Partnership for Work, Health and Safety

Research BRIEF

Heat-related illness among workers in British Columbia

June 2022

Background

Heat-related illness can occur in occupational settings when workers are exposed to high indoor or outdoor temperatures. Occupational exposure to heat is an area of emerging concern for both outdoor and indoor workers due to projected increases in the severity and frequency of extreme heat events due to climate change. Heat-related illnesses, including heat stroke, can occur for outdoor workers during periods of hot weather, and for indoor workers due to indoor environments that are not climate-controlled or due to exposure to heat from work processes or equipment. Risks are heightened in occupations requiring physical activity and/or the use of protective clothing.

The incidence of occupational heat-related illness is not well-described among workers in Canada, and in particular has not been quantified in British Columbia (BC). The objective of this study was to describe the incidence of heat-related illness among workers in BC, from 2001 to 2020, by age, sex, and occupation.

What we did

We identified cases of heat-related illness occurring among workers age 15 and older from records of accepted lost-time claims from WorkSafeBC, the provincial worker's compensation board. Claims for heat-related illness encompass a range of illnesses of varying severity, including dehydration.

We calculated incidence rates for each year using the number of heat-related illnesses as the numerator and monthly estimates of the working population from Statistics Canada's Labour Force Survey as the denominator. We also calculated average rates over the study period by month, and by age, sex, and occupation.

What we found

Between 2000 and 2020, we found 528 accepted lost-time claims for heat-related illness, corresponding to a rate of 1.21 (95% confidence interval (CI): 1.10, 1.31) claims per 100,000 workers per year. Rates for individual years varied from 0.64 (95% CI: 0.35, 1.08) claims per 100,000 in 2011 to 2.65 (95% CI: 3.05, 3.37) claims per 100,000 in 2018, with no visually apparent yearly trend (Figure 1A).

Ninety-six percent of heat-related illness claims occurred during the warmer months of May through September, and 84% occurred during June through August. The single month with the highest claims rate on average over the study period was July, followed by August (Figure 1B).

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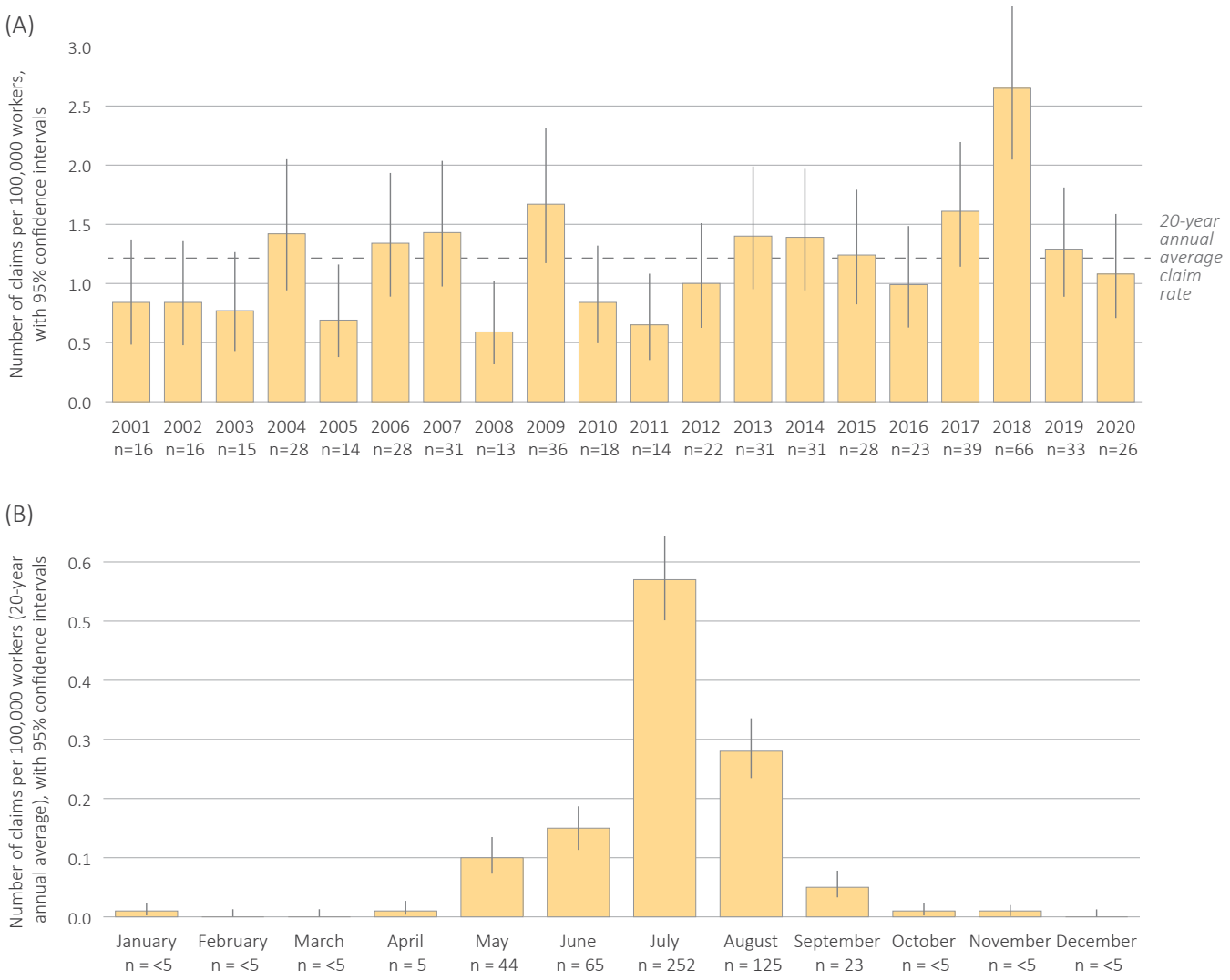
Figure 1 | Rates of accepted lost-time claims for heat-related illness per 100,000 workers by (A) year and (B) month

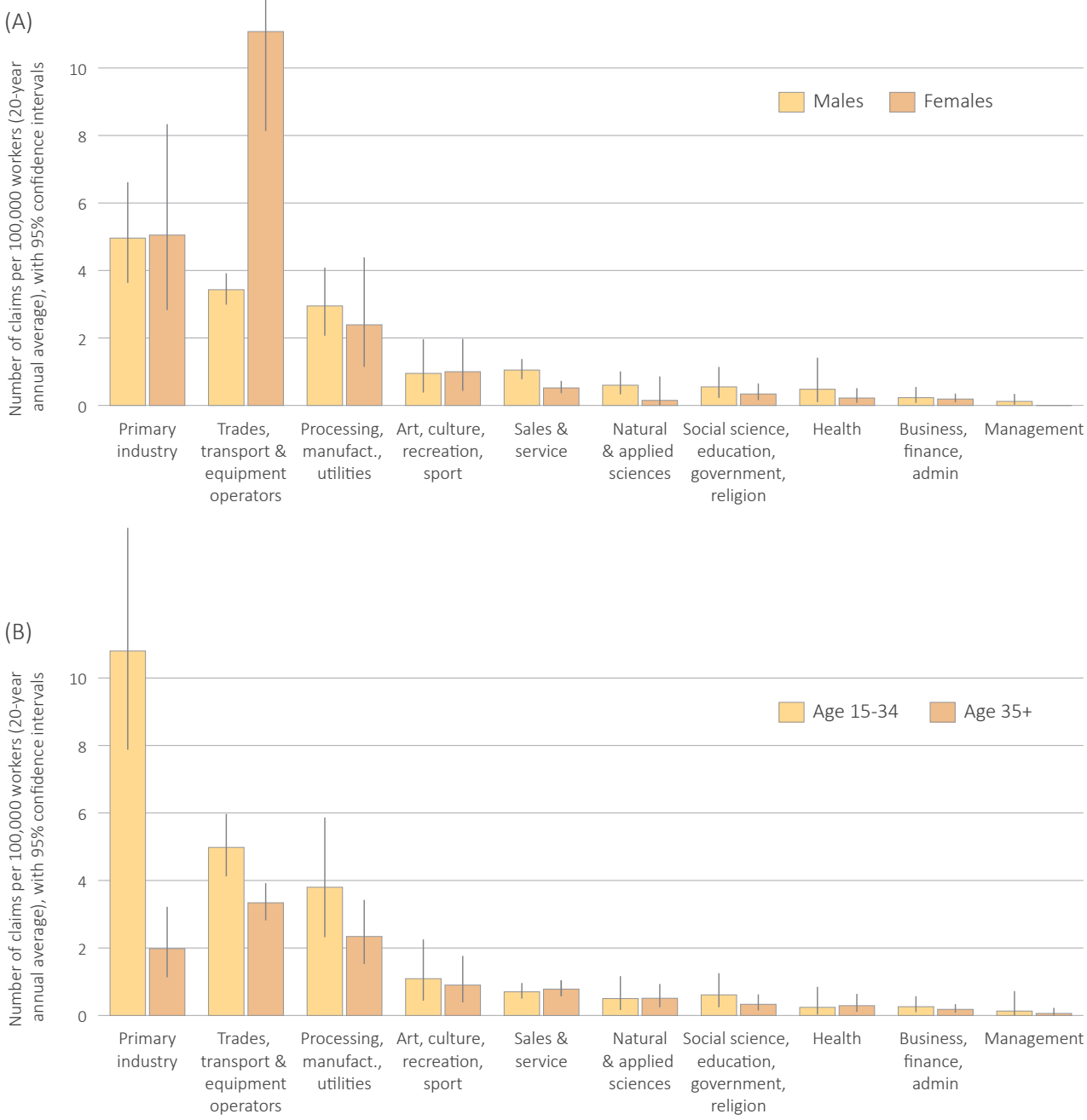


Overall, we found higher rates of heat-related illness among male workers (1.69 (CI: 1.53, 1.87) claims per 100,000 workers, compared to 0.67 (CI: 0.57, 0.79) claims per 100,000 for female workers), and younger workers (1.71 (CI: 1.40, 2.01) claims per 100,000 workers for age 15-24, compared to 0.71 (CI: 0.54, 0.93) claims per 100,000 for age 55+). By occupation, three categories had rates that were more than double the annual average rate: primary industry; trades, transport and equipment operators; and processing, manufacturing, and utilities.

While rates were higher among men overall, within occupational categories differences by sex were less pronounced or even reversed. For example, among workers in primary industry, rates among men and women were both approximately 5 claims per 100,000 per year, while among workers in the trades, transport and equipment operators category rates were higher among women than men (Figure 2A).

Rates among younger workers remained higher than among older workers within occupations,

Figure 1 | rates of accepted lost-time claims for heat-related illness per 100,000 workers by (A) broad occupational category and sex and (B) broad occupational category and age



particularly in occupations with relatively high rates overall (Figure 2B). Among major occupational groups nested within broad occupational categories, rates were higher among labourers than among occupations requiring a greater degree of education or training (not shown).

What do the results mean?

Incidence rates of lost-time claims for heat-related illness vary by season, sex, age group, and occupation in BC. Overall, rates are much higher in the summer months, suggesting an influence of summer heat. Rates are higher among male workers, younger

workers, and in primary industry occupations; trades, transport and equipment operators; and processing, manufacturing, and utilities occupations. Collectively, these results are consistent with prior studies of occupational heat illness both within and outside of Canada.

The results of this study should be viewed in the context of several limitations. The rates reported may be an underestimate of the true burden of heat-related illness on workers, as they only reflect illnesses that were reported to WorkSafeBC and were severe enough to result in lost time at work. Additionally, the rates do not provide information about the potential influence of exposure to extreme heat on the risk of occupational injury, which has been documented in a number of jurisdictions outside BC. Finally, it was not possible to determine whether individual heat-related illness claims occurred indoors or outdoors, nor was there information on the level of physical activity or protective clothing required.

Summary

In BC, lost-time claims due to heat-related illness occur disproportionately among certain subgroups of the workforce. The identification of such subgroups may inform the development of prevention policy and practices, which is especially critical in light of projected increases in temperatures due to climate change.

All inferences, opinions, and conclusions drawn in this research brief are those of the authors, and do not reflect the opinions or policies of the Data Stewards.

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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