

Does gender/sex matter for risk and compensation of activity-related soft tissue disorders?

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Background

Activity-related soft tissue disorders (ASTDs) are disorders of the extremities (arms and legs) involving muscles, tendons and/or ligaments. These disorders may be caused or aggravated by employment activities such as over-use and repetitive activities, or exposure to mechanical vibrations. Determining if an ASTD is due to the nature of a worker's employment requires an analysis of occupational risk factor(s) as the most responsible cause of the disorder. Compensation benefits (e.g. time loss, health care) may be paid where employment-related factors are determined to have contributed to causing or aggravating an ASTD.

The purpose of this project was to conduct a gender/sex-based analysis of workers' compensation claims for ASTDs in the Canadian province of British Columbia (BC) in order to investigate differences in (1) the risk of ASTDs within the same occupations, and (2) experiences with the adjudication of ASTDs for work-relatedness and for workers' compensation benefits.

Explanations for different ATSD rates and compensation experiences

In general, women experience and report more work-related musculoskeletal pain and disorders,¹ including for ASTDs such as repetitive strain.² Mechanisms that explain gender/sex differences in the risk of these disorders are multifactorial^{3, 4} and include the highly

gendered division of the labour force, where women and men dominate different occupations with different exposures and risks, with women more likely to be in jobs with repetitive and over-use tasks.⁵ However, even in similar occupations with similar tasks, gender/sex differences persist. This may be due to physical and biological differences in exposure responses, including for repetitive and over-use tasks where women may work further past the point of pain than men, increasing the risk of a musculoskeletal disorder.⁴

Gender/sex differences for work-related ASTDs and compensation experiences may also be attributable to differences in health care utilization and interactions.⁶ Women generally experience higher health care utilization, even after adjusting for health status. Studies also show that gender/sex health care differences vary depending on the health outcome, such as significantly lower likelihood of clinically recommended decisions for musculoskeletal surgeries for women compared to men.^{7,8} Further, the effectiveness of pain medication is highly gendered due to physiological, molecular and cellular differences.⁹ These gender/sex differences in health care may lead to differences in the way workers recognize, experience and manage ASTDs; and ultimately in decisions to seek, receive or accept treatment for work disability.

Criteria for evaluating ASTDs as work-related are strongly linked to medical expertise and scientific evidence. Studies within the Canadian



context suggest that the adjudication of ASTDs as work related may impact women differentially compared to men. A study of 314 workers' compensation appeal tribunal decisions on compensation claims in Quebec for musculoskeletal disorders associated with repetitive work (including tendonitis, epicondylitis, and carpal tunnel syndrome) found that women were significantly less likely than men to have their occupational disease claims accepted by the tribunal.¹⁰

Four indicators were selected for this investigation of gender/sex based differences in work-related ASTDs among workers in BC:

1. The rate of accepted short-term disability compensation claims for ASTDs within the same occupation (a measure of risk),
2. The ratio of disallowed or suspended claims to accepted claims (a measure of potential bias in the adjudication of the work-relatedness of ASTDs),
3. The duration of time to final eligibility decision (a measure of potential biases in adjudication and compensation system experiences), and
4. The percentage of claims with two or more eligibility decisions (another measure of potential biases in adjudication and compensation system experiences).

Approach

This project included all ASTD compensation claims in BC with a claim date between 2003 and 2017.¹¹ All claims included accepted (for health care only, short-term disability, long-term disability, and/or fatal benefits), disallowed (adjudicated as non-work related), and suspended claims (pending further documentation/withdrawn). For the analysis of rates, ASTDs were defined using the claim diagnosis code (International

Sex and gender

As described in the Canadian Institutes for Health Research's *Gender, Sex and Health Research Guide*, there are no definitive, universally accepted definitions of 'gender' or 'sex'. Gender is usually associated with social constructs (roles, relationships, behaviors) for women and men and sex is usually associated with physical constructs (biology, physiology) for females and males. While gender and sex are distinct constructs, they are also significantly and complexly interrelated. For the purposes of this research, we used the sex variable recorded in the workers' compensation claims data as indicative of the biological construct for males and females as well as being highly correlated with the social construct of gender for men and women. In sum, this study investigated 'gender/sex' differences.

Claim definitions

Accepted ASTD claims are those adjudicated as work-related and workers provided with workers' compensation benefits for health care, lost-wages, and/or long-term disability. Disallowed ASTD claims are those adjudicated as non-work related (more likely than not caused by non-work exposures) and workers do not receive workers' compensation benefits. Suspended ASTD claims are those where the adjudication is pending additional documentation or workers have withdrawn the claim for benefits. Rejected ASTD claims were excluded for workers were not eligible/covered for benefits in BC

Classification of Diseases v9)¹² and the claim assignment type code of 'ASTD' or 'Section 6' (occupational disease).

In order to calculate rates of ASTD claims for men and women in the same occupations, the analysis included only accepted short-term disability claims for which detailed occupational codes were available (National

Occupational Coding, 2006v),¹³ and included workers aged 15 to 64 years for which labour force count data were available. Counts of the number of men and women working in the same occupations during the study period in BC were obtained from Statistics Canada’s Labour Force Survey.¹⁴ Rates were calculated as the number of ASTD claims divided by the number of workers in an occupation, stratified by sex/gender. The rates were age-adjusted in order to make fair comparisons between gender/sex and occupation groups with different age distributions.

The analysis of the ratios of claims by final eligibility decision and the duration of final eligibility decision included all ASTD claims defined solely by the claim assignment type code, as the only code available across all claim types. The ratios of disallowed or suspended to accepted claims were calculated by sex/gender. Duration to claim eligibility decision was calculated as the number of days from initial claim registration date to final eligibility decision date by sex/gender and type of final decision (accepted, disallowed, rejected). The percentage of claims with two or more eligibility

decisions was calculated by gender/sex and type of decision. No other comparisons were possible due to a lack of detailed coding, such as for occupation or diagnoses, and because of smaller claim counts, for disallowed and suspended claims.

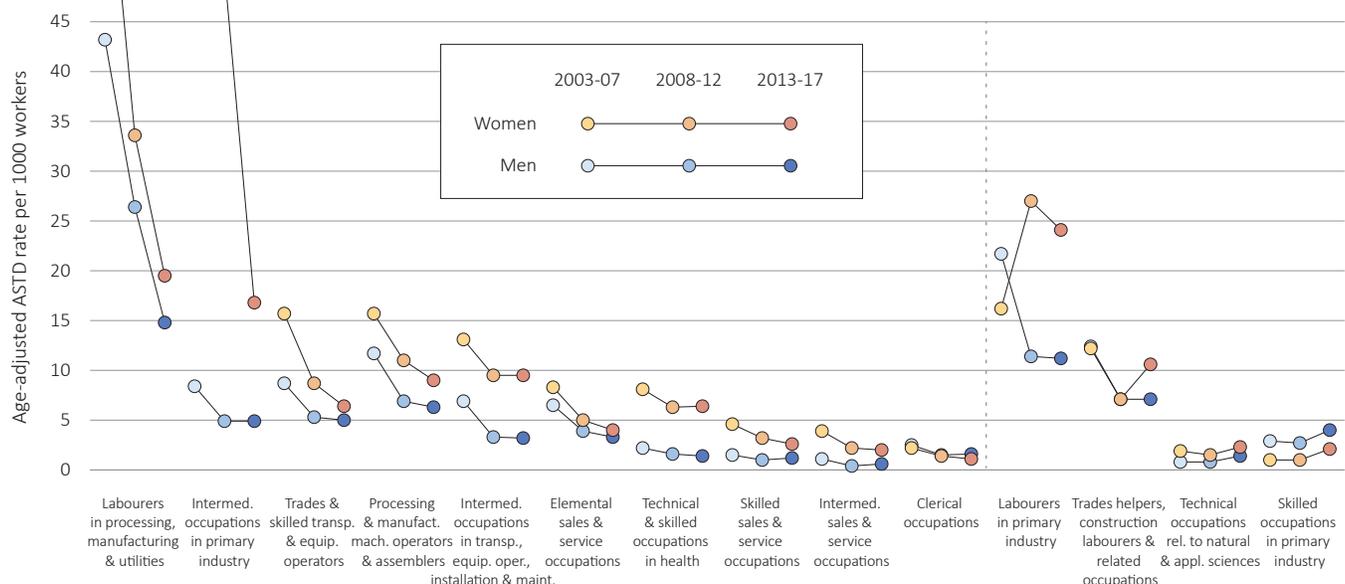
What we found

Rates of ASTDs by occupations

From 2003 to 2017, there were approximately 9,500 and 6,500 accepted short-term disability compensation claims for ASTDs for men and women, respectively. While the burden of ASTD claims in terms of absolute numbers is higher among men compared to women, it is also important to investigate the rate of claims by taking into account differences in the number of men and women within an occupation—for comparison of gender/sex differences.

Figure 1 provides the age-adjusted rates of accepted claims per 1,000 workers by occupations and over time by sex/gender. In general, ASTD rates are higher for women than for men in the same occupation. Rates have declined over time but more so for women than for men,

Figure 1 | Age-adjusted ASTD rates per 1,000 workers, women and men, by occupation and over time



with many of the rates converging within occupations by gender/sex. For example, women working in labourer occupations in processing, manufacturing and utilities had an ASTD rate of 65 claims per 1,000 workers for the period 2003 to 2007, compared to 43 claims per 1,000 workers for men. These rates declined to 20 claims (70% decrease) and 15 claims (65% decrease) per 1,000 workers respectively for the period 2013 to 2017. As another example, women working as skilled transportation and equipment operators had an ASTD rate of 15 claims per 1,000 workers for the period 2003 to 2007, compared to 8 claims per 1,000 workers for men. These rates declined to 6 claims (60% decrease) and 5 claims (38% decrease) per 1,000 workers, respectively, for 2013 to 2017.

Two occupations experienced an increase in the ASTD rate over time for both men and women—technical occupations related to natural and applied sciences, and skilled occupations in primary industries. Two additional occupations experienced an increase in the ASTD rate over time but for women only—labourers in primary industries, and trades helpers/construction labourers and related occupations. No new patterns emerged when looking at rates by the three most common ASTD diagnoses (tendonitis, bursitis or carpal tunnel syndrome) or by age groups (10 year groupings).

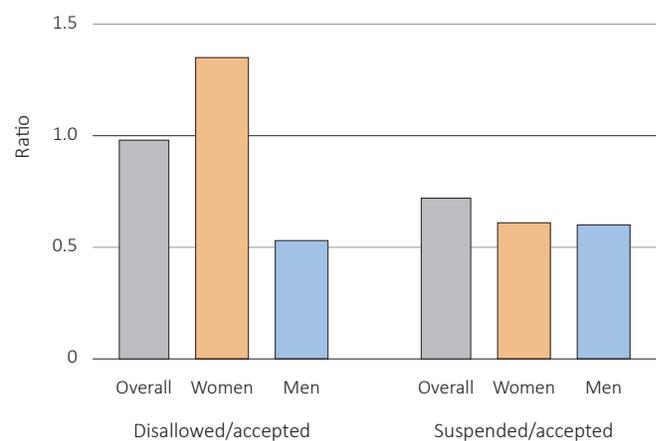
Ratio of disallowed and suspended claims

There were approximately 83,000 accepted (37%), disallowed (36%) and suspended (27%) ASTD claims from 2003 to 2017 in BC, of which 15% were missing sex/gender coding (see note at right). Figure 2 shows that overall, the ratio of disallowed or suspended to accepted claims was 1.0 and 0.7, respectively; or in other words, for every ten accepted ASTD claims there were ten disallowed claims and seven suspended claims. Among women, there were more disallowed ASTD

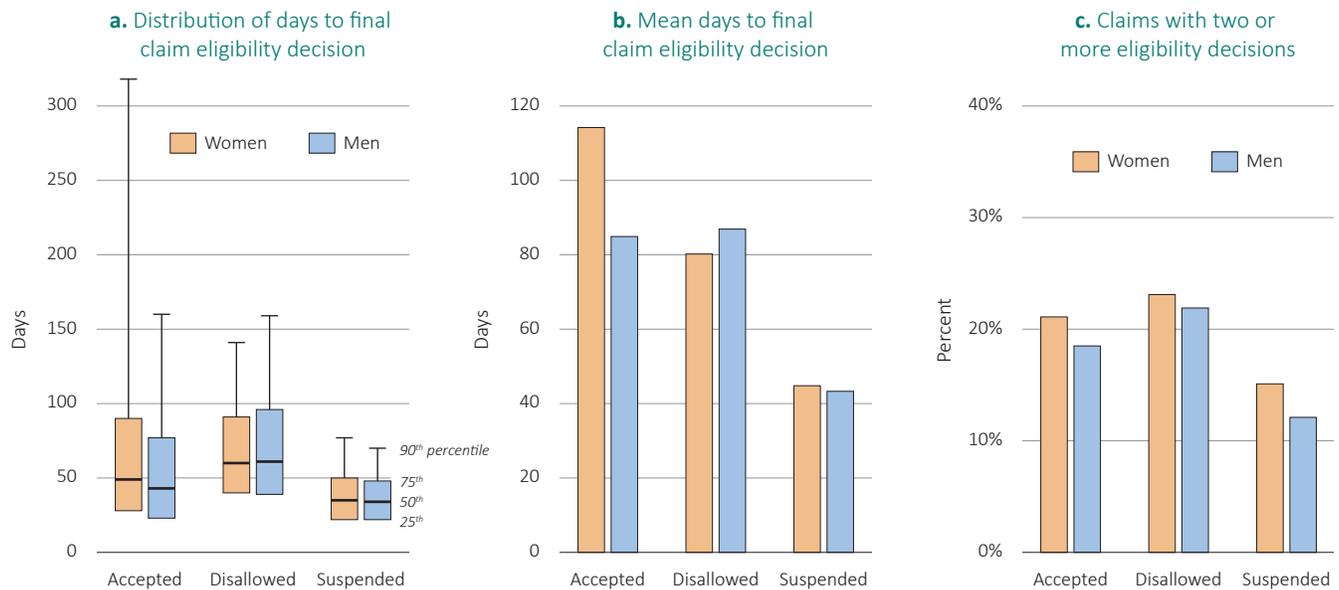
claims than accepted claims with a ratio of 1.4; or, in other words, for every ten accepted claims there were fourteen disallowed claims for women. Conversely for men, there were more accepted ASTD claims than disallowed claims with a ratio of 0.5; or, in other words for every ten accepted claims there were five disallowed claims. Gender/sex differences in the ratio of suspended to accepted claims was not evident at 0.6 for both men and women.

For comparison purposes, the ratio analysis was replicated for claims for non-traumatic hearing loss and for traumatic injuries. The gender/sex differences observed for ASTD ratios were not evident for claims coded for traumatic injuries, but were magnified for claims coded for non-traumatic hearing loss.

Figure 2 | Claim non-acceptance ratios for both genders, women, and men



Missing data: Among claims with missing gender/sex coding, there was a higher ratio of both disallowed and suspended to accepted claims at 2.3 and 2.0, respectively; or, in other words, for every ten accepted claims there was at least twenty disallowed and suspended claims. This is largely as a result of a higher probability of missing data for disallowed and suspended claims that do not result in payments/benefits. Collecting demographic data for all disallowed and suspended claims (representing 60% of approximately 13,000 claims with missing gender/sex) is recommended for the ongoing monitoring of potential biases in adjudication.

Figure 3 | Differences in time to claim eligibility decision for women and men

Time to final claim eligibility decision and number of decisions

The distribution of time measured in days to claim eligibility decision is highly skewed to the right, or stated differently, some workers have very long decision durations that influence the mean duration. As an alternative to the mean, days to a final accepted ASTD claim eligibility decision was also examined at the 50th percentile, the interquartile range (25th to 75th), and at the 90th percentile of the distribution. As shown in Figure 3a, overall, the distribution of time in days to a final accepted ASTD claim decision was shifted to the right for women with a longer duration at the 50th percentile (49 days), the interquartile range (28 to 90 days) and the 90th percentile (317 days), compared to the distribution for men (43, 23 to 77, and 160 days, respectively). The distribution of time to final claim eligibility decisions for both disallowed and suspended claims was comparable for women and men at the 50th percentile and interquartile ranges, but variable at the 90th percentile.

The mean duration is also presented, in Figure 3b, as the inclusion of workers with the longest disability durations (e.g. ‘data outliers’) can be meaningful to understanding experiences with the adjudication of ASTDs claims. Overall, the mean time to a final accepted ASTD claim eligibility decision was longer for women (114 days) compared to men (85 days) by almost 30 days. The mean time to a suspended ASTD claim eligibility decision was only two days longer for women compared to men (45 versus 43 days). Conversely, the mean time to a final disallowed ASTD claim eligibility decision was longer for men (85 days) than women (80 days) by 5 days.

Finally, Figure 3c shows that the percentage of claims with two or more eligibility decisions during the ‘life’ of the claim was higher for women compared to men by a couple of percentage points for all final claim eligibility decisions of accepted (21% versus 19%), disallowed (23% versus 22%), and suspended (15% versus 12%). This difference was evident in different time periods from 2008 to 2012 and from 2013 to 2017.

For comparison purposes, this gender/sex difference in number of claim eligibility decisions was observed for trauma claims during the same time period.

What do the results mean?

Taken together, the results show an increased risk of work-related ASTDs among women compared to men within the same occupations in BC, as evidenced by higher rates of accepted compensation claims (consistent with other studies). While a convergence of these rates over time (with only a few exceptions) could indicate improvement in prevention efforts for women, especially in non-traditional occupations, the higher ratio of final disallowed claim eligibility decisions, a longer duration of time to a final accepted claim eligibility decision, and a higher percentage of two or more claim eligibility decisions (e.g. transitions) indicate greater challenges for women compared to men when presenting with potential ASTDs to the workers' compensation system. It is important to note that if the ratio of disallowed to allowed claims among women was that of men, their rates (risks) of ASTDs would be higher than that observed in the current analyses. The observed sex/gender differences are not readily explained with the existing claims data and are worthy of further investigation for potential biases in the adjudication of ASTDs.

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About us

The Partnership for Work, Health and Safety (PWHS), between WorkSafeBC and the University of BC, is an innovative research unit that combines rigorous work and health research with effective knowledge translation. PWHS brings together policy-makers, researchers and data resources from national and international organizations to address current and emerging issues of work-related health in Canada.

Our research is aimed at improving understanding of the causes and consequences of injuries and illness, identifying high-risk industries and occupations, and investigating the effectiveness of interventions that improve worker health, prevent occupational illness and injury, and reduce work-related disability.

Our collaboration, based on best practices of knowledge transfer, enables researchers and decision-makers to work together to identify relevant questions, understand data, and produce useful information to effectively inform policy and practice.

More information

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