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Letting Cooler Heads Prevail: The Necessity of Occupational Regulation of Heat and Smoke Exposure

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Heat and air pollution are inextricably linked. Since 1880, global temperatures have increased by 1.60°C, with several of the warmest years on record occurring in the past decade (1). Burning of fossil fuels is accelerating climate change, resulting in wildfire seasons that last longer, burn more intensely, and impact wider areas. In the past 20 years, we have witnessed a more than doubling in the frequency of extreme wildfire events, releasing a toxic mix of particulate matter and hazardous air pollutants. Short-term wildfire smoke exposure has been linked to an increased risk of both all-cause mortality and respiratory and cardiovascular morbidity and hospitalizations, particularly in susceptible and vulnerable populations (2). The impact of heat and air pollution exposure in combination is synergistic, where together these exposures have been shown to worsen cardiovascular and respiratory mortality (3).

Climate change reflects one of the greatest threats to public health, with consequences especially dire for outdoor workers. Extreme heat is already a major driver of workplace mortality and morbidity. Although the Bureau of Labor Statistics estimates that roughly 33 workers die of occupational heat exposure each year, this number is likely to be a significant underestimate (4). Heat-related deaths are poorly recognized and variably documented because of a combination of factors, including a lack of central public health surveillance, limited recognition of the scale of potential effects of heat on health by healthcare professionals, and the significant barriers to accessing workplace protections, including health hazard reporting, faced by the most marginalized worker groups. Marginalized individuals are also disproportionately at risk for the most severe consequences of heat exposure and bear the highest occupational heat-related death and illness burden. Within the construction industry, the risk of heat-related death is significantly higher for non-White workers (5). In studies of seasonal farmworkers, more than one-third of workers surveyed report symptoms of heat-related illness (6). Where marginalized workers are actively threatened by deportation and may fear advocating for safe working conditions or accessing health care, rates of heat-related death and illness are likely to continue to rise.

Although research into the synergistic effects of heat and air pollution on worker health remains limited, there is clear evidence that in firefighters, long-term occupational exposure to wildfire smoke has been associated with an increased risk of lung cancer, cardiovascular disease, and lung function decline (7). The true risk to health is likely greater because few studies have accounted for wildfires burning entire communities, with houses, buildings, and cars introducing their own hazardous smoke and ash, as was seen recently in the Maui and Los Angeles wildfires (8).

Despite the long-standing recognized threat to workforce health, efforts to protect workers from wildfire smoke and extreme heat in the United States are in their infancy. Although several states have adopted standards to protect workers from these combined hazards, most outdoor workers in the United States remain unprotected. In the past 4 years, there has been a substantial push to bridge this gap and

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develop standards to protect worker health. In 2024, the Occupational Safety and Health Administration (OSHA) was working to develop a final rule to protect workers from heat injury and illness. At the same time, the National Institute for Occupational Safety and Health (NIOSH) published an extensive hazard report highlighting the potential impact of wildfire smoke on worker health, together with potential approaches to protect the workforce (9). This work is the result of thousands of hours of data collection, examination, and consensus building to support the foundation of the U.S. economy, a healthy worker population. However, the OSHA rule, together with numerous other rules meant to protect public health, track weather and wildfire smoke, and provide advanced warning for heat and climate change-related exposures are actively threatened by federal efforts to deregulate industry. If the United States increases fossil fuel burning while failing to issue a final ruling on heat or wildfire smoke, workers will be dually affected by a heightened risk for heat- and pollution-related injury and a lack of safeguards against this increased risk.

Failing to act is likely to have significant consequences not only for the health of our workforce but also for our economy. The agricultural industry contributes more than $1.5 trillion to the U.S. gross domestic product (10). Heat and air pollution exposure threatens the workers who form the backbone of this industry. If unchecked, an unhealthy and/or unavailable workforce will likely increase food costs and threaten our supply chain. The interventions proposed by OSHA and NIOSH are relatively inexpensive, especially when compared with the unmeasured and potential costs of lost productivity, emergency room use, and worker's compensation claims.

As healthcare providers, we have a duty to speak up and highlight the increasing risks to health faced by outdoor workers in the setting of climate change. Although progress has been made, it is not sufficient. Rather than waiting until even more workers are at risk, we call on this administration to build on the years of existing work by OSHA and NIOSH to address these dual health hazards. Failure to do so will have devastating effects both for the health of our work force and for the food and financial security of all Americans. ■

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