

Motorcycle Injuries

Every year in Ontario, more than 30 motorcyclists are killed and at least 700 more are hospitalized with an injury.

Results

In Ontario, there were 736 injured motorcyclists hospitalized during the 2002/03 fiscal year. Males accounted for 90% of these hospitalizations. A peak in the number of motorcycle hospitalizations was observed among males 22-33 years of age (Figure 1).

Noncollisions, such as losing control or falling from a motorcycle, was the most frequent type of injury, representing 47% of all Ontarians hospitalized with a motorcycle injury (Figure 2). A collision with a motor vehicle was also common, accounting for 28% of all motorcycle injury hospitalizations.

The driver of the motorcycle was injured 83% of the time. A motorcycle passenger was injured in 5% of the cases and unspecified motorcycle occupants accounted for the remaining hospitalizations.

About 48% of the motorcycle injury hospitalizations occurred in traffic situations, followed by 46% in nontraffic locations. The remaining 6% of injury hospitalizations occurred in unspecified locations. Traffic injuries are described as those occurring on a public street, road, or highway and non-traffic incidents include all other settings.

Fractures and head injuries were some of the most common natures of injury experienced by motorcyclists (Figure 3). More specifically, a leg fracture was the diagnosis most responsible for hospitalization in 32% of the cases, followed by a fracture of the arm (15%), intracranial injury (7%), and a fracture of the spine or pelvis (7%).

The 736 injured motorcyclists spent more than 4,600 days in an acute care hospital, with an average length of stay of 6.4 days. Some of the longest lengths of hospital stay were observed for a motorcycle collision with a motor vehicle (average of 8.4 days) or a fixed object (average of 8.9 days). More than 80% of hospitalized motorcyclists were discharged home. About 13% of cases were transferred to another facility providing inpatient care, such as a rehabilitation centre. Approximately 1% of cases died during their hospital stay.

July, August, and September were the most common months for motorcycle injury. Few injuries occurred from December to February.

FIGURE 1. Motorcycle injury hospitalizations by age and sex (Ontario, 2002/03)

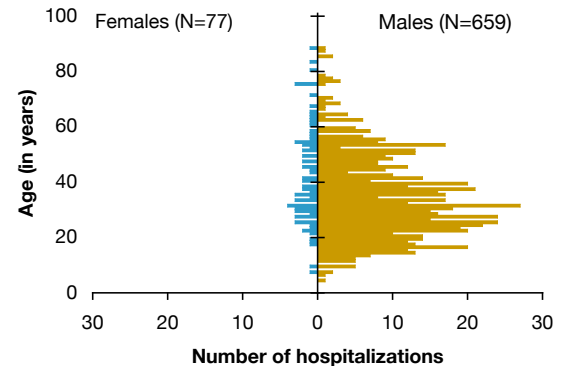


FIGURE 2. Type of motorcycle injury hospitalization (Ontario, 2002/03)

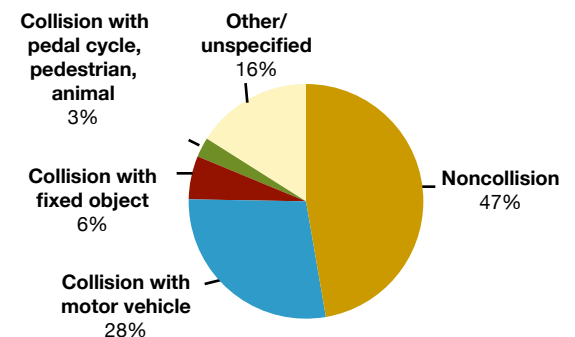


FIGURE 3. Nature of motorcycle injury hospitalization (Ontario, 2002/03)

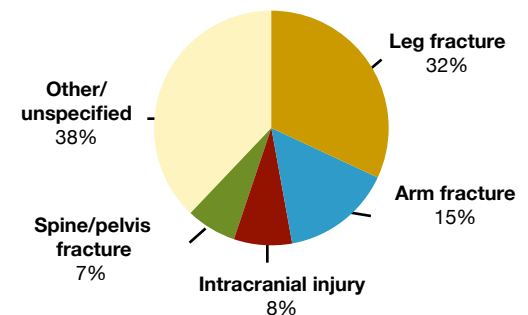


TABLE 1. Comparison of motorcycle injury hospitalizations by region of residence (Ontario, 2002/03)

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
Number	119	102	111	139	75	97	73	736
Rate per 100,000 ^a	8.3	9.0	5.6	7.8	2.9	6.6	8.3	6.6
Average age (in years)	33	39	35	33	38	33	33	35
% male	95	85	87	95	87	87	89	90

a. Age-standardized rate per 100,000 population. Note: Region of residence unknown/outside of Ontario for 20 hospitalizations.

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TABLE 2. Age comparison of motorcycle injury hospitalizations by region of residence (Ontario, 2002/03)

Age group	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
Number (Rate per 100,000)								
<15 years	8 (8.7)	6 (8.9)	8 (5.7)	7 (6.0)	0 (-)	4 (4.5)	7 (14.0)	41 (5.8)
15-19 years	15 (14.2)	6 (7.7)	11 (7.3)	19 (13.5)	1 (0.7)	9 (8.6)	13 (21.5)	74 (9.3)
20-29 years	36 (33.9)	22 (28.0)	28 (19.7)	33 (23.9)	24 (17.3)	34 (32.8)	14 (22.5)	194 (25.2)
30-39 years	25 (23.5)	22 (28.7)	30 (21.9)	42 (32.2)	26 (18.8)	23 (23.0)	13 (20.0)	187 (24.8)
40-49 years	15 (3.5)	19 (5.8)	13 (2.0)	20 (3.7)	8 (0.9)	11 (2.4)	12 (4.8)	103 (2.9)
50-59 years	15 (3.8)	15 (4.9)	11 (2.1)	15 (2.9)	10 (1.6)	12 (2.8)	11 (4.5)	93 (3.0)
60+ years	5 (1.8)	12 (5.4)	10 (3.8)	3 (1.1)	6 (1.4)	4 (1.5)	3 (1.8)	44 (2.3)

a. Age-specific rate per 100,000 population. Note: Region of residence unknown/outside of Ontario for 20 hospitalizations.

In Ontario, the age-standardized hospitalization rate for injured motorcyclists was 6.6 per 100,000 population (Table 1). The Central South region experienced the highest rate of injury and Toronto had the lowest. In terms of absolute numbers, the Central East region experienced the highest number of motorcycle injuries and the lowest number was observed in the North. In general, the highest rates were observed among the 20-29 and 30-39 year age groups, and in the North the rate was also high among the 15-19 year old age group (Table 2).

Discussion

This Compass highlights patterns of hospitalization for injured motorcyclists in Ontario and its regions. In 2002/03, there were 736 motorcycle hospitalizations. Noncollision incidents, such as losing control or falling from a motorcycle was the most frequent cause of hospitalization.

Hospitalizations represent only one aspect of the issue. According to the 2002 Ontario Road Safety Annual Report (ORSAR), there were reports of 1,300 drivers and 371 passengers involved in a motorcycle collision.¹ The severity of injury ranged from cases where no injuries were detected or minor injuries to fatal incidents.

Motorcycle ownership has increased dramatically in the past 5 years. There were more than 118,000 motorcycles registered in Ontario in 2002 up from 98,000 in 1998.^{1,2}

Several factors have been linked with motorcycle collisions, such as aggressive driving or risk-taking behaviour, reduced visibility of motorcycles, and size or other characteristics of motorcycle design.^{3,4} In Ontario, some common characteristics for fatal collisions were high speed or loss of control (43%) and the presence of alcohol (in 25% of cases).¹ Other facts of interest were that a helmet was not worn in 5% of deaths and 12% of drivers were unlicensed.¹

References

1. Government of Ontario. *Ontario Road Safety Annual Report 2002*. Toronto: Safety Policy & Education Branch, Ministry of Transportation; 2004.
2. Government of Ontario. *Ontario Road Safety Annual Report 1998*. Toronto: Safety Policy & Education Branch, Ministry of Transportation; 2000.
3. Huang B, Preston J. *A Literature Review on Motorcycle Collisions. Final Report*. Oxford: Transport Studies Unit, Oxford University; 2004.
4. Wells S, Mullin B, Norton R, Langley J, Connor J, Lay-Yee R, Jackson R. Motorcycle rider conspicuity and crash related injury: case-control study. *BMJ* 2004;328:857.

Managing the risk

With the increased number of motorcycles on the road there is a need to develop ways to manage the risks. Some examples include:

- ❖ **Motorcycle skills training** - The Cochrane Injuries Group is currently conducting a systematic review of the effectiveness of pre- and post-licence motorcycle training as a way of preventing collisions.
- ❖ **Graduated driver licensing (GDL)**- The GDL program was implemented in Ontario in April 1994. Positive impacts of the program have been suggested, as the number of deaths among teen motorcyclists has declined over time, but more research is required.
- ❖ **Motorcycle helmet use** - Observational studies suggest that helmets reduce risks for head injury by 72%. Motorcycle helmets are also effective for preventing deaths. However, other crash factors such as speed may play a role in helmet effectiveness.
- ❖ **Protective clothing and visibility** - The effectiveness of visibility aids, such as daytime use of headlights, colour and reflectivity of the motorcycle and riders are currently being reviewed by the Cochrane Injuries Group.

For Further Information

Cochrane Injuries Group
www.cochrane-injuries.ishtm.ac.uk/

SMARTRISK Catalogue of Best Practices
www.smartrisk.ca/ListingSections.aspx?dd=4&sd=207

Ontario Ministry of Transportation
www.mto.gov.on.ca/english/

Published Studies

Baldi S, Baer JD, Cook AL. Identifying best practices states in motorcycle rider education and licensing. *J Safety Res* 2005;36:19-32.

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Methods

This Compass includes acute care hospitalizations for motorcyclists injured in a transport incident in Ontario. Data were obtained for the 2002/03 fiscal year from the Discharge Abstract Database at the Canadian Institute for Health Information. Injured motorcyclists are classified according to the International Classification of Diseases, 10th revision (ICD-10) using codes V20-V29. In-hospital deaths are included (1% of injured motorcyclists died during their hospital stay). Regions are defined according to Ontario Ministry of Health Region Codes.