

Non-fatal injuries among Aboriginal Canadians

Michael Tjepkema

Abstract

Objectives

This article compares rates and characteristics of non-fatal injuries among off-reserve Aboriginal persons aged 12 to 64 with those of other Canadians the same ages. Information on injury-caused activity limitations is also presented.

Data sources

Results are based on data from two cycles of Statistics Canada's Canadian Community Health Survey (CCHS), conducted in 2000/01 and 2003. Supplementary information about injuries among children aged 11 or younger is from the 2000/01 National Longitudinal Survey of Children and Youth.

Analytical techniques

Cross-tabulations were used to compare injury rates and injury characteristics of the off-reserve Aboriginal and non-Aboriginal populations in the provinces and territories. Multiple logistic regression models were used to examine differences in rates for non-fatal injuries and injury-caused activity limitations between the two populations when controlling for socio-economic and socio-demographic variables.

Main results

In 2000/01 and 2003, about 20% of the off-reserve Aboriginal population in the provinces reported an injury serious enough to limit their normal activities: 1.4 times higher than that for other provincial residents. For injury-caused activity limitations in the provinces, the rate for the Aboriginal population was 1.7 times higher than that for the non-Aboriginal population. In the territories, injury and injury disability rates did not differ significantly between the two groups.

Key words

disability, health status indicators, indigenous population

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Injuries, which rank fourth among the leading causes of death in Canada,¹ have a tremendous impact on Canadian society. The effect on the economy, for example, is considerable. A 1995/96 study estimated the costs of major unintentional injuries at close to \$9 billion.² In addition to quantifiable costs, injuries can result in diminished quality of life from emotional anguish, pain, disability and activity limitation.³

Although injuries are an important health concern for all Canadians, research has shown that injury has a disproportionate impact on Aboriginal peoples.^{4,5} In fact, the burden of unintentional injuries on Aboriginal communities, in terms of deaths, hospitalizations and health care use, is greater than that for many other health problems.⁶ For instance, a recent study found injuries to be the leading cause of death for Aboriginal people aged 1 to 44, as well as a major component of disability.⁷ Other research has estimated that deaths due to injuries are much higher for Registered Indians in British Columbia than for other residents of the province.⁸

Methods

Data sources

This analysis is based on data from the 2000/01 and 2003 Canadian Community Health Survey (CCHS), conducted by Statistics Canada. The CCHS collects cross-sectional information about the health of Canadians every two years. It covers the household population aged 12 or older in the provinces and territories, except residents of Indian reserves, Canadian Forces bases, and some remote areas. The first cycle (1.1) began in September 2000 and continued over 14 months. Half of the interviews were conducted face-to-face. The response rate was 84.7%, yielding a sample of 131,535 respondents. Cycle 2.1 began in January 2003 and ended in December that year. The response rate was 80.6%; sample size, 135,573. Most interviews were conducted by telephone. A description of the CCHS methodology is available in a published report.⁹

Data for the population aged 12 to 64 living in the provinces and territories who indicated their cultural or racial background were used: 106,411 respondents in 2000/01 and 104,244 in 2003. Respondents who did not indicate their cultural/racial background were excluded (843 in 2000/01; 2,657 in 2003).

Supplementary cross-sectional data for children aged 11 or younger are from the fourth cycle of the National Longitudinal Survey of Children and Youth (NLSCY), conducted in 2000/01. The NLSCY collects information about factors influencing a child's social, emotional and behavioural development and monitors the impact of these factors over time. Information is provided by the person considered most knowledgeable about the child, usually the mother. Cycle 4 of the NLSCY gathered data on 30,307 children aged 0 to 17 in 2000/01. More detail is available in a previously published report.¹⁰

Information about these surveys, including the CCHS questionnaire, can be found on Statistics Canada's Web site (www.statcan.ca).

Analytical techniques

To improve the reliability of estimates, data from the 2000/01 and 2003 CCHS (cycles 1.1 and 2.1) were combined to compensate for the relatively small number of Aboriginal respondents. Proportions were estimated using the CCHS sample weights, which sum to the target population at the time of data collection (Appendix Tables A and B). Injury rates and injury characteristics are compared between the off-reserve Aboriginal and non-Aboriginal populations with cross-tabulations. Two multiple logistic regression models that controlled for sex, age, urban/rural residence, marital status, household income, education, work status and physical activity were used to compare injury rates between Aboriginal and non-Aboriginal residents in the provinces and territories. The models were run separately by sex and age group. The same technique was used to compare injury-caused activity limitations between the two populations. In total, 16 models were run for non-fatal injuries, and 14 models for injury-caused activity limitations.

In the 2000/01 data used for this analysis, 3,658 respondents indicated that they were Aboriginal persons of North America, and 582 of these reported a combination Aboriginal and non-Aboriginal background. Respondents who did not indicate Aboriginal culture or race were considered non-Aboriginal. In the 2003 CCHS, 4,448 respondents indicated they were Aboriginal, which includes 948 with an Aboriginal–non-Aboriginal background.

To account for survey design effects, standard errors and coefficients of variation were estimated with the bootstrap technique.^{13,14} The significance level was set at $p < 0.05$. Rates were not age-standardized; however, when injury and injury-caused activity limitation rates were compared, regression models controlled for differences in age.

According to the 2001 Census, over 70% of the entire Aboriginal population live off-reserve.¹¹ Yet a recent review of research on Aboriginal Canadians found that Métis, urban Aboriginal and First Nations people not living on reserves are underrepresented in academic research.¹² Furthermore, that same review found that there has been an insufficient number of studies of injury among Aboriginal people, although injuries account for one-third of deaths in that population.¹²

Studies of injuries in the Aboriginal population tend to ignore non-fatal injuries, focussing instead on injury death. The lack of adequate data on injuries among Aboriginal persons is thought to represent a significant barrier to injury prevention programs.¹⁵

This article attempts to fill a data gap by comparing non-fatal injuries among two Canadian household populations aged 12 to 64: Aboriginal people living off-reserve and non-Aboriginal

Definitions

For this analysis, *Aboriginal* refers only to Aboriginal people living in households in non-reserve areas. The Canadian Community Health Survey (CCHS) asked respondents: "To which ethnic or cultural group(s) did your ancestors belong (for example: French, Scottish, Chinese)?" The next question, which was used to define Aboriginal people for this article was: "People living in Canada come from many different cultural and racial backgrounds. Are you...Aboriginal (North American Indian, Métis, Inuit/Eskimo)?" The question included a list of 12 categories, and multiple responses were permitted. Respondents who said they were members of the Aboriginal peoples of North America were defined as Aboriginal for this analysis (see *Limitations*).

For definitions related to injuries, see *Defining non-fatal injuries*.

Five *age groups* were used: 12 to 19, 20 to 24, 25 to 34, 35 to 44 and 45 to 64. For injury-caused activity limitation, the first two age groups were combined because of the small numbers of respondents reporting such a limitation.

Urban areas are those with a population of 1,000 or more and a population density of 400 people per square kilometre based on the previous census. Areas that do not meet this threshold are considered *rural*.

Marital status was classified as: married or living in a common-law relationship; previously married (divorced, separated or widowed); and never married.

Education was based on the highest level attained: less than secondary graduation, secondary graduation, some postsecondary, and postsecondary graduation.

Worked for the entire past year, worked part of past year, and did not work in past year were used to classify *work status*.

Household income groups were based on the number of people in the household and total household income from all sources in the 12 months before the interview.

Income group	Number of household members	Household income
Lowest	1 to 4	Less than \$10,000
	5 or more	Less than \$15,000
Lower-middle	1 or 2	\$10,000 to \$14,999
	3 or 4	\$10,000 to \$19,999
	5 or more	\$15,000 to \$29,999
Middle	1 or 2	\$15,000 to \$29,999
	3 or 4	\$20,000 to \$39,999
	5 or more	\$30,000 to \$59,999
Upper-middle	1 or 2	\$30,000 to \$59,999
	3 or 4	\$40,000 to \$79,999
	5 or more	\$60,000 to \$79,999
Highest	1 or 2	\$60,000 or more
	3 or more	\$80,000 or more

To derive *leisure-time physical activity level*, respondents' energy expenditure (EE) was estimated for each activity they engaged in during leisure time. This was calculated by multiplying the number of times a respondent engaged in an activity over a 12-month period by the average duration in hours and by the energy cost of the activity (kilocalories expended per kilogram of body weight per hour of activity). To calculate an average daily EE for the activity, the estimate was divided by 365. This calculation was repeated for all leisure-time activities reported, and the resulting estimates were summed to provide an aggregate average daily EE. Respondents whose leisure-time EE was below 1.5 kcal/kg/day were considered physically inactive. Respondents with an EE of 1.5 or more kcal/kg/day were considered active.

Canadians. Results are based on combined data from two cycles of the Canadian Community Health Survey (CCHS), conducted in 2000/01 (cycle 1.1) and 2003 (cycle 2.1). Characteristics of non-fatal injuries, as well as health care use for treatment of the injury, are compared between the two groups by province and territory (see *Definitions* and *Defining non-fatal injuries*). More serious injuries that caused long-term activity limitation are also examined (see *Methods* and *Limitations*). A secondary goal is to present supplementary information about who is most likely to be injured within the Aboriginal population (see *Injury risk in the Aboriginal population*),

as well as injury data for children aged 11 or younger (see *Injuries among children*).

Higher risk among provincial Aboriginals

According to the 2000/01 and 2003 CCHS, about 20% of Aboriginal persons aged 12 to 64 living off-reserve in the provinces reported having had an injury in the year before the survey interview that was serious enough to limit their normal activities (about 67,000 a year). This was significantly higher than the proportion of other provincial residents who reported such an injury (14%). Although these

Injury risk in the Aboriginal population

The risk of being injured is not equally distributed within a population.^{16,17} For example, males are known to have a greater risk of non-fatal injuries than females, and young people compared with old.¹⁸⁻²¹ This excludes injuries requiring hospitalization, for which older people also have an increased risk.²² Few studies have examined who is most susceptible to non-fatal injuries within the off-reserve Aboriginal population in Canada. In other words, do the differences found in non-Aboriginal populations also exist within the Aboriginal population? Based on data from the 2000/01 and 2003 Canadian Community Health Survey (CCHS), Aboriginal people in the provinces had a higher non-fatal injury rate (20%) than their counterparts living in the territories (12%).

While 23% of provincial Aboriginal males sustained a serious injury in a 12-month period, 17% of Aboriginal females had such an injury. The same was true for territorial Aboriginal residents: males had a higher injury rate (17%) than females (9%). These patterns likely reflect males' participation in higher-risk activities (sports, for example) and employment in occupations that carry more risk.^{19,23}

Among provincial Aboriginal residents, 26% of 12- to 19-year-olds and 25% of 20- to 24-year-olds reported a serious injury, compared with 15% for those aged 45 to 64. In the territories, the comparable figures were: 14% and 16% for the younger ages versus 10% for the older group.

In both the provinces and territories, Aboriginal people aged 25 to 64 who were single (never married) had a higher rate of serious injury than those who were married or living in common-law relationships. Being physically active also increased the chance of sustaining a serious injury. Other variables, such as urban/rural residence, education, work status, and household income were not associated with injury. Results of research on the association between income and non-fatal injuries have been mixed, with most studies showing either no relationship or a positive association.^{18,23-25} These studies may reflect increasing opportunities for more potentially hazardous outdoor and recreational activities as income rises.

In addition to serious injuries, the CCHS asked respondents if they had activity limitations that had lasted or were expected to last at least six months that had been caused by an injury (see *Definitions*). According to CCHS data, Aboriginal people in the provinces had a higher rate of injury-caused activity limitation (12%) than did their counterparts in the territories (8%).

Injury-caused activity limitation was more common among provincial Aboriginal males (14%) than females (10%). This sex difference was also evident in the Aboriginal population in the territories: 11% versus 6%.

Age was also an important factor: more than 17% of provincial Aboriginal people aged 35 to 64 had an injury-caused activity limitation, much higher than the proportions in the younger age groups. A similar pattern was evident for the Aboriginal population in the territories. Even though younger Aboriginal people had an increased risk of serious injury, this finding for injury-caused activity limitation was as expected, given that such limitations are cumulative over a person's life.¹⁸

In both the provinces and territories, Aboriginal residents aged 25 to 64 who had not worked in the past year had a higher injury-caused activity limitation rate than those who had worked the entire year. This may indicate that they were unable to work because of their limitation.

Percentage of off-reserve Aboriginal people reporting a serious injury in past year or injury-caused activity limitation, household population aged 12 to 64, provinces/territories, 2000/01 and 2003 combined

	Serious injury in past year		Injury-caused activity limitation	
	Provinces	Territories	Provinces	Territories
	%	%	%	%
Total	19.7	12.3	12.3	8.4
Sex				
Male	22.9*	16.7*	14.4*	10.7*
Female†	16.9	8.5	10.4	6.3
Age group				
12-19	26.3*	14.3*
20-24	25.1*	15.6*
12-24	5.8*E1	5.2*E1
25-34	18.2	12.8	9.6*	6.8*
35-44	17.7	9.6	19.5	11.1
45-64†	15.0	9.7	16.7	14.1*E1
Residence				
Urban†	20.0	14.6	11.6	8.0*E1
Rural	18.9	11.0	14.4	8.5
Marital status‡				
Married/Common-law†	15.1	8.0	14.6	10.8
Previously married	16.6	11.1*E1	20.3	11.4*E2
Never married	21.8*	17.4*	13.8	8.7*E1
Education‡				
Less than secondary graduation†	15.8	9.1	15.2	9.4
Secondary graduation	13.1	13.3*E2	15.5*E1	F
Some postsecondary	16.3*E1	13.4*E2	16.4*E1	F
Postsecondary graduation	19.1	11.9	14.8	12.7
Work status‡				
Worked entire past year	17.5	9.9	11.9	8.3*
Worked part of past year	18.6	13.6	18.9*	11.7
Did not work past year†	14.6	7.9*E1	18.0*	13.1
Household income				
Low	18.6	12.2	15.6*E1	5.6*E1
Lower-middle	17.0	10.2*E2	10.8	7.0*E1
Middle	17.5	11.0	12.0	8.0*E1
Upper-middle	22.3	13.7*E1	12.2	7.1*E1
High†	17.9	13.6	15.5	11.6*E1
Leisure-time activity				
Active	22.2*	15.5*	11.7	9.5
Inactive†	17.9	10.3	13.2	7.9

Data source: 2000/01 and 2003 Canadian Community Health Survey

† Reference category

‡ Age 25 to 64

* Significantly different from reference category ($p < 0.05$)

E1 Coefficient of variation between 16.6% and 25.0%

E2 Coefficient of variation between 25.1% and 33.3%

F Coefficient of variation greater than 33.3%, or sample size less than 10

... Not applicable

estimates based on CCHS data indicate that provincial Aboriginal people have an injury rate 1.4 times higher than that for other provincial residents, the difference is less than reported elsewhere.^{8,26} For example, Registered First Nations people in British Columbia had an injury mortality rate 3.4 times that of other British Columbian residents.⁸ Another study found that members of Manitoba's First Nation's population were 3.7 times more likely than other Manitobans to be hospitalized because of an injury.²⁶ This discrepancy is likely the result of differing definitions of "Aboriginal" status, as well as the severity of injury measured.

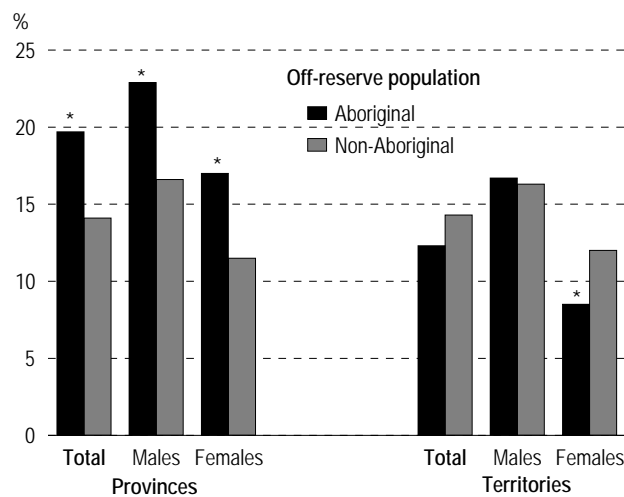
The higher injury rate reported by Aboriginal people remained when males and females were analyzed separately (Chart 1). This concurs with research that compared potential years of life lost (PYLL) because of injury and poisoning deaths and concluded that off-reserve Aboriginal males and females had a higher rate of PYLL than their non-Aboriginal counterparts.⁵

A higher proportion of Aboriginal people aged 20 or older reported an injury than did non-Aboriginal individuals of the same ages (Chart 2).

Injury rates were similar for both populations in the 12-to-19 age group. This agrees with previous research that found the injury rate for Aboriginal children aged 14 or younger in non-reserve areas was only slightly higher than the figure for other children of the same ages²⁷ (see *Injuries among children*).

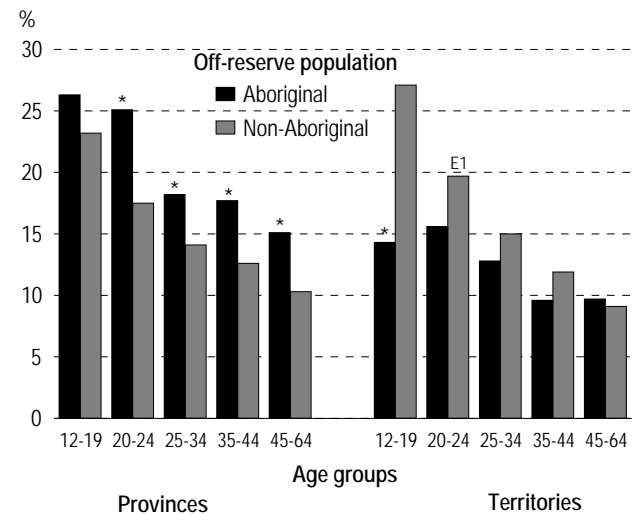
Aboriginal and non-Aboriginal people have different demographic and socio-economic characteristics; for example, Aboriginal persons tend to have lower incomes, less education and higher unemployment. Their population is also younger and disproportionately located in rural areas, the western provinces and the territories.^{11,28} These differences might relate to the disparity in injury rates between Aboriginal and non-Aboriginal individuals. To explore such a possibility, the odds of injury for Aboriginal and non-Aboriginal populations were compared while controlling for differences in sex, age, marital status, urban/rural residence, household income, education, work status, and leisure-time physical activity level. The dependent variable was an injury in the past year that affected normal activities (see *Methods*). The higher likelihood of injury for the provincial Aboriginal population

Chart 1
Percentage reporting a serious injury in past year, by sex and Aboriginal status, off-reserve household population aged 12 to 64, provinces/territories, 2000/01 and 2003 combined



Data source: 2000/01 and 2003 Canadian Community Health Survey
*Significantly different from estimate for non-Aboriginal population ($p < 0.05$)

Chart 2
Percentage reporting a serious injury in past year, by age group and Aboriginal status, off-reserve household population aged 12 to 64, provinces/territories, 2000/01 and 2003 combined



Data source: 2000/01 and 2003 Canadian Community Health Survey
*Significantly different from estimate for non-Aboriginal population ($p < 0.05$)
E1 Coefficient of variation between 16.6% and 25.0%.

Defining non-fatal injuries

This article is based on data from the Canadian Community Health Survey (CCHS). Respondents were asked a series of questions about *non-fatal injuries*, beginning with: "In the past 12 months, were you injured seriously enough to limit your normal activities?" Those who answered "yes" were considered to have a *serious injury*. Respondents who reported at least one such injury were asked to provide information on the most serious one.

Six groups were established for *type of injury*: broken or fractured bone; burn, scald or chemical burn; sprain or strain; cut, puncture, animal bite; scrape, bruise, blister; and "other."

Seven categories describe the *body part* affected: head or neck (excluding eyes); shoulder, arm or elbow; wrist or hand; thigh, leg, knee; ankle or foot; back or spine; and all other body parts.

Respondents were asked about the *location of injury*, and replies were grouped as follows: at home or in surrounding area; school, college or university (excludes sports areas); sports or athletics area (includes school sports areas); street, highway, sidewalk; commercial area (e.g., store, restaurant, office building, transport terminal); industrial or construction area; and all other locations.

The *activity when injured* was determined by asking respondents what they were doing when they sustained the injury: sports or physical exercise (includes school activities); leisure or hobby (includes volunteering); working at a job or business (includes travel to or from work); household chores, other unpaid work or education; and other activities.

The *cause of injury* was determined with two questions: "Was the injury a result of a fall?" and "What caused the injury?" The following eight groups were used: fall; transportation accident; accidentally bumped, pushed, bitten, etc., by person or animal; accidentally struck or crushed by object(s); accidental contact with sharp object, tool or machine or accidental contact with hot object, liquid or gas; overexertion or strenuous movement; physical assault; or any other cause.

Respondents to the 2000/01 CCHS were asked: "Did you receive any medical attention for this injury within 48 hours from a health professional?". In 2003, wording for the treatment question was slightly different: "Did you receive any medical attention for the injury from a health professional in the 48 hours following the injury?" Those who answered "yes" to either question were read a checklist of possible locations: doctor's office, hospital emergency room, walk-in clinic, or "other" locations. Respondents could provide more than one location.

For the 2000/01 CCHS, interviewers read the following preamble regarding *injury-caused activity limitation*: "The next few questions deal with any health limitations which affect your daily activities. In these questions, 'long-term conditions' refer to conditions that 'have lasted or are expected to last six months or more.'" The wording in 2003 was: "The next few questions deal with any *current* limitations in your daily activities caused by a long-term health condition or problem. In these questions, 'long-term conditions' refer to a condition that is expected to last or has already lasted six months or more." The following questions were asked in both survey cycles: "Do you have any difficulty hearing, seeing, communicating, walking, climbing stairs, bending, learning or doing any similar activities?" Does a long-term physical condition or mental condition or health problem reduce the amount or the kind of activity you can do: at home, at work, or at school or other activities (e.g., transportation or leisure)?" Those who answered "yes—often" or "yes—sometimes" to any of these questions were then asked, "Which of the following is the best description of the cause of this condition?" This analysis considers *activity limitations* caused by injury at home, during sports or recreational activities, and related to work or a motor vehicle (2000/01 CCHS), or to an accident at home or work, involving a motor vehicle, or any other type of accident (2003 CCHS).

persisted (data not shown). Even when the same multivariate analysis was run for each sex and age group separately, the difference remained for both men and women, and for all age groups except 12 to 19, among which the odds of injury were similar (data not shown). In other words, differences in selected demographic and socio-economic characteristics do not explain the difference in injury rates between Aboriginal and non-Aboriginal people living in the provinces.

Territories: Aboriginal females have lower injury rate

Based on combined data from the 2000/01 and 2003 CCHS, an estimated 12% of Aboriginal people in the territories reported a serious injury in the 12 months before their survey interview—about 3,500 per year. This was statistically similar to the 14% for other territorial residents (Chart 1). These results contrast with those from another study, which found that Aboriginal people living in the Northwest

Territories had an increased risk of injury mortality compared with other residents.²⁹ This lack of agreement likely results from the comparison between fatal and non-fatal injuries. Research that used the same definition of injury as this analysis concluded that Aboriginal people in the territories were less likely to report an injury than were other territorial residents.³⁰

In the territories, the proportion of males reporting a serious injury did not differ significantly by Aboriginal status. However, a lower proportion of Aboriginal females reported a serious injury than did other female territorial residents (Chart 1). Only Aboriginal people aged 12 to 19 had a reduced risk of sustaining an injury compared with other territorial residents in the same age group; for the other age groups, reports of injuries did not differ significantly between the two populations (Chart 2). The lower likelihood of injury for Aboriginal females and for 12- to 19-year-olds remained when other factors were taken into account (data not shown), suggesting that the characteristics included in these models do not explain the differences in injury rates. Results for men and all other age groups remained statistically similar between the two groups when these other factors were controlled (data not shown).

More than one injury

Some of the individuals who reported a serious injury in the past year had sustained more than one. For example, 22% of injured provincial Aboriginal people reported two or more activity-limiting injuries, as did 21% of other provincial residents. Results for the two territorial population groups were 24% and 25%, respectively.

Types of injuries

CCHS respondents who had been injured were asked for detailed information on their most recent injury; for example, the type, the body part affected, and what they were doing when they were injured (see *Defining non-fatal injuries*). Those who had sustained more than one injury were asked to provide this information for their most serious injury. In the provinces, sprains and strains were the most common injuries among both Aboriginal and non-Aboriginal individuals, but Aboriginal

people had a slightly lower proportion (Table 1). Broken or fractured bones and cuts or punctures were also typical injuries for both groups.

Table 1
Characteristics and circumstances of injury, by Aboriginal status, off-reserve household population aged 12 to 64 who sustained a serious injury in past year, provinces/territories, 2000/01 and 2003 combined

	Provinces		Territories	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
	%	%	%	%
Type of injury				
Sprain or strain	38.7*	43.8	39.1	41.3
Broken or fractured bone	20.5	17.7	21.9	15.8
Cut, puncture, animal bite	14.5	13.1	12.4 ^{E1}	15.3
Scrape, bruise, blister	7.5	5.7	7.1 ^{E1}	8.5 ^{E2}
Burn, scald, chemical burn	2.4 ^{E1}	3.4	F	2.5 ^{E2}
Other	16.4	16.2	17.5 ^{E1}	16.5
Body part				
Ankle or foot	21.2	22.2	25.8	23.6
Wrist or hand	22.7	20.7	15.6 ^{E1}	21.4
Thigh, knee, leg	14.6	14.0	18.8*	12.1
Back or spine	11.5	13.8	10.1 ^{E1}	12.2
Shoulder, arm, elbow	11.2	12.0	12.0 ^{E1}	13.7 ^{E1}
Head or neck (excluding eyes)	7.2 ^{E1}	6.3	8.3 ^{E1}	5.7 ^{E1}
Other	11.6	11.0	9.3 ^{E1}	11.3 ^{E1}
Activity when injured				
Sports or physical exercise	28.0*	33.4	34.3	39.1
Working at job/business	21.2*	26.0	17.1*	25.1
Household chores	14.4	15.7	9.0	13.4 ^{E1}
Leisure or hobby	18.4*	12.8	26.3*	14.5
Other	17.9*	12.2	13.3 ^{E1}	7.9 ^{E2}
Location of injury				
Home or surrounding area	32.2	30.4	28.5	29.3
Sports or athletics area	18.3*	24.9	25.3	29.0
Street, highway, sidewalk	16.1*	11.2	15.8	11.7 ^{E1}
Commercial area	9.6	8.7	4.4 ^{E2}	9.2 ^{E1}
Industrial or construction area	9.0	8.0	5.4 ^{E1}	6.4 ^{E1}
School area (excluding sports field)	4.6 ^{E1}	5.0	7.5 ^{E2}	5.0 ^{E1}
Other	10.2	11.8	13.0 ^{E1}	9.5
Cause of injury				
Fall	39.3	36.2	37.8	37.4
Overexertion or strenuous movement	15.9*	20.7	21.1	22.2
Accidental contact with sharp/hot object	10.4	12.7	6.2 ^{E1}	9.9
Accidentally struck by object	9.1 ^{E1}	8.4	7.4 ^{E1}	8.6 ^{E1}
Accidentally bumped/bitten by person/animal	6.0 ^{E2}	6.6	9.2 ^{E1}	7.6 ^{E2}
Transportation accident	7.6 ^{E1}	6.4	5.1 ^{E1}	F
Physical assault	5.5 ^{E2}	1.6	F	F
Other	6.2 ^{E1}	7.4	8.8 ^{E1}	7.6 ^{E1}

Data source: 2000/01 and 2003 Canadian Community Health Survey

Note: Because of rounding, detail may not add to 100%

* Significantly different from non-Aboriginal population ($p < 0.05$)

^{E1} Coefficient of variation between 16.6% and 25.0%

^{E2} Coefficient of variation between 25.1% and 33.3%

F Coefficient of variation greater than 33.3%, or sample size less than 10

Limitations

As with all self-reported data, results from the Canadian Community Health Survey (CCHS) are subject to recall errors and misinterpretation of questions. In addition, cultural differences between Aboriginal and non-Aboriginal people could affect the results. Several studies have shown that cultural groups interpret questions differently and differ in their willingness to respond to sensitive questions,³¹⁻³⁵ but the extent of such reporting biases is unknown.

Injury severity was not measured; therefore, injuries with different degrees of severity were grouped together. This may mask associations, as research has shown that more serious injuries have different risk factors than less serious ones.²⁴

The CCHS sample size for Aboriginal people is small. This limits the precision of the estimates, and differences between two estimates, and odds ratios must be large to achieve statistical significance. As a result, some differences and odds ratios are large but not significant.

Information on people aged 65 or older could not be included because of the small number of Aboriginal respondents in this age group reporting injury.

The extent to which the Aboriginal respondents in the CCHS represent the entire Canadian off-reserve Aboriginal population is not known. Only respondents who identified their cultural and racial background as "Aboriginal peoples of North America" were considered Aboriginal. Respondents who did not state their cultural and racial background were excluded from the analysis. Some research has shown that respondents' views of their own background change with time.^{36,37} There could be many reasons why respondents would choose not to disclose their culture and race.

Combining the three recognized Aboriginal groups, namely North American Indian, Métis and Inuit, is a crude measure of ethnicity,³⁸ and it would be best to analyze them separately because each group

has its own history and culture. Unfortunately, this is not possible with CCHS data.

The Aboriginal population as measured by the CCHS is not strictly comparable with the Aboriginal population measured by the Census (1996, 2001) or the 2001 Aboriginal Peoples Survey (APS) because the definitions of Aboriginal differ. In the Census and APS, an identity concept is used; the CCHS uses a racial/cultural concept. In the Census and APS, Aboriginal Identity refers to people who reported: (1) being North American Indian, Métis, and/or Inuit, and/or (2) having Registered Indian status as defined by the Indian Act, and/or (3) having Band or First Nations membership. The variations in the definition of the Aboriginal population may result in slightly different target populations.

Data from the APS were not used in this analysis because the survey did not collect information on injuries for individuals aged 15 or older. And although questions on activity limitations were asked, the APS did not determine if the activity limitation was caused by an injury.

Data from the 2001 Participation and Activity Limitation Survey (PALS) were not used for this analysis for several reasons. PALS collected information only on injuries that caused an activity limitation. Although it might be possible to use PALS data for analysis on injury-caused activity limitations, PALS did not collect information for the territories, and its definition of an Aboriginal person differs from that used in the CCHS (see *Definitions*). Therefore, to be consistent with definitions throughout the paper, PALS data were not used.

Residual confounding of socio-economic status remains in the logistic regression models that compare injury and injury-caused activity limitation rates between Aboriginal and non-Aboriginal people. Other research has suggested using as many different socio-economic variables as possible to reduce any residual confounding.²⁵

No temporal or causal relationships can be inferred, as the CCHS data are cross-sectional.

The body part affected did not differ significantly between the two provincial populations. For both groups, the most common injuries were to the hand or wrist, or the ankle or foot, with each representing at least one-fifth of all injuries.

Twenty-eight percent of injured Aboriginal people said they had sustained their injury during a sports activity or while exercising, and 21% cited a work activity—both significantly lower than the proportions reported by non-Aboriginal residents

who were injured. Aboriginals were more likely than other provincial residents to report being injured during leisure/hobby and other activities. For both populations, sports- and work-related injuries were most common, as found in other research.²⁰

In general, the territorial Aboriginal population had injury characteristics similar to those of non-Aboriginal residents. A notable exception was the higher proportion of injuries among Aboriginal people that occurred during leisure or hobby

activities (Table 1). Because of small sample sizes, differences must be large to be considered statistically significant (see *Limitations*).

Location and causes

About one-third of injuries occurred in or around the home for the provincial Aboriginal and non-Aboriginal populations alike (Table 1). But Aboriginal people were more likely to report being injured on a street, highway or sidewalk than were other provincial residents (16% versus 11%). About 18% of injuries in the Aboriginal population occurred in sports or athletics areas, less than among the non-Aboriginal group.

Causes of injury were generally similar between Aboriginal and non-Aboriginal people. Falls were the most common, representing 39% of all injuries for the provincial Aboriginal population. The proportion of injuries attributed to overexertion was lower in the Aboriginal population; injuries caused by physical assault, higher.

Majority sought treatment

The majority of people who had a serious injury in the past year had sought treatment from a health care professional within 48 hours, regardless of Aboriginal status or geographic location (Table 2).

In the provinces, Aboriginal people were more likely than non-Aboriginals to have received treatment in an emergency department, and less likely to have been to a doctor's office. In the territories, the situation was reversed: non-Aboriginal individuals were more likely to have been treated in emergency, while Aboriginal people were more likely to have been treated outside hospital. Health care delivery in the territories is likely behind these differences. With the exception of urban areas, in Northern communities, health care is typically delivered in nursing stations or health centres.³⁰

Hospital admissions indicate that the injuries sustained by Aboriginal people may have been more severe than those sustained by the non-Aboriginal population. In both the provinces and territories, Aboriginal people who had sought medical help for their injuries were more likely to have been admitted

Table 2

Treatment of injury and location of treatment, by Aboriginal status, off-reserve household population aged 12 to 64 who sustained a serious injury in past year, provinces/territories, 2000/01 and 2003 combined

	Provinces		Territories	
	Aboriginal	Non-Aboriginal	Aboriginal	Non-Aboriginal
	%	%	%	%
Treated within 48 hours	65.9	62.3	58.8	60.3
Location of treatment[†]				
Emergency department	62.2*	54.0	44.5*	58.5
Doctor's office	15.1*	21.1	F	16.5 ^{E1}
Walk-in clinic	13.0 ^{E1}	13.0	F	F
Other location	12.3 ^{E1}	14.3	48.2*	21.6
Admitted overnight to hospital	12.5* ^{E1}	6.4	15.2* ^{E1}	8.4 ^{E1}

Data source: 2000/01 and 2003 Canadian Community Health Survey

[†] Treatment could have been received at more than one location.

* Significantly different from estimate for non-Aboriginal population ($p < 0.05$)

^{E1} Coefficient of variation between 16.6% and 25.0%

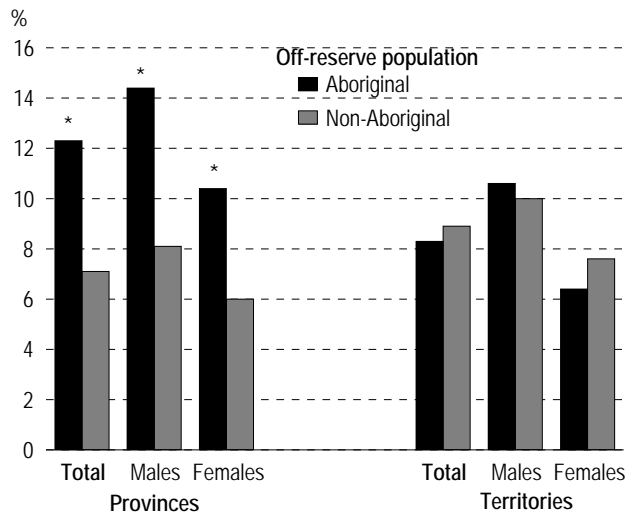
F Coefficient of variation greater than 33.3%, or sample size less than 10.

for an overnight stay in the hospital than were their non-Aboriginal counterparts.

Injury-caused activity limitations

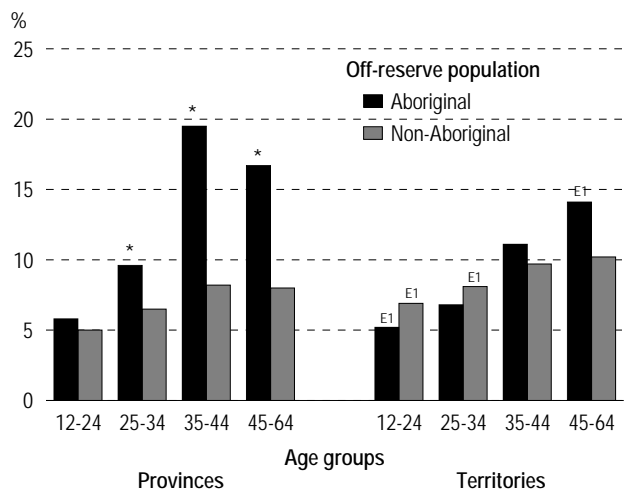
The CCHS asked respondents if they had an activity limitation that had lasted or was expected to last six months or more and that had been caused by an injury (see *Definitions*). According to the 2000/01 and 2003 CCHS, 12% of Aboriginal people living in non-reserve parts of the provinces (an average of 41,400) reported an injury-caused activity limitation. This was 1.7 times higher than the 7% for the non-Aboriginal provincial population. When injury-caused activity limitations were examined by sex, consistently higher rates emerged for the Aboriginal group (Chart 3), a result supported by previous research.³⁹ In the territories, 8% of Aboriginal residents (an estimated 2,400) had this type of disabling injury—statistically similar to the rate for non-Aboriginal territorial residents. Furthermore, injury-caused activity limitation rates did not differ by sex or by age group in the territories (Charts 3 and 4).

Chart 3
Percentage reporting injury-caused activity limitation, by sex and Aboriginal status, off-reserve household population aged 12 to 64, provinces/territories, 2000/01 and 2003 combined



Data source: 2000/01 and 2003 Canadian Community Health Survey
*Significantly different from estimate for non-Aboriginal population ($p < 0.05$)

Chart 4
Percentage reporting injury-caused activity limitation, by age group and Aboriginal status, off-reserve household population aged 12 to 64, provinces/territories, 2000/01 and 2003 combined



Data source: 2000/01 and 2003 Canadian Community Health Survey
*Significantly different from estimate for non-Aboriginal population ($p < 0.05$)
E1 Coefficient of variation between 16.6% and 25.0%

In the provinces, though, the disparity between the two populations did differ by age for injury-caused activity limitations, especially in the 35-to-64 age groups. The higher overall likelihood of

Injuries among children

According to the 2000/01 National Longitudinal Survey of Children and Youth (NLSCY) (see *Methods*), about 12% of Aboriginal children aged 11 or younger who lived in non-reserve parts of the provinces had sustained an injury within the past year that was serious enough to require medical attention. This is statistically similar to the 10% reported for provincial non-Aboriginal children, and is consistent with results from another study.²⁷

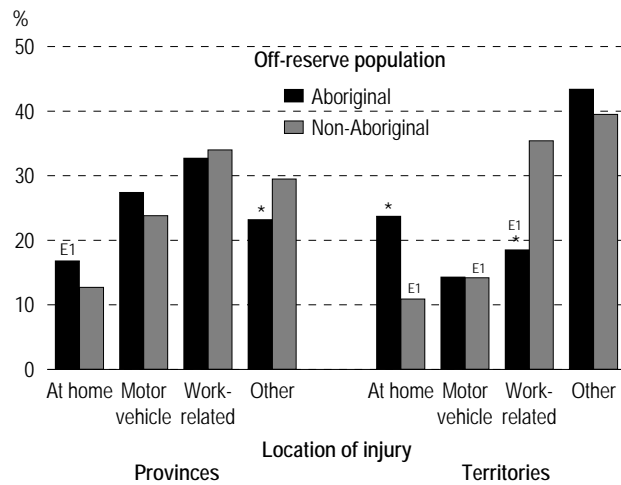
A higher proportion of Aboriginal boys than girls had been injured: 14% compared with 9%, respectively. For both sexes, 9% of children aged 4 or younger had had an injury in the past year, as did 14% in the 5-to-11 age group. At all ages, the proportion of Aboriginal children who had had a serious injury did not differ significantly from the proportion for non-Aboriginal children (data not shown; all estimates for Aboriginal children have coefficients of variation between 16.6% and 33.3%). Because of the small sample of Aboriginal respondents, differences between estimates must be large to be considered statistically significant (see *Limitations*).

The NLSCY asked about injuries such as a “broken bone, bad cut or burn, head injury, poisoning, or a sprained ankle, which occurred in the past 12 months, and were serious enough to require medical attention, by a doctor, nurse or dentist”.

Children were identified as Aboriginal based on the respondent’s (usually a parent’s) answers to: “How would you best describe his/her race or colour?” In the NLSCY, native/Aboriginal people (North American Indian, Métis or Inuit/Eskimo) were considered Aboriginal.

injury-caused activity limitation for the Aboriginal population held when age, sex, and socio-demographic and socio-economic variables were taken into account, indicating that the disparity in injury-caused activity limitation is not a result of these factors (data not shown). This model was run separately for each sex and age group, and the disparities in the odds of injury-caused activity limitation were present for both sexes and age groups 35 or older. For those aged 12 to 34, injury-caused activity limitations were not significantly different between the two groups (data not shown). The same technique was used for the territories, and no changes were observed (data not shown).

Chart 5
Injury-caused activity limitation, by location of injury and Aboriginal status, off-reserve household population aged 12 to 64, provinces/territories, 2000/01 and 2003 combined



Data source: 2000/01 and 2003 Canadian Community Health Survey
 * Significantly different from estimate for non-Aboriginal population ($p < 0.05$)
 E1 Coefficient of variation between 16.6% and 25.0%

In the territories, 24% of injury-caused activity limitations for the Aboriginal population resulted from an accident at home, significantly higher than the 11% for non-Aboriginals. Injury-caused activity limitations resulting from a work-related injury were much more common among non-Aboriginal respondents (Chart 5).

Concluding remarks

In the early 2000s, the disparity in non-fatal injury rates between Aboriginal and non-Aboriginal people varied depending on sex, age and geographic location. In terms of serious injuries, the disparity in injury rates between Aboriginal and non-Aboriginal people was evident in the provinces, but not in the territories. When examined more closely, though, the nature and circumstances of the injuries did differ between the two groups.

As indicated by the higher injury-caused activity limitation rate, the impact of injuries is greater for the provincial Aboriginal population than for other provincial residents. Specifically, the provincial Aboriginal population had a higher rate, a disparity that appears after age 24. In the territories, injuries had a similar impact on both the Aboriginal and non-Aboriginal populations. This is only part of the picture, as previous research has concluded that the Aboriginal population in the territories has a higher injury mortality rate than other territorial residents.²⁹

The higher injury and injury-caused activity limitation rates experienced by the provincial Aboriginal population underscore just how prevalent injuries are in this group, as well as the impact they can have—information that may be useful to injury prevention programs. ●

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Appendix

Table A

Distribution of selected characteristics, off-reserve Aboriginal household population aged 12 to 64, provinces/territories, 2000/01 and 2003 combined

	Provinces						Territories			
	Male			Female			Both sexes			
	Sample size	Estimated population		Sample size	Estimated population		Sample size	Estimated population		
	'000	%		'000	%		'000	%		
Total	2,328	319	100.0	3,022	360	100.0	2,014	57	100.0	
Injury in past year										
Yes	515	73	22.9	482	61	16.9	255	7	12.3	
No	1,812	246	77.1	2,539	299	83.0	1,758	50	87.7	
Missing	1	F	F	1	F	F	1	F	F	
Injury-caused activity limitation										
Yes	305	46	14.3	270	37	10.3	155	5	8.3	
No	2,008	272	85.1	2,716	320	89.1	1,847	52	91.1	
Missing	15	F	F	36	2 ^{E1}	0.6 ^{E1}	12	F	0.5 ^{E2}	
Age group										
12-19	604	67	21.0	602	68	18.9	539	15	25.7	
20-24	200	37	11.6	332	41	11.5	220	7	12.7	
25-34	475	68	21.4	753	84	23.5	487	13	22.8	
35-44	436	67	20.9	600	84	23.2	402	12	21.1	
45-64	613	80	25.1	735	82	22.9	366	10	17.6	
Residence										
Urban	1,529	240	75.3	2,082	280	78.0	744	21	36.5	
Rural	799	79	24.7	940	79	22.0	1,270	36	63.5	
Marital status (age 25 to 64)										
Married/Common-law	880	139	64.5	1,027	143	57.0	698	23	64.4	
Previously married	239	25	11.6	479	49	19.7	159	3	9.3	
Never married	401	50	23.3	576	58	23.1	395	9	26.1	
Missing	4	F	F	6	F	F	3	F	F	
Education (age 25 to 64)										
Less than secondary graduation	526	69	32.3	667	71	28.6	636	18	50.0	
Secondary graduation	250	38	17.5	310	40	15.9	91	3	7.4	
Some postsecondary	137	20	9.4	241	32	12.9	85	2	6.2	
Postsecondary graduation	559	81	37.5	825	101	40.2	422	12	34.3	
Missing	52	7 ^{E1}	3.3 ^{E1}	45	6 ^{E2}	2.5 ^{E2}	21	F	2.1 ^{E1}	
Work status (age 25 to 64)										
Worked entire past year	758	116	53.8	828	96	38.6	594	17	48.5	
Worked part of past year	426	55	25.7	488	64	25.6	402	12	32.9	
Did not work past year	301	40	18.4	727	85	34.0	241	6	17.0	
Missing	39	4 ^{E2}	2.0 ^{E2}	45	5 ^{E2}	1.8 ^{E2}	18	F	1.6 ^{E1}	
Household income										
Low	208	22	6.8	328	30	8.3	267	7	12.0	
Lower-middle	287	40	12.7	618	62	17.3	331	9	16.1	
Middle	487	71	22.3	690	82	22.7	446	13	23.1	
Upper-middle	620	86	26.8	620	86	23.9	404	11	18.6	
High	382	57	17.8	321	48	13.4	332	11	18.4	
Not stated	344	44	13.7	445	52	14.4	234	7	11.8	
Leisure-time activity										
Active	1,315	172	54.0	1,496	176	48.8	869	26	45.8	
Inactive	856	120	37.7	1,434	170	47.3	999	27	46.5	
Missing	157	27	8.4	92	14	3.9	146	4	7.7	

Data source: 2000/01 and 2003 Canadian Community Health Survey

Note: Because of rounding, detail may not add to totals. Also, estimated population would be approximately double the Canadian population because two different cycles were combined.

E1 Coefficient of variation between 16.6% and 25.0%

E2 Coefficient of variation between 25.1% and 33.3%

F Coefficient of variation greater than 33.3%, or sample size less than 10

Table B

Distribution of selected characteristics, non-Aboriginal household population aged 12 to 64, provinces/territories, 2000/01 and 2003 combined

	Provinces						Territories		
	Male			Female			Both sexes		
	Sample size	Estimated population		Sample size	Estimated population		Sample size	Estimated population	
	'000	%	'000	%	'000	%	'000	%	
Total	95,114	21,684	100.0	104,650	21,573	100.0	2,690	82	100.0
Injury in past year									
Yes	16,332	3,609	16.6	12,752	2,486	11.5	388	12	14.3
No	78,749	18,075	83.3	91,861	19,078	88.4	2,302	70	85.7
Missing	33	F	F	37	9 ^{E1}	0.0 ^{E1}			
Injury-caused activity limitation									
Yes	8,351	1,746	8.0	6,671	1,289	6.0	222	7	8.9
No	86,363	19,863	91.6	97,414	20,171	93.5	2,456	74	90.8
Missing	400	84	0.4	565	113	0.5	12	F	F
Age group									
12-19	17,055	3,228	14.9	16,598	3,065	14.2	341	11	13.5
20-24	6,036	2,101	9.7	7,176	2,018	9.4	178	7	8.4
25-34	16,175	3,994	18.4	18,993	3,975	18.4	591	17	20.8
35-44	21,298	5,139	23.7	22,480	5,093	23.6	651	21	25.2
45-64	34,550	7,230	33.3	39,403	7,422	34.4	929	26	32.1
Residence									
Urban	69,610	17,603	81.1	78,338	17,698	82.0	2,006	62	75.8
Rural	25,504	4,090	18.9	26,312	3,874	18.0	684	20	24.2
Marital status (age 25 to 64)									
Married/Common-law	48,168	12,116	74.0	53,582	12,100	73.4	1,315	46	72.3
Previously married	8,998	1,288	7.9	15,108	2,188	13.3	310	6	9.5
Never married	14,759	2,946	18.0	12,040	2,180	13.2	539	11	17.9
Missing	98	15	0.1	146	23	0.1	7	F	F
Education (age 25 to 64)									
Less than secondary graduation	13,686	2,605	15.9	13,559	2,475	15.0	244	7	11.0
Secondary graduation	13,089	2,956	18.1	16,338	3,404	20.6	287	9	14.1
Some postsecondary	4,644	1,054	6.4	5,577	1,106	6.7	136	4	6.0
Postsecondary graduation	39,510	9,462	57.8	44,492	9,289	56.3	1,472	43	66.7
Missing	1,094	286	1.7	910	216	1.3	32	1 ^{E1}	2.2 ^{E1}
Work status (age 25 to 64)									
Worked entire past year	48,031	11,440	69.9	43,569	9,168	55.6	1,495	44	68.5
Worked part of past year	14,593	3,121	19.1	16,670	3,413	20.7	502	15	23.4
Did not work past year	8,764	1,660	10.1	19,907	3,765	22.8	157	5	7.2
Missing	635	143	0.9	730	145	0.9	17	F	0.8 ^{E2}
Household income									
Low	3,282	580	2.7	4,592	707	3.3	71	2	2.7
Lower-middle	4,466	923	4.3	7,665	1,315	6.1	95	3	3.1
Middle	15,290	3,343	15.4	19,740	3,737	17.3	271	8	10.2
Upper-middle	31,769	6,811	31.4	33,705	6,748	31.3	626	18	21.7
High	30,407	7,763	35.8	26,180	6,409	29.7	1,373	42	51.7
Not stated	9,900	2,273	10.5	12,768	2,657	12.3	254	9	10.6
Leisure-time activity									
Active	49,037	10,839	50.0	51,285	10,029	46.5	1,415	43	53.1
Inactive	40,564	9,459	43.6	50,841	10,823	50.2	1,139	33	40.5
Missing	5,513	1,395	6.4	2,524	720	3.3	136	5	6.5

Data source: 2000/01 and 2003 Canadian Community Health Survey

Note: Because of rounding, detail may not add to totals. Also, estimated population would be approximately double the Canadian population because two different cycles were combined.

E1 Coefficient of variation between 16.6% and 25.0%

E2 Coefficient of variation between 25.1% and 33.3%

F Coefficient of variation greater than 33.3%, or sample size less than 10