

Bicycle injury hospitalization in Canadian children

Understanding the Issue

Cycling is an important source of recreation and exercise for children. However, it is not without risk. Most cycling injuries to children are due to high speeds, lack of control and lack of protective gear.¹

Efforts can be made to reduce the incidence and severity of these injuries. This Canada Injury Compass highlights the incidence, risk factors, and prevention strategies to address bicycle injury in children between the ages of 1-14 years.

Risk Factors

Age

As seen in Figure 1, children between the ages of 1-14 years had the highest incidence of bicycle injury hospitalization* as compared to any other age group in 2010/11. Of these, children aged 10-14 years represent

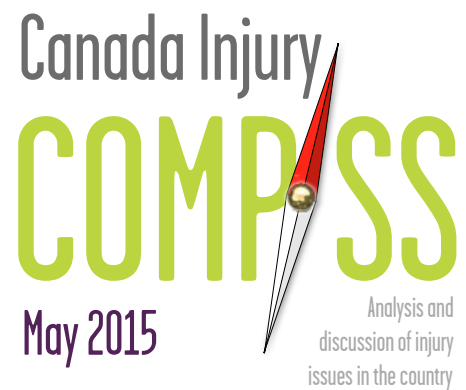
the majority (N=865; 63%) of hospitalizations, followed by the 5-9 year age group and 1-4 years age group.

Sex

A trend common to this age group (1-14 years), is the disproportionate representation of male children. Injury hospitalization was much higher in male children as compared to females. In 2010/11, 670 male children were hospitalized from bicycle injury as opposed to 195 female children; i.e. for every female child, at least three male children were hospitalized for a bicycle injury.

Circumstances of Injury

In 2010/11, children (1-14 years) were most commonly (77%) injured in a non-collision transport incident; which refers to the child falling or being thrown off a bicycle, but not as the result of a collision. This could be attributed to loss of control due to speed, unexpected road conditions,



etc. For this age-group (1-14 years), falls of this nature are the most common mechanism of injury.

However, It is important to note that there are some marked differences in circumstances of bicycle related injury between young (1-10 years) and older children (11-14 years)³. The former and younger age group is prone to injury due to loss of control caused by excessive speed, distraction and other risks inherent to their age and development^{3,4}.

Children aged 10-14 years, on the other hand, have loss of control injuries resulting from doing stunts/tricks, biking on rough/unsteady terrain, and collision with motor vehicles³.

Figure 1. Bicycle injury hospitalization, by Age and Sex, HMDB 2010/11, Canada

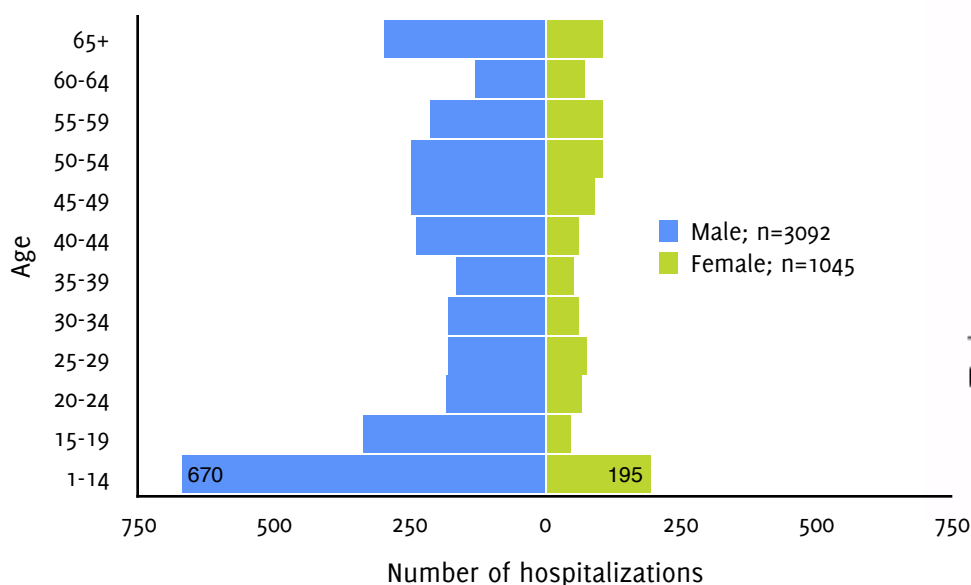
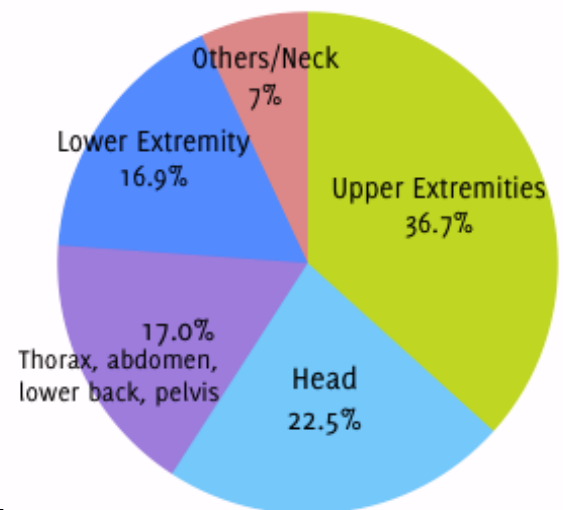


Figure 2. Bicycle injury hospitalization, by most responsible diagnosis, HMDB 2010/11, Canada



* Hospitalization in this context refers to the child being admitted to the hospital as an inpatient

Nature of Injuries

In 2010/11, children most commonly sustained injuries to the upper extremities, followed by head injuries, injuries to the midriff and lower extremities (Figure 2).

Head injuries can have serious consequences in the short term as well as long term. Traumatic brain injuries are the leading cause of severe injury to children on bicycles⁵. In 2010/11, a total of 193 children (22%) were hospitalized for treatment of a bicycle-related head injury.

Table 1 details the types and incidence of head injuries sustained.

Prevention Strategies

Properly-fitted protective equipment

Helmet use reduces the severity of head injuries by up to 80%.⁶ Organizations such as Parachute and Health Canada recommend the use of properly fitted helmets.

Safe road use & Role modelling

Young and practising riders, should choose areas based on their skill level; traffic risks and road safety knowledge. Parents can guide their child's activities by modelling safe behaviour and practices on the road and also being aware of the child's skill level.

Policy/Enforcement

Another proven-effective injury prevention strategy is helmet use for cycling. Across Canada, head injury rates among child and youth cyclists are about 25% lower in jurisdictions with helmet legislation compared to those without⁷.

Figure 4 highlights inconsistency in mandatory helmet legislation for all ages across various provinces of Canada (Figure 3).

British Columbia, Nova Scotia and New Brunswick have mandatory bike helmet legislation for all ages. Ontario, Manitoba and Alberta mandate that only those under 18 have to wear bicycle helmets. Saskatchewan and Quebec had no provincial legislation as of 2014.

Methodology

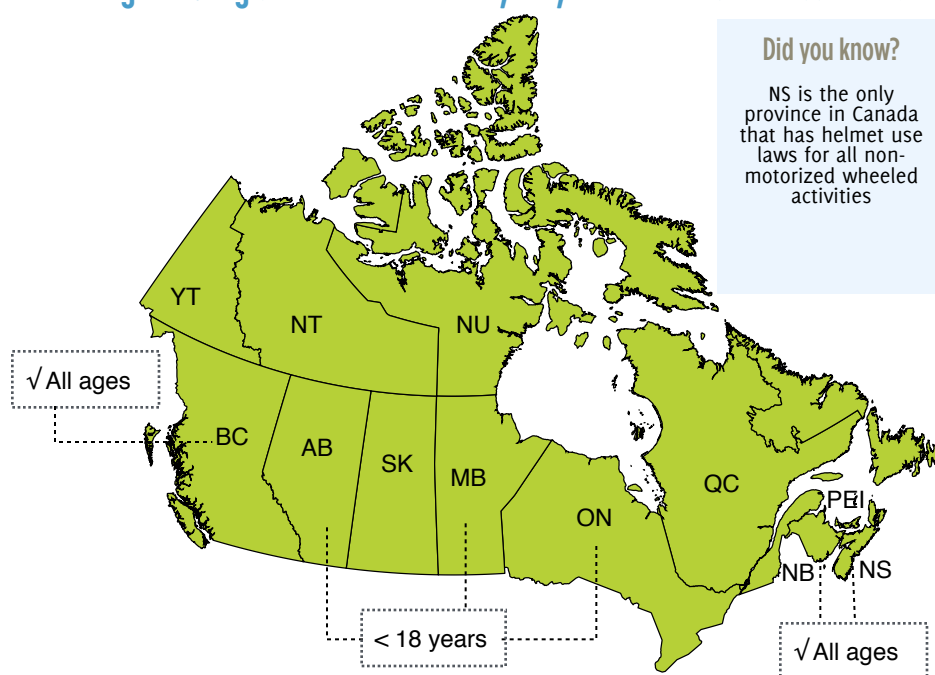
'Analysis of the hospitalization data from CIHI's Hospital Morbidity Database (HMDB), for fiscal year 2010/11 (April 1-March 31) was provided by the Public Health Agency of Canada (PHAC). ICD-10 coding was used to isolate all hospitalizations related to bicycling injuries (V10-18, V19(.0-.3), V19.4, V19.6, V19(.8-.9))

Table 1. Types of injuries to the head in children, 1-14 years, HMDB 2010/11, Canada

Type of Head Injury	1-4*	5-9*	10-14	Total
Superficial & open wound injury	<5	<5	7	10
Facial and skull fractures	<5	15	16	32
Concussion	<5	18	41	63
Other intracranial	<5	18	41	60
Other head injury	<5	9	18	28

*Counts below 5 are not published for privacy reasons. Total includes missing counts.

Figure 3. Legislation for mandatory bicycle helmet use across Canada



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