Data Brief

Occupational Heat-Related Illness Claims Among California Workers, 2000–2022

CDPH California Department of Public Health

Key Findings

- Workers filed over 20,000 workers' compensation claims for heat-related illness (HRI) between 2000 and 2022 in California, with rates more than doubling during that time.
- Most claims for HRI happened from May to September, indicating a need for increased attention to the dangers of heat during these months.
- Male workers and young workers had higher rates of HRI than other workers
- The highest rates of HRI were among *protective services* occupations, followed by *farming, fishing, and forestry* occupations, then *construction and extraction* occupations.
- Rates of occupational HRI may be underestimated for some occupations. This may be due to barriers to reporting illnesses and/or receiving care (i.e., immigration status, fear of retaliation, or lack of healthcare access).

Introduction

Californians are increasingly exposed to extreme heat due to climate change. In 2024, the state experienced its hottest July on record.[i] Workers are uniquely vulnerable to the effects of extreme heat.

Many indoor and outdoor occupations require heavy physical activity in hot conditions, increasing the risk of heat-related illness (HRI). A lack of acclimatization, which provides workers with time to adjust to high temperatures, can increase workers' risk of HRI. Wearing heavy clothing or personal protective equipment (PPE) while working may also contribute to the risk of HRI.

Additionally, workers with a chronic disease or who take certain medications are at increased risk of HRI.[ii] HRI encompasses various conditions ranging from mild to severe, including heat cramps, heat exhaustion, and heat stroke. Heat stroke can be fatal without timely medical treatment and kills dozens of workers each year in the United States[iii].

HRI is preventable. California's Division of Occupational Safety and Health (Cal/OSHA) requires employers to take steps to prevent HRI in both indoor and outdoor workplaces.[iv]

This data brief builds on previous research to estimate the burden of HRI in California.[v] Using worker's compensation data, we calculate the rate of HRI in California from 2000 to 2022, and present rates by several factors, such as age, occupation, and sex. These findings may help to identify worker populations with the highest risk of HRI to inform prevention strategies and efforts.

Methods

When workers are injured or become ill on the job a workers' compensation claim must be filed with their employer's workers' compensation insurance carrier.[1] The Workers' Compensation Information System (WCIS), managed by the California Department of Industrial Relations (DIR), collects information on these work-related illnesses and injuries which resulted in more than one day of lost work time, or that required treatment beyond first aid. This study included WCIS claims from January 1, 2000, to December 31, 2022.[vi] We identified claims as heat-related if the nature or cause of injury was heat-related, or if HRI keywords were included in the injury description. We used employment data from the US Bureau of Labor Statistics (BLS) Current Population Survey (CPS) to calculate rates of HRI per 100,000 workers by sex, age, and occupation.

Each claim contains a description of the worker's occupation (their job, for example, registered nurse or construction worker). We used the National Institute for Occupational Safety and Health (NIOSH) Industry and Occupation Computerized Coding System to assign standard occupation codes.[vii] To compare occupations with many workers (such as retail salespersons) with occupations with few workers (such as arcade repairpersons), we calculated average yearly rates of HRI per occupation group. Some occupations were excluded from these calculations if they had fewer than 1,000 workers a year. WCIS data does not include information on the worker's race or ethnicity.

Results

There were 20,564 total HRI claims in California from 2000–2022. This represents an average yearly rate of 5.9 HRI claims per 100,000 workers. The yearly rate more than doubled between 2000 and 2022 as shown in Figure 1. Male workers and young workers had the highest average rates of HRI claims, shown in Table 1a and 1b. Male workers had a rate of 6.8 and workers 16-24 had a rate of 7.7 HRI claims per 100,000 workers. Table 2 shows the number and average yearly rate of claims by occupation. Protective services (50.2), farming, fishing, and forestry (37.0), and construction and extraction (12.4) occupation groups had the highest rates of HRI claims.

> "I worked in a skilled nursing facility without air conditioning, standing the entire shift. I experienced heat-related illnesses, including fainting, not knowing it was HRI. My employer did not tell us about the importance of taking breaks, drinking water, and resting when working in hot conditions. Even if I knew about my right to file a workers' compensation claim for my illnesses, I would have been afraid to."
>
> - Alyssa*, former skilled nursing facility worker
>
> * Name changed to protect privacy

The highest rate of HRI claims by year occurred in 2017, with 9.4 claims per 100,000 workers (Figure 1). The second highest rate occurred in 2022. Most HRI claims occurred between May and September. The number of HRI claims was highest in July (N=5,332 total for 2000–2022) (Figure 2).

[1] Workers' compensation claims may not be filed if an employee does not report that the injury or illness was work-related. Some workers, such as self-employed and domestic workers and family members of employers are not eligible for workers' compensation.

Table 1a. Total number and average yearly rates of heat-related illness by age in California, 2000-2022.

Age (years)*	Number and percent of total claims	Claims per 100,000 workers per year
16-24	3,830 (18.7%)	7.7
25-34	5,761 (28.1%)	6.3
35-44	4,462 (21.7%)	4.8
45-54	3,924 (19.1%)	4.5
55-64	2,080 (10.1%)	3.8
65+	475 (2.3%)	2.7

*Age was missing for 32 individuals.

Table 1b. Total number and average yearly rates of heat-related illness by sex in California, 2000-2022.

Sex**	Number and percent of total claims	Claims per 100,000 workers per year
Male	14,715 (72.2%)	6.8
Female	5,672 (27.8%)	3.2

** Sex was missing for 176 individuals. Data collected by WCIS does not distinguish sex and gender or provide a category for non-binary workers.

Table 2: Total number and average yearly rates of heat-related illness for 10 highest occupation groups, California, 2000-2022.

Occupation Group	Number and percent of total claims	Claims per 100,000 workers per year
Protective service occupations*	3,776 (22.4%)	50.2
Farming, fishing, and forestry occupations	1,928 (11.5%)	37.0
Construction occupations	2,114 (12.6%)	12.4
Transportation and material moving occupations**	2,115 (12.6%)	8.7
Building and grounds cleaning and maintenance occupations	1,028 (6.1%)	7.6
Installation, maintenance, and repair occupations	802 (4.8%)	7.5
Production occupations	711 (4.2%)	4.1
Arts, design, entertainment, sports, and media occupations	226 (1.3%)	3.5
Architecture and engineering occupations	250 (1.5%)	3.1
Personal care and service occupations	189 (1.1%)	2.7

* Includes firefighters, police officers, and correctional officers
** Includes transportation workers, refuse collectors, and hand packers

Figure 1: Heat related illness claims per 100,000 workers per year, California, 2000–2022. Blue circles represent rates.

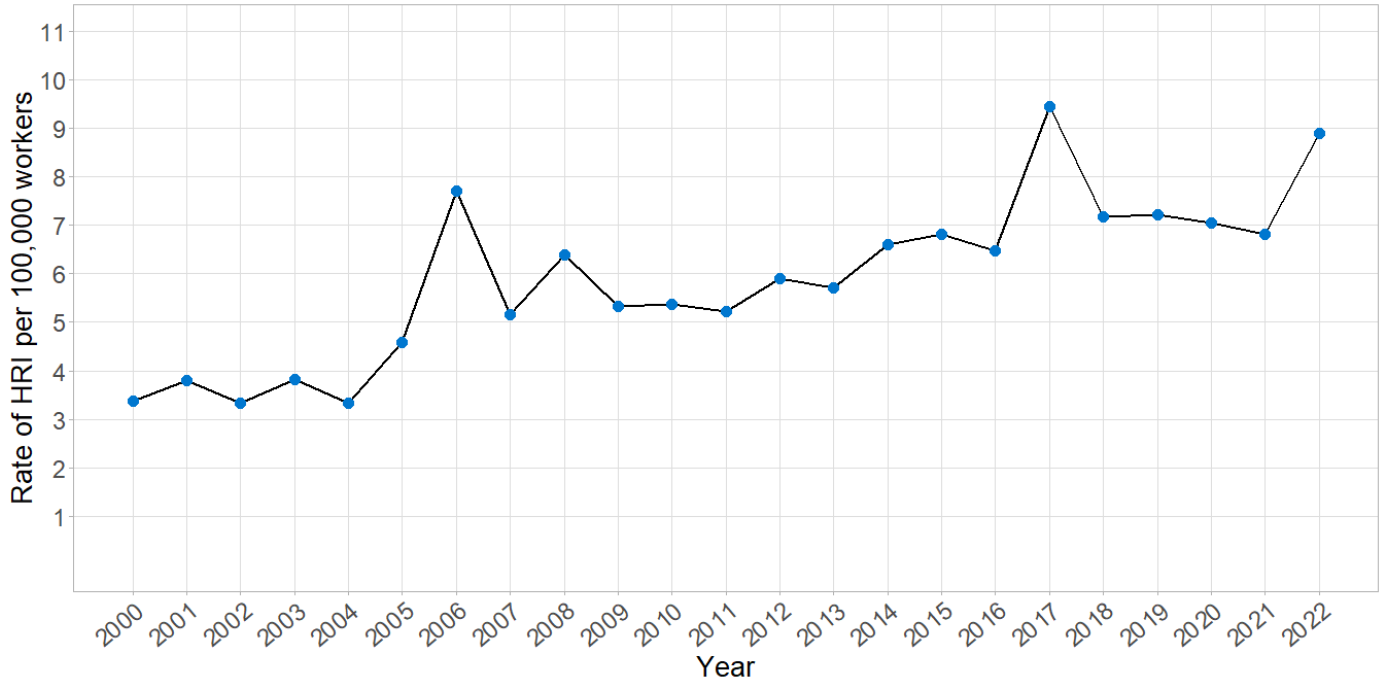
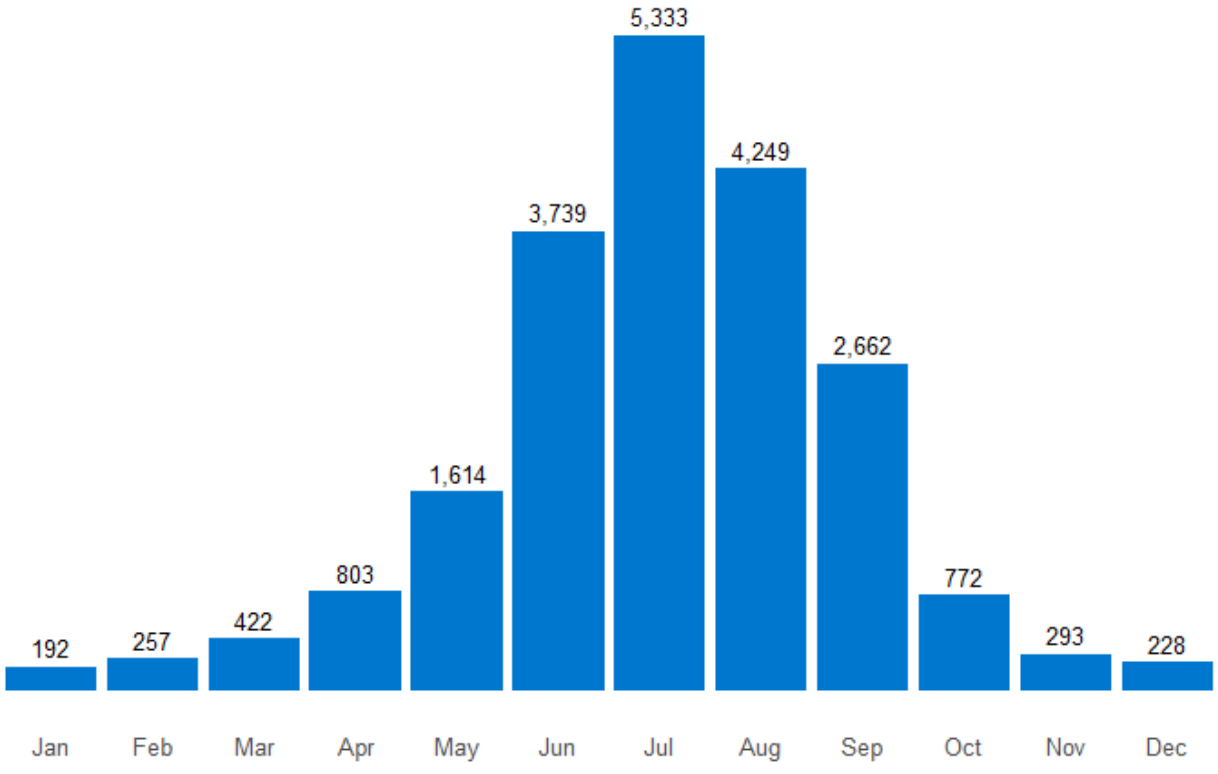


Figure 2: Counts of occupational heat related illness per 100,000 workers by month of injury, California, 2000–2022.



Limitations

There are limitations to interpreting workers' compensation claims for HRI. Some occupations are likely to be underrepresented in the data presented, such as workers with barriers to obtaining healthcare, or those who struggle to file workers' compensation claims. Other barriers to filing a workers' compensation claim include fear of retaliation (for example, getting hours reduced or being fired); vulnerability due to immigration status; and a lack of accessible information about rights when injured at work.[viii] Individuals who work in occupations with a high level of organized labor may face fewer barriers to filing a workers' compensation claim. Additionally, the COVID-19 pandemic is likely to have affected workers' ability to seek care and may have resulted in lower rates of HRI; for this reason, caution must be used when comparing data from 2000–2019 to later years. Lastly, incarcerated individuals were not included in this analysis due to the lack of available data on the total number of incarcerated people who were also working in the state.

Conclusion

In this study, we found that over 20,000 workers' compensation claims for HRI were made between 2000 and 2022 in California, indicating that HRI represents a significant threat to workers' health. HRI is a preventable illness which can cause mild to life-threatening symptoms. Workers are vulnerable to HRI when they labor in hot working environments without adequate access to water, rest, and cool down areas. This number is likely to be an underestimate due to the barriers many workers face to reporting injuries at work, including fear of retaliation and limited knowledge of HRI symptoms.

These findings show that not all workers are equally impacted by HRI. The rate of HRI was twice as high among men compared to women. Young workers, and workers in certain occupations, such as protective services; farming, fishing, and forestry; and construction also had significantly higher rates of HRI. From 2000 to 2022, rates of occupational HRI more than doubled.

As workers are exposed to hotter temperatures due to climate change, it is vital to take steps towards preventing HRI in every workplace. Most claims for HRI happened from May to September, indicating a need for increased attention to the dangers of heat during these months. Many workers may not recognize the signs and symptoms of HRI, which can range in severity from cramps to loss of consciousness to death. Prevention and educational campaigns can include how to recognize and respond to HRI; the importance of acclimatization, access to cool-down areas, hydration, and rest breaks; and how clothing and personal protective equipment impact the risk of HRI. It is also vital that workers understand their rights, and that employers establish a culture where employees are encouraged to seek care and file workers' compensation claims when injured.

Every workplace HRI is preventable. We hope this data brief provides information to reduce the burden of occupational injuries and illnesses in California.

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Acknowledgements

Cassandra Marquez[2], Debbie Shrem[2], Joyce Vea[2], Simone Schubert[2], Kristin Cummings[2], Kathryn Gibb[2], Ximena Vergara[2], Michelle Pearl[3]

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