

THE VALIDITY OF ALBERTA SAFETY STATISTICS

Bob Barnettson

Associate Professor of Labour Relations,
Faculty of Humanities and Social Sciences,
Athabasca University,
Edmonton, Alberta, Canada
barnetso@athabascau.ca

ABSTRACT

This study examines the validity of injury statistics used to monitor workplace safety in the Canadian province of Alberta. These indicators were found to significantly under-report the rate of injury and to be vulnerable to gaming by both employers and the workers' compensation board. These threats to the validity of the measures should limit the inferences drawn from the measures. Injury-based statistics were also found to be inadequate proxies for the broader construct of workplace safety. The political feasibility of alternative measures is also discussed.

INTRODUCTION

Over the past decade, two measures of workplace injury derived from workers' compensation claims data have become widely used in the Canadian province of Alberta. The lost-time claims (LTC) rate and the disabling injury (DI) rate are used to assess workplace safety efforts and communicate the risk of injury to the public. A key question among labour-side practitioners is whether these rates are accurate and valid measures of both workplace injury and safety. That is to say, are the inferences drawn about the real world from these indicators meaningful and correct?

This study examined the validity of these injury measures. It concluded these indicators significantly understate the occurrence of injury. This is particularly problematic when these rates are used to communicate the incidence and risk of injury to the public. The study also raised questions about the degree that gaming by employers and, indeed, the workers' compensation board (WCB) may undermine the validity of inferences subsequently drawn about injury rates. Finally, this study suggested injury-rate indicators do not effectively engage the real construct of interest – workplace safety.

SAFETY STATISTICS IN ALBERTA

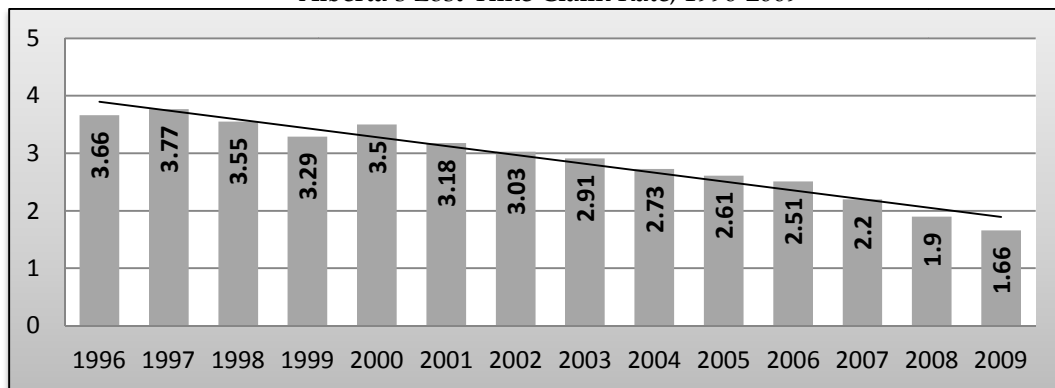
The Government of Alberta adopted a business planning and reporting

system in the mid-1990s. Its stated purpose was to enhance transparency and improve accountability (Speers 2004), although Townley, Cooper and Oakes (2004) suggest its real purpose was to displace interest-group politics and achieve a managerialist rationality in the public sector (e.g., reducing the size and cost of the public sector, introducing market-based mechanisms and emphasizing entrepreneurialism). This latter analysis is consistent with the then-popular notion of “reinventing government” (Osbourne and Gaebler 1993).

Over time, questions have arisen about whether political pressure to tell good news stories has affected the validity (and perhaps reliability) of the measures. This dynamic may compound legitimate disputes about public-sector goals and appropriate performance measures. Alberta reports two measures of workplace injury each year to assess whether workplaces are fair, safe and healthy: the lost-time claim (LTC) rate and the disabling injury (DI) rate. Each statistic is created using claims data from the provincial WCB. This paper extends a critique of how Alberta measures labour programming (Barnetson 2008) by examining the validity of workplace safety measures, given the uses to which they are put.

The LTC rate measures the number of times per 100 person years worked that a work-related injury causes a worker to be away from work beyond the date of injury. The government notes that the LTC rate “represents the probability or risk of injury or disease to a worker during a one-year work period” (AEI 2010b: 6). That is to say, the LTC rate is the percentage chance (assuming injuries are evenly distributed) of a worker incurring an injury that will result in a LTC. One calculates the LTC rate by dividing the annual number of LTCs by the person-years worked and multiplying by 100 (AEI 2009a). In 2009, for example, there were 28,688 LTCs and 1,730,000 person years worked, so the LTC rate was 1.66 lost-time claims per 100 person years worked (WCB 2010a; see note in Figure 1). Figure 1 shows Alberta’s LTC rate from 1996 to 2009 with a trend line imposed.

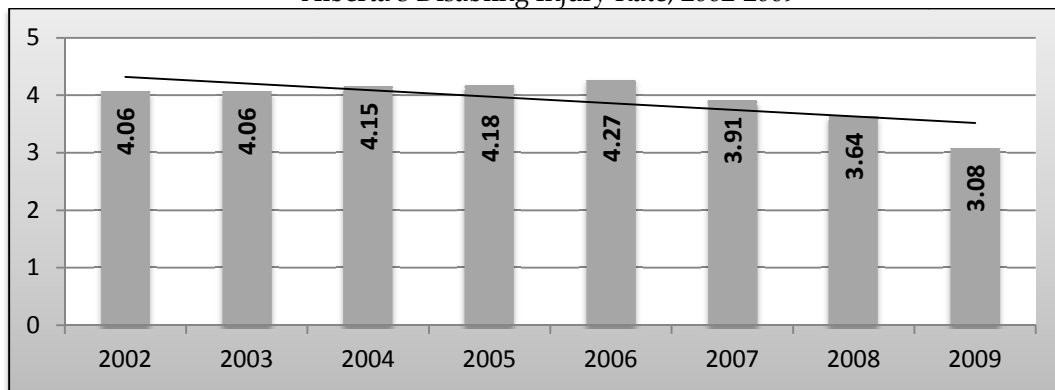
Figure 1
Alberta’s Lost-Time Claim Rate, 1996-2009



Source: WCB (2010a). Author’s calculations. The LTC calculated by the WCB differs slightly from the LTC reported by the government, although the trend and levels are comparable. This reflects minor differences in data filtering and the time period of the calculations.

The DI rate measures the number of times per 100 person years worked that a work-related injury causes either an LTC *or* requires the worker to have modified duties. In this way, the DI rate incorporates all compensation claims where a worker was unable to do some, or all, of the worker's job the next day, due to injury. The government asserts the DI rate represents "the probability or risk of a disabling injury or disease to a worker during a period of one-year of work" (AEI 2010b: 6). One calculates the DI rate by dividing the annual number of DIs by the person-years worked and multiplying by 100 (AEI 2009a). In 2009, for example, there were 53,313 DIs and 1,730,000 person years worked, so the DI rate was 3.08 disabling injuries per 100 person years worked (WCB 2010a, see note in Figure 2). Figure 2 shows Alberta's DI rate from 2002 to 2009 with a trend line imposed.

Figure 2
Alberta's Disabling Injury Rate, 2002-2009



Source: WCB (2010a). Author's calculations. The DI calculated using WCB data differs slightly from the DI reported by the government, although the trend lines are comparable. This reflects minor differences in data filtering and the time period of the calculations. The DI rate prior to 2002 is unreliable and the DI rate from 2002 to 2004 should be used cautiously.

The LTC and DI rates have been used in provincial business plans and annual reports to assess the degree to which the government has achieved "[...] a fair, safe and healthy work environment" (AEI 2009a: 43). These indicators are also used to communicate information about the risk of injury to the public. This press release is typical:

April 28, 2010

Provincial on-the-job injury rate hits record low

Annual workplace safety statistics also show decrease in fatalities

Edmonton [...] Fewer people were hurt on the job last year as Alberta's workplace injury rate hit a record low. Occupational fatalities were also down, from 166 in 2008 to 110 in 2009. "We've made good progress reducing workplace injuries but we can still do better," said Thomas Lukaszuk, Minister of Employment and Immigration. [...] (AEI 2010a: 1).

The disabling injury claim rate decreased to 3.09 per 100 full-time jobs in 2009, from 3.63 per 100 in 2008. This included injured workers who could not work their next shift (lost time) or had to be placed on modified work to accommodate their injuries.

Lost-time claim rates were down across all major industry sectors, with the manufacturing, processing and packaging, and the mining and petroleum development sectors experiencing the biggest drops. The provincial lost-time claim rate for 2009 was 1.69 per 100 full-time jobs, down almost 10 per cent from the previous year (AEI 2010a).

Finally, firm-level LTC data was publically released beginning in late 2010 (AEI 2010c; D'Aliesio 2010). According to the Minister, this public release is designed enhance employer compliance with occupational health and safety (OHS) legislation (De Guzman 2010).

VALIDITY OF INJURY MEASURES

A key question among labour-side practitioners is whether these injury rates are valid measures of both workplace injury and safety. That is to say, are the inferences drawn about the real world from these indicators meaningful and correct? A valid measure adequately operationalizes the concept it seeks to measure, such that inferences are meaningful (Sireci 1998). Examining a measure's construct validity assesses the degree to which a construct's operationalization accurately reflects the underlying construct it seeks to measure (Trochim and Donnelly 2006). This includes how well the measure(s) operationalized the underlying construct (i.e., content validity) by determining the degree to which the indicators measured all forms of workplace injury. This, in turn, requires establishing the purposes of the measures and how their operationalization limits the kinds of workplace injury that are visible. This information can then be combined with analysis of how the measures are used to assess whether the inferences drawn are meaningful.

It is also useful to consider the concurrent and convergent validity of the measures to determine if the measures were "accurate" assessments of those aspects of workplace injury they purport to measure. More specifically, concurrent validity determines whether the measures can distinguish between behaviours they should, theoretically, be able to distinguish between. This includes assessing whether and to what degree gaming could shift injuries between and outside of these measures. And convergent validity determines how well outcomes match those of other measures that are theoretically related. For example, what relationships exist between the measures as well as between the measures and fatality and duration data?

PURPOSE OF THE LTC AND DI RATES

The LTC rate emerged in the wake of public consultations about workplace injuries. The Provincial Strategic Working Group on Workplace Safety (2002) recommended that the government seek to ensure "Alberta has a healthy and

injury-free workplace” (4). Short-term reductions in workplace injuries and illnesses were sought and measured by the LTC rate. This goal was adopted by the provincial government and given significant profile by the then-Minister of Human Resources and Employment, Clint Dunford.

The DI rate was developed following a 2004 review (Provincial Strategic Working Group on Workplace Safety 2004). This measure was intended to mitigate the potential distortion of the LTC rate caused by employers increasingly assigning injured workers modified work duties to avoid an LTC (i.e., gaming the measure). The introduction of the DI rate was supposed to result in “a more accurate picture of the total number of illnesses and injuries” (AEI 2010d: 3). This background suggests that these measures operationalize “workplace injury.” That construct is, in turn, used as a proxy for “workplace safety”.

A definition of workplace injury might be a normally unexpected outcome of a workplace event that results in physical or mental damage to the structure or function of a worker’s body. The LTC and DI rates capture only a portion of such injuries. This may be problematic, depending upon what inferences are drawn from the rates. To determine whether the inferences drawn are valid, we need to have some sense of the degree and nature of the under-reporting they exhibit.

UNDER-REPORTING AS A THREAT TO CONTENT VALIDITY

A lost-time claim occurs when (1) a worker within the ambit of the workers’ compensation system is injured, (2) the injury is reported to and deemed compensable by the WCB, and (3) the injury causes a worker to be away from work beyond the date of injury. These criteria mean that LTCs comprise only a fraction of all workplace injuries. While under-reporting is a well-known aspect of claims-based injury statistics (Ison 1986; Cox and Lippel 2008), explicating the nature of the under-reporting is useful to assess its degree.

The most obvious source of under-reporting is the exclusion of injuries to the 10-20 percent of workers not covered by workers’ compensation. Assuming the rate of injury among workers with and without workers’ compensation coverage is comparable, this exclusion does not affect the LTC and DI rates. But this exclusion does significantly under-report the number of LTCs and DIs that occur. This is important because it affects the percentage of injuries visible when injuries are defined as LTCs and DIs.

Injuries not recognized as compensable are also excluded, including some rejected claims as well as accepted claims that did not trigger a lost-time claim. The exclusion of non-LTC injuries is somewhat mitigated by the presence of the DI rate (which captures injuries that required modified work). But both the LTC and DI measures ignore injuries that did not affect workplace attendance. Claims that required “medical-aid only” or those with no cost (to the WCB) are excluded. Further, minor injuries (e.g., burns, cuts, sprains and strains that do not require medical attention or more than the rest of the shift off) for which

reporting is not required and psychological injuries (which is largely excluded from the ambit of workers' compensation in Alberta) are excluded.

Potentially compensable injuries not reported to a WCB are also excluded. Shannon and Lowe (2002) suggest approximately 40 percent of compensable injuries in Canada are unreported. The reasons for non-reporting vary. Smith, Kosny and Mustard (2009) suggest the availability of other forms of compensation may be an important factor. Occupational diseases are also subject to significant under-reporting, perhaps because their long latency periods and murky causality make it difficult to recognize occupational origins (Kraut 1994, 2009). Recent assessments of under-reporting include studies of mesothelioma (Payne and Pichora 2009; Cree *et al.* 2009) and asthma (Cherry *et al.* 2009). It is difficult to estimate the magnitude of this effect, but consider the example of occupational cancer.

In 2005, approximately 13,100 Albertans were diagnosed as having cancer and 5,500 Albertans died from cancer (Canadian Cancer Society/National Cancer Institute 2005). The then-Alberta Cancer Board conservatively estimated that 8 percent of all cancers have an occupational link (Alberta Cancer Foundation 2005). This suggests just over 1,000 of Alberta's 2005 reported cancers and cancer deaths were occupational cancers and about 440 deaths were occupationally related. Yet, the Alberta WCB accepted only 29 claims for cancer (2.9 percent) and reported just 38 cancer-related fatalities (8.6 percent) that year (WCB 2005). Considering occupational cancer alone could have increased the 2005 LTC rate by as much as 2.5 percent and the occupational fatality rate by an astounding 276 percent.

Gender discrimination may also impact under-reporting. Work arrangements and injuries more common to women than men result in the under-reporting or under-acceptance of injury (Cox and Lippel 2008; Quinlain, Mayhew and Bohle 2001; Lippel 2006; Azarhoff *et al.* 2004). Storey's (2009) analysis of Ontario suggests systemic discrimination against claims filed by women. Lippel (1999, 2004) also reports gender differences in Quebec's compensation system regarding stress-related and musculo-skeletal injuries. There is no reliable way to estimate the effect discrimination has on claims data. Further, Smith *et al.* (2009) note that gender is not the only worker characteristic associated with reduced access to compensation benefits.

DEGREE OF UNDERSTATEMENT OF INJURY

An example illustrates the degree these measures distort our perception of workplace injury levels. In 2009, Alberta reported 28,688 lost-time claims. To this must be added approximately 24,625 more claims for injuries requiring modified work. A further 95,854 claims for medical aid-only injuries should also be added. Ignoring the approximately 16,000 claims denied for various reasons (e.g., insufficient information, worker not covered by compensation, or injury not compensable), this totals some 149,167 accepted claims (WCB, 2010a).

There is no way to accurately estimate the number of minor injuries (which did not trigger a workers' compensation claim), psychological injuries (which are broadly excluded from compensation), unreported occupational diseases or the effects of gender discrimination. It is possible to correct for the 13 percent of the workforce not covered by workers' compensation (WCB 2010a). Assuming a similar rate of injury among covered and uncovered workers, total injuries increase to around 171,456 ($149,167/87 \times 100$). Accounting for the 40 percent of compensable injuries that are not reported at all brings the number of workplace injuries to approximately 285,760 ($171,456/60 \times 100$).

What this example shows is that the largest number of workplace "injuries" visible in claims statistics (149,167) still only reveals about half of the total injuries (285,760) that required at least some medical aid. Further, even the "corrected" number of 285,760 effectively ignores occupational disease and psychological injuries as well as minor injuries where no treatment beyond first aid was required. These injuries include strains, contusions, lacerations and burns of a degree that varies based upon the worker's ability to tolerate the injury without seeking medical treatment. Discussion among practitioners suggests accounting for disease and minor injuries would push the number close to 500,000 injuries per year but, for the purpose of this analysis, this estimate will be ignored. Consequently, this analysis suggests defining workplace injuries as LTCs under-reports workplace injury by a factor of at least 10. And defining them as DIs under-reports injuries by a factor of at least 5.4.

IMPACT OF UNDER-REPORTING ON VALIDITY

Under-reporting by the LTC and DI rates suggests these measures do not fully engage the construct of workplace injury. Rather, they operationalize workplace injuries by counting serious injuries that affect job performance. It is not fully clear why such narrow measures were chosen. Foster (2010) indicates the government chose the LTC because of its availability and reliability. Push back from the Provincial Strategic Working Group on Workplace Safety (2004) later led to the adoption of the DI rate. One result of the measures' narrow focus is that it limits the government's ability to meaningfully generalize from the measures.

For example, to say to the public that the LTC and DI rates indicate "[f]ewer people were hurt on the job last year as Alberta's workplace injury rate hit a record low" (AIE 2010a: 1) overstates the inferences these measures support. The LTC and DI rate have declined. But this does not mean the overall number or rate of workplace injury has declined to the same degree or even at all. At best, it demonstrates the rate of serious injuries resulting in accepted workers' compensation claims has declined (although see the discussion below regarding the source of this decline).

Similarly, consider how injury rates are discussed:

The disabling injury claim rate decreased to 3.09 per 100 full-time jobs in 2009, from 3.63 per 100 in 2008. This includes injured workers who cannot work their next shift (lost time) or have to be placed on modified work to accommodate their injuries. Lost-time claim rates were down across all major industry sectors, with the manufacturing, processing and packaging, and the mining and petroleum development sectors experiencing the biggest drops. The provincial lost-time claim rate for 2009 was 1.69 per 100 full-time jobs, down almost 10 per cent from the previous year (AEI 2010a: 1).

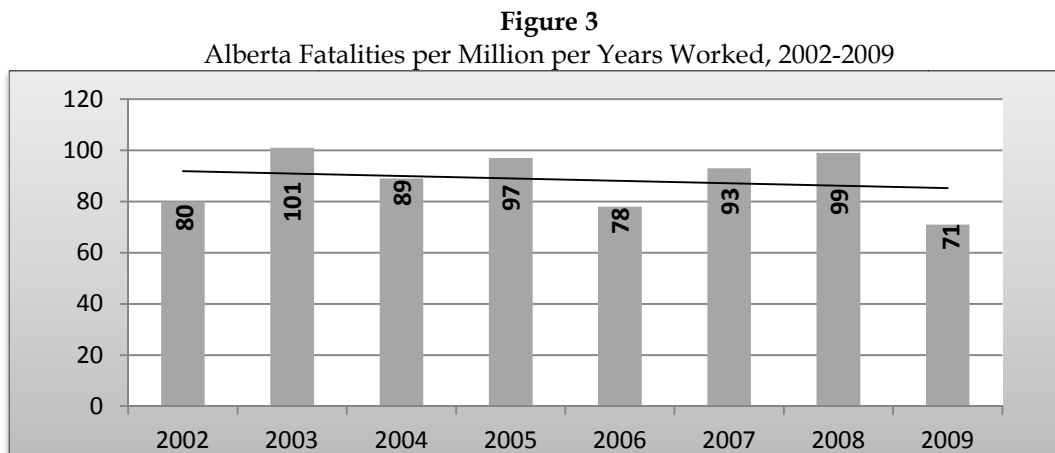
The target of this information is the public (via the media), which has a non-expert understanding of injury measures. The discussion of injury rates, put colloquially, suggests the probability of a worker experiencing a DI is about 3 percent. It is improbable that the public will understand that the DI rate considers only about 33 percent of workplace injuries that require at least medical attention and that DIs comprise some significantly smaller subset of all workplace injuries that workers might find objectionable. The incorrect conclusions that workers will likely draw about the risks they face in the workplace suggests the inferences drawn from the LTC and DI measures, when they are used as tools of public communication, are not valid. Further, these incorrect assumptions may negatively affect practical or political action by workers to make workplaces safer.

Similarly, assertions about the rigor of Alberta's measures can also be overstated:

[...] Alberta's system for gathering and reporting workplace injury data is one of the most stringent in the country. Different provinces have different measuring sticks for injury reporting—some require certain days off from work for an injury to be statistically counted as an "accident", while Alberta counts every single injury, regardless of severity or lost time from work, as an accident, (Minister) Lukaszuk explained (De Guzman 2010: 1).

While Alberta's counting system may be stringent (i.e., reliable), it is not necessarily accurate (i.e., valid). Alberta does not count "every single injury, regardless of severity or lost time from work, as an accident" (emphasis mine). Rather, it counts *only* those injuries that require time lost from work or modified work.

That said, the LTC and DI rates report many of the most serious workplace injuries. This may provide useful information to policy makers about the risk or incidence of very serious injury. Fatalities are the most serious forms of workplace injury and the downward trends in the LTC (Figure 1) and DI (Figure 2) rates broadly mirror the downward trend in Alberta's fatality rate (Figure 3), although the LTC and DI rates have declined much more quickly. This raises the question of what we can safely infer about workplace injuries or safety from declines in the LTC and DI rates.



Source: AEI (2010b). Excludes fatalities under the federal jurisdiction.

DECLINING LOST-TIME CLAIM RATES

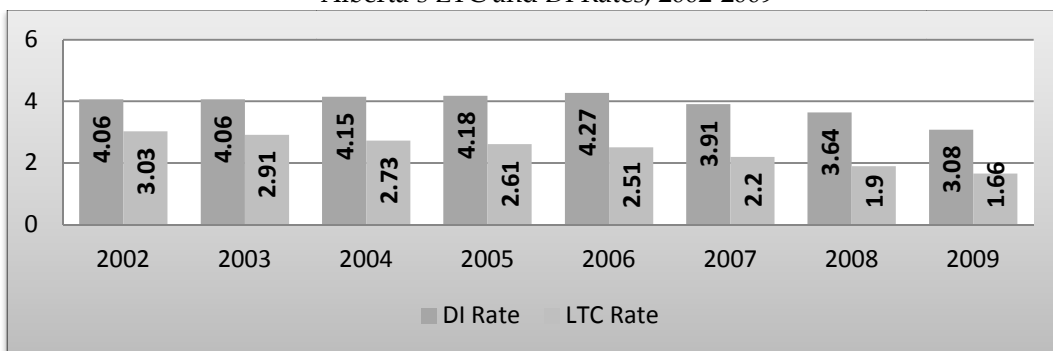
Figure 1 shows changes in the LTC rate over time, indicating a decline. It is unclear whether declining LTCs reflect declining rates of injury or some other factor. No obvious linkage between economic indicators and injury rates exists, although more careful research may tease some out. There was a significant increase in employment levels from 2002 to 2009, with a sharp and large reduction in employment in 2009 as a result of the recession (AHS 2012). The Alberta Federation of Labour (AFL 2010) suggests the recession disproportionately affected resource extraction industries and thus affected injury rates, but this assertion requires better evidence than the AFL presents. During the entirety of this period, there was a significant increase in migration of workers, and a shift from domestic migrants to temporary foreign workers (Alberta 2011a). It is unclear how this change affected injury rates, but Kosny *et al.* (2011) suggest that migrant workers frequently do not report injuries in a timely manner. Due to changes in government data calculations, it is not possible to track industry-level injury rates over time (Alberta 2011b).

An important criticism of claims-based measures is the underlying data is vulnerable to gaming activity by employers. The prospect of workers' compensation premium rebates gives employers an incentive to aggressively manage injury claims to reduce claim costs. Rebates are available to most Canadian employers under experience-rating systems. Large Alberta employers can access premium discounts of up to 40 percent as well as further rebates of 20 percent under the Partnership in Injury Reduction (PIR) program (WCB 2007). Research suggests employers often pursue rebate incentives via aggressive claims management rather than by improving workplace safety (Lanoie 1992; Kralj 1994, 1995; Hyatt and Kralj 1995; MacEachen 2001; Thomason and Pozzebon 2002). In 2010, the WCB reported that 9264 employers saved \$77 million in premiums in the PIR system (WCB 2011). At the same time, Alberta's Auditor General (2010) found that half of employers who persistently fail to comply with health and safety orders continued to receive PIR rebates.

Employer claims management can include legitimate activities, such as offering injured workers appropriate modified duties or filing legitimate appeals of claims. It can also include illegitimate activities, such as hiding accidents and pressuring workers to not file claims, providing inappropriate modified work or failing to provide promised modified work, contracting out hazardous work, and filing spurious appeals of claims. Such activities undermine the concurrent validity of the LTC and DI rates because the measures lose the ability to distinguish types of (or even identify) injuries.

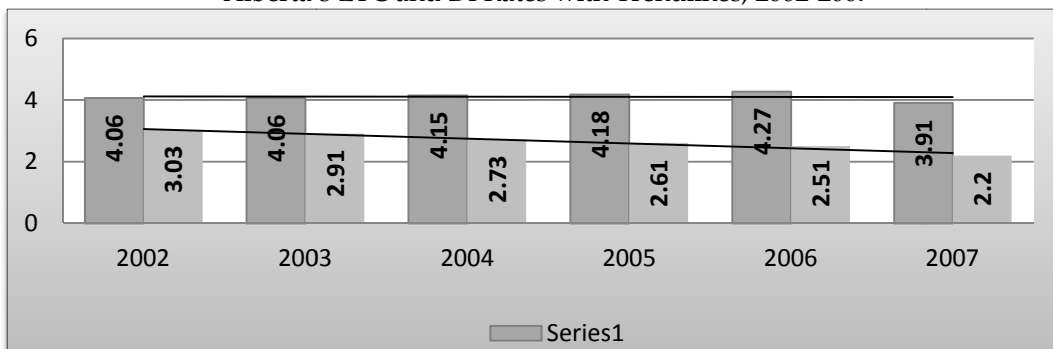
It is generally accepted that gaming (legitimate and/or illegitimate) does occur in Alberta. In fact, the introduction of the DI rate was a response to distortions caused by employer gaming to reduce claim costs (Provincial Strategic Working Group on Workplace Safety 2004; Foster 2010). There is some evidence to support this assumption, although it is not conclusive. Figure 4 combines the LTC and DI rates for comparative purposes. Figure 5 plots the LTC and DI rates from 2002 to 2007 with a trend line.

Figure 4
Alberta's LTC and DI Rates, 2002-2009



Source: WCB (2010a). Author's DI calculations.

Figure 5
Alberta's LTC and DI Rates with Trendlines, 2002-2007



Source: WCB (2010a). Author's DI calculations.

Figure 5 shows decreases in the LTC rate from 2002 to 2007 being offset by increases in the DI rate. There are two main explanations for this trend: declining severity or gaming. It may be that there were fewer severe injuries, which

therefore caused a shift in claim type from lost-time to disabling injury. Claim duration provides equivocal support for this conclusion. The average duration of an LTC declined from 50.9 days in 2003 to 33.4 days in 2007 (WCB 2008). This may reflect declining severity or that employers are reducing lost-time claim duration (e.g., by offering employees modified work sooner) rather than actually reducing the incidence of serious injuries. Reduced duration may also reflect increased WCB attention to speeding up the processing and closing of claims. Fatality data does not support the reduction in severity hypothesis: the 2002 to 2007 fatality rate (not shown) has a flat trend-line (AEI 2009b).

Alternately, the substitution effect may indicate legitimate or illegitimate claims management behaviour by employers in pursuit of Alberta's premium rebate systems (i.e., "converting" LTCs into DIs). If this gaming is illegitimate, it can negatively affect injured workers (MacEachen *et al.* 2007). It is, however, also possible that both declining severity and gaming are at work simultaneously. Of the two explanations (declining severity or gaming), legitimate and/or illegitimate gaming seems more consistent with the observer, fatality and duration evidence. If gaming has made an important contribution to the decline in the LTC rate, this suggests the LTC rate may overstate the degree to which workplaces became safer between 2002 and 2007.

DECLINING DISABLING INJURY RATE

Practitioners generally accept that the downward trend in the DI rate (see Figure 4) that began in 2007 suggests the overall rate of serious workplace injury (where a worker cannot do his or her normal job the next day) has declined. This reflects the belief that it is much more difficult to game the DI rate than the LTC because gaming the DI rate requires forcing an injured worker to continue to perform work while injured or not report injuries at all. Yet some practitioners privately suggest gaming the DI rate is possible and, as the return on LTC to DI conversions diminishes (because easily converted LTCs have already been converted), the economic incentive to converting DIs to no- or low-cost claims increases.

For example, one employer-side OHS staffer also suggests that the PIR program requires employers in some industries to present WCB claim records and a valid Certificate of Recognition (COR) to receive or maintain contracts. Reporting serious injuries can trigger suspensions of the COR which, in turn, will limit employers' ability to bid on contracts.

[...] Now they are faced with... employees potentially not working in a market where skilled help is very difficult to maintain. So what happens with MOST business at this point or even before it – is they will cheat.

Big companies are notorious for it. They will maintain their own medical staff, pay for air ambulance privately, have employees sitting in an office essentially doing nothing so time loss is either hidden completely or vastly minimized though no meaningful work was ever performed. I have worked for midsized employers in the

past who had a practice of discouraging staff from any WCB paperwork and they would pay them to sit at home and recover in exchange.

This is far more common than one would like to think but it's because the systems implemented ostensibly to improve safety have not achieved a safer work environment but has created penalization if you do not have huge dollars to put into disability "management" which in truth is all too often just subterfuge at the ongoing expense of the worker. In the mean time, the real issues with workplace safety continue to languish because they are not effectively addressed by these programs and are a distraction to the employer in regards to what is actually important (Labour & Employment in Alberta 2011: 1).

Anecdotal evidence has its perils, but voluntary disclosures against one's interest tend to ring true. Further, employers can make an injured worker do tasks the worker "cannot" do because injured workers have some discretion in how much pain they are prepared to put up with before seeking accommodation of their discomfort through modified work. The exercise of this discretion may be responsive to incentives (or threats) from supervisors and other workers.

Evidence to support the suggestion of gaming is difficult to find. But consider Figure 6, which presents the number DI claims accepted, rejected and processed. Processed claims are those that entailed little to no wage-loss (i.e., the only costs were medical aid costs) thus the WCB did not have to adjudicate and "accept" them (WCB 2010a). These might be claims where the injury prevented the worker from doing the workers' job the next day but the employer imposed no wage-loss and, thus, the cost of the claim was confined to medical aid costs. Note the percentage of DI claims processed each year.

Figure 6
Disabling Injury Claims by Acceptance Decision

Decision	2002	2003	2004	2005	2006	2007	2008	2009
Accepted	51917	53843	56488	61264	57538	48222	46985	38317
Denied	1938	2448	3220	3772	3468	3668	3977	3676
Investigation	1	0	0	0	1	9	41	125
Not Yet	0	2	0	0	0	0	0	8
Processed	2848 (5.2%)	3015 (5.3%)	2840 (4.8%)	3066 (4.7%)	12893 (18.3%)	19737 (29%)	19539 (29.4%)	14996 (28.1%)
Total	56704	59308	62548	68102	73900	71636	70542	57122

Source: WCB (2010a).

Note that the DI rate is calculated based on accepted + processed claims. Also note that the sharp decline in DIs in 2009 may be the result of dramatic reduction in employment in construction, oil-and-gas, and manufacturing, Alberta's three most dangerous occupations (AFL 2010).

The number of "accepted" DI claims began a downward trend in 2005. By contrast, the number of "processed" claims quadrupled between 2005 and 2006 and grew again by 50 percent the next year. A similar, although less dramatic, shift occurred in the categorization of "medical-aid only" claims (not shown)

during this time period. There are three explanations that, individually or collectively, account for this shift.

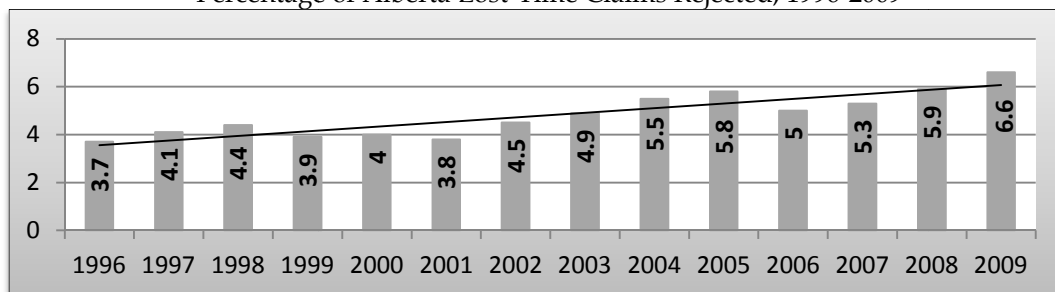
It may be that, as the province prepared to release the disabling injury rate in 2006, the WCB began more carefully classifying disabling injury claims. In this case, the increase in processed claims is an artifact of inconsistent coding over time. Alternately, employers may have begun reducing the number of DIs for which they claimed wage-loss in order to reduce their overall claim costs and qualify for premium rebates. Or it may be that there has been a decline in the severity of disabling injuries over time thus triggering fewer instances of modified work where the employer claimed a wage-loss. Finally, some combination of factors may be responsible.

It is not clear which explanation is correct. The point, though, is that this sort of analysis is absent from most discussions of the DI rate. What this data suggests is that (1) there appear to be important changes occurring within the DI rate and (2) one explanation is employer gaming, which may undermine the conclusion that declining DI rates means workplaces are safer. That there are difficult-to-see changes occurring within the data from which these measures are drawn suggested examining whether there were changes in the claims acceptance rate that might further confound assertions about what we can conclude from changes in the LTC and DI rates

THE IMPACT OF RISING REJECTION RATES

Figure 7 shows the percentage of Alberta LTCs rejected by the WCB from 1996 to 2009. Between 1996 and 2001, the annual rejection rate averaged 3.98 percent. After 2001, there is a distinct upwards trend in the rate of LTC rejections. Medical-aid only claim rejection rates also increased after 2001, rising from 5 percent in 2001 to 9.7 percent in 2009. Disabling injury claim rejections rates are more difficult to calculate due to data limitations, but show a general trend upwards from 3.4 percent in 2002 to 6.4 percent in 2009 (WCB 2010a).

Figure 7
Percentage of Alberta Lost-Time Claims Rejected, 1996-2009



Source: WCB (2010a).

The post-2001 increase in the LTC rejection rate coincided with a government-sponsored effort to reduce workplace injuries (as measured by the LTC) by 40 percent by 2004 (Provincial Strategic Working Group on Workplace

Safety 2002). There is no evidence of major changes in the nature of workplace injuries between 2001 and 2002. Consequently, this suggests that the WCB may have begun applying additional rigor post-2001 when determining whether claims are compensable. An alternate (or complementary) explanation is that employers may have begun supplying additional information and/or applying pressure to WCB adjudicators. Some practitioners privately opine that the WCB or its employees may be engaging in gaming behaviour in pursuit of political or financial rewards respectively.

This possibility is largely ignored by the literature and makes for an interesting discussion. All WCB employees may face implicit pressure to minimize claim acceptance rates or benefit duration in order to minimize employer premiums. Alberta's WCB also has a bonus system that presently rewards employees for (among other things) ensuring no more than 862 claims exist with disability payments lasting longer than three months (Cryderman 2010a; WCB 2010b). The bonuses handed out for meeting such goals are significant, comprising up to 8 percent of employee salaries (an average of \$5,600) and costing \$8 million in 2009 (Cryderman 2010b).

The possibility of WCB gaming claims is typically dismissed based on the assertion that claim decisions are driven by medical evidence and thus there is no opportunity for gaming (e.g., Cryderman 2010b). This overstates the objectivity of medical diagnoses and recommendations (McKinlay, Potter and Fledman 1996; Tracy *et al.* 2005; Hajjaj *et al.* 2010). It also ignores that WCB adjudicators have discretion, for example, in determining whether an injury is compensable. In determining compensability, some forms of injury are subjected to more stringent scrutiny and different standards of proof, such as psychological injuries and occupational diseases (Barnetson 2010). And adjudicators can also simply make an improper or incorrect decision. In 2009, for example, Alberta's independent WCB appeals commission overturned 25.5 percent of nearly 1900 decisions referred to it – a typical year (WCB 2010c).

Whether WCB claims adjudicators use legitimate or illegitimate means in order to achieve this benchmark is difficult to assess.¹ The benchmark itself reflects WCBs (as organizations) may find political advantage in minimizing claim costs that, in turn, reduce employer premiums (Alberta has the lowest in the country). WCBs may also find political value in generating data that suggests injury rates are declining, particularly if the WCB is responsible for occupational health and safety in the jurisdiction (which is not the case in Alberta). While it is not clear whether increased rejection rates post-2001 were appropriate or inappropriate, the net effect of a rising rejection rates is to exaggerate the reduction in the LTC and DI rates.

DISCUSSION

Alberta's LTC and DI rates are narrow measures of workplace injury. The claims data underlying these measures create two important threats to their validity. First, unreported injuries and diseases mean the LTC and DI rate under-

estimate the true rate of serious injury. Second, there is some question about whether employer and WCB gaming—an effect that may vary over time—may account for some of the changes seen in the rates. These threats to the concurrent and convergent validity suggest inferences that changes in workplace injury statistics should be treated with caution.

The content validity of the measures—how well the measures engage the broader construct of workplace injury—is also questionable, given the uses that the measures are put to by the government. As an indicator of whether Alberta has fair, safe and healthy workplaces, both the LTC and DI rates provide a very partial picture. Their focus on the most serious forms of injury ignores (and indeed obscures) other forms of injury that might also be of concern to Albertans. Consequently, these measures under-report the risk of workplace injury.

This under-reporting can be recognized via careful consideration of the definitions that accompany these indicators. But members of the public are unlikely possess or develop the definitional knowledge about the categories of workers' compensation claims and other sources of under-reporting. Further, they would have little reason to do so, given the government's "good news" communication efforts around workplace injury. For example, in a January 2012 radio interview, I criticized the government's claim that 20 successful OHS prosecutions in 2011 was a good news story (AHS 2011a), given both the reported and actual levels of serious injury in Alberta (CBC 2012a). The next day, government spokesperson Barry Harrison responded that the injury numbers I used in my interview were not quantifiable (CBC 2012b). That the government does not provide accurate workplace injury statistics appears lost on Harrison. Further, his assertion that the government went after "the big fish" (where there was a serious injury and a reasonable likelihood of prosecution) is difficult to view as anything but spin: of the 50,000 disabling injuries that occur each year, only 20 meet these criteria?

Overall, this analysis suggests that the content validity of these indicators is too limited to sustain the inferences drawn (and likely to be drawn) from them about the risk of workplace injury. Criticism of the LTC and DI rates are often met with the response that no better injury indicators are available. This misses the point that using the construct of workplace injury as the sole proxy for the construct of workplace safety is inappropriate. The government's espoused goal is to protect workers from workplace injuries by developing a safe work environment. Injury measures assess an important outcome, but tell us little about the safety of workplaces. Focusing measurement on the indicators of workplace safety would result in more valid measures.

For example, the government recently released the results of several safety inspection blitzes in residential construction (AHS 2011b), commercial construction (AEI 2010e), workplaces that operate forklifts (AEI 2011a) and workplaces that employ younger workers (AEI, 2011b). This inspection data showed widespread non-compliance with safety rules (even after employers were apprised the inspections would occur) but does not show changes over time. Time-series administrative data on employer safety records from random

inspections (based on assumptions that compliance with standards is a good proxy for safety and inspections are accurate) is readily available in government databases. The government already provides similar restaurant inspection reports for public consumption.

In the wake of the 2010 Auditor General's report on OHS, the government decided to release employer safety data (eight years after they promised to), but in the form of LTC information (D'Aliesio 2010). This is problematic in several ways. The volume of data (Alberta has approximately 140,000 employers with WCB accounts) and the ability of workers to identify their employer (many of which will be numbered companies or similarly named companies in large corporate families) will hamper identification of employers (AFL 2010). Further the use of LTC data under-reports the incidence of injury by a factor of 10. The government has indicated it will not release a shorter list of employers with long-term claims rates in excess of industry norms or the results of OHS inspections.

It is unclear why the government would not release the more accurate inspection data. One explanation is that such data might generate the kind of political difficulties that Speers (2004) suggests foreclose their usage. For example, this data might draw attention to the relatively small number of annual inspections completed. At present rates, it would take approximately 14 years to inspect each Alberta workplace once (Barnetson 2010). This, in turn, might raise politically difficult questions about the adequacy of resources allocated to worker safety. It might also reveal information about the time lag between safety complaints and inspection (up to 18 days) as well as between an order being issued and compliance (an average of 86 days) (Auditor General 2010). Further, the overall level of (non)compliance might provide disturbing data about the degree of compliance among employers.

CONCLUSION

The lost-time claims and the disabling injury rates provide useful information about workers' compensation claims for serious workplace injuries. When used as broader measures of workplace injury, two concerns arise. First, the narrow scope of the measures under-reports the true level of workplace injury, although the nature and degree of under-reporting may not be evident to the audiences to whom this information is reported. This limited engagement with the construct of workplace injury suggests inferences drawn from the measures about workplace injury may be misleading and invalid.

Second, the data upon which these measures are based may be subject to gaming by employers and the WCB. Such gaming confounds our ability to draw meaningful inferences about even general trends in the incidence or severity of workplace injuries. Measuring the presence and degree of gaming that occurs poses significant methodological challenges, but represents the most important future direction for research stemming from their study.

This study indicates that injury data is also not an adequate proxy by which to measure whether workplaces are fair, safe and healthy. The under-reporting of

occupational disease and exclusion of psychological injuries from compensation precludes drawing any meaningful conclusions about how healthy workplaces are. And inferences about safety are limited to only the most serious worker injuries, which also trigger a claim. There is little focus on working conditions, or indeed, the behaviour of employers.

Alternative measures of workplace safety are available, but they may be politically unpalatable. This raises the question, alluded to by Townley *et al.* (2004) about whether these indicators serve political purposes. For example, under-reporting the incidence and risk of injury can reduce the motivation and political leverage of workers taking workplace safety precautions and/or advocating more stringent (or even maintaining existing) health and safety standards. It can also reduce the threat workplace injury poses to social stability. These considerations go beyond the scope of this article but represent interesting lines of further inquiry.

ACKNOWLEDGMENTS

Athabasca University's Research Incentive Grants program funded data collection. The author would like to thank two anonymous reviewers and Jason Foster for their comments on earlier versions of this paper.

NOTES

- ¹ The author attempted to access Alberta WCB policy documents to search for evidence bearing upon this question. An initial freedom of information request resulted in a quote of \$236,000 for production of the materials (apparently a record cost estimate!). A narrowing of the request reduced the cost to approximately \$4000. Of the several hundred pages of material produced by the WCB in response to the narrowed request, 75 percent was redacted thereby rendering this data collection approach ineffective and thus the inner workings of the WCB opaque. Subsequent efforts to engage current and former WCB employees in discussion about this system or WCB adjudication in general has been unsuccessful. Typically potential informants indicated they feared sanction by the WCB if they spoke, even off of the record.

REFERENCES

- AEI. 2008. *Fact Sheet: Lost-Time Claim Rate*. Edmonton: Alberta Employment and Immigration.
- 2009. *Ministry Annual Report, 2008-09*. Edmonton: Employment and Immigration.
- 2009b. *Occupational fatalities and fatality rates, 1999 to 2008*. Edmonton: Employment and Immigration.
- 2010a. *Provincial on-the-job injury rate hits record low*. Press release. April 28. Edmonton: Employment and Immigration.

-
- 2010b. *2009 Workplace Health and Safety Data Analysis*. Edmonton: Employment and Immigration.
- 2010c. *Ten-point plan to achieve greater Occupational Health and Safety accountability and transparency*. Press release. July 30. Edmonton: Employment and Immigration.
- 2010d. *Work Safe Alberta Strategy 2006-2008: Implementation Status Update*. Edmonton: Employment and Immigration.
- 2010e. *Occupational health and safety (OHS) focused inspection: Commercial construction report*. Edmonton: Employment and Immigration.
- 2011a. *Occupational health and safety (OHS) focused inspection: Powered mobile equipment report*. Edmonton: Employment and Immigration.
- 2011b. *Occupational health and safety (OHS) focused inspection: Young workers report*. Edmonton: Employment and Immigration.
- 2010. *Decline in workplace deaths no cause for complacency: Fewer injuries in 2009 reflect the fact that fewer Albertans are working, not tougher government regulations*. Press release. May 5. Edmonton: Alberta Federation of Labour
- AHS. 2011a. *2011 Occupational Health and Safety penalties double from previous year*. Press release. December 29. Edmonton: Human Services.
- 2011b. *Occupational health and safety (OHS) focused inspection: Residential construction report*. Edmonton: Human Services.
- 2012. *Alberta Labour Force Statistics, January 2012*. Edmonton: Human Services.
- Alberta. 2011a. *2010 Annual Alberta Labour Market Review*. Edmonton: Author.
- 2011b. *Occupational injuries and diseases in Alberta: 2010 Summary*. Edmonton: Alberta
- Alberta Cancer Foundation 2005. *Cancer and the workplace: An overview for workers and employers*. Edmonton: Author.
- Auditor General. 2010. *Report of the Auditor General, April 2010*. Edmonton: Auditor General.
- Azarhoff, L., Lax, M., Levenstein, C. and Wegman, D. 2004. "Wounding the messenger: The new economy makes occupational indicators too good to be true." *International journal of health services*. 34(2), 271-303.
- Barnetson, B. 2008. "Performance measures in Alberta's labour programming." *Canadian political science review*. 2(1): 35-50.
- 2010. *The political economy of workplace injury in Canada*. Edmonton: Athabasca University Press.
- Canadian Cancer Society/National Cancer Institute of Canada (2005). *Canadian Cancer Statistics 2005*. Toronto: Author.
- CBC. 2012a. Interview with Bob Barnetson. RadioActive, CBC Edmonton. January 5, 1710-20h.
- 2012b. Interview with Barry Harrison. RadioActive, CBC Edmonton. January 6, 1710-20h.
- Cherry, N., Beach, J., Burstyn, I., Fan, X., Guo, N. and Kapur, N. 2009. "Data linkage to estimate the extent and distribution of occupational diseases: New

- onset adult asthma in Alberta, Canada." *American journal of industrial medicine*. 52: 831-40.
- Cree, M., Lalji, M., Jiang, B. and Carriere, K. 2009. "Under-reporting of compensable mesothelioma in Alberta." *American journal of industrial medicine* 52. 526-33.
- Cox, R. and Lippel, K. 2008. "Falling through the legal cracks: The pitfalls of using workers' compensation data as indicators of work-related injuries and illnesses." *Policy and practice in health and safety*. 6(2). 9-30.
- Cryderman, K. 2010a. "WCB staff efficiency bonuses called moral hazard." *Calgary Herald*, July 23.
- Cryderman, K. 2010b. "Critics say WCB offers bonuses for hurrying injured workers back to work." *Calgary Herald*, July 22.
- D'Aliesio, R. 2010. "Alberta announces plan to boost workplace safety records." *Calgary Herald*, July 30.
- De Guzman, M-L. 2010. "Employment minister mulls release of Alberta employers' safety records." *Canadian Occupational Safety Magazine*. Retrieved July 5, 2010
<http://www.cos-mag.com/201004161854/safety/safety-stories/alberta-set-to-release-employers-safety-records.html>
- Foster, J. 2010, August 4. Interview with former director of policy for the Alberta Federation of Labour. Edmonton.
- Hajjaj, F., Salek, M., Basra, M. and Finlay, A. 2010. "Non-clinical influences on clinical decision-making: a major challenge to evidence-based practice." *Journal of the Royal Society of Medicine*. 103. 178-87
- Hyatt, D. and Kralj, B. 1995. "The impact of workers' compensation experience rating on employer appeals activity." *Industrial relations* 34(1): 95-106.
- Ison, T. 1986. "The significance of experience rating." *Osgoode Hall law journal*. 24(4): 723-42.
- Kosny, A., MacEachen, E., Lifshen, M., Smith, P., Joya Jafri, G., Neilson, C., Pugliese, D. and Shields, J. 2011. "Delicate dances: Immigrant workers' experiences of injury reporting and claim filing." *Ethnicity & health* Pre-press. DOI:10.1080/13557858.2011.614327
- Kralj, B. 1994. "Employer responses to workers' compensation insurance experience rating." *Relations industrielles/Industrial relations*. 49(1): 41-59.
- 1995. "Experience rating of workers' compensation insurance premiums and the duration of workplace injuries." Pp. 106-22 in *Research in Canadian Workers' Compensation*, edited by T. Thomason and R. Chaykowski. Kingston: IRC Press.
- Kraut, A. 1994. "Estimates of the extent of morbidity and mortality due to occupational diseases in Canada." *American journal of industrial medicine*. 25(2): 267-78.
- 2009. "Hospitalization in Winnipeg, Canada due to occupational disease: A pilot study." *American journal of industrial medicine*. 52: 372-79.

-
- Labour & Employment in Alberta. 2011. "An employer perspective on OHS in Alberta." Retrieved December 13, 2011
<http://albertalabour.blogspot.com/2011/12/employer-perspective-on-ohs-in-alberta.html>
- Lanoie, P. 1992. "The impact of occupational safety and health regulation on the risk of workplace accidents: Quebec, 1983-87." *Journal of human resources*. 27(4): 643-60.
- Lippel, K. 1999. "Workers' compensation and stress: gender and access to compensation." *International journal of law and psychiatry*. 22(1). 79-89.
- 2004. "Compensation for musculo-skeletal disorders in Quebec: Systemic discrimination against women workers?" *International journal of health services*. 33(2). 2253-281.
- 2006. "Precarious employment and occupational health and safety regulation in Quebec." Pp. 241-55 in *Precarious employment: Understanding of labour market insecurity in Canada*, edited by L. Vosko (ed). Montreal: McGill-Queen's University Press.
- MacEachen, E. 2001. "The mundane administration of worker bodies: From welfarism to Neoliberalism." *Health, risk & society*. 2(3): 316-27.
- MacEachen, E., Ferrier, S., Kosny, A. and Chambers, L. 2007. "A deliberation on 'hurt versus harm' in early-return-to-work policy." *Policy and practice in health and safety*. 5(2): 41-62.
- McKinlay, J., Potter, D. and Feldman, H. 1996. "Non-medical influences on medical decision-making." *Social science and medicine*. 42(5): 769-76.
- Osborne, D. and Gaebler, T. 1993. *Reinventing government*. New York: Plume.
- Payne, J. and Pichora, E. 2009. "Filing for workers' compensation among Ontario cases of mesothelioma." *Canadian respiratory journal*. 16:148-52.
- Provincial Strategic Working Group on Workplace Safety. 2002. *Joint industry and government strategy on workplace safety*. Edmonton: Provincial Strategic Working Group on Workplace Safety.
- 2004. Progress Report. Edmonton: Author.
- Quinlain, M., Mayhew, C. and Bohle, P. 2001. "The global expansion of precarious employment, work disorganization, and the consequences for occupational health: A review of recent research." *International journal of health services*. 31(2). 335-414.
- Shannon, H. and Lowe, G. 2002. "How many injured workers do not file claims for workers' compensation benefits?" *American journal of industrial medicine*. 42(6): 467-73.
- Sireci, S. 1998. "The construct of content validity." *Social indicators research*. 45. 83-117.
- Smith, P., Kosny, A. and Mustard, C. 2009. "Difference in access to wage replacement benefits for absences due to work-related injury or illness in Canada." *American journal of industrial medicine*. 52. 341-49.

- Speers, K. 2004. "Performance measurement in the Government of Alberta: Propaganda or truth?" Paper presented at the Canadian Political Science Association Annual Conference. Winnipeg: June 5-7.
- Storey, R. 2009. "From invisibility of equality? Women workers and the gendering of workers' compensation in Ontario, 1900-2005." *Labour/Le travail*. 64(2). 75-106.
- Thomason, T. and Pozzebon, S. 2002. "Determinants of firm workplace health and safety and claims management practices." *Industrial and labor relations review*. 55(2): 286-307.
- Townley, B. Cooper, D and Oakes, L. 2003. "Performance measures and the rationalization of organizations." *Organization studies*. 24(7): 1045-71.
- Tracy, C., Dantas, G., Moineddin, R and Upshur, R. 2005. "Contextual factors in clinical decision making: national survey of Canadian family physicians." *Canadian family physician*. 51. 1106-7.
- Trochim, W . and Donnelly, J. 2006. *The research methods knowledge base, 3rd Ed.* Atomic Dog Publishing.
- WCB. 2005. *Cancers and Respiratory Diseases, Number of Newly Reported Claims and Accepted Claims (by Detailed Description), Transaction Year: 1991-2005.* Edmonton: Workers' Compensation Board.
- 2007. *Partners in Injury Reduction Brochure.* Edmonton: Alberta Workers' Compensation Board.
- 2008. *2008 Premium Rate.* Edmonton: Workers' Compensation Board.
- 2010a. *Injury statistics released in response to FOIP Request 2010-G-003.* Edmonton: Workers' Compensation Board.
- 2010b. *2010-Q1 WCB-Alberta Corporate Scorecard.* Edmonton: Workers' Compensation Board
- 2010c. *2009 accountability framework: Supplement measures report.* Edmonton: Workers' Compensation Board.
- 2011. *Partnerships in Injury Reduction PIR Refund Results.* Edmonton: Workers' Compensation Board.