

CLIMATE CHANGE, HEALTH, AND RESILIENCE

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BACKGROUND

The earth is rapidly getting hotter, with potentially dire consequences for human health. Since the pre-industrial era, greenhouse gas emissions have increased the average global temperature by 1.0°C, and the increase will likely reach 1.5°C between 2030 and 2052 if this trend is unchanged.¹ Although this increase may seem small in terms of day-to-day temperature fluctuations, the sustained temperature increase is a radical change for the planet.

The Intergovernmental Panel on Climate Change (IPCC) estimates that this additional half-degree of warming would expose approximately 31 to 69 million people to flooding from sea level rise worldwide, greatly impacting small island nations and coastal communities. Along with progressively higher temperatures and rising sea

levels, climate change is also driving fluctuations in global precipitation, water and food insecurity, as well as surges in the magnitude and frequency of extreme weather events, each of which generate global public health challenges.² These challenges should spur increasing attention to disaster preparedness, preventive medicine, rapid diagnostics, and the education of health professionals—but few medical schools and schools of public health are tackling these issues comprehensively.³

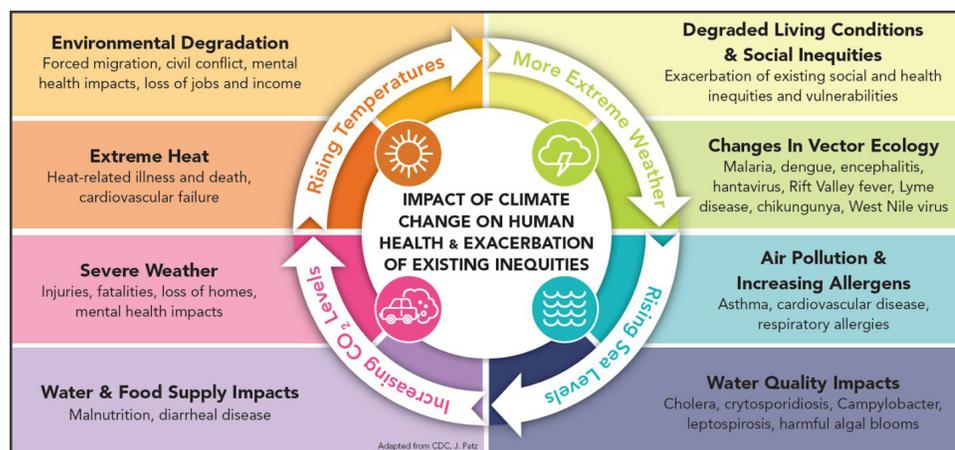
The health impacts of global climate change are diverse (see Figure 1).⁴ The World Health Organization (WHO) estimated the effects of climate change on selected causes of death between 2030 and 2050.⁵ Modeling a range of scenarios, in comparison to a future without climate change, WHO estimated that climate change will account for

thousands of excess deaths by the year 2030, including: 38,000 from heat exposure in elderly populations, 48,000 from diarrheal diseases, 60,000 from malaria, and 95,000 due to childhood undernutrition. Although this prediction does not account for all causal pathways, WHO estimated that climate change will have a profound adverse impact on future mortality with 250,000 excess deaths per year between 2030 and 2050.

“Last year, the administration released its third national climate assessment...That’s a consensus document of about 300 scientists - all who have advanced degrees in climate science. That document unequivocally states that, ‘climate change, once considered an issue for a distant future has moved firmly into the present.’”

— Judge Alice Hill, JD
Former Senior Director for Resilience for the National Security

Figure 1. Impacts of Climate Change on Human Health (CDC)



RESILIENCE

Climate change will impact the health of all populations, regardless of socioeconomic status or geography. However, already vulnerable populations will suffer disproportionately.⁶ In addition to geographic differences that influence the intensity of environmental changes, climate change exacerbates existing health and social inequities.⁷

The capacity to mitigate the loss of life and destruction caused by a hurricane, to prevent an outbreak of an emerging vector-borne disease, or to withstand a severe drought all depends on the resiliency of a community. The concept of resilience refers to “the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events” caused by climate hazards.⁸

The ability of communities to build resilience depends on many factors, but is largely influenced by differential access to resources among populations and demographic groups. For instance, populations of lower socioeconomic status may be at higher risk of experiencing detrimental effects from extreme heat or severe storms, if respectively, they are unable to afford air conditioning or flood insurance. On a larger scale, lower-income communities may not have the capacity to strengthen their built environments through necessary modifications. Updates to aging water and sewage infrastructure aid in preventing flooding and subsequent water contamination during extreme weather events. Likewise, planting trees and maintaining public parks in cities—sometimes viewed as optional urban amenities—can reduce the effects of excessive heat in urban heat islands. These public investments are vital to bolstering community climate resilience.⁹

RESILIENCE IN ACTION

100 RESILIENT CITIES

The 100 Resilient Cities initiative is an organization designed to increase the capacity of urban environments to survive, adapt, and grow regardless of stressors, including ones associated with climate change. For example, as a part of this initiative, San Francisco plans to do the following:¹⁰

- ➔ Construct disaster-resilient waterfronts by 2040 to adapt to sea level rise
- ➔ Enact a 0, 50, 100 plan to reduce carbon emissions
 - » 0 waste
 - » 50% of transportation by sustainable modalities
 - » 100% renewable energy sources

UNICEF WASH

United Children’s Fund (UNICEF) leads a Water Sanitation and Hygiene (WASH) initiative focused on safe water, sanitation, and hygiene challenges expected as a result of climate change.¹¹ The WASH Initiative seeks to protect against additional hazards including:

- ➔ Increased water pollution from more frequent flooding
- ➔ Increasing pathogens in water
- ➔ Saline introduction to fresh-water supplies

To combat these safe water challenges, a WASH project in Ethiopia increased rural access to sustainable drinking water by providing inexpensive technologies to purify water and field guidance to have local officials administer the project permanently.¹²

CONCLUSION

While initiatives such as the United Nations’ Paris Agreement strive to slow global temperature rise and reduce the effects of climate change, nations are already dealing with its consequences.¹³ The development and implementation of strategies to mitigate the effects of climate change must be developed with an eye towards equity to account for all populations, particularly the most vulnerable. The creation of strategies is necessary across sectors and in collaboration with partners at all levels to ensure that countries, communities, and individuals are well equipped to adapt to and withstand impending planetary changes.

ABOUT CPHI

The Center for Public Health Initiatives was founded in 2007 by the University of Pennsylvania to act as an interdisciplinary public health center that brings together faculty, staff, and students from across Penn’s campus. The mission of CPHI is to educate and train new and emerging public health leaders, foster multi-disciplinary collaborations, and promote excellence in public health research and community partnerships.

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