



EXTREME HEAT



Emergency Preparedness and Response to Climate Change: The Role of the Environmental Health Professional

The National Environmental Health Association (NEHA) aims to raise awareness of the impacts of climate change. These changes, including the effects of extreme weather events on infrastructure and human health, have increased the need for preparedness and response across every sector of public health, especially environmental health. Environmental health professionals play an integral role in mitigation, preparedness, response, and recovery. Clearly, NEHA's mission, *to advance the environmental health professional for the purpose of providing a healthful environment for all*.

Climate change is the greatest threat to global health.⁷ It affects human health through air quality, extreme heat, drought, wildfires, extreme storms, floods, vector borne illnesses, and changing local weather patterns.

Though global, the effects of climate change are inherently local. All people are susceptible to physical and mental health impacts; however, certain groups carry a heavier burden. These populations include children, people of color, older adults, people with disabilities, and people in impoverished communities.

! FAST FACTS !

Between 2000 and 2016, the number of people exposed to heatwaves worldwide increased by around **125 MILLION**.¹

NINE OF THE TEN warmest years have occurred since 2005, with 2014-2018 comprising the five hottest.³

Heat is the **TOP CAUSE** of natural weather-related deaths in the U.S.⁶

Heat-related deaths occurred most frequently in **URBAN AREAS** (81%).²

36% of the heat-related deaths from 1999-2010 were 65+ aged populations.

From 1992-2006, heat-related deaths were **20 TIMES HIGHER** among crop workers than the general U.S. population.⁴

EXTREME HEAT HARMS HEALTH

Climate change is increasing both the intensity and severity of heatwaves across the U.S. Heatwaves are becoming hotter, lasting longer, and occurring more frequently and have a massive impact on human health. In addition to extreme heat's direct health effects, higher temperatures contribute to the build-up of harmful air pollutants causing more health impacts. Examples of extreme heat-related health concerns include:

- Increase in cardiovascular and respiratory complications, renal failure, electrolyte imbalance, kidney stones, negative impacts on fetal health, and preterm birth⁸
- Through overexposure to extreme temperatures and heat-related illnesses, mental health effects like anxiety and loss of focus can occur

- Urban heat islands are densely populated communities with fewer trees, less green space, more buildings, higher energy use, and more impervious asphalt and concrete. These urban heat islands may have nighttime temperatures that may be as much as 22°F higher than surrounding areas¹⁰
- Farmers, construction workers, and landscapers are at risk of developing occupational heat stress due to extended work time outdoors⁵
- People aged 65+ are more likely to have a chronic medical condition that changes normal body responses to heat⁹
- Extreme heat and the impacts on those who do not have air conditioning pose greater health inequities. African American households have a 5.3% higher heat-related mortality rate than White households and 50% less access to central AC¹²

HEALTH OUTCOMES

Heart and lung disease onset or exacerbation	Heart-related illness like heat stroke	Negative impacts on fetal health
Conflict with medications	Dehydration, heat cramps, heat exhaustion	Death

ENVIRONMENTAL HEALTH WORKFORCE ROLE

Monitor and regulate emissions	Educate vulnerable populations on the signs of heat related illness and prevention	Providing easy access to public drinking fountains and cooling centers
Disseminate heat wave alerts	Educate and respond to an extreme heat event	Updating building codes and landscaping laws can increase energy efficiency

POPULATIONS VULNERABLE TO EXTREME HEAT





ENVIRONMENTAL HEALTH WORKFORCE ROLE

Environmental health professionals play an essential role in action planning, heatwave response efforts, and reduction of public health risks of extreme heat. Increased heatwaves multiply the need for preparedness and response from environmental health professionals. An environmental health professional specializing in extreme heat preparedness has the appropriate education and training needed to support local impacts and protect human health.

In order to address the health threats of extreme heat events, environmental health professionals must be able to:

- Understand the impact of extreme heat on health outcomes
- Interpret extreme heat and health research utilizing science to educate communities on the potential health risks
- Provide recommendations, interventions, guidelines, and policies to protect health and control extreme heat hazards
- Provide the public with warnings and alerts before extreme heat events
- Educate communities on where to go during an extreme heat event and provide a list of cooling centers and accessible transportation
- Update building codes and landscaping laws to regulate extreme heat exposure and prevent urban heat islands
- Understand the impact that systems, social and structural inequities, institutional power and structural racism can have on climate change

Environmental health professionals are uniquely qualified to respond to extreme heat impacts due to their in-depth knowledge of the relationship between heat, health, and the environment.



RECOMMENDATIONS

- EH organizations should support climate mitigation that reduces greenhouse gas emissions and enforces urban planning regulations to prevent extreme heat and urban heat island effect.
- Health departments should support efforts to create heat-related policies and forge partnerships that assure equitable access to cooling centers.
- Health departments should utilize CDC's Building Resilience Against Climate Effects (BRACE) Framework to estimate the burden of heat-health outcomes and vulnerabilities.

Resources

- 1 World Health Organization. (2018, July 31). Information and public health advice: Heat and health. Retrieved from <https://www.who.int/globalchange/publications/heat-and-health/en/>
- 2 Centers for Disease Control and Prevention. (n.d.). Heat-Related Illness. Picture of America. Retrieved from https://www.cdc.gov/pictureofamerica/pdfs/picture_of_america_heat-related_illness.pdf
- 3 National Aeronautics and Space Administration. (2019, July 23). 2018 fourth warmest year in continued warming trend, according to NASA, NOAA – Climate Change: Vital Signs of the Planet. Retrieved from <https://climate.nasa.gov/news/2841/2018-fourth-warmest-year-in-continued-warming-trend-according-to-nasa-noaa/>
- 3 National Oceanic and Atmospheric Administration. (2019, February 6). 2018 was 4th hottest year on record for the globe. Retrieved from <https://www.noaa.gov/news/2018-was-4th-hottest-year-on-record-for-globe>
- 4 California Natural Resources Agency. "Safeguarding California Plan: 2018 Update, California's Climate Adaptation Strategy" (California Natural Resources Agency, January 2018). <http://resources.ca.gov/docs/climate/safeguarding/update2018/safeguarding-california-plan-2018-update.pdf>
- 5 Prein, A., Holland, G., Rasmussen, R., Clark, M., & Tye, M. (2016). Running dry: the U.S. Southwest's drift to a drier climate state. *Geophysical Research Letters*, 23(3): 1272-1279. Available at <http://onlinelibrary.wiley.com/doi/10.1002/2015GL066727/full>
- 6 National Oceanic and Atmospheric Administration. (2017). Summary of Natural Hazard Statistics for 2016 in the United States. National Weather Service. Retrieved from <https://www.nws.noaa.gov/os/hazstats/sum16.pdf>



EXTREME HEAT



ASSESSMENT

EH professionals identify, assess, and help recommend solutions for extreme heat vulnerabilities.

- Assess local temperatures and investigate current community health needs by identifying health and extreme heat trends and vulnerabilities across the jurisdiction. For example, monitoring extreme heat levels and connecting the human health effects to adaptation, response efforts, and vulnerable communities.

POLICY DEVELOPMENT

EH professionals support community efforts to address extreme heat through policy.

- Addressing urban heat islands through local legislation to prevent extreme heat in urban settings; for example, developing more parks and green space, efficient public transportation, shaded bus stops, and community facilities.

ASSURANCE

EH professionals have an essential role in protecting the health of the public by ensuring extreme heat preparedness, management plans, and intervention actions.

- In order to address extreme heat events, issuing alerts to the public of local cooling centers using multiple media outlets and different languages is critical to connect with all populations.

- Academic EH programs should develop a highly skilled and well-trained workforce by training on heat vulnerabilities, community engagement, education, and preparedness for future extreme temperatures.
- Members of the EH workforce must collaborate to share information and resources on adaptation and response activities; environmental health resources can be found at neha.org.

- 7 Holt, D. (2015, August). Columbia Law School - Sabin Center for Climate Change (Rep.). Retrieved from https://web.law.columbia.edu/sites/default/files/microsites/climate-change/holt_-_heat_in_us_prisons_and_jails.pdf
- 8 The Society for Cardiovascular Angiography and Interventions. (2018, December 10). Extreme Weather and Your Heart: What You Need to Know When It Gets Really HOT! Retrieved from <http://www.secondscount.org/heart-condition-centers/info-detail-2/extreme-weather-your-heart-what-you-need-to-know-w-#XVRFhpNkJOQ>
- 9 CDC (U.S. Centers for Disease Control and Prevention). 2016. CDC WONDER database: Multiple cause of death file. Accessed July 2016. <http://wonder.cdc.gov/mcd-icd10.html>
- 10 Environmental Protection Agency. (2017, January 11). Learn About Heat Islands. Retrieved from <https://www.epa.gov/heat-islands/learn-about-heat-islands>
- 11 "WHO Calls for Urgent Action to Protect Health from Climate Change – Sign the Call." World Health Organization, World Health Organization, 14 Apr. 2016, www.who.int/globalchange/global-campaign/cop21/en/
- 12 American Public Health Association, & Centers for Disease Control and Prevention. (n.d.). Extreme Heat Can Impact Our Health in Many Ways. Retrieved from https://www.cdc.gov/climateandhealth/pubs/EXTREME-HEAT-Final_508.pdf
- 12 Rudolph, L., Harrison, C., Buckley, L. & North, S. (2018). Climate Change, Health, and Equity: A Guide for Local Health Departments. Oakland, CA and Washington D.C., Public Health Institute and American Public Health Association.
- 12 (M. S. O'Neill, "Disparities by Race in Heat-Related Mortality in Four US Cities: The Role of Air Conditioning Prevalence," *Journal of Urban Health: Bulletin of the New York Academy of Medicine* 82, no. 2 (May 11, 2005): 191–97, <https://doi.org/10.1093/jurban/jti043>.)