Hospitalizations for unintentional injuries among Canadian adults in areas with a high percentage of Aboriginal-identity residents

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Abstract

Introduction: Injuries are a leading cause of death and morbidity. While individual Aboriginal identifiers are not routinely available on national administrative databases, this study examines unintentional injury hospitalization, by cause, in areas with a high percentage of Aboriginal-identity residents.

Methods: Age-standardized hospitalization rates (ASHRs) and rate ratios were calculated based on 2004/2005-2009/2010 data from the Discharge Abstract Database.

Results: Falls were the most frequent cause of injury. For both sexes, ASHRs were highest in high-percentage First Nations-identity areas; high-percentage Métis-identity areas presented the highest overall ASHR among men aged 20–29 years, and high-percentage Inuit-identity areas presented the lowest ASHRs among men of all age groups. Some causes, such as falls, presented a high ASHR but a rate ratio similar to that for all causes combined; other causes, such as firearm injuries among men in high-percentage First Nations-identity areas, presented a relatively low ASHR but a high rate ratio. Residents of high-percentage Aboriginal-identity areas have a higher ASHR for hospitalization for injuries than residents of low-percentage Aboriginal-identity areas.

Conclusion: Residents of high-percentage Aboriginal-identity areas also live in areas of lower socio-economic conditions, suggesting that the causes for rate differences among areas require further investigation.

Keywords: *First Nations, Métis, Inuit, Aboriginal people, injuries, hospitalization, Census, geographical methods*

Introduction

Aboriginal people in Canada (i.e., First Nations, Métis and Inuit) generally experience poorer health and lower life expectancy than the overall Canadian population;[1-9] they also experience high rates of mortality and morbidity due to injuries.[10-12] Unintentional injuries are important to study because they are considered largely preventable, are a leading cause of death and morbidity, have long-term health effects and are associated with large health care costs.[13]

Individual Aboriginal identifiers are not routinely available on national hospitalization or mortality databases that contain injury information. As a result, existing studies tend to either use provincial databases that do contain this information or a geographical approach. Provincial studies that use hospitalization data containing individual Aboriginal identifiers have been limited to those of the western provinces, where there is information on people registered under the Indian Act. For example, Karmali et al.[12] found that people with Registered Indian status had an unintentional trauma rate about 3 times higher than the general population in Alberta, while a Health Canada study that used hospitalization data for the western provinces found that First Nations had an unintentional injury rate 4 times higher than the general population.[11] We found no injury-specific studies for Métis or Inuit populations using national hospitalization data. However, using census-linked mortality data, Tjepkema et al.[5] found that Registered Indians and Métis were more likely to die due to external causes (i.e. injury) than the non-Aboriginal population.

Several studies have also used area-based approaches to examine injury hospitalization and mortality in regions with a high percentage of Aboriginal-identity residents. Fantus et al.[14] found that those living in First Nations communities in Ontario had an all-cause injury rate 2.5 times higher than northern Ontario communities and 3.0 times higher than southern Ontario communities. National hospitalization data (excluding Quebec) revealed higher rates of all-cause injury in areas with a high percentage of Aboriginal-identity residents.[15] Two studies focusing on children—one national study[16] and one in Newfoundland and Labrador[17]—found that rates of hospitalizations for unintentional injuries among children living in areas with a high

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percentage of Aboriginal residents were higher than those among children living in areas with a low percentage of Aboriginal residents. Furthermore, Peters[18] found that 52.0% of the total gap in life expectancy between residents of Inuit Nunangat and the rest of Canada was as a result of injuries.

In this study, we examined unintentional injury hospitalization, by cause, among adults (aged 20 years or older) living in areas where at least 33% of residents reported an Aboriginal identity. Our two purposes were to: (1) calculate rates of unintentional injury hospitalization, by age group, sex, and cause of injury for geographical areas with a relatively high percentage of residents who self-identify as First Nations, Métis or Inuit, and (2) compare these rates with those for areas with a low percentage of Aboriginal-identity residents. Our study differs from those of others (for example, Garner et al.,[4] Carrière et al.[15] and Oliver et al.[16]) as it focuses on unintentional injuries among adults, examines different causes of injury and compares results for high-percentage First Nations-, Métis- and Inuit-identity areas and low-percentage Aboriginal-identity areas.

Methods

Hospitalization data

Hospitalization data for 6 fiscal years, 2004/2005 to 2009/2010, came from the Discharge Abstract Database.[19] This file contains information on all in-patient acute-care hospital separations (due to discharges, deaths, sign-outs and transfers) in the Canadian provinces and territories excluding Quebec. For each separation, information is available on age, sex, residential postal code, the date of admission and discharge and diagnoses codes based on the *International Classification of Diseases 10th Revision, Canadian version* [ICD-10-CA].[20] (Data quality reports indicate that the accuracy of ICD-10-CA on separation records is high.[19]) Using a classification developed by the International Collaborative Effort on Injury Prevention,[21] we examined 12 categories of unintentional injury based on ICD-10-CA codes: cut/pierce, drowning/suffocation, falls, fire/hot substance (i.e. burns), firearms, machinery, motor vehicle traffic, other land transportation, natural/environmental, poisoning, injury due to being struck, and other (which includes categories such as overexertion, water transport accidents, exposure to electric transmission lines, etc). Because this last category contains heterogeneous causes, we did not analyze it specifically, but we do present the results in the tables for comparison. In addition, we excluded adverse effects due to drugs or medical care. Injury codes and examples for each category of unintentional injury are available on request.

Because separation records contain multiple diagnosis codes, more than one type of unintentional injury identified (e.g. fall and burn) could be identified. Also, patients transferred between hospitals would have multiple separation records, which would result in counting a single injury episode many times. To account for this, we counted discharge and admission occurring on the same day as a single injury episode. Thus, data represent injury episodes rather than the number of individuals injured, as it is possible that an individual was hospitalized for the same injury more than once over the six-year period.

Geozones method

Because the Discharge Abstract Database does not contain information on patients' Aboriginal identity, we used a geographical method[22] to determine Dissemination Areas (DAs) with a high percentage of residents identifying as Aboriginal (i.e. First Nations, Métis or Inuit) in the 2006 Census. DAs, which consist of one or more neighbouring dissemination blocks and have a population of 400 to 700, are the smallest geographical unit for which information from the census is available nationally. Following earlier Statistics Canada research into hospitalizations and Aboriginal identity in Canada,[15] DAs where at least 33% of the population reported an Aboriginal identity in the 2006 census are classified as areas with a relatively high percentage of Aboriginal-identity residents. The population is further classified as First Nations, Métis or Inuit based on the predominant Aboriginal-identity group. Excluding Quebec, 1929 DAs were classified as high-percentage First Nations identity, 186 as high-percentage Métis identity and 59 as high-percentage Inuit identity, with the Aboriginal population accounting for 80%, 55% and 81%, respectively, of the population in the DAs. In contrast, the Aboriginal population accounted for 3% of the population in low-percentage Aboriginal-identity areas. It has to be mentioned that, because many Aboriginal people do not live in the areas identified as being high-percentage Aboriginal identity and because these areas also contain individuals who do not report an Aboriginal identity, results of this study represent characteristics of areas of residence and not characteristics of individuals. The 4 types of areas—high-percentage First Nations-identity, Métis-identity or Inuit-identity DAs or low-percentage Aboriginal-identity DAs—differ according to several socio-economic characteristics (see Table 1, which includes only DAs for which those characteristics were available).

The Postal Code Conversion File[23] was used to determine the DA of residence for each hospital separation record based on the patient's residential postal code. Over 99% of hospital records were successfully assigned to a DA.

Results produced

Denominators were derived from the 2006 Census, which corresponds to the midpoint of the hospitalization data, and multiplied by 6 to account for the 6 years of hospitalization data. Because of small populations, global non-response or incompletely enumerated Indian Reserves, a small number of DAs lacked the detailed age and sex data needed to provide a complete denominator. To retain these DAs in the analysis, age and sex were estimated from total population counts or population estimates of incompletely enumerated Indian Reserves.

Rates (per 10 000 person-years) were age-standardized in 5-year age intervals according to the age distribution of the Aboriginal-identity population in the 2006

TABLE 1
Socio-economic characteristics of types of areas defined by Aboriginal identity group[a]

	High-percentage Aboriginal-identity DAs[a,b]			Low-percentage Aboriginal-identity DAs[a]
	High-percentage First Nations-identity DAs	High-percentage Métis-identity DAs	High-percentage Inuit-identity DAs	
Number of DAs, n	1288	178	56	38710
Aboriginal identity, %	79.9	54.7	81.4	2.8
Living in crowded conditions, %	19.7	8.1	27.4	3.2
Living in dwellings in need of major repairs, %	36.7	20.5	23.7	6.9
Population aged 25–64 years without high school diploma, %	42.1	32.6	41.5	14.4
Population aged $\geq$ 15 years who are unemployed, %	20.0	12.3	16.5	6.2
Population aged $\geq$ 15 years in the labour force, %	55.5	63.6	66.3	67.7
DA in CMA/CA, %	21.8	27.4	0.0	78.9
DA in strong/moderate MIZ[c], %	6.8	14.0	0.0	11.8
DA in weak/no MIZ, %	71.3	58.6	100.0	9.3
Mean household income (SD), $	22512 (10541)	32163 (10517)	41252 (14528)	47406 (25792)

Source: 2006 Census.

Abbreviations: CMA/CA, Census Metropolitan Area/ Census Agglomeration; DA, Dissemination Area; MIZ, Metropolitan Influence Zone.

[a] According to the 2006 Census, excluding Quebec.

[b] DAs where at least 33% of the population reported Aboriginal identity are classified as high-percentage Aboriginal identity. Classification as high-percentage First Nations, Métis or Inuit is based on the predominant group.

[c] The MIZ assigns a category to municipalities outside of a CMA/CA based on the percentage of the employed labour force that commute to work in a CMA/CA.

Census. They are presented for high-percentage First Nations-identity areas, high-percentage Métis-identity areas, high-percentage Inuit-identity areas, and low-percentage Aboriginal-identity areas, and are produced by cause of injury, sex and age group (20–29, 30–44, 45+ years). Rate ratios allow for the comparison of rates for high-percentage First Nations-, high-percentage Métis-, and high-percentage Inuit-identity areas relative to low-percentage Aboriginal-identity areas. According to Statistics Canada rules on confidentiality, rates and rate ratios were not shown in any cell in a table if the number of episodes for that cell was less than 10. For rates and rate ratios, 95% confidence intervals (CIs) were produced according to the assumption of log-normality.[24] Data manipulation and computations were done using statistical package SAS version 9.1.3 (SAS Institute Inc., Cary, NC, US).

Results

Slightly more than 730 000 episodes of unintentional injuries requiring hospitalization among adults aged 20 years plus were reported in the Canadian provinces and territories (excluding Quebec) for the 6 years of data (2004/2005-2009/2010), among which more than 26 000 occurred in areas with high percentage of Aboriginal-identity residents (Table 2).

Age-standardized hospitalization rates

Among men, overall age-standardized hospitalization rates (ASHRs) for injury were highest in high-percentage First Nations-identity areas (146/10 000 person-years; 95% CI: 144–148), followed by high-percentage Métis-identity areas (112/10 000 person-years; 95% CI: 108–116), high-percentage Inuit-identity areas (100/10 000 person-years; 95% CI: 95–107) and low-percentage Aboriginal-identity areas (55/10 000 person-years; 95% CI: 54–55) (Table 3). Among women, ASHRs were highest in high-percentage First Nations-identity areas (103/10 000 person-years; 95% CI: 102–105), followed by high-percentage Inuit-identity areas (87/10 000 person-years; 95% CI: 82–92), high-percentage Métis-identity areas (74/10 000 person-years; 95% CI: 71–77), and low-percentage Aboriginal-identity areas (37.2/10 000 person-years; 95% CI: 37.0–37.3). However, the patterns were more complex for specific sex–age combinations: in high-percentage First Nations-identity areas, ASHRs for total causes increase with age, from 133/10 000 (95% CI: 128–138) person-years for men aged 20 to 29 years to 158/10 000 (95% CI: 154–162) person-years for men aged 45 years plus and from 77/10 000 (95% CI: 73–81) person-years for women aged 20 to 29 years to 141/10 000 (95% CI: 138–145) person-years for women aged 45 years plus. In contrast, ASHRs in high-percentage Métis-identity areas decreased with age among men and presented a U-shape pattern among women. In high-percentage Inuit-identity areas, such a U-shape was observed for men and an increasing trend was observed for women. For all areas and both sexes, the highest rates were observed for the oldest age group, with the exception of men living in high-percentage Métis-identity areas for which the highest rates were observed among the youngest group aged 20 to 29 years.

Rates of hospitalizations for falls were high in all areas for both sexes and all age groups: for men, they accounted for about one-third of all hospitalizations, at 55/10 000 (95% CI: 54–56) in high-

TABLE 2
Number and percentage distribution of unintentional injury-hospitalizations by age group, sex, and by Aboriginal identity group[a], DAs, population aged ≥ 20 years, Canada excluding Quebec, 2004/2005–2009/2010

	Population ≥ 20 years							
	Total		20–29 years		30–44 years		≥ 45 years	
	n	%	n	%	n	%	n	%
Men	**349 426**		**49 991**		**71 817**		**227 618**	
Areas with high percentage of Aboriginal residents[b]								
First Nations	12 224	3.5	2458	4.9	3784	5.3	5982	2.6
Métis	709	0.2	209	0.4	191	0.3	309	0.1
Inuit	1867	0.5	397	0.8	507	0.7	963	0.4
Areas with low percentage of Aboriginal residents	334 626	95.8	46 927	93.9	67 335	93.8	220 364	96.8
Women	**380 960**		**19 879**		**35 083**		**325 998**	
Areas with high percentage of Aboriginal residents[b]								
First Nations	9736	2.6	1473	7.4	2164	6.2	6099	1.9
Métis	531	0.1	100	0.5	152	0.4	279	0.1
Inuit	1613	0.4	179	0.9	257	0.7	1177	0.4
Areas with low percentage of Aboriginal residents	369 080	96.9	18 127	91.2	32 510	92.7	318 443	97.7

Source: Discharge Abstract Database, 2004/2005–2009/2010.

Abbreviation: DA, Dissemination Area.

[a] The percentage of Aboriginal identity is provided by the 2006 Census.

[b] Dissemination areas where at least 33% of the population reported Aboriginal identity are classified as high-percentage Aboriginal identity. Classification as high-percentage First Nations, Métis or Inuit is based on the predominant group.

percentage First Nations-identity areas, 37/10 000 (95% CI: 35–40) in high-percentage Métis-identity areas, 35/10 000 (95% CI: 32–38) high-percentage Inuit-identity areas, and 21.3/10 000 (95% CI: 21.2–21.4) in low-percentage Aboriginal-identity areas; for women, they accounted for more than half, at 55/10 000 (95% CI: 54–56) in high-percentage First Nations-identity areas, 39/10 000 (95% CI: 37–41) in high-percentage Métis-identity areas, 49/10 000 (95% CI: 46–53) in high-percentage Inuit-identity areas and 22/10 000 (95% CI: 22–23) in low-percentage Aboriginal-identity areas. The proportion of hospitalizations due to falls increased with age: for men aged 45 years plus, this reason accounted for about half of all unintentional injuries; for women of the same age, it accounted for about two-thirds of all unintentional injuries, which is in line with results observed in the general population.[25]

Rates of hospitalization for motor vehicle, traffic and other land transportation injuries together accounted for about one-quarter of all hospitalizations among men and one-sixth of all hospitalizations among women. Variations of their combined rate were observed between age groups (i.e. they were much higher among individuals aged 20–29 years than among other age groups) and sex (i.e. they were higher among men). Also, the main contributor to their combined rate varied according to the predominant Aboriginal identity group: whereas in high-percentage Inuit-identity areas, hospitalizations for other land transport were more frequent than for motor vehicle traffic, this pattern was reversed in the other areas.

Among men, unintentional injuries due to poisoning and being struck had similar ASHRs for all ages combined within every area. Among women, injuries due to being struck were less frequent than poisoning. Other noteworthy causes of injuries include, among men, cut/pierce and environmental/natural for high-percentage First Nations-identity areas, high-percentage Métis-identity areas, and high-percentage Inuit-identity areas, as well as being burned by fire or a hot substance and injured by machinery for high-percentage First Nations-identity areas and high-percentage Métis-identity areas; and, among women, being cut/pierced, sustaining environmental/natural injuries and being burned by fire or a hot substance for high-percentage First Nations-identity areas, high-percentage Métis-identity areas, and high-percentage Inuit-identity areas.

Rate ratios

Rate ratios comparing areas with a high percentage of Aboriginal-identity residents with those with a low percentage of Aboriginal-identity residents vary according to the predominant Aboriginal-identity group, cause of injury, sex and age group (Table 4). The CIs for most rate ratios contain lower and higher bounds greater than 1.00, which means that the ASHRs observed in areas with a high percentage of Aboriginal-identity residents are significantly higher than those observed in areas with a low percentage of Aboriginal-identity residents. Among men, rate ratios for all causes combined are highest in high-percentage First Nations-identity areas (2.7; 95% CI: 2.6–2.7) followed by high-percentage Métis-identity areas (2.0; 95% CI: 2.0–2.1) and high-percentage Inuit-identity areas (1.8; 95% CI: 1.7–1.9). Among women, rate ratios are highest in high-percentage First Nations-identity

TABLE 3
Age-standardized hospitalization rates (per 10 000 person-years) for unintentional injuries by sex, age group, cause of injury, and by Aboriginal identity group[a], dissemination areas[b], population ≥ 20 years, Canada (excluding Quebec), 2004/2005–2009/2010

Cause of injury[c]	Total		20–29 years		30–44 years		≥ 45 years	
	ASHR	95% CI	ASHR	95% CI	ASHR	95% CI	ASHR	95% CI
Men								
Total								
High % First Nations	145.94	144.13–147.77	132.93	127.77–138.29	142.13	137.67–146.74	157.54	153.50–161.68
High % Métis	111.76	107.71–115.97	137.57	124.68–151.79	106.05	97.20–115.70	100.46	93.89–107.49
High % Inuit	100.47	95.14–106.09	108.88	95.04–124.72	71.15	61.72–82.03	121.00	108.18–135.33
Low % Aboriginal	54.53	54.36–54.70	52.27	51.80–52.74	44.76	44.43–45.10	64.58	64.29–64.88
Cut/Pierce								
High % First Nations	6.08	5.73–6.47	9.03	7.76–10.51	6.58	5.67–7.63	3.78	3.18–4.50
High % Métis	4.41	3.65–5.33	8.32	5.58–12.41	3.16	1.90–5.25	3.03	2.00–4.61
High % Inuit	5.04	4.09–6.21	8.77	5.45–14.13	4.57	2.59–8.05	x	x
Low % Aboriginal	1.75	1.72–1.78	2.39	2.29–2.50	1.77	1.71–1.84	1.32	1.27–1.36
Drowning, Suffocation								
High % First Nations	1.09	0.92–1.28	x	x	0.79	0.52–1.21	1.80	1.42–2.28
High % Métis	0.74	0.45–1.19	x	x	x	x	1.21	0.68–2.15
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	0.40	0.39–0.42	0.19	0.16–0.22	0.18	0.16–0.21	0.73	0.70–0.76
Fall								
High % First Nations	54.56	53.50–55.64	29.18	26.82–31.75	45.93	43.42–48.57	78.24	75.48–81.10
High % Métis	37.21	34.97–39.59	27.29	21.89–34.02	31.63	26.98–37.09	48.41	44.08–53.17
High % Inuit	34.96	32.01–38.18	22.28	16.51–30.06	19.19	14.61–25.20	56.90	48.31–67.02
Low % Aboriginal	21.32	21.21–21.42	12.52	12.29–12.75	13.02	12.84–13.20	34.20	34.00–34.41
Fire/Hot substance								
High % First Nations	3.45	3.15–3.77	2.59	1.95–3.44	3.53	2.89–4.32	3.91	3.31–4.63
High % Métis	2.70	2.07–3.50	x	x	2.91	1.73–4.92	2.24	1.40–3.60
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	0.81	0.79–0.84	0.83	0.77–0.89	0.73	0.68–0.77	0.88	0.84–0.91
Firearm								
High % First Nations	1.01	0.86–1.20	1.79	1.27–2.52	1.08	0.75–1.56	0.46	0.27–0.76
High % Métis	x	x	x	x	x	x	x	x
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	0.19	0.18–0.21	0.45	0.41–0.50	0.16	0.14–0.18	0.07	0.06–0.08
Machinery								
High % First Nations	2.27	2.07–2.48	1.73	1.23–2.45	2.25	1.75–2.90	2.62	2.13–3.22
High % Métis	3.25	2.73–3.88	x	x	5.20	3.51–7.69	2.28	1.41–3.69
High % Inuit	1.62	1.11–2.35	x	x	x	x	x	x
Low % Aboriginal	1.31	1.29–1.34	1.30	1.23–1.38	1.34	1.28–1.40	1.31	1.26–1.35
Motor vehicle traffic								
High % First Nations	19.64	18.98–20.32	28.92	26.56–31.48	18.99	17.41–20.72	14.34	13.13–15.66
High % Métis	18.92	17.39–20.59	31.88	25.99–39.11	18.88	15.35–23.21	10.76	8.67–13.35
High % Inuit	6.08	4.78–7.73	10.69	6.96–16.41	x	x	5.08	2.94–8.76
Low % Aboriginal	7.52	7.46–7.58	10.53	10.32–10.74	6.72	6.59–6.86	6.31	6.21–6.41

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TABLE 3 (continued)
Age-standardized hospitalization rates (per 10 000 person-years) for unintentional injuries by sex, age group, cause of injury, and by Aboriginal identity group[a], dissemination areas[b], population ≥ 20 years, Canada (excluding Quebec), 2004/2005–2009/2010

Cause of injury[c]	Total		20–29 years		30–44 years		≥ 45 years	
	ASHR	95% CI	ASHR	95% CI	ASHR	95% CI	ASHR	95% CI
Other land transportation								
High % First Nations	13.82	13.22–14.44	18.45	16.59–20.51	15.06	13.65–16.60	9.79	8.79–10.90
High % Métis	12.10	10.65–13.76	19.74	15.23–25.59	12.73	9.90–16.36	6.72	5.10–8.86
High % Inuit	18.09	15.83–20.67	33.25	26.01–42.50	11.72	8.23–16.68	14.11	10.22–19.48
Low % Aboriginal	5.39	5.33–5.45	7.37	7.19–7.55	5.45	5.34–5.57	4.08	4.00–4.16
Environmental/Natural								
High % First Nations	5.21	4.88–5.57	3.84	3.05–4.85	6.10	5.23–7.12	5.30	4.59–6.11
High % Métis	4.30	3.63–5.11	4.89	2.90–8.26	3.95	2.52–6.20	4.24	3.05–5.88
High % Inuit	5.39	4.25–6.83	x	x	5.80	3.55–9.48	7.09	4.46–11.27
Low % Aboriginal	0.97	0.94–0.99	0.77	0.71–0.83	0.80	0.75–0.84	1.24	1.20–1.29
Poisoning								
High % First Nations	9.69	9.23–10.18	8.16	6.96–9.57	11.22	10.02–12.57	9.32	8.36–10.38
High % Métis	6.28	5.39–7.33	9.37	6.43–13.67	5.70	3.91–8.31	4.84	3.56–6.58
High % Inuit	5.87	4.79–7.19	x	x	6.24	3.88–10.05	5.77	3.48–9.58
Low % Aboriginal	2.39	2.36–2.43	2.17	2.07–2.26	2.15	2.08–2.22	2.76	2.69–2.82
Struck								
High % First Nations	9.90	9.39–10.44	14.00	12.40–15.82	10.30	9.15–11.60	6.96	6.13–7.90
High % Métis	7.37	6.24–8.69	11.46	8.15–16.12	8.50	6.23–11.59	3.77	2.63–5.41
High % Inuit	6.28	4.89–8.07	11.18	7.29–17.17	4.75	2.75–8.18	4.53	2.50–8.20
Low % Aboriginal	3.84	3.78–3.90	5.72	5.57–5.88	3.92	3.82–4.02	2.58	2.52–2.65
Others[d]								
High % First Nations	19.22	18.59–19.88	14.86	13.20–16.72	20.30	18.66–22.09	21.04	19.57–22.61
High % Métis	13.63	12.32–15.08	15.94	11.94–21.28	12.75	9.92–16.39	12.95	10.68–15.71
High % Inuit	13.44	11.62–15.54	10.90	7.10–16.73	8.80	5.89–13.14	19.13	14.40–25.41
Low % Aboriginal	8.64	8.57–8.70	8.04	7.86–8.23	8.52	8.38–8.67	9.12	9.00–9.23
Women								
Total								
High % First Nations	103.47	101.95–105.02	77.32	73.47–81.37	79.37	76.09–82.78	141.24	137.54–145.04
High % Métis	73.63	70.51–76.87	58.98	50.94–68.28	52.14	46.14–58.92	101.93	95.50–108.78
High % Inuit	86.87	81.77–92.28	51.13	42.01–62.22	59.55	50.77–69.85	133.45	118.43–150.39
Low % Aboriginal	37.17	37.04–37.29	19.90	19.62–20.19	20.53	20.30–20.75	62.75	62.49–63.01
Cut/Pierce								
High % First Nations	1.53	1.34–1.76	2.26	1.67–3.04	1.79	1.35–2.37	0.86	0.59–1.24
High % Métis	1.68	1.27–2.22	3.62	2.01–6.54	x	x	x	x
High % Inuit	2.85	2.11–3.85	x	x	x	x	x	x
Low % Aboriginal	0.42	0.40–0.43	0.55	0.51–0.60	0.44	0.41–0.48	0.31	0.28–0.33
Drowning/Suffocation								
High % First Nations	0.55	0.43–0.70	x	x	x	x	0.99	0.72–1.36
High % Métis	x	x	x	x	x	x	x	x
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	0.25	0.23–0.26	0.09	0.07–0.11	0.11	0.10–0.13	0.47	0.44–0.49

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TABLE 3 (continued)
Age-standardized hospitalization rates (per 10 000 person-years) for unintentional injuries by sex, age group, cause of injury, and by Aboriginal identity group[a], dissemination areas[b], population ≥ 20 years, Canada (excluding Quebec), 2004/2005–2009/2010

Cause of injury[c]	Total		20–29 years		30–44 years		≥ 45 years	
	ASHR	95% CI	ASHR	95% CI	ASHR	95% CI	ASHR	95% CI
Fall								
High % First Nations	54.74	53.71–55.78	24.99	22.84–27.34	30.61	28.60–32.76	94.75	91.81–97.78
High % Métis	39.14	37.12–41.27	20.78	16.23–26.60	20.92	17.25–25.38	66.82	61.90–72.13
High % Inuit	49.33	45.59–53.37	16.03	11.27–22.80	24.33	18.91–31.30	92.32	79.81–106.80
Low % Aboriginal	22.49	22.41–22.58	6.11	5.96–6.28	8.31	8.17–8.46	45.32	45.11–45.54
Fire/hot substance								
High % First Nations	1.46	1.25–1.70	1.78	1.28–2.50	1.39	1.01–1.91	1.32	0.99–1.75
High % Métis	1.93	1.45–2.58	x	x	2.45	1.39–4.32	1.65	0.98–2.76
High % Inuit	2.13	1.40–3.22	x	x	x	x	x	x
Low % Aboriginal	0.35	0.33–0.36	0.27	0.24–0.30	0.29	0.27–0.32	0.44	0.42–0.47
Firearm								
High % First Nations	x	x	x	x	x	x	x	x
High % Métis	x	x	x	x	x	x	x	x
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	0.01	0.01–0.02	0.03	0.02–0.04	0.01	0.01–0.02	0.01	0.00–0.01
Machinery								
High % First Nations	0.19	0.14–0.27	x	x	x	x	x	x
High % Métis	x	x	x	x	x	x	x	x
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	0.10	0.10–0.11	0.10	0.08–0.12	0.09	0.08–0.11	0.12	0.11–0.13
Motor vehicle traffic								
High % First Nations	14.73	14.14–15.34	19.52	17.63–21.61	14.21	12.87–15.70	12.22	11.10–13.46
High % Métis	9.53	8.37–10.84	13.25	9.72–18.06	9.10	6.80–12.19	7.60	5.82–9.92
High % Inuit	4.42	3.28–5.95	x	x	4.88	2.83–8.41	x	x
Low % Aboriginal	4.03	3.99–4.08	4.87	4.73–5.02	3.24	3.15–3.33	4.23	4.15–4.30
Other land transportation								
High % First Nations	4.91	4.54–5.32	6.56	5.50–7.82	5.15	4.37–6.08	3.68	3.08–4.40
High % Métis	3.95	3.07–5.09	4.28	2.48–7.37	3.24	1.98–5.29	4.39	3.08–6.26
High % Inuit	9.40	7.78–11.35	9.54	6.08–14.96	8.19	5.33–12.58	10.39	6.80–15.89
Low % Aboriginal	1.72	1.69–1.76	1.81	1.72–1.90	1.65	1.59–1.72	1.74	1.69–1.79
Environmental/Natural								
High % First Nations	2.30	2.06–2.56	2.15	1.59–2.93	1.98	1.52–2.59	2.66	2.18–3.26
High % Métis	1.53	1.08–2.16	x	x	x	x	2.17	1.33–3.53
High % Inuit	1.76	1.12–2.79	x	x	x	x	x	x
Low % Aboriginal	0.62	0.60–0.64	0.45	0.40–0.49	0.49	0.45–0.52	0.84	0.81–0.87
Poisoning								
High % First Nations	10.25	9.75–10.77	8.72	7.49–10.15	11.50	10.29–12.85	10.08	9.07–11.20
High % Métis	5.90	5.04–6.91	4.88	2.94–8.10	4.88	3.27–7.29	7.45	5.72–9.69
High % Inuit	5.05	3.97–6.41	7.15	4.23–12.08	4.93	2.80–8.70	x	x
Low % Aboriginal	2.28	2.25–2.32	1.79	1.71–1.88	1.91	1.85–1.98	2.92	2.86–2.98

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TABLE 3 (continued)
Age-standardized hospitalization rates (per 10 000 person-years) for unintentional injuries by sex, age group, cause of injury, and by Aboriginal identity group[a], dissemination areas[b], population ≥ 20 years, Canada (excluding Quebec), 2004/2005–2009/2010

Cause of injury[c]	Total		20–29 years		30–44 years		≥ 45 years	
	ASHR	95% CI	ASHR	95% CI	ASHR	95% CI	ASHR	95% CI
Struck								
High % First Nations	3.06	2.77–3.37	3.77	3.00–4.76	3.04	2.45–3.77	2.62	2.14–3.22
High % Métis	2.51	1.89–3.32	3.96	2.25–6.97	x	x	2.22	1.39–3.53
High % Inuit	2.07	1.43–3.00	x	x	x	x	x	x
Low % Aboriginal	0.85	0.82–0.87	1.00	0.94–1.07	0.76	0.72–0.80	0.83	0.80–0.86
Others[d]								
High % First Nations	9.65	9.17–10.15	7.14	6.04–8.45	8.99	7.93–10.19	11.78	10.72–12.95
High % Métis	6.74	5.82–7.80	5.58	3.47–8.97	6.48	4.58–9.16	7.69	5.99–9.88
High % Inuit	9.39	7.76–11.36	6.08	3.45–10.71	7.24	4.62–11.37	13.36	9.30–19.19
Low % Aboriginal	4.04	4.00–4.09	2.83	2.73–2.95	3.21	3.12–3.30	5.54	5.45–5.62

Source: Discharge Abstract Database, 2004/2005–2009/2010.

Abbreviations: ASHR, age-standardized hospitalization rate; CI, confidence interval.

Note: "x" indicates that the data was suppressed to meet the confidentiality requirements of the Statistics Act.

[a] The percentage of Aboriginal identity is provided by the 2006 Census.

[b] Dissemination areas where at least 33% of the population reported Aboriginal identity are classified as high-percentage Aboriginal identity. Classification as high-percentage First Nations, Métis or Inuit is based on the predominant group.

[c] Categories of unintentional injury based on ICD-10-CA codes. More information available on request.

[d] Includes categories such as overexertion, water transport accidents, exposure to electric transmission lines, etc.

areas (2.8; 95% CI: 2.7–2.8) followed by high-percentage Inuit-identity areas (2.3; 95% CI: 2.2–2.5) and high-percentage Métis-identity areas (2.0; 95% CI: 1.9–2.1).

Several unintentional injury causes present a significant rate ratio for all sex–age combinations. In high-percentage First Nations-identity areas, consistent disparities with low-percentage Aboriginal-identity areas are observed for 8 causes of injuries (cuts, falls, fire/hot substance, motor vehicle traffic, other land transport, environmental/natural causes, poisoning and being struck). Consistent disparities across all sex–age combinations are observed for 4 causes of injuries (falls, motor vehicle traffic, other land transport, and poisoning) in high-percentage Métis-identity areas and for 2 causes of injuries (falls and other land transport) in high-percentage Inuit-identity areas.

Rates of unintentional injury hospitalizations due to being burned by a fire or a hot substance, environmental/natural causes and poisoning in high-percentage First Nations-identity areas are more than 3 times those in low-percentage Aboriginal-identity areas, and this is observed for all sex–age combinations. For high-percentage Inuit-identity areas, other land transportation accidents present a rate ratio higher than 3.0 among all sex–age combinations, with the exception of men aged 30 to 44 years, where the rate ratio was closer to 2.0 (2.1; 95% CI: 1.5–3.1). For those people living in high-percentage Métis-identity areas, no cause presents a rate ratio consistently higher than this threshold among the 6 sex–age combinations.

Firearm injuries, which represent a low rate of injury (Table 3), have a high rate ratio for men living in high-percentage First Nations-identity areas (Table 4): the rate ratio increases from 4.0 (95% CI: 2.8–5.7) for 20- to 29-year-olds to 7.0 (95% CI: 3.9–12.4) for those aged 45 years plus. Likewise, drowning/suffocation injuries, although relatively rare among men aged 30 to 44 years living in high-percentage First Nations-identity areas, present a high rate ratio of 4.3 (95% CI: 2.8–6.7) in this age group. In contrast, falls, the most frequent cause of injury, do not present the highest rate ratios observed, but are still significantly greater than 1.0. With the exception of men aged 30 to 44 years living in high-percentage First Nations-identity areas, rate ratios for falls do not exceed the rate ratios for all causes combined.

Discussion

This study examined unintentional injury hospitalizations, by cause, among adults living in high-percentage First Nations-identity, Métis-identity and Inuit-identity areas and low-percentage Aboriginal-identity areas. Falls account for approximately one-third to two-thirds of all injury hospitalizations. In general, for all high-percentage Aboriginal-identity areas and for both sexes, the highest injury rates are observed among the oldest age group, the only exception being for men living in high-percentage Métis-identity areas among whom the highest rates were observed for the 20- to 29-year age group.

The rate ratios are consistently higher in areas with high proportions of First Nations-, Métis- and Inuit-identity residents: for all causes and all ages combined, rate ratios lie between 1.8 and 2.7 for men and 2.0 and 2.8 for women.

TABLE 4
Age-standardized rate ratios per 10 000 person-years for unintentional injuries by sex, age group, cause of injury, and by Aboriginal identity group[a], dissemination areas[b], population ≥ 20 years, Canada (excluding Quebec), 2004/2005–2009/2010

Cause of injury[c]	TOTAL ≥ 20 years		20–29 years		30–44 years		≥ 45 years	
	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI
Men								
Total								
High % First Nations	2.68	2.64–2.71	2.54	2.44–2.65	3.18	3.07–3.28	2.44	2.38–2.50
High % Métis	2.05	1.97–2.13	2.63	2.38–2.91	2.37	2.17–2.59	1.56	1.47–1.65
High % Inuit	1.84	1.74–1.95	2.08	1.81–2.39	1.59	1.38–1.83	1.87	1.67–2.10
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Cut								
High % First Nations	3.48	3.27–3.71	3.77	3.22–4.41	3.71	3.19–4.33	2.87	2.39–3.46
High % Métis	2.52	2.08–3.05	3.48	2.32–5.20	1.78	1.07–2.97	2.30	1.44–3.67
High % Inuit	2.88	2.34–3.55	3.66	2.27–5.92	2.58	1.45–4.59	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Drowning/Suffocation								
High % First Nations	2.71	2.28–3.22	x	x	4.31	2.76–6.72	2.46	1.99–3.05
High % Métis	1.83	1.13–2.98	x	x	x	x	1.66	1.05–2.61
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Fall								
High % First Nations	2.56	2.51–2.61	2.33	2.14–2.54	3.53	3.33–3.74	2.29	2.22–2.36
High % Métis	1.75	1.64–1.86	2.18	1.75–2.72	2.43	2.07–2.85	1.42	1.31–1.53
High % Inuit	1.64	1.50–1.79	1.78	1.32–2.41	1.47	1.13–1.93	1.66	1.41–1.97
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Fire/Hot substance								
High % First Nations	4.25	3.86–4.67	3.13	2.34–4.18	4.87	3.95–6.02	4.47	3.76–5.30
High % Métis	3.32	2.55–4.33	x	x	4.02	2.38–6.79	2.56	1.60–4.11
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Firearm								
High % First Nations	5.19	4.36–6.19	3.97	2.78–5.66	6.89	4.69–10.12	6.97	3.92–12.38
High % Métis	x	x	x	x	x	x	x	x
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Machinery								
High % First Nations	1.72	1.57–1.89	1.33	0.94–1.90	1.68	1.30–2.18	2.00	1.62–2.48
High % Métis	2.48	2.07–2.96	x	x	3.89	2.63–5.75	1.75	1.01–3.02
High % Inuit	1.23	0.85–1.79	x	x	x	x	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Motor vehicle								
High % First Nations	2.61	2.52–2.71	2.75	2.52–3.00	2.82	2.58–3.09	2.27	2.08–2.49
High % Métis	2.52	2.31–2.74	3.03	2.47–3.72	2.81	2.28–3.46	1.71	1.37–2.12
High % Inuit	0.81	0.64–1.03	1.01	0.66–1.55	x	x	0.80	0.46–1.40
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a

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TABLE 4 (continued)
Age-standardized rate ratios per 10 000 person-years for unintentional injuries by sex, age group, cause of injury, and by Aboriginal identity group[a], dissemination areas[b], population ≥ 20 years, Canada (excluding Quebec), 2004/2005–2009/2010

Cause of injury[c]	TOTAL ≥ 20 years		20–29 years		30–44 years		≥ 45 years	
	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI
Other land transport								
High % First Nations	2.56	2.45–2.68	2.50	2.25–2.79	2.76	2.50–3.05	2.40	2.14–2.68
High % Métis	2.25	1.97–2.55	2.68	2.06–3.48	2.33	1.82–3.00	1.65	1.23–2.20
High % Inuit	3.36	2.94–3.84	4.51	3.52–5.79	2.15	1.50–3.07	3.46	2.51–4.76
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Environmental/Natural								
High % First Nations	5.39	5.02–5.78	5.01	3.92–6.40	7.65	6.49–9.01	4.26	3.69–4.92
High % Métis	4.45	3.74–5.29	6.37	3.74–10.87	4.96	3.16–7.78	3.41	2.54–4.58
High % Inuit	5.57	4.39–7.07	x	x	7.28	4.51–11.73	5.71	3.55–9.17
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Poisoning								
High % First Nations	4.05	3.85–4.26	3.77	3.19–4.45	5.22	4.64–5.88	3.38	3.03–3.77
High % Métis	2.62	2.25–3.06	4.33	2.96–6.33	2.65	1.81–3.89	1.76	1.34–2.31
High % Inuit	2.45	2.00–3.00	x	x	2.91	1.82–4.64	2.09	1.26–3.47
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Struck								
High % First Nations	2.58	2.44–2.72	2.45	2.16–2.77	2.63	2.33–2.97	2.70	2.37–3.07
High % Métis	1.92	1.62–2.27	2.00	1.42–2.82	2.17	1.58–2.97	1.46	1.03–2.07
High % Inuit	1.64	1.27–2.10	1.95	1.25–3.05	1.21	0.71–2.06	1.76	0.93–3.31
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Others[d]								
High % First Nations	2.23	2.15–2.30	1.85	1.64–2.08	2.38	2.18–2.60	2.31	2.15–2.48
High % Métis	1.58	1.43–1.75	1.98	1.48–2.65	1.50	1.16–1.92	1.42	1.18–1.71
High % Inuit	1.56	1.34–1.80	1.36	0.88–2.09	1.03	0.70–1.53	2.10	1.56–2.81
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Women								
Total								
High % First Nations	2.78	2.74–2.83	3.88	3.68–4.10	3.87	3.70–4.04	2.25	2.20–2.30
High % Métis	1.98	1.90–2.07	2.96	2.56–3.43	2.54	2.25–2.87	1.62	1.55–1.70
High % Inuit	2.34	2.20–2.48	2.57	2.11–3.13	2.90	2.47–3.40	2.13	1.87–2.42
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Cut								
High % First Nations	3.68	3.19–4.25	4.07	2.98–5.56	4.02	3.02–5.37	2.81	1.89–4.16
High % Métis	4.03	3.04–5.34	6.54	3.59–11.89	x	x	x	x
High % Inuit	6.84	5.05–9.27	x	x	x	x	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Drowning/Suffocation								
High % First Nations	2.22	1.72–2.86	x	x	x	x	2.12	1.62–2.79
High % Métis	x	x	x	x	x	x	x	x
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a

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TABLE 4 (continued)
Age-standardized rate ratios per 10 000 person-years for unintentional injuries by sex, age group, cause of injury, and by Aboriginal identity group[a], dissemination areas[b], population ≥ 20 years, Canada (excluding Quebec), 2004/2005–2009/2010

Cause of injury[c]	TOTAL ≥ 20 years		20–29 years		30–44 years		≥ 45 years	
	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI
Fall								
High % First Nations	2.43	2.39–2.48	4.09	3.72–4.49	3.68	3.43–3.95	2.09	2.04–2.14
High % Métis	1.74	1.65–1.84	3.40	2.65–4.36	2.52	2.07–3.06	1.47	1.40–1.55
High % Inuit	2.19	2.03–2.37	2.62	1.83–3.76	2.93	2.26–3.78	2.04	1.73–2.40
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Fire/Hot substance								
High % First Nations	4.21	3.58–4.94	6.68	4.67–9.57	4.71	3.39–6.55	2.98	2.31–3.83
High % Métis	5.58	4.16–7.48	x	x	8.33	4.67–14.85	3.72	2.43–5.70
High % Inuit	6.13	4.04–9.31	x	x	x	x	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Firearm								
High % First Nations	x	x	x	x	x	x	x	x
High % Métis	x	x	x	x	x	x	x	x
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Machinery								
High % First Nations	1.82	1.29–2.56	x	x	x	x	x	x
High % Métis	x	x	x	x	x	x	x	x
High % Inuit	x	x	x	x	x	x	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Motor vehicle								
High % First Nations	3.65	3.50–3.81	4.01	3.60–4.45	4.39	3.96–4.87	2.89	2.62–3.19
High % Métis	2.36	2.07–2.69	2.72	1.99–3.72	2.81	2.10–3.77	1.80	1.33–2.43
High % Inuit	1.10	0.81–1.48	x	x	1.51	0.89–2.54	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Other land transport								
High % First Nations	2.85	2.63–3.10	3.63	3.03–4.36	3.12	2.64–3.70	2.12	1.76–2.55
High % Métis	2.29	1.78–2.96	2.37	1.37–4.09	1.96	1.20–3.21	2.53	1.67–3.82
High % Inuit	5.45	4.51–6.60	5.28	3.37–8.27	4.96	3.23–7.61	5.99	3.78–9.48
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Environmental/Natural								
High % First Nations	3.72	3.32–4.17	4.83	3.50–6.66	4.07	3.09–5.37	3.17	2.62–3.84
High % Métis	2.47	1.74–3.51	x	x	x	x	2.58	1.52–4.38
High % Inuit	2.86	1.81–4.53	x	x	x	x	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Poisoning								
High % First Nations	4.49	4.26–4.73	4.87	4.15–5.71	6.01	5.35–6.75	3.45	3.11–3.83
High % Métis	2.59	2.21–3.03	2.73	1.65–4.51	2.55	1.71–3.82	2.55	1.95–3.34
High % Inuit	2.21	1.74–2.81	3.99	2.35–6.79	2.58	1.42–4.68	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a

Continued on the following page

TABLE 4 (continued)
Age-standardized rate ratios per 10 000 person-years for unintentional injuries by sex, age group, cause of injury, and by Aboriginal identity group[a], dissemination areas[b], population ≥ 20 years, Canada (excluding Quebec), 2004/2005–2009/2010

Cause of injury[c]	TOTAL ≥ 20 years		20–29 years		30–44 years		≥ 45 years	
	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI
Struck								
High % First Nations	3.61	3.26–4.00	3.77	2.96–4.79	4.01	3.21–5.01	3.17	2.60–3.85
High % Métis	2.96	2.23–3.93	3.95	2.23–7.00	x	x	2.68	1.80–3.98
High % Inuit	2.45	1.69–3.55	x	x	x	x	x	x
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a
Others[d]								
High % First Nations	2.39	2.27–2.51	2.52	2.12–3.00	2.80	2.46–3.18	2.13	1.96–2.32
High % Métis	1.67	1.44–1.93	1.97	1.22–3.17	2.02	1.43–2.86	1.39	1.12–1.72
High % Inuit	2.32	1.92–2.81	2.15	1.22–3.79	2.26	1.46–3.50	2.41	1.67–3.49
Low % Aboriginal	1.00	n/a	1.00	n/a	1.00	n/a	1.00	n/a

Source: Discharge Abstract Database, 2004/2005–2009/2010.

Abbreviations: CI, confidence interval; n/a, Not applicable; RR, rate ratio.

Note: "x" indicates that the data was suppressed to meet the confidentiality requirements of the Statistics Act.

[a] The percentage of Aboriginal identity is provided by the 2006 Census.

[b] Dissemination areas where at least 33% of the population reported Aboriginal identity are classified as high-percentage Aboriginal identity. Classification as high-percentage First Nations, Métis, or Inuit is based on the predominant group.

[c] Categories of unintentional injury based on ICD-10-CA codes. More information available on request.

[d] Includes categories such as overexertion, water transport accidents, exposure to electric transmission lines, etc.

However, rate ratios present high variability as some causes of unintentional injuries produce a rate ratio as large as 7.0 (firearms for men aged 45 years plus living in high-percentage First Nations-identity areas) and others have a rate ratio less than 1.0, suggesting smaller disparities compared to low-percentage Aboriginal-identity areas.

Our findings show that ASHRs and rate ratios are two measures of injury hospitalization that are complementary but not overlapping. Indeed, causes of unintentional injuries that present both a "high" ASHR and a "high" rate ratio are relatively rare. Only 13 instances have both an injury rate higher than 10/10 000 and rate ratio higher than 3.0,* which means that the injury being considered is both much more frequent than other injuries and much more frequent in the high-percentage Aboriginal-identity area than in low-percentage Aboriginal-identity areas: (1) for falls, among men aged 30 to 44 years living in high-percentage First Nations-identity areas, among women aged 20 to 29 years or 30 to 44 years living in high-percentage First Nations-identity areas and among women aged 20 to 29 years living in high-percentage Métis-identity areas; (2) for motor vehicle traffic accidents, among men aged 20 to 29 years living in high-percentage Métis-identity areas and among women aged 20 to 29 years or 30 to 44 years living in high-percentage First Nations-identity areas; (3) for other land transport accidents, among men aged 20 to 29 years or 45 years or more living in high-percentage Inuit-identity areas and among women aged 45 years or more living in high-percentage Inuit-identity areas; and (4) for poisoning, among men aged 30 to 44 years living in high-percentage First Nations-identity areas and among women aged 30 to 44 or 45 years or more living in high-percentage First Nations-identity areas.

In summary, areas with high percentage of Aboriginal-identity residents can be characterized as follows:

- High-percentage First Nations-identity areas present the highest total ASHRs among the 4 types of areas for each sex–age combination, a high ASHR of 29 per 10 000 for motor vehicle traffic among men aged 20 to 29 years, a relatively high ASHR for poisoning for all sex–age combinations, a relatively high ASHR for being struck for all age groups among men, and relatively high rate ratios for drowning/suffocation, fire/hot substance and firearm injuries (for all sex–age combinations for which results were available), even though the ASHR for these causes is low;
- High-percentage Métis-identity areas present a total ASHR among men aged 20 to 29 years that is higher than in other age groups, the lowest total ASHRs among women living in high-percentage Aboriginal-identity areas and a relatively high ASHR for machinery among men aged 30 to 44;
- High-percentage Inuit-identity areas present the lowest total ASHRs among men of all age groups living in high-percentage Aboriginal-identity areas, the highest ASHR for other land transportation for most sex–age combinations and a high rate ratio for environmental/natural causes among

* Thresholds of 10/10 000 person-years for ASHR and 3.0 for rate ratios were chosen arbitrarily in this section.

men, for all age groups for which results were available.

Although we used a different methodology, our results are in line with those of Fantus et al.[14] concerning falls and motor vehicle traffic accidents: these authors found an age- and sex-adjusted rate of 57 and 14 per 10 000 person-years respectively for these 2 causes, whereas we found ASHRs of 55 per 10 000 for falls for both sexes and of 20 and 15 per 10 000 respectively for men and women for motor vehicle accidents. Also, even though we examined hospitalizations rather than deaths, used geozones instead of a record-linkage approach and did not use the same age groups, our results for rate ratios on falls for high-percentage First Nations and high-percentage Métis identity areas are similar to those found by Tjepkema et al.[5]

Limitations

This analysis only included injuries resulting in hospitalizations, and not those that caused death.[13] Also, individuals presenting to emergency departments, physicians' offices or clinics were not captured by these data.

As with any study based on an ecological approach, bias can occur because the results are based on geographical areas and not on individuals.[22,26] Our results relate to people living in areas with high proportions of Aboriginal-identity residents—according to a previously defined threshold—and include those who do not necessarily self-identify as Aboriginal; therefore, the results are not representative of First Nations, Métis or Inuit individuals in Canada. As well, any difference observed between high-percentage Aboriginal-identity areas and low-percentage Aboriginal-identity areas may be explained by other factors such as socio-economic characteristics (not related to Aboriginal identity), some of which are described in Table 1. In particular, residing in rural or urban areas could be a confounding factor. This variable, represented in Table 1 by Metropolitan Influence Zones (MIZs), was not used in this study. A limitation related to not using MIZs is the fact that, because Aboriginal identity is defined from the 2006 Census whereas the Discharge Abstract Database is used for 6 fiscal years (2004/2005 to 2009/2010), there may be a discrepancy in how the regions are defined in these two databases.

Other limitations related to geographical data should be mentioned. First, the province of Quebec as well as one hospital from the territories did not provide administrative data and thus were not included. Second, the geographical location where the injury occurred was not available and the residential postal code was used as a proxy. Third, it should be noted that, for some rural areas, postal codes are not an accurate representation of residential location because of the use of P.O. Box numbers, which may be located in a different area than the place of residence; also, rural postal codes may map on to more than one DA, thus reducing the ability to determine the specific place of residence.[19]

Conclusion

We presented hospitalization data for unintentional injuries in Canada, allowing for comparisons between areas with a high percentage of Aboriginal (First Nations, Métis or Inuit)-identity residents and areas with a low percentage of Aboriginal-identity residents. Health disparities in the Aboriginal population need to be considered within their broader social context: Aboriginal people in Canada
generally live in areas characterized by lower socio-economic conditions than the general Canadian population, including lower income, higher rates of unemployment, crowded living conditions and houses in need of repairs.[7] The results presented in Table 1, showing that high-percentage Aboriginal-identity areas are made up of a majority of Aboriginal-identity individuals and are characterized by lower socio-economic conditions than low-percentage Aboriginal-identity areas, lend support to this. In addition, our data also show a higher rate of hospitalizations due to unintentional injuries in areas with a high proportion of Aboriginal-identity residents, which may indicate people living in lower socio-economic conditions who are at risk of problems related to health.

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