

# Wheeled Recreation Injuries

Each year, nearly 500 Ontarians are hospitalized with a skateboard, in-line skate, roller skate, or scooter injury. Males 11-16 years account for more than one-third.

## Results

In Ontario, there were a total of 485 skateboard, in-line skate, roller skate, and non-motorized scooter injury hospitalizations during the 2002/03 fiscal year. Approximately 42% of the injury hospitalizations occurred as a result of a fall involving a skateboard, followed by a fall involving in-line skates or roller skates, and a fall involving a non-motorized scooter (Table 1).

Males accounted for 72% of the wheeled recreation injury hospitalizations. There was a peak in the number of injury hospitalizations among young males 11-16 years of age (Figure 1). Age patterns varied according to type of wheeled recreation activity. The average age of injured skateboarders was 16 years compared to an average of 26 years for injured in-line skaters and roller skaters and 27 years for those hospitalized with a non-motorized scooter injury.

For wheeled recreation injuries, injuries to the elbow and forearm were the diagnoses most responsible for hospitalization in 35% of cases, followed by injuries to the knee and lower leg (Figure 2). In particular, fractures were most common. Different injury patterns were observed by type of wheeled recreation activity. For example, a lower leg fracture was the most common type of injury for in-line skating and roller skating, accounting for 48% of the injury hospitalizations. In contrast, lower leg and forearm fractures each accounted for 34% of skateboarding injuries and lower leg fractures were most common for scooter injuries, representing 29% of persons hospitalized with a non-motorized scooter injury.

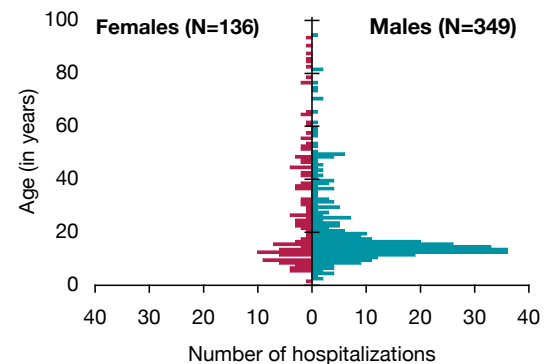
The 485 cases accounted for more than 1,300 days in acute care hospitals, with an average length of stay of 2.8 days. Some of the longest lengths of hospital stay were observed for injuries caused by a fall involving a non-motorized scooter (average of 4.1 days). About 94% of cases were discharged home and 4% were transferred to another inpatient facility (e.g., rehabilitation centre). Fewer than 1% of people died during their hospital stay.

The highest number of wheeled recreation injury hospitalizations occurred in July and the lowest number was observed in December (Figure 3).

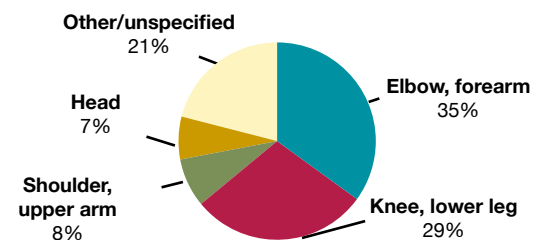
**TABLE 1. Type of wheeled recreation injury hospitalization (Ontario, 2002/03)**

Type of wheeled recreation injury	Number	%
Skateboard	203	41.9
In-line skates/roller skates	163	33.6
Non-motorized scooter	119	24.5
Total	485	100

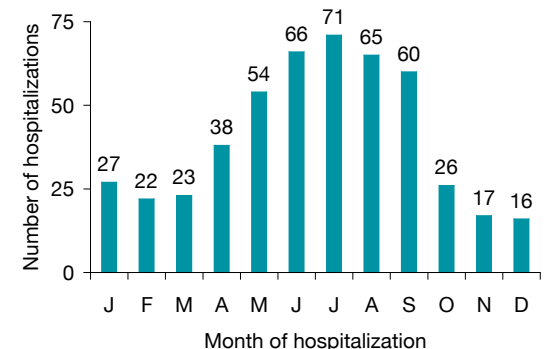
**FIGURE 1. Wheeled recreation injury hospitalizations by age and sex (Ontario, 2002/2003)**



**FIGURE 2. Site of injury for wheeled recreation injury hospitalizations (Most responsible diagnosis, Ontario, 2002/03)**



**FIGURE 3. Month of wheeled recreation injury hospitalization (Ontario, 2002/03)**



**TABLE 2. Regional comparison of wheeled recreation injury hospitalizations (Ontario, 2002/03)**

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
Number	52	69	73	86	82	63	51	485
Rate per 100,000 <sup>a</sup>	3.5	6.2	3.6	4.5	3.6	4.2	5.6	4.3
Average age (in years)	23	20	21	19	24	28	22	22
% male	65	61	75	72	80	68	76	72

a. Age-standardized rate per 100,000 population. Note: Region of residence unknown/outside of Ontario for 9 hospitalizations.

## Ontario Injury Compass

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**TABLE 3. Regional comparison of wheeled recreation injury hospitalizations for select age groups (Ontario, 2002/03)**

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
<b>Rate per 100,000 population<sup>a</sup> (Number)</b>								
5-9 years	5.7 (6)	14.0 (11)	4.0 (6)	7.1 (10)	6.6 (10)	4.8 (5)	13.2 (8)	7.1 (56)
10-14 years	15.1 (16)	33.1 (26)	25.3 (36)	24.7 (34)	15.8 (22)	12.5 (13)	19.3 (12)	20.8 (160)
15-19 years	7.5 (8)	13.1 (10)	6.6 (9)	15.3 (20)	6.5 (9)	16.0 (16)	26.1 (17)	11.9 (90)
20-29 years	5.0 (10)	5.4 (8)	2.1 (6)	2.2 (5)	4.1 (16)	3.9 (8)	3.5 (<5)	3.8 (59)

a. Age-specific rate per 100,000 population. Note: Region of residence unknown/outside of Ontario for 9 hospitalizations.

In Ontario, the age-standardized hospitalization rate for skateboard, in-line skate, roller skate, and scooter injuries was 4.3 per 100,000 population (Table 2). By region, the highest number of injuries was observed in the Central East region and the highest injury rate was seen in the Central South region. The lowest number of wheeled recreation injury hospitalizations was seen in the North and the lowest rate was observed in the South West region.

Regional variations in injury patterns were observed by age (Table 3). In general, the numbers and rates of wheeled recreation injury hospitalizations were highest among the 10-14 year age group. The East and North regions were exceptions, as the highest numbers and rates of hospitalization in these regions were observed for the 15-19 year age group.

## Discussion

This Compass highlights patterns of wheeled recreation injury hospitalizations in Ontario. Similar patterns of injury have been reported in other provincial analyses.<sup>1,2</sup>

Wearing protective gear has been recognized as an important component of preventing wheeled recreation injuries. Factors such as age, sex, skill level, income, location, and parental attitudes or behaviours have been associated with protective equipment use.<sup>3-8</sup> Research studies have examined use of protective equipment.<sup>3-8</sup> However, there are variations in reports due to observational versus self-reported measures and location of study.

Helmet use has been identified as one key area of interest. Safety and public education programs or campaigns have been employed. Similar to cycling, there have also been efforts in Ontario to legislate mandatory helmet use while on skateboards, in-line skates and scooters.

## References

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## Managing the risk

In Ontario, skateboarding, in-line skating, roller skating, and scooting are popular recreational activities. Here are some tips that can be used to help reduce the risk for injury:

- ❖ Make sure you have all of the necessary equipment and that it fits properly. Wear a certified helmet, elbow and knee pads, and wrist guards. Ensure that all equipment is in good working order.
- ❖ Replace a helmet after a major impact, such as a fall.
- ❖ Take lessons to learn proper technique. It is important to be in control and respectful of others.
- ❖ Know your limits and abilities. Tricks you attempt and routes you take should be geared towards your skill level.
- ❖ Watch and listen to your surroundings. Be aware of other people and vehicles. Avoid wearing headphones.
- ❖ Check riding surfaces for holes and debris. If performing tricks, check ramps and rails to make sure they are secure.
- ❖ Supervise young children and avoid high traffic areas.
- ❖ Designated areas for wheeled recreation activities, such as trails and skate parks, should be regularly maintained.

## For Further Information

Public Health Agency of Canada - CHIRPP Injury Reports  
[www.phac-aspc.gc.ca/injury-bles/](http://www.phac-aspc.gc.ca/injury-bles/)  
Health Canada Consumer Product Safety - In-line Skating and Skateboarding  
[www.hc-sc.gc.ca/cps-spc/index\\_e.html](http://www.hc-sc.gc.ca/cps-spc/index_e.html)  
ThinkFirst Foundation of Canada  
[www.thinkfrist.ca](http://www.thinkfrist.ca)  
SMARTRISK Catalogue of Best Practices  
[www.smartrisk.ca/ListingSections.aspx?dd=4&sd=207](http://www.smartrisk.ca/ListingSections.aspx?dd=4&sd=207)

### Published Studies

Rush C. Wheeled recreation resources: bikes, in-line skates, scooters, and skateboards. *Int J Trauma Nurs* 2001;7:104-7.  
Sherker S, Cassell E. Preventing in-line skating injuries: how effective are the countermeasures? *Sports Med* 1999 ;28:325-35.  
Committee on Injury and Poison Prevention; American Academy of Pediatrics. Skateboard and scooter injuries. *Pediatrics* 2002;109:542-3.

## Methods

Wheeled recreation injuries include the following activities: skateboarding, in-line skating/roller skating, and non-motorized scooting. Hospitalization data included acute care hospitalizations for wheeled recreation injuries in Ontario from the 2002/03 fiscal year. Data were obtained from the Discharge Abstract Database at the Canadian Institute for Health Information (CIHI). Wheeled recreation injuries were classified according to the International Classification of Diseases, 10th revision (ICD-10) using codes W02.02, W02.03, and W02.08. Fewer than 1% of cases resulted in an in-hospital death. Regions were defined according to place of residence using the Ontario Ministry of Health Region Codes.