



doi: 10.31729/jnma.v64i301.9648

The Clinical Conundrum of Climate Crisis: Rethinking Global Health Systems for Climate-driven Health Emergencies

Aishana Joshi^{1,2}¹Department of Wellness, Nepal Medicit Hospital, Bhaisepati, Lalitpur, Nepal, ²Journal of Nepal Medical Association, Pradarshani Marg, Kathmandu Nepal.

Climate crisis has evolved from an environmental concern into an accelerating clinical and public health emergency.^{1,2} In recent years, climate crisis is being increasingly evident in emergency departments, at bedside, in operating theatres, intensive care units and across communities and public health systems worldwide.^{3,4} Frequent and intense floods, heatwaves, wildfires, droughts and storms along with shifting patterns of infectious diseases are exposing communities, clinicians and health systems to a complex and evolving spectrum of health risks. The vulnerability of health systems to these climate-driven emergencies is particularly concerning in low- and middle-income (LMIC) countries where infrastructure, workforce capacity and essential services are already constrained.^{5,6} The fundamental question for global health is therefore no longer whether climate change affects health, but whether our health systems are prepared to anticipate, respond and adapt to increasingly complex clinical consequences of a changing climate. The World Health Organization (WHO) emphasizes the need for health facilities to become both climate-resilient and environmentally sustainable.⁷ Despite mounting evidence, preparedness remains inadequate in many healthcare settings. Emergency plans often focus on isolated disasters rather than recurrent and compounding climate-related hazards. Healthcare infrastructure remains vulnerable to flooding, extreme heat and severe weather events. Supply chains for medicines, vaccines and essential medical equipment are susceptible to disruption in climate vulnerable regions.⁸ Workforce shortages further limit the capacity to respond to cascading emergencies, while surveillance systems frequently fail to integrate climate and environmental data into public health decision-making.

The World Health Organization now recognizes climate change as a fundamental health-system challenge, emphasizing that climate hazards can simultaneously increase healthcare needs while undermining the infrastructure and services required to respond to them.⁹ The clinical challenges of climate change are becoming more frequent, complex and increasingly difficult to separate from other global health emergencies. For decades, climate change was predominantly framed as an environmental or ecological concern, with health considered as one of its consequences among many. That framing is no longer adequate. Healthcare has traditionally operated predominantly through a reactive model, diagnosing and treating disease after it occurs while disaster medicine has often been structured around the assumption that the health system will remain substantially functional while responding to an external event. Climate-

driven emergencies challenge both assumptions as they can tremendously impact the health systems from multiple directions simultaneously: infrastructure, electricity, water, communications, transport, supply chains and workforce capacity.^{8,10} These create a fundamental clinical conundrum; the extreme climate event can simultaneously increase the demand for healthcare while compromising the capacity to deliver care. The health systems across the globe are designed primarily for episodic emergencies rather than responding to recurring environmental disruption and emergencies. The devastating flash floods along the Nepal- Tibet border in August 2026 reflects a stark and painful illustration of emerging climate-driven health emergency. Reports indicate that a sudden glacier-related collapse and massive debris flow unleashed catastrophic flooding through the Himalayan river system, destroying infrastructure and claiming substantial loss of lives and displacement.¹¹ Although the precise causal chain still remains under investigation, the broader context is unequivocal: a warming climate is altering glaciers and the stability of mountains increasing the potential risk for cascading hazards. Such disasters demonstrate how an environmental hazard can rapidly evolve into a complex health emergency involving trauma, disruption of essential services, infectious disease outbreak, mass displacement and mental health consequences overwhelming the health-systems.

The clinical consequences of climate change span nearly every medical specialty. Rising temperatures increase heat-related illnesses, acute kidney injury, cardiovascular events and exacerbations of chronic respiratory diseases. Wildfire smoke and deteriorating air quality contribute to asthma, chronic obstructive pulmonary disease and adverse cardiovascular outcomes.^{12,13} Changes in temperature and rainfall patterns influence the geographical distribution of vector-borne diseases, while floods and water insecurity increase the risk of waterborne infections.¹⁴ Climate-sensitive conditions increasingly intersect with non-communicable diseases, maternal and neonatal health, occupational exposures and mental health.¹⁵ Climate-related food insecurity threatens nutritional health particularly among children, elderly and pregnant women. Climate disasters also intersect with mental health impacts including anxiety, depression, post-traumatic stress disorder and community displacement.¹⁶ Climate change has become a major cause of health risks widening inequities and increasing demand across the continuum of care.

A fundamental transition in health system design is therefore imperative; a shift from reactive care and episodic disaster

response towards anticipatory, adaptive and resilient health systems capable of preparing, absorbing and responding to recurrent and cascading climate-driven health emergencies. Policymakers should embed climate resilience within national health strategies, and healthcare institutions should incorporate climate risk into operational planning. Clinicians should advocate for policies that protect both public health and the environmental sustainability and researchers should generate robust implementation evidence to guide climate adaptation strategies. Climate resilience should become a core component of healthcare planning to withstand extreme weather events while maintaining essential services during emergencies. The healthcare workforce must be equipped with knowledge, skills and capacity to tackle emerging climate related health challenges. Public health surveillance should incorporate climate data to anticipate emerging disease trends and guide resource allocation. Climate and planetary health should be

integrated into undergraduate medical education, postgraduate training and continuing professional development. Primary healthcare services which often serve as the first line of response during climate-related crises should be strengthened to ensure continuity of essential services. Early warning systems for heatwaves, floods, air pollution and infectious disease outbreaks should be integrated within healthcare delivery to enable timely prevention and effective action. Clinicians should be prepared not only to recognize and manage climate-related illnesses but also to counsel patients on preventive measures and contribute to community preparedness. Developing climate-literate health professionals is essential to translate scientific knowledge into effective clinical practice. The challenge, therefore, extends beyond building hospitals and infrastructure; it is to build resilient health systems capable of functioning effectively and efficiently amid adverse environmental and climatic conditions.

REFERENCES

- Solomon CG, LaRocque RC. Climate Change—A Health Emergency. *New England Journal of Medicine*. 2019 Jan 17;380(3):209-11. DOI: [10.1056/nejmp1817067](https://doi.org/10.1056/nejmp1817067)
- Conn DB, Magalhães RS. Climate Change: A Health Emergency for Humans, Animals, and the Environment. *One Health*. 2024 Dec 1;19:100867. DOI: [10.1016/j.onehlt.2024.100867](https://doi.org/10.1016/j.onehlt.2024.100867)
- Sorensen CJ, Salas RN, Rublee C, Hill K, Bartlett ES, Charlton P, Dymond C, Fockele C, Harper R, Barot S, Calvillo-Hynes E. Clinical Implications of Climate Change on US Emergency Medicine: Challenges and Opportunities. *Annals of Emergency Medicine*. 2020 Aug 1;76(2):168-78. DOI: [10.1016/j.annemergmed.2020.03.010](https://doi.org/10.1016/j.annemergmed.2020.03.010)
- Clark DG, Jackson EH, Hohl CM, Liang KE. Extreme Heat Impacts on Acute Care: Examining Emergency Department Visits and Hospital Admissions During the 2021 British Columbia heatwave. *The Journal of Climate Change and Health*. 2024 May 1;17:100310. DOI: [10.1016/j.joclim.2024.100310](https://doi.org/10.1016/j.joclim.2024.100310)
- Sharpe I, Davison CM. Climate Change, Climate-related Disasters and Mental Disorder in Low-and Middle-income Countries: A Scoping Review. *BMJ open*. 2021 Oct;11(10):e051908. DOI: [10.1136/bmjopen-2021-051908](https://doi.org/10.1136/bmjopen-2021-051908)
- Morris K, Pasha A, Li X, Qiao S. Disaster Preparedness of Health Systems in LMICs in the Face of Climate Change: A Systematic Mapping Review of Vulnerabilities and Response Strategies. *BMC Public Health*. 2025 Dec 12;26(1):217. DOI: [10.1186/s12889-025-25873-5](https://doi.org/10.1186/s12889-025-25873-5)
- World Health Organization (WHO). Geneva: WHO Guidance for Climate-resilient and Environmentally Sustainable Health Care Facilities; 2022. Available from: <https://www.who.int/publications/i/item/9789240012226>
- Gkouliveras V, Kalogiannidis S, Kalfas D, Kontsas S. Effects of Climate Change on Health and Health Systems: A Systematic Review of Preparedness, Resilience, and Challenges. *International Journal of Environmental Research and Public Health*. 2025 Feb 6;22(2):232. DOI: [10.3390/ijerph22020232](https://doi.org/10.3390/ijerph22020232)
- World Health Organization (WHO). Geneva: WHO Climate Change Key Facts; 2026. Available from: <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>
- Tsakonas K, Badyal S, Takaro T, Buse CG. Rapid Review of the Impacts of Climate Change on the Health System Workforce and Implications for Action. *The Journal of Climate Change and Health*. 2024 Sep 1;19:100337. DOI: [10.1016/j.joclim.2024.100337](https://doi.org/10.1016/j.joclim.2024.100337)
- World Meteorological Organization (WMO). Nepal Floods 2026. Available from: <https://wmo.int/media/news/flood-tragedy-nepal-highlights-cross-border-and-cascading-risks>
- Tran HM, Tsai FJ, Lee YL, Chang JH, Chang LT, Chang TY, Chung KF, Kuo HP, Lee KY, Chuang KJ, Chuang HC. The Impact of Air Pollution on Respiratory Diseases in an Era of Climate Change: A Review of the Current Evidence. *Science of the Total Environment*. 2023 Nov 10;898:166340. DOI: [10.1016/j.scitotenv.2023.166340](https://doi.org/10.1016/j.scitotenv.2023.166340)
- de Bont J, Jaganathan S, Dahlquist M, Persson Å, Stafoggia M, Ljungman P. Ambient Air Pollution and Cardiovascular Diseases: An Umbrella Review of Systematic Reviews and Meta-analyses. *Journal of Internal Medicine*. 2022 Jun;291(6):779-800. DOI: [10.1111/joim.13467](https://doi.org/10.1111/joim.13467)
- Dhimal M, Ahrens B, Kuch U. Climate Change and Spatiotemporal Distributions of Vector-borne Diseases in Nepal: A Systematic Synthesis of Literature. *PloS one*. 2015 Jun 18;10(6):e0129869. DOI: [10.1371/journal.pone.0129869](https://doi.org/10.1371/journal.pone.0129869)
- Grace JM, Kassa MD. Public Health Challenges of Climate Change-induced Non-communicable Diseases in Vulnerable Populations and Resource-limited Healthcare System: A Systematic Review. *BMC Public Health*. 2026 Jun 1. DOI: [10.1186/s12889-025-25049-1](https://doi.org/10.1186/s12889-025-25049-1)
- Cianconi P, Betrò S, Janiri L. The Impact of Climate Change on Mental Health: A Systematic Descriptive Review. *Frontiers In Psychiatry*. 2020 Mar 6;11:74. DOI: [10.3389/fpsy.2020.00074](https://doi.org/10.3389/fpsy.2020.00074)