



The mission of the California Labor Lab is to extend the pursuit of health and safety for workers in traditional employment to those in a wide range of alternative arrangements in partnership with affected communities.

Data Brief #12: Heat Exposure, Heat Mitigations, and Heat-Related Illness among California's Workers

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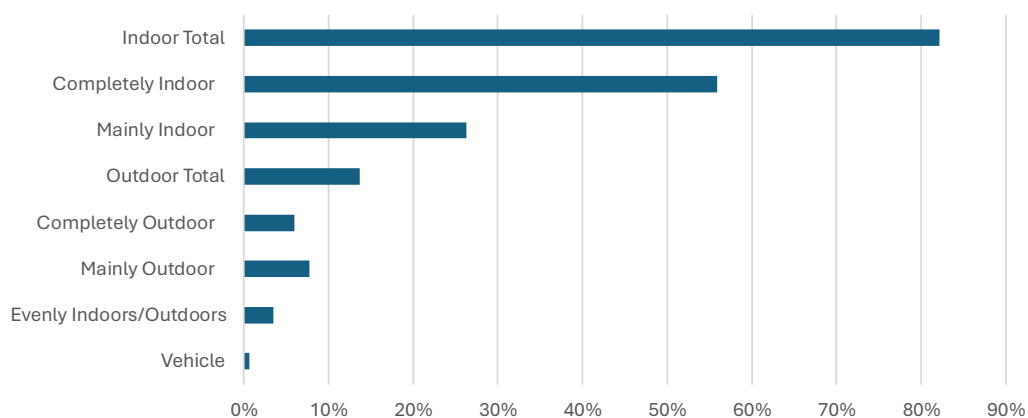
The California Work and Health Survey addresses the relationship between work and health among working age Californians (those 18-70 years of age). In 2025, those who had been interviewed in 2022-2023 were re-interviewed. One set of questions in the re-interview asked those who were employed about whether they worked inside or outside mainly, exclusively, or evenly or in another environment, for example vehicles. They were then asked about a range of potential mitigations on the job, including provision of cool water, shady rest areas, broad-brimmed hats, fans, cooling systems such as air conditioning, cessation of work when the temperature exceeded 104degF, rescheduling of work time, and being able to work at one's own pace. Respondents were also asked whether they had experienced a heat-related illness in their current main job, including heat rashes, heat cramps, heat exhaustion, or heat stroke. The questions about mitigations were asked regardless of whether the individual reported a heat-related illness.

In this Data Brief, we report on the prevalence of potential exposure to workers who work inside, outside, or in a vehicle, the mitigations used in the workplace, and heat-related illness. The prevalence of heat-related illness is shown by demographic and geographic characteristics, major occupation and industry groups, and select work characteristics.

Site of Potential Exposure

Among the 18.9million working age Californians who were employed in the week prior to the 2025 interview, about 15.5million (82%) worked completely or mainly indoors, about 2.6million worked completely or mainly outdoors (14%), while another 0.7million (4%) worked indoors or outdoors in even amounts. About another 0.1million (< 1%) worked elsewhere – usually in a vehicle.

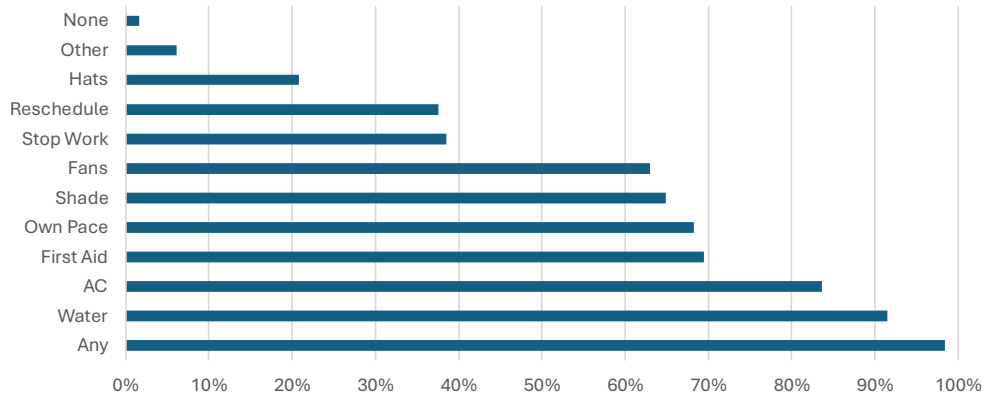
Prevalence of Potential Exposure to Heat



Prevalence of Mitigations for Heat Exposure

Almost all workers reported at least one mitigation for heat exposure, with the most common being provision of cool drinking water and the presence of air conditioning or other cooling system. Fewer than half, however, said that work could be stopped when the temperature was at or above 104deg Fahrenheit or that they could reschedule work time due to the heat. Just under 70 percent said that they could set their own pace of work. For both those working indoors and out, rescheduling work time or stopping work when the temperature was at or above 104deg Fahrenheit occurred less than half the time (data on prevalence of mitigations indoors or outdoors not in figure).

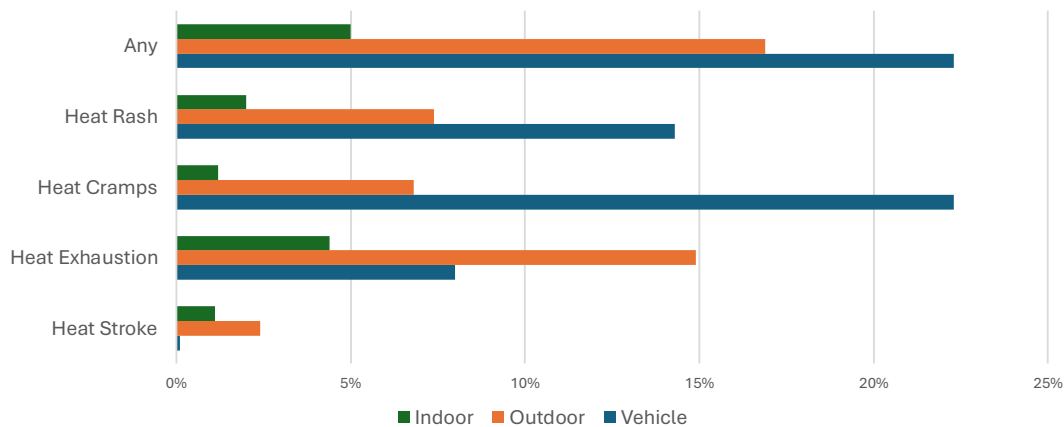
Prevalence of Mitigations for Exposure to Heat



Prevalence of Heat-Related Illness, by Site of Exposure

The prevalence of heat-related illnesses varied by the site of potential exposures at work. For heat rashes and heat cramps, those who reported working from vehicles had the highest rates, followed by those working outside. For both heat-exhaustion and heat-stroke, those working outside had the highest rates. Overall, more than a fifth of those working from a vehicle experienced a heat-related illness, while about a sixth and a twentieth of those working outside and inside did.

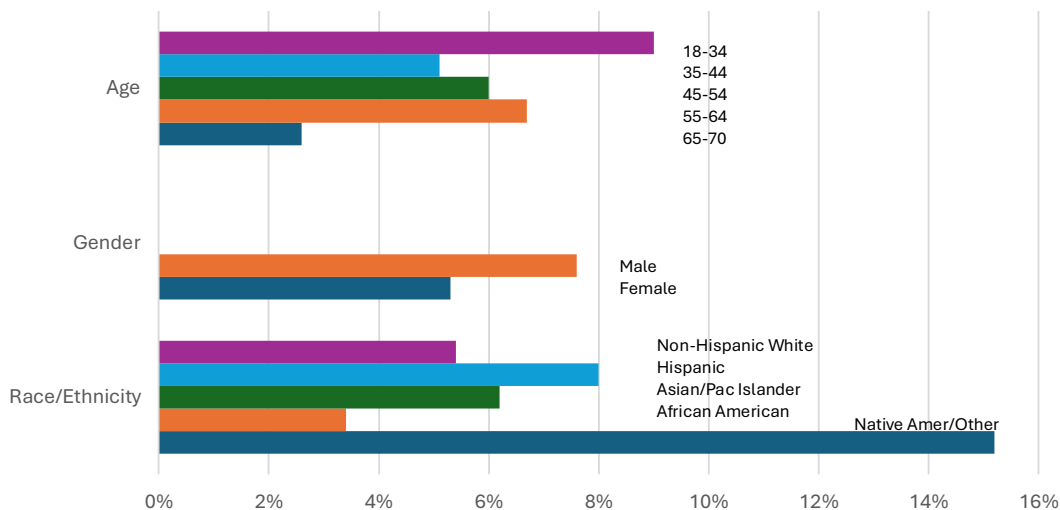
Prevalence of Heat-Related Illness, by Site of Exposure



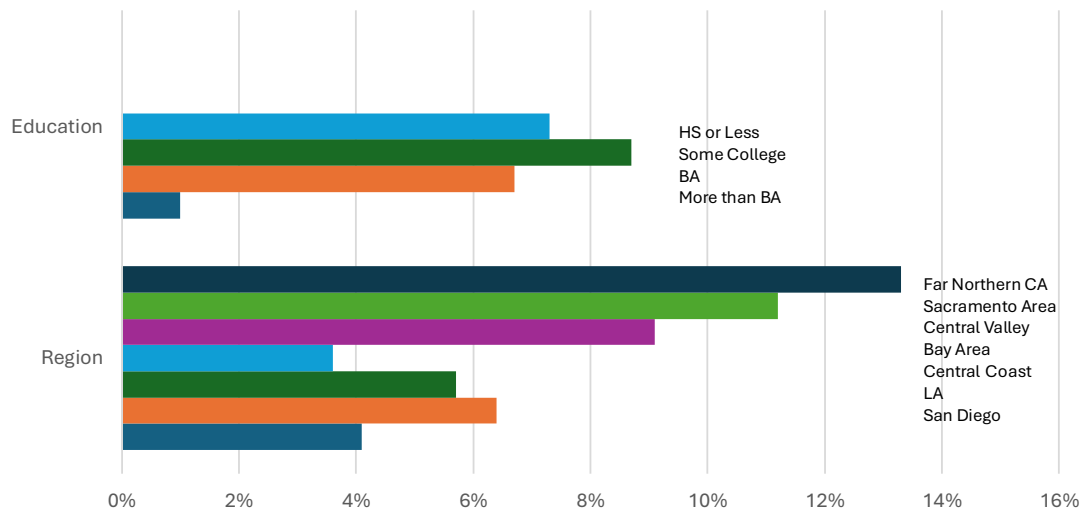
Prevalence of Heat-Related Illness, by Demographic Characteristics and Region

The prevalence of heat-related illness is substantially higher among workers ages 18-34; it is lowest among those 65-70, probably reflecting the kinds of jobs individuals these ages hold. The prevalence is higher among men, among those who are either Native Americans or in other or mixed races, and among those with educations at the BA level or lower compared to those with at least some graduate education. As a result of the kinds of jobs and weather patterns, illness rates are highest in the far northern parts of the State, the Sacramento area which stretches into the foothills of the Sierras, and the Central Valley. Prevalence rates are lowest in the Bay Area.

Prevalence of Heat-Related Illness, by Age, Gender, and Race/Ethnicity



Prevalence of Heat-Related Illness, by Education and Region

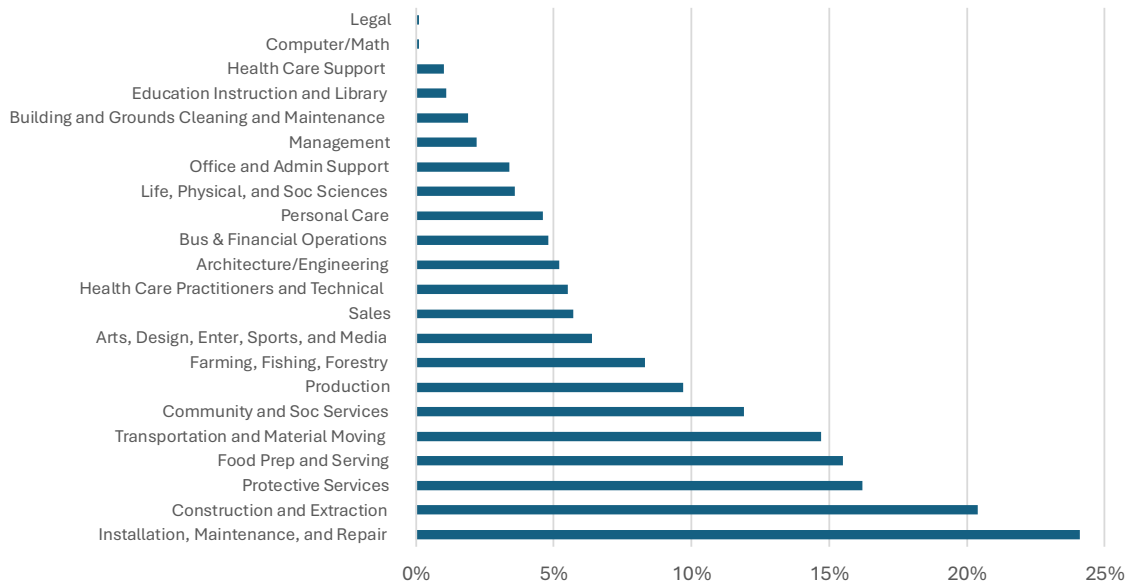


Prevalence of Heat-Related Illness, by Occupation and Industry

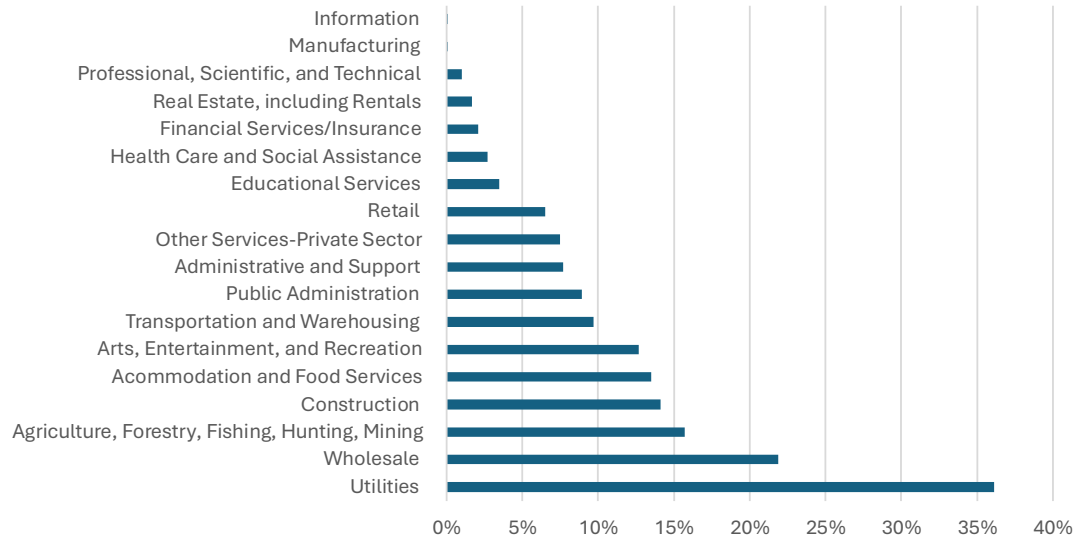
Occupations with high rates of heat-related illness include installation, maintenance, and repair; construction and extraction; protective services; food preparation; and transportation and material moving, but surprisingly also community and social services. Low rates are reported in legal and computer and math occupations, as expected, but also in building and grounds cleaning and maintenance which is not. In the occupations with the two highest rates of heat-related illness, rates exceeded 20 percent.

Turning to industry, the highest prevalence rates of heat-related illness occur in utilities, wholesale trade; agriculture, forestry, fishing, and mining; construction; and accommodations and food services. However, rates are also surprisingly high in arts, entertainment, and sports industries (a lot of work in these industries, however, is in jobs like food service or janitorial services at sports stadiums and theme parks). As expected, the prevalence of heat-related illness is essentially zero in information industry, but rates are also low in manufacturing which would require physical exertion. However, many jobs in the latter sector may be in white collar occupations within the sector or in computer- or AI-run manufacturing.

Prevalence of Heat-Related Illness, by Occupation



Prevalence of Heat-Related Illness, by Industry



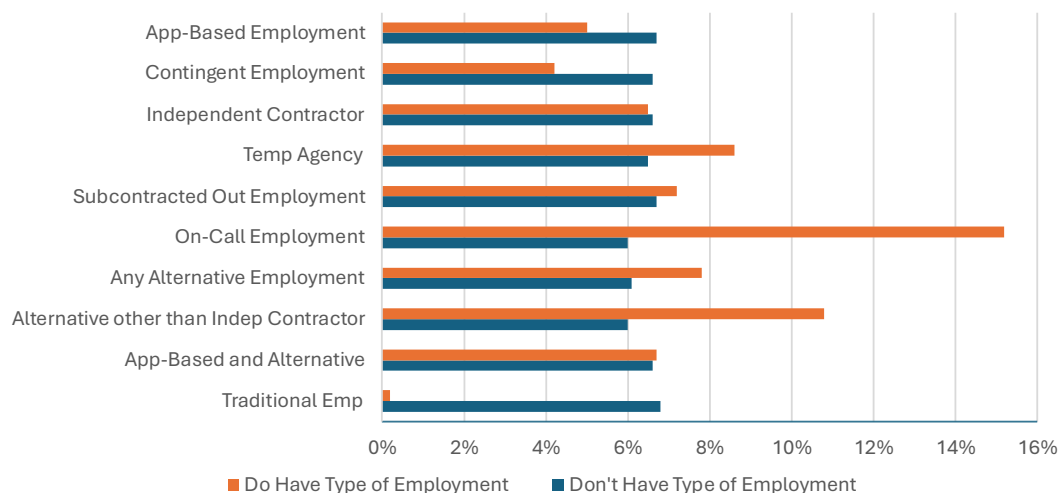
Prevalence of Heat-Related Illness, by Types of Work

In the contemporary economy, many people are not formally hired to do work. Instead they work by connecting with customers through apps (often called “gig jobs”); in contingent employment, that is job scheduled to last beyond the current year; in the four types of work subsumed within alternative employment, including working as an independent contractor, for

a temp agency, having one's work subcontracted out to another firm; or working on an on-call basis. These forms are often done in combination, for example jobs that are contingent are also frequently in one of the forms of alternative employment. To synthesize the forms of employment without permanence or alternative modes, the California Labor Laboratory created a "traditional employment" category which includes being formally hired by the firm for which the work is done, on a permanent basis, working full-time, full-year on a regular shift; the null case for traditional employment encompasses any of the alternative or contingent forms of employment or securing work through an app.

The ways that workers are hired to do jobs affects their exposure to heat-related illness. Among the four kinds of alternative employment, independent contractors, those whose work was subcontracted from one firm to another, temp agency workers, and on-call workers, all but independent contractors had a higher rate of heat-related illness. The highest prevalence was among on-call workers, 15.2% of whom reported one or more heat-related illness. However, those who secured work through an app and those in contingent positions did not have higher rates of heat-related illness, perhaps because in the former kind of work they could regulate their exposure or worked in airconditioned environments, while in the latter the impermanence shielded the workers from cumulative effects of exposure.

Prevalence of Heat-Related Illness, by Types of Work



The overall effect of the type of work is substantial: workers in traditional employment were almost totally shielded from heat-related illness, while those in any form of non-traditional employment spanning app-based, contingent, or alternative hiring modes were multiple-fold at higher risk.

Summary and Conclusions

About one in fifteen of California's workers reported one or more heat-related illness. The prevalence of heat-related illness is considerably higher among those working outside, but is substantial (5%) even among those working inside; it is highest, however, among those working from a vehicle.

Most workers report at least one workplace mitigation for heat, the most common being the provision of cool water and, of relevance only to those working inside, the presence of air conditioning or another cooling system. Fewer than half of workers indicated that they could stop work when the temperature exceeded 104deg Fahrenheit and only a fifth reported that they were provided with a broad-brimmed hat. Thus, exposure to extremes of heat would continue unabated for many.

The groups with the highest prevalence of heat-related illness included those 18-34, men, Hispanics and those in the category combining Native Americans and other small race and ethnicity groupings, and those with lower levels of education.

Regional differences, reflecting the mix of occupations and industries as well as climate, were profound. Workers in the Bay Area, the region with the lowest prevalence of heat-related illness (3.6%), were only about a quarter as likely to report such an illness as workers in Far Northern California (the North Coast and counties inland from there), the region with the highest (13.3%).

Occupational and industry differences in the prevalence of heat-related illness were even greater. The occupations with the highest prevalence rates exceeded the rates of those with the lowest by more than 25-fold; differences among industries were even greater, 35-fold.

Alternative employment *overall* affects exposure to heat-related illness, although among forms of alternative employment, the largest, independent contracting, is not related to heat-related illness. Nor was app-based and contingent employment.

The overall effect of the type of work is substantial: workers in traditional employment were almost totally shielded from heat-related illness, while those in any form of non-traditional employment spanning app-based, contingent, or alternative hiring modes were at multiple-fold higher risk.

Efforts to reduce exposure have mostly relied on specific occupations and industries. While this should continue to be a principal focus of intervention and regulation, policymakers should expand their focus to incorporate the type of employment. Non-traditional forms of

employment in which the workers are either not formally hired or are hired only in contingent or episodic ways make surveillance of heat-related illness more difficult precisely because the workers may not be as visible to surveillance systems or because firms may not take the same level of responsibility for worker welfare.

About the Survey

The California Work and Health Survey (CWHHS) used a random sample of cell phones to develop its study cohort of 4,014 working age Californians. The CWHHS was administered between November 2022 and May 2023 by telephone interviewers or completed on-line at the respondents' choice. Both the telephone-administered and on-line surveys could be completed in English or Spanish. The survey covered current employment status, working conditions among the employed, health status, and economic well-being. The results were weighted to reflect known characteristics of the working age population of California. In winter 2025, 1,826 of the 4,014 were re-interviewed. The number re-interviewed was reduced due to potential funding constraints. Nevertheless, after weighting, the results again reflect known characteristics of the working age population, albeit with greater sampling variation than the baseline survey.

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