

CLIMATE EFFECTS



Climate change poses many risks to human health. Scientific research provides a solid foundation to recognize that the changing climate will continue to have profound impacts on the health of all Americans. The health impacts of climate change are already being felt in the US. We need to safeguard our communities by protecting people’s health, well-being, and quality of life from climate change impacts.

The Problem

Extreme Heat

Extreme heat events can trigger a variety of heat stress conditions. Heat stroke is the most serious heat-related disorder, caused by the body overheating. The condition can cause death or permanent disability without timely emergency treatment. Young children, the elderly, people with chronic diseases, low-income populations, and outdoor workers have higher risk for heat-related illness.

Extreme heat events contributed to more than 7,800 deaths in the US from 1999 to 2009, and experts predict that such events will occur more frequently, last longer, and be more severe in the future.^{1,2} Many US cities, including St. Louis, Philadelphia, Chicago, and Cincinnati, already have seen large increases in death rates during heat waves.^{3,4}

Air Quality

Warmer temperatures increase conditions that can worsen air quality, introducing a number of health risks and concerns. According to the US Global Change Research Program, climate change will make it more difficult to clean up ground-level ozone and will worsen particulate matter air pollution in large parts of the country.⁵

Ground-level ozone (a key component of smog) causes many health problems, including diminished lung function, increased asthma hospitalizations, and emergency department visits, plus an increased risk for premature death. Particulate matter in the smoke from wildfires—which are also expected to be more frequent and severe—increases sudden onset respiratory illness, respiratory

and cardiovascular hospitalizations, and medical visits for lung illnesses, as well as the risk of premature death. The frequency of wildfires is expected to increase as drought conditions become more prevalent.

Additionally, when sensitive individuals are simultaneously exposed to allergens and air pollutants, allergic reactions often become more severe. Thus, the increase in air pollutants makes the effects of increased allergens associated with climate change even worse. People with existing pollen allergies may have increased risk for acute respiratory effects.^{5, 6}

Vector-borne Disease

The development and survival of ticks, their animal hosts (e.g., deer), and the bacterium that causes Lyme disease are all strongly influenced by climatic factors, especially temperature, precipitation, and humidity. Most US Lyme disease cases occur in the Northeast, particularly Connecticut. An expansion of ticks' geographic range may lead to more human contact with infected ticks. In regions where Lyme disease already exists, milder winters result in fewer disease-carrying ticks dying during the cold season, increasing the overall tick population and the concomitant risk of human-tick interactions.

West Nile virus is another vector-borne disease likely influenced by climate change. Preventing people from contracting the virus is important because there is no West Nile virus vaccine or drug treatment, and recovery from severe disease may take several weeks or months.⁷

Extreme Weather

Flooding, hurricanes, tornadoes, and droughts are just some of the extreme weather events predicted to occur more frequently as a result of climate change. Not only can these events directly harm human health (e.g., through drownings in floodwaters), but responses to the events also threaten health. As seen with Hurricane Katrina and Superstorm Sandy, extreme weather can force residents to evacuate their homes, leaving behind medical care, jobs, and pets. Cleaning up storm debris potentially exposes people to harmful chemicals, sewage water, and downed electrical lines. Getting homes, schools, child care facilities, hospitals, and other essential buildings repaired or rebuilt after devastating events often takes far longer than expected, delaying recovery for many communities.⁵

Vulnerable Populations

Many climate-related health impacts are already occurring.⁸ Disadvantaged populations with limited resources to adapt to climate change will experience disproportionately greater adverse health impacts.⁹ Vulnerability to climate change impacts depends on community and individual resilience. Communities can increase general resilience by addressing the core social determinants of health (e.g., poverty, educational level, social capital, and health care access). But they must also implement specific mitigation measures critical to reducing vulnerability.¹⁰

As noted by the US Global Change Research Program’s Climate and Health Assessment, “Every American is vulnerable to the health impacts associated with climate change.” However, some groups face even greater risks. Among the groups most at risk are children and teens, older adults, people with chronic diseases, people who work or exercise outdoors, and low-income individuals and communities (including many communities of color and tribal communities).

Climate change threatens health through extreme temperatures, worsening air quality, and extreme weather events. For example, outdoor workers, such as farmers and military personnel, face potentially excessive heat events on the job. Children are especially vulnerable to air pollution, heat-related illness, and waterborne diseases. Older adults react severely to heat waves and face serious harm from air pollution and infectious diseases. People with chronic medical conditions, including asthma, diabetes, and cardiovascular diseases, face special risks if their access to medical care is interrupted.⁵

Opportunities for Action

- 1) Reduce emissions of carbon dioxide, methane, and other pollutants that worsen climate change.
- 2) Increase the use of clean renewable energy.
- 3) Increase the energy efficiency of cooling systems, all modes of transportation, and other energy-intensive products.
- 4) Help communities plan for and adapt to the impacts of climate change. Many states and localities have begun this planning but will need resources to continue this work and to coordinate with neighboring jurisdictions. Disadvantaged communities will need special assistance to explore and develop ways to protect residents.
- 5) Require federally supported activities to include a climate risk and impacts analysis.
- 6) Encourage the US Occupational Safety and Health Administration to adopt a standard to protect workers against excessive heat.
- 7) Ensure that funding is sufficient for implementation of climate-health initiatives and to conduct climate change research and programs across federal agencies.

For more information, visit

Agency for Toxic Substances and Disease Registry

- Social Vulnerability Index: <https://svi.cdc.gov/>

American Public Health Association

- Policy statement on climate change: <http://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2015/12/03/15/34/public-health-opportunities-to-address-the-health-effects-of-climate-change>

Centers for Disease Control and Prevention

- Climate and Health Program: <http://www.cdc.gov/climateandhealth/default.htm>
- CDC/APHA climate and health factsheets: <http://www.cdc.gov/climateandhealth/effects/default.htm#factsheets>
- National Environmental Public Health Tracking Network
 - Climate change data: <https://ephtracking.cdc.gov/showClimateChangeLanding.action>
 - Heat stress illness data: <https://ephtracking.cdc.gov/showHeatStressIllnessLanding>

US Environmental Protection Agency

- EPA/CDC climate change guidebook: <http://www.cdc.gov/climateandhealth/pubs/extreme-heat-guidebook.pdf>

Federal Executive Actions/Orders on Climate Change Adaptation

- US Global Research Change Program: <http://www.globalchange.gov/browse/federal-adaptation-resources/executive-orders-and-policies>
- White House Council of Environmental Quality resilience initiative: <https://www.whitehouse.gov/administration/eop/ceq/initiatives/resilience>
- US Environmental Protection Agency “Adapting to Climate Change” website: <https://www3.epa.gov/climatechange/adaptation/federal-partner-collaboration.html>

National Association of County and City Health Officials

- Climate change website: <http://www.naccho.org/programs/environmental-health/hazards/climate-change>

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