

A population health bulletin published by the Office of the Chief Medical Officer of Health

Injury in New Brunswick

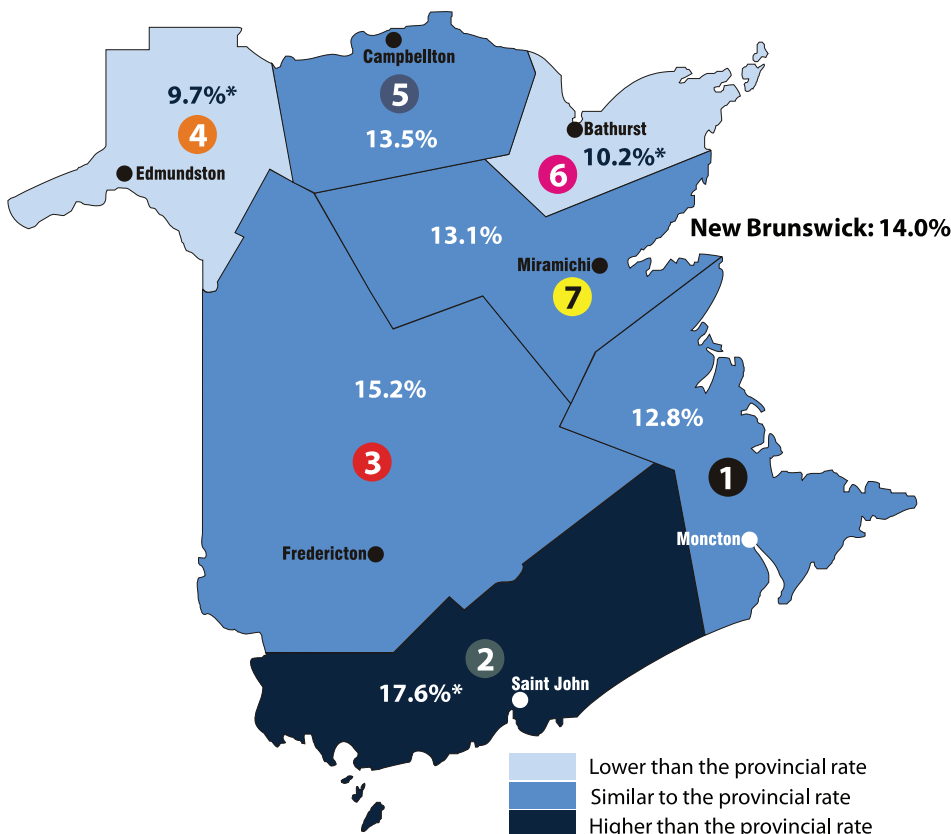
Injuries – resulting from causes such as traffic collisions, falls, burns, poisoning, assault or self-harm – kill more than five million people worldwide annually and wound millions more [1]. They are one of the leading causes of avoidable mortality across Canada, especially among males [2]. In New

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Figure 1: Percentage of New Brunswickers ages 12 and older who were injured in the previous year, by health region, 2009-2010

One in seven New Brunswickers aged 12 and over (about 90,300 individuals) report having sustained injuries in the past 12 months serious enough to limit normal activities, about the same as the national rate. Self-reported injury rates varied across the province; they were highest in health region 2 and lowest in health regions 4 and 6.



Brunswick, injuries are responsible for some 350 deaths each year, representing approximately six per cent of all deaths in the province (eight per cent among males and four per cent among females) [3]. Findings from the 2009-10 Canadian Community Health Survey (CCHS) indicate that 14.0 per cent of New Brunswickers aged 12 and over sustained injuries in the previous 12 months causing limitation of normal activities, a rate reflecting the national trend (14.9 per cent) (Figure 1) [4].

The health consequences for individuals may be seen as mostly physical but injuries can also affect mental health and social well-being. They can have an impact on families, workplaces, communities, the health-care system and society as a whole. They are one of the leading causes of disability and hospitalization among children, youth and seniors.

Injury is a significant public health issue and comes with a cost. The economic burden of injury in New Brunswick has been assessed at \$463 million per year, or approximately \$618 for every resident [5]. Most of the total

Note: * = statistically different from the provincial rate (p<0.05). Rate for New Brunswick was not significantly different from the national average. Injuries causing institutionalization or death excluded.

Source: Canadian Community Health Survey, 2009-2010 (combined annual rounds; sample size for New Brunswick: 4,598).

costs (84 per cent) are attributed to unintentional injuries, that is, where the circumstances of the event leading to bodily harm did not involve deliberate intention to harm self or others. The estimated costs include both direct costs to the health-care system (encompassing hospital, ambulatory, rehabilitation and home care) as well as indirect costs associated with reduced productivity from hospitalization, disability and premature death. Injuries affect everybody at some point in their lives and are, for the most part, preventable.

Health impacts of injuries

Injuries range in severity from minor bumps and bruises to life-long disability (e.g. blindness, spinal cord injury, brain injury) or even death. As with other health conditions, the onset of physical symptoms can result in help-seeking, diagnosis and treatment, including hospitalization. Data from multiple sources – e.g. population-based surveys, clinical care records, death records, and administrative records from government agencies, community groups and others – offer valuable information on the injury burden in New Brunswick as well as regionally, nationally and around the world.

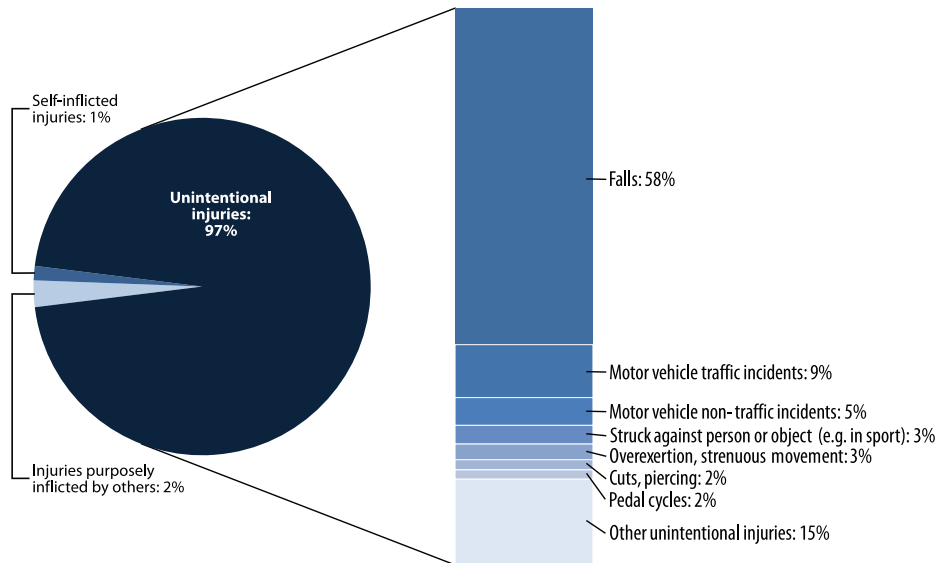
Based on data from the CCHS, about one in two (53 per cent) of New Brunswickers who sustained an activity-limiting injury in the previous 12 months sought medical attention within 48 hours following the injury, representing approximately 47,700 individuals [4]. The rate was similar to the national average (54 per cent).

Data from the Hospital Discharge Abstract Database further reveal injuries result in approximately 5,600 acute-care hospitalizations in New Brunswick each year (Figure 2). Unintentional injuries account for most (97 per cent) injury-related hospitalizations, with falls being the single most common cause (58 per cent). Motor vehicle traffic incidents (i.e. injuries sustained as

driver or passenger of a motor vehicle on a public highway or street) and motor vehicle non-traffic incidents (e.g. as occupant of an all-terrain vehicle, snowmobile or dirt bike) are also important causes, together accounting for 14 per cent of injury-related hospitalizations in the province.

Figure 2: Percent distribution of hospitalizations due to injuries in New Brunswick, by cause

Injuries have resulted in approximately 5,600 acute-care hospitalizations in New Brunswick each year since 2000. Most were due to unintentional injuries, often related to everyday activities. The most common cause was falls (e.g. from slipping, tripping or stumbling), which represented 58 per cent of all injury-related hospitalizations.



Note: Data for New Brunswick residents receiving acute inpatient hospital care for injuries, categorized according to the International Classification of Diseases (ICD-10-CA). Ambulatory care, adverse events as a result of medical care, and injuries of undetermined intent excluded.

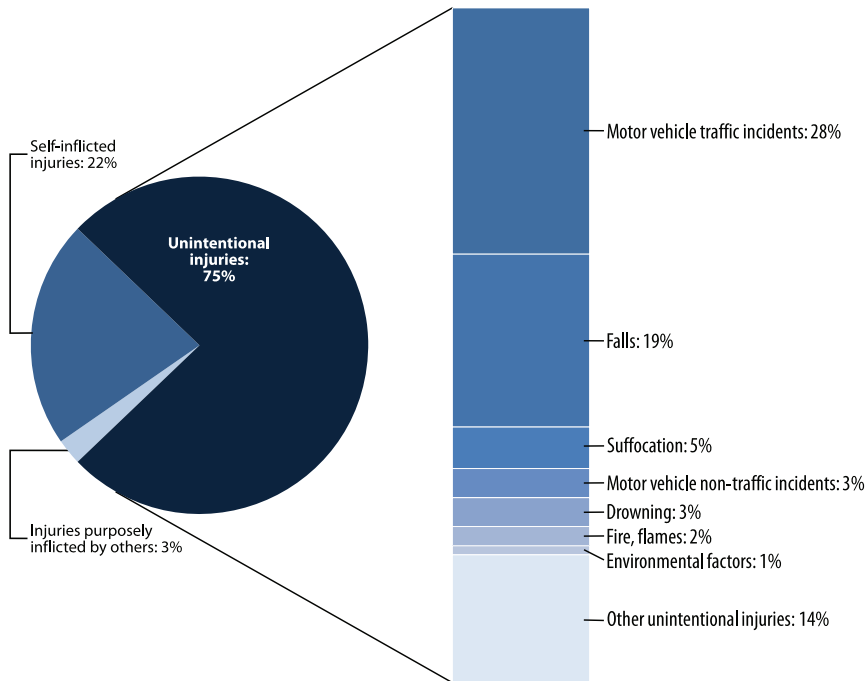
Source: Office of the Chief Medical Officer of Health, using data from the Hospital Discharge Abstract Database covering the fiscal years 2000-01 to 2010-11 (total number of hospitalizations due to injuries: 61,971 over the eleven-year period).

In terms of severe injury (i.e. requiring admission to a trauma care centre, as recorded in the National Trauma Registry), 15 per cent of cases in New Brunswick are related to sport and recreational activities, about the same as the national average (13 per cent) [6], yet most of these injuries are preventable. For example, over the past decade, 78 per cent of cyclists hospitalized with a traumatic head injury in Canada were not wearing a helmet when their injury occurred [7]. Injuries leading to hospitalization among young Canadians for off-road motor vehicle incidents most often occur when children and youth below the legal driving age were in the driver's seat: 89 per cent for dirt bikes, 60 per cent for snowmobiles and 50 per cent for all-terrain vehicles [8].

A small but non-negligible proportion of injuries result in death. Three-quarters of all fatal injuries in New Brunswick are due to unintentional injuries, largely related to motor vehicle traffic incidents and falls (Figure 3). Deaths from motor vehicle traffic injuries account for approximately one-quarter of all injury-related deaths in New Brunswick. The proportion echoes the World Health Organization's estimate of deaths from road traffic injuries worldwide [9].

Figure 3: Percent distribution of deaths due to injuries in New Brunswick, by cause

Over the past decade, injuries have claimed some 350 lives (4.6 per 10,000 population) in New Brunswick each year. The most common causes include motor vehicle traffic incidents and falls, which together accounted for nearly half (47 per cent) of fatal injuries. Despite a prevailing attitude that such injuries are “accidental”, they mostly result from events that are both predictable and preventable.



Note: Data for New Brunswick residents with fatal injuries, categorized according to the International Classification of Diseases (ICD-10). Injuries of undetermined intent excluded.

Source: Office of the Chief Medical Officer of Health, using mortality data from New Brunswick Vital Statistics covering the calendar years 2000 to 2009 (total number of deaths due to injuries: 3500 over the ten-year period).

Rates of premature mortality have been declining in New Brunswick and across Canada over the past 30 years. Overall, life expectancy at birth, a measure of the average life span, is about the same for New Brunswick as the national average (80.2 years versus 80.9 years) [2]. However progress of reductions in potentially avoidable mortality due to injuries has been slower compared to certain other causes, notably diseases of the circulatory system (e.g. heart disease and stroke). Unintentional injury is now the second leading cause of potential years of life lost (PYLL) in New Brunswick, after cancer [10]. An indicator that reflects mortality trends of younger age groups, the PYLL due to unintentional injury is estimated among New Brunswickers at 89 per 10,000 population (Figure 4). The provincial rate is significantly higher than that for all of Canada (62 per 10,000 population), reflecting some combination of a greater number of premature deaths or younger ages at death for New Brunswick. The PYLL for deaths by suicide and other self-inflicted injuries in New Brunswick is 40 per 10,000 population, which was not statistically different from the national average ($p < 0.05$), once adjusting for differences in the age structure between the provincial and national populations.

More data and information on the injury burden in New Brunswick can be found in the annex.

Contributing factors

Injuries can happen in all settings, at home, work, school or play, and across all stages of life, from newborns to seniors. Injury risks vary across population groups. Interventions to prevent injuries need to consider the differing risks and impacts by gender and age group, including risk assessment and risk management. Males are generally more likely to sustain fatal self-inflicted or unintentional injuries than females. Epidemiological and population-based studies show that children are more susceptible than older age groups to morbidity and mortality due to unintentional injury [11]. There is also widespread evidence that injury disproportionately impacts socially and economically disadvantaged groups, including First Nations communities [12-16].

In New Brunswick, while the majority of children and youth today are healthy, CCHS data show that this group has the highest likelihood of being injured: more than one quarter of those aged 12-19 (27 per cent) suffered an activity limiting injury in the previous 12 months, almost twice the proportion for adults aged 20-64 (14 per cent) and three times the proportion for seniors aged 65 and over (nine per cent) (Figure 5) [4]. Among school-aged children, younger students are more likely to be injured around the home, and older students at sport facilities [17]. Injury is one of the leading causes of hospitalization and death among children and youth. In particular, in 2009-10, unintentional injury accounted for 45 per cent of deaths among New Brunswickers aged 15-24, compared to four per cent for the whole population [3]. This is partly due to the fact that adolescents and young adults experience fewer chronic conditions and lower mortality compared to older adults. Canada and New Brunswick have generally been successful in lowering rates of unintentional injury during the younger years, although there is still

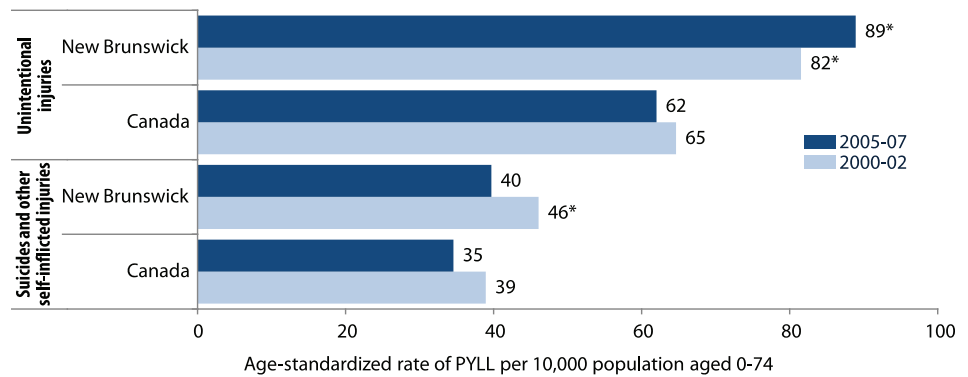
room for improvement [11]. New Brunswick had the highest rate of unintentional injury hospitalizations among children aged 1-14 in Atlantic Canada over the ten-year period 1996-2005 [18].

Many interventions have shown success in reducing adverse injury-related health outcomes among the younger population, including education and awareness initiatives, legislation and policy frameworks, and consumer product standards and guidelines. Examples include use of car safety seats, helmets, personal floatation devices and other types of physical safeguards. However not all children have benefited from the progress that has been made. There is increasing evidence that social deprivation is associated with a higher injury burden in childhood [19]. Studies from across Canada show that children in lower-income neighbourhoods generally have higher rates of hospitalization due to unintentional injuries, compared with children in higher-income neighbourhoods [20, 21]. Adequacy of housing is an important risk factor for unintentional injury among children, as housing quality affects exposures to physical hazards and indoor pollutants [22]. Economic incentives for disadvantaged groups (e.g. free booster seats) may have beneficial effects on the acquisition and use of certain types of safety equipment. At the same time, an important barrier to uptake of home safety equipment to reduce unintentional injury in children is the parents' inability to modify rented or shared accommodation [23]. Social stigma, secrecy and embarrassment continue to hinder efforts to address mental health literacy and why some young people may resort to self-harm [15].

Unintentional injury continues to be one of the leading causes of morbidity and mortality among adults of working age, notably injury from transport-related incidents.

Figure 4: Trends in the rates of potential years of life lost due to injury, New Brunswick and Canada

In New Brunswick, the rate of potential years of life lost (PYLL) due to unintentional injuries – the number of which accounts for 18 per cent of the total PYLL for all causes of premature death – has been stable in recent years and at levels significantly higher than the national average. The number of PYLL due to suicides and other self-inflicted injuries accounts for 8 per cent of the total PYLL for all causes, down from 9 per cent five years earlier. The latest estimates show the rate is similar to the national average.

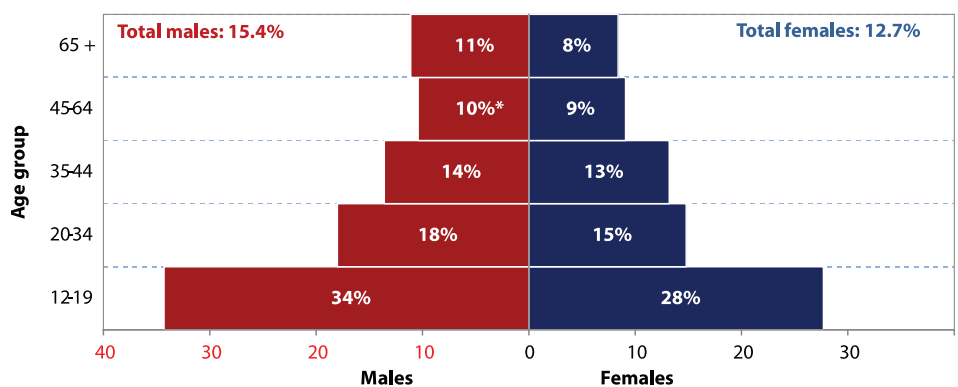


Note: * = statistically higher than the Canadian rate (p<0.05). Rates for New Brunswick were not significantly different across the two reference periods. The PYLL is the number of years of potential life not lived when a person dies prematurely, defined here as before age 75. Rates of PYLL are calculated using the population aged 0 to 74, and age-standardized using the 1991 Canadian census population structure.

Source: Statistics Canada, CANSIM Table 102-4309: Mortality and potential years of life lost, by selected causes of death and sex, three-year average, Canada, provinces, territories.

Figure 5: Percentage of New Brunswickers ages 12 and older who were injured in the previous year, by age group and sex, 2009-2010

The risk of injury is generally higher among males than females. About 15 per cent of male New Brunswickers reported an injury in the previous 12 months, compared to 13 per cent of females. For both sexes, injury risks generally decline with age from childhood and adolescence.



Note: * = statistically lower than the Canadian rate (p<0.05). Other age- and sex-specific rates for New Brunswick were not significantly different from the national average. Injuries causing institutionalization or death excluded.

Source: Canadian Community Health Survey, 2009-2010.

Alcohol is an important contributing factor to the injury burden. Two-fifths (39 per cent) of motor vehicle fatalities in Canada involved alcohol use in 2008, mostly between the ages of 16 and 55, with no significant decrease in the contribution of alcohol to the mortality trend since 1998 [8]. In New Brunswick, the Office of the Chief Coroner reports that alcohol or drugs are a contributing factor to one in six (17 per cent) of all deaths from unintentional injury in the province [24]. Substance abuse along with other social problems such as employment disruption, family breakdown and poverty are also closely associated with suicide-related behaviours [15].

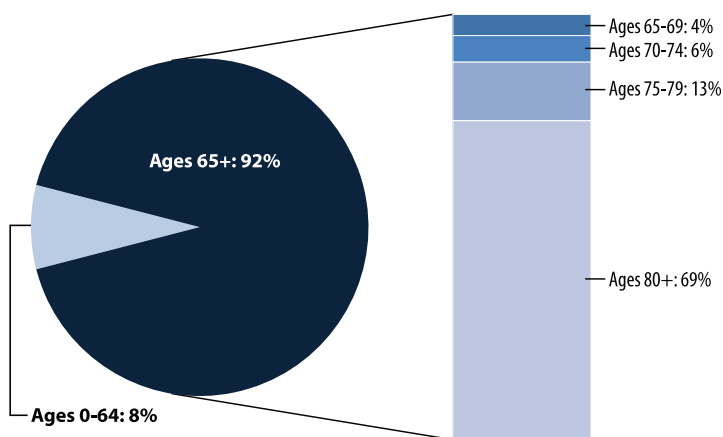
Other important health and safety concerns among adults are injuries that occur at the workplace and around the home during leisure activities. Nationally, according to findings from the CCHS, nearly one-third (29 per cent) of activity-limiting injuries among adults of working age occur while they are engaged in sport or exercise, and 18 per cent while working at a paid job or business [25]. Injuries caused by overexertion or strenuous movements are approximately twice as frequent in working-age adults compared to youth and seniors.

Fall-related injuries are a significant cause of morbidity, loss of independence and mortality in older age groups (Figure 6). Falls are the most common cause of injuries among seniors in Canada and around the world, with an estimated one in three persons aged 65 and over likely to fall at least once each year [26, 27]. In New Brunswick, in 2007-08, 6.3 per cent of hospitalizations among seniors were related to an unintentional fall, about the same as the national average (7 per cent). More than one-third (36 per cent) of fall-related hospitalizations involve a hip fracture and most falls occur at home [28].

While in general males are more likely than females to sustain unintentional injuries, the statistic reverses among seniors: elderly women are far more likely to be injured through falls than elderly men [12]. This is partly because

Figure 6: Age distribution of deaths due to unintentional falls in New Brunswick

Unintentional falls result in some 87 deaths (1.2 per 10,000 population) in New Brunswick each year. The burden of fall-related injuries increases with age. Over 90 per cent of fatal injuries from falls are among seniors, three-quarters of which are among those aged 80 and over.



Note: Data for New Brunswick residents categorized according to the underlying cause of death, defined as the circumstances of the incident that produced the fatal injury.

Source: Office of the Chief Medical Officer of Health, using data from New Brunswick Vital Statistics for 2006-2008.

women live longer than men and the frequency of fall-related injuries increases with age [29]. According to the Canadian Institute for Health Information, in New Brunswick, 28 per cent of seniors required transfer to a residential care facility after a fall-related hospitalization in 2007-08, compared to 19 per cent as the average transfer rate for the Atlantic region [28]. Access to suitable home supports and residential care facilities could influence the time a senior occupies an acute-care hospital bed.

A number of biological, behavioural, environmental and socio-economic factors are commonly associated with falls among seniors. Muscle weakness and decreased physical function are important risk factors, increasing the risk of falling by four to five times [28]. Other risk factors include chronic illnesses, decreased visual acuity, cognitive impairment, certain medications, inability to purchase safety devices (e.g. hip protectors, appropriate footwear), and lack of opportunities for physical activity. Exercise programs targeted to older individuals with physical risk factors as well as untargeted group exercises in the community (notably, Tai Chi and other activities that challenge balance) have been shown to prevent falls at the population level [30].

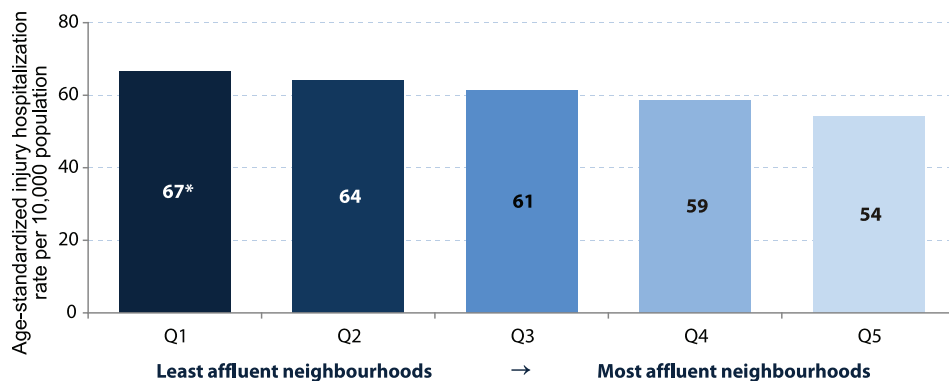
Most injuries are not the result of a single factor, but rather the result of the interaction of multiple factors, many of which can be changed. Further data and evidence are needed to fully quantify the levels, trends, risks and impacts of injuries in New Brunswick as well as evaluate the effectiveness and appropriateness of injury prevention policies, programs and services, addressing both the medical and non-medical determinants of health and injury (Figure 7). The need for integrated services that consider the relationships between the physical, mental and social domains is increasingly recognized. The Office of the Chief Medical Officer of Health is collaborating

with the New Brunswick Trauma Program, the Public Health Agency of Canada and other partners to strengthen the evidence base on the injury burden across the province and nationally through enhanced surveillance, research, analysis and knowledge exchange [31]. Success in injury prevention for all population groups takes time and requires commitment from policy makers, program planners, health practitioners, the enforcement community, educators, community groups, the private sector and others including family, friends and colleagues.

Injury prevention in New Brunswick, as elsewhere, is everyone's responsibility.

Figure 7: Hospitalization rates for injuries by neighbourhood income quintile, New Brunswick, 2010-2011

Socio-economic disparity is associated with a higher injury burden. New Brunswickers living in lower-income neighbourhoods have significantly higher rates of hospitalization due to injuries, compared with those in higher-income neighbourhoods. If each neighbourhood income group experienced the rate of the most affluent group, the province could expect an 11 per cent drop in the overall rate of injury hospitalizations. Measuring gradients by neighbourhood income quintile is one approach to evaluating health disparities; it should be complemented with other indicators of socio-economic status and health system performance to better target policies, programs and services where important gains could be realized.



Note: * = statistically significant disparity between Q1 and Q5 rates ($p < 0.05$). Quintile 1 (Q1) refers to the least affluent neighbourhoods, while quintile 5 (Q5) refers to the most affluent. The quintiles were constructed according to methods developed by Statistics Canada.

Source: Adapted from *Health Indicators 2012*, Statistics Canada and Canadian Institute for Health Information, Ottawa, 2012.

For more information:

- **Prevention of unintentional injury:** http://www.gnb.ca/content/gnb/en/departments/ocmoh/healthy_people/content/injury_prevention.html
- **Suicide prevention:** <http://www.gnb.ca/0055/index-e.asp>
- **Violence prevention:** <http://www.gnb.ca/0012/violence/index-e.asp>

Next issue of *New Brunswick Health Indicators*:

- Spotlight on unintentional injuries related to sport, recreation and exercise.

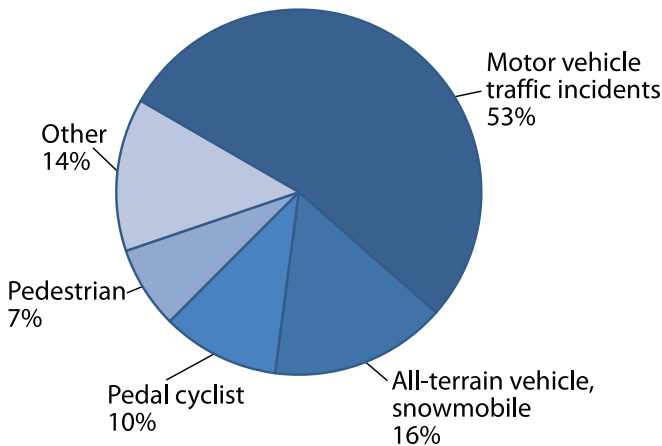
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Annex

Figure A.1. Distribution of the costs of transport-related injuries in New Brunswick

The economic burden of transport incidents in New Brunswick is estimated at \$128 per capita each year, or 21 per cent of the total cost of injuries. More than half of the cost of transport-related injuries is due to motor vehicle traffic incidents, followed by all-terrain vehicles and snowmobiles.

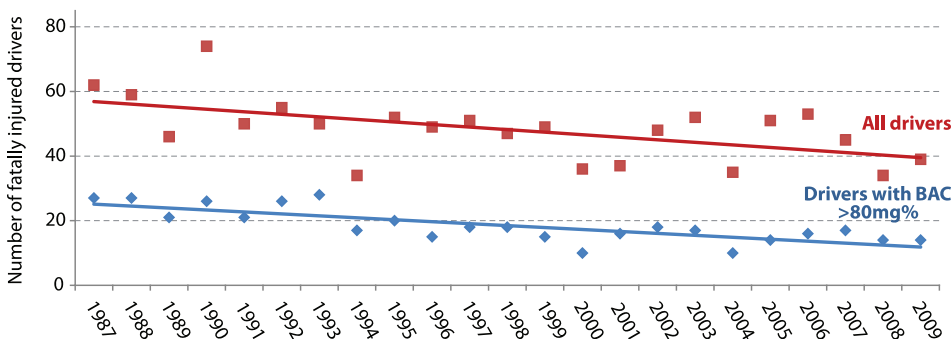


Note: Economic burden includes direct costs to the health-care system (hospital, ambulatory, rehabilitation and home care) and indirect costs associated with reduced productivity from hospitalization, disability and premature death.

Source: Adapted from *The Economic Burden of Injury in Canada*, SMARTRISK, Toronto, 2009.

Figure A.2. Trends in the numbers of fatally injured motor vehicle drivers in New Brunswick, by alcohol use

In New Brunswick, all drivers fatally injured in a motor vehicle incident in 2009 were tested for alcohol. Test results showed 40 per cent had been drinking and 36 per cent had a blood alcohol concentration (BAC) over the statutory limit of 80 mg%. The number of fatally injured legally impaired drivers has decreased in the province by more than one-third over the last two decades. The overall number of fatally injured drivers decreased at about the same pace, such that the share of fatally injured drivers who were legally impaired has remained roughly constant since the 1990s.

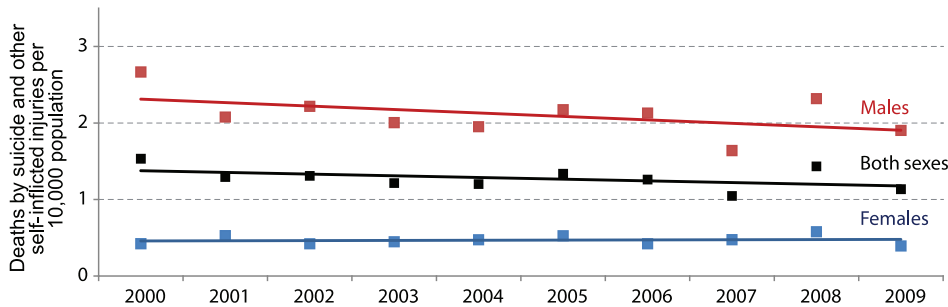


Note: Data for drivers of an automobile, truck, van or motorcycle dying in less than six hours of a collision on or off public roadways. Lines on the chart statistically describe the average movements in the numbers. Incidents where the driver was not tested for alcohol and collisions associated with a drinking pedestrian excluded.

Source: Adapted from *Alcohol-Crash Problem in Canada: 2009*, Traffic Injury Research Foundation of Canada, Ottawa, 2011.

Figure A.3. Trends in the rates of fatal self-inflicted injuries in New Brunswick, by sex

The average annual number of deaths by suicide and other fatal self-inflicted injuries in New Brunswick was 93 (1.1 per 10,000 population) over the period 2005-09, down from 98 (1.5 per 10,000 population) in 2000-04. The rate of deaths by suicide decreased among males over the past decade but was more stable among females, such that the gender gap has been decreasing over time. The rate remains more than four times higher among males compared to females.

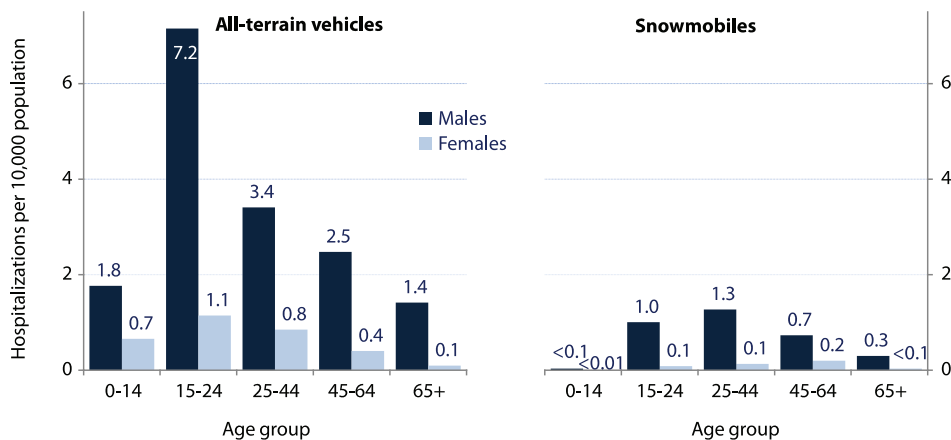


Note: Data for New Brunswick residents categorized according to the underlying cause of death, defined as the circumstances of the incident or violence that produced the fatal injury.

Source: Office of the Chief Medical Officer of Health, drawing on data from New Brunswick Vital Statistics and population estimates from Statistics Canada.

Figure A.4. Hospitalization rates for injuries due to all-terrain vehicles and snowmobiles, by age group and sex, New Brunswick

Each year, injuries among occupants of all-terrain vehicles result in some 137 acute-care hospitalizations in New Brunswick. Another 32 hospitalizations occur annually on average for occupants of snowmobiles. Most hospitalizations are among males: 83 per cent for ATV incidents and 87 per cent for snowmobile incidents. Nearly two-thirds (62 per cent) of hospitalizations for ATV- or snowmobile-related injuries occur at ages 15-44, but all age groups are affected.

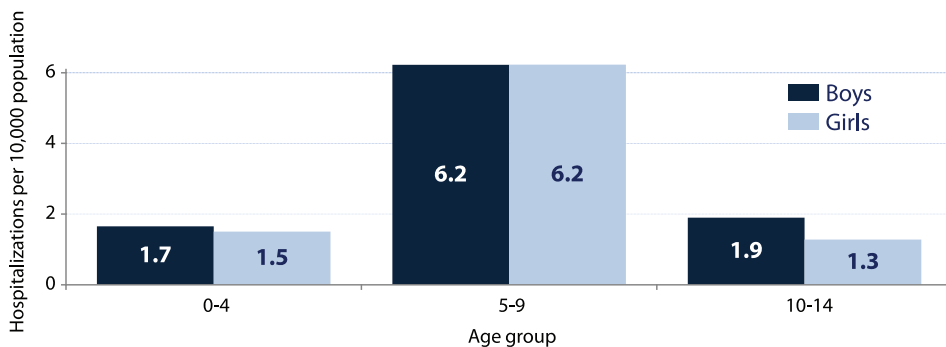


Note: Data for New Brunswick residents receiving acute inpatient hospital care for injuries sustained as driver or passenger of an all-terrain vehicle or snowmobile.

Source: Office of the Chief Medical Officer of Health, using data from the Discharge Abstract Database from 2004 to 2008.

Figure A.5. Hospitalization rates for injuries among children due to falls involving playground equipment, by age group and sex, New Brunswick

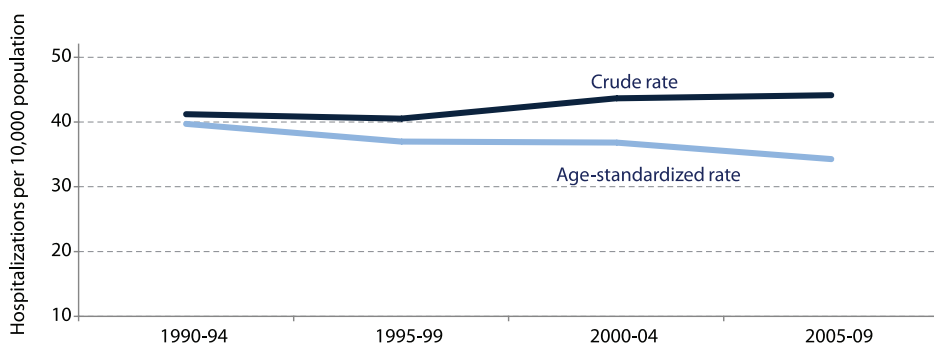
Each year in New Brunswick, an average of 37 children under age 15 sustain injuries from falls involving playground equipment serious enough to require hospitalization. Injury prevention strategies need to balance the positive health impacts of increased physical activity at play while reducing the risk of harm. Prevention efforts have often been hampered by the perception of injuries as unavoidable, or as a result of behaviours that are difficult to change. Development of effective action plans requires reliable, relevant and timely data and evidence, including identification of high-risk priority populations and injury categories.



Note: Data for New Brunswick residents receiving acute inpatient hospital care.
Source: Office of the Chief Medical Officer of Health, using data from the Discharge Abstract Database from 2004 to 2008.

Figure A.6. Trends in the hospitalization rates due to unintentional falls in New Brunswick

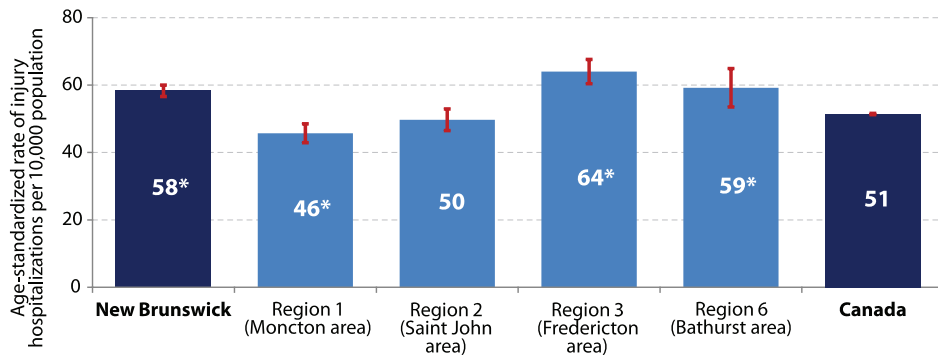
The crude rate of fall-related hospitalizations has increased somewhat in New Brunswick over the last two decades, attributable in part to increasing proportions of elderly individuals in the population, as injuries from falls are more common among seniors. Crude rates of injury-related hospitalizations (or other health events) consider the magnitude of the problem in the population at a given time, but have limitations for comparing across populations or over time. One way to enhance understanding of the needs for and impacts of prevention efforts is by using age-standardized rates. The downward trend of age-standardized rates over time points to a relatively lower risk level of hospitalization due to unintentional falls, after controlling for effects of changing demographics.



Note: Rates are based on five-year averages according to the cause of injury as categorized by ICD-10 codes W00-W19; age-standardized rates are based on the 1991 Canadian census population.
Source: Office of the Chief Medical Officer of Health, using data on acute-care hospitalizations from the Discharge Abstract Database and data on population structure from Statistics Canada.

Figure A.7. Hospitalization rates due to injuries, selected health regions, New Brunswick, Canada, 2010-2011

Indicators need to pass numerous tests to be good measures of health and injury. Confidence intervals are a way to indicate the reliability of a given population health measure. Measures based on larger sample populations will usually lead to smaller confidence intervals and thus better estimates. In contrast, measures based on smaller populations - such as some health regions of New Brunswick - are subject to a higher degree of variability and thus should be interpreted with caution. In this chart, the vertical lines represent the confidence intervals surrounding each rate, which can help in reaching conclusions about whether the values are statistically different. Rates for smaller regions are not presented here.



Note: * = statistically different from the Canadian rate ($p < 0.05$). Data for acute-care hospitalizations due to injuries (excludes poisoning). Vertical lines on the chart refer to the 95 per cent confidence intervals for each rate. Data for regions with small populations (fewer than 50,000 inhabitants) not reported to ensure stability in rates and reduce the risk of suppression stemming from privacy and confidentiality issues.

Source: Adapted from *Health Indicators 2012*, Statistics Canada and Canadian Institute for Health Information, Ottawa, 2012.