

8. WHAT IS THE HEALTH AGENDA FOR CLIMATE ADAPTATION?

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Source: David Trilling

Climate change is already reshaping health outcomes across India through more frequent and intense heat waves, erratic rainfall, wildfires, and coastal degradation. Among these, extreme heat poses the most direct and immediate threat to human health and well-being. Rising temperatures exacerbate infectious disease patterns, reduce agricultural productivity, and strain India's already burdened health system. Without urgent investments in adaptation, escalating heat and climate impacts will outpace the capacity of India's health infrastructure and workforce, deepening inequities across regions and populations.

To frame a credible health agenda for climate adaptation, we first need to understand the limits of what we know, and why our data systems fail to capture the true scale of climate-related health impacts.

Ascertainment challenges

Accurately measuring the health impacts of heat remains one of the central challenges in developing a credible climate-health agenda. Many heat-related illnesses and deaths go unrecorded or are misclassified under other causes, making the true burden of heat exposure difficult to ascertain. Attribution is further complicated by India's climatic and social diversity: Human adaptability to heat varies across regions, occupations, and housing conditions, while underlying health, gender, and socioeconomic inequalities shape vulnerability.

While global studies illuminate broad climate-health trends, India's highly heterogeneous environments demand fine-grained analyses of vulnerability and exposure. Yet, much of India's current evidence base relies on coarse environmental thresholds or extrapolations from temperate regions (Mazdiyasi et al.,

2017). Heat-health research must evolve to capture the synergistic effects of temperature, humidity, and radiation—metrics such as wet-bulb temperature or heat indices are better aligned with physiological stress than simple ambient temperature measures.

Building an evidence base will require local, contextually grounded research and improved epidemiological data. Current thresholds for declaring heat waves in India are environmental, not epidemiological. As a result, they fail to reflect the actual temperature-mortality relationships that should guide preparedness and response. Finer-grained epidemiological data would enable threshold-setting that reflects real health impacts rather than arbitrary meteorological categories. Similarly, vector-borne disease models must be recalibrated to account for local environmental and behavioral realities rather than relying on generalized temperature-transmission correlations.

Finally, timely and transparent communication of uncertainty must become a central norm in climate-health modeling. All models carry uncertainty; formal mechanisms to communicate confidence ranges would strengthen public trust and enable policymakers to make risk-informed decisions. Long-term, large-scale cohort studies that track heat exposure and outcomes will be critical to understanding chronic climate-health interactions, but interim progress can and should be driven by locally owned, shorter-term surveillance systems and sentinel sites.

Data challenges

Beyond scientific uncertainty, India's ability to measure and respond to heat-health impacts is further constrained by fragmented data systems. India has begun enhancing surveillance and digitizing data on climate-sensitive health outcomes, including heat-related illness and vector-borne diseases. However, significant gaps persist. Data from the private sector, which delivers nearly two-thirds of all inpatient care, remain largely absent from national registries (National Sample Survey Office, 2019; La Forgia and Nagpal, 2012). Where records exist, inconsistent coding and limited digitization impede their integration into usable datasets. The absence of updated demographic baselines (India's last census was conducted in 2010) further undermines accurate disease burden estimation. Civil registration systems still fail to fully capture mortality, and morbidity data remain fragmented across institutions with limited interoperability. The monetization of meteorological data by national agencies adds a further barrier, constraining access to information that should be treated as a public good.

Bridging these gaps requires both regulatory reform and a shift in mindset. Mandating aggregated and anonymized health reporting from the private sector, treating publicly funded meteorologic and public health data as open-access infrastructure as clearly articulated by the government's Digital Public Infrastructure goals (Chawla and Iyer, 2025), and improving data interoperability, would transform the ability to link local environmental exposures with health outcomes. Investments in minimum viable datasets that integrate meteorological and health data—even if imperfect—would deliver far more value than delayed, high-precision systems. Integrating insurance claims and electronic health records could further accelerate the creation of a robust indigenous evidence base on climate-health linkages.

Possible intervention pathways

To be meaningful, the health agenda for climate adaptation must first center heat, the most pervasive and measurable stressor linking climate change and health. Heat offers a diagnostic lens for systemic weaknesses across surveillance, infrastructure, and governance. A credible adaptation agenda must therefore transform

how India anticipates and manages both acute and chronic exposures, strengthening prevention, workforce readiness, data integrity, and institutional coordination, all while embedding equity as its guiding principle. Adaptation is not only about protecting lives during extreme events; it is also about rebuilding health systems for resilience under sustained climatic stress.

The three approaches we propose below (of several other possible approaches) acknowledge that Alma-Ata goals from the late 20th century remain unattained for the vast majority of the world's population, and these interventions must be seen not as a panacea but as complementary efforts to strengthen primary care, and to invest in improving social determinants of disease.

Human capacity

Across South Asia, frontline clinicians frequently misdiagnose heat-related illness, mistaking it for other conditions (Chakraborty, 2024). Updating medical, nursing, and allied health curricula to include climate-health competencies is essential. In-service training modules must enable providers to recognize, treat, and prevent heat stress, while managing its interactions with chronic diseases, maternal health, and mental health. Task-sharing models—empowering community health workers to monitor vulnerable populations and deliver early interventions—can extend the reach of care in resource-constrained settings.

Programmatic pathways

Heat resilience must also be embedded within existing health programs. Maternal and child health, noncommunicable disease management, and WASH programs should integrate heatwave-specific protocols. Nutrition schemes, including school meals and the public distribution system, must adapt to heat- and drought-induced food insecurity. The National Programme on Climate Change and Human Health provides a national scaffolding for such integration, but sustained progress will depend on state-level innovation, financing, and accountability.

Infrastructure

A credible adaptation agenda also must confront the challenge of building climate-resilient health systems—particularly those capable of responding to extreme heat. Heat waves and floods routinely strain India's health facilities, disrupt power and water supply, and overwhelm staff. Strengthening resilience, however, requires both structural and functional reforms, including in facility design and siting, updated building codes for public and private providers, and national standards for climate-resilient infrastructure. Existing frameworks such as the Indian Green Building Council's rating system and the Ministry of Health and Family Welfare's guidelines for green and climate-resilient health facilities (NCDC, 2023) provide useful starting points. Mandating their application to future building codes and standard procurement processes for health facilities would be a practical first step.

In conclusion

India's health system stands at a crossroads. The country has made commendable progress in data digitization, surveillance, and programmatic innovation. Yet, the accelerating pace of climate change—and the centrality of heat as its most visible manifestation—demands an urgent shift from incremental adaptation to systemic reform. Strengthening data systems, building locally relevant evidence, and investing in resilient infrastructure and workforce capacity will be essential to safeguard health in a warming world. Centering heat adaptation within this agenda can provide the practical and conceptual foundation for a broader transformation toward climate-resilient health systems.