Inland Empire Labor and Community Center

Climate Hazards Affecting Workers and their Communities in the Inland Empire, California, and the United States: An Annotated Bibliography

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Brennan, E. (2022, September 16). *Amazon Warehouse Workers Document Extreme Temperatures in Western Air Hub, Demand Safety Protections* [Press Release]. Warehouse Worker Resource Center. https://warehouseworkers.org/amazon-warehouse-workers-document-extreme-temperatures-in-western-air-hub-demand-safety-protections/

This press release details the firsthand experiences and advocacy efforts of Amazon warehouse workers at the West Coast Air Freight Fulfillment Center (KSBD), a facility located in the Inland Empire region that is susceptible to extreme heat. The document highlights the critical issue of excessive indoor and outdoor workplace temperatures, with workers documenting readings as high as 121 degrees Fahrenheit in outdoor work areas, and noting inconsistencies with Amazon's internal temperature monitoring systems. These workers experienced various forms of heat illness, underscoring significant climate health concerns within this occupational setting.

As a result of their organized efforts and a collaboratively released report, these workers successfully advocated for improved safety measures. These include an increase in cool-down breaks, although inconsistently applied, enhanced access to water, ice, and electrolyte packets, and the deployment of additional fans within the facility. Furthermore, their advocacy secured temporary indoor relocation and increased rotation for employees assigned to outdoor tasks. This account identifies warehouse workers as an occupation highly susceptible to heat-related health risks due to the physically demanding nature of their roles and the environmental conditions of large fulfillment centers. Originating from a labor organization, the documented

experiences provide valuable qualitative data on the real-world impact of extreme heat on a critical segment of the workforce and demonstrate the efficacy of collective action in compelling employers to implement essential safety protections.

Cheney, A. M., Barrera, T., Rodriguez, K., & Jaramillo López, A. M. (2022). The intersection of workplace and environmental exposure on health in Latinx farm working communities in rural Inland Southern California. International Journal of *Environmental Research and Public Health, 19*(19), 12940. https://doi.org/10.3390/ijerph191912940

Workplace and environmental exposures pose health risks for racial/ethnic minorities in rural agricultural communities, placing them at a disadvantage in accessing needed health care. Over three fourths (76%) of the 2.4 million farmworkers in the United States are immigrants, mostly from Mexico. However, little is known of the community health concerns and barriers to care of Latinx farmworkers in inland Southern California. This qualitative study used a community-based participatory research approach, conducting nine in-home meetings to obtain meaningful community input on health concerns and barriers to access healthcare services among rural residents of the Eastern Coachella Valley, who are also located near the desert-bound Salton Sea of inland Southern California. All interviews were audio-recorded and analyzed via listening to the audio recordings and summarizing data in templates and matrices. Participants discussed health concerns related to agricultural labor, including heat-related illness, musculoskeletal ailments and injuries, skin disorders, respiratory illness, and trauma. Participants raised concerns about environmental exposures related to agriculture and the nearby Salton Sea, a highly saline lakebed, and proposed solutions to improve the health of their communities. In all in-home meetings participants discussed the effects of extreme heat conditions, long work hours, bending and lifting, excessive consumption of caffeine, little water consumption, and pesticide exposure on chronic health conditions and psychological and emotional distress. They were aware that their status as immigrants (documented or undocumented) exposed them to these negative labor conditions. They also noted some health conditions were directly connected to workplace negligence and their inability to ask for better work conditions. Participants raised concerns about employers failing to provide cool water and workplace training on heat-related illness. Participants said the water provided was often hot due to the high temperatures outdoors. Having to work under extreme heat without appropriate hydration, they explained, put farmworkers at risk for heat exhaustion and other heat-related illness—topics about which they lacked information. Participants also stated that farmworkers

are afraid to speak up to superiors about workplace conditions.These findings suggest that farmworkers are aware of the health risks posed by living and working in rural farmlands but lack resources and information to act upon and advocate for improved public health.

County of Riverside Human Resources. (2015). *Standard Safety Operations Manual*. https://rc-hr.com/safety/riverside-county-safety-manual

Within its Standardized Safety Operations Manual, the County of Riverside has adopted a specified section dedicated to the prevention of heat illness for its employees who work outdoors. The manual provides definitions regarding heat illness, acclimatization, and proper procedures for recovering from heat exhaustion. The county has several provisions listed for supervisors to follow in order to minimize the risk of heat related illnesses. Supervisors must take steps to either modify work schedules or adopt less intense work for a designated "break-in" period for acclimatization. Additionally, proper provision of shade and water must be accounted for as well as proper training for employees on assisting in heat illness prevention and emergency response. Lastly, supervisors must be vigilant in regards to recognizing the signs and follow emergency protocols if needed. Riverside county managers are expected to follow these steps in order to curb any heat related illnesses within county departments, agencies, and special districts.

Dahl, K., & Licker, R. (2021, August 17). *Too hot to work: Assessing the threats climate change poses to outdoor workers*. Union of Concerned Scientists. https://www.ucs.org/resources/too-hot-to-work

This publication investigates the escalating dangers posed by extreme heat to outdoor workers across the United States, a threat exacerbated by climate change. The report underscores the critical dilemma faced by these essential workers, often forced to choose between their well-being and their livelihood under hazardous conditions. A central finding projects substantial economic losses, estimating that outdoor workers could collectively forfeit $55.4 billion in annual earnings by midcentury if global heat-trapping emissions remain unchecked.

The health implications are profound, with outdoor laborers facing a risk of mortality from heat exposure up to 35 times greater than the general populace. The publication identifies professions such as construction, agriculture, and emergency response as particularly vulnerable. It further highlights that Black and Hispanic/Latino workers are disproportionately

represented in these high-risk roles, consequently experiencing greater exposure and amplified economic hardship. The analysis critiques the inadequacy of existing heat exposure regulations, noting that only California and Washington state have enforceable protective standards. Projections within the document indicate a dramatic increase—three to fourfold—in outdoor workers' exposure to days exceeding a 100°F heat index by midcentury under current emissions trajectories. This would result in a significant rise in unsafe workdays, affecting millions and intensifying existing social, economic, and health disparities. The report's detailed assessment of heat impacts, vulnerable occupations, and policy recommendations makes it highly relevant for understanding climate-related occupational health challenges, particularly concerning the Inland Empire.

Delp, L., Cole, B., Lozano, G., & Riley, K. (2021). Worker injuries in Southern California's warehousing industry: How to better protect workers in this burgeoning industry? *New Solutions: A Journal of Environmental and Occupational Health Policy, 31*(2), 178–192. https://doi.org/10.1177/10482911211017445

Warehousing in Southern California has risen significantly over the decades, leading to the area becoming one of the largest economic hubs for Trans-Pacific trade. Despite the portrayal of warehouses as lucrative producers of economic growth, tax revenue, and job creation for social mobility, the latter claim is being disputed as more is revealed of the negative impacts of the non-union, flexible, and disposable labor systems created for minimizing costs and reducing employer responsibilities. Additionally, the industry has not only imposed costs on the environment through air pollution, noise and traffic congestion, but also costs on the workers who experience low pay, long hours, a relentless work pace, and job insecurity creating physical, mental, and financial burdens on workers and their families. Thus, the authors of this paper deemed it necessary to analyze workers' compensation injury claims and California Division of Occupational Safety and Health (Cal/OSHA) citations to complement existing sources of data and contribute to a fuller picture of worker injuries and working conditions. This research builds on the foundation established through previous collaborations between workers, researchers, and advocates to document unsafe working conditions and support injured workers. The researchers identified 593 citations into nine categories of related standards. Employers were most frequently cited for failure to comply with Cal/OSHA requirements to implement health and safety plans and programs. These 138 citations comprised 23 percent of the total and included failure to implement an Injury and Illness

Prevention Program, report work-connected fatalities and serious injuries, or create a Hazard Communication plan. A similar proportion of citations were issued for unsafe vehicle operation (136, 23% of total), demonstrating a failure to train, ensure safe operating rules, and maintain safe brakes and functional warning devices. Other common citations resulted from lack of Personal Protective Equipment, especially foot protection; failure to prepare for emergencies including lack of fire extinguishers, eyewashes, and access to exits; unsafe work environments due to blocked aisles, unsafe walkways, extreme heat, and unsanitary facilities; dangerous machinery and equipment operations, including lack of lock-out/tag-out procedures; electrical hazards; and lack of protections against falls from heights. The authors' recommendations focus on improving government data systems to capture injuries and exposure to hazards among the temporary work force, improving the reliability of agency data, and collaborating to strengthen efforts to enforce workers' rights and protections, as well as proposing additional areas of analysis using their data to shed light on occupational health and safety inequities. Although climate hazards were not the main focus of this report, extreme heat was mentioned as one of the occupational hazards commonly experienced by warehouse workers. The authors' recommendations for improving data on occupational health and safety and strengthening enforcement of health and safety laws are also relevant to addressing issues related to workers' exposure to extreme heat.

This research analyzed data from a variety of sources for warehousing establishments in eight Southern California counties for the period 2014 to early 2019. These establishments were identified using the six-digit NAICS (North American Industry Classification System) code, 493110, "General Warehousing and Storage." The authors first describe growth in employment and union organizing efforts as a backdrop to understanding the industry in this region. Then the researchers examine 9,257 workers' compensation claims obtained from the California Division of Workers' Compensation and analyze trends over time, causes of the most frequently reported injuries, and initial medical treatment which they used as a proxy for severity. The authors similarly examine 593 citations issued by Cal/OSHA inspectors during 155 inspections of 147 establishments, summarizing the most common Cal/OSHA violations and those cited as serious; that is with the potential to cause serious injury or death. The researchers compared results from both datasets and analyzed whether Cal/OSHA issue citations for those hazards that cause the most frequent and the most severe injuries were reported in the workers'

compensation data. The authors lacked information in the workers' compensation dataset about where injured workers were employed so they unfortunately could not determine if Cal/OSHA inspections were conducted in the same workplaces. However, the authors triangulated these data sources, referencing worker reports, and comparing Cal/OSHA citations with previous inspection data.

Dunseith, L. (2021, July 16). *High temperatures increase workers' injury risk, whether they're outdoors or inside*. UCLA Luskin Center for Innovation. https://innovation.luskin.ucla.edu/2021/07/16/high-temperatures-increase-workers-injury-risk-whether-theyre-outdoors-or-inside/

This UCLA Luskin Center for Innovation report summarizes a peer-reviewed study, "Temperature, Workplace Safety, and Labor Market Inequality," by Park, R.J., Pankratz, N., and Behrer, A.P. (see: https://ucla.app.box.com/s/14m6pj1algt7rwb8ihq4lyqjhm2ueejj). This study analyzes the relationship between rising ambient temperatures and workplace injury risk in California between 2001 and 2018. The research examined over 11 million injury reports and correlated them with daily temperature records, allowing for a highly granular statistical assessment of heat exposure and injury outcomes. Results demonstrate that hotter days substantially increase the likelihood of injuries, not only in outdoor sectors such as agriculture and construction but also in indoor industries including manufacturing and warehousing. This challenges the assumption that only outdoor workers face heat-related risks and highlights how ambient temperatures can exacerbate accidents, equipment misuse, or lapses in judgment indoors as well.

The study estimates that workplace heat exposure causes an additional 20,000–39,000 injuries per year in California—equivalent to roughly 300,000 injury reports from 2001–2018. These injuries include falls, machine accidents, transportation incidents, and other non-heat-diagnosed harms, suggesting that heat acts as a contributing factor to a wide range of occupational risks. Notably, the report finds the burden is disproportionately borne by low-income workers, young employees, and people of color, groups overrepresented in both outdoor labor and physically demanding indoor jobs. Thus, climate-driven heat risk amplifies existing socioeconomic and racial inequities in workplace safety.

For the Inland Empire region, where warehousing and logistics employment is common and agricultural employment is also present, the findings are especially relevant. The report

underscores the urgency of implementing stronger worker protections, such as heat standards, rest breaks, and workplace cooling interventions. It also reinforces the importance of regional climate adaptation planning that addresses both outdoor and indoor work environments. By quantifying the hidden costs of heat on worker health and productivity, this study provides compelling evidence for policymakers and advocates seeking to link climate resilience with labor protections in Southern California.

Fulcher, J. (2023, May 25). *Hot Take – Urgent heat crisis for workers: The demand for immediate worker protections increases as dangerous temperatures rise*. Public Citizen. https://www.citizen.org/article/hot-take/

This article forcefully addresses the escalating issue of heat stress in U.S. workplaces, highlighting its severe impact on worker health and safety. It reports alarming statistics, estimating that heat exposure contributes to as many as 2,000 worker fatalities and up to 170,000 injuries annually, with a direct correlation between rising temperatures and increased workplace injuries. The publication underscores that these dangers disproportionately affect low-income, Black, and Brown workers. The report identifies farmworkers as the occupation with the highest rates of heat-related deaths, but also highlights risks for construction workers, postal carriers, and others in physically demanding outdoor jobs. Furthermore, it notes the substantial economic burden, estimating nearly $100 billion in annual losses for the U.S. economy due to reduced productivity, absenteeism, and increased workers' compensation premiums resulting from inadequate heat safety measures.

The article critically points out the longstanding failure of the Occupational Safety and Health Administration (OSHA) to implement a federal workplace heat hazard rule, despite decades-old recommendations, thereby prolonging key climate health concerns for workers. It advocates for the Asuncíon Valdivia Heat Illness, Injury and Fatality Prevention Act, which would mandate an interim heat standard, citing California's state occupational heat standard as a successful model that significantly reduced heat-related injuries. This source is highly relevant for understanding the severe and preventable health risks associated with extreme heat as a climate hazard, outlining the specific occupations most at risk, and emphasizing the crucial need for comprehensive regulatory measures and simple mitigation strategies—such as providing cool drinking water, adequate breaks in shaded areas, and acclimatization procedures—to protect workers, particularly in regions like the Inland Empire.

Hoegh-Guldberg, O., Jacob, D., Taylor, M., Bindi, M., Brown, S., Camilloni, I. A., Diedhiou, A., Djalante, R., Ebi, K. L., Engelbrecht, F., Guiot, J., Hijioka, Y., Portner, H. O., Kovats, R. S., Lissner, T. K., Low, P. S., Mustafa, M. A., Oppenheimer, M., Pereira, J. J., ... Zommers, Z. (2018). ***Impacts of 1.5°C Global Warming on Natural and Human Systems. An IPCC Special Report on the Impacts of Global Warming of 1.5°C Above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty*****. Intergovernmental Panel on Climate Change.** https://www.ipcc.ch/site/assets/uploads/sites/2/2019/02/SR15_Chapter3_Low_Res.pdf

This chapter, from the IPCC Special Report on Global Warming of 1.5°C, provides an authoritative scientific consensus on how increasing global temperatures, driven by extreme heat, contribute to and intensify various climate hazards. The publication is essential for illustrating how heat causes or exacerbates wildfire, drought, and flooding. It explains that higher temperatures lead to increased evaporation, intensifying drought conditions and drying out vegetation, which then creates prime conditions for larger and more frequent wildfires.

Concurrently, the report details how a warmer atmosphere holds more moisture, leading to more intense precipitation events when rain does fall, which can overwhelm infrastructure and result in increased flooding, even in areas experiencing overall drought. This source is crucial for establishing the foundational scientific link between extreme heat as a primary driver and these other significant environmental hazards. It provides the necessary scientific context for understanding how climate change impacts cascade through natural systems, ultimately affecting the conditions in which workers operate, serving as a highly credible reference from the leading international body for assessing climate change.

International Labour Organization [ILO]. (2024, April 22). ***Ensuring safety and health at work in a changing climate.*** https://www.ilo.org/publications/ensuring-safety-and-health-work-changing-climate

This report highlights the escalating threats posed by climate change to worker health and safety globally. The ILO asserts that a staggering 70% of the world's workforce, approximately 2.4 billion individuals, are exposed to excessive heat annually, a figure that has notably increased since 2000. Beyond heat, the document identifies a "cocktail of hazards" including solar ultraviolet (UV) radiation, extreme weather events, workplace air pollution, vector-borne diseases, and elevated exposure to agrochemicals.

These climate-related hazards are linked to a wide array of adverse health conditions in workers, such as cancer, cardiovascular and respiratory illnesses, kidney dysfunction (including chronic kidney disease of unknown etiology), and mental health issues. The publication estimates substantial global impacts, including approximately 18,970 work-related deaths and 22.85 million occupational injuries annually attributable to excessive heat alone. Occupations particularly at risk encompass those involving outdoor labor, such as agriculture and construction, as well as indoor roles in poorly regulated or heat-generating environments. The ILO underscores that existing occupational safety and health (OSH) protections are struggling to adapt to these evolving risks. The organization calls for urgent action, advocating for stronger national policies, improved legislation, increased funding for safety agencies, and enhanced workplace preventive measures, emphasizing that a safe and healthy working environment is a fundamental human right. This comprehensive assessment serves as a crucial resource for understanding global climate hazards, their health implications for workers, and necessary policy responses.

Integrated Climate Adaptation and Resiliency Program [ICARP]. (2023). *Extreme heat and community resilience program: Summary of public comments*. California Governor's Office of Planning and Research. https://lci.ca.gov/climate/icarp/grants/docs/20230919-EHCRP_R1_Engagement_Summary.pdf

This report from the California Governor's Office of Planning and Research summarizes public comments and feedback gathered during workshops and listening sessions for the Extreme Heat and Community Resilience Program (EHCRP). The program is a statewide grant initiative designed to support under-resourced communities in preparing for and responding to extreme heat. The report outlines the program's background and its goals to invest in community-led projects that build resilience to heat, with a focus on equity and collaboration. It serves as a crucial document for understanding how the state is attempting to engage with communities to develop climate adaptation strategies. This initial engagement process is intended to help ICARP incorporate a variety of perspectives into the program's draft guidelines.

The Inland Deserts Listening Session (pages 25-26) highlighted several key findings and concerns directly relevant to the Inland Empire. Participants in this session emphasized the urgent need for funding to support community outreach and education, particularly for

vulnerable populations and essential workers. There was a strong call for grant programs that are easier for small community-based organizations to access. Specific feedback from the session pointed to a desire for program features that would directly address common barriers, such as providing advance pay for projects, simplifying reporting requirements, and funding staff time for grant writing and administration. These points underscore the importance of not just having a grant program, but designing it in a way that truly empowers the communities it seeks to serve.

Jiao, A., Vargas, A. L., Gluhova, Y. D., Headon, K., Rangel, L., Abdallah, S., Ramsey, E. C., Truong, K., Chal, A. M., Hopfer, S., & Wu, J. (2025). Wildfire risk perception and communication in disadvantaged communities: Insights from Eastern Coachella Valley in Southern California. International Journal of Disaster Risk Reduction, 117, 1-13. https://doi.org/10.1016/j.ijdrr.2025.105186.

As a result of the increasing number of wildfires in California, threats to the safety of individuals and their communities have significantly increased. Disadvantaged communities, mostly those with low socioeconomic status, are disproportionately affected by wildfires. These communities are more vulnerable due to several determinants such as, language and education barriers, housing and transportation challenges, and demographic factors, thereby leading to higher sensitivity and limited adaptive capacity. Underserved and disadvantaged communities usually face language barriers, have limited access to information resources, and experience historical marginalization in disaster planning processes. These factors might introduce misinformation and biases into estimates of wildfire risks, potentially leading to inadequate risk perception and increased social vulnerability. Thus, the authors developed an in-person survey of several unincorporated communities in the Eastern Coachella Valley to gather information on community preparedness for wildfires.

The authors found that higher safety awareness, more participation in community or social groups, and poorer health were associated with increased wildfire risk perception. Short messages were the most preferred for wildfire alerts, and television was the most favored information channel. Social media was the most preferred channel among young adults. Elderly individuals and those lacking a high school education were more likely to seek information from doctors than other groups. Agricultural workers relied more on mobile phone texts and personal observations than those in other occupations. This study highlights significant gaps in preparedness and the inadequacies of current wildfire risk communication in these

disadvantaged communities, underscoring the importance of leveraging social interactions to enhance wildfire risk awareness and implementing tailored communication strategies that effectively reach targeted populations.

Kiefer, M., Rodríguez-Guzmán, J., Watson, J., Berna, Mergler, D., & Soares, A. (2016). Worker health and safety and climate change in the Americas: issues and research needs. *Revista Panamericana de Salud Publica, 40*(3), 192-197. https://pmc.ncbi.nlm.nih.gov/articles/PMC5176103/

This article examines the profound implications of climate change, particularly heat stress, on the occupational health and safety of workers across the Americas. It posits that workers are uniquely vulnerable to climate change impacts, often serving as early indicators of broader public health challenges. The article elucidates how escalating global temperatures intensify existing thermal burdens in both indoor and outdoor work environments, culminating in occupational heat stress.

This stress manifests in a spectrum of adverse health outcomes, including severe heat-related illnesses such as heat stroke and heat exhaustion. Beyond these direct ailments, heat exposure can lead to decreased chemical tolerance, heightened fatigue, impaired cognitive function, and an elevated risk of workplace injuries. The publication emphasizes the heightened vulnerability of outdoor workers engaged in physically demanding tasks. It also underscores the significant impact on indoor workers within inadequately ventilated spaces or environments characterized by heat-generating industrial processes. A notable concern raised is the paucity of robust regulatory standards designed to shield workers from climate change-induced hazards. To mitigate these risks, the article advocates for the development of effective control and adaptation strategies, continuous vigilance for unforeseen hazards, the establishment of novel work practices, and the exploration of alternative chemicals and materials. This scholarly contribution is highly relevant for understanding climate hazards, key health concerns, and at-risk occupations in regions experiencing significant heat.

***La, L.* (2024, April 19). *California workers to get indoor heat protections*. CalMatters. https://calmatters.org/newsletter/california-workers-indoor-heat-rules/**

California has recently implemented the "Heat Illness Prevention in Indoor Places of Employment" standard, effective July 23, 2024, addressing a critical gap in worker safety as climate change intensifies indoor temperatures. This regulation, enacted by the Occupational

Safety and Health Standards Board (Cal/OSHA), applies to most indoor workplaces when temperatures reach 82°F, or 87°F in general scenarios, with lower thresholds for workers wearing restrictive clothing or in high radiant heat areas. The standard mandates that employers establish a written Indoor Heat Illness Prevention Plan, which must include provisions for providing access to cool, potable drinking water, designated cool-down areas maintained below 82°F, and encouraging preventative cool-down rest periods.

The regulation further requires comprehensive training for both supervisory and non-supervisory employees on heat illness risks, prevention procedures, and emergency response protocols. Employers must implement acclimatization procedures for new workers or those exposed to high heat, and ensure close observation during heat waves. Research, such as a UCLA study led by R. Jisung Park, indicates that high temperatures significantly elevate the risk of workplace injuries, both outdoors and indoors. Researchers find that seemingly unrelated incidents like falls and machinery accidents increase on hotter days. This finding highlights that heat-related health concerns extend beyond direct heat illness to broader safety impacts. The new standard aims to mitigate these risks by outlining control measures, including engineering and administrative controls, and the provision of personal heat-protective equipment when other measures are insufficient. This regulatory development is highly relevant for understanding the evolving landscape of climate health concerns affecting workers in regions like the Inland Empire, providing a framework for protecting vulnerable occupations from the growing threat of indoor heat.

Marlier, M. E., Brenner, K. I., Liu, J. C., Mickley, L. J., Raby, S., James, E., Ahmadov, R., & Riden, H. (2022). Exposure of agricultural workers in California to wildfire smoke under past and future climate conditions. *Environmental Research Letters, 17*(9), 094045. https://doi.org/10.1088/1748-9326/ac8c58.

Wildfire emissions contribute to degraded air quality that is dangerous for public health. Global fire emissions have been linked to hundreds of thousands of deaths per year due to elevated smoke and fine particulate matter (PM2.5) concentrations. Agriculture is an important part of California's economy and employs more than 400 000 people per year (possibly more due to undercounting of seasonal, part-time, and/or undocumented workers), according to the California Employment Development Department (EDD). California's Central Valley, one of the primary agricultural producing regions of the state, has some of the worst air quality in the country, which can be further degraded by regional fire activity. In addition, many farmworkers

have underlying health risks, low socioeconomic status, and reduced health care access that increases their vulnerability to wildfire smoke exposure. Due to the outdoor and physically demanding nature of their work, agricultural workers are particularly vulnerable to wildfire smoke pollution. This study quantifies the potential exposure of agricultural workers in California to past (2004–2009) and future (2046–2051) fine particulate matter (PM2.5) concentrations from smoke. While absolute increases in smoke PM2.5 exposure are largest in northern California, agricultural regions in the Central Valley and Central Coast may be highly vulnerable to future increases in smoke PM2.5 concentrations. The authors found an increase from 6 to 8 million worker smoke exposure days (+35%) of 'smokewave' exposure for agricultural workers across the state under future climate conditions, with the largest increases in Tulare, Monterey, and Fresno counties. Under future climate conditions, 1.9 million workers will be subjected to smoke exposure days, withlevels of total PM2.5 pollution, deemed 'unhealthy for sensitive groups.' This is a 190% increase over past climate conditions. Wildfire smoke PM2.5 contributes, on average, to more than 90% of these daily PM2.5 exceedances compared with non-fire sources of air pollution. Using the recent extreme wildfire season of 2020 as a case study, the Marlier et.al show that existing monitoring networks do not provide adequate sampling of PM2.5 in many future at-risk wildfire regions with large numbers of agricultural workers. Policies will need to consider the changing patterns of smoke PM2.5 exposure under future climate conditions to better protect outdoor agricultural workers.

Masson, S., & van der Wiel, K. (2023). Hot weather and mental health: an interdisciplinary literature review. *Climatic Change*, *176*(12), 173. https://doi.org/10.1007/s10584-023-03657-3

The interdisciplinary literature review by Masson and van der Wiel provides a comprehensive synthesis of the growing evidence linking hot weather, including extreme heat, to a range of adverse mental health outcomes. This publication is highly relevant for understanding the psychological effects of extreme heat on workers, as it details how direct physiological impacts on the brain (e.g., from dehydration and electrolyte imbalance) and indirect effects such as sleep disruption, discomfort, and general stress can exacerbate existing mental health conditions like anxiety and depression, increase irritability, and impair cognitive function. The review highlights that these impacts can lead to reduced concentration, increased errors, and a higher risk of workplace accidents, extending beyond direct physical heat illnesses.

For workers, particularly those in physically demanding roles or environments without adequate cooling in regions like the Inland Empire, this source underscores the significant mental health burdens imposed by extreme heat. A holistic approach to worker protection should consider their psychological well-being alongside physical safety. The article's interdisciplinary approach strengthens its credibility, drawing from various fields to build a robust case for heat's profound influence on mental health.

Milken Institute School of Public Health. (2017, January 9). *Hazard Zone: The Impact of Climate Change on Occupational Health*. The George Washington University. https://onlinepublichealth.gwu.edu/resources/impact-of-climate-change-on-occupational-health/

This article provides a comprehensive overview of how global climate change profoundly affects worker health and safety. It highlights that climate change not only exacerbates pre-existing occupational health issues but also introduces entirely new threats. The publication identifies several critical climate-related hazards impacting workers, including heightened exposure to extreme heat, ground-level ozone, various pathogens, infectious diseases, polycyclic aromatic hydrocarbons (PAHs), and the direct and indirect effects of wildfires. It also surprisingly notes a potential link between climate change and increased workplace violence, expanding the scope of climate hazards.

The article details a wide array of adverse health outcomes for workers, such as severe heat-related illnesses (including heat stroke and heat exhaustion), cardiopulmonary and respiratory dysfunctions, diminished lung capacity, allergies, asthma, cancer, ischemic heart disease, and traumatic injuries from extreme weather events. It extensively identifies occupations most at risk, encompassing outdoor laborers in agriculture, construction, transportation, and firefighting, as well as those in hot indoor environments like steel mills, manufacturing facilities, and warehouses—many of which are prominent in regions like the Inland Empire. The resource is highly relevant for understanding the breadth of climate hazards, the anticipated health risks for workers, and the specific occupations vulnerable to these escalating environmental challenges.

National Institute for Occupational Safety and Health (NIOSH). (2024). *Outdoor Workers: Working Safely Outdoors*. Centers for Disease Control and Prevention. https://www.cdc.gov/niosh/outdoor-workers/about/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fniosh%2Fclimate%2Fabout%2Findex.html

This resource from the National Institute for Occupational Safety and Health (NIOSH) outlines the diverse hazards faced by outdoor workers, emphasizing that risks vary significantly by work type, geography, and season. It categorizes these threats into physical hazards, including extreme heat, extreme cold, sun exposure, and wildland fire smoke, and biological hazards such as vector-borne diseases, venomous wildlife, and poisonous plants. The document highlights that outdoor workers are particularly susceptible to climate-related health risks like heat stroke or exhaustion from extreme temperatures, skin cancer from prolonged sun exposure, and respiratory issues from wildfire smoke. It also notes that these environmental hazards disproportionately impact occupational health equity, with migrant, immigrant, and low-resource workers often at higher risk due to factors like lack of safety training, poverty, and language barriers.

The NIOSH guidance is highly relevant for understanding the key climate health concerns affecting workers and identifying which occupations are most at risk, particularly in a region like the Inland Empire that experiences intense heat and wildfires. It details anticipated health risks beyond direct heat illness, such as hearing loss from noise, traumatic injuries, and exposure to chemicals. While not explicitly listing common signs of heat-related illnesses, it broadly covers various health outcomes. The document implicitly identifies occupations with significant outdoor exposure as high-risk and underscores the crucial role of employers in providing comprehensive training on hazard identification and prevention to safeguard the health and safety of their outdoor workforce.

Ndugga, N., Pillai, D., & Artiga, S. (2023, June 26). *Climate-related health risks among workers: Who is at increased risk?* Kaiser Family Foundation. https://www.kff.org/racial-equity-and-health-policy/issue-brief/climate-related-health-risks-among-workers-who-is-at-increased-risk

This KFF issue brief examines the escalating climate-related health risks for workers in the United States, pinpointing the demographic groups most vulnerable to these hazards. It highlights that over 65 million nonelderly adult workers, representing more than 40% of the U.S. workforce, are employed in occupations with heightened exposure to climate impacts such as

extreme heat, poor air quality, and severe weather events. The analysis reveals significant disparities, with a disproportionate number of people of color, noncitizen immigrants, and individuals with lower educational attainment and income levels concentrated in these high-risk jobs. For instance, more than half of Hispanic, Black, and Native Hawaiian or Pacific Islander workers are in such occupations, compared to a considerably lower percentage of White workers, underscoring existing social and economic inequities and directly identifying populations and occupations most at risk.

The publication underscores that these job-related risks compound pre-existing challenges faced by historically marginalized groups, often exacerbated by lower rates of employer-sponsored health coverage. It delves into the specific climate health concerns, including direct heat exposure, poor air quality from wildfires, and exposure to infectious diseases, outlining the anticipated health risks such as respiratory and cardiovascular issues. The brief strongly advocates for policy interventions that address underlying social and economic inequities and implement effective mitigation strategies to safeguard workers from the increasing threats of climate change. Its comprehensive focus on health disparities, occupational vulnerability, and the specific types of climate hazards provides crucial insights for a policy brief aimed at comprehensive worker protection in regions like the Inland Empire.

Occupational Safety and Health Administration. (n.d.). *Heat-related illnesses and first aid.* U.S. Department of Labor.
https://www.osha.gov/heat-exposure/illness-first-aid

The Occupational Safety and Health Administration (OSHA) provides guidance on heat-related illnesses and necessary first aid measures, which is highly relevant to understanding key climate health concerns affecting workers. This resource outlines various heat-related conditions, including heat stroke, heat exhaustion, heat cramps, heat syncope, heat rash, and rhabdomyolysis. It details their respective common signs and symptoms, emphasizing that while specific diagnoses are less critical in emergency response, recognizing these indicators is vital for prompt intervention and preventing escalation to life-threatening conditions.

The document also provides clear, actionable first aid steps essential for protecting workers, particularly those in high-risk occupations in the Inland Empire. These measures include moving affected individuals to cooler areas, immediate and aggressive cooling

techniques (such as cold water immersion or applying ice packs), remaining with the worker, and promptly calling 911 in serious cases. The OSHA guidance underscores the importance of taking all symptoms seriously, especially for new workers in warm environments. This information is critical for educating policymakers and employers on practical safety protocols and emergency responses to heat exposure, aligning directly with the research question on common signs of heat-related health illnesses affecting workers.

Occupational Safety and Health Administration & National Institute for Occupational Safety and Health. (2011, May). *Protecting workers from heat illness* (No. 2011-174) [Infosheet]. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. https://www.cdc.gov/niosh/docs/2011-174/pdfs/2011-174.pdf?id=10.26616/NIOSHPUB2011174

This informational sheet is a crucial guide detailing the risks and prevention strategies for heat-related illnesses in occupational settings. It explicitly states that when the human body fails to maintain a normal temperature in hot environments, severe health problems, including fatalities, can occur. The infosheet identifies numerous factors that heighten a worker's risk, such as high temperature and humidity, direct sun exposure, lack of air movement, physical exertion, heavy protective clothing, poor physical condition, certain medications, pregnancy, and lack of acclimatization. These factors highlight the multi-faceted challenges faced by workers in hot climates, directly addressing the key climate health concerns and anticipated health risks for workers, particularly in regions like the Inland Empire.

The document systematically outlines the common signs and symptoms of various heat-related health illnesses, including heat stroke (confusion, loss of consciousness, seizures, very high body temperature, hot/dry skin or profuse sweating), heat exhaustion (headache, nausea, dizziness, heavy sweating, elevated body temperature), heat cramps (muscle pains), and heat rash (red clusters of pimples). For each condition, it provides essential first aid measures and emphasizes the immediate need for emergency medical help in severe cases like heat stroke. Furthermore, the infosheet offers comprehensive prevention recommendations for both indoor and outdoor work environments, such as worker training, providing ample cool water, scheduling rest periods, and adjusting workloads. This resource is invaluable for those seeking to understand heat hazards, their specific health impacts, and practical preventative measures for at-risk occupations.

Pacific Institute, Cooley, H., Moore, E., Heberger, M., & Allen, L. (2012). Social Vulnerability to Climate Change in California. A White Paper from the California Energy Commission's California Climate Change Center.
https://escholarship.org/uc/item/0696v9nb

The State of California faces a range of impacts from global climate change, including increases in extreme heat, wildfires, coastal flooding, and erosion. Changes are also likely to occur in air quality, water availability, and the spread of infectious diseases. To date, a great deal of research has been done to forecast the physical effects of climate change, while less attention has been given to the factors that make different populations more or less vulnerable to harm from such changes. While disaster events may not discriminate, impacts on human populations are shaped by intervening conditions that determine the human impact of the event and the specific needs for preparedness, response, and recovery. In this study, the authors analyzed the potential impacts of climate change by using recent downscaled climate model outputs to create a variety of statistics and visualizations that show their distribution across the state. To understand how the population exposed to these impacts will be affected, social vulnerability – defined as the susceptibility of a given population to harm from exposure to a hazard, directly affecting its ability to prepare for, respond to, and recover, must be evaluated. The researchers developed a new climate vulnerability index to indicate the social vulnerability of a region's population to climate-related harm. The index combines 19 indicators into one overall climate vulnerability score and includes factors specifically related to climate impacts, such as air conditioner ownership, childhood obesity, percentage of tree cover, pre-term births, workers in outdoor occupations, and others. The authors present a series of maps showing where social vulnerability to climate change is greatest, and where it intersects with the most severe projected climate change impacts. The most significant risk from climate change occurs where there are large groups of people exposed to a climate-related hazard and where there is high social vulnerability. The authors find that crop workers are particularly vulnerable to heat related death due to their high exposure rates; between 1992 and 2006, crop workers died from heat stroke at a rate nearly 20 times greater than the general population and 40 percent of these workers that died were identified as Mexican or Central American. In addition to their long work days in the sun, these workers are excluded from some labor and occupational health legal protections, which makes them particularly vulnerable. Similarly, about 12.4 million Californians live in census tracts with high social vulnerability to climate impacts. A disproportionate number of those with high vulnerability are located in Los Angeles County.

Approximately 27 percent of the state's population lives in Los Angeles County. Yet, more than 40 percent of those in census tracts with high social vulnerability, or about 5 million people, are located in Los Angeles County. There are also large numbers of people in high vulnerability areas in Orange, Riverside, and San Diego Counties. Understanding vulnerability factors and the populations that exhibit these factors are critical for crafting effective climate change policies and response strategies. They are also important to the emerging study of climate justice, which is the concept that no group of people should disproportionately bear the burden of climate impacts or the costs of mitigation and adaptation.

Parajuli, S. P., Biggs, T., de Sales, F., Zavala Perez, M. A., He, C., Jones, C., Thompson, C., Galvez, N. L., Ciborowski, H., Quintino, T., Di Napoli, C., Montazar, A., Yazdi, T. H., & Soucier, M. (2024). Impact of irrigation on farmworkers' heat stress in California differs by season and during the day and night. *Communications Earth & Environment*, 5(1), 787. https://doi.org/10.1038/s43247-024-01959-7

Farmworkers, the frontline workers of our food system, are often exposed to heat stress that is likely to increase in frequency and severity due to climate change. Irrigation can either alleviate or exacerbate heat stress, quantification of which is crucial in intensely irrigated agricultural lands such as the Imperial Valley in southern California. We investigate the impact of irrigation on wet bulb globe temperature (WBGT), a key indicator of heat exposure in humans, using a validated high-resolution Weather Research and Forecasting (WRF) regional climate model, during day and night and in different seasons. The authorsfind that irrigation reduces WBGT during the daytime in summer due to strong evaporative cooling. However, during the summer nights, irrigation increases WBGT, when a large increase in humidity sufficiently raises the wet-bulb temperature. Urban and fallow areas adjacent to cropped fields also experience increased heat stress due to moisture advection from irrigated areas. The researchers presented a robust high-resolution regional climate model (WRF) for irrigated agriculture and urban areas, with a case study in the Imperial Valley, and used the high-resolution output fields from WRF to calculate heat stress (WBGT) using the thermofeel Python library. Although there are a few localized studies conducted in the Central Valley and Imperial Valley to assess heat stress, this study is the first that deploys a regional climate model to calculate WBGT at a crop-field scale in the entire Imperial Valley. The authors also examined the impact of irrigation on heat stress in detail, in urban and cropped areas, and in daytime and nighttime. The researchers' results can inform heat-related policies in agricultural regions of California and elsewhere.

Petek, G. (2022, April 5). *Climate Change Impacts Across California - Workers and Employers*. California Legislative Analyst's Office. https://lao.ca.gov/Publications/Report/4587

This publication offers a comprehensive analysis of how climate change affects the California's workforce. It highlights several critical climate hazards, including extreme heat, droughts, and severe wildfires, detailing their increasing prevalence and intensity. The report establishes a direct correlation between these environmental changes and elevated occupational risks, such as increased injuries, illnesses, and fatalities among laborers, particularly those in outdoor professions or environments with inadequate climate control.

The LAO's analysis identifies key climate-related health concerns impacting workers. High temperatures are directly linked to heat stress, potentially resulting in severe injuries or death. Wildfire smoke is noted for causing respiratory and cardiovascular problems, and for possibly increasing susceptibility to infectious diseases. Additionally, drought conditions are associated with heightened exposure to occupational hazards such as Valley Fever. The publication underscores that low- and middle-wage workers are disproportionately vulnerable due to their significant representation in heavily impacted sectors such as agriculture, forestry, construction, landscaping, hospitality, services, and recreation. These outdoor-centric occupations often feature lower median hourly wages, and Latino workers are identified as overrepresented in these high-risk industries. This LAO report is highly relevant for understanding the multifaceted challenges posed by climate change to California's workforce, providing a credible foundation for policy discussions on worker protection and public health in regions facing similar climate vulnerabilities, such as the Inland Empire.

Reindel, R. L., Shrestha, A., Arberry, C., & AFL-CIO Safety and Health Department. (2025, April 23). *Death on the job: The toll of neglect, 2025*. American Federation of Labor and Congress of Industrial Organizations (AFL-CIO). https://aflcio.org/reports/dotj-2025

This report provides an extensive assessment of occupational safety and health in the United States, representing the 34th iteration of this comprehensive annual report. While acknowledging historical advancements since the Occupational Safety and Health Act (OSH Act) of 1970, the document emphasizes the persistent and significant risks faced by American workers. It cites alarming statistics for 2023, including approximately 140,000 workplace

fatalities, comprising 5,283 from traumatic injuries and an estimated 135,000 from occupational diseases, arguing these figures represent a severe undercount.

A critical finding for understanding climate-related hazards is the documented increase in heat-related worker deaths, with at least 55 fatalities attributed to heat on the job in 2023, marking a 28% rise from the previous year. This statistic directly highlights extreme heat as a growing and deadly climate hazard impacting the workforce, relevant to regions like the Inland Empire. The publication identifies industries with the highest fatality rates, including agriculture, forestry, fishing and hunting, mining, and construction, many of which involve significant outdoor exposure. It also notes the disproportionately high fatality rates among Black and Latino workers, as well as older workers and minors. The AFL-CIO advocates for enhanced enforcement of safety regulations, increased funding for job safety agencies, and the implementation of new legislative measures to adequately protect workers from escalating environmental and occupational hazards, including heat. This report is highly credible and valuable for a policy brief focusing on climate health concerns, at-risk occupations, and the imperative for robust worker protections.

Riley, K., Delp, L., Cornelio, D., & Jacobs, S. (2012). From agricultural fields to urban asphalt: The role of worker education to promote California's Heat Illness prevention standard. *New Solutions: A Journal of Environmental and Occupational Health Policy*, 22(3), 297–323. https://doi.org/10.2190/NS.22.3.e

This article describes an innovative approach to reach and educate workers and worker advocates about California's outdoor heat illness prevention standard. In 2010, Cal/OSHA initiated a statewide education campaign to reduce heat-related illnesses and fatalities and increase awareness of the standard's requirements. In Southern California, the UCLA Labor Occupational Safety and Health Program (LOSH) focused on three principal strategies of community-based outreach, popular education, and organizational capacity building. Central to the LOSH approach was the integration of health "promotores" into core program planning and training activities and the expansion of campaign activities to a wide variety of rural and urban workers throughout the Los Angeles metropolitan area, made up of the counties of Los Angeles, Orange, Riverside, San Bernardino, and Ventura. Riley et al. describe each of these strategies and analyze the possibilities and constraints of worker education to support implementation of this standard, particularly given the vulnerabilities of the impacted workforce,

the often precarious nature of employment arrangements for these workers, and the resource limitations of Cal/OSHA.

Schlegel, M., & Seid, M. (2022). The mental health consequences of climate change for vulnerable populations in the United States. *Current Opinion in Environmental Science & Health*, *28*, 100373. https://doi.org/10.1016/j.coesh.2022.100373

Schlegel and Seid's review specifically examines the diverse mental health consequences of climate change for vulnerable populations in the United States, making it directly applicable to understanding the psychological effects of extreme heat on workers in regions like the Inland Empire. The authors explain that high temperatures can contribute to increased stress, anxiety, depression, and post-traumatic stress disorder (PTSD), and can intensify symptoms in individuals with pre-existing mental health conditions. For workers experiencing prolonged heat exposure or facing job insecurity due to climate-related disruptions, the cumulative psychological toll can be substantial, affecting decision-making, mood, and overall well-being.

The review particularly highlights that frontline workers (e.g., in agriculture, construction, and emergency services) are susceptible to both the physical and mental health impacts of working under increasingly hazardous climate conditions. This source is valuable for emphasizing the intersection of climate change, occupational vulnerability, and mental health, providing a critical perspective for policy development aimed at comprehensive worker protection that acknowledges the full spectrum of heat's impacts, including the less visible but equally significant psychological burdens.

U.S. Environmental Protection Agency [EPA]. (2016). *Climate Change and the Health of Occupational Groups*. https://www.epa.gov/sites/default/files/2016-06/documents/occupational-health-climate-change.pdf

This EPA resource provides an overview of how climate change profoundly impacts the health and safety of various occupational groups, emphasizing that certain workers are exceptionally vulnerable due to their work environment and duties. It identifies key climate hazards, including increases in temperature and extreme heat, poor air quality stemming from wildfire smoke, ground-level ozone, and dust from droughts, as well as extreme weather events like floods and storms, and an increase in disease-carrying pests. The report highlights that

these environmental shifts exacerbate existing occupational risks and introduce new health threats, disproportionately affecting outdoor workers and those in indoor settings that are inadequately cooled.

The EPA details a range of anticipated health risks and key climate health concerns for workers, such as heat-related illnesses (e.g., heat stroke, heat exhaustion, fatigue), respiratory illnesses (e.g., asthma, lung inflammation, decreased lung function from air pollutants), skin cancer from sun exposure, and vector-borne diseases like West Nile virus and Lyme disease. It explicitly identifies occupations most at risk, including agricultural workers, construction workers, emergency responders, and transportation workers, who face direct outdoor exposure. Furthermore, it includes indoor workers in high-heat environments like manufacturing facilities and warehouses, making it highly relevant for understanding the multifaceted challenges faced by workers in regions susceptible to these hazards, such as the Inland Empire.

U.S. Global Change Research Program. (2018). *Impacts, risks, and adaptation in the United States: Fourth National Climate Assessment, Volume II* (D. R. Reidmiller, C. W. Avery, D. R. Easterling, K. E. Kunkel, K. L. M. Lewis, T. K. Maycock, & B. C. Stewart, Eds.). U.S. Global Change Research Program. https://repository.library.noaa.gov/view/noaa/19487

This document offers a comprehensive analysis of how various climate hazards, including those exacerbated by extreme heat like wildfire, drought, and flooding, impact human health, with direct implications for workers. This source is valuable for understanding how these secondary climate impacts affect the workforce beyond direct heat exposure. For example, it details how wildfires lead to significant respiratory and cardiovascular issues due to smoke inhalation, impacting outdoor workers and those in areas affected by smoke plumes.

Furthermore, the report highlights that droughts are linked to increased dust and airborne particulate matter, exacerbating respiratory conditions and increasing exposure to pathogens like those causing Valley Fever, which disproportionately affects agricultural and construction workers in regions like the Inland Empire. While less direct for workers, the report also addresses the mental health impacts of climate events, including stress and anxiety from flooding and displacement. This NCA chapter provides a robust, recent, and geographically relevant (US-focused) overview of the complex ways in which cascading climate impacts,

driven by extreme heat, create a myriad of health and safety challenges for various occupations.

Warehouse Workers United and Cornelio, D. (2011). *Shattered Dreams and Broken Bodies: A Brief Review of the Inland Empire Warehouse Industry.* https://warehouseworkers.org/wp-content/uploads/2014/06/Shattered_Dreams_and_Broken_Bodies718.pdf

This report examines the health and safety conditions of Inland Empire warehouse workers, shedding light on what takes place within the region's goods movement industry and the human costs of delivering goods to our stores and homes. More importantly, the researchers discuss ways that industry leaders and regulators can deliver on the promise of good blue-collar jobs by better protecting a workforce that is often overburdened. The report discusses various occupational hazards, including workplace exposure to extreme heat.

Of the 101 current or former warehouse workers surveyed, sixty-three told the researchers that they had been injured on the job, eighty-three had suffered from a job-related illness, and eighty-four witnessed an injury to a fellow co-worker. These initial results confirm that Inland Empire warehouse workers often work in dangerous conditions. Within this report, the authors identified that some of the most prevalent workplace hazards faced by warehouse workers include: chemicals and air pollutants, injuries caused by poor management of ergonomics (such as repetitive stress, straining, lifting, pulling, falling, and other impacts), dangerous machinery, extreme outdoor temperatures and a lack of provided water. Many of these hazards cause injuries due to several key factors such as: lack of training or precautionary measures, extreme time constraints, intimidation in regards to reporting accidents, and a lack of existing enforcement for existing safety laws.

Authors collected individual data through 101 interviews with warehouse workers from Riverside and San Bernardino counties. Interviews were conducted by a team of twenty current and former warehouse workers who received forty-two hours of health and safety training from the UCLA Labor and Occupational Safety and Health program (UCLA LOSH). Together, UCLA LOSH and the team developed a 52-question needs assessment tool that was then used with warehouse workers identified through cluster and snowball (referral) sampling from specific warehouse districts across the region. The survey included questions aimed at determining the state of working conditions, the frequency and nature of injuries, and the level of training and

safety precautions in major warehouses from across the Inland Empire. The research was carried out in collaboration with Warehouse Workers United (WWU), a labor advocacy organization that seeks to improve working conditions for warehouse workers in the area. In July 2010, five warehouse workers spoke before a Community Accountability Commission and recounted how they struggled to overcome workplace-related health and safety issues. The Commission made a recommendation to collect further information about the conditions in the warehouse industry and this preliminary report is a product of that decision.

Western Riverside Council of Governments [WRCOG]. (2019). *San Bernardino County Resilience Strategy*.
https://www.wrcog.us/DocumentCenter/View/7660/San-Bernardino-County-Resilience-Strategy2019_FINAL

This report outlines the region's efforts to address and adapt to the escalating impacts of climate change, serving as a critical resource for understanding climate hazards in the Inland Empire. Building upon a previous Vulnerability Assessment, the strategy identifies a comprehensive range of key climate hazards affecting San Bernardino County, including extreme heat, wildfires, flooding, drought, air quality and public health concerns, severe weather and wind events, and mudslides/landslides. The document acknowledges that these hazards are expected to intensify in frequency and intensity, posing significant threats to life, property, and natural resources, particularly within disadvantaged communities. It serves as a foundational text for local jurisdictions to incorporate climate change considerations into their general plans and hazard mitigation efforts.

The strategy also touches upon the potential impacts of these climate hazards on vulnerable sectors, including transportation infrastructure and, implicitly, the workers who maintain and operate it. For instance, wildfires are noted for their potential to damage critical power infrastructure and disrupt transportation routes, affecting daily operations and necessitating adaptation measures such as shifting outdoor physical work hours during extreme heat days. While the document's primary focus is on broader resilience and adaptation, its identification of specific climate threats directly informs an understanding of the anticipated health risks for workers in at-risk occupations in the Inland Empire. The strategy underscores the importance of proactive planning to reduce vulnerability and enhance the region's capacity to withstand climate-related challenges.

Varela, N. V., Shiran, M., and Cohen, N. L. (January 2024). *The Promise Of Gender Inclusive Climate Action: An introduction to the gendered impacts of climate change and recommendations for action in California*. Gender Equity Policy Institute. http://www.jstor.org/stable/resrep57242

The Promise of Gender Inclusive Climate Action is intended as an introduction to the current global research and frameworks on climate and gender. It features original demographic analysis, showing how the geographic distribution of women across California's climate regions could affect their exposure to climate change impacts. The authors review the extensive academic and institutional research on the gendered dimensions of climate change on women and provide examples of model policies and planning frameworks to integrate gender considerations within climate action. The report concludes with recommendations on ways to advance gender equity in climate action in the California context. While California is the focus herein, many of the authors' methods, findings, and recommendations are applicable to climate research and policymaking elsewhere in the United States. Climate change exacerbates all forms of inequality, and inequality between men and women remains one of the fundamental social divides globally, in the U.S., and in California. Two principal dynamics are at the root of women's greater exposure, sensitivity, and vulnerability to climate change, no matter where they live: 1) economic inequality and 2) women's disproportionate responsibility for caregiving and domestic labor. First, on average, women earn lower wages, possess less wealth and savings, and are employed in lower paying occupations than men. Women are more likely than men to be poor. They are underrepresented in high-paid management and leadership roles and have less access to capital for business formation. The jobs most likely to be created by public investment to advance the transition to clean energy and a green economy-such as in infrastructure, construction, energy and water systems, and public safety-are ones in which women are grossly underrepresented. For example, only 32% of renewable energy jobs in the U.S. are held by women.

Second, women do a disproportionate share of caregiving and domestic work in the home. And, as importantly, women make up the overwhelming majority of paid caregivers and domestic workers. The gender gap in care, also known as the care burden, often reinforces women's economic disadvantages; taking care of children, older parents, or ill or disabled relatives leaves women with less time for paid work. The COVID-19 pandemic, which saw a

plunge in women's labor force participation, illustrated that when emergencies strike, women are the ones most likely to forego paid work to handle the increased burden of care.

In sum, gendered economic inequality and caregiving disparities amplify women's sensitivity and vulnerability to the impacts of climate change and reduce their adaptive capacity. Racial and gender inequality intersect, resulting in greater vulnerability for women of color. Women make up a sizable majority of the elderly, the population most sensitive to climate impacts. Women are more likely to struggle economically to pay energy bills and more likely to live in homes with poor energy efficiency. Women and girls are particularly vulnerable to gender-based violence during climate-driven disasters like wildfires and floods. Numerous studies have documented worse maternal and neonatal health outcomes associated with climate-driven droughts, heat waves, floods, and vector-borne disease. Crucially, women are less likely to be included in the benefits of climate action, whether through investments or job creation.

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