
Unintentional injury mortality and external causes in Canada from 2001 to 2007

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Abstract

Introduction: To understand the distribution pattern and time trend of unintentional injury mortalities is crucial in order to develop prevention strategies.

Methods: We analyzed vital statistics data from Canada (excluding Quebec) for 2001 to 2007. Mortality rates were age- and sex-standardized to the 2001 Canadian population. An autoregressive model was used for time-series analysis.

Results: Overall mortality rate steadily decreased but unintentional injury mortality rate was stable over the study period. The three territories had the highest mortality rates. Unintentional injury deaths were less common in children than in youths/adults. After 60, the mortality rate increased steadily with age. Males were more likely to die of unintentional injury, and the male/female ratio peaked in the 25- to 29-year age group. Motor vehicle crashes, falls and poisoning were the three major causes. There was a substantial year after year increase in mortality due to falls. Deaths due to motor vehicle crashes and drowning were more common in summer months, and deaths caused by falls and burns were more common in winter months.

Conclusion: The share of unintentional injury among all-cause mortality and the mortality from falls increased in Canada during the period 2001 to 2007.

Keywords: age standardization, burn, Canada, consumer product, drowning, fall, mortality, poisoning, unintentional injury, suffocation, vehicle traffic crash, vital statistics

Introduction

Injuries are among the leading causes of death and disabilities worldwide.¹ They represent about 16% of the global burden of disease² and are the leading cause of death in people aged under 60 years.³ In 2004, World Health Organization estimated that injuries caused over 5 million deaths per year, of which 3.9 million were unintentional.⁴ Compared to many other diseases, injuries affect more young people, and therefore result in more years of life lost.¹ In Canada, the total economic burden of injury was about \$20 billion in

2004, of which \$16 billion was as a result of unintentional injuries.⁵

Unintentional injury is any injury that is not caused on purpose or with intention to harm. Since not all unintentional injuries are random events and some of them can be prevented, it is not usually appropriate to use the word “accident” to define unintentional injury. Unintentional injury can be further classified according to external causes such as motor vehicle collisions, falls, poisoning, drowning, suffocations and so on.⁶ Unintentional injuries may be work-related or sports-related.

Different types of unintentional injury may have unique patterns in different subpopulations, for example, motor vehicle crashes are most common among young people⁷ while falls are more likely to cause a fatal outcome among the elderly.⁸ Monitoring the changing patterns of overall and cause-specific unintentional injury mortalities gathers information essential to developing new programs on unintentional injury prevention and intervention and modifying existing ones. In this study, we conducted a descriptive analysis of vital statistics data to investigate the distribution patterns and time trends of overall and cause-specific unintentional injury mortalities in Canada (excluding Quebec).

Methods

The study was based on mortality data from the Canadian Vital Statistics Death Database (excluding deaths registered in the province of Quebec, since these were not available on the Data Extraction and Analysis System, Public Health Agency of Canada) for the period from January 1, 2001, to December 31, 2007. Death statistics are based on information abstracted and compiled from death certificates, and are provided to Statistics Canada by the vital statistics registrars in each province or territory. The mortality data in this analysis are coded using the *International Classification of Diseases, 10th Revision* (ICD-10), in which external causes are classified under a series of alphanumeric codes, V01–Y98. These codes were used to identify unintentional injury deaths (ICD-10: V01–X59, Y85–Y86) and unintentional

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injury deaths by cause including motor vehicle traffic crashes (V02–V04 [9], V09.2, V12–V14 [3–9], V19 [4–6], V20–V28 [3–9], V29 [4–9], V30–V79 [4–9], V80 [3–5], V81–V82 [1], V83–V86 [0–3], V87 [0–8], V89.2); pedal cycle (ICD-10: V10–V14, V16–V19); pedestrian (traffic-related) (ICD-10: V02–V04 [1], V09.2, V09.3); recreation boating (ICD-10: V90.2–V90.8, V91.2–V91.8, V92.2–V92.8, V93.2–V93.8, V94.2–V94.8); drowning (ICD-10: V90, V92, W65–W74); falls (ICD-10: W00–W19); burns or fire (ICD-10: W85–W91, X00–X19); suffocations (ICD-10: W75–W84); poisoning (ICD-10: X40–X49) and other unintentional causes.

We took annual population estimates from Statistics Canada's annual demographic statistics.^{9,10} Age- and sex-standardized mortality rates were calculated using the direct method with reference to the 2001 Canadian population. For each province and for the three territories (Northwest Territory, Yukon and Nunavut) combined, average overall mortality rates were calculated for the 7-year study period, that is, the total number of deaths during the period divided by the sum of the annual populations, which is equivalent to a weighted average of annual rates using the annual population as a weight.

To explore time trends for unintentional injury mortality rates from 2001 to 2007 and seasonal pattern for cause-specific unintentional injury mortalities in males and females, we conducted time-series analysis. The mortality rates were calculated by using average annual population as the denominator since there were no monthly population estimates. Because the numbers of death per month were small and could not be further stratified by age, we conducted age and sex-standardization by using the ratios of annual standardized versus crude rates (crude monthly rate × standardized/crude mortality for the year). The adjusted monthly rates were then plotted to visually display their time trends and seasonal patterns. Autoregressive models were fitted to determine the associations of secular year and month with various unintentional injury mortalities. In the models, the first order autocorrelation was considered, with monthly rates being dependent vari-

ables and year and month indicators being independent variables.

All analyses were conducted using SAS version 9.1 statistical software (SAS Institute Inc., Cary, NC, US).

Results

There were a total of 51 178 deaths due to unintentional injuries, which accounted for 4.2% of all deaths in Canada excluding Quebec during the study period from 2001 to 2007. The age- and sex-standardized mortality for all causes steadily decreased from 702 per 100 000 in 2001 to 631 per 100 000 in 2007 ($p < .001$) while the mortality due to unintentional injuries was relatively stable year after year ($p = .571$). As a result, the proportion of uninten-

tional injury mortality versus all mortality increased significantly ($p = .003$) in the 7-year period. Males accounted for 61.1% of all unintentional injury deaths. However, males and females had similar time trends for unintentional injury mortality, overall mortality (all causes combined) and their ratio (Table 1).

After age- and sex-standardization, the three territories combined had the highest overall mortality (842.3 per 100 000) and unintentional injury mortality (69.1 per 100 000) (Table 2). British Columbia had the lowest overall mortality (626.8 per 100 000) while Newfoundland and Labrador had the lowest mortality due to unintentional injuries (24.8 per 100 000). The unintentional injury mortality for the three territories was almost triple that of

TABLE 1
Crude and standardized mortality by calendar year, total and by sex, Canada (excluding Quebec), 2001–2007

Calendar year	Crude mortality		Standardized mortality ^a		
	All causes, per 100 000	Unintentional injury, per 100 000	All causes, per 100 000	Unintentional injury, per 100 000	Unintentional injury/All causes, %
Total					
2001	701.8	28.7	702.1	28.7	4.09
2002	704.3	29.9	692.3	29.6	4.28
2003	710.3	29.5	685.3	28.8	4.20
2004	702.2	28.7	664.6	27.7	4.27
2005	708.5	30.1	656.8	28.6	4.35
2006	699.2	30.5	633.6	28.5	4.50
2007	709.7	32.0	631.0	29.7	4.71
Male					
2001	725.0	36.4	879.5	39.9	4.54
2002	720.3	37.1	857.7	40.6	4.73
2003	729.5	36.2	851.2	39.3	4.62
2004	718.7	35.2	824.1	37.8	4.59
2005	722.6	37.3	811.2	39.6	4.88
2006	715.1	36.8	783.2	38.5	4.92
2007	725.9	39.0	778.3	40.4	5.19
Female					
2001	679.1	21.2	572.7	18.5	3.23
2002	688.5	22.8	571.3	19.7	3.45
2003	691.4	22.9	564.3	19.3	3.42
2004	686.0	22.4	547.8	18.4	3.36
2005	694.5	23.0	650.3	18.9	2.91
2006	683.5	24.3	626.4	19.4	3.10
2007	693.8	25.0	624.7	20.0	3.20

^a Standardized according to the entire 2001 Canadian population.

Newfoundland and Labrador. Ontario also had a low unintentional injury mortality (26.3 per 100 000), which was similar to Newfoundland and Labrador, but all-cause mortality was very different in the two provinces, 655.9 per 100 000 in Ontario versus 802.9 per 100 000 in Newfoundland and Labrador. The differences between the other provinces were relatively small for both all-cause mortality and unintentional injury mortality (Table 2). Table 2 also shows that the unintentional injury mortality and the ratio of unintentional injury versus all-cause mortalities were higher in males than in females across all provinces/territories.

Unintentional injury deaths were less common among children (< 7 per 100 000) than among youths and adults (Table 3). Unintentional injury mortality was generally similar for those aged 15 to 59 years (28.5–37.7 per 100 000 in males and 8.5–12.7 per 100 000 in females). After age 60 years, mortality increased steadily with age from 35.3 per 100 000 in the 60- to 64-year age group to 801.0 per 100 000 in the 90-year-plus age group in men and from 14.4 to 663.1 per 100 000 in women. In all the age groups, males were more likely to die of unintentional injuries (Table 3). The male to female mortality ratio increased with age after 5 to 9 years (1.34), peaked at 25 to 29 years (3.76) and then steadily decreased with age. Table 3 also shows that of unintentional injury deaths from identified causes, motor vehicle traffic crashes were most common in males, with a mortality rate of 10.2 per 100 000, followed by falls (7.7 per 100 000) and poisoning (5.1 per 100 000). In females, the first three identified causes for unintentional injury death were falls, motor vehicle traffic crashes and poisoning with the mortality rates being 7.9, 4.5 and 2.2 per 100 000, respectively. Cause-specific unintentional injury mortalities were all higher in males than in females except for fall mortality (Table 3). Overall, falls accounted for 26% of all unintentional injury deaths, motor vehicle traffic crashes for 24% and poisoning for 12% (Figure 1).

Although unintentional injury mortality increased sharply after 60 years of age, it comprised a much higher proportion of all deaths in younger age groups

TABLE 2
Average mortality by province/territory, Canada (excluding Quebec), total and by sex, 2001–2007

Province	Crude mortality		Standardized mortality ^a		
	All causes, per 100 000	Unintentional injury, per 100 000	All causes, per 100 000	Unintentional injury, per 100 000	Unintentional injury/All causes, %
Total					
British Columbia	715.7	32.1	626.8	30.1	4.80
Alberta	582.4	27.8	660.7	28.7	4.34
Saskatchewan	896.0	42.5	693.8	37.5	5.41
Manitoba	843.7	38.1	720.3	34.7	4.82
Ontario	680.7	27.0	655.9	26.3	4.01
New Brunswick	831.2	38.3	713.2	35.3	4.95
Nova Scotia	871.2	35.6	733.9	31.8	4.33
Prince Edward Island	837.9	35.5	703.7	32.4	4.60
Newfoundland and Labrador	841.0	25.2	802.9	24.8	3.09
Territories ^b	396.5	52.3	842.3	69.1	8.20
Male					
British Columbia	741.7	42.0	769.8	42.5	5.52
Alberta	603.3	37.3	822.0	41.0	4.99
Saskatchewan	926.4	53.3	881.0	52.8	5.99
Manitoba	850.1	44.9	903.0	46.6	5.16
Ontario	691.7	31.5	808.1	35.0	4.33
New Brunswick	856.7	49.8	906.6	50.9	5.61
Nova Scotia	892.3	43.1	921.3	44.3	4.81
Prince Edward Island	852.6	43.4	895.2	45.3	5.06
Newfoundland and Labrador	905.2	32.9	1022.9	34.7	3.39
Territories ^b	486.9	74.8	1023.9	92.1	9.00
Female					
British Columbia	690.0	22.3	520.0	18.6	3.58
Alberta	561.0	18.1	543.9	17.6	3.24
Saskatchewan	866.1	31.9	557.7	23.5	4.21
Manitoba	837.5	31.4	587.7	24.4	4.15
Ontario	670.1	22.7	544.7	18.7	3.43
New Brunswick	806.5	27.2	572.9	21.4	3.74
Nova Scotia	851.2	28.4	596.4	20.7	3.47
Prince Edward Island	823.9	28.0	566.9	20.1	3.55
Newfoundland and Labrador	778.6	17.8	647.5	15.3	2.36
Territories ^b	300.5	28.5	695.6	45.2	6.50

^a Standardized according to the entire 2001 Canadian population.

^b Yukon, Northwest Territory, Nunavut.

(Table 4), peaking at age 15 to 19 years (45.2%) for both males (46.7%) and females (41.8%), then gradually decreasing (Table 4).

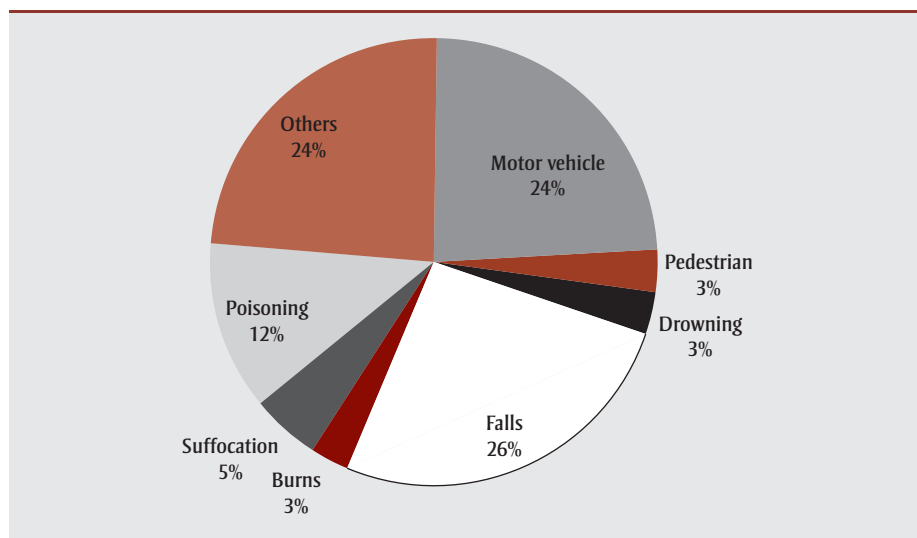
We investigated major external causes for unintentional injury mortality separately, including motor vehicle traffic crashes, falls, poisoning, pedestrian (traffic-

TABLE 3
Mortality and male to female ratio for mortality due to unintentional injury by age and external causes, Canada (excluding Quebec), 2001–2007

Age group, years	Mortality, per 100 000		Ratio Male:Female
	Male	Female	
0–4	7.5	5.3	1.42
5–9	4.3	3.2	1.34
10–14	6.2	3.5	1.77
15–19	29.0	12.0	2.42
20–24	37.7	12.1	3.12
25–29	32.0	8.5	3.76
30–34	28.5	8.6	3.31
35–39	30.4	9.8	3.10
40–44	33.1	10.6	3.12
45–49	34.8	11.9	2.92
50–54	33.3	11.5	2.90
55–59	33.3	12.7	2.62
60–64	35.3	14.4	2.45
65–69	42.8	21.0	2.04
70–74	56.9	32.3	1.76
75–79	98.0	61.4	1.60
80–84	187.2	122.5	1.53
85–89	362.9	271.4	1.33
≥90	801.0	663.1	1.21
External causes			
Motor vehicle crashes	10.2	4.5	2.3
Pedestrian (traffic-related)	1.3	0.8	1.6
Pedal cycle	0.4	0.1	5.4
Recreation boating	0.2	0.0	10.4
Drowning	1.5	0.4	4.3
Falls	7.7	7.9	1.0
Burns	1.1	0.6	1.9
Suffocation	1.6	1.1	1.4
Poisoning	5.1	2.2	2.3
Others	7.9	5.6	1.4

related), drowning, burns, and suffocation in males (Table 5; Figure 2) and in females (Table 6; Figure 3). There was a substantial year after year increase in mortality as a result of injuries due to falls in both males ($p < .01$) and females ($p < .01$). For other type of injuries, age-standardized mortalities either decreased

FIGURE 1
Proportion of unintentional injury deaths by cause in Canada excluding Quebec, 2001–2007



slightly (burns and drowning in males, motor vehicle crashes and burns in females) or showed no significant changes. The risk of death caused by motor vehicle traffic crashes and drowning was significantly higher in summer months and was more marked in males than females. Deaths caused by falls and burns were more common in winter months. More poisoning deaths could be seen in March and April ($p < .05$) and pedestrian accident deaths in September and October ($p < .05$) and November and December ($p < .01$) when compared with January and February. There was no significant difference between the month periods for suffocation.

Discussion

Our study demonstrated that age- and sex-standardized mortality from all unintentional injuries was stable during the 7-year study period whereas overall mortality declined approximately 10% and the proportion of unintentional injury versus overall mortalities increased from 4.1% to 4.7%. This indicated that the share of unintentional injury in all causes for mortality is on the increase in Canada. All unintentional injury mortality in males, as well as cause-specific injury mortalities but with the exception of fall mortality, exceeded those in females.

The three territories had the highest overall mortality and unintentional injury

mortality. The unintentional injury versus overall mortality ratio was almost double in the three territories compared with the nine provinces. A previous population-based case-control study conducted in the Northwest Territories demonstrated that being male, aged over 14 years, living in remote communities, living in the far north, and being Aboriginal were risk factors for injury mortality.¹¹ There is a higher proportion of Aboriginal people in the territories compared with the rest of Canada. A study conducted among Albertan children showed that Aboriginal children had a significantly higher risk for both intentional and unintentional injury deaths.¹² Injury mortality rates among Indigenous people in the United States and Australia are approximately 2 to 3 times greater than rates for non-Aboriginal populations.¹³

Motor vehicle traffic crashes and falls were two major causes for unintentional injury deaths in Canada. The former was a more common cause in males than females and was a main reason for the markedly increased mortality from unintentional injuries in youths and young adults. The mortality due to motor vehicle traffic crashes changed little year after year during the study period in males and declined slightly in females. However, the data showed a clear seasonal pattern with a significantly increased risk in summer and more so in males than in females. During the traditional summer vacation

TABLE 4
Overall and unintentional injury mortality (per 100 000) by age and sex, Canada (excluding Quebec), 2001–2007

Age group, years	Total			Male			Female		
	All causes, per 100 000	Unintentional injury, per 100 000	Unintentional injury/All causes, %	All causes, per 100 000	Unintentional injury, per 100 000	Unintentional injury/All causes, %	All, per 100 000	Unintentional injury, per 100 000	Unintentional injury/All causes, %
0–4	124.4	6.43	5.2	135.4	7.5	5.5	112.9	5.3	4.7
5–9	11.7	3.73	31.9	13.0	4.3	33.1	10.3	3.2	30.8
10–14	14.3	4.89	34.2	16.2	6.2	38.3	12.3	3.5	28.2
15–19	45.9	20.78	45.2	62.1	29.0	46.7	28.8	12.0	41.8
20–24	60.0	25.19	42.0	85.8	37.7	43.9	33.1	12.1	36.6
25–29	58.5	20.35	34.8	82.6	32.0	38.7	34.0	8.5	25.0
30–34	69.6	18.60	26.7	92.1	28.5	30.9	46.8	8.6	18.4
35–39	95.9	20.12	21.0	122.1	30.4	24.9	69.4	9.8	14.1
40–44	140.6	21.91	15.6	174.9	33.1	18.9	106.0	10.6	10.0
45–49	221.8	23.35	10.5	272.9	34.8	12.8	170.8	11.9	7.0
50–54	349.8	22.34	6.4	431.0	33.3	7.7	269.7	11.5	4.3
55–59	545.1	22.92	4.2	674.1	33.3	4.9	417.8	12.7	3.0
60–64	881.9	24.67	2.8	1092.7	35.3	3.2	677.4	14.4	2.1
65–69	1406.4	31.51	2.2	1751.8	42.8	2.4	1082.9	21.0	1.9
70–74	2270.4	43.83	1.9	2850.2	56.9	2.0	1755.2	32.3	1.8
75–79	3711.0	77.39	2.1	4684.2	98.0	2.1	2953.0	61.4	2.1
80–84	6157.3	147.78	2.4	7759.1	187.2	2.4	5130.4	122.5	2.4
85–89	10708.7	302.40	2.8	13173.0	362.9	2.8	9445.9	271.4	2.9
≥ 90	20590.7	700.09	3.4	23399.0	801.0	3.4	19562.0	663.1	3.4

months, people may drive longer distances while on vacation and teens and young adults may have more opportunities to drive and ride in cars,¹ and hence are more likely to be exposed to vehicle- and traffic-related risk factors. Effective interventions on motor vehicle crashes are most important for reducing unintentional

injury mortality among youths and young adults, especially for males.

Mortality due to falls was the only cause-specific mortality that showed a steady increase during the study period, and it was slightly more common in females than males. Fall injury accounted for

about one-third of all unintentional injury deaths in adults, and was the principal reason for the dramatic increase in mortality due to unintentional injury with age in the elderly. Worldwide, motor vehicle crashes account for 33% while falls only account for 11% of unintentional injury death,¹ but in this study they

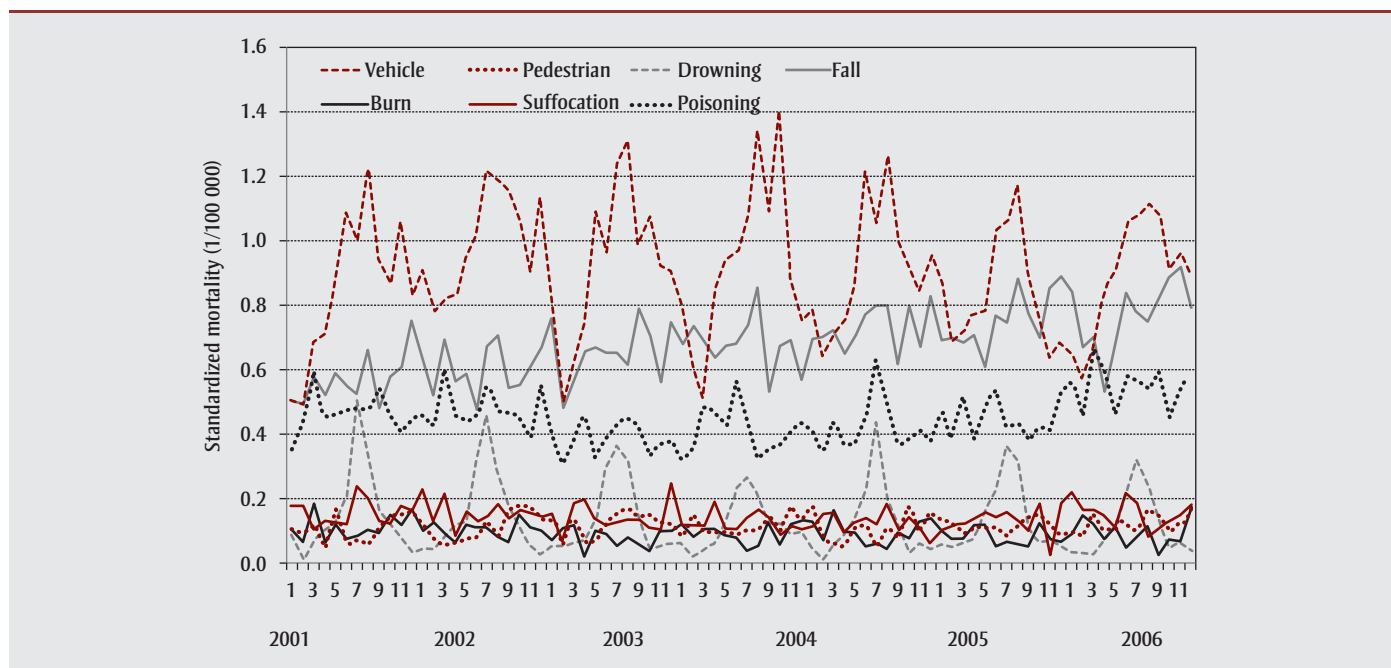
TABLE 5
Results of time-series analysis (autoregressive model) for major types of unintentional injury mortality (per 100 000) in males

Variable	Regression coefficient (Standard error)						
	Motor vehicle	Falls	Poisoning	Drowning	Pedestrian	Burns	Suffocation
Secular year	-0.0080 (0.0072)	0.0342 (0.0039)**	0.0090 (0.0062)	-0.0069 (0.0023)**	0.0012 (0.0016)	-0.0028 (0.0014)*	-0.0023 (0.0021)
Month							
1–2	-0.4768 (0.0490)**	-0.0742 (0.0280)**	-0.0729 (0.0325)*	-0.2976 (0.0170)**	0.0011 (0.0118)	0.0311 (0.0105)**	-0.0124 (0.0150)
3–4	-0.4310 (0.0490)**	-0.0936 (0.0280)**	0.0354 (0.0318)	-0.2743 (0.0169)**	-0.0173 (0.0118)	0.0310 (0.0105)**	-0.0116 (0.0150)
5–6	-0.1822 (0.0484)**	-0.0701 (0.0287)*	-0.0053 (0.0281)	-0.1435 (0.0177)**	-0.0026 (0.0121)	0.0167 (0.0111)	-0.0227 (0.0154)
7–8	[Reference]	[Reference]	[Reference]	[Reference]	[Reference]	[Reference]	[Reference]
9–10	-0.1600 (0.0484)**	-0.0521 (0.0287)	-0.0310 (0.0281)	-0.2383 (0.0177)**	0.0336 (0.0121)**	0.0138 (0.0111)	-0.0306 (0.0154)
11–12	-0.2846 (0.0490)**	0.0029 (0.0280)	-0.0243 (0.0317)	-0.2806 (0.0169)**	0.0281 (0.0118)*	0.0449 (0.0105)**	-0.0202 (0.0150)

* $p < .05$

** $p < .01$

FIGURE 2
Monthly standardized mortality due to different types of unintentional injury in males, Canada (excluding Quebec), 2001–2007



were 24% and 26%, respectively (Figure 1). The aging process and low levels of bone mineral density are closely associated with the severity of an injury and the consequence of the fall.^{8,14–19} However, we do not know if aging and bone mineral density are the main reasons for the steady increase in mortality in the 7-year study period. Other factors such as medication use, especially in older people,²⁰ overweight and obesity,^{21,22} engagement in physical activity,^{23,24} utilization of medical products and day-to-day activities^{25–28} warrant further investigation for possible impact on the uptrend of mortality from

falls in the Canadian population. Our study also showed a seasonal pattern for fall mortality, that is, it was the highest in November and December. One study from the United States found that fall injuries were associated with holiday decorating or related activities, which is also likely in our current context.²⁹ Weather is probably another important reason.^{30,31}

Poisoning was the third leading cause of unintentional injury mortality in Canada, and accounted for 14% of unintentional injury deaths in males and 10% in females (data not shown). Unintentional poisoning

may be work-related, and other common agents are household chemicals and pesticides, medications and plants.^{32–35} Other causes of unintentional deaths such as drowning and burns were less common. Our data showed that deaths due to drowning most frequently happened in summer, and that males versus females and children versus adults accounted for a higher proportion of drowning-related deaths. Most drowning accidents are related to recreation or leisure. Our data also showed an increased mortality due to burns in winter but no seasonal variations for suffocation.

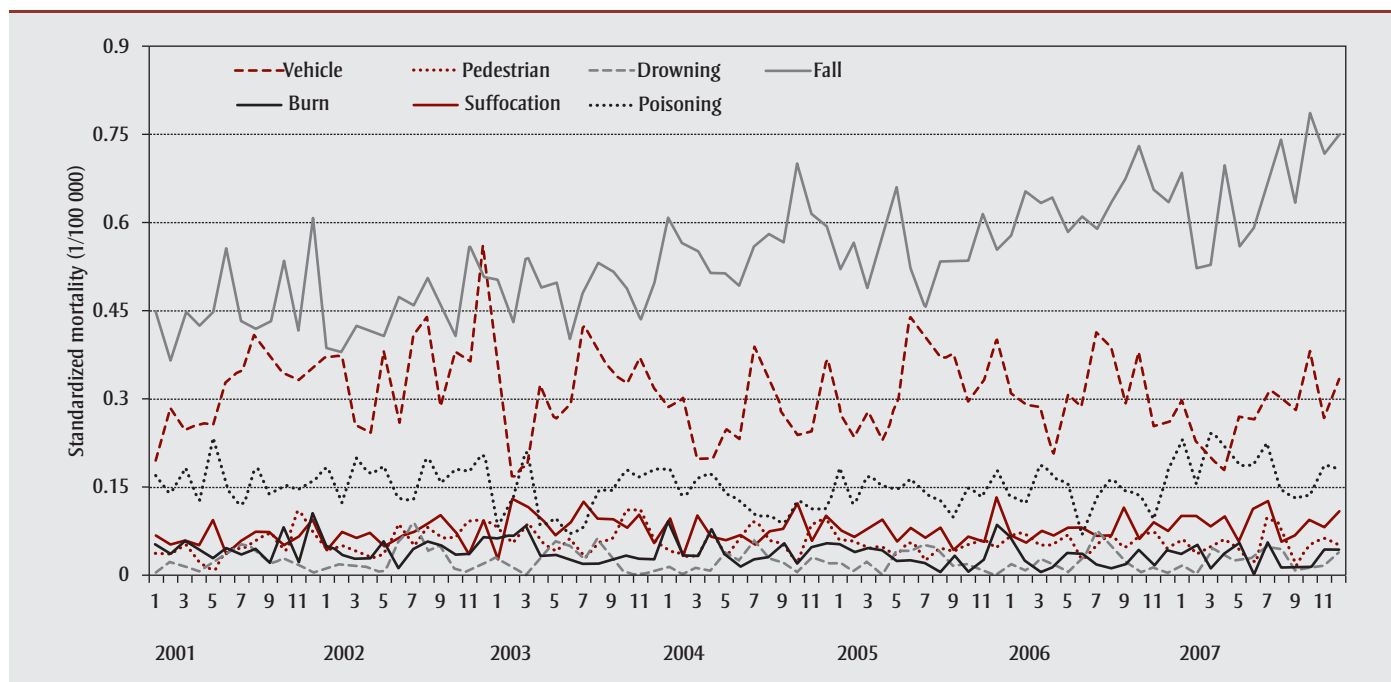
TABLE 6
Results of time-series analysis (autoregressive model) for major types of unintentional injury mortality (per 100 000) in females

Variable	Regression coefficient (Standard error)						
	Motor vehicle	Falls	Poisoning	Drowning	Pedestrian	Burns	Suffocation
Secular year	−0.0069 (0.0033) [*]	0.0365 (0.0034) ^{**}	0.0016 (0.0025)	−0.0001 (0.0007)	−0.0006 (0.0012)	−0.0026 (0.0009) ^{**}	0.0028 (0.0011) [*]
Month							
1–2	−0.0984 (0.0217) ^{**}	−0.0277 (0.0230)	−0.0005 (0.0157)	−0.0360 (0.0049) ^{**}	−0.0073 (0.0081)	0.0216 (0.0067) ^{**}	−0.0079 (0.0080)
3–4	−0.1435 (0.0217) ^{**}	−0.0158 (0.0230)	0.0297 (0.0156)	−0.0317 (0.0049) ^{**}	−0.0094 (0.0081)	0.0097 (0.0067)	0.0011 (0.0080)
5–6	−0.0859 (0.0211) ^{**}	−0.0204 (0.0228)	0.0038 (0.0148)	−0.0182 (0.0048) ^{**}	−0.0155 (0.0079)	0.0040 (0.0070)	−0.0074 (0.0082)
7–8	[Reference]	[Reference]	[Reference]	[Reference]	[Reference]	[Reference]	[Reference]
9–10	−0.0516 (0.0211) [*]	0.0284 (0.0228)	−0.0046 (0.0148)	−0.0326 (0.0049) ^{**}	−0.0063 (0.0079)	0.0022 (0.0069)	0.0007 (0.0082)
11–12	−0.0422 (0.0217)	0.0388 (0.0230)	0.0094 (0.0156)	−0.0357 (0.0049) ^{**}	0.0153 (0.0081)	0.0174 (0.0067) [*]	0.0029 (0.0080)

^{*} *p* value < .05

^{**} *p* value < .01

FIGURE 3
Monthly standardized mortality due to different types of unintentional injury in females in Canada (excluding Quebec), 2001–2007



Limitations

Death registration is mandatory in Canada and therefore there is minimal missing vital statistics data. However, the underlying cause, defined as the disease or injury that initiated the chain of events leading directly to death, is considered. Some people might not die instantly after an injury, and subsequent conditions (e.g. heart failure) might be coded as primary cause of death. This method of death registration relies on medical examiners or coroners' judgment; it may happen that an injury is closely related to the death but is not considered the underlying cause. Since secondary diagnoses are excluded, it may underestimate the true burden of unintentional injury mortality. Miscoding and data entry errors may also result in misclassification of information on cause of deaths and external causes of injuries. In addition, the study period of 7 years is relatively short.

Conclusion

Overall unintentional injury mortality changed little from year to year while overall mortality showed a steady decline

in Canada. The three territories had the highest unintentional injury mortality, both absolutely and as a share of overall mortality. Motor vehicle traffic crashes and falls were the leading causes of injury death. Fall mortality was the only type of unintentional injury mortality that showed an annual increase. Death from fall injury was more common in females than males while other types of injury death were stable and were more common in males than in females. There were seasonal patterns for some types of unintentional injury mortalities such as higher risks of death due to motor vehicle traffic crashes and drowning in summer and falls and burns/fire in winter. The increasing share of overall unintentional injury mortality versus all-cause mortality and the increasing trend for fall mortality call for more research on risk factor identification and effective interventions.

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