

Tool Injuries

Each day in Ontario, more than 65 people visit an emergency department and almost every day one person is hospitalized due to a tool-related injury. Injuries are the most frequent in the summer months.

Results

In Ontario, during the 2004/05 fiscal year, there were a total of 23,750 visits to an emergency department and 346 hospitalizations due to contact with a powered or nonpowered hand tool or household machinery (e.g., axe, chain saw, blender, scissors). About 58% of the emergency department visits were due to nonpowered tools compared to 42% for powered tools. In contrast, for hospitalizations, 71% of cases were related to powered items and the remaining injuries were associated with nonpowered hand tools.

Males accounted for about 77% of emergency department visits and 86% of hospitalizations. For emergency department visits, a peak in the number of injuries was observed among males 18-49 years and females 40-45 years of age (Figure 1). For hospitalizations, a peak was seen among Ontarians 40-47 years of age. Note that data for hospitalizations were not presented in some figures and tables due to small numbers.

Upper limb injuries were most common, followed by injuries to the lower limb (Figure 2). Specifically for emergency department visits, open wounds of the hand were most frequent. In contrast, for hospitalizations, finger amputations and fractures of the hand were most frequent.

More than 95% of persons who visited an emergency department with a tool injury were discharged to their place of residence, 2% were triaged and left the emergency department before being seen, and fewer than 1% died after arrival in the emergency department. For hospitalized cases, about 97% were discharged home. No deaths were reported after admission to hospital. The 346 hospitalized cases accounted for more than 1,100 days in acute care hospitals with an average length of stay of 3.4 days.

FIGURE 1. Emergency department visits for tool injuries by age and sex (Ontario, 2004/2005)

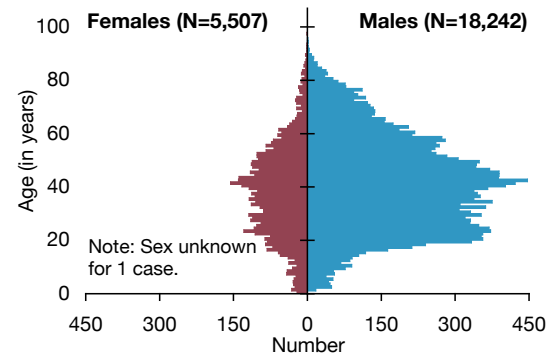
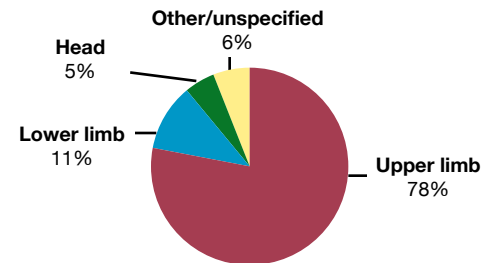


FIGURE 2. Site of tool injury (Most responsible diagnosis, Ontario, 2004/05)

Emergency Department Visits



Hospitalizations

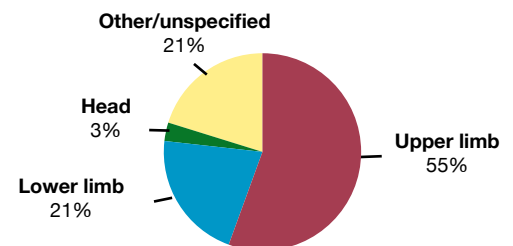


TABLE 1. Regional comparison of tool injuries (Ontario, 2004/05)

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
Emergency Department Visits								
Number	3,827	3,079	3,066	4,250	2,929	3,603	2,615	23,750
Rate per 100,000 ^a	247.3	263.9	130.7	197.9	109.0	217.3	307.2	190.8
Average age (in years)	39	39	38	39	40	40	40	39
% male	78	76	77	78	71	75	81	77
Hospitalizations								
Number	52	59	53	61	38	26	54	346
Rate per 100,000 ^a	2.0	1.8	2.4	1.1	1.6	2.0	1.6	1.8
Average age (in years)	44	41	46	41	38	40	44	42
% male	87	75	92	87	87	96	87	86

a. Age-standardized rate per 100,000 population.

Note: Region of residence unknown/outside of Ontario for 381 emergency department visits and 3 hospitalizations.



Ontario Injury Compass

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Edited by

Philip Groff, PhD

Director,
Research and Evaluation
SMARTRISK
(416) 596-2718
pgroff@smartrisk.ca

Principal Analyst

Kelly Cimek, MSc

Research Associate
SMARTRISK
(416) 596-2720
kcimek@smartrisk.ca

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

SMARTRISK

790 Bay St.
Suite 401
Toronto, Ontario
M5G 1N8
(416) 977-7350
info@smartrisk.ca
www.smartrisk.ca

TABLE 2. Regional comparison of tool injuries for select age groups (Ontario, 2004/05)

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
Emergency Department Visits - Rate per 100,000 population^a (Number)								
15-19 years	275.7 (305)	290.3 (238)	138.4 (223)	202.5 (319)	97.1 (143)	202.3 (221)	343.0 (212)	202.6 (1,681)
20-24 years	351.5 (390)	417.5 (337)	191.5 (313)	291.4 (417)	135.6 (244)	289.5 (320)	421.8 (242)	272.1 (2,302)
25-29 years	352.4 (349)	393.1 (283)	181.3 (294)	308.5 (383)	142.1 (317)	298.7 (316)	463.3 (209)	265.5 (2,207)
30-34 years	327.2 (332)	368.7 (280)	162.9 (292)	263.5 (381)	146.8 (346)	274.2 (309)	431.0 (223)	242.5 (2,186)
35-39 years	301.0 (337)	344.5 (302)	158.0 (318)	244.7 (431)	149.8 (328)	286.6 (359)	408.6 (244)	240.4 (2,358)
40-44 years	312.1 (405)	337.6 (337)	182.5 (388)	240.5 (491)	151.8 (331)	307.4 (445)	365.3 (271)	250.2 (2,710)
45-49 years	270.4 (327)	284.6 (264)	161.7 (292)	235.9 (423)	142.5 (271)	285.6 (376)	386.6 (276)	233.9 (2,261)
50-54 years	257.2 (273)	260.8 (212)	158.6 (238)	212.3 (317)	141.5 (234)	236.7 (272)	312.2 (197)	214.1 (1,777)
55-59 years	284.9 (267)	287.4 (208)	131.0 (167)	219.0 (276)	136.2 (193)	243.2 (248)	350.1 (198)	219.8 (1,582)
60-64 years	241.9 (177)	246.2 (140)	126.1 (116)	225.7 (207)	107.2 (113)	244.3 (189)	285.4 (130)	202.2 (1,096)

a. Age-specific rate per 100,000 population.

Note: Region of residence unknown/outside of Ontario for 334 emergency department visits among those 15-64 years of age.

By region, the lowest rate of emergency department visits was observed in the Toronto region and the lowest hospitalization rate was seen in the Central East region (Table 1). The highest rate for emergency department visits was seen in the North region and the highest hospitalization rate was observed in the Central East region.

In Ontario, the highest age-specific injury rates for emergency department visits were observed among the 20-24 year and 25-29 year age groups (Table 2). Regional variations were seen in the numbers and rates of injury by age group.

Discussion

This Compass highlights patterns of emergency department visits and hospitalizations for tool injuries in Ontario. Cuts to the hand, amputated fingers, and hand or finger fractures were found to be the most common injuries sustained. Research studies of tool-related injuries are rare and focus on one specific aspect (e.g., work-related hand injuries or hand injuries in shop class).^{1,2}

In this analysis it was not possible to determine the specific tool or equipment that was associated with the injury. Cases were broadly classified as hand tools and household machinery that were either powered or nonpowered. It is also important to note that it was not possible to determine the specific setting (e.g., work-related) where the injury occurred.

One U.S. study of non-work related finger amputations reported power tools as a serious concern among men aged 45 to 64 years.³ In general, one reason tool injuries might be more common among adult males is due to their more frequent use of use hand tools.

Several other factors have been suggested to be associated with increased risk for injury including inexperience, improper use of equipment or guards, and inattention.²⁻⁴

References

1. Schofield MM. Work-related hand injuries in Ontario: an historical perspective. *Clin Plast Surg* 2005;32:485-9.
2. Beavis RC, Classen DA. Hand trauma in shop class. *J Pediatr Orthop* 2006;26:36-8.
3. Conn JM, Annett JL, Ryan GW, Budnitz DS. Non-work-related finger amputations in the United States, 2001-2002. *Ann Emerg Med* 2005;45:630-5.
4. Becker TM, Trinkaus KM, Buckley DI. Tool-related injuries among amateur and professional woodworkers. *J Occup Environ Med* 1996;38:1032-5.

Managing the risk

While there are numerous types of injuries that a person can sustain from a hand tool, there are simple ways to avoid these injuries:

- ❖ Select the right tool for the task and avoid using tools for jobs they are not intended for.
- ❖ Keep tools in good condition. Prior to each use, inspect tools for any damage or defect.
- ❖ Make sure all guards are in place before using the equipment. Always unplug the machine before taking it apart for cleaning or removing a blockage.
- ❖ Ensure that you have proper training and are aware of the hazards and limitations of the equipment. Read all owner's manuals before beginning work, and follow instructions.
- ❖ Wear the gear that is appropriate for the task you are doing (e.g., safety glasses, safety boots or shoes). Avoid using bulky gloves with hand tools.
- ❖ Keep the area free of clutter and debris.
- ❖ Make sure you can concentrate on the task at hand. If you are distracted wait and work on the project at another time.
- ❖ Do-it-yourselfers should think about the possible dangers before they begin, and manage those risks accordingly. And it is important to be realistic – if a project is outside of your abilities, hire a professional.

For Further Information

Canadian Centre for Occupational Health and Safety-
OSH Answers
www.ccohs.ca/oshanswers
WorkSmartOntario!
www.worksmartontario.gov.on.ca
Young Worker Awareness Program
ywap.ca
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Methods

Emergency department data were obtained from the National Ambulatory Care Reporting System and data for acute care hospitalizations were obtained from the Discharge Abstract Database at the Canadian Institute for Health Information for the 2004/05 fiscal year. Powered and nonpowered hand tools and household machinery injuries were classified according to the International Classification of Diseases, 10th revision (ICD-10) using codes W27 and W29. 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.