

Declining Trends in Work-Related Morbidity and Disability, 1993–1998: A Comparison of Survey Estimates and Compensation Insurance Claims

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In the past decade, rates of workplace injury resulting in wage-replacement compensation for lost time have declined by approximately 50% in the province of Ontario, as they have in many jurisdictions in North America.¹ There is substantial uncertainty about the causes of this decline and controversy about the extent to which the reduction in rates of lost-time wage-replacement claims corresponds to an underlying reduction in the incidence of workplace injury.^{2–4}

Compensable workplace injury and illness represent a substantial source of illness burden and disability in working-age populations. Approximately 70% of compensable workplace injury and illness has an underlying musculoskeletal origin arising both from acute traumatic exposures and from sustained, cumulative biomechanical challenges.⁵ The pattern of prevalent musculoskeletal pain symptoms across a spectrum of severity has been likened to the metaphor of an iceberg, with the majority of symptomatic individuals not qualifying for compensation.^{6–8} Over the past decade, increasing attention has been paid to understanding the roles played by policies and practices of employers and insurers in influencing the threshold of pain and disability that results in a workers' compensation claim. It is increasingly acknowledged that this threshold has a discretionary component.^{9,10}

Many explanations have been offered for the observed decline in compensable workplace injury and illness over the past decade. Macroeconomic factors such as demographic changes in the labor force, sectoral shifts in the distribution of employment in the economy, and business-cycle effects have been considered. Within the workplace, the potential role of increased penetration of ergonomic design in capital investment, the nature of work organization, and heightened attention to workplace safety and health management may be respon-

Objectives. This study compared trends in the incidence of work-related morbidity and disability across 3 sources of surveillance data in a Canadian province.

Methods. Time series estimates of workplace injuries and work-related disability based on 2 panel surveys in the province of Ontario, Canada, for the period 1993–1998 were compared with rates of work-related injury and illness compensation claims during the same period.

Results. Lost-time compensation claims declined by 28.8% over this 6-year period. The incidence of self-reported work-related injury declined by 28.2%, and the self-reported incidence of work absence for work-related causes declined by 32.2%.

Conclusions. Parallel reductions in work-related morbidity were seen in 3 independent data sources. These results support an interpretation that there has been an important reduction in injury risk in Ontario workplaces over the past decade. (*Am J Public Health*. 2003; 93:1283–1286)

sible for an actual decline in the incidence of disability arising from workplace exposures.

A contrary hypothesis proposes that the underlying prevalence of exposures and the incidence of disability arising from these exposures have not changed. Instead, according to this theory, the influence of policies and practices of insurers, regulators, and employers has raised the threshold of disability for a compensation claim, and this changing disability threshold is responsible for the decline in compensable workplace injury and illness over the past decade.

In this article, we report time series results from 2 separate national survey samples that measured the self-reported incidence of workplace injuries and work-related disability among large, representative samples of Ontario labor force participants. The objective of this analysis was to determine whether the change in lost-time compensation claims over the period 1993–1998 corresponded to changes in the self-reported incidence of work-related injuries and disability.

METHODS

Study Design and Study Samples

Three sources of information on workplace injuries and work-related disability were used

in this study: work-related injury and illness compensation claims presented to the single-payer workers' compensation agency in Ontario, the Workplace Safety and Insurance Board (WSIB); the Ontario sample of the National Population Health Survey (NPHS); and the Ontario sample of the Survey of Labour and Income Dynamics (SLID). Descriptions of sample design, measures, and response rates for the NPHS and the SLID panel surveys are available from Statistics Canada.^{11–13}

Measures

Injury claims resulting in lost-time compensation. Reports of injury or illness arising from workplace exposures are required by law to be reported to the WSIB. Injury claims resulting in lost-time compensation were obtained from the WSIB for both Schedule 1 employers (who are required to pay insurance premiums to the WSIB) and Schedule 2 employers (who are eligible to self-insure; injury claims from workers employed by Schedule 2 firms are administered by the WSIB). We tabulated the claims by the year of injury incidence for the period 1993–1998 using estimates of the Ontario labor force obtained from the SLID. During the period of this study, approximately 70% of the Ontario labor force was employed by firms listed as Schedule 1 employers.

Workplace injuries resulting in activity restriction. The injury measures in the NPHS are based on a question sequence that asks respondents to recall, for the past 12 months, any injuries serious enough to limit normal activities. For those respondents who identify 1 or more injury events that satisfy the criterion of activity limitation, a further question asks the cause of the most serious injury experienced over the past 12 months. An injury occurring at the workplace is 1 of the response categories. We calculated rates per 1000 workers using denominators based on labor force participation during the week of the NPHS survey. Self-employed respondents were excluded from both numerator and denominator estimates.

Absence from work for 1 week or longer. The SLID measures work absences of 1 week or longer in the following question sequence. Respondents who reported working in the week of the survey are asked to recall absences from work for 1 week or longer in the 12-month recall period, excluding absences attributable to fully paid vacations. In addition to reporting the duration of absences, the respondent is asked to identify the main reason for the absence. Among the eligible re-

sponses is the category “illness or disability.” For respondents reporting an absence attributable to illness or disability, a further question asks the respondent if this absence was due to a work-related injury or illness. We calculated rates per 1000 workers for work-related injury or illness using denominators based on labor force participation during the past year. Respondents reporting less than full-year participation were included in the denominator. Self-employed respondents were excluded from both numerator and denominator estimates.

Comparability of study populations. The SLID and the NPHS panel survey samples were generally comparable in sampling design and measurement of labor force participation. Estimates of the employed labor force were similar and were consistent with estimates from the Labour Force Survey, which is the primary Statistics Canada survey for monitoring labor market activity. As panel studies, both the SLID and the NPHS collected repeated measures on the same study sample over time. Table 1 provides a description of the target population, sampling, case definition, measurement method, and inclusion/exclusion criteria for the 3 study sam-

ples. The SLID and the NPHS, representative of the Ontario labor force, provided accurate estimates of the WSIB insured population.

Analysis

We calculated the measures derived from survey sources using sample weights. Confidence intervals were calculated for the survey estimates.

RESULTS

Table 2 presents trends in WSIB lost-time claims, NPHS respondents’ reports of work-related injury resulting in activity limitation, and SLID respondents’ reports of the incidence of a work absence of at least 1 week. For each measure, the table shows the percentage change over the period 1993–1998. To facilitate comparisons within this table, we calculated rates based on labor force estimates from survey sources. Over this 6-year time period, the Ontario labor force expanded by 9.1%, and the rate of lost-time compensation claims declined by 28.8%.

Among Ontario labor force participants in the NPHS, the survey estimated a 1994 injury rate of 180.9 per 1000 workers and a 1994

TABLE 1—Summary of Characteristics of Target Populations, Sampling, and Measurement: Ontario, Canada, 1993–1998

	Workplace Safety and Insurance Board (WSIB)	National Population Health Survey (NPHS)	Survey of Labour and Income Dynamics (SLID)
Population	Employees of firms registered with the single-payer workers' compensation authority in Ontario	NPHS target population for province of Ontario includes household residents aged 12 years and older, except persons living on Indian reserves, on Canadian Forces bases, and in some remote areas	SLID target population for province of Ontario is all persons aged 16 years and older, excluding persons living on Indian reserves, on Canadian Forces bases, and in some remote areas
Sampling	Complete insured population	Multistage stratified sample of private dwellings selected within clusters One member per household was selected for the health survey; n = 3063 (1994)	Stratified, multistage design that used probability sampling to select households Up to 12 members of each sampled household were included; n = 4964 (1993)
Inclusion and exclusion criteria	Full-time or part-time employees with full or partial employment in past year; self-employed workers were excluded	Current full-time, part-time, or unemployed labor force participants living in province of Ontario, excluding respondents who were self-employed	Current full-time, part-time, or unemployed labor force participants living in province of Ontario
Case definition	Accepted compensation claim for wage-loss for work-related injury or illness resulting in work absence of 1 day or longer	In the past 12 months, did you have any injuries that were serious enough to limit your normal activities? If YES, thinking about the most serious injury in this period: was this a work-related injury?	In the past year, were you absent from this job for 1 week or longer, not counting fully paid vacations? If YES, the main reason for this absence was: own illness or disability? If YES: was this due to a work-related illness or injury?
Measurement method and frequency	Electronic records of claims administration	Panel study, with respondents interviewed at 24-month intervals and data collection by computer-assisted interviewing	Panel study, with respondents interviewed annually and data collection by computer-assisted interviewing

TABLE 2—Comparison of Trends in Lost-Time Claims (WSIB) and Survey Respondents' Reporting of Work-Related Injury Resulting in Activity Limitation (NPHS) or Work-Related Illness or Injury Work Absence of 1 Week or Longer (SLID): Ontario Labor Force Participants, Excluding Self-Employed, 1993–1998

	1993	1994	1995	1996	1997	1998	Percentage Change 1993–1998 ^a
Labor Force, No. ^b	5 015 251	5 187 442	5 201 610	5 146 359	5 429 347	5 472 119	9.1
Workplace Safety and Insurance Board (WSIB)							
WSIB lost-time claims (Schedule 1 and Schedule 2 firms), No. ^c	125 122	125 644	118 814	103 080	101 806	97 190	-22.3
No./1000 workers	24.9	24.2	22.8	20.0	18.8	17.8	-28.8
Proportion of lost-time claims of greater than 7 days ^d	0.55	0.53	0.51	0.49	0.48	0.47	-14.5
Estimated number of WSIB lost-time claims of greater than 7 days, No.	68 817	66 591	60 595	50 509	48 867	45 679	-33.6
No./1000 workers	13.7	12.8	11.6	9.8	9.0	8.3	-39.2
National Population Health Survey (NPHS)							
Work-related injury resulting in activity limitation, previous 12 months, No.		347 011		133 456		202 707	-36.2
No./1000 workers		61.9		23.9		33.7	-28.2
95% CI		53.5, 70.3		21.8, 26.0		26.7, 40.7	
Survey of Labour and Income Dynamics (SLID)							
Work-related illness- or injury-caused absence from work for 1 week or more, No. ^e	85 028	79 032	68 752	60 709	64 028	62 907	-26.0
No./1000 workers	17.0	15.2	13.2	11.8	11.8	11.5	-32.2
95% CI	14.2, 22.4	11.7, 18.8	9.9, 16.5	9.7, 13.9	9.7, 13.9	9.4, 13.6	

Note. CI = confidence interval.

^aEstimated from linear slope regression.

^bWeighted estimate of Ontario labor force, excluding self-employed (SLID).

^cWSIB Statistical Supplement.¹⁴

^dSpecial tabulation, WSIB claim files.

^eSpecial tabulation, SLID.

work-related injury rate of 61.9 per 1000. The 1996 work-related injury rate was 23.9 per 1000, and the 1998 rate was 33.7 per 1000. The proportion of all injuries attributed to work and resulting in activity restriction was 33% in 1994, 28.2% in 1996, and 27.9% in 1998.

To provide an appropriate comparison with the measure of a 1-week absence for work-related illness or injury obtained from the SLID, Table 2 displays the proportion of WSIB lost-time claims of 7 days or greater. There was a reduction in the overall proportion of lost-time claims over this 6-year period, from 55% of all claims receiving wage-loss compensation in 1993 to 47% of claims in 1998. In the SLID, the incidence rate of a 1-week absence for work-related injury or illness was 17.0 per 1000 workers in 1993 (30.1% of total 1-week absences for illness or disability), declining to 11.5 per 1000 in 1998 (26.2% of the total 1-week absences for illness or disability). The number of WSIB lost-time claims of more than 7 days' duration declined by 33.6%, and the rate of long-duration claims per 1000 labor force participants declined by 39.2%. In comparison, SLID respondents re-

ported a 32.2% reduction in the rate of absence per 1000 labor force participants.

DISCUSSION

We report results from 2 independent survey-based time series that show declines in the self-reported incidence of workplace injury and in the incidence of work absence for work-related injury or illness that closely parallel the reduction in lost-time compensation claims filed with the Ontario WSIB. These results support the concept that there has been an important reduction in injury risk in Ontario workplaces over the past decade.

We offer a number of observations on the evidence from health interview and labor market surveys concerning the proposition that claim reporting has diverged from injury incidence over the past decade in Ontario. In the NPHS, respondents were asked to report the incidence of injuries that were serious enough to result in activity restriction. The NPHS respondents were not specifically asked if the workplace injury resulted in a work absence. Accordingly, the NPHS respondents would be

reporting a spectrum of injuries that would include both those resulting in an absence from work and those resulting in activity restriction at work but not an absence from work. On this basis, the NPHS incidence estimates should be greater than the WSIB claim rate for lost-time compensation but less than the aggregate claim rate for lost-time and no-lost-time injury claims. These are the results observed in the data in Table 2. Similarly, if there were a strong trend over the decade for persons experiencing disabling injuries to be less likely to file a lost-time claim, it would be expected that the NPHS estimates would show greater divergence from the WSIB lost-time claim rate at the end of the decade compared with the beginning of the decade. This pattern was not observed.

SLID respondents were asked to report the incidence of a work absence of 1 week or longer that the respondent attributed to a work-related cause. These incidence estimates of long-duration work absences should be lower than the lost-time injury rates reported by the WSIB, which include work absences of less than 1 week. These are the results observed in the data in Table 2.

When one compares the slope of the trend for WSIB lost-time claims with the slope of the trend in long-duration work absence estimated from the SLID, it would appear that the rate of decline in lost-time compensation claims is steeper than that in long-duration work absences. Over the 6-year period, the proportion of SLID respondents reporting a 1-week absence for work-related injury or illness who also reported receiving wage-loss compensation from the WSIB declined from 65.2% in 1993 (95% confidence interval [CI]=55.3%, 75.1%) to 50.0% in 1998 (95% CI=41.3%, 58.7%). This decline in the proportion of potentially eligible workers reporting wage-loss compensation is consistent with an interpretation that the decline in wage-loss compensation claims has been greater than the decline in the actual incidence of morbidity attributable to occupational exposures. This interpretation is also supported by evidence that the slope of decline in self-reported work-related injury among NPHS respondents is less aggressive than the slope of decline in wage-loss compensation claims. The imprecision in slope estimates resulting from the limited number of measurement points, especially in the case of the NPHS, limits the confidence of this interpretation. Declines over time in the severity of workplace injuries resulting in work absences and changes over time in the active workplace management and accommodation of lost-time injuries could account for these different slope trends.

Both survey sources are panel studies. In the case of the NPHS, panel participants provided 3 measures of injury: a baseline measure and 2 subsequent measures at 24-month intervals. In the case of the SLID, the initial panel participants provided 6 measures of injury: a baseline measure and 5 annual follow-up measures. Estimates of workplace injury based on panel study designs may underestimate the population incidence of workplace injury because the cohort is closed to the recruitment of new workers. A well-established workplace injury risk is associated with young workers and with recent employment. Over time, members of panel studies will be increasingly likely to be more experienced in their employment than would be expected in a random sample of the labor force. Similarly, seriously injured members in a panel study are at high risk of labor force exit. The combined effect of these 2 fac-

tors would lead to a decline in the incidence of workplace injury over time in a cohort study design with repeated measures. The results reported for both the NPHS and the SLID samples are consistent with this expectation.

In this effort to compare trends in administrative records of compensated injury claims with survey-based estimates of self-reported workplace injury and self-reported absences of long duration attributable to workplace injury and illness, we have demonstrated a pattern of declining incidence over the past decade in all 3 data sources. Although an alternate study design based on detailed prospective surveillance of workplace injury and workplace disability management decisions is required to definitively address this question, we believe that these results argue strongly in favor of an interpretation that the aggressive decline in lost-time injury claims presented to the WSIB over the decade 1990–2000 may well be primarily due to a true reduction in the incidence of injury in workplaces. Work by other researchers has excluded macroeconomic factors such as demographic changes in the labor force and sectoral shifts in the distribution of employment as principal explanations for the decline in compensation claims.¹⁵ Attention needs to be focused on understanding the nature of workplace primary prevention practices that have made a primary contribution to this decline. ■

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Contributors

C. Mustard, D. Cole, H. Shannon, and T. Sullivan conceived of the study. C. Mustard and J. Pole contributed the study design, and J. Pole conducted the analyses. C. Mustard wrote the first draft of the article, which

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Human Participant Protection

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