



Reducing Health Risks From Warming Temperatures and Weather Disasters: A Progress Update

The National Institutes of Health (NIH) recognizes the unique role it has in bringing the research community together to address the health impacts of climate change and health inequities. Through the **NIH Climate Change and Health Initiative** launched in 2022, NIH is taking action to expand research funding and support to address these urgent and complex problems.

As the climate continues to change, and weather-related events such as floods, hurricanes, wildfires, and heat waves become more extreme, the risk to human health grows, exacerbating existing health threats and creating new public health challenges around the world.

NIH is uniquely positioned to lead a solutions-focused health research initiative to reduce the health consequences associated with extreme weather events and evolving climate conditions. NIH has a strong history of creating innovative tools, technologies, and data-driven solutions to address global environmental problems.

Because NIH has made modest investments in climate change and health research for several decades, there is already a community of NIH-supported scientists who are qualified, willing, and eager to do more to address this issue, and to grow the community of practice.

Important Research Is Needed

- Solution-focused research on **health conditions**, including infectious diseases, injury and trauma, mental health impacts, chronic conditions such as asthma, and health disparities.
- Research that integrates health and climate data to better predict the **communities at greatest risk around the world**.
- Strategies to minimize disruptions to **local health care systems** that provide services, such as dialysis, chemotherapy, prenatal care for pregnant women, and assistance for people with disabilities.
- **Basic laboratory studies** to understand how extreme heat impacts cellular systems, such as mitochondrial function.



NIH Climate Change and Health Initiative

- Reduce health threats across the lifespan and build health resilience, especially among those at highest risk.
- Support and train multidisciplinary teams of researchers across the globe.
- Identify regional impacts from climate change and develop interventions that local communities can use.
- <https://www.nih.gov/climateandhealth>

- Research to identify ways to prevent heat stress among **agricultural workers**.
- Development and evaluation of interventions, such as community cooling stations for **older adults** and other people with no access to air conditioning.
- Tools to forecast **harmful algal blooms** in warming waters and mitigate their toxic effects in lakes, rivers, and coastlines.
- Models to **track mosquito-borne diseases**, such as malaria, yellow fever, and dengue, as higher global temperatures extend their geographic ranges and transmission rates. Identify safe and protective measures to reduce mosquito populations and breeding.
- Research to identify interventions that can **reduce asthma rates in children** who live in urban settings with poor air quality. For example, [a new study](#) shows zero-emission vehicles can lower pollution and decrease urgent medical care for asthma.
- Horticultural studies to determine which trees planted in urban settings can **improve air quality** by reducing air pollution.
- Research to understand how natural disasters, like flooding, redistribute **hazardous substances**. Then develop tools to clean up these hazardous exposures.
- Use of **precision medicine principles** to evaluate how environmental exposures caused by climate change may influence an individual person's health.

NIH supports research to understand the direct and indirect health effects of climate change.

Direct Health Effects

- Heat-related illness
- Respiratory disease
- Heart disease
- Food-, water-, and vector-borne diseases
- Injury
- Premature death
- Mental health impacts
- Poor maternal and birth outcomes

Indirect Health Effects

- Chemical releases into environment
- Changes in air, water, food quality and quantity
- Population displacement
- Interruptions to health care
- Infrastructure and supply chain disruption
- Economic impacts – more people living in poverty

NIH Climate Change and Health Initiative Leadership

In 2024, a coalition of 12 NIH institute and center directors serve as the Executive Committee, establishing broad support and comprehensive leadership to address this emerging health threat.

National Institute of Environmental Health Sciences (NIEHS), Rick Woychik, Ph.D., Chair

Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), Diana Bianchi, M.D.

Fogarty International Center (FIC), Peter Kilmarx, M.D.

National Cancer Institute (NCI), W. Kimryn Rathmell, M.D., Ph.D.

National Center for Complementary and Integrative Health (NCCIH), Helene Langevin, M.D.

National Heart, Lung, and Blood Institute (NHLBI), Gary Gibbons, M.D.

National Institute of Allergy and Infectious Diseases (NIAID), Jeanne Marrazzo, M.D.

National Institute on Aging (NIA), Richard Hodes, M.D.

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), Lindsey Criswell, M.D.

National Institute of Mental Health (NIMH), Joshua Gordon, M.D., Ph.D.

National Institute on Minority Health and Health Disparities (NIMHD), Eliseo Pérez-Stable, M.D.

National Institute of Nursing Research (NINR), Shannon Zenk, Ph.D., RN

Progress to Date, and Moving Forward

NIH and its stakeholders worked together to develop the NIH Climate Change and Health Strategic Framework to guide NIH research investments.

The Framework is comprised of four core goals: **Health Effects Research** to identify climate change threats to health; **Training and Capacity Building** to provide the next generation of scientists with the cutting-edge skills needed to meet this challenge; **Intervention Science** to develop targeted preventions and adaptations; and **Health Equity** to ensure an emphasis on efforts to protect those most at risk from climate change.

Since the initiative launched, applications for grants to do health research focused on climate change have increased, and NIH has been able to increase the number of grants awarded. Some of the major accomplishments from the initiative include the following research and training activities:



Research Funding

- **Established a Research Coordinating Center (RCC)** for the initiative. In 2023, a three-year award was made to the Boston University School of Public Health and the Harvard T.H. Chan School of Public Health to Convene, Accelerate, Foster, and Expand (CAFÉ) the climate and health community of practice in the U.S. and globally.
- **Funded five new Exploratory Centers.** NIH has awarded the first five awards to build the research capabilities of transdisciplinary teams that will study the impacts of climate change on health and develop action-oriented strategies that protect health and build resiliency at the individual, community, national, and global levels. A second round of awards is expected to be made in 2024.

Climate Change Affects Us Unequally



Underserved populations with health disparities

(Some communities of color, low-income populations, low-educational attainment groups, immigrant groups, and Indigenous populations)



Exposed workers

(e.g., farmers, construction workers)



Persons with disabilities



Vulnerability by life stage

(Fetal and prenatal, infants, young children, pregnant women, and older adults)



Vulnerability associated with chronic medical conditions

(e.g., diabetes, asthma, cardiorespiratory diseases, or psychiatric diseases)



Populations in low- and middle-income countries (LMICs)

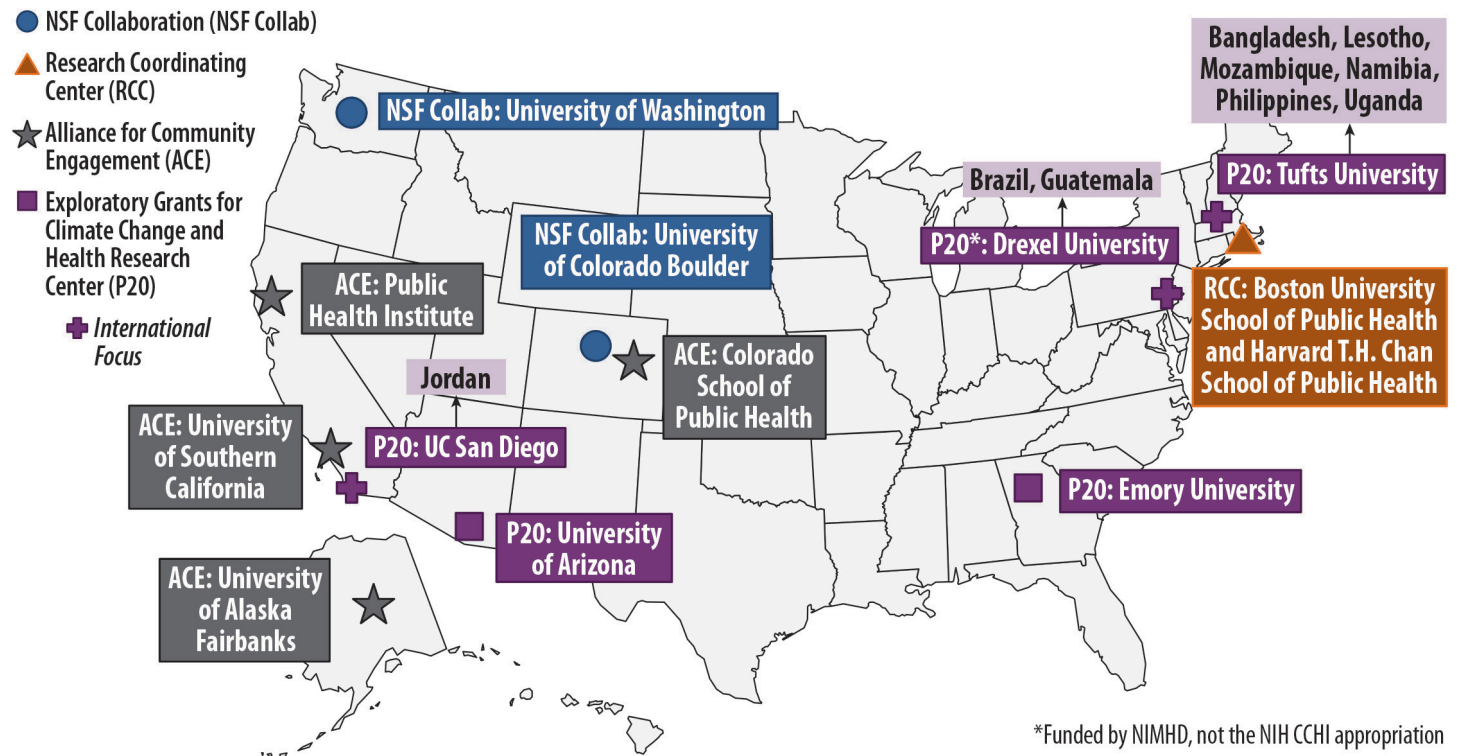
(Higher rates of existing diseases, malnutrition, and extreme poverty)

- **Awarded administrative supplements** to existing grants to expand climate and health research capacity and leverage existing investments to study various health outcomes. NIH continues to provide funding to **investigator-initiated research projects.**

Capacity Building and Training

- **A new partnership with the U.S. National Science Foundation** was formed to bolster efforts to rapidly fund researchers addressing climate-related disasters. Two centers housed at universities known for their disaster response expertise are available to provide support for the timely collection of perishable data and health research.

NIH Climate Change and Health Centers Across the Country



- Created a successful **NIH Climate and Health Scholars program**. In 2022-2023, eight established scientists from academia and a nonprofit organization with expertise in climate and health were part of the inaugural class that shared knowledge and helped build NIH capacity for conducting climate-related and health research. Seven new scientists were selected for the 2023-2024 program.
- The **Climate and Health Outcomes Research Data Systems (CHORDS)** project, which received funding from the U.S. Department of Health and Human Services, will integrate environmental, climate-related, societal, and health outcomes data so researchers can identify, analyze, and reduce the health effects associated with climate-related events and improve patient and population health outcomes.
- In addition to supporting grantees, the initiative also established a component that utilizes the talents of the **NIH in-house research community**. The **Intramural Targeted Climate Change & Health (ITCCH)** program is supporting six pilot projects led by NIH intramural investigators that are focused on basic and applied research on the health effects of climate change.

Community Engagement

- **The Alliance for Community Engagement – Climate and Health (ACE-CH)** builds on the successful community engagement program established by NIH to address COVID-19 and other health disparities. ACE-CH will ensure the inclusion of underserved, racial and ethnic minority, and rural populations to build trust in climate science. The alliance will work to promote sustainable strategies that address the impacts of climate change on vulnerable communities, while emphasizing health equity. The first four awards were made in early 2023.
- Each Exploratory Center funded in 2023 has an **engagement** core designed to work with communities.

Outreach and Communications

- The initiative established a seminar series to share information about the human health implications of climate change. Additionally, NIH leadership and staff continue to present and **share new findings and programs** with a range of audiences, including at scientific conferences, community forums, congressional briefings, through academic and general publications, as well as speaking to the media and promoting information through social media.