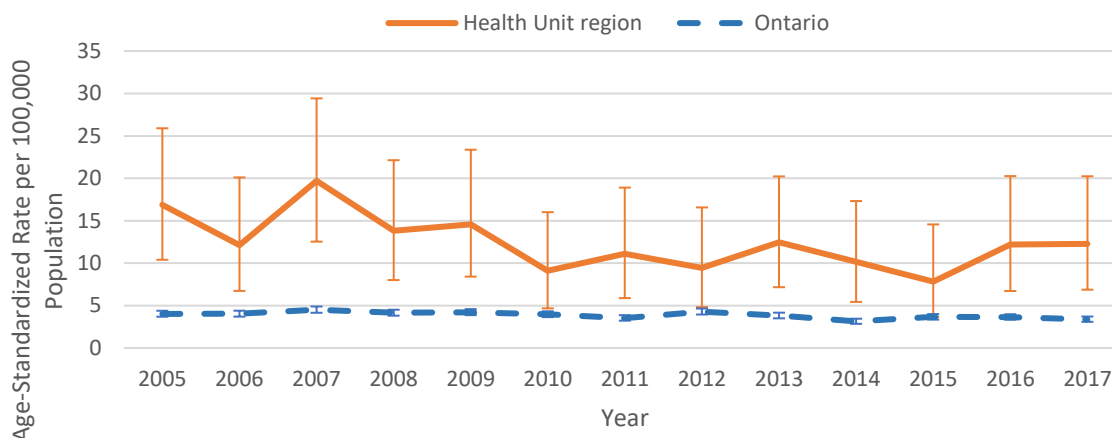


Table 3. Age-standardized Rate per 100,000 Population of ATV Injury-Related Hospitalizations, By Region, 2005 to 2017

Year	Number of Hospitalizations	Health Unit rate (95% CI)	Ontario rate (95% CI)
2005	21	16.9* (10.4, 25.9)	4.0 (3.7, 4.4)
2006	15	12.1* (6.7, 20.1)	4.0 (3.7, 4.4)
2007	24	19.7* (12.5, 29.4)	4.5 (4.2, 4.9)
2008	17	13.8* (8.0, 22.1)	4.2 (3.8, 4.5)
2009	17	14.6* (8.4, 23.4)	4.2 (3.9, 4.6)
2010	12	9.1* (4.7, 16.0)	4.0 (3.6, 4.3)
2011	13	11.1* (5.9, 18.9)	3.5 (3.2, 3.9)
2012	12	9.4* (4.8, 16.6)	4.3 (3.9, 4.7)
2013	17	12.5* (7.2, 20.2)	3.8 (3.5, 4.2)
2014	14	10.1* (5.4, 17.3)	3.1 (2.9, 3.5)
2015	10	7.8 (3.7, 14.6)	3.7 (3.3, 4.0)
2016	15	12.2* (6.7, 20.3)	3.6 (3.3, 4.0)
2017	16	12.3* (6.9, 20.2)	3.4 (3.1, 3.7)

*Age-standardized rate (ASR) for the Health Unit region is significantly higher compared to Ontario rate during the corresponding calendar year

By Geography

Age-standardized rates for ATV injury-related ED visits and hospitalizations were calculated by smaller levels of geography for visits for 2013 and 2017 combined. The ATV injury-related ED visit rates in the West Parry Sound, West Nipissing, and East Nipissing and North East Parry Sound areas were 40% to 60% higher compared to the Health Unit region overall (Table 4). The ATV injury-related hospitalization rates were four times higher in the Unorganized North Part of Nipissing compared to the Health Unit region overall, and the rate in West and Central Parry Sound was double the Health Unit rate. ATV injury-related ED visit and hospitalization rates were significantly lower among North Bay residents.

Table 4. Age-Standardized Rate per 100,000 Population of ATV Injury-Related ED Visits and Hospitalizations, by Region, 2013 and 2017 combined

Region	ED Visit Rate (95% CI)	Hospitalization Rate (95% CI)
East Nipissing and North East Parry Sound ¹	175.7* (149.2, 205.2)	14.6 (8.3, 23.9)
Nipissing, Unorganized North Part	202.7 (112.8, 333.7)	54.5* (14.7, 137.8)
City of North Bay	48.7 (40.6, 57.8)	4.6 (2.4, 7.9)
Town of Parry Sound	101.7 (66.5, 148.1)	4.1 (0.1, 20.6)
West Nipissing ²	158.3* (129.9, 190.9)	10.5 (4.1, 21.5)
West and Central Parry Sound ³	181.1* (155.7, 209.4)	22.3* (14.4, 32.9)
Health Unit region	113.2 (104.7, 122.3)	11.2 (8.7, 14.1)

¹The East Nipissing & North East Parry Sound region includes Bonfield, Callander, Powassan, Nipissing, East Ferris, Calvin, Mattawa, Mattawan, Papineau-Cameron, Chisholm, Unorganized South Part of Nipissing, and the Unorganized North East Part of Parry Sound

²West Nipissing & Nipissing 10 the Municipality of West Nipissing and Nipissing 10 First Nations reserve

³The Central, West, and South East Parry Sound region includes outlying areas of the Town of Parry Sound, The Archipelago, Henvey Inlet 2 First Nations reserve, Magnetawan 1 First Nations reserve, French River 13 First Nations reserve, Seguin, McDougall, Shawanaga 17 First Nations reserve, McKellar, Carling, Machar, Whitestone, Magnetawan, Joly, Sundridge, Strong, South River, Kearney, Perry, Ryerson, Burk's Falls, McMurrich/Monteith, Armour, and the Unorganized Centre Part of Parry Sound

*Rate is significantly higher compared to overall Health Unit region

Age- and Sex-Specific Rates

Age-specific rates for ATV injury-related ED visits and hospitalizations were calculated for visits from 2013 and 2017 combined. Approximately 75% of ATV injury-related ED visits were made by males. The ATV injury-related ED visit rate was highest among children aged 12 to 15 years old, and the Health Unit rate for 12 to 15 year olds was over double the Ontario rate for the same age group (Table 5). Females aged 12 to 24 years old had the highest ATV injury-related ED visit rate among all females (Figure 3; Table 6).

ATV injury-related hospitalizations in the Health Unit region were highest among children aged 11 years or younger, young adults aged 16 to 24 years, and adults aged 36 years or older (Table 7). ATV injury-related hospitalizations were six times higher among children aged 11 years or younger compared to

children of the same age in Ontario, and over four times higher among adults aged 36 years or older compared to Ontario adults of the same age.

Table 5. Age-Specific Rates of ATV Injury-Related ED Visits per 100,000 Population, by Age Group and Region, 2013-2017 combined.

Age group (years)	Health Unit Region Rate (95% CI)	Ontario Rate (95% CI)
11 years or younger	88.4* (67.6, 113.6)	26.0 (24.9, 27.1)
12 to 15	254.0* (195.6, 324.4)	113.0 (109.2, 116.9)
16 to 24	238.8* (203.4, 278.5)	93.6 (91.5, 95.7)
25 to 35	151.3* (125.4, 180.9)	52.5 (51.1, 53.9)
36 years or older	64.5* (56.8, 72.9)	20.9 (20.4, 21.3)

*Age-specific rate is significantly higher compared to the Ontario rate for the corresponding age group

Figure 3. Age-Specific Rates of ATV Injury-Related ED Visits per 100,000 Population, By Age Group & Sex, Health Unit region, 2013-2017 Combined

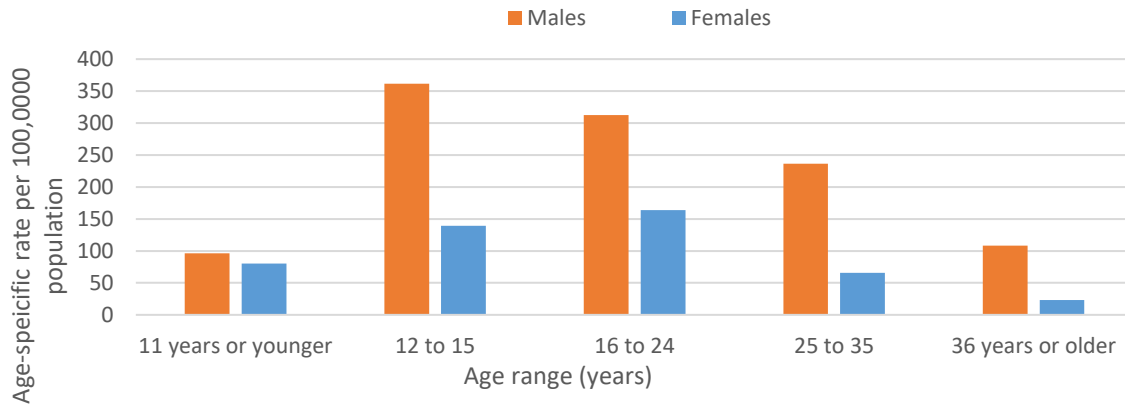


Table 6. Age-Specific Rates of ATV Injury-Related ED Visits per 100,000 Population, by Age Group and Sex, Health Unit Region, 2013-2017 combined.

Age group (years)	Rate Among Males (95% CI)	Rate Among Females (95% CI)
11 years or younger	96.4 (66.8, 134.7)	80.1 (52.8, 116.5)
12 to 15	361.6* (265.7, 480.9)	139.3 (81.2, 223.1)
16 to 24	312.5* (256.1, 377.6)	163.7 (123.3, 213.1)
25 to 35	236.6* (191.2, 289.5)	65.7 (42.9, 96.2)
36 years or older	108.1* (93.9, 123.7)	23.0 (16.9, 30.6)

*Age-specific rate for males is significantly higher than the female rate for the corresponding age group

Table 7. Age-Specific Rates of ATV Injury-Related Hospitalizations per 100,000 Population, by Age Group and Region, 2013-2017 combined

Age group (years)	Health Unit Region Rate (95% CI)	Ontario Rate (95% CI)
11 years or younger	11.6* (5.0, 22.9)	1.9 (1.6, 2.2)
12 to 15	4.0 (0.1, 22.1)	8.0 (7.0, 9.0)
16 to 24	14.7* (7.1, 27.1)	6.4 (5.9, 7.0)
25 to 35	10.1 (4.4, 19.9)	4.4 (4.0, 4.8)
36 years or older	11.3* (8.2, 15.1)	2.6 (2.5, 2.8)

*Age-specific rate is significantly higher than the Ontario rate for the corresponding age group

Injury Location

The number and percentage of ATV injury-related ED visits and hospitalizations and their location of where the injury took place were calculated for visits from 2012 and 2017 combined. The majority of ATV injury-related ED visits and hospitalizations were a result of incidents that occurred in non-highway environments (e.g., private property, recreational trails, etc.) (Table 8). These percentages were similar to percentages for ED visits and hospitalizations within Ontario.

Table 8. Number and Percentage of ATV Injury-Related ED Visits and Hospitalizations, by the Location Where the Injury Took Place & Health Region, 2013 and 2017 combined

Injury location	Health Unit Region ED Visits (Percentage)	Ontario ED Visits (Percentage)	Health Unit Region Hospitalization (Percentage)	Ontario Hospitalization (Percentage)
Highway	31 (4.7%)	1480 (5.5%)	9 (12.2%)	221 (9.2%)
Non-highway	625 (94.1%)	25216 (93.5%)	63 (87.5%)	2177 (90.3%)
Unspecified	8 (1.2%)	275 (1.0%)	2 (2.7%)	14 (0.6%)

Most Common Injured Regions of the Body

The number and percentage of ATV injury-related ED visits and hospitalizations and the regions of the body injured were calculated for visits from 2012 and 2017 combined. Multiple regions of the body may be injured for each ED visit or hospitalization. For ATV injury-related ED visits, the most common body injuries were to the upper extremity (i.e., arms and shoulders), followed by the lower extremity injuries (i.e., hips, legs and feet; Table 9).

For ATV injury-related hospitalizations, the trunk (i.e., abdomen, thorax, spine, pelvis, and lower back, and shoulders) were the body regions most commonly injured. The internal organ injuries were found as the majority (64%) trunk injuries of ATV related hospitalizations.

Table 9. Number and Percentage of ATV Injury-Related ED Visits and Hospitalizations, by Injured Region of the Body, 2013 and 2017 combined.

Injured Region of the Body	ATV ED visits (percentage)	ATV Hospitalization (percentage)
Head/Neck	110 (17%)	16 (22%)
Lower Extremity	188 (28%)	18 (25%)
Trunk	128 (19%)	28 (39%)
Upper Extremity	241 (36%)	27 (38%)

Definitions and Data Sources

Definition

All-terrain vehicle (ATV) injury-related emergency department visits, including the location of the incident: Emergency department visits that included unscheduled visits to the emergency department with all problem external causes relating to operation of an ATV, including driving, a passenger of, unspecified occupant of an all-terrain or other off road motor vehicle where an injury occurred (U99.032 & select codes under V86; International Statistical Classification of Health Problems, 10th Revision (ICD-10CA)).

All-terrain vehicle (ATV) injury-related hospitalizations, including the location of the incident: Hospitalizations all problem external causes relating to operation of an ATV, including driving, a passenger of, unspecified occupant of an all-terrain or other off road motor vehicle where an injury occurred (U99.032 & select codes under V86; International Statistical Classification of Health Problems, 10th Revision (ICD-10CA)).

Injured region of the body: Identified for ATV injury-related emergency department visits and hospitalizations using ICD-10-CA codes S-section and T-section.

Data sources:

1. ATV injury-related emergency department visit data: Ambulatory Emergency External Cause [2005-2017], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [2019/1/14].
2. ATV injury-related hospitalization data: Discharge Abstract Database (DAD) [2005-2017], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date Extracted: [2019/1/14].
3. Population estimates: Population Estimates [2007-2016], Ontario Ministry of Health and Long-Term Care, IntelliHEALTH Ontario, Date Extracted: [2017/11/03].
4. Canadian Community Health Survey 2009/10, 2013/14, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Analysis:

Age-standardized rate:

The age-standardized rate was calculated by using the Direct Method and standard 2011 Canadian population.

Confidence intervals:

Confidence intervals (CI) and variances were estimated using the Poisson distribution in STATA IC/14.2 (2014) for all regions.

Interpretation of a significant difference:

A statistic interpreted as ‘significantly different’ from another is an estimate found to be statistically meaningful; the difference is unlikely due to chance. Error ranges noted in tables within this report illustrate 95% confidence intervals. If there is no overlap in range between confidence intervals, the difference can be described as statistically significant.