

# Occupational Heat-Related Illness Emergency Department Visits, California, 2016-2023

## Key Findings

- ✓ During 2016-2023 there were 5,925 emergency department visits for work-related heat illness, with 4.3 visits for every 100,000 California workers occurring per year on average.
- ✓ Latinx patients accounted for the greatest proportion of visits among racial and ethnic groups.
- ✓ Half of the visits are by younger worker (age 16-33 years).
- ✓ The highest rate of ED visits per 100,000 workers was in Imperial County, which experienced 7 times the statewide average rate.

## Key Messages

- ✓ Occupational heat-related illness is preventable.
- ✓ California employers are required to comply with Cal/OSHA standards for preventing heat illness.

## Introduction

Exposure to heat and hot weather can cause heat-related illnesses (HRI) such as heat exhaustion, heat cramps, and heat stroke. Heat stroke is a life-threatening medical emergency which can lead to death if not treated promptly. HRI is a significant, but preventable, source of occupational (work-related) illness and death. People who work outdoors such as those in the agriculture and construction industries are at elevated risk of HRI, as well as indoor workers in non-air-conditioned environments like warehouses and kitchens. Occupational HRI can be prevented with adequate hydration, rest breaks, and acclimatization (allowing the body to gradually adjust to working in high heat).

Two regulations enforced by the California Division of Occupational Safety and Health (Cal/OSHA) protect workers from HRI. Since 2006, all employers with outdoor workers have been required to comply with the regulation for heat illness prevention in outdoor places of work, [Title 8 CCR Section 3395](#). This requires employers to implement protections including adequate shade, water, and rest breaks as well as training, recordkeeping, and additional procedures for exposure to extreme heat. Beginning in 2024 employers with indoor workers have been required to comply with [Title 8 CCR Section 3396](#), which mandates similar protections. The California Department of Industrial Relations maintains information about both standards on their website [Cal/OSHA Heat Illness Prevention Guidance and Resources](#).

Some cases of HRI are mild and can be treated with rest, hydration, and cooling, but others are more severe and may require an emergency department (ED) visit for adequate treatment. This report summarizes a study that the Occupational Health Branch (OHB) of the California Department of Public Health (CDPH) performed to help understand risk factors for ED visits for occupational HRI among California workers.

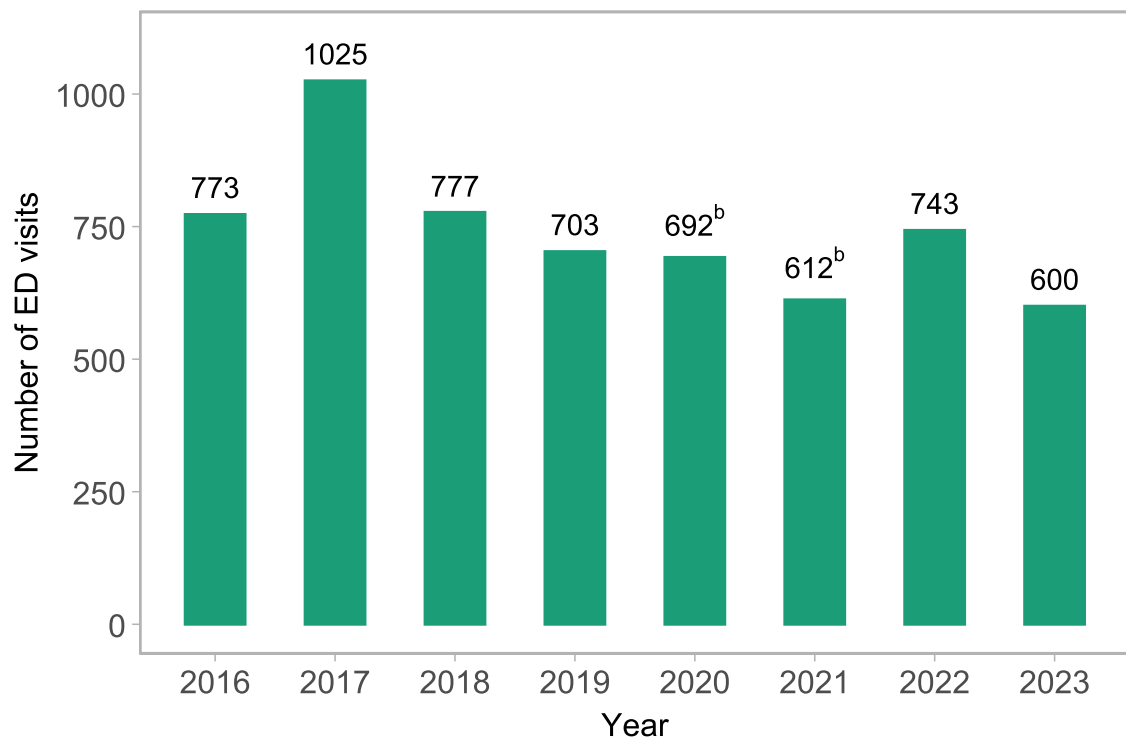
## Study Methods

In California, all EDs must submit summary information for each visit to the Department of Health Care Access and Information. These data include codes for the diagnoses received by the patient and personal information about the patient including age, race and ethnicity, and county of residence. OHB searched these data for the years 2016-2023 for ED visits with HRI diagnostic codes that were accompanied by either a code indicating a work-related event or that the medical bill was expected to be paid by Workers' Compensation insurance. HRI diagnoses are heat exhaustion, heat stroke, heat fatigue, heat syncope (fainting), heat cramps, and heat edema (swelling of extremities). OHB followed CDPH guidelines on data de-identification and did not include identifying information in any results presented in this report.

## Results

During the years 2016-2023, there were 47,223 ED visits with an HRI diagnosis among people of working age (16-84 years). Of these visits, 5,925 (12.5%) were occupational. Figure 1 shows the number of ED visits for occupational HRI in each year. Fewer people visited EDs during 2020 and 2021 due to the COVID-19 pandemic, so it is not possible to tell whether the true number of HRI cases declined from 2017 to 2021.

**Figure 1.** Emergency department visits for occupational heat-related illness, California, 2016-2023<sup>a</sup>.



<sup>a</sup> 2016-2021 counts may differ from the previous version of this data brief due to an error in identifying severe HRI cases that has been corrected.

<sup>b</sup> 2020-2021 data subject to bias caused by reduced emergency department utilization during the COVID-19 pandemic.

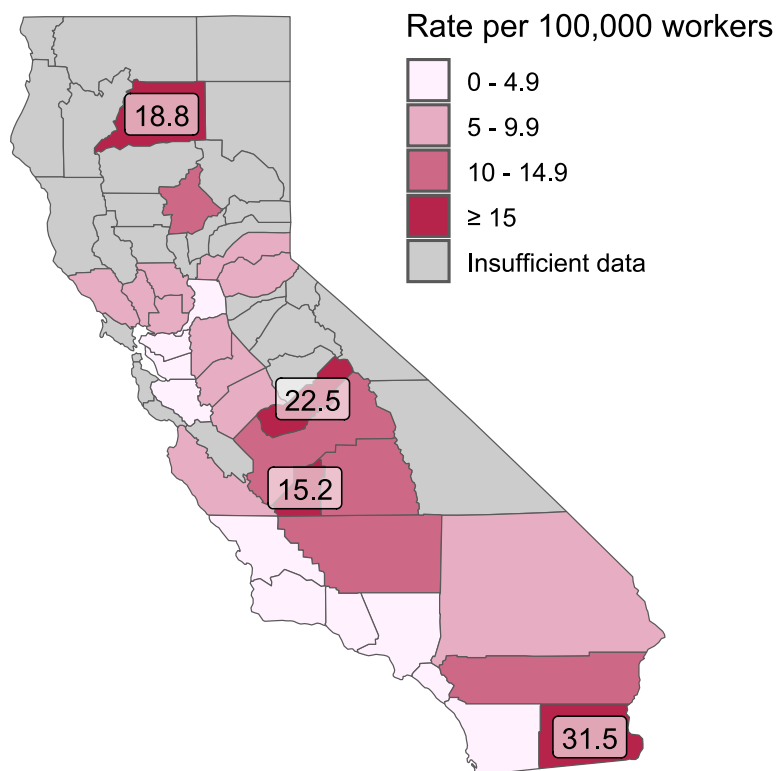
**Table 1:** Demographic characteristics of occupational heat-related illness emergency department patients, California, 2016-2023

Characteristic	N = 5,925 <sup>a</sup>
Age (years)	33 (26, 46)
Sex	
Male	4,591 (78%)
Female	1,278 (22%)
Race and Ethnicity	
Hispanic, any race	2,661 (45%)
White, non-Hispanic	2,313 (39%)
Black, non-Hispanic	365 (6.2%)
Other or multiracial, non-Hispanic	295 (5.0%)
Asian or Pacific Islander, non-Hispanic	179 (3.0%)
Race/ethnicity unknown	112 (1.9%)
<sup>a</sup> Median (IQR); n (%)	

During the study period, there were on average 4.3 occupational HRI ED visits per 100,000 California workers per year.<sup>1</sup> Figure 2 shows the rate of occupational HRI visits per 100,000 workers by patient's county of residence, averaged over the eight years of data. The highest rate is seen in Imperial County, with Kings, Madera and Shasta Counties also having high rates. Imperial County experiences the hottest temperatures in California and has agriculture as a major industry – potentially explaining the high rate of workers visiting the ED for HRI. It is possible that the high rate in Shasta County was caused by overlapping wildfire and heat events. Counties shown in gray reported relatively few total ED visits, preventing reliable estimates of the rate.

<sup>1</sup> State and county annual employment from Bureau of Labor Statistics Quarterly Census of Employment and Wages (<https://www.bls.gov/cew/>)

**Figure 2.** Rate of occupational heat-related illness (HRI) emergency department visits per 100,000 workers by county, California, 2016-2023<sup>a</sup>.



<sup>a</sup> Counties with rates of HRI  $\geq 15$  per 100,000 workers are labeled. North to South, the counties are Shasta, Madera, Kings, and Imperial.

## Conclusions

The results summarized in this report show that occupational HRI is a significant contributor to total HRI, and that the risk does not affect all workers equally. HRI is more common among Latinx, younger, and male workers, and the rates per 100,000 workers vary greatly by county. Imperial County has a particularly high rate of occupational HRI visits to the ED. The effects of the COVID-19 pandemic on ED utilization prevent an analysis of trends in HRI rates during this time period.

It is important to note that this report includes only cases of HRI that are severe enough to require emergency treatment, and there are many HRI cases that are not counted because they were treated at home, the workplace, or non-ED healthcare settings. In addition, there are likely to be occupational HRI cases that were missed because the hospital records did not include a work-related diagnostic code or list Workers' Compensation insurance as the payer.

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### **Disclaimer**

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