

# Injuries

**T**his section describes unintentional injuries arising from work, play, traffic, and other causes. Injuries are a major cause of hospitalization (Topic 77), and accidents are still a major contributor to potential years of life lost (Topic 83), although there have been impressive declines in accidental death rates in the past 25 years. Unintentional injuries are the second leading cause of potential years of life lost before age 70 and cost an estimated \$8.7 billion annually, excluding the costs of violence and suicide.<sup>1</sup> The indicators in this section are drawn exclusively from administrative sources.

## **Overview**

In 1995–96, over 2 million patient-days in acute care hospitals were due to more than 217,000 admissions for injuries (Topic 60). Falls accounted



for more than half of these admissions, and the rate for injury admissions among seniors was more than double the rate for the population as a whole. Among Canadians age 15–34, motor vehicle crashes were the principal cause of hospital admission. Such crashes caused 762 injuries per 100,000 persons in 1996 and resulted in over 3,000 deaths (Topic 63). Traffic injuries and fatalities were concentrated in the age group 15–24. Injuries resulting in time off work (Topic 61) exceeded 377,000 in 1996, the lowest figure ever recorded. This is down about a third from the peak a decade earlier. Childhood injuries resulted in 1,397 deaths and 47,228 hospitalizations (Topic 62).

Because injury statistics come from administrative sources, there is only limited description of the victims' personal characteristics (usually just age and province of residence) and nothing on social status. However, it is apparent that specific types of injury are clustered in specific age groups (falls among the elderly, traffic crashes among youth) and in certain industries (forestry). Injury rates also vary from province to province, and the contrasts can be dramatic. There is more than a two-fold

difference in rates of hospital admissions and traffic injuries between the first- and the last-ranked provinces, and over a three-fold difference in work-loss injuries. This clustering clearly identifies areas and groups where further improvement in the injury rate can be sought, although differences in record-keeping or administrative characteristics may be factors as well.

### On data sources and gaps

As noted, the sources for injury statistics are typically administrative. While this results in efficiency of data collection, it is at the expense of desirable detail. On the other hand, most attempts to collect accident data with population surveys suffer from sample size problems. Given this trade-off and the existence of some useful time series for accidents, the administrative sources would appear to be the first choice on an ongoing basis, with periodic surveys to supplement the available detail.

### References

1. SmartRisk Foundation. *The Economic Burden of Unintentional Injury in Canada*. Toronto: SmartRisk Foundation, 1998.

## 60

## Hospitalization due to trauma

### Introduction

Injuries are among the most serious of all major health problems (Topic 83),<sup>1</sup> and it is estimated that 90% of them are preventable.<sup>2</sup> Injuries are the leading cause of death between the ages of 1 and 44 years in Canada (Topic 82), the United States, and many developing countries.<sup>3,4,5,6</sup> Injuries are also a serious cause of disability and affect children (Topic 62), workers (Topic 61), and persons who have been drinking (Topic 80).

This topic presents data for the Canadian population from the National Trauma Registry on admissions to acute care hospitals resulting from injury.

### Nature and type of injury admissions, 1995–96

Nationally, there were 217,396 injury admissions to acute care hospitals in 1995–96 (Table 60),<sup>7</sup> resulting in 2,187,305 patient-days. Injury admissions on average involved 10 days' stay in hospital, and most (77%) were discharged home, while 3% (6,382) died in hospital (data not shown). These deaths did not include those who died at the scene or en route to the hospital.

Unintentional falls accounted for the majority (52%) of injury admissions for all ages (Fig. 60).<sup>7</sup> Injury admissions due to unintentional falls also accounted for 67% of all hospital days due to injury and 75% of all in-hospital injury deaths (data not shown). The second most common cause of injury admissions was motor vehicle collisions (16%), followed by being struck by objects, persons, or falling objects (5%), injury purposefully inflicted by another person (5%), and self-inflicted injury, excluding poisoning (2%). All other causes accounted for 21% of injury admissions, including 7,859 admissions due

to overexertion and strenuous physical movements (data not shown).

More than one injury can be reported per admission. In 1995–96, 321,696 injuries were documented for the 217,396 injury admissions.<sup>7</sup> Sixty-seven percent of injury admissions had one injury documented, 20% had two injuries, and 13% had three or more. Orthopedic injuries accounted for 64% of injury admissions. Unintentional falls accounted for 62% of all orthopedic injuries. The most common injuries were fractures and dislocations of the lower limbs (37%), followed by fractures and dislocations of the upper limbs (20%). Forty-eight percent of all fractures and dislocations of the lower limbs and 27% of all fractures and dislocations of the upper limbs occurred in those 65 years of age and older (data not shown).

### Differences among groups

Injury admissions are highly concentrated among seniors, whose chances of being admitted to hospital are almost three times those of the population as a whole and four times higher than those of children under 15 (Table 60).<sup>7</sup> Over all age groups, admission rates are slightly higher for males than for females, but this masks an interaction with age: female rates of injury admission are much higher for those age 65 and older and markedly lower for all younger age groups.

The highest injury admission rates per 10,000 population were in the Northwest Territories (136.3) and Yukon (111.3). In sharp contrast was the rate in Prince Edward Island (57.7). The national rate was 72.2.

Unintentional falls were the leading cause of admissions for all age groups except the 15–34 year old age group. The leading cause of injury for 15–34 year olds was motor vehicle collisions, which accounted for 29% of injury admissions in this age

group. In those 65 years of age and older, unintentional falls accounted for 84% of injury admissions (data not shown).

### On definitions and methods

The National Trauma Registry includes demographic, diagnostic, and procedural information for all acute care hospital admissions due to injury. The source of this information is the Canadian Institute for Health Information's Discharge Abstract Database for provinces that submit 100% of in-patient discharge abstracts to the Institute. For those provinces not submitting 100% of in-patient discharge abstracts to the Institute in 1995–96 (i.e., Quebec, Manitoba, and Saskatchewan), injury admission information is based on data submitted to the provincial ministries of health.

The data do not include injuries not requiring hospitalization (i.e., treated in emergency wards and released) or injury deaths that occur at the scene or during transport to hospital (see Topic 63), nor do the data include injury admissions due to poisoning. Poisoning is excluded because trauma is defined as resulting from the transfer of energy.

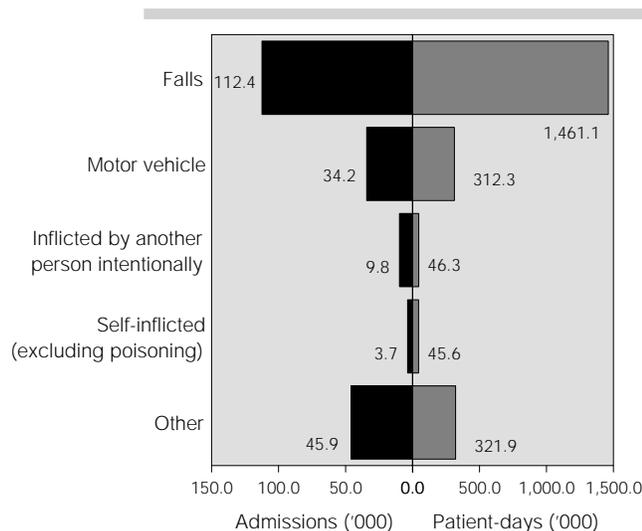
Rates reported in Table 60 have been age- and sex-standardized using the 1991 population of Canada as the reference.

### References

1. Baker SP. Injuries: the neglected epidemic; Stone Lecture, 1985 American Trauma Society Meeting. *Journal of Trauma* 1987; 27(4): 343–348.
2. SmartRisk Foundation. *How to Host HEROES Guide*. Toronto: SmartRisk Foundation, 1996.
3. Selya RM. Deaths due to accidents in Taiwan: a possible indicator of development. *Social Science and Medicine* 1980; 14D: 361–367.

4. Meade MS. Potential years of life lost in countries of southern Asia. *Social Science and Medicine* 1980; 14D: 277–281.
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6. Gu XY, Chen ML. Vital statistics (of Shanghai County). *American Journal of Public Health* 1982; 72(Suppl.): 19–23.
7. Canadian Institute for Health Information. *National Trauma Registry Report — Hospital Injury Admissions 1995–96*. Ottawa: CIHI, 1998.

Figure 60. Injury admissions to hospitals and patient-days, by cause, all ages, Canada, 1995–96



Source: Canadian Institute for Health Information, *National Trauma Registry Report — Hospital Injury Admissions 1995–96*, Ottawa: CIHI, 1998.

Table 60. **Admissions to hospital due to injuries, by age and sex and by province/territory, Canada, 1995–96**

	Injury admissions <sup>a</sup>	Admissions per 10,000 population <sup>b</sup>	Patient-days
<b>Total, all ages</b>	<b>217,396</b>	<b>72.2</b>	<b>2,187,305</b>
Male	119,383	80.9	942,567
Female	98,011	63.5	1,244,732
Age <15, total	28,250	47.2	107,176
Male	17,729	57.8	66,545
Female	10,521	36.0	40,631
Age 15–34, total	54,269	60.4	293,681
Male	39,166	85.9	202,460
Female	15,103	34.2	91,221
Age 35–64, total	62,374	56.3	446,771
Male	39,308	70.9	271,053
Female	23,065	41.8	175,717
Age 65+, total	72,472	199.8	1,339,212
Male	23,168	152.2	402,400
Female	49,303	234.3	936,807
Newfoundland	3,739	66.0	32,157
Prince Edward Island	832	57.7	7,255
Nova Scotia	6,054	61.5	53,668
New Brunswick	6,343	81.0	50,955
Quebec	45,265	60.9	570,323
Ontario	71,629	63.3	680,042
Manitoba	10,801	89.1	204,585
Saskatchewan	11,622	106.3	120,448
Alberta	24,810	93.6	172,531
British Columbia	35,336	91.7	292,204
Yukon	273	111.3	1,006
Northwest Territories	692	136.3	2,131

<sup>a</sup> There are 31 injury admissions with an unknown age (12 males, 19 females) accounting for 465 hospital days (males, 109; females, 356) and two admissions with an unknown sex accounting for six hospital days.

<sup>b</sup> Directly standardized for age and sex using the 1991 Canadian population as the standard population.

Source: Canadian Institute for Health Information, *National Trauma Registry Report — Hospital Injury Admissions 1995–96*, Ottawa: CIHI, 1998.

## 61

## Time-loss work injuries

### Introduction

Most Canadians work (Topic 7), and most claim to get considerable satisfaction from their work (Topic 55). However, levels of chronic work stress are cause for concern (Topic 9). Injuries and the prospect of injuries can be a source of stress to workers in many occupations, as well as a significant cause of lost productivity and health care costs.

This topic describes the number and rate of injuries suffered on the job that result in compensation to the injured worker.

### Incidence of work injuries, 1996

In 1996, there were more than 377,000 time-loss work injuries in Canada, a rate of 27.6 injuries for every 1,000 workers (Table 61).<sup>1</sup>

There were two key trends of reported work injuries over the period 1982–1996 (Fig. 61a).<sup>1</sup> There was a steady increase from an injury rate per 1,000 workers of 43.5 in 1982 to a peak of about 48.5 in 1987. A steady *decrease* in the number of reported injuries followed, to the all-time recorded low for 1996.

### Differences among groups

In 1996, men had more than two and a half times as many work injuries as women. The rate of injuries per 1,000 workers was highest among young workers age 15–29 (Table 61). The age–sex group most at risk was men age 15–29, whose injury rate was 43.3 per 1,000, or 57% above the average for all ages and both sexes. In contrast, women of this age group had the lowest injury rate of any age–sex category. Trends over time were virtually identical for work injuries to men and women, with the changes mostly occurring among male workers (Fig. 61a).

The rate of compensated injuries in forestry and logging was far higher than in any other industry, although transportation, wholesale trade, manufacturing, and construction were also well above average (Table 61). Among white-collar industries, government and health had the two highest rates of time-loss injuries in 1996 (Fig. 61b).<sup>1</sup>

Provincial rates for time-loss injury vary widely, from a low of 12.5 per 1,000 in New Brunswick to a high of 40.6 per 1,000 in Prince Edward Island. Quebec and British Columbia also had very high rates of injuries as well as high total numbers of injuries. These variations reflect not only the nature of the provincial economy (e.g., the prominence of the forestry industry in Quebec and British Columbia) but also the workers' compensation schemes in place in each province and thus the availability of compensation. As a result, interprovincial and inter-industry comparisons should take these factors into consideration.

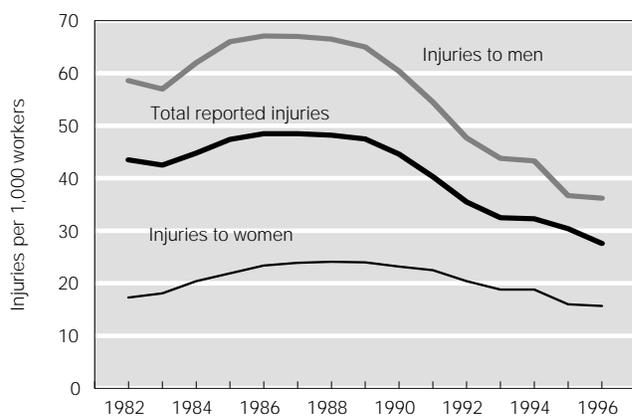
### On definitions and methods

A time-loss injury is defined as an injury resulting in compensation for lost wages due to time off work or for a permanent disability, regardless of time lost. Differences in reporting requirements and standards may well account for some of the differences among provinces and industries seen in Table 61. The data are collected by Statistics Canada on behalf of the Association of Workers' Compensation Boards of Canada.

### References

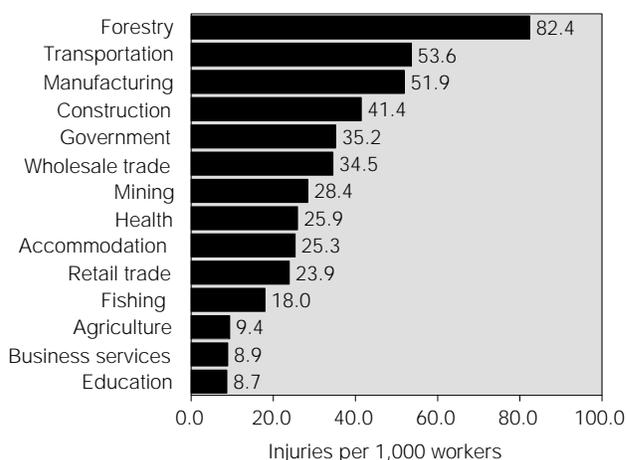
1. Statistics Canada, Health Statistics Division. Special tabulations of data from the Association of Workers' Compensation Boards of Canada (collected by Statistics Canada) and the *Labour Force Survey* subdivision of Statistics Canada.

Figure 61a. **Time-loss work injuries, employed persons age 15+, Canada, 1982–1996**



Source: Statistics Canada, Health Statistics Division, special tabulations of data from the Association of Workers' Compensation Boards of Canada (collected by Statistics Canada) and the *Labour Force Survey* subdivision of Statistics Canada.

Figure 61b. **Time-loss work injuries, by industry, employed persons age 15+, Canada, 1996**



Source: Statistics Canada, Health Statistics Division, special tabulations of data from the Association of Workers' Compensation Boards of Canada (collected by Statistics Canada) and the *Labour Force Survey* subdivision of Statistics Canada.

Table 61. **Time-loss work injuries,<sup>a</sup> by age and sex, by industry, and by province/territory, age 15+, Canada, 1996**

	Number of injuries	Rate per 1,000 workers
<b>Total, age 15+</b>	<b>377,885</b>	<b>27.6</b>
Male	270,751	36.2
Female	97,056	15.7
<b>Age 15–29, total</b>	<b>109,717</b>	<b>29.8</b>
Male	83,468	43.3
Female	24,326	13.9
<b>Age 30–49, total</b>	<b>207,744</b>	<b>27.7</b>
Male	149,336	36.8
Female	55,091	16.0
<b>Age 50+, total</b>	<b>55,616</b>	<b>22.2</b>
Male	37,359	25.0
Female	17,335	17.3
Agriculture	4,278	9.4
Fishing and trapping	642	18.0
Logging and forestry	6,255	82.4
Mining	4,784	28.4
Manufacturing	108,072	51.9
Construction	29,771	41.4
Transportation	28,565	53.6
Wholesale trade	21,857	34.5
Retail trade	41,289	23.9
Health and social services	36,862	25.9
Accommodation, food and beverage	22,589	25.3
Newfoundland	5,272	27.7
Prince Edward Island	2,436	40.6
Nova Scotia	7,940	20.6
New Brunswick	3,906	12.5
Quebec	119,633	37.2
Ontario	103,071	19.4
Manitoba	17,255	32.8
Saskatchewan	13,465	29.2
Alberta	31,835	22.5
British Columbia	71,602	39.7
Yukon	975	n/a
Northwest Territories	495	n/a

n/a = not available

<sup>a</sup> The sum of Male plus Female does not equal the Total because of some injury cases where the sex was not identified.

Source: Statistics Canada, Health Statistics Division, special tabulations of data from the Association of Workers' Compensation Boards of Canada (collected by Statistics Canada) and the *Labour Force Survey* subdivision of Statistics Canada.

## Childhood injuries

### Introduction

Injuries are a leading cause of death (Topic 82) and a major contributor to potential years of life lost (Topic 83) because of their concentrated impact upon young people. In recent years, the importance of childhood injuries has received increased recognition, and comprehensive data on the incidence and circumstances of these injuries are now available. These data are being used to develop intervention programs and to evaluate the results of such programs.

This topic presents data for the Canadian population of children and youth up to 19 years of age. Child abuse, including death from child abuse, is covered more extensively in Topic 10.

### Injuries treated in emergency departments, 1997

In 1997, almost 96,000 injured children were treated in the emergency department of hospitals participating in the Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP). More than half (57%) of these children were injured while they were involved in play activities. Only 8% of these injuries took place on roads (Table 62).<sup>1</sup> Adolescents sustained more sports-related injuries than younger children, and younger children were injured much more frequently in their homes than older children and adolescents.

The most common injuries (Fig. 62a)<sup>1</sup> were fractures, open wounds, and superficial injuries (20% for each category). Injuries to the head and neck (35%) and to the arm (34%) accounted for two-thirds of all injuries (Fig. 62b).<sup>1</sup>

### Fatal injuries and hospitalizations, 1995

In 1995, 1,397 Canadian children and youth (0–19 years of age) died as a result of injuries, and 47,228 were hospitalized.<sup>2</sup> Injuries are the leading cause of death among Canadian children. The burden of injuries is not limited to these outcomes. It has been estimated that for every Canadian who dies from an injury, a further 1,300 are seen in hospital emergency departments, and an unknown number have their injury treated outside hospitals or do not seek treatment. All too often, these non-fatal injuries result in impairment and disability.

Injury-related death rates among children and youth (0–19 years of age) have declined dramatically in the last 20 years. In 1991, rates were 28.7 per 100,000, less than half the rate reported in the early 1970s. Injury-related hospitalizations among children have had a less dramatic but nonetheless steady decline of almost 20% during the 1980s, and that trend continues.<sup>3</sup>

In addition to the impact of human suffering and death caused by injuries, the financial cost to society is large. The economic burden of injury to Canadians of all ages is estimated to be in excess of \$14 billion, ranking third among health problems.<sup>4</sup> Costs related to property damage and insurance claims related to injury add further billions to the total cost.

### On definitions and methods

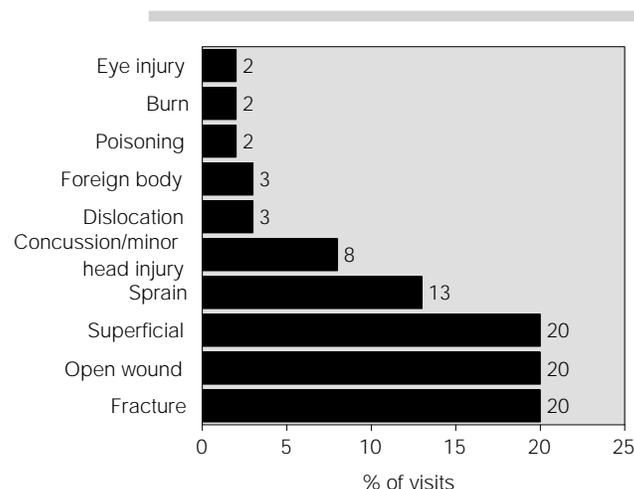
CHIRPP is a surveillance database collecting information on circumstance and outcome of injuries treated in the emergency departments of all 10 pediatric hospitals and six general hospitals across

Canada.<sup>1</sup> Information on the injury event is provided by the injured child or care-giver bringing the child to the emergency department, while the attending physician completes information on the nature of the injury and treatment provided. CHIRPP contains cumulative information on injuries to children and some adults (treated at the general hospitals) over almost 10 years.

## References

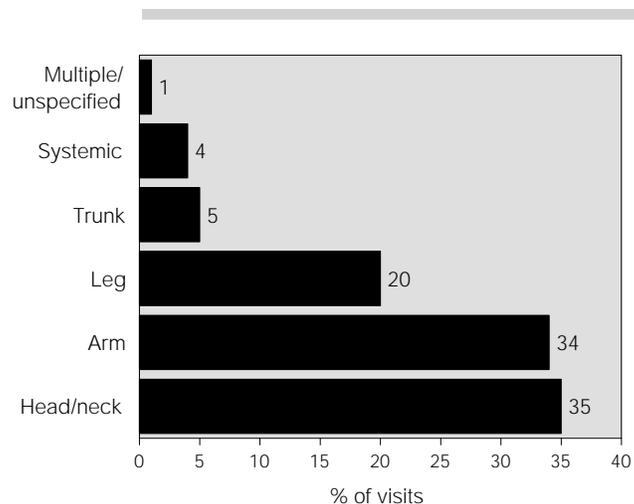
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2. Mackenzie SG. Framework of E-code groupings for presenting injury mortality data. *CHIRPP News* 1998; 12. Ottawa: Health Canada, 1998.
3. Health Canada. *For the Safety of Canadian Children and Youth: From Injury Data to Preventive Measures*. Ottawa: Health Canada, 1997 (Cat. No. H39-412/1997E).
4. Moore R, Mao Y, Zhang J, et al. *Economic Burden of Illness in Canada, 1993*. Ottawa: Health Canada, Laboratory Centre for Disease Control, 1997 (Cat. No. H21-136/1993E).

Figure 62a. **Leading types of childhood injuries: emergency department visits, age 0–19, Canada, 1997**



Source: Health Canada, Laboratory Centre for Disease Control, *Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) Database, 1998*.

Figure 62b. **Most frequent sites of childhood injuries: emergency department visits, age 0–19, Canada, 1997**



Source: Health Canada, Laboratory Centre for Disease Control, *Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) Database, 1998*.

Table 62. **Emergency department visits, activity at time of injury, and location at time of injury, by age, age 0–19, Canada, 1997**

	Total emergency room visits		Activity at time of injury <sup>a</sup>		Location <sup>a</sup> at time of injury		
	Number	(%)	Transportation	Sports/leisure	Home	Schools	Sports facilities
			(%)	(%)	(%)	(%)	(%)
<b>Total, age 0–19</b>	<b>95,908</b>	<b>100</b>	<b>8</b>	<b>57</b>	<b>44</b>	<b>19</b>	<b>13</b>
Age <1	4,091	4	6	24	81	1	1
Age 1–4	28,133	29	3	55	73	5	5
Age 5–9	24,159	25	10	62	42	22	13
Age 10–14	27,883	29	10	63	23	30	20
Age 15–19	11,642	12	9	53	19	23	21

<sup>a</sup> Activities and locations are distinct classifications, not all categories are presented above, and percentages do not add to 100%.

Source: Health Canada, Laboratory Centre for Disease Control, *Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) Database, 1998*.

## 63

## Motor vehicle traffic crashes

### Introduction

Accidents remain one of the leading causes of hospitalization (Topic 77) and of potential years of life lost (Topic 83), despite declines in recent years. Motor vehicle crashes are one of the major contributors to this toll, and alcohol plays a role in a substantial minority of such accidents (Topic 80). This topic presents data on injuries and deaths resulting from motor vehicle traffic crashes.

### Incidence of traffic injuries and deaths, 1996

In 1996, there were more than 230,000 injuries and 3,000 deaths due to motor vehicle crashes (Table 63).<sup>1</sup> This amounts to 762 injuries and 10 fatalities per 100,000 population. There was one death for every 75 injuries and 7.7 deaths per 100,000 licensed drivers (Fig. 63).<sup>1</sup>

### Differences among groups

Injury and fatality rates are very strongly clustered in two age groups — 15–19 and 20–24. Their rates, which are virtually identical, are approximately double the rates for the population as a whole (Table 63). Injuries and fatalities among children age 0–4 and 5–14 are the lowest of all age groups, suggesting strongly that the acquisition of a driver's licence at the age of 16 is the factor underlying the sudden and dramatic rise in collisions. No gender-specific statistics are available.

Provincial rates for traffic injuries and fatalities vary widely. Newfoundland has the lowest rate of injuries per 100,000 population and of fatalities per 100,000 *licensed drivers* (Fig. 63). Among the provinces, British Columbia has by far the highest rate for injuries, while Prince Edward Island has the most

fatalities per population and per driver. Fatalities, by both measures, are higher still in the territories.

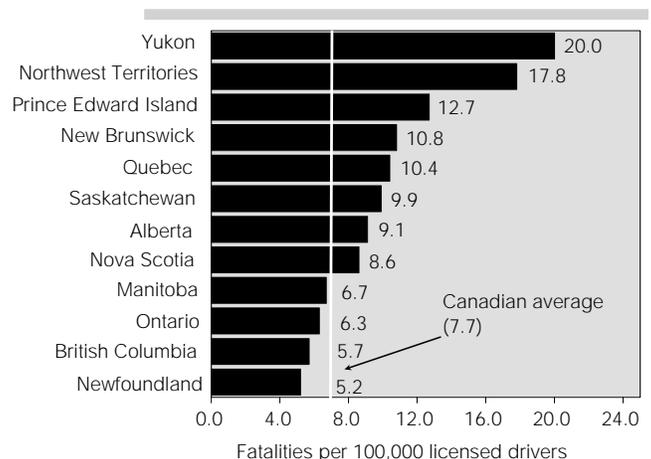
### On definitions and methods

These data are compiled by Transport Canada from provincial police sources. They describe injuries requiring hospitalization or fatalities arising from a traffic collision within a year of the event. Victims may be drivers, passengers, or pedestrians as long as a motorized vehicle is involved. Population rates were calculated with data from the 1996 Census (Topic 1); driver rates were based on provincial data. (Some, but not all, provinces also publish estimated total kilometres driven by all drivers.)

### References

1. Transport Canada. *1996 Canadian Motor Vehicle Traffic Collision Statistics*. Special tabulations.

Figure 63. **Fatally injured drivers, by province/territory, Canada, 1996**



Source: Transport Canada, *1996 Canadian Motor Vehicle Traffic Collision Statistics*, special tabulations.

Table 63. **Motor vehicle traffic deaths and injuries, by age and by province/territory, Canada, 1996**

	Number of fatalities	Fatalities/ 100,000 population	Number of injuries	Injuries/ 100,000 population
<b>Total, all ages</b>	<b>3,082</b>	<b>10</b>	<b>230,885</b>	<b>762</b>
Age 0–4	39	2	3,660	191
Age 5–14	129	3	15,678	385
Age 15–19	380	19	29,805	1,473
Age 20–24	393	19	30,188	1,484
Age 25–44	966	10	89,174	897
Age 45–64	611	9	40,365	614
Age 65+	544	15	15,604	419
Newfoundland	47	8	2,612	463
Prince Edward Island	19	14	847	618
Nova Scotia	113	12	6,288	663
New Brunswick	94	12	4,781	627
Quebec	877	12	47,588	641
Ontario	929	8	88,445	775
Manitoba	93	8	10,467	914
Saskatchewan	133	13	6,791	664
Alberta	349	12	22,268	728
British Columbia	406	10	40,188	1,022
Yukon	7	22	346	1,081
Northwest Territories	15	22	264	388

Source: Transport Canada, *1996 Canadian Motor Vehicle Traffic Collision Statistics*, special tabulations.