

Forces of Nature.

On average, every month 20 people are hospitalized for a condition related to exposure to excessive heat, cold, and other forces of nature. The majority of cases involve heat exhaustion and heatstroke.

Results

During the 2005/06 fiscal year, there were a total of 2,572 emergency department visits and 251 hospitalizations for injuries as a result of being exposed to environmental factors, which will be referred to as forces of nature. Included for this analysis are injuries resulting from exposure to forces of nature including those effects of heat and light, which encompasses heat exhaustion, heatstroke, and sunstroke, among others, as well as incidents resulting in frostbite, hypothermia and burns and corrosions, which includes sunburns. (See Methods Section for Data Sources). These numbers translate into provincial rates of 20.9 per 100,000 population for emergency department visits and 1.9 per 100,000 for hospitalizations (Table 1).

For emergency department visits and hospitalizations, peaks in the numbers of injuries from forces of nature were observed in young adults 15-24 years of age as well as seniors over 80 years of age. Rates of hospitalizations were especially high in this older age group. Males in the younger age group comprised a slightly higher representation of emergency department visits and hospitalizations for injuries from forces of nature, whereas females represented a greater proportion of these incidents in the older age group (Figure 1).

The majority of cases in both emergency department visits and hospitalizations were for treatment of conditions due to exposure to heat and light. Heat exhaustion was the most common followed by sunstroke and heatstroke. Frostbite and hypothermia were the next most prevalent, representing 10% and 7% of all emergency department visits and 10% and 15% of all hospitalizations respectively (Figure 2).

Injury rates varied by region, with the highest rates of emergency department visits and hospitalizations for treatment due to exposure to forces of nature found in the Northern region of Ontario (Table 1).

Close to 90% of individuals who visited an emergency department for injuries due to involvement in a motor vehicle collision were discharged to their place of residence. Close to 7% were admitted as an inpatient directly from ambulatory care. For hospitalized cases,

FIGURE 1. Emergency department visits for injuries due to forces of nature (Ontario, 2005/2006)

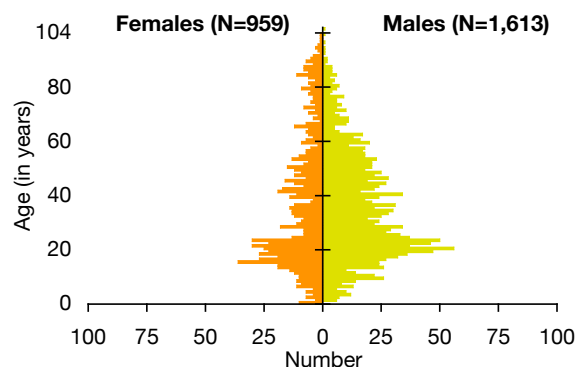
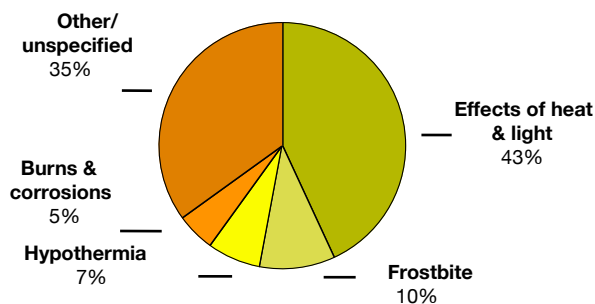


FIGURE 2. Nature of condition due to forces of nature (Most responsible diagnosis, Ontario, 2005/2006)

Emergency Department Visits



Hospitalizations

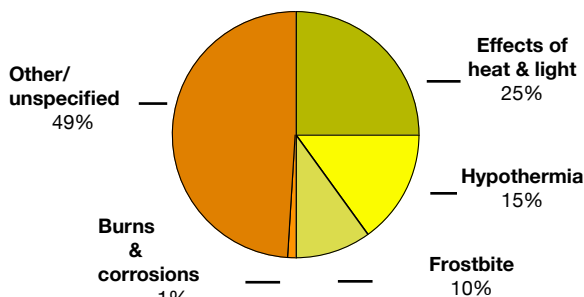


TABLE 1. Regional comparison of injuries due to forces of nature (Ontario, 2005/06)

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
Emergency Department Visits								
Number	424	286	280	413	236	417	452	2,572
Rate per 100,000 ^a	27.4	24.1	12.1	19.4	8.7	26.2	54.1	20.9
Average Age	36	39	34	34	43	34	34	36
% Male	62	62	65	63	59	64	63	63
Hospitalizations								
Number	34	9	34	46	33	21	69	251
Rate per 100,000 ^a	1.9	0.6	1.5	1.9	1.1	1.2	7.1	1.9
Average Age	57	63	55	51	60	48	50	53
% Male	68	78	71	74	67	90	68	72

a. Age-standardized rate per 100,000 population. Note: Region of residence unknown/outside of Ontario for 64 emergency department visits and 5 hospitalizations.



Ontario
Injury



Ontario Injury Prevention
Resource Centre

1-888-537-7777
info@oninjuryresources.ca
www.OnInjuryResources.ca

Produced by

SMARTRISK



SAUVE QUI PENSE
preventing injury with smart thinking

Ontario Injury Compass

is produced by
SMARTRISK
with support from
The Government of Ontario



Edited by

Philip Groff, PhD

Director,
Research and Evaluation
Ontario Injury Prevention Resource
Centre at SMARTRISK
(416) 596-2718
pgroff@smartrisk.ca

Principal Analyst

Pamela Farmer, MSc

Research Associate
Ontario Injury Prevention Resource
Centre at SMARTRISK
(416) 596-2717
pfarmer@smartrisk.ca



Ontario Injury Prevention
Resource Centre

1-888-537-7777
info@oninjuryresources.ca
www.OnInjuryResources.ca

TABLE 2. Regional comparison of injuries due to forces of nature by age group (Ontario, 2005/06)

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
Emergency Department Visits- Rate per 100,000^a (Number)								
0-14 years	19.2 (56)	17.2 (37)	8.2 (39)	17.6 (75)	6.6 (29)	25.7 (75)	35.4 (54)	16.2 (372)
15-19 years	45.2 (50)	32.9 (27)	26.7 (43)	31.7 (50)	9.5 (14)	50.3 (55)	132.7 (82)	39.8 (330)
20-24 years	50.5 (56)	39.6 (32)	22.6 (37)	33.5 (48)	12.2 (22)	48.8 (54)	102.8 (59)	38.3 (324)
25-79 years	24 (240)	22.3 (172)	10.1 (150)	16 (222)	8.3 (146)	20.1 (216)	43.4 (246)	17.7 (1420)
80+ years	37.2 (22)	37 (18)	20.4 (11)	30.5 (18)	26.9 (25)	29.3 (17)	36.8 (11)	31.4 (126)
Hospitalizations- Rate per 100,000^a (Number)								
0-14 years	1 (3)	0.5 (1)	0.6 (3)	0.9 (4)	0.5 (2)	0.3 (1)	2.6 (4)	0.8 (18)
15-19 years	0 (0)	0 (0)	0.6 (1)	1.9 (3)	0.7 (1)	0 (0)	12.9 (8)	1.8 (15)
20-24 years	0.9 (1)	0 (0)	0.6 (1)	0.7 (1)	0.6 (1)	0.9 (1)	7 (4)	1.2 (10)
25-79 years	2.1 (21)	0.8 (6)	1.5 (22)	2.3 (32)	1.2 (21)	1.7 (18)	7.9 (45)	2.1 (167)
80+ years	15.2 (9)	4.1 (2)	13 (7)	10.2 (6)	8.6 (8)	1.7 (1)	26.8 (8)	10.2 (41)

a. Age-specific rate per 100,000 population. Note: Region of residence unknown/outside of Ontario for 64 emergency department visits and 5 hospitalizations.

6% of patients were transferred to another facility providing inpatient hospital care, which includes acute, sub acute, and rehabilitation care. An additional 10% were transferred to a long term care facility. Approximately 67% were discharged home and another 8% were discharged home with support services. Fewer than 1% of individuals died after arrival in the emergency department and close to 5% died after hospital admission. The 251 hospitalized cases accounted for more than 1,449 days in acute care hospitals with an average length of stay of 5.8 days.

Discussion

This Compass highlights patterns of emergency department use and hospitalizations for treatment from being exposed to forces of nature, in particular heat and light. Dehydration, heat exhaustion, heatstroke, and sunstroke are all serious conditions, which, if left untreated, can be potentially life threatening. Children are especially vulnerable to effects of hot summer days, as their small bodies are not able to dissipate heat as well as adults.¹ The elderly, as well as individuals with chronic or acute illnesses are also a vulnerable age group for developing these types of conditions in response to heat. It is therefore important to monitor children in the summer and be able to recognize signs and symptoms of heat related illness (see Managing the risk section). Hypothermia and frostbite, although not particularly relevant for this time of year, are also serious conditions. Considering the majority of cases in this Compass were a result of effects of heat and light, the 'Managing the risk' section will be devoted to this topic. For those living in a climate such as Canada's, however, it is essential to know what to look for and what to do in the event of suffering from frostbite or hypothermia. Tips for handling these two conditions can be found at: http://www.smartrisk.ca/seasonal_tips/preventing_frostbite_and_hypothermia.htm² as well as at: http://www.pc.gc.ca/pn-np/nu/auyuittuq/visit/visit6f_E.asp³

References

1. About Kids Health: Trusted answers from The Hospital for Sick Children. Summer safety: avoiding harm from heat. 2007; <http://www.aboutkidshealth.ca/news/Summer-safety-Avoiding-harm-from-heat.aspx?articleID=10308&categoryID=news-poh2>
2. SMARTRISK. Preventing frostbite and hypothermia. 2009; http://www.smartrisk.ca/seasonal_tips/preventing_frostbite_and_hypothermia.html
3. Parks Canada. Hypothermia and frostbite. 2009; http://www.pc.gc.ca/pn-np/nu/auyuittuq/visit/visit6f_E.asp

Managing the risk

Public Health can work with physicians, parents, OTs, PTs, nursing homes, and other community groups, to ensure the following messages are communicated effectively:

❖ Heat exhaustion is a dangerous condition which is caused by a loss of water and salt in the body, usually due to exercise in hot weather. If any of the following symptoms appear, be sure to get treatment; otherwise, it can progress into the more serious heat stroke:

- normal or slightly elevated body temperature (not above 40 degrees Celsius)
- profuse sweating
- skin that appears pale
- skin that is moist and cool to the touch
- fast, shallow breathing and weak pulse
- headache
- nausea, vomiting, diarrhea
- dizziness/weakness/fainting

Monitor the individual in a cool/shady or air conditioned area. Have the individual lie down and remove extra clothing and equipment. Cool the person with water, fans or cold towel. If there is vomiting, have him/her drink chilled water or juice.

If symptoms persist or become more severe, seek medical attention.

❖ Heatstroke can be recognized by the following symptoms:

- increase in body temperature, often above 40 degrees Celsius
- altered consciousness, seizures, confusion, irritable behaviour.
- hot and wet or dry skin
- increased heart rate and breathing rate
- headache
- nausea, vomiting, and diarrhea

❖ Heatstroke requires immediate medical attention. Call 911 right away. Remove clothing and any sports equipment. Immerse the individual in cold water; spray the individual with cold water, fans, or ice bags. Do not give anything to drink.

❖ For Further Information

Safe Kids Canada
www.safekidscanada.ca
Health Canada
<http://www.hc-sc.gc.ca/cps-spc/index-eng.php>
SMARTRISK
www.smartrisk.ca

Methods

Emergency department data were obtained from the National Ambulatory Care Reporting System and acute care hospitalization data were obtained from the Discharge Abstract Database at the Canadian Institute for Health Information for the 2005/06 fiscal year. ICD-10 coding (X30-X39) was used to isolate all emergency department visits and hospitalizations for injuries due to forces of nature. Note that some persons were seen in an emergency department and then admitted to hospital; however, persons can be admitted to hospital without visiting an emergency department. Regions were defined according to place of residence using the Ontario Ministry of Health Region Codes. Deaths occurring outside of the hospital setting were not included in this analysis.

To subscribe to
Ontario Injury Compass
please email your request to:
compass@oninjuryresources.ca