Vol. 7, Issue 3 March 2010

Exposure to smoke, fire and flames

On average, each month 25 people are hospitalized for injuries due to exposure to smoke, fire and flames.

Results

During the 2007/08 fiscal year, there were a total of 4,609 emergency department visits and 300 hospitalizations for injuries due to exposure to smoke, fire and flames (See Methods Section for Data Sources). These numbers translate into provincial rates of 38.0 per 100,000 population for emergency department visits and 2.3 per 100,000 for hospitalizations (Table 1). Residential fires accounted for 86% of all fires in Ontario, followed by vehicle fires at 7% (1999-2008).

Males represented over 70% of emergency department visits and close to 80% of hospitalizations. For emergency department visits, peaks in the numbers were seen in young children, young adults, as well as adults in their 40s (Figure 1). For hospitalizations, peaks in the number of cases were seen in adults over 45 as well as those 25-29 years of age.

According to the Office of the Fire Marshal, there has been a decrease in the number of fire fatalities in 2008 compared to 1999. Specifically, with respect to these cases, which include arson, homicide, and suicides, but do not include fire deaths in vehicles, there has been a 16% decrease (Figure 2).

Further, the majority of fatal fires in Ontario from 1999-2008 were caused unintentionally (Figure 3). For example, in all fatal residential fires occurring during that period of time, less than 1/3 of these residences had an operating smoke alarm. Over 1/3 either had no smoke alarm or had one that did not operate (Figure 4).

From 2004 to 2008, the vast majority of fatalities caused by preventable fires in residences were ignited by a cigarette, followed by cooking as the ignition source (Figure 5).

Rates of injuries due to exposure to smoke, fire and flames varied by region, with the highest overall rates reported in the northern region of the province (Table 1).

Of the 4,609 individuals who visited an emergency department for injuries from exposure to smoke, fire and flames, over 85% were discharged to their place of residence. Approximately 3% were admitted as an in-patient directly from ambulatory care and another

FIGURE 1. Emergency department visits for exposure to smoke, fire and flames by age and sex (Ontario, 2007/2008)

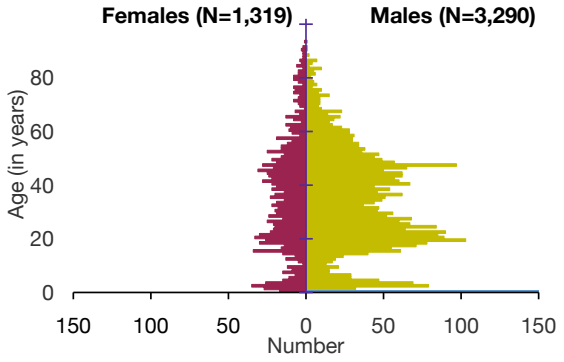


FIGURE 2. Fire fatalities in Ontario by year (The Office of the Fire Marshal, 1999-2008)

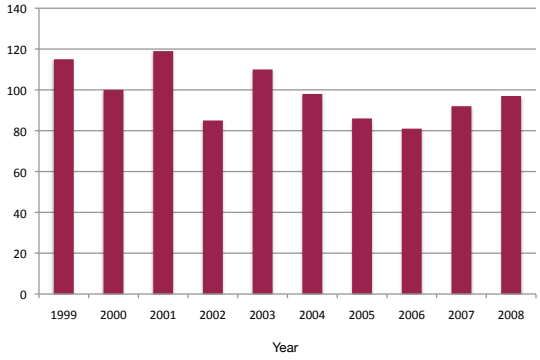


FIGURE 3. Cause of fatal fires in Ontario (The Office of the Fire Marshal, 1999-2008)

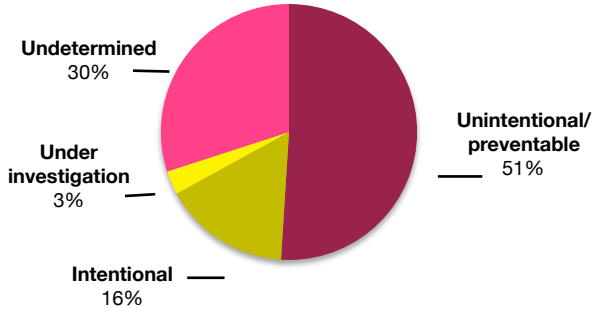


FIGURE 4. Smoke alarm operation: fatal residential fires (The Office of the Fire Marshal, 1999-2008)

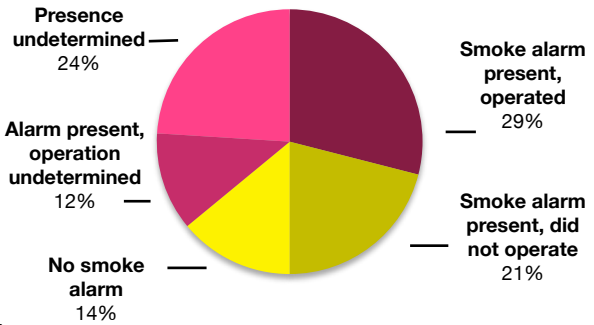
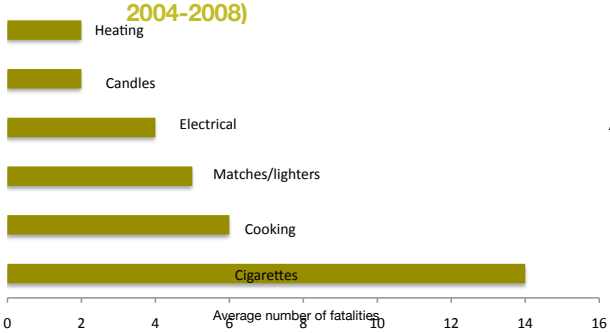


FIGURE 5. Residential preventable fatal fires: ignition source. Average number of fire fatalities/ year (The Office of the Fire Marshal, 2004-2008)



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Ontario Injury Compass
is produced by
SMARTRISK
with support from
The Government of Ontario

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TABLE 1. Regional comparison of injuries due to exposure to smoke, fire and flames (Ontario, 2007/08)

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
Emergency Department Visits								
Number	829	584	574	771	554	642	581	4,609
Rate per 100,000[a]	54.5	51.0	25.0	36.8	20.9	40.5	71.8	38.0
Hospitalizations								
Number	16	13	11	13	16	11	19	102
Rate per 100,000[a]	2.4	2.4	1.8	2.6	1.4	1.4	5.9	2.3

a. Age-standardized rate per 100,000 population. Note: Region of residence unknown/outside of Ontario for 74 emergency department visits and 7 hospitalizations.

3% were triaged and left the emergency department without being seen by a physician. For hospitalized cases, approximately 10% were transferred to a long term care facility, which includes personal care homes, auxiliary care, nursing homes, and extended care. One third were discharged to a home setting with support services (seniors' lodge, attendant care, home care) and approximately 45% were discharged home. Fewer than 1% of individuals died after arrival in the emergency department and approximately 5% died after hospital admission. The 102 hospitalized cases accounted for 300 days in acute care hospitals with an average length of stay of 2.94 days.

Discussion

Fire related injuries are an important issue to address in Ontario. Far too often, an unsuspecting family or individual is caught in a potentially life threatening situation involving a residential fire. Many of these fires, which cause serious injuries, significantly large health care costs, property damage, and in the most serious cases death, are preventable. Most fatal fires occur at night when people are asleep and often victims never wake up. With a working smoke alarm in place, smoke from the fire can be detected, signalling the alarm to go off, alerting residents, and giving them time to escape.

Smoke alarms are a proven way to prevent injuries and death from fires. The risk of fire-related deaths is three times higher in homes without smoke alarms than those with smoke alarms.[1] Correspondingly, most children who died in residential fires were in homes without smoke alarms or without working smoke alarms. An estimated 40 children under 14 die from these causes and the majority of these deaths (75%) are due to smoke inhalation.[1]

Reducing the risk and occurrence of these tragedies requires the implementation of programs and other techniques to effectively improve the awareness, knowledge, and vigilance of citizens regarding fire safety. Specifically, citizens need to know how to go about reducing the risk of being involved in a fire, and how to safely manage a situation involving a fire. Fire safety is an important issue for all of society. The following managing the risk section illustrates ways to protect yourself which can be used by public health to educate the public.

Managing the risk[1,2,3]

- Install smoke detectors on every level of the home (including the basement) and inside each sleeping area.
  - Smoke alarms reduce your risk of injury.
  - The Ontario Fire Code requires that every home have working smoke alarms. Read and follow the manufacturer's directions when installing.
- Test your smoke alarm every month.
  - Use the alarm test button.
- Vacuum smoke alarm every six months.
  - If electrically connected, shut off the power and vacuum the outside vents only. Restore power and test when finished.
- Change batteries annually.
  - If the low battery warning beeps, replace battery immediately.
- Replace smoke alarm at least every 10 years.
- Make sure that each member of the residence is familiar with the sound of the smoke alarm and knows what to do if a fire occurs.
- Regularly practise your home fire escape plan.
  - Know two ways out of every room and have a pre–arranged meeting place outside. Once out, stay out and call the fire department from a nearby house.
- Keep lighters, even if they are child resistant, and matches out of sight and out of reach of children.
- Always extinguish candles before leaving a room.
- Avoid leaving unattended pots on the stove.

For Further Information:

Choosing the correct smoke detector:
http://www.safekidscanada.ca/SKCForParents/section.asp?s=Safety+Information+by+Topic&sID=10774&ss=Scalds+and+Burns&ssID=24880&sss=Smoke+Detectors&sssID=24906

Consumer Product Safety, Health Canada:
http://www.hc-sc.gc.ca/iyh-vsv/prod/detect_e.html or call 1 866-662-0666.

Health Canada
www.hc.sc.gc.ca
Safe Kids Canada
www.safekidscanada.ca
The Office of the Fire Marshal
http://www.ofm.gov.on.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 2007/08 fiscal year. ICD-10 coding (X00-X09) was used to isolate all emergency department visits and hospitalizations for exposure to smoke, fire and flames. 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.

References

1. Safe Kids Canada. *Flame burns: Protect your child from flame burns.* Toronto: Safe Kids Canada, 2009.
2. The Office of the Fire Marshal. *Ontario fatal fire summary: 10 years.* The Office of the Fire Marshal, Ontario, 2009.
3. City of Toronto: Toronto Fire Services. *Safety and fire prevention :smoke alarms.* http://www.toronto.ca/fire/prevention/smoke_alarms.htm