

Bicycling-Related ED Visits in Ontario: A focus on children and youth

Understanding the Issue

All bicyclists are vulnerable road users, but children and youth face additional risks.

Bicyclists are vulnerable road users because they are not protected by a surrounding structure the way the driver of a vehicle is. Children and youth (ages 1-14) face additional risks because of their level of physical and cognitive development.

Children are smaller physically, making it more difficult for drivers and other road users to see them. It can also be difficult for children to see surrounding traffic or around visual barriers. Younger children may not have the experience or cognitive development to interpret sights, sounds or the movement of vehicles around them. Older children and youth are prone to taking risks, which can impact their safety on the road.¹

With a particular focus on children and youth, this Ontario Injury Compass presents data on emergency department (ED) visits for bicycling-related injuries and prevention strategies to address this injury issue.

Causes

The number one cause of bicycling-related injuries seen in Ontario EDs in 2010/11 was non-collision transport incidents (Table 1). This term means the rider fell or was thrown off their bicycle, but not because of a collision with a person, vehicle or other object. An example might be a rider losing control of their bike on a slippery road surface. These types of incidents resulted in 7,266 ED visits for the 1-14 age group.

The second-highest cause, accounting for 327 ED visits for children and youth, was bicyclist collisions with cars, vans or pickup trucks.

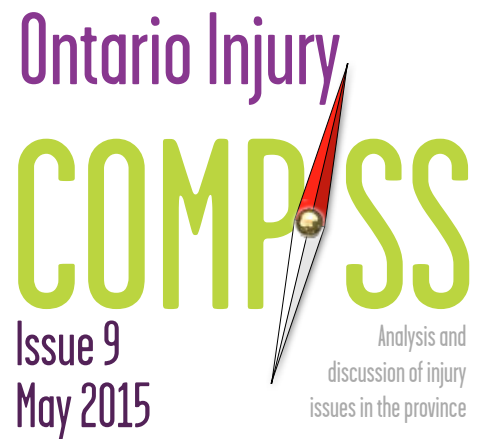
Injury Characteristics

Age

In 2010/11, there were 26,012 ED visits related to bicycling injuries in Ontario. In 33% (8,577) of these visits, the injured persons were children and youth (Figure 1). The single age group with the highest number of visits was 10-14 years, with 4,862 or 19% of all ED visits.

Sex

In 2010/11, 73% of all visitors to EDs in Ontario for bicycling-related injuries were males (Figure 1). This ratio is consistent within the 1-14 age group,



where males accounted for 72% of ED visits.

Body Region

As shown in Figure 2, the majority of child and youth injuries seen in Ontario EDs in 2010/11 for bicycling were to the upper extremities (44%) and to the

TABLE 1. External causes for ED visits associated with bicycling injuries, ages 1 - 14, NACRS, Ontario, 2010/11

Age group (years)	Noncollision transport incident*	Collision with car, van or pickup truck	Collision with stationary or fixed object	Collision with other pedal cycle	Other**/ Unspecified	TOTALS
1 - 4	599	4	12	5	55	675
5 - 9	2,583	88	64	34	271	3,040
10 - 14	4,084	235	110	54	379	4,862
TOTALS	7,266	327	186	93	705	8,577

*Noncollision transport incidents refer to a person falling or being thrown off an overturning bicycle, but not as the result of a collision.

**Other includes collisions with pedestrians, animals, and other types of transport vehicles not specified in other categories.

FIGURE 1. ED Visits associated with bicycling injuries, by age and sex, NACRS, Ontario, 2010/11

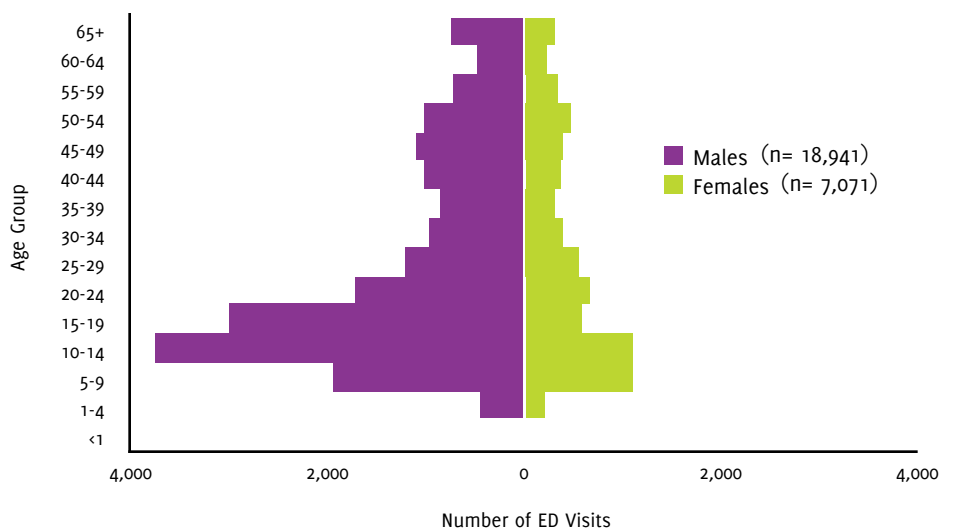
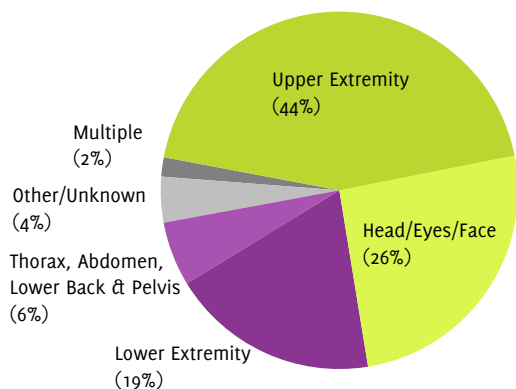


FIGURE 2. Injury diagnosis related to bicycling, by most responsible diagnosis, ages 1 - 14, NACRS, Ontario, 2010/11



head, eyes or face (26%).

Taking a closer look at head, eye and facial injuries, more than half of these (59%) were superficial or open wound head injuries (Table 2). The next most diagnosed injury to this body region was concussion. A total of 174 children and youth were identified in Ontario EDs as having bicycling-related concussions in 2010/11, with 169 of these occurring in 5 - 14 year olds.

Prevention Strategies

Properly-Fitted Helmets

Helmets that fit and are worn properly reduce the risk of head and facial injuries.^{2,3} For helmet-fitting tips, visit Parachute's Helmet FAQ page. Evidence shows that bike helmet legislation increases helmet use in children and youth, and also reduces their head injury risk.²

Visibility

Bicyclists can increase their visibility to other road users by:

- ▶ placing retroreflective materials and additional lights on their bike
- ▶ wearing bright, retroreflective clothing
- ▶ using their bell or horn to alert others of their presence.

Bicycle Maintenance

It is important for riders to ensure their bicycle is in good working condition, especially safety features like brakes.³

TABLE 2. Head, eye, and facial injuries related to bicycling, by most responsible diagnosis and age group, ages 1 - 14, NACRS, Ontario, 2010/11

Diagnosed Injury	1-4 years	5-9 years	10-14 years	TOTALS	%
Superficial and open wound head injuries	270	661	359	1,290	59
Concussion	5	53	116	174	8
Facial/skull fracture	*	36	42	81	4
Eye, cranial nerve, head ligament injuries	7	20	7	34	2
Other Intracranial	*	*	20	23	1
Other head injury	85	232	272	589	27
Total				2,191	101

*Counts less than 5 but greater than zero have been suppressed.

Route Choice

If possible, children should ride in areas with no motor vehicle traffic. Choose designated cycling areas where available.³

Infrastructure

The Office of the Chief Coroner's [Cycling Death Review](#) recommends a "complete streets" approach be adopted in Ontario to enhance safety for all road users. One literature review suggests elements such as bike-only facilities (bike paths, bike lanes, etc), street lighting, paved surfaces, and low-angled grades may positively impact cyclist safety.⁴

Methodology

Emergency room data were obtained from the National Ambulatory Care Reporting System (NACRS) at the Canadian Institute for Health Information (CIHI) for the 2010/11 fiscal year (April 1 - March 31). The Public Health Agency of Canada provided the data and analysis for this report. The International Statistical Classification of Disease and Related Health Problems, 10th Revision (ICD-10) is an international standard for

classifying diseases and external cause of injury. ICD-10 coding was used to isolate all ED visits related to bicycling injuries (V10-18, V19(.0-.3), V19.4, V19.6, V19 (.8-.9)).

References

1. World Health Organization. (2015). *Ten Strategies for Keeping Children Safe on the Road*. Retrieved from: http://apps.who.int/iris/bitstream/10665/162176/1/WHO_NMH_NVI_15.3_eng.pdf?ua=1&ua=1
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