

Ladders and Injuries

The fall and winter seasons provide many instances when one needs to use a ladder, whether it is for cleaning eaves or putting up holiday lights, creating many opportunities for falls and injuries. Falls are the leading cause of unintentional home injury fatality and, therefore, extra caution is required when using a ladder.

Methods

This bulletin provides a descriptive analysis of injury falls from ladders in Ontario and its regions. The source of data is the Discharge Abstract Database from the Canadian Institute for Health Information. The Discharge Abstract Database contains data on hospital discharges across Canada. Data reported in this bulletin include cases discharged from an acute care facility in Ontario for the fiscal years of 1997/98 to 2000/01. Falls from ladders are defined using code E881.0 in the International Classification of Diseases, 9th revision (ICD-9). Supplemental data for the 2002/03 fiscal year (coded according to ICD-10-CA) were used to describe the place of injury occurrence. Regions are defined according to the Ontario Ministry of Health Region Code.

Results

Ladder-related falls accounted for 5,965 injury hospitalizations in Ontario over the 5-year period from 1997/98-2001/02. In Ontario, the annual age-standardized hospitalization rate for ladder-related falls was 9.7 per 100,000 population (Table 1).

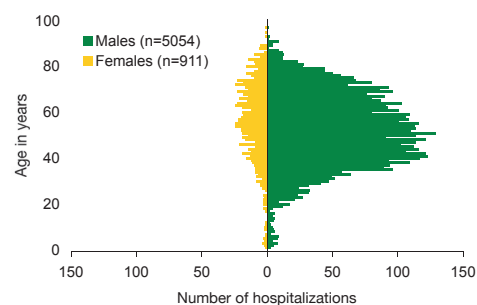
Males were hospitalized with a ladder-related fall about five times more often than females. A large peak in the number of hospitalizations was observed among men 35-70 years of age (Fig. 1).

Fractures were the most responsible diagnosis for admission in 77.5% (4624/5965) of the cases. Fractures of the wrist or forearm (13.4%), ankle (10.8%), spine (with or without spinal cord injury; 9.8%), and foot (9.3%) were most common (Fig. 2).

By month, the highest number of hospitalizations occurred in October and November and the lowest number was observed in February and March (Fig. 3).

The home was specified as the place of injury occurrence for 73.3% of the ladder-related falls in

FIGURE 1. Falls from ladders by age and sex in Ontario (1997/98-2001/02)



Ontario for 2002/03. Industrial/construction and trade/services areas were reported as the location of injury for 12.1% and 5.2% respectively of the falls from ladders (Fig. 4). These percentages are based on cases with a specified place of injury occurrence and should be interpreted with caution as 35% of the cases had an unspecified place of occurrence.

Regional variations were observed in the number and rate of injury. The annual hospitalization rate for ladder-related falls ranged from a low of 6.3 in Toronto to a high of 12.4 per 100,000 population in the North region (Table 1).

FIGURE 2. Leading diagnoses of falls from ladders in Ontario (1997/98-2001/02)

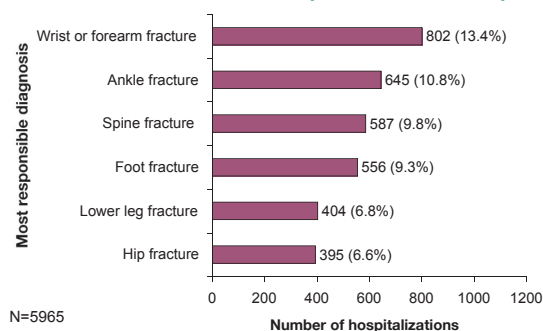


TABLE 1. Description of falls from ladders in Ontario by region of residence (1997/98-2001/02)

	South West	Central South	Central West	Central East	Toronto	East	North	Ontario
Number of hospitalizations								
Total over 5 years	985	648	917	1059	866	800	606	5965
Average/year	197	130	183	212	173	160	121	1193
Annual hospitalization rate* (95% confidence interval)	12.1 (10.3-14.0)	10.3 (8.3-12.2)	9.0 (7.7-10.3)	10.8 (9.3-12.4)	6.3 (5.3-7.3)	9.4 (7.8-10.9)	12.4 (10.0-14.8)	9.7 (9.1-10.3)
% male	82.8	84.6	87.2	83.9	85.0	84.0	86.0	84.7
Average age (std deviation)	53.3 (16.9)	53.1 (16.9)	50.6 (15.8)	53.2 (15.8)	53.7 (17.0)	53.8 (15.5)	52.8 (15.8)	52.9 (16.3)
Length of hospital stay								
Average days (range)	5 (1-99)	6 (1-111)	6 (1-180)	6 (1-182)	7 (1-204)	7 (1-132)	6 (1-123)	6 (1-204)

* Age-standardized rate per 100,000 population

Note: 84 cases were hospitalized in an Ontario hospital but did not reside in the province.

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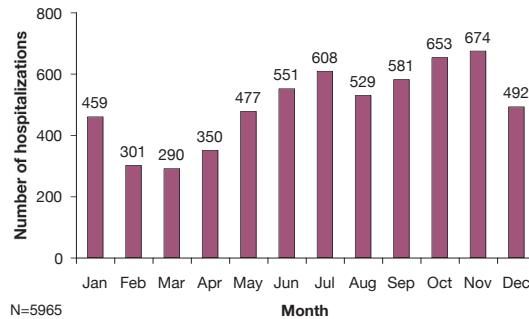
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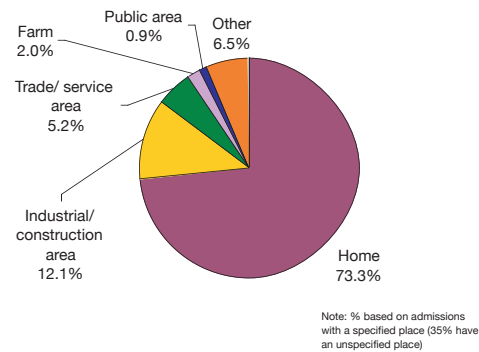
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FIGURE 3. Falls from ladders by month of admission in Ontario (1997/98-2001/02)



Falls from ladders accounted for 35,509 hospital days in Ontario over the 5-year period. The average length of hospital stay was 6 days. By region, the average length of stay ranged from 5 to 7 days (Table 1).

FIGURE 4. Place of occurrence of falls from ladders in Ontario (1997/98-2001/02)



Discussion

In an analysis of consumer products, ladders were associated with some of the highest risks for injury and longest durations of incapacity.¹

Previous studies have examined patterns of ladder falls and similar findings were observed.²⁻⁴ Falls from ladders are predominantly experienced by men and typically result in fractures of the upper and lower limbs.

Detailed data on the type/design of ladder, height fallen, and circumstances surrounding the injury event were not available. However, Muir and Kanwar⁵ suggest that a fall from a small ladder, such as a step-ladder, may result in serious injury and people falling from a height of even a few feet should not be dismissed as insignificant cases.

It was also not possible to specifically determine whether these injuries occurred in occupational settings. The home was noted as the place of injury occurrence for a large percentage of the cases. There was a large portion of cases, however, with an unspecified location. Bjornstig and Johnsson⁶ found that most of the leisure time falls occurred at home while performing tasks such as household repairs or cleaning, removing snow from the roof, and getting objects from the attic.

Managing the risk

Ladders may look harmless but improper use may present several hazards. Falls from ladders can result in serious injury including permanent disability or death. It is important to recognize the risk in using a ladder, and to make smart choices when doing so. Following these tips may help reduce the risk of falling, and of serious injury.

- Select an appropriate, CSA approved, ladder for the task. Check for defective equipment.
- Before using a ladder outdoors, choose a location that is well away from all power lines. Coming in contact with live wires can be fatal.
- Place ladders where access is not obstructed. For example, stay clear of unlocked doors.
- Place the ladder on level ground, where it will be free from loose or slippery substances, and open it completely, making sure all locks are engaged.
- Always face the ladder when climbing and wear slip-resistant shoes.
- Make sure rungs are dry before using the ladder.
- Ensure hands and feet are free from oil, grease, or other substances before climbing a ladder.
- Stand at or below the highest safe standing level on a ladder. For a stepladder, the safe standing level is the second rung from the top, and for an extension ladder, it's the fourth rung from the top.
- Move the ladder as necessary to avoid overreaching. If your belt buckle crosses either side of the ladder you are reaching too far.
- The distance from the feet of an extension ladder to the wall should be no more than 1/4 to 1/3 of the height on the wall it is reaching.

References

1. Hayward G. Risk of injury per hour of exposure to consumer products. *Accid Anal Prev* 1996;28:115-21.
2. Faergemann C, Larsen LB. Non-occupational ladder and scaffold injuries. *Accid Anal Prev* 2000;32:745-50.
3. O'Sullivan J, Wakai A, O'Sullivan R, et al. Ladder fall injuries: patterns and cost of morbidity. *Injury* 2004;35:429-31.
4. Partridge RA, Virk AS, Antosia RE. Causes and patterns of injury from ladder falls. *Acad Emerg Med* 1998;5:31-4.
5. Muir L, Kanwar S. Ladder injuries. *Injury* 1993;24:485-7.
6. Bjornstig U, Johnsson J. Ladder injuries: mechanisms, injuries and consequences. *J Saf Res* 1992;23:9-18.