

# All-Terrain Vehicle Injuries

On average, more than 15 people each day are seen in Ontario emergency departments for injuries related to all-terrain vehicles. More than one person is hospitalized each day for an ATV injury; males 15-19 are most commonly injured.

## Results

For the purposes of this analysis, all-terrain vehicle (ATV) injuries were defined as those transport incidents occurring to occupants of an ATV or other motor vehicle designed primarily for off-road use. Snowmobiles as well as vehicles in stationary use or maintenance were excluded from analysis.

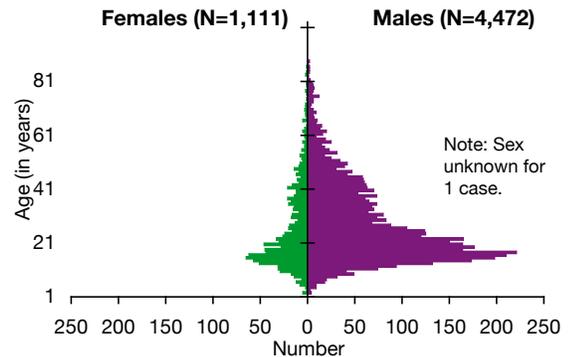
During the 2005/06 fiscal year, there were a total of 5,584 emergency department visits and 579 hospitalizations due to ATV injuries (See Methods Section for Data Sources). These numbers translate into provincial rates of 47.1 per 100,000 population for emergency department visits and 4.8 per 100,000 for hospitalizations (Table 1).

Males accounted for 80% of emergency department visits and 83% of hospitalizations for ATV injuries. Males and females 10 to 24 years of age had the highest numbers and rates of emergency department visits and hospitalizations. Specifically, males 15-19 years of age had the highest number of emergency department visits and hospitalizations for all age groups for both males and females. At 935 emergency department visits and 87 hospitalizations, males had over three times that of females 15-19 years of age.

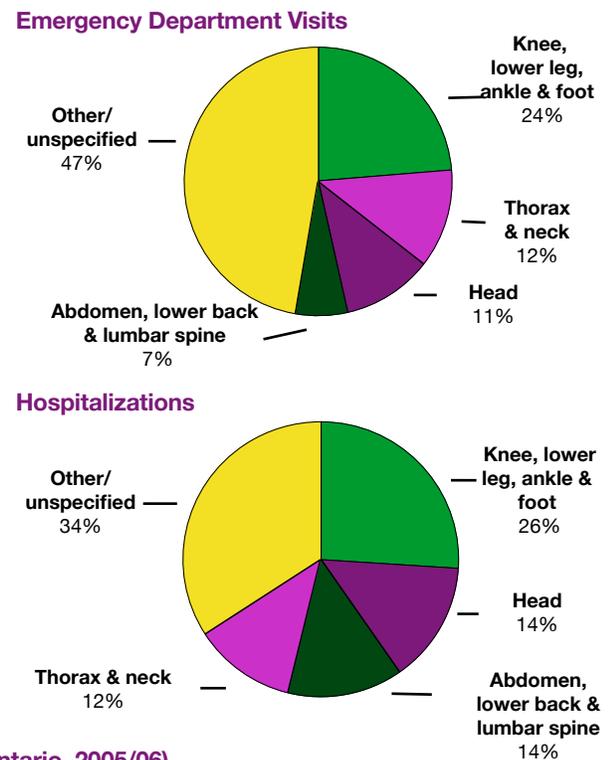
The most common injuries requiring an emergency department visit or hospitalization were those to the driver of the ATV.

For both emergency department visits and hospitalizations, injuries to the lower limbs (knee, lower leg, ankle, and foot) were the most frequent, accounting for 24% and 26% of all injuries respectively (Figure 2). More specifically, fracture to the lower leg (including the ankle) was the most common injury for emergency department visits and hospitalizations, followed by fracture of the shoulder and upper arm for both, in addition to fracture of the forearm for hospitalizations. Injury rates varied by region with the highest overall rates reported in the North region of Ontario (Table 1).

**FIGURE 1. Emergency department visits due to all-terrain vehicle injuries by age and sex (Ontario, 2005/2006)**



**FIGURE 2. Nature of all-terrain vehicle injuries (Most responsible diagnosis, Ontario, 2005/2006)**



**TABLE 1. Regional comparison of ATV injuries (Ontario, 2005/06)**

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
<b>Emergency Department Visits</b>								
Number	1,160	561	491	1,180	127	1,017	919	5,584
Rate per 100,000 <sup>a</sup>	78.5	50.9	21.4	56.0	5.2	65.5	114.3	47.1
Average Age	25	27	27	28	29	27	28	27
% male	83	80	79	82	71	82	75	80
<b>Hospitalizations</b>								
Number	112	62	50	117	14	87	112	579
Rate per 100,000 <sup>a</sup>	7.6	5.3	2.1	5.5	0.5	5.4	13.1	4.8
Average Age	28	27	29	34	32	30	32	30
% male	85	76	92	88	71	85	78	83

a. Age-standardized rate per 100,000 population. Note: Region of residence unknown/outside of Ontario for 129 emergency department visits and 25 hospitalizations.



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**TABLE 2. Regional comparison of ATV injuries by age group (Ontario, 2005/06)**

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
<b>Emergency Department Visits- Rate per 100,000<sup>a</sup></b>								
10-14 years	179 (194)	111.3 (90)	42.3 (71)	123 (197)	10.8 (16)	143.3 (157)	216.9 (128)	104.3 (870)
15-19 years	223.3 (247)	131.7 (108)	54.6 (88)	142.2 (224)	16.3 (24)	217.8 (238)	362.5 (224)	142.1 (1179)
20-24 years	175.8 (195)	101.6 (82)	52 (85)	118.1 (169)	7.2 (13)	132.1 (146)	240.5 (138)	99.6 (843)
<b>Hospitalizations- Rate per 100,000<sup>a</sup></b>								
10-14 years	17.5 (19)	19.8 (16)	5.4 (9)	8.1 (13)	/ $<5$	4.6 (5)	27.1 (16)	9.9 (83)
15-19 years	19 (21)	9.8 (8)	8.1 (13)	9.5 (15)	/ $<5$	19.2 (21)	38.8 (24)	13 (108)
20-24 years	15.3 (17)	12.4 (10)	/ $<5$	7 (10)	/ $<5$	14.5 (16)	17.4 (10)	8.2 (69)

a. Age-specific rate per 100,000 population. Note: Region of residence unknown/outside of Ontario for 129 emergency department visits and 25 hospitalizations.

Regional variations in injury patterns were observed by age. For 15-19 year olds, 10 to 14 year olds and 20-24 year olds, the highest rates for both emergency department visits and hospitalizations were seen in the North region of Ontario (Table 2).

Over 85% of individuals who visited an emergency department for an ATV injury were discharged to their place of residence. For hospitalized cases, approximately 78% of patients were discharged home and close to 10% were discharged to a home with support services. Approximately 1% of individuals died after arrival in the emergency department and the same after hospital admission; however, this Compass does not capture those cases where the individual died at the scene of the incident and is therefore only a partial representation of ATV related mortality. The 579 hospitalized cases accounted for more than 2,600 days in acute care hospitals with an average length of stay of 4.5 days.

## Discussion

This Compass highlights patterns of injury for emergency department visits and hospitalizations for ATV injuries in individuals living in Ontario.

Riding ATVs, vehicles characterized by their large size and powerful motors, is a popular recreational activity for many Canadians. In 2004, approximately 850,000 Canadians owned an off-road vehicle.<sup>1</sup>

Although injuries from ATV use account for a small proportion of hospital admissions in Canada, the majority of injuries sustained are severe, often resembling injuries resulting from motor vehicle collisions (e.g., head or spinal cord injuries).<sup>2</sup> Further, when compared to non-motorized forms of recreation, such as cycling, ATV injuries have been found to occur more often and to be more severe in nature.<sup>1</sup>

As illustrated in this Compass, a large proportion of individuals under the age of 25 sustain injuries from ATV use. Other studies have highlighted this vulnerable population.<sup>2</sup>

## References

1. Canadian Institute for Health Information (CIHI). National Trauma Registry Analysis in Brief: ATV Injury Hospitalizations in Canada, 2004-2005. Toronto: CIHI; 2007
2. Yanchar, NL. Kennedy, R. Russell, C. (2006). ATVs: motorized toys or vehicles for children? *Injury Prevention*: 12:30-34.
3. SafeKids Canada (2008) Public Policy and Advocacy. All Terrain Vehicles (ATVs). [www.sickkids.ca](http://www.sickkids.ca)
4. Sibley, AK. Tallon, JM. (2002). Major injury associated with all-terrain vehicle use in Nova Scotia: A 5 year review. *CJEM*: 4(4):263
5. Alawi, K. Lynch, T. Lim, R. (2006) All terrain vehicle major injury patterns in children: a five year review in southwestern Ontario

A higher injury rate in this age group may be, in part, due to the lack of required motor and cognitive skills, as well as the necessary physical development to operate these vehicles in a safe manner.<sup>3</sup> The Canadian Paediatric Society has recommended that children under 16 years of age be prohibited from operating or riding ATVs.<sup>5</sup>

Legislation and guidelines for ATV use covering such issues as age restrictions, helmet use, safety training and testing vary by province.<sup>1</sup> In Ontario, children under 12 years cannot operate an ATV unless they are on land owned by the ATV owner or supervised by an adult.<sup>3</sup>

Although legislation has been implemented in some areas of Canada, ATV-related incidents continue to be a significant cause of injury.<sup>4</sup>

## Managing the risk

- ❖ The Canadian Paediatric Society and Safe Kids Canada recommend limiting ATV use to older children.<sup>3,5</sup>
- ❖ Males and females in each age group require a targeted strategy to address the problem of ATV injuries.<sup>2</sup>
- ❖ To reduce ATV injury and death, additional publicized research may be needed to convince policy makers to implement change.
- ❖ A coordinated province-wide initiative that brings together the many diverse stakeholders involved with this issue should be developed.
- ❖ With evidence based information, public health officials can work towards ongoing policy change; A community based awareness and educational ATV program can be implemented.

## For Further Information

Canadian Paediatric Society: "Are We Doing Enough?"  
[www.cps.ca/english/advocacy/StatusReport07.pdf](http://www.cps.ca/english/advocacy/StatusReport07.pdf)

Safe Kids Canada  
[www.safekidsCanada.ca](http://www.safekidsCanada.ca)

SMARTRISK  
[www.smartrisk.ca](http://www.smartrisk.ca);  
<http://www.smartrisk.ca/ContentDirector.aspx?tp=1301>

Canadian Paediatric Society ATV Position Statement  
[www.cps.ca/english/statements/IP/IP04-01.htm](http://www.cps.ca/english/statements/IP/IP04-01.htm)  
[http://www.caps.ca/docs/CAPS\\_position\\_statement\\_on\\_ATVs%5B2%5D.pdf](http://www.caps.ca/docs/CAPS_position_statement_on_ATVs%5B2%5D.pdf)

## Methods

Emergency department data were obtained from the National Ambulatory Care Reporting System and acute care hospitalization data were obtained from the Discharge Abstract Database at the Canadian Institute for Health Information for the 2005/06 fiscal year. ICD-10 coding (V86 excluding snowmobiles) was used to isolate all ATV injuries resulting in emergency department visits or hospitalizations. Note that some persons were seen in an emergency department and then admitted to hospital; however, persons can be admitted to hospital without visiting an emergency department. Regions were defined according to place of residence using the Ontario Ministry of Health Region Codes. Deaths occurring outside of the hospital setting were not included in this analysis.