



Regional trends in occupational injury in the province of Ontario: A comparison of two data sources

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Regional Trends in Occupational Injury

This work aligns to two purposes:

supporting the implementation of the Expert Advisory Panel's recommendations regarding enhanced surveillance of occupational injury

examining the utility of a secondary data source for the surveillance of occupational injury to address concerns about the validity of workers' compensation records.



Percent change 2004-2008 among work-related emergency department records and lost-time claims

	Emergency department visits	Lost-time claims, WSIB	Ratio of emergency department visits to lost-time claims
2004	149,965	94,407	1.59
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	707,933	435,336	1.62
Percent change: 2004-2008	-14.5%	-17.8%	



Reductions in Occupational Injury

The field of occupational health and safety has made great progress in the reduction of hazardous exposures

- Prevention initiatives have been targeted to groups of workers known to have an elevated risk
- Elevated prevalence of specific types of injuries have also influenced the direction of prevention efforts.

The parallel decline in the occupational injury rate documented in both lost-time claims and work-related emergency department records is evidence that the control of work injury hazards is improving in Ontario.



Study Objectives

Work related injuries have declined by 14.5% and 17.8% (2004-2008) among emergency department records and lost-time claims, respectively.

It is important to know whether this decline is being observed consistently across Ontario and for all types of work injuries.

The objective of this analysis was to describe rates of occupational injury in Ontario (2004-2010) by economic region, injury event and by injury severity.



Data Sources

(1) Emergency Department Records

- In 2000, Ontario mandated the reporting of all emergency department visits to NACRS
- Records were extracted where 'responsibility for payment code' was assigned to the WSIB
- 2004-2010, 833,425 work-related emergency department records were available with information to allocate the economic region
- Information available: gender, age, visit type, triage date & time, and up to 10 fields describing main problem and external cause (ICD10)



Data Sources

(2) Workers' Compensation Claims

- 2004-2010 558,920 lost-time records were available with information with information to allocate the economic region
- Administrative records maintained by the Ontario Workplace Safety & Insurance Board contain information describing registered employers and the course and outcome of individual compensation claims
- Lost-time claims use a national coding standard (CSA Z-795) to classify information describing the nature of injury, part of body involved, source of injury or disease and the event or exposure.



Data Sources

(3) Labour Force Survey

- Denominators for the emergency department records are based on the number of employed persons obtained from the Statistics Canada's Labour Force Survey.

(4) Insured Labour Force

- Denominator for the lost-time claims were based on estimates of the insured labour force.



Work Injuries requiring health care and/or time off work

Work Injuries requiring health care
reported to the WSIB, 2004-2008

A

Lost-time claims,
N=435,336

B

No Lost-time
claims,
N=887,562

C

Work Injuries requiring health
care **not** reported to the WSIB
(N=unknown)

D

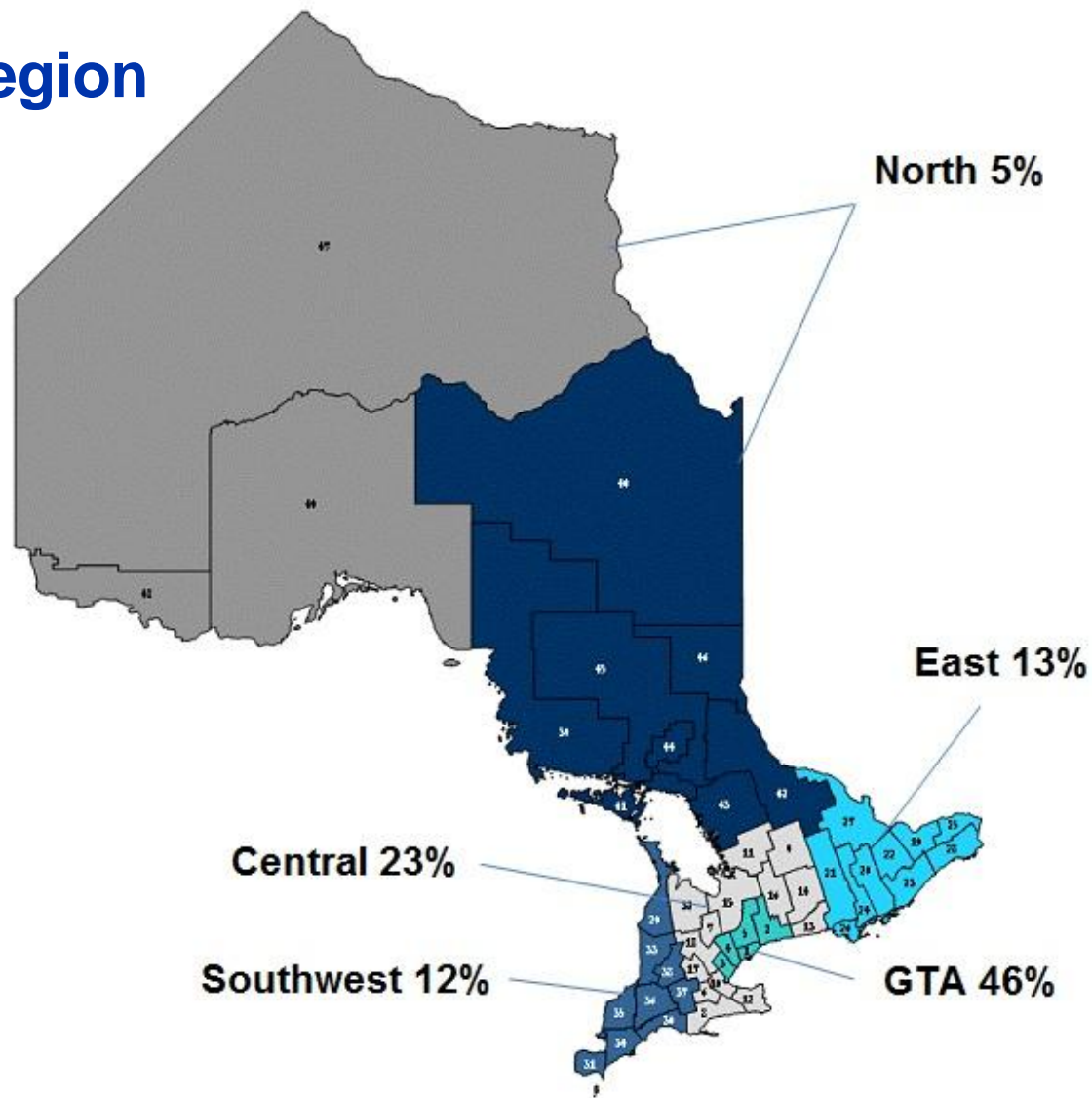
Work Injuries not
requiring health care,
not required to be
reported to the WSIB
N= unknown

E

Injuries presenting to Ontario emergency departments
coded as work-related (N=699,196)



Economic Region





Geographic Region

Emergency Department Records:

- Geographic region recorded in the emergency department records corresponds to the forward sortation area (FSA), the first three digits of the injured workers home address.

Lost-time Claims:

- The variable used to establish the geographic region is a four digit code that refers to where the accident occurred



The Economic Recession

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2008	128,277	77,613	1.65
2009	106,450	64,899	1.65

Percent change:
2008-2009

-17.1

-18.0



Lost-time Claims – Trends by Injury Severity

	Concussion or fracture injuries	% Change previous year	Other injuries	% Change previous year
2004	7,661		86,634	
2005	7,498	-2.1%	85,892	-0.9%
2006	6,900	-8.0%	79,638	-7.3%
2007	6,832	-1.0%	77,196	-3.1%
2008	6,527	-4.5%	72,511	-6.1%
2009	5,199	-20.3%	57,519	-20.7%
2010	5,357	3.0%	53,556	-6.9%



Emergency Department Visits – Trends by Injury Severity

	Concussion or fracture injuries	% Change previous year	Other injuries	% Change previous year
2004	8,273		129,865	
2005	8,262	-0.1%	132,660	2.2%
2006	7,725	-6.5%	122,195	-7.9%
2007	7,796	0.9%	115,608	-5.4%
2008	8,241	5.7%	109,429	-5.3%
2009	7,204	-12.6%	90,178	-17.6%
2010	7,544	4.7%	94,626	4.9%



There is good evidence that the frequency of workers' compensation claims **per hour worked** declines in recessions and increase in times of economic recovery.

Some possible explanations are that during recessions:

- there are fewer inexperienced workers
- the least safe equipment is taken out of use
- the pace of work is slower
- workers fearing job loss may defer filing claims
- hazardous industries experience the largest decline in employment

issue briefing

Workers' compensation and the business cycle

A worldwide recession has begun in the wake of the fall 2008 meltdown of financial markets. What is the likely impact of the recession on workers' compensation costs? Are claims likely to be more or less frequent? Are work-related injuries likely to be more severe? How is the length of time off work affected? What can we anticipate about claim frequency and severity when recovery occurs and economic growth resumes?

This policy brief explores findings from past research on workers' compensation and the business cycle. The Institute for Work & Health has contributed to this research, mainly through the work of Ann-Sylvia Brooker, John Frank and Valerie Tarasuk on claim rates for back pain and acute injuries.

Theoretical considerations

Claims and claim frequency

As employment falls in a recession, one would expect the absolute number of claims to fall, since there are fewer workers to make claims. However, premiums for workers' compensation insurance, which are usually based on payroll, would also fall. Workers' compensation benefit providers are more interested in the frequency of claims: claims per worker covered or — even better, but not always available in the data — claims per hour worked. The research on this issue points to several factors likely to affect claim frequency, generally in the direction of fewer claims per hour worked during recessions, and increased claim frequency in expansions. Considerations include the following.

- Inexperienced workers, who tend to have higher injury rates, are typically laid off first during recessions, and there are fewer new hires, so employees are less likely to be new to the job. In boom times, the opposite occurs as less experienced workers become a larger part of the workforce. The work of IWH Scientists Curtis Breslin and Peter Smith shows that inexperienced workers have elevated claim rates. In particular, workers on the job for less than a month have over three times as many workers' compensation claims as those who have held their current job for more than a year. Shuford (2008), citing data from the U.S. Bureau of Labor Statistics, reports that workers with less than one year with their current employer have a 46 per cent higher claim rate than the average worker.

KEY MESSAGES

- There is a long-term trend in Canada, the United States and a number of other countries towards fewer workers' compensation claims per hour worked.
 - There is fairly strong evidence that, relative to this trend, the frequency of workers' compensation claims per hour worked tends to decline in recessions and increase in times of economic recovery. Some possible explanations are that during recessions:
 1. there are fewer inexperienced workers
 2. the least safe equipment is taken out of use
 3. the pace of work is slower
 4. workers fearing job loss may defer filing claims
 5. hazardous industries experience the largest decline in employment.
 - While it is also possible that workers facing layoff are more likely to file claims, the evidence indicates that this is outweighed by factors tending to reduce claims in recessions.
 - The evidence regarding costs per claim — both wage replacement and medical costs — is thinner and somewhat mixed. The available evidence suggests that it is unlikely that recessions would accelerate the growth of these costs.
 - In booms, older, less safe equipment may be brought back into use in order to meet growing production targets, and workers may be less familiar with the machinery if it has been out of use. In recessions, the least efficient — which often means least safe — equipment is taken out of use first.
 - Booms are associated with more overtime work and a faster pace of work, both of which lead to more fatigue and higher injury rates.
 - The cyclical swings in employment tend to be greater in industries that are more hazardous, such as construction. This means that, in recessions, employment falls more in the hazardous industries than in the rest of the economy, tending to reduce injury rates. The reverse happens in boom periods.
 - When unemployment is rising, workers may defer filing claims, especially if the injuries are relatively minor, out of fear of losing their jobs.
- The first three of these reasons for lower claim frequency in





Findings: Trends in the rate of occupational injury by economic region and injury event

- There is very little variation in the rate of lost-time claims across the 5 economic regions; there is greater regional variation in the rate of emergency department encounters.
- There has been a larger decline among lost-time claims than emergency department records over the period 2004-2010. The decline in the incidence of more severe injuries parallels the decline in less serious injuries in both data sources
- The reduction over time in injuries attributed to falls was less substantial than other causes in both data sources.
- In both data sources, the North has the highest overall rate of occupational injury and the highest rate of more severe injury



Rate of occupational injury (2010) by region

ED Records:

	N	Employed Persons	Rate per 1,000
Ontario	100,403	6,599,117	15.2
East	13,629	881,850	15.5
Central	27,510	1,528,550	18.0
GTA	28,858	3,065,200	9.4
Southwest	17,380	768,733	22.6
North	13,026	354,783	36.7

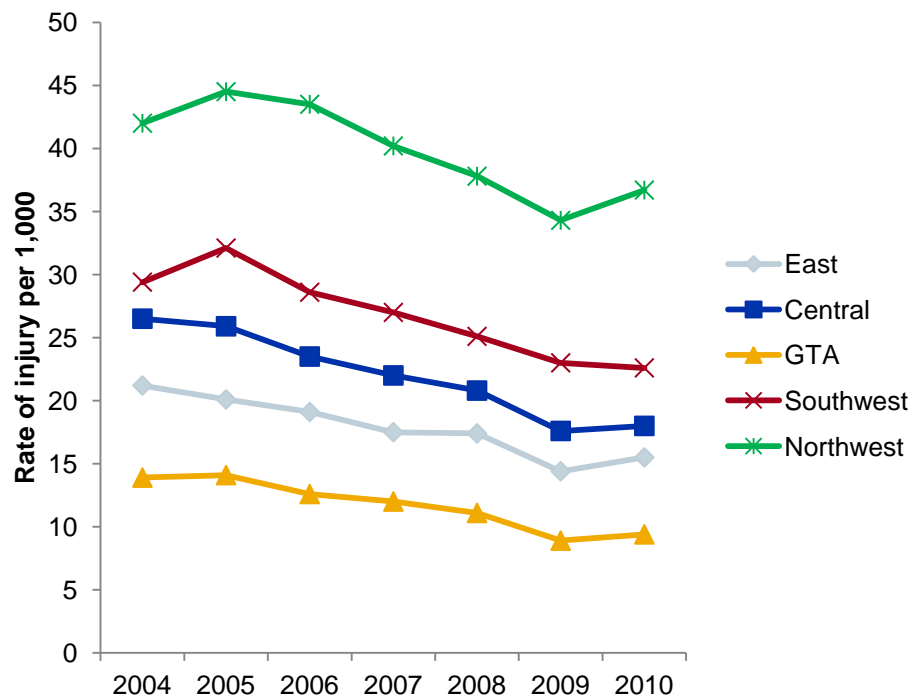
LT Claims:

	N	Insured Labour Force	Rate per 1,000
Ontario	58,913	4,732,679	12.4
East	8,070	650,860	12.4
Central	12,631	1,129,107	11.2
GTA	27,124	2,101,226	12.9
Southwest	7,096	573,458	12.4
North	3,992	278,028	14.4

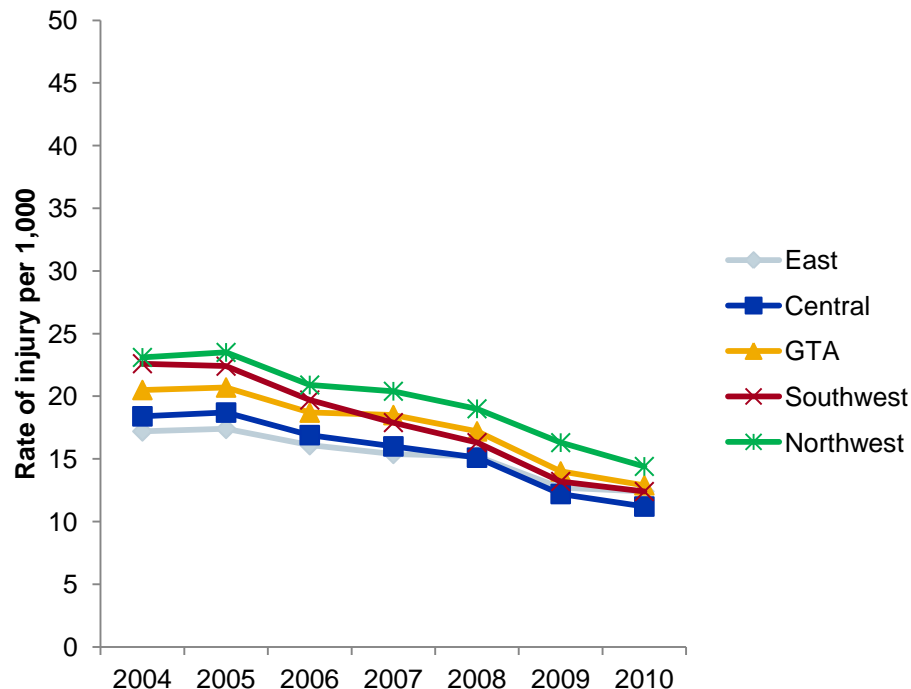


Rate of occupational injury by region and year

Emergency department records:



Lost-time claims:





Rate of occupational injury by region and year

	Emergency Department Records		Lost-time Claims	
	2004 vs 2007	2007 vs 2010	2004 vs 2007	2007 vs 2010
Ontario	↓13.7%	↓17.7%	↓12.3%	↓28.9%
East	↓17.3%	↓11.7%	↓10.6%	↓19.3%
Central	↓16.7%	↓18.4%	↓13.2%	↓30.0%
GTA	↓14.1%	↓21.3%	↓9.6%	↓30.2%
Southwest	↓8.2%	↓16.2%	↓20.8%	↓30.9%
North	↓4.3%	↓8.7%	↓11.8%	↓29.5%



Overall Decline 2004-2010

	Emergency Department Records	Lost-time Claims
Ontario	↓29%	↓38%
East	↓27%	↓28%
Central	↓32%	↓39%
GTA	↓32%	↓37%
Southwest	↓ 23%	↓ 45%
North	↓ 13%	↓ 38%



Rate of injury per 1,000 employed persons by region and severity (2010)

	Emergency department records		Lost-time claims	
	Concussion and Fractures	Other injuries	Concussion and Fractures	Other injuries
Ontario	1.1	14.1	1.1	11.3
East	1.1	14.4	1.0	11.4
Central	1.2	16.8	1.0	10.2
GTA	0.9	8.5	1.2	11.7
Southwest	1.5	21.1	1.2	11.2
North	2.3	34.4	1.3	13.0



Percent change by injury severity and region 2004-2007

	Emergency Department Records		Lost-time Claims	
	Concussion and Fractures	Other Injuries	Concussion and Fractures	Other Injuries
Ontario	↓9.1%	↓14.0%	↓12.2%	↓12.3%
East	↓8.2%	↓17.8%	↓12.7%	↓10.4%
Central	↓8.7%	↓17.2%	↓15.5%	↓13.0%
GTA	↓8.9%	↓14.6%	↓10.9%	↓9.5%
Southwest	↓8.2%	↓8.2%	↓15.0%	↓21.3%
North	↓11.1%	↓3.9%	↓2.6%	↓12.7%



Percent change by injury severity and region 2007-2010

	Emergency Department Records		Lost-time Claims	
	Concussion and Fractures	Other Injuries	Concussion and Fractures	Other Injuries
Ontario	↓3.5%	↓18.7%	↓20.5%	↓29.7%
East	6.4%	↓12.8%	↓12.3%	↓19.9%
Central	↓11.0%	↓18.8%	↓21.3%	↓30.8%
GTA	↓10.3%	↓22.3%	↓20.7%	↓31.1%
Southwest	8.4%	↓17.5%	↓20.7%	↓31.9%
North	24.7%	↓10.3%	↓28.9%	↓29.6%



Injury Event

	Rate of injury per 1,000			% Change 2004 vs 2007	% Change 2007 vs 2010
	2004	2007	2010		
Lost-time Claims:					
Bodily reaction and exertion	9.3	8.3	5.5	-11.3%	-33.0%
Contact with objects or equipment	5.0	4.1	2.7	-17.9%	-33.0%
Falls	3.5	3.2	2.3	-9.4%	-26.7%
Exposure to harmful substances	1.0	0.9	0.9	-9.0%	2.1%
Other	1.2	1.1	1.0	-7.2%	-14.8%
Emergency Department Records:					
Bodily reaction and exertion	4.8	4.4	3.7	-7.8%	-17.4%
Contact with objects or equipment	11.0	9.0	7.3	-18.2%	-18.7%
Falls	2.8	2.6	2.2	-5.6%	-16.8%
Exposure to harmful substances	2.2	1.8	1.5	-18.9%	-17.0%
Other	1.1	0.9	0.8	-12.2%	-15.2%



Rate of work-related emergency department records per 1,000 employed persons by injury event, 2010

	East	Central	GTA	Southwest	North	Ontario
Strains	3.9	4.3	1.8	5.8	10.5	3.6
Contact	7.2	8.6	4.7	10.6	15.5	7.2
Falls	2.2	2.4	1.4	3.0	5.1	2.1
Exposure	1.4	1.7	0.9	2.1	3.8	1.5
Other*	0.7	0.9	0.5	1.0	1.8	0.8
TOTAL	15.5	17.9	9.4	22.6	36.7	15.2



Rate of lost-time claims per 1,000 employed persons by injury event, 2010

	East	Central	GTA	Southwest	North	Ontario
Strains	5.4	5.3	5.5	6.0	6.8	5.9
Contact	2.5	2.4	3.0	2.5	2.7	2.9
Falls	2.0	2.1	2.5	2.2	2.5	2.5
Exposure	1.6	0.6	0.8	0.8	1.1	0.9
Other*	0.8	0.8	1.1	0.9	1.2	1.0
TOTAL	12.4	11.2	12.9	12.4	14.4	13.2



Summary

Work related injuries captured in both lost-time claims and emergency department records are on the decline.

The recession resulted in a dramatic reduction in work related injuries captured in both data sources.

Despite significant progress, rates of occupational injury are still high and vary by economic region and injury event.

The north economic region was found to have the highest overall rate of occupational injury; however, there was much less variation among the lost-time claims.

To some extent the two data sources may be capturing different types of occupational injuries. It will be important to further understand the degree of concordance between these two data sources.



Next Steps

Plans are underway to examine the extent to which records from the WSIB can be matched to emergency department records. This will tell us more about the validity of the NACRS data system as a source of surveillance for work-related injury and illness.



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Distribution of employed persons by industry

	Percent of total employed persons		
	Ontario	North	Southwest
Resources	0.5	5.8	0.5
Agriculture	1.5	0.8	4.2
Info., Culture & Recreation	5.0	3.8	3.9
Public Administration	5.0	7.4	2.9
Construction	6.3	6.0	6.5
Education	7.1	8.5	6.5
Distributive	9.0	8.8	9.4
Personal Services	10.1	10.4	11.0
Health & Social Assistance	10.2	14.5	11.9
Retail Trade	12.1	14.0	12.2
Manufacturing	14.4	8.5	18.0
Finance, Prof. Mgmt	18.9	11.5	13.1