



Climate Change: The Urgent Need for Global Health Strategies to Counter Adverse Impacts on Human Health

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ABSTRACT

The environmental consequences of climate change have become a global health emergency. Reports and reviews continue to document multiple health impacts from increasing temperatures, rising sea levels and more frequent extreme weather events like severe drought, flooding and wildfires. The consequences of global warming on human health include heat-related morbidity and mortality, an increase in vector borne and infectious diseases, greater severity of respiratory diseases, adverse nutritional effects from food insecurity, higher rates of injury and multiple effects from financial, educational, social and psychological stressors. The extent to which climate change is impacting human health and lives is such that action by the public health community is urgently required to provide public education and define effective intervention, prevention and treatment strategies. Only in this way can the initiatives and policies be generated that are required to inform and engage everyone in society, and make people aware that action is needed to counter the dangers to health posed by climate change.

Keywords: *Climate change; Global warming; Air pollution; Climate adaptation; Health risks.*

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Editorial

Concerns over climate change and the effects of global warming most often focus on the environment. Reports of unusual storms and flooding, rising sea levels due to the melting of arctic ice, disappearing fish stocks and adverse effects on other wildlife remind us of the consequences of warming temperatures. Calls for action are commonplace and national initiatives and international agreements are being enacted, but global warming rightly remains in the news, with experts continuing to warn that not enough is being done. Even reporting on the recent election in the USA chose to include a focus on climate change, raising concern over the scepticism among members of the incoming administration that it is even occurring, and counterproductive prior action like withdrawal from the Paris climate accord.

However, climate change is also having a major effect on global health that has to concern all of us involved in public health and related disciplines. As a recent Lancet review stated, "Climate change is placing human health and survival at risk in every region of the world" (Romanello, et al, 2023). In addition to claiming millions of lives annually, global warming is compromising the day to day health of millions more, in part because the eight years up to 2023 have been confirmed as being the warmest on record (World Meteorological Organization, 2023), and now 2024 has been identified by the COP29 climate conference as likely to surpass the record-breaking heat of 2023, with several consecutive months recording temperatures above 1.5 degrees Celsius. In addition, the economic fallout from the continuing warming trend is predicted to be immense and hence will compound the adverse consequences on both human health and the environment (Brändlin, 2024).

Humans suffer directly and indirectly from rising temperature and the increase in intensity and frequency of extreme climatic events. In addition to sharply rising rates of heat related deaths, direct effects of heat include environmental effects on disease prevalence, lack of water due to drought, increasing air pollution from wildfire particulate matter, and a rise in infectious and water borne diseases. Indirect effects come from the impact of drought on livestock and agriculture, for example, food insecurity is rising due to heat waves and crop failure. Disruption of public services occurs due to worse flooding and growing number natural disasters, as a consequence of which greater number of children and young adults are losing education opportunities, and more of the population face financial hardship.

Climate change has been described as "the biggest challenge humanity has ever faced," something that "requires each of us to take positive steps to alter," and where adapting how we live "will require us to change how we do virtually everything." (Rowlatt, 2022). In addition to each of us looking for ways in which we can individually make a difference, society needs all of us to collaborate in order for our efforts to translate into beneficial practices and new public policies. In both a personal and societal context it is fortunate that as humans we have proved to be highly adaptable time and time again, and are also capable of great ingenuity and innovation.

For those of us involved in public health, our actions to reduce the impact of climate change have to come in many forms. For example, there needs to be both a preventive and management focus for the health consequences of rising temperatures and a range of diseases; managing the increase in vector borne diseases (e.g. malaria, dengue, zika), including their extension beyond traditional endemic areas, and working to reduce the incidence of infections that can be prevented through routine immunizations are examples. Health promotion to educate about the ways in which global warming impacts human health and what individuals can do to reduce their own risks from rising temperatures is of obvious importance.

Parents need to learn that the risks their children face, what clinical signs they need to be aware of, and health related practices that offer protection. Like the elderly, the young are at risk from heat exhaustion, heat stroke and dehydration. The under-fives will contract more infectious diseases due to rising temperatures, warming waters, altered rainfall and increasing humidity, all of which promote vector borne illnesses and the growth of bacteria that cause diarrheal diseases, including cholera. More infants and children will face hunger and malnutrition due to rising food prices and crop failure. Over time the accumulated effects of air pollution will lead to a higher incidence of lung disease which in turn increases the likelihood of the onset of heart conditions and cancers in early adult life.

In the context of air pollution, global warming will compound the health impact already being caused by pollution from transportation, industrial emissions and agricultural burning. The current situation in Thailand is an example, where the city of Bangkok already faces persistent air pollution and more than 10 million Thais needed medical help for pollution-related lung disease in 2023. The PM 2.5 standard is a measure of air quality that monitors levels of tiny hazardous particles (measuring 2.5 micrometers or smaller) that can enter the body through the lungs. PM 2.5 levels in Bangkok have increased progressively since 2019, and at the start of 2025 exceeded acceptable health standards; currently 64 of Thailand's 77 provinces are similarly affected with 17 recording levels known to be hazardous to health (Bangkok Post, 2025).

Government intervention is essential to counter both the threat from current levels of pollution and the increases that rising global temperatures will cause, but broader public health measures are also urgently required. Education is needed which is innovative in nature and targets all age groups, but young people are a particularly important target audience as positive health-related behaviours learned before adolescence tend to carry over and become part of adult lifestyles. WHO also sees effective school-based programs as valuable because they enable young people to acquire competencies that translate into greater control over their health and their environment (Turunen et al, 2017), and there is growing evidence of the beneficial impact of youth-focussed initiatives and the positive influence that can be achieved through innovative use of social media (Macnab et al., 2024).

There are many ways to approach what needs to be done and we should all look to contribute in ways that are creative and novel. WHO guidelines emphasize the importance of building public policy, strengthening community action, creating supportive environments, reorienting health services and developing health knowledge and skills in the population.

Campaigns that promote simple achievable goals are a good way to start, as success in achieving a modest target then leads to further efforts to achieve change. Working with teachers to add climate related health facts and skills to the curriculum involves pupils in schools and engaging the support of leaders in your communities extends knowledge and coping skills to adults and families; we should all also look for opportunities to join and support national initiatives. Celebrity endorsement of validated strategies raises awareness and encourages belief and compliance. Competitions can raise interest, promote participation and help to generate new ideas.

Interagency collaborations are valuable as they bring together experts with different skills and a range of resources. The multiple strategies and approaches required to provide clean and safe water are an example; these can range from home collection and storage of rainwater, through reduction of pollution of groundwater and rivers by untreated sewage, to ways to limit the entry of micro plastics and other chemical pollutants into the water supply.

In terms of resources, the Lancet Countdown series is valuable: this provides information from international, multidisciplinary research collaboration between academic institutions and practitioners across the world which tracks progress on health and climate change. This series of publications initially covered five thematic areas which represent different aspects of the complex association between health and climate change: climate hazards; health resilience and adaptation; health co-benefits of climate change mitigation; economics and finance; and political and broader engagement (Watts et al., 2018). Since then, the methods behind the indicators presented have been improved, with nine new indicators added; these cover leishmaniasis, ticks, food security, health-care emissions, production and consumption-based emissions, clean energy investment, and scientific, political, and media engagement with climate and health (van Daalen et al, 2024).

In the words of the UN secretary-general Antonio Guterres "Climate catastrophe is hammering health, widening inequalities, harming sustainable development and rocking the foundations of peace, with the vulnerable hardest hit" (Brändlin, 2024). Moreover, with climate change claiming millions of lives annually and its threats rapidly growing, seizing the chance to secure a healthier future has never been more vital (Romanello et al, 2023). Importantly, in terms of global health, tackling climate change should be seen as both an urgent priority and a great opportunity to make a difference (Wang, 2015), where society needs all of us to collaborate in order for our efforts to translate into beneficial practices and effective public policies.

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