

# Building Climate-resilient Health Systems: A Critical Strategy for Safeguarding Public Health and Emerging Environmental Risks

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## Abstract

Climate change poses an increasing threat to public health, necessitating urgent action to build climate-resilient health systems. As extreme weather events intensify, healthcare workers face new challenges in managing climate-induced diseases and disasters. However, current medical training lacks sufficient emphasis on climate-related health risks. Governments and institutions must develop policies that integrate climate considerations into healthcare planning, emphasizing cross-sectoral collaboration. Artificial intelligence has potential in risk assessment and response planning, but its current capabilities remain limited. Strengthening government ecosystems, investing in community resilience, and promoting climate diplomacy are essential for safeguarding public health. Moreover, integrating climate components into clinical guidelines and medical education will prepare healthcare professionals to address climate-driven health crises effectively. This paper highlights the urgency of policy reforms and infrastructure investments to mitigate climate-related health risks. Collaborative efforts among nations, academia, and public health systems are crucial in shaping sustainable healthcare models that can adapt to evolving environmental challenges. By prioritizing renewable energy, enhancing healthcare accessibility, and promoting international cooperation, climate-resilient health systems can be established to safeguard global health in an era of rapid climate change.

**Keywords:** Artificial intelligence in healthcare, Climate diplomacy, Climate-resilient health systems, Climate change adaptation

In an era of escalating climate change, the interface between environmental shifts and public health has become a critical focus for governments worldwide. As temperatures rise, ecosystems transform, and extreme weather events become more frequent, the impacts on human health and well-being are increasingly evident.<sup>[1]</sup> At the forefront of this nexus are health workers and healthcare systems, which must not only respond to immediate health crises but also proactively address the long-term consequences of a changing climate. However, medical doctors and nurses often lack training in managing climate-induced risks, as the current medical curriculum does not provide training to face these emerging challenges. With the increasing reliance on technology and artificial intelligence (AI), concerns arise about whether AI can effectively be used to study the complexities of climate-related health issues which are cross-sectoral and cascading in nature. While AI may not yet be advanced enough to predict future climate risks or fully help us in managing climate-related health impacts, it could assist in identifying low-to-moderate risks and support in designing targeted responses to extreme weather

events and disasters. However, with AI's rapid evolution, its future potential in these domains holds promise for more comprehensive solutions to climate-related challenges.<sup>[2]</sup>

The nexus between climate change, extreme weather events, and public health consequences is undeniable. The implications for the Asia Pacific Region, in particular, are severe, threatening to reverse hard-won development gains.<sup>[3]</sup> Considering this complex interplay of shifting asymmetry around health systems, the onus of preparing climate-resilient health systems falls back on governments to prepare new algorithms and revise existing plans and policies that address

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future risks.<sup>[4]</sup> Countries burdened by infectious diseases will need to respond differently from those countries grappling with noncommunicable diseases as climate acts as a threat multiplier.<sup>[5]</sup> Preparing healthcare workers worldwide to understand the cross-sectoral implications, from emerging disease dynamics to pandemics and disasters is essential to safeguarding human lives in an increasingly warmer world. The burden of climate change is a transboundary concern, and emission reduction commitments must be matched with the ability of health workers to comprehend and address the climate risks and consequences that play out in our world.

## STRENGTHENING GOVERNMENT ECOSYSTEMS TO RESPOND

Practitioners of the healthcare craft in government systems, the existing bureaucracy, and the political leadership will have to embrace a never-before-done culture of transformative public health leadership in favor of citizens. The COVID-19 pandemic exposed the bottlenecks that prevail and demonstrated how fragile government ecosystems have been around the world to respond to the magnitude of the virus which brought humanity to suspended animation. Line ministries will have to work collaboratively and daily beyond the cosmetic sharing of opinions and exchange of files. In essence, this requires a new vision and line of thought in an age where new challenges exist. Existing healthcare policies will need to factor inbuilt environment and resilience to address the health impact of climate future besides future shocks. This naturally means that health policies will have to be altered and upgraded at primary healthcare as well as in the tertiary healthcare level. All future health centers must prioritize renewable energy at the core of development planning besides aligning with nationally determined contributions.

Ministry of Public Health around the world must engage in updating clinical guidelines to integrate climate components and offer educational credits for specially designed climate courses, besides preparing the health workforce to handle surge capacities during risk events. Departments such as cardiology, nephrology, neurology, and emergency medicine, which are directly linked to climate-driven outcomes must be equipped at the earliest to understand and manage the unique patient profiles who will come to the departments not due to traditional problems, but as an exacerbation to climate effects which may need interventions beyond standard medications, but rather an all-inclusive social and environmental determinants of health approach. Research institutions and universities must look at epidemiological associations around climate and health across various disciplines to facilitate a better understanding of informed policy solutions. As such the recognition that students and society must prepare for climate adaptation and change is established and rising among academia, universities must lead by example, promoting carbon-neutral practices, and outcomes.<sup>[6-8]</sup> Health science-based universities, in particular, have a crucial role in preparing future doctors for the challenges of a climate-affected world.

## AMPLIFYING CLIMATE DIPLOMACY AND AFFORDABLE HEALTHCARE

A climate-resilient health system is “one that is capable to anticipate, respond to, cope with, recover from and adapt to climate-related shocks and stress, so as to bring sustained improvements in population health, despite an unstable climate.”<sup>[9]</sup> The urgency of creating such robust systems cannot be overstated. With excessive heat becoming the new normal in many parts of the world, the battle for affordable healthcare is increasingly complex. Protecting at-risk populations, delivering low-cost healthcare, prioritizing patients, and engaging nongovernment organization partners through corporate social responsibility to strengthen grassroots healthcare will deliver superior results rather than unilateral decisions by countries resulting in multilateral setbacks, painting a watershed moment for climate diplomacy.<sup>[10]</sup>

Global health diplomacy and international health regulations must be amended to incorporate climate-centered, risk-informed planning. Member nations must cooperate to promote health diplomacy, as climatic risks are inherently transboundary. In this effort, the role health attaches play in influencing global health becomes ever more critical.<sup>[11]</sup> Foreign ministries, embassies, consulates, and honorary consulates must amplify the conversation around the intersection of health and climate to achieve visible results beyond mere talks.

## INVESTING IN COMMUNITY RESILIENCE

Local actors must be supported to create partnerships around communities to identify vulnerabilities, prioritize infrastructure upgrades, and develop localized response plans tailored to unique needs based on existential geopolitics. In addition to this, policy interventions around health promotional campaigns and built-in social protection can be thought through to nurture a healthier world. Investing in community resilience will mean addressing issues through loss and damage, to build adaptation gaps, and to also ensure global stocktake reaches grassroots uptakes. Multilateral climate dialogs will continue to progress at a snail’s pace unless grassroots champions are nurtured by co-creating health promotional initiatives cushioned with community practices. Capacity-building initiatives to prepare civil society partners and bureaucrats around risk-informed planning, preparing primary healthcare staff and support workers to be able to interpret health concerns around climate change is necessary to invest and build all cadres of professionals from a policy standpoint in achieving the desired outcome. Finally, climate financing for health systems strengthening will be a critical lever in shaping the coming decades in favor of a resilient healthcare delivery system.

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There are no conflicts of interest.

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