

Climate Change and Global Health: Emerging Threats and Evolving Priorities

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Abstract

Climate change represents one of the most significant global public health challenges of the twenty-first century. Increasing frequency and intensity of heatwaves, food and water insecurity, deteriorating air quality, and the emergence and spread of infectious diseases are increasingly linked to climatic and environmental changes. These impacts disproportionately affect vulnerable populations, including children, older adults, and socioeconomically disadvantaged communities, thereby exacerbating existing health inequities. Addressing these challenges requires robust, evidence-based research to identify population vulnerabilities, quantify health impacts, and evaluate the health co-benefits of climate mitigation and adaptation strategies. Integrating health considerations into national and international climate policies is essential, alongside strengthening climate-resilient health systems through early warning mechanisms, disaster preparedness, and workforce capacity building. A coordinated, cross-sectoral approach is urgently needed to protect human health, reduce inequalities, and safeguard the well-being of present and future generations in the face of ongoing climate change.

Keywords: Climate Change, Public Health, Health System, Climate-resilient

Overview: Climate Change as a Current Health Emergency

Climate change is now a pressing public health emergency rather than a far-off environmental issue. Human health and well-being are currently being negatively impacted by intense heatwaves, droughts, floods, wildfires, and rising global temperatures. The World Health Organization states that if sufficient mitigation and adaptation measures are not taken, climate change is expected to cause tens of thousands more deaths annually by 2050 from malnutrition, malaria, diarrhea, and heat stress, endangering the fundamental pillars of health, such as fresh air, pure water, nutritious foods, and adequate shelter¹.

According to the most thorough worldwide evaluation of the effects of climate change on health, the 2025 Lancet Countdown on Health and Climate Change, health risks associated with climate change are getting worse across important metrics. Food insecurity is rising as a result of droughts and excessive heat, heat-related mortality has increased dramatically, and delays in climate action are costing lives and livelihoods worldwide. These results highlight how crucial it is to put health at the forefront of climate policy and research initiatives².

Impact of Climate Change on Health

Deadly Heatwaves: The Hidden Toll on Lives

Heat-related mortality and heat stress are on the rise due to rising temperatures, particularly among vulnerable groups like infants, outdoor workers, and elderly persons. According to the Lancet Countdown report, there has been a notable increase in heat-related mortality. Each year, heat exposure causes thousands of deaths and hundreds of billions of dollars in productivity losses².

Climate-Driven Threats to Food and Water Security

Water supply and food production are impacted by climate change. Millions of people are experiencing moderate to severe shortages of food as a result of prolonged droughts, heat

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waves, and harsh weather. This is because crop yields are declining and water supplies are becoming less reliable, which worsens nutrition and raises the danger of waterborne illnesses^{1,2}.

Ecosystem Disruptions and the Rising Burden of Infectious Diseases

The extent of vector-borne illnesses like dengue and malaria is increased by changes in temperature and precipitation patterns that affect mosquito habitats. Furthermore, diarrheal illnesses and other infections are exacerbated by disruptions to water and sanitation systems during extreme weather events, putting additional strain on health systems³.

Breathing Danger: Climate-Driven Air Pollution and Health

In addition to being a major contributor to climate change, the burning of fossil fuels releases dangerous air pollutants. These contaminants are linked to cardiovascular disorders, respiratory illnesses, and early mortality. By lowering exposure to hazardous particulate matter and ozone, addressing the twin problems of air pollution and climate change can have an immediate positive impact on health⁴.

Unequal Burdens: Climate Change and Health Disparities

The consequences of climate change are not equally distributed. Heat exposure, harsh weather, infectious ailments, and food and water insecurity pose disproportionate hazards to pregnant women, young children, older persons, and people with preexisting health concerns. These risks are made worse by inadequate infrastructure and weak health systems in many low- and middle-income nations, which exacerbate global health disparities⁵.

Advancing Knowledge: Research Priorities for Health and Climate Policy

Strong, useful evidence is necessary for effective climate action in order to direct measures and safeguard public health. Among the top research priorities are:

Tracing the Climate Fingerprint: Linking Change to Health Impacts

Calculate the impact of climate change on certain health outcomes, such as respiratory disorders, vector-borne infections, and heat-related illnesses^{6,7}.

Fortifying Health Systems: Preparing for a Warming World

Learn how early warning systems, climate-smart infrastructure, and staff training may help health care prepare for, respond to, and recover from climate stresses⁸.

Vulnerability Mapping

To properly focus treatments, identify the neighborhoods and populations most at risk, such as low-income groups, older adults, and children³.

Co-Benefits Analysis

Examine how mitigation techniques, such as switching to sustainable transportation and clean energy, enhance public health outcomes, such as improved air quality and a lower burden of disease^{6,8}.

Thorough research in these areas will improve preparedness, promote policy responsiveness, and guide evidence-based climate-health solutions.

Turning Knowledge into Power: Climate-Health Policy in Action

Integrated climate and health policies must be given top priority by policymakers.

Mainstream Health in Climate Plans:

Include health hazards in national and international climate policies to guarantee that population well-being is taken into consideration when making decisions^{6,7}.

Strengthen Climate-Resilient Health Systems:

To survive the effects of climate change, put early warning systems, disaster preparedness procedures, and climate-smart infrastructure into place¹⁰.

Accelerate Mitigation for Health Co-Benefits:

Lower the risk of respiratory and cardiovascular diseases by reducing greenhouse gas emissions and enhancing air quality^{6,9}.

Ensure Equity in Adaptation Financing:

To lessen health inequities, concentrate resources on disadvantaged and high-risk groups³.

These approaches save lives, decrease healthcare costs, and create communities that are equal and resilient.

The interrelated consequences of population increase, urbanization, environmental change, and pathogen evolution in the twenty-first century led to epidemics, highlighting the necessity of comprehensive global preparedness and equitable health measures¹¹.

Uniting for Survival: A Global Call to Climate-Health Action

One of the most pressing and complex global public health emergencies of our time is climate change. Millions of people worldwide are already being impacted by its complex effects, which include deteriorating air quality, increasing food and water insecurity, more frequent heatwaves, and changing patterns of infectious diseases. Strategic, evidence-based initiatives that integrate health concerns into climate policy and strengthen climate-resilient health systems are crucial to reducing these risks. We can only successfully protect human health and guarantee the welfare of present and future generations via concerted, cross-sectoral, international action.

Adaptive health systems that raise public awareness, promote preventative practices, and include communities in response activities frequently support effective epidemic control¹².

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