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Emergency department visits for the treatment of work-related injury and illness in Ontario



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A detailed report on which this summary is based is available from:
Mustard CA, Chambers A, McLeod C, Bielecky A, Smith PM.
Comparison of two data sources for the surveillance of work injury.
Institute for Work & Health, February 2011

Executive Summary

The objective of this study was to compare the incidence of work-related injury and illness presenting to Ontario emergency departments to the incidence of workers' compensation claims reported to the Ontario Workplace Safety and Insurance Board over the period 2004-2008.

Records of work-related injury were obtained from two administrative data sources in Ontario for the period 2004-2008: workers' compensation lost-time claims (N=435,336) and records of non-scheduled emergency department visits where the main problem was attributed to a work-related exposure (N=699,196). Denominator information required to compute the risk of work injury per 200,000 work hours, stratified by age and gender, was estimated from labour force surveys conducted by Statistics Canada.

The frequency of emergency department visits for all work-related conditions was approximately 60 per cent greater than the incidence of accepted lost-time compensation claims. When restricted to injuries resulting in fracture or concussion, injury incidence was similar in the two data sources. Between 2004 and 2008, there was a 17.3 per cent reduction in emergency department visits attributed to work-related causes and a 17.8 per cent reduction in lost-time compensation claims. There was evidence that younger workers were more likely than older workers to seek treatment in an emergency department for work-related injury.

In this setting, emergency department records available for the complete population of Ontario residents are a valid source of surveillance information on the incidence of work-related disorders. Occupational health and safety authorities should give priority to incorporating emergency department records in the routine surveillance of the health of workers.

Introduction

More than 80 per cent of the increase in life expectancy over the past 100 years in North America is attributed to advances in public health. Among the 10 most important public health contributions to the improvement in population health are achievements in reducing hazardous exposures arising from work. Despite these contributions, work exposures continue to cause a large preventable burden of injury and illness in working-age adults. For example, approximately one quarter of injuries resulting in activity limitation among U.S. adults are work-related.

In this summary, we highlight findings from a study of the incidence of work injury over a five-year period, 2004-2008, that compared the incidence of work-related injury and illness presenting to Ontario emergency departments to the incidence of workers' compensation claims reported to the Ontario Workplace Safety and Insurance Board resulting in the payment of wage-replacement benefits. In many settings, there are concerns about the reliability of workers' compensation administrative records as a source of surveillance information on the incidence of work-related injury and illness. These controversies centre on concerns about the integrity of workplace reporting of work-related injury and illness among particular groups of workers or for certain types of injuries, as well as concerns about some classes of workers (self-employed and independent contractors) who are excluded from insurance coverage. The findings of this study, describing the degree of concordance between two population sources of surveillance information, speak to these concerns.

Both sources of information in this study are population-based. In the province of Ontario, citizens are universally insured for medically necessary health care, including services provided in hospital emergency departments. Similarly, a single publicly administered insurance agency administers wage-replacement benefits and purchases health-care services in circumstances of work-related disability. Approximately 30 per

cent of the Ontario labour force is in employment relationships that are excluded from coverage by the workers' compensation insurance agency, the Workplace Safety and Insurance Board (WSIB). Figure 1 illustrates the conceptual concordance between the two sources of information. The WSIB administers work disability claims that result in time off work (lost-time claims) and claims that only require health-care services (no-lost-time claims). A proportion of both lost-time and no-lost-time claimants will seek treatment in a hospital emergency department. In addition, there will be work-related injury or illness episodes presenting to an emergency department that are not reported to, accepted by or eligible for coverage from the WSIB (see Column C in Figure 1).

In designing this study, we established four hypotheses concerning the concordance of the two data sources that, if supported, would provide evidence supporting the use of these information sources for surveillance purposes:

- 1) over the five year observation period, the annual rate of change in the frequency of compensation claims and emergency department visits will be equivalent;
- 2) while the incidence of emergency department visits for work-related conditions is expected to be higher than the incidence of workers' compensation lost-time claims, across age groups and gender, the ratio of rates of compensation claims and emergency department visits will be equivalent;
- 3) the distribution of records relative to the external cause of injury will be equivalent between compensation claims and emergency department visits; and
- 4) the incidence of emergency department visits and lost-time compensation claims for serious injuries (defined as those resulting in fracture or concussion) will be equivalent between the two administrative data sources.

How the study was done

The study compared the incidence of work-related injury and illness presenting to Ontario emergency departments to the incidence of workers' compensation claims filed with the Ontario Workplace Safety and Insurance Board over the period 2004-2008 for adults aged 15-64. To examine the concordance of these two data sources, the study describes the frequency of emergency department records and workers' compensation claims over time, by age and gender and by the external cause of injury. Estimates of annual hours worked for the Ontario labour force by age and gender, derived from labour force surveys, are used to compute rates of work injuries per 200,000 hours worked. Denominator estimates were adjusted for differences in the coverage of the Ontario labour force between the WSIB and the Ontario Health Insurance Plan in the calculation of age- and sex-specific injury rates.

Administrative records maintained by the Ontario Workplace Safety and Insurance Board contain information describing registered employers and the course and outcome of individual compensation claims. Electronic records of compensation claims resulting in the payment of wage-replacement benefits (referred to as lost-time claims in this study) contain information on the date and time of injury, the employer's economic sector and the gender, birth date and occupation of the injured worker. In addition, a national coding standard is used to classify information describing the injury-event characteristics and the injury characteristics: 1) the nature of injury; 2) the part of body involved; 3) the source of injury or disease; and 4) the event or exposure.

The National Ambulatory Care Reporting System (NACRS) was established by the Canadian Institute for Health Information in 1997, providing data on individual client visits to facility-based ambulatory care services, primarily emergency departments in acute-care hospitals. In July 2000, the province of Ontario mandated the reporting of all emergency department visits to NACRS. There are more than five million annual emergency department visits in the province of Ontario recorded in NACRS. For the

purposes of this study, we obtained extracts for 699,196 NACRS records reported in the province of Ontario over the period April 2004 to December 2008 with a 'responsibility for payment' code indicating the Workplace Safety and Insurance Board. This coding indicates the clinical determination of a work-related cause of the injury or illness presenting for emergency department treatment and is independent of the registration or acceptance of a workers' compensation claim. Variables included in extracted records were: gender, birth date, visit type, triage date, triage time, and a series of up to 10 fields documenting the main problem and the external cause of injury. Of the 699,196 emergency department records, 588,186 (84 per cent) had an accompanying code for an external cause of injury, indicating a traumatic cause.

What the study found

This study found an important degree of concordance between two potential sources of information for the surveillance of work-related injury and illness. There was strong concordance in temporal trends: between 2004 and 2008, there was a 17.3 per cent reduction in emergency department visits attributed to work-related causes and a 17.8 per cent reduction in lost-time compensation claims (see Table 1). In addition, when restricted to injuries resulting in fracture or concussion, injury incidence per 2,000,000 hours of work by age group and gender was generally similar in the two data sources (see Table 2).

The study also found some important discordant patterns in the two sources of information on work-related injury and illness. While there was concordance in the frequency of some categories of injury cause between the two data sources (for example, the frequency of work-related injuries arising from transportation accidents), there were two prominent differences in the distribution of injury cause information between the two sources of information. The workers' compensation claims had a higher proportion of records attributing the injury cause to bodily reaction and exertion. The

emergency department records had a higher proportion of attributed cause to events associated with contact with objects or equipment.

We identify four principal strengths of this proposed study. The first strength is reliance upon two independent sources of information that can be used to identify the occurrence of a work-related injury. Second, both sources of administrative data are population-based, each providing high coverage of the Ontario labour force. The third strength is the five-year period of observation, providing descriptions of temporal trends in the incidence of work-related disorder. We note a fourth strength. The emergency department records described in this study are cost-efficient relative to available alternatives such as cross-sectional or longitudinal surveys. In gaining this efficiency, the potential source of surveillance information trades off the opportunity to have access to detailed information on work environments and worker characteristics.

In conclusion, in this setting, emergency department records available for the complete population of Ontario residents are an important source of surveillance information on the incidence of work-related disorders. Occupational health and safety authorities should give priority to incorporating emergency department records in the routine surveillance of the health of workers.

Figure 1

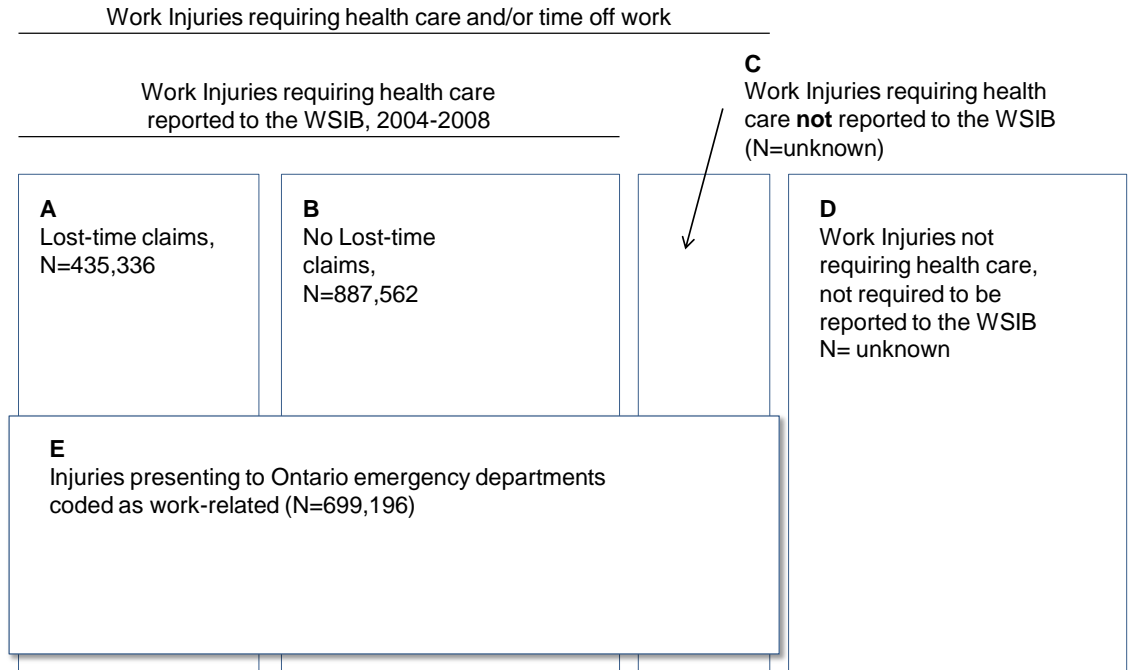


Table 1
Comparison of emergency department records for work-related conditions and lost time claims, Workplace Safety and Insurance Board Ontario 2004-2008

	Emergency department visits for work-related conditions	Lost-time claims, Workplace Safety and Insurance Board	Ratio of emergency department visits to lost-time claims
2004	155,079	94,407	1.64
2005	153,010	93,306	1.64
2006	141,766	86,354	1.64
2007	134,915	83,656	1.61
2008	128,277	77,613	1.65
Total	699,196	435,336	1.61
Percent change: 2004-2008	-17.3	-17.8	

A total of 116 emergency department records were missing information on injury year. Emergency department records were available for the period April-December 2004 (N=116,309). In this table, we have projected the full year count of emergency department records for 2004.

Table 2
Incidence of fracture or concussion:
Comparison of emergency department records for work-related conditions
and lost time claims, Workplace Safety and Insurance Board
Ontario 2004-2008

	Emergency department records				Lost-time claims			
	Fracture or concussion	All visits	Fracture or concussion as a percent of all visits	Fracture or concussion incidence per 2,000,000 hours of work	Fracture or concussion	All claims	Fracture or concussion as a percent of all claims	Fracture or concussion incidence per 2,000,000 hours of work (1)
	N	N	%		N	N	%	
Males								
15-24	4,845	103,065	4.7	9.54	4,447	40,240	11.1	11.17
25-34	6,959	123,703	5.6	7.21	6,558	60,275	10.9	9.10
35-44	8,018	119,513	6.7	7.02	8,779	74,918	11.7	9.87
45-54	7,276	89,748	8.1	6.57	6,160	64,641	9.5	6.92
55-64	3,661	36,070	10.1	6.39	3,351	29,496	11.4	7.41
TOTAL	30,759	472,099	6.5	7.16	29,295	269,570	10.9	8.74
Females								
15-24	1,098	34,337	3.2	2.58	998	18,063	5.5	3.28
25-34	1,464	37,299	3.9	1.97	1,475	30,902	4.8	3.24
35-44	1,997	43,017	4.6	2.35	2,352	46,045	5.1	4.44
45-54	2,836	39,248	7.2	3.32	3,416	48,541	7.0	6.41
55-64	1,901	15,691	12.1	5.07	2,435	21,431	11.4	10.59
TOTAL	9,296	169,592	5.5	2.86	10,676	164,982	6.5	5.20

(1) Annual hours of work are adjusted for age- and sex-specific workers' compensation coverage estimates