

Heatwave Deaths Are Avoidable

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INTRODUCTION

Heatwave Deaths Are Avoidable

By *Mihir R. Bhatt**, AIDMI, India

All disaster deaths may not be avoidable but all heatwave deaths are avoidable.

This is what I have picked up today here from over a hundred participants and panellists during this Avoidable Deaths Network's (ADN) International Awareness Day for Avoidable Deaths (IAD4AD) global campaign event. We now know enough about how to reduce heatwave-caused mortality as well as reducing the number of heatwave-affected people who may suffer loss of life.

We also know from the efforts of the National Disaster Management Authority (NDMA) of India how best to reduce and avoid direct heatwave-related economic losses that lead to deprivation and deaths. We also know how to reduce damage to health and life during a heatwave. The Indian Institute of Public Health (IIPS) has also accelerated its efforts to protect the health and well-being of citizens from heatwaves.

We have more and more cities coming up with heatwave action—plans since their inception in Ahmedabad, India—that can protect life and, therefore, prevent deaths. The India Meteorological Department (IMD) now has more actionable outreach to key sections of the Indian population of heatwave-affected cities.

We know how to cooperate around heatwaves to save lives, may it be through local or international collaboration or alliances among the best expert and experienced agencies. We have a universal multi-hazard Early Warning System (EWS) that is effectively focused on heatwave warning to each citizen who can take action to save lives as an individual, as an institution, or as

a part of an enabling policy environment. And this EWS is improving each season, as is evident.

It has been established that states such as Gujarat and Odisha in India and cities such as Dhaka in Bangladesh and Karachi in Pakistan have taken broad steps to mitigate heatwave impacts in time to save lives and livelihoods.

Therefore, there is no reason to have any more heatwave deaths in India. Heatwave deaths are avoidable. And we must do all that we can to avoid heatwave deaths.

ADN has clearly shown a way ahead for us all now for some time on how to prevent avoidable deaths from disasters. We must focus our efforts. Heatwave is one such important focus for us. We must move ahead on that path to save lives during any heatwave in 2024 and from 2025 onwards. Now, allow me to list down how to achieve this.

What is needed is universal awareness that heatwave deaths are avoidable. We need this awareness among all authorities, across the private sector, and among citizens. All India Disaster Mitigation Institute (AIDMI)'s new work with the Uttar Pradesh State Disaster Management Authority (UPSMDA) on the agriculture sector shows that heatwave awareness is possible to be actionable when convergence takes place. AIDMI's work with ALNAP on global lessons from heatwave response also suggests the collaborative role of awareness among the affected population.

What is needed is investment, specifically in areas that are hotspots: cities, economic sectors, and social strategy. A recent ongoing national demand study of small businesses affected by heatwaves in Odisha,

Kerala, Gujarat, and Uttar Pradesh by AIDMI shows what affected businesses know, what they want, and how much money to use for loss and damage, anticipation, and insurance fund.

What is needed is governance to reduce the impact of heatwaves, increase the impact of cooling measures, and actions that protect life, especially at the local level. AIDMI work with communities in the deserts of Gujarat, the coastline of Mumbai, and the delta of Sundarbans with leading social scientists in project TAPESTRY shows the local, decentral, inclusive, transparent, and accountable governance works in addressing the impact of heatwave on people in marginal environments.

What is needed is anticipatory actions to reduce deaths as the heatwaves and related loss of life are and will accelerate in the coming years. In this affected poor, migrants, women, youth, and small farmers must be leading actions to avoid heatwave deaths. AIDMI's work with the Institute of Development Studies (IDS), UK on the ANTICIPATE project findings in north Gujarat underlines that it is possible for locally affected population groups to anticipate protection and preparedness actions from the lessons they have learned from heatwaves.

This is what I have learned from ADN and AIDMI on heatwave deaths: heatwave deaths are avoidable. It is up to us, to save lives. And that is what each of the contributors is saying in this publication. ■

**Mihir R. Bhatt presented at ADN's IAD4AD global campaign event in Odisha, March 12, 2024.*

OVERVIEW

Comment from the Guest Editor

By *Dr. Nibedita S. Ray-Bennett, Avoidable Deaths Network, UK*

The Special Issue *Heatwave Deaths Are Avoidable* is released to mark the first year of the Avoidable Deaths Network's (ADN) Global Campaign 'International Awareness Day for Avoidable Deaths' (IAD4AD) on 12 March 2024.

I congratulate Mr Mihir Bhatt and his team at the [All India Disaster Management Institute](#) (AIDMI) for bringing this Special Issue to fruition. The Newsletter consists of 17 articles written by 22 national and international authors representing more than four countries. The articles bring forth the debilitating impact of heatwaves on health, livelihood, critical infrastructure and ecosystems across time, space and scale. The articles are short, succinct, and easy to read. I am confident this newsletter will act as an excellent reference point for readers now and in the future.

Heatwave disasters are one of the most pressing issues of the second half of the 21st century and beyond. The direct impact of this type of disaster is mortality and morbidity. Both outcomes are detrimental to sustainable human development. Therefore, it is paramount that international, national and local governmental and non-governmental organisations including the at-risk community prioritise taking action to reduce the impact of mortality or disaster deaths and morbidities from heatwaves.

I am the convenor of ADN - a global-local membership network of more than 800 members dedicated to reducing avoidable deaths from natural hazards, naturally triggered technological hazards and human-made hazards. ADN is based at the University of Leicester in the UK and Kansai University in Japan.

Four important questions underpin ADN's research, enterprise, engagement, and outreach activities:

1. Who is carrying the most burden of avoidable disaster deaths?
2. What are the 'causes and circumstances' surrounding avoidable disaster deaths?
3. Who is responsible for reducing avoidable disaster deaths?
4. How can avoidable disaster deaths be reduced?

I used these questions to review the articles and I found answers that are informative and merit attention from policymakers and practitioners to bring positive change to reduce avoidable heatwave disaster deaths.

Tribal people (Saxena et al., (Article 3) and Rao and Sahoo (Article 7)); daily labourers, small vendors (Nanda (Article 6); economically and socially marginalised urban residents, e.g., those living in informal settlements (Fernandes Article 14); and children, the elderly, and people who are chronically ill (Liao and Cai (Article 15)) carry the most burden of avoidable heatwave disaster deaths. The data from these articles demonstrate that circumstances surrounding these deaths vary based on occupation, place of residence, socioeconomic status, pre-existing morbidity, vulnerability by age, environmental risk, and individual and the community's risk-taking behaviours (among others).

The responsibility to reduce the impact of heatwave disaster deaths and morbidities at household and population levels does not lie with one stakeholder but with multiple stakeholders at different levels and spaces. The decision-making to save lives with actionable solutions then

lies with different sectors, organisations, and individuals (see Yadav - Article No. 18).

Hazard mitigation and management that requires a cross-sectoral and multi-stakeholder approach can be challenging. Authors offer novel approaches to overcome this challenge by using a cultural theory of risk by Morgner (Article 26); a whole-of-society approach by Fernandes (Article 14); AIDMI's strength-based appreciative inquiry approach (Article 13); Kerala State Disaster Management Authority's pro-active approach (Article 4); and data science that informs decision approach (Article 8) (among others).

The articles also bring forth evidence-based strategies, plans, and actions for self-care and collective care to mitigate the impact of heatwaves. For instance, Saxena et al., and Rao and Sahoo's indigenous self-care practices; AIDMI's Heatwave Early Warning System and eight preventable strategies to reduce heatwave-related deaths in India, and Heatwave Guide for Red Cross Red Crescent Branches (among others).

As our human-built environment continues to heat up due to the changing climate, it is paramount we understand how the heatwave disasters impact our bodies and minds (see Nanda and Ekezie's articles). It is also important to understand the circumstances that lead to avoidable heatwave deaths to derive context-specific solutions. Although heatwave disasters are a global problem (see Ghadiali Article 18), they require local solutions to save the lives of the most vulnerable groups in low and high-income countries. ■

Heatwave Avoidance Techniques and Routes to Health Resilience in India

By Nishant Saxena¹, Arpit Maurya² and Shruti Singh Saxena³

We were amidst the Bhil tribe of Rajasthan - one of the most populous tribes of India - and facing scorching heat during our fieldwork in April and May. Facing the atrocities of harsh climate is one of the hurdles anthropologists face, often successfully, but barely evident in our writings!

As global warming continues to impact the world, the frequency and intensity of extreme weather events such as floods, droughts, and heatwaves have increased which have drastic consequences on humans and biodiversity. India saw the year 2023 ending as the second warmest on record since 1901, with the Indian Meteorological Department (IMD) noting that August and February 2023 were the warmest in the last 123 years (Ray, 2024). A very important study comes to cognizance by Azhar et al. (2017) which attempted mapping of heatwave vulnerability across the country and highlighted that districts with higher heat vulnerability are found in the country's centre (*i.e.*, Central India), particularly in less urbanised areas with low rates of literacy, lesser access to water and sanitation, and the scanty presence of household amenities. So, when it comes to coping with heatwaves, what about the tribes who are mainly concentrated in this part of the country and mostly exposed to low-resource settings? Mind you, India is



Traditional head covers used by the Baiga tribe of Dindori, Madhya Pradesh to save themselves from direct sunlight. Photo Copyright: Dr. Nishant Saxena, ICMR-NIRTH Jabalpur.

home to about 104 million tribal population inhabiting almost all parts of the country.

We find that since time immemorial traditional knowledge of tribes, has been inseparable and intricate part of their culture has been coming to their rescue. Tribes behold extensive know-how about shelter and home

architecture, clothing and personal protection, water management, dietary practices, traditional herbal knowledge and healing practices, to name a few. A vibrant example of this waning knowledge system is the use of traditional headgear like turbans, hats, or scarves to protect the head and face from direct sunlight. For instance, the Bishnoi

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tribe in Rajasthan wears turbans (safa or pagri or pagdi), usually white in colour, that serves both as a cultural symbol and as effective protection against the intense desert sun (Dashora & Srivastava, 2019; Choudhary & Qureshi, 2024). Likewise, ornamental accessories like large bamboo hats worn by the Konyak tribe in the northeast part of India not only showcase cultural identity but also protect from the sun. In consonance with the traditional knowledge of tribes, the recent strengthening of primary healthcare infrastructure in rural and tribal areas by the government has certainly been of some help when it comes to battling heatwaves. However, there is a long path to traverse.

Our view is that there is a dire need to aggregate more structured data on mortality and morbidities due to heatwaves, especially in tribal areas which are mostly far-flung and face resource crunch (Pandey, 2023). Furthermore, a helpful initial step in shielding the general people from the negative health effects of heat is the creation and mapping of a heat vulnerability index. Sub-district levels of susceptibility could be investigated, and data on heat exposure and health outcomes can be included in future research to validate the index. Furthermore, to make the health measures derived from indigenous tribal knowledge more widespread, beyond their immediate communities, several steps may be initiated. The first is a concerted effort to document and

validate these traditional practices through scientific research to lend credibility and acceptability within mainstream healthcare systems. Then, IEC (information education and communication) programs could be developed to raise awareness in the public about the effectiveness of these traditional tribal practices in mitigating heatwave-related illnesses. Such efforts should involve tribal communities.

We believe that by combining research, education, community engagement, and policy advocacy, the age-old health measures of tribes can be more widely recognized and incorporated into broader healthcare strategies to benefit a larger population in India.

Conflict of interest: There is no conflict of interest.

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Further readings:

1. Mishra, N. (2022). Cost-effective traditional and modern coping strategies for heatwaves prevalent in tribal, rural, and urban India. Global Disaster Preparedness Centre. <https://preparecenter.org/wp-content/uploads/2023/01/India-Heat-Strategies-Research-by-N.-Mishra-2022.pdf>

2. Prayas, (2022, May). A review of Heat and Health research in India: Knowledge gaps in building climate change adaptation responses. https://energy.prayaspune.org/images/pdf/a_review_of_heat_and_health_research_in_india._391591819.pdf

References:

1. Azhar, G., Saha, S., Ganguly, P., Mavalankar, D., & Madrigano, J. (2017). Heat Wave Vulnerability Mapping for India. *International Journal of Environmental Research and Public Health*, 14(4), 357. <https://doi.org/10.3390/ijerph14040357>
2. Choudhary, R., & Qureshi, S. (2024). A study on the traditional costumes of the Bishnoi community. *International Journal of Home Science*, 10(1), 115-120. <https://www.homesciencejournal.com>
3. Dashora, S., & Srivastava, M. (2019). Rajasthanian traditional headgear: protection to sophistication. *Asian Journal of Home Science*, 14(2), 463-467.
4. Pandey, K. (2023, July 26). Data gaps in heatwave deaths widen as India battles record-smashing temperatures. *Down to Earth*. <https://www.downtoearth.org.in/news/climate-change/data-gaps-in-heatwave-deaths-widen-as-india-battles-record-smashing-temperatures-90839>
5. Ray, K. (2024, January 1). IMD says 2023 was the second warmest year for India since 1901. *Deccan Herald*. <https://www.deccanherald.com/india/imd-says-2023-was-second-warmest-year-for-india-since-1901-2831841>

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Kerala Battles the Heat: A Proactive Approach

By *Fahad Marzook T U*, Hazard Analyst (Meteorology), Kerala State Emergency Operations Center (KSEOC), Kerala State Disaster Management Authority (KSDMA), Kerala, India

Kerala, with its well-known monsoon season and moderate temperatures, is facing a new challenge – extreme heat. This rise in temperatures is not just uncomfortable; it's a serious threat to people, wildlife, and the environment. Kerala, however, is demonstrating a proactive approach to combating heatwaves. The Kerala State Disaster Management Authority (KSDMA) is at the forefront of this fight. Recognizing the urgency, KSDMA has declared **heatwaves, sunstroke, and sunburn as state-specific disasters**. This allows access to disaster relief funds (SDRF & SDMF) for crucial relief and mitigation efforts. KSDMA also launched awareness programs to educate the public and established a UV index monitoring network to track harmful ultraviolet radiation.

Kerala's Heat Action Plan (HAP) is a comprehensive strategy for

tackling heatwaves. It uses scientific analysis to address heat-related challenges, with a particular focus on protecting vulnerable communities. The plan includes measures to reduce disaster risks, allocates finances for mitigation initiatives, and promotes **sustainable cooling solutions**. To address local needs, **Local Heat Action Plans (LHAPs)** are being developed in collaboration with local governments. The revised HAP goes beyond immediate physical dangers. It incorporates considerations for **mental health during extreme heat events**, explores architectural interventions for heat mitigation in buildings, and addresses potential **human-animal conflicts** that might arise due to changing weather patterns. Importantly, the plan emphasizes collaboration across various sectors – from water management and energy efficiency to ensuring inclusivity in heat resilience strategies.

A pioneering initiative under KSDMA, **Heat Resilient LSGs**, focuses on building resilience at the local level. LSG stands for Local Self Government, the building blocks of Kerala's administration. This initiative promotes sectoral interventions, strengthens the capacity of local bodies to respond to heatwaves, and aims to create replicable models for other regions. Moodadi, a coastal panchayat in Kozhikode has been selected as the living lab of KSDMA for the Heat Resilient LSGs program. Along with Sectoral interventions guidelines for construction practices ensure heat resilience in infrastructure, including the creation of **Heat Resilient Anganwadi centres**.

To address immediate health concerns, Kerala is establishing **heat clinics** in major hospitals. Additionally, the health department will ensure primary health centres



KSDMA establish water kiosks in Thanneer Pandals, Kerala. See the location of water kiosks: https://sdma.kerala.gov.in/wp-content/uploads/2020/09/Water-Kiosks_Kerala_compressed.pdf

are equipped to handle heat-related emergencies. During the scorching summer of 2023, **Thanneer Pandals** – cooling centres offering water, fruits, and oral rehydration solutions – were a huge success. Local communities played a vital role in setting these up. The Kerala water authority collaborates with KSDMA to identify areas facing water scarcity during hot summers and establish **water kiosks** in those locations. Local governments are responsible for maintaining these kiosks, with financial support from KSDMA.

Kerala's commitment to combating heat extends beyond the HAP. The State Action Plan on Climate Change (SAPCC) provides a broader

framework for comprehensive climate adaptation and mitigation strategies. KSDMA collaborates with the Kerala Institute of Local Administration (KILA) to focus on climate change downscaling for LSGs, ensuring local governments have the information they need to prepare. Additionally, partnerships with institutions like the Woodwell Climate Research Centre and Geohazards International helps create localized data on **heat projections** using advanced climate models (CMIP6). This data is crucial for effective planning and decision-making in the face of climate change-induced extreme heat events. Furthermore, Kerala collaborates with UNICEF, GeoHazards Society,

WRI India, and various universities & institutes to share knowledge and develop effective heat mitigation strategies.

Kerala's battle against extreme heat is a testament to its unwavering commitment to public well-being. From recognizing heatwaves as disasters to pioneering initiatives like Thanneer Pandals and the Heat Resilient LSGs project, KSDMA has consistently demonstrated proactive leadership. The state's emphasis on collaboration with NGOs, communities, and academic institutions fosters collective ownership of heat mitigation strategies, ensuring effective implementation and adaptation. ■

HEATWAVE GUIDE

Heatwave Guide for Red Cross Red Crescent Branches

By *Prepare Centre, IFRC Global Disaster Preparedness Centre, USA*

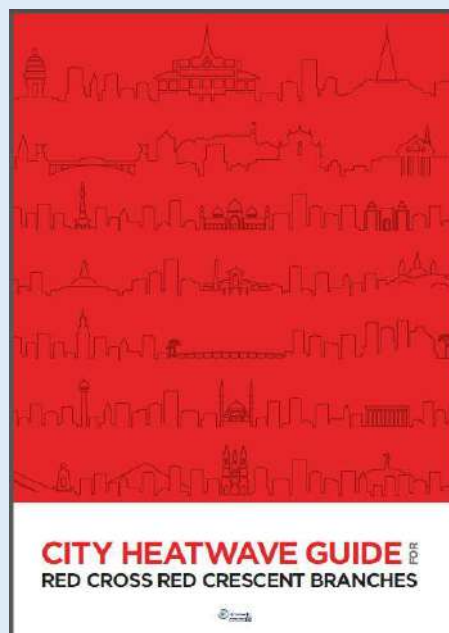
This guide is tailored towards practical actions that can be led by Red Cross Red Crescent branches in preparing for, and responding to, heatwaves in towns and cities.

The City Heatwave Guide for Red Cross Red Crescent Branches is a guide based on the comprehensive [Heatwave Guide for Cities](#) but it is tailored towards practical actions that can be led by Red Cross Red Crescent branches in preparing for, and responding to, heatwaves in towns and cities. While aspects of these actions may be new, the most recommended actions can be easily integrated into existing branch activities.

While heatwaves can affect rural and urban areas, **this guide is tailored towards actions in urban areas.** Temperatures in towns and cities tend to be hotter than the surrounding rural areas due to the many surfaces – such as densely packed buildings, roads, and pavements – that absorb heat and release it slowly.

This effect makes towns and cities hotter for longer. A branch located in a rural area may choose to modify some of the actions to be better suited for this area.

The [City Heatwave Guide for Red Cross Red Crescent Branches](#) is available in [Amharic](#), [English](#), [French](#), [Dutch](#), [Hindi](#), [Indonesian](#), [Spanish](#), and [Swahili](#). ■



Heatwave: A Silent Disaster

By Dr. Ambika Prasad Nanda, Head, Corporate Social Responsibility, Tata Steel, Odisha, India

The world is experiencing a significant increase in extreme heat that can be attributed to an increase in average global surface temperature. Within a period of 150 years, the global surface temperature has increased by about 0.3 to 0.6°C, and the increase of temperature has fastened in post-1975 years. Data confirms that the frequency and duration of heatwaves have increased significantly over the last 50 years. In the United States, heatwaves already killed more people during a typical year than floods, tornadoes and earthquakes combined. *There has been a remarkable run of record-shattering heatwaves in recent years, from the Russian heatwave of 2010 that set forests ablaze to the historic heatwave in Texas leading to critical drought conditions, claiming huge economic and resource loss in 2011. 2003 European heatwave claiming 70,000 lives from all over Europe to chronicle heatwaves shattering the life and economy of the Indian subcontinent within the last 25 years is a matter of great concern. Economically poor and marginalized sections of India are the worst victims of heatwaves. Extreme temperatures generating a number of ripple effects like heatwaves, drought, forest fire, and drying up the water bodies to mention a few have a tremendous impact on the life and economy of the country. Data shows that extreme temperatures, agricultural failure, and labour migration moves in the same direction.*

Heatwave is an atmospheric condition in which hot and humid days consecutively prevail for a long period of time. World Meteorological Organization defines a heatwave as five or more consecutive days during which the daily maximum

temperature exceeds the average maximum temperature by five degrees Celsius. If the maximum temperature of any place continues to be more than 45° C consecutively for two days, it is termed a heatwave condition. There will be no harm to the human body if the environmental temperature remains at 37° C. Whenever the environmental temperature increases above 37° C, the human body starts gaining heat from the atmosphere. If humidity is high, a person can suffer from heat stress disorders even with the temperature at 37°C or 38°C.

Temperature beyond a certain threshold limit along with high humidity rate is the main reason behind the sufferings. In the coastal area humidity is high during the summer season. Tremendously high temperatures and high humidity lead to excessive sweating in the human body. The sweat won't dry on the skin to give it a cooling effect; on the contrary it gets vaporized due to atmospheric temperature leading to dehydration of the body. It is not only the high temperature but the combination of heat and humidity that makes matters worse. Sometimes the condition proves to be fatal.

The systems in the human body that enable it to adapt to heat become overwhelmed. When a person is exposed to heat for a very long time, the first thing that shuts down is the ability to sweat. It is known that when perspiration is dried by the air there is a cooling effect on the body. Once a person stops perspiring, in very short order, a person can move from heat exhaustion to heat stroke.

During the transition from heat exhaustion to heat stroke, the body begins perspiring profusely, and when that shuts down, the body becomes very hot. Eventually, that begins to affect the brain, and that's when people begin to get confused and lose consciousness. As the body temperature increases very rapidly, the central nervous system and circulatory system are impacted. In places where there have been prolonged heat exposures, there is probably a broad impact on many organ systems.

High temperatures not only increase the risk of mortality, they also increase the incidence of morbidity. If the temperature remains elevated overnight, then the body doesn't get the respite that it needs. This leads to other kinds of heat-related diseases like heat rash accompanied by acute inflammation and blocked sweat ducts. Continuation of heat rash for a duration of time leads to the development of chronic dermatitis a secondary bacterial infection. Heat syncope is another kind of heat-related disease. It happens because of intense sweating leading to dehydration followed by peripheral vasodilatation and reduced venous blood return in the face of decreased vasomotor control. Management of heat syncope consists of cooling and rehydration of the patient using oral rehydration therapy.

Heat cramps are painful, brief muscle cramps that occur during or after exercise or a heavy load of work in a hot environment. Muscles may spasm or jerk involuntarily. Cramping may also be delayed and occur a few hours later. They are

caused by a deficiency in electrolytes and are treated by rehydrating with fluids through the mouth or intravenously (IV).

Heat exhaustion is considered to be the forerunner of heat stroke. It may even resemble heat stroke, with the difference being that the neurological functions remain intact. It is a medical emergency that caused by the loss of water and electrolytes through sweating. Symptoms include nausea, dizziness, irritability, headaches, thirst, weakness, high body temperature, excessive sweating, and decreased urine output. Heat stroke is more severe and requires medical attention—it is often accompanied by dry skin, a body temperature above 103 degrees Fahrenheit, confusion and sometimes unconsciousness.

Health Impact

- This brings a strong impact on health by creating

cardiovascular problems, renal and respiratory disorders, metabolic disorders and heat stroke.

- Sporadic increase in vector born disease by affecting the geographic range of vector distribution and increase in vector population and vector activity. Cases of “Chikungunya” and “Dengue” fever increase during the summer season.
- Water scarcity is a major problem of heatwave. High temperatures and heavy precipitation reduce the availability of water for the common man dependent on natural sources like rivers, ponds, streams, etc. This causes major suffering for the people.
- Insufficient availability of water sometimes forces people to take food in an unhygienic manner causing food-borne disease.

- Ultraviolet radiation increases during high temperatures in summer. Daily labourers, small vendors, and lower-income groups are mostly exposed to radiation and are susceptible to serious kinds of skin-related diseases.
- Temperature beyond a threshold affects psychology, creating hypertension, thereby creating mental unhealthiness among the masses.
- Rise in the number of Chronic Kidney Diseases (CKD).

The rising temperature and the frequency of the heatwaves are looming large over human society, and many lives are lost because of ignorance about the impact of heatwaves. This is the most opportune time to make the people aware and build appropriate health care facilities to save the lives of the people. ■

COPING MECHANISM

Heat Stress and Coping Mechanism among the Kutia Kondh Tribes of Lanjigarh, Kalahandi District

By *T. Jyoti Rao*, Research Scholar; and *Dr. Madhulika Sahoo*, Assistant Professor; Department of Anthropology, MaaManikeshwari University, Odisha, India

Heatstress includes a series of conditions where the body is under stress from overheating. Every year, because of heat, India loses thousands of people during the summer. In a western city of India, the heat-related death count in the year 2010 was nearly 1400, and in 1998, Odisha lost 2042 people (Swain 2019). Odisha experiences heatwaves from March until June, with extremes in May. Odisha is projected to see 42,334 excess climate-related

deaths due to the increase in temperature till now (Sahu 2023).

Kalahandi district is quite famous for its scorching weather, especially during the summer when the maximum temperature is 45C. This study aims to explore the perception of the causes and effects of heatwaves and explore the coping mechanism by the Kondh tribes of Lanjigarh block’s “Batelima” Panchayat.

Causes and Experiences of Heatwave

Kutia Kondh spend most of their time in the forest for MFP, i.e. Kendu leaves, Siali leaves, Sal seeds, Mahua flowers, tamarind, etc. and found it difficult to deal with the searing heat in summer. Tribal homes would earlier be made of mud, baked clay tiles or paddy straws, which were eco-friendly and relatively cooler during summer and have been replaced by concrete houses given under government schemes.

People witnessed extreme heat in summer for nearly 6 months over 10 years. The amount of rain and cold has decreased due to the hills and deforestation for the Industry like “Vedanta”. The level of groundwater could actually turn out to be a mirage in the hilly parts of the area. Water scarcity is a major problem with no water bodies like ponds and wells. Participants noted an increase in incidents of sunstroke, problems like dehydration, heat cramps, and heat exhaustion during heatwaves were common. In order to protect themselves from heat stress the tribal people adopt various coping mechanisms.

Coping Mechanism

People use clay and cow dung in plastering the walls and floors for cooling purposes and make heat-resistant houses by using coconut, palm leaves, paddy straws and other natural fibres as reinforcements in

Food / Fruits	Local Name	Scientific Name
Finger millet/ Ragi	Mandiacopeh/Dorcopoh	Eleusine coracana
Maize/Corn	Maja/ Jana	Zea mays
Kendu /Tendu	Kendu	Diospyros melanoxylon Roxb
Ram phal/ Bullock’s heart	Ram phal	Annona reticulata
Lemon	Lembu	Citrus limon
Kuler Saag/ Koinar Saag	Borda saag	Bauhinia variegata
	Gandhri saag	

mud houses which are low-weight, and breathable.

Applying castor oil to hair and feet for cooling purposes, using thin cotton clothes, covering the whole body while exposed to the sun and using wet towels around the head and face at work are the remedies followed by the tribal people.

Millets are among the major crops cultivated by the tribes, it is a staple food and central to their culture. People cultivate (Ragi, Maka, Kusla,

Rice, Kandul, Kating, Gurji, Jawri). *Ragijau or Mandiapeja* (Dorcopoh) is incorporated as a regular diet in the Kutia Kondh tribes as it has a naturally cooling effect which mitigates excess heat, and acidity and provides stability and energy.

The practice of eating “*Kushlabhat*” (a local grain), and “*pakhal*” (fermented water rice) during summer is a relief from extreme hot temperatures and it saves from dehydration. Local green leaves i.e. ‘*Gandhri sag*’ and ‘*Borda sag*’ (Bauhinia variegata) are often taken as leafy vegetables. They frequently use summer drinks such ‘*TaadiKallu*’ (Palm wine). The table showcases the various foods consumed by the tribal people to protect themselves from the heat stress.

References:

1. Mishra, M.M. and Sahu, N., Climate and disease vulnerability analysis in blocks of Kalahandi District of Odisha.
2. Kovats, R.S. and Kristie, L.E., 2006. Heatwaves and public health in Europe. *The European Journal of Public Health*, 16(6), pp.592-599.
3. Swain, S., Bhattacharya, S., Dutta, A., Pati, S. and Nanda, L., 2019. Vulnerability and adaptation to extreme heat in Odisha, India: a community-based comparative study. *International Journal of Environmental Research and Public Health*, 16(24), p.5065.
4. Sahu, P. R., 2023. Odisha reels under intense heatwave condition; IMD issues orange alert, Climate Change. ■



Image showing tribal women with Gandhri Saag, Odisha, India.

DATA and Humanitarian Action in India

By *Anoushka Wanchoo*, Humanitarian Aid International, New Delhi, India

1. What is the Dashboard for Aid Transparency and Accountability (DATA)?

DATA, an acronym for "[Dashboard for Aid Transparency and Accountability](#)," is a user-friendly platform tailored for NGOs operating in India and donors worldwide contributing funds within the country. Its core objective is to bolster the financial transparency of humanitarian funding in India and meticulously track the allocation of funds to grassroots organisations. By providing NGOs with a platform to proactively showcase their accountability to the communities they serve, DATA fosters transparency in the aid sector. It offers comprehensive information on humanitarian funding from inception to utilisation, promoting greater participation, instilling donor confidence in recipient organisations, highlighting active organisations, and facilitating enhanced coordination among donors and stakeholders.

2. Why it matters to India?

Currently, there exist two prominent international platforms, namely the Financial Tracking Service (FTS) overseen by UN OCHA and the International Aid Transparency Initiative (IATI). While these platforms primarily focus on capturing global-level funding, the Dashboard for Aid Transparency and Accountability (DATA) introduces additional features tailored to enhance relevance for country-level reporting and tracking, particularly in the context of humanitarian responses in India. DATA offers simplified reporting

templates, ensuring that even smaller organisations can easily report their financial data. Moreover, it includes specific data fields to capture both domestic and international humanitarian funding flowing into India. Furthermore, DATA meticulously tracks the utilisation pattern of funds until they reach the affected communities, providing insights into the effectiveness of aid delivery. Additionally, it captures data on funding passed on to local or national organisations, thereby fostering transparency and accountability throughout the aid distribution process.

3. What is data important in humanitarian action?

- **Sources of Funding:** Funding data reveals where financial resources are coming from. This may include government grants, donations from individuals or corporations, revenue from fundraising activities, investments, or loans from financial institutions.
- **Transparency of Funds:** Understanding how funds are allocated provides insights into organisations' priorities and strategies. DATA will help to determine who the first responders are and the funding they were able to access. Eventually, DATA will help the local actors to get more prominence and to have better access to funding.
- **Impact Assessment:** By analysing funding data alongside programme outcomes, organisations can assess the effectiveness of their

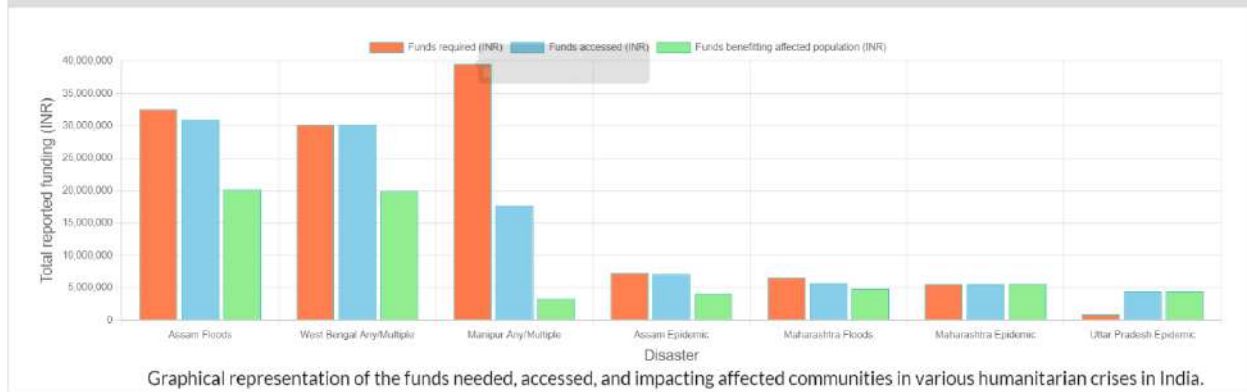
spending. This helps determine whether the investments are achieving their desired outcomes and where adjustments may be needed to optimise impact.

- **Resource Mobilisation:** Analysing funding data helps organisations identify funding gaps and opportunities for resource mobilisation. By understanding where funding is lacking or where there is potential for growth, organisations can develop strategies to attract new funding sources and diversify their revenue streams.
- **Decision-Making:** Funding data informs strategic decision-making at various levels, from individual organisations to policymakers and donors. It helps stakeholders assess needs, set priorities, allocate resources efficiently, and evaluate the impact of funding decisions.

4. And how will it strengthen response?

- **Resource Allocation:** By analysing funding data, organisations can identify where financial resources are most needed and allocate them accordingly. This ensures that response efforts are adequately funded and targeted to address the most pressing needs.
- **Timely Response:** Having access to real-time funding data enables organisations to respond more quickly to emergencies. They can mobilise resources, deploy personnel, and deliver aid promptly to affected areas, minimising the

Disaster-wise Funding



impact of disasters and saving lives.

- **Adaptation and Flexibility:** Funding data provides insights into evolving needs and changing circumstances on the ground. Organisations can adapt their response strategies in real-time, reallocating funds to address emerging priorities and unforeseen challenges as they arise.
- **Coordination and Collaboration:** Transparent reporting of funding data fosters coordination and collaboration among humanitarian actors. Organisations can share information about funding sources, projects, and activities, enabling more effective partnerships and avoiding gaps or overlaps in assistance.
- **Accountability and Transparency:** DATA fosters accountability and transparency by enabling stakeholders to track fund utilization, assess response impact, and hold organizations accountable for results. By identifying first responders and their accessed funding, DATA enhances visibility and facilitates improved funding access for local actors.
- **Evidence-Based Decision-Making:** Funding data provides

evidence for decision-making at all levels of the response. Organisations can use data-driven insights to prioritise interventions, allocate resources strategically, and advocate for additional funding where needed.

5. What data can be shared with or via social media?

On the platform, users can access comprehensive data regarding funds mobilised and their allocation, categorised by financial year. It provides information on top donors, top recipient organisations, and their respective categories. Additionally, users can see which areas are heavily funded and which disasters are underfunded, enabling informed decision-making and resource allocation.

Furthermore, the platform displays critical data on operating and HR costs, essential for understanding the overhead costs associated with the response. Users can also access information on the funding gap and the duration it takes for organisations to collect funds and initiate a response. This data enables stakeholders to understand the challenges in resource mobilisation and response initiation, facilitating efforts to reduce the gap in funding and response time. By identifying bottlenecks and implementing

strategies to expedite fundraising and response activities, the platform aims to enhance efficiency and effectiveness in addressing humanitarian needs.

Furthermore, to facilitate in-depth analysis and reporting, users have the option to download a detailed CSV file. This file enables the users to expand their analysis, conduct further research, and generate custom reports tailored to their specific needs and requirements.

By offering this functionality, the platform empowers users with robust data tools, fostering transparency, accountability, and informed decision-making in the management of financial resources.

6. What are the limitations?

Misinterpretation: Publicly available aid data may be misunderstood or misinterpreted by various stakeholders, leading to inaccurate conclusions or perceptions about the effectiveness or impact of aid programmes.

Data Incompleteness: Aid data may be incomplete or fragmented, lacking comprehensive coverage of all aid activities or omitting certain critical information, thereby limiting the usefulness and reliability of the data for analysis and decision-making.

Privacy and Confidentiality: Publishing aid data may raise privacy and confidentiality concerns, particularly regarding sensitive information about individuals or vulnerable populations, necessitating careful handling and protection of such data to prevent unauthorised access or misuse.

Capacity Constraints: Limited institutional capacity and technical expertise among aid organisations, governments, or local partners may hinder their ability to collect, manage, analyse, and report aid data effectively, impeding transparency and accountability efforts.

7. What are the challenges and risks in making aid data public? Risk to the affected population? Risk to NGOs? Risks to authorities?

- **Risk to the Affected Population:** Publicly available aid data can be misinterpreted by the affected population, leading to unrealistic expectations or misunderstandings about the assistance's nature or scope. Additionally, excessive reliance

on this data may hinder self-reliance and community resilience, fostering a dependency mindset rather than promoting sustainable development efforts.

- **Risk to NGOs:** NGOs may encounter challenges with the misuse or misrepresentation of aid data, risking damage to their reputation, trust with donors, and unintended consequences for beneficiaries. Concerns about transparency pressure may also deter some NGOs from disclosing financial or operational details, fearing scrutiny or competitive disadvantages.
- **Risks to Authorities:** Government authorities distributing aid may face heightened pressure to demonstrate accountability and transparency in public fund usage, leading to increased scrutiny. Additionally, they may encounter data management challenges, such as accuracy and

timeliness issues, impacting decision-making and resource allocation processes.

8. What are your plans to make government data public?

The data reporting on our platform is absolutely voluntary. We are not planning to publish data on behalf of the Government. Instead, we are approaching different SDMAs, NDMA and NIDM, to inform them about the existence of this portal. We are optimistic, that eventually, they will accept its usefulness and start reporting data. We hold a positive outlook that as these entities recognize the utility and benefits of our platform, they will willingly choose to participate and report relevant data. Through ongoing dialogue and collaboration, we seek to cultivate a culture of transparency, accountability, and effective data-sharing practices in disaster management. By empowering all stakeholders with access to timely and accurate information, we aim to collectively strengthen our disaster preparedness and response capabilities. ■

Key Aspects of Heat-Health Early Warning System (HHEWS) for AIDMI Priority in 2024-2025

By AIDMI Team, India

1. Participation is a key to an effective Heat-Health Early Warning System (HHEWS).
2. Sustained and substantial resource investment in HHEWS is essential.
3. Continuous adaptation and learning from HHEWS is crucial.
4. Coordinated and complementary HHEWS spreads faster.
5. Report performance and laps and complaints related to HHEWS in real-time.
6. Reduce harm or setback to other EWS or anticipatory actions urgently.
7. Help prepare better and act towards resilient response through HHEWS.
8. Timely and effective actions due to HHEWS must be tracked.
9. Team and HHEWS users must be better aware and active between two warnings. ■

For more information contact: support@aidmi.org

Enhancing Heatwave Resilience in Jodhpur

By *Bindiya Patel*, Programme Manager, Mahila Housing Trust and *Aarohi Makdani*, Development Associate (Urban Planner), Mahila Housing Trust, India

Jodhpur, like many other cities in India, confronts the terrible consequences of heatwaves, especially on its vulnerable populations. While heatwaves are a natural occurrence, their severity is compounded by urbanization, climate change, and inadequate infrastructure. Addressing this urgent issue requires a comprehensive strategy aimed at minimizing heatwave fatalities in Jodhpur.

In April 2023, Mahila Housing Trust (MHT) took a significant step towards climate resilience with the launch of the comprehensive 'Jodhpur Heat Action Plan' manual. Led by MHT, NRDC India, and Jodhpur Nagar Nigam North, this pioneering initiative lays the groundwork for proactive measures to combat heatwaves and protect vulnerable communities.

Central to the Heat Action Plan is a multi-faceted approach that begins with a thorough Vulnerability Assessment. This assessment



Inclusive Early Heat Warning System.



House painted with solar-reflective white paint.

identifies high-risk areas and populations, enabling targeted interventions where they are most needed. Additionally, a robust Early Warning System, bolstered by interagency coordination, ensures timely alerts and efficient resource mobilization during heatwave emergencies.

At the local level, preparedness within health and education departments strengthens community resilience and enhances the capacity to respond to heat-related health risks. Capacity-building initiatives in the health system equip healthcare professionals with the necessary skills and resources to provide prompt medical assistance during heatwaves. Moreover, public awareness campaigns and community outreach activities raise awareness about heatwave risks and empower individuals to adopt preventive actions. MHT also plays a crucial role in supporting vulnerable communities by implementing preventive and adaptive measures like installing cool roofs. With over

1500 households in slum communities painted with reflective coatings, these roofs serve as a vital defence against scorching temperatures, reducing indoor heat stress and promoting sustainable urban development.

These cool roofs with solar reflective coatings, serve as a barrier against the scorching temperatures, significantly reducing indoor temperatures and alleviating the heat stress experienced by residents. By implementing such measures, MHT not only enhances the resilience of vulnerable communities but also fosters sustainable urban development.

Collaboration with non-governmental organizations and civil society fosters inclusive and participatory approaches to heatwave preparedness. By leveraging community networks and resources, these partnerships support vulnerable populations and enhance overall resilience.

Continuous evaluation mechanisms ensure that interventions remain effective and responsive to evolving challenges. Impact evaluations drive continuous improvement, ensuring that strategies to mitigate heatwave-related risks are continuously refined and optimized.

The first-of-its-kind 'Net Zero Cooling Station' for the Informal Sector

One of the crucial initiatives under the Heat Action Plan is the introduction of the 'Net-Zero Cooling Station' for the Informal Sector. Developed collaboratively by MHT and Jodhpur Nagar Nigam North, this innovative station is a crucial step in preventing heat-related fatalities among the city's vulnerable populations. Equipped with integrated mist sprinklers and solar panels, the station efficiently reduces temperatures while operating sustainably. Its innovative design includes a wind tower for natural airflow and transparent façades for safety and community



engagement. Providing essential amenities such as drinking water, ORS, and first-aid kits, the station prioritizes the well-being of its users. Constructed with durable Bison and *Khas* panels, it ensures longevity, symbolizing resilience in the face of climate challenges. The cooling station has successfully reduced internal temperatures by approximately 5-6 degrees, showcasing its effectiveness in providing relief during extreme heat events.

As part of the broader plan to mitigate avoidable heatwave deaths, the Cooling Station serves as a testament to collaborative efforts and community-driven solutions. It offers hope for a safer and more equitable future in Jodhpur, demonstrating the effectiveness of proactive measures in safeguarding vulnerable communities against the impacts of extreme heat events. ■



Net- Zero Cooling Station.

Avoidable Deaths: Recognize the Needs and Promote Preparedness for Heatwaves

By Vishal Pathak, AIDMI, India



Field Practitioners from eighteen districts and three states came together to celebrate the International Awareness Day for Avoidable Deaths. Photo credit: AIDMI.

Preventable deaths refer to fatalities that could have been prevented through public health and education and related governance measures targeting various factors influencing health, behavior, lifestyle, socioeconomic status, and the environment. The number of accidental deaths in India reached 4.3 lakh in 2022, the highest in five years (according to the NCRB⁴). Road and rail traffic crashes accounted for 46% of these fatalities, followed by drowning, falls, and poisoning. 4.2 lakh deaths were due to preventable causes.

Unnatural mortality in India was found to make up 10.3% of total deaths and was greater among the population aged 10 to 45 years. The

unnatural mortality rate in India was 0.67 per 1000 population: 0.84 per 1000 among the male population and 0.49 per 1000 among the female population⁵. Recently, [AIDMI](#) designed and conducted several actions in the month of March 2024 to celebrate International Awareness Day for Avoidable Deaths'. AIDMI reached out to over 50 practitioners working in eighteen districts of three states of India. A dedicated workshop on the theme 'Disaster Deaths Are Avoidable' was designed and conducted. The communication team contacted many individuals and organizations to build engagement on the avoidable deaths. A special focus has been given to 'heatwave deaths are avoidable.' In

the first week of March, we organized an internal meeting that built the conceptual thematic understanding and role of the organization and stakeholders and the plan of action for the month. As a way ahead, [ADN](#) (Avoidable Death Network) and AIDMI developed a special issue of [Southasiadisasters.net](#) titled 'Heatwave Deaths Are Avoidable.'

Teamwork with district practitioners who work with rural communities (including women farmers, children, teachers, family businesses, local institutions—milk cooperatives, panchayats, *Anganwadi* workers, SHGs, and farmer's groups) resulted in recognition of avoidable deaths, coverage of indirect disaster deaths

⁴ National Crime Records Bureau (NCRB), www.ncrb.gov.in.

⁵ Basant Kumar Panda, Udaya S Mishra, (2020), Unnatural Deaths in India, <https://pubmed.ncbi.nlm.nih.gov/32398177/#:~:text=Unnatural%20mortality%20in%20India%20was,1000%20among%20the%20fe,male%20population.>

Natural Calamities	Accidents	Heatwaves	Drug Abuse	Suicidal deaths
<ul style="list-style-type: none"> Floods Cyclones Earthquakes Drought 	<ul style="list-style-type: none"> Road Accidents Falling into Open wells/ Patholes Snake-bites Electric Shocks Death at construction sites Fire Animal attacks Gutter cleaning Maternal deaths 	<ul style="list-style-type: none"> Heat shock Cardiovascular (heart attack) Triggering other diseases Worse health conditions - people with cronic diseases Increased risk of dengue infection 	<ul style="list-style-type: none"> Excessive alcohol consumption Smoking Tobacco/ smoking 	<ul style="list-style-type: none"> Farmers - due to huge debt / crop spoilage Young adults - due to depression

Reasons for deaths that the field practitioners have observed as 'Avoidable Deaths'.

and identification of cause and possible local actions to solve the issue.

The 50 practitioners working in 18 districts agree to raise the visibility of disaster deaths, including indirect deaths, highlight the causes and circumstances that lead to deaths locally, and understand the context of interventions to avoid such deaths. The above table shows key reasons for deaths that practitioners found avoidable.

Heatwaves have been identified as a major factor leading to numerous deaths, yet they are not often directly linked to the causes of death. As a

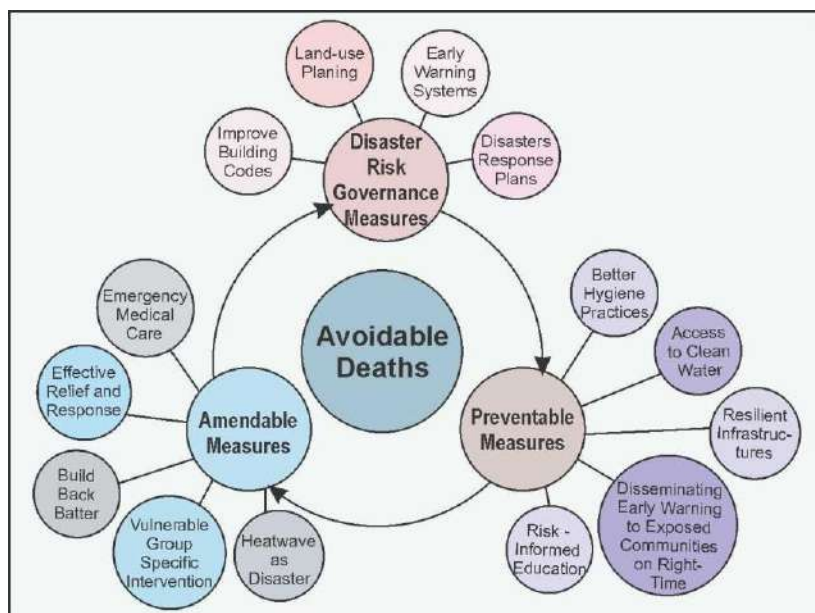
result, they have not garnered as much attention in mainstream discussions on avoidable deaths. Ms. Ashwini Mali, the field coordinator from Maharashtra state, said we must recognize that understanding indirect death is crucial to building consciousness for improved decision-making and development efforts.

Climate change has already led to more severe heatwaves in India and beyond. The difference in temperature between the hottest and coolest parts of cities or districts is not nominal. Planting trees can make a big difference in reducing heat in areas. Air pollution can further harm

people who are at risk from the heat. Greener areas support the fight against heat waves and air pollution. Whether urban or rural, development without the provision of green space exacerbates temperature increases within our areas and exposes people, especially children, senior citizens, and people involved in businesses and services, to deadly heatwaves. We must have a mandatory process to increase green cover, said Ms. Nayna Parkara, a Field Practitioner from the Saurashtra region.

Two aspects are essential to promoting and strengthening practices to deal with heat waves – first, greater fuel efficiency reduces carbon pollution and other pollutants that damage the lungs, hearts, and brains. Second, greener places, whitewashing roofs, and using solar energy make a big difference for people living there. These two aspects not only support reducing costs but also reduce the chances of deadly diseases we are witnessing on an increasing scale.

To recognize and reduce the number of 'avoidable deaths', a framework has been suggested to focus on three measures – governance, preventable, and amendable. Practitioners reflected on types of actions that can support the reduce the number of such deaths. ■



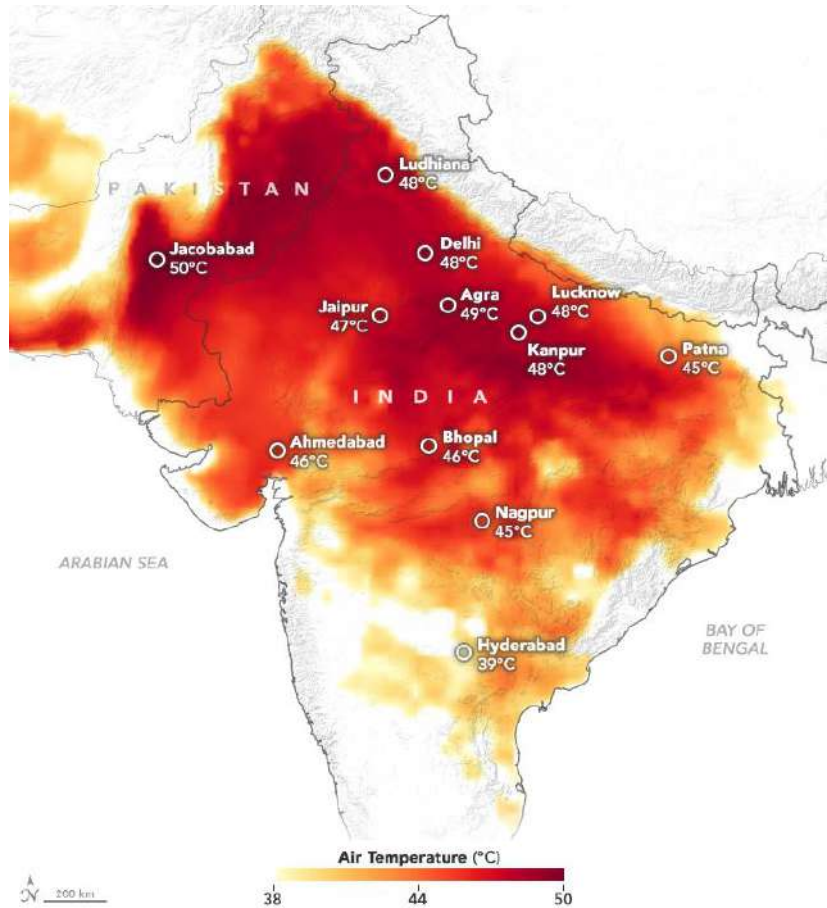
Measures from the practitioners to reduce the number of avoidable deaths. (Based on Avoidable Deaths Framework)

Use of Data to Avoid Heatwave Deaths

By Akash Yadav, AIDMI, India

Recently, AIDMI embarked on its data journey by releasing a report on the aftermath of Cyclone Michaung in Chennai. Based on our analysis, we found out that nearly every fatality that occurred in Chennai due to the cyclone was either within 1 km of a slum or a low-lying area. Insights like these have profound implications in our ability to anticipate and mitigate the adverse effects of climate-related extreme events by targeting scarce resources to places where they are most needed. Gearing up for the upcoming heatwave season, we are reminded that such an effort becomes even more critical since extremely hot temperatures will leave crores of Indians exposed in the upcoming months.

How do we then prepare to limit the mortality risk of heatwaves using data and data science? This was also a question posed by the National Disaster Management Authority (NDMA) in their 2-day workshop on Heatwaves in February 2024. Participants from a diverse range of backgrounds including urban planning, healthcare, civil society, academia and others came together



Source: NASA, Earth observatory.

to provide their insights. They highlighted the need for getting timely access to data on temperature and humidity to build precise early

warning systems, map information on at-risk communities so that mitigation efforts can be localized, and collect data on morbidities and mortalities along with data on healthcare infrastructure such that resources can be effectively targeted and preparedness measures can be scaled.

Advancements in meteorological science now allow for the precise forecasting of temperatures, enabling authorities to accurately predict severe heatwave days. This precision in forecasting can facilitate the timely issuance of public alerts to prompt changes to work or school



National Workshop on Heatwave 2024, NDMA, India.

schedules and encourage the adoption of precautionary measures to mitigate heat-related risks. Incorporating satellite data, like Google's Dynamic World maps to highlight real-time land use and land classification processes improves in the identification of areas at increased risk. Specifically, it helps pinpoint regions where high temperatures meet impervious surfaces, thereby highlighting urban heat islands. Understanding the mobility behavior of urban populations using GPS data from ad tech companies allows for the strategic placement of resources like water kiosks and cooling shelters, ensuring they are accessible to those most in need during critical times.

The state of Andhra Pradesh's deployment of a 'Heat Wave Atlas' and the establishment of automatic weather stations for real-time heat forecasts showcase the power of technology and data in enhancing preparedness for heatwave threats.

Despite the availability of advanced data and technology, navigating the complexities of accurately monitoring and responding to heatwaves remains a challenge. This challenge is partly due to the lack of a unified approach to understanding the myriad factors that influence vulnerability and mortality rates contributing to the difficulty in achieving a coordinated response among various governmental

entities. India also encounters significant hurdles in precisely documenting and addressing the deaths caused by heatwaves, exacerbated by inconsistencies in data reporting by different governmental agencies. Recognizing these complexities, AIDMI and its partners are advocating for enhanced open data access, improved tools, and robust accountability frameworks. Such advancements would enable the full potential of data and data science to be harnessed in the fight against heatwaves throughout the country, fostering a more informed and effective approach to mitigating their impact. ■

HEATWAVE PREPAREDNESS IN INDIA

India Reviews Heatwave Preparedness for 2024

By [Express News Service](#), April 12, 2024

Preparedness in the health sector was reviewed in terms of availability of essential medicines, intravenous fluids, ice packs, ORS and drinking water, the statement said.

Prime Minister Narendra Modi reviews preparedness for heat wave related situation in New Delhi on April 11, 2024.

Amid a forecast for extremely hot conditions this summer, Prime Minister Narendra Modi, at a review meeting on Thursday, called for all arms of governments at central, state and district levels to work in synergy.

A statement from the PMO said: "The Prime Minister was briefed about the temperature outlook for the period from April to June 2024 including the forecasts for the upcoming hot weather season (April to June), the likelihood of above-

normal maximum temperatures over most parts of the country, especially with high probability over Central India and western peninsular India."

The statement said preparedness in the health sector was reviewed in terms of the availability of essential medicines, intravenous fluids, ice packs, ORS, and drinking water.

The timely dissemination of essential information, education and communication (IEC) awareness material, especially in regional languages, through all platforms such as television, radio and social media were stressed upon at the meeting, it said.

"Since a hotter than normal summer is expected in 2024, which coincides with the general elections, it was felt that the advisories issued by the Health Ministry and NDMA be

translated into regional languages and disseminated widely," it said.

Modi stressed upon the whole of government approach, and said all arms of the government at central, state and district levels, besides various ministries, need to work on this in synergy.

He also stressed awareness creation along with adequate preparation in hospitals, highlighting the need for quick detection and putting out forest fires.

The principal secretary to the prime minister, home secretary, officials from India Meteorological Department, and the National Disaster Management Authority attended the meeting.

Source:

<https://indianexpress.com/article/india/pm-modi-reviews-preparedness-for-heat-wave-9265029/>

Research and Innovation Needs: How to Avoid Deaths Due to Heatwaves?

By Mehul Pandya, AIDMI, India

Escalating global temperatures intensify the threat of heatwaves, notably in populous locales like India, where the National Disaster Management Authority (NDMA) warns that nearly all states are increasingly vulnerable. These scorching periods wreak havoc on agriculture and strain healthcare systems, while infrastructural wear and surging energy needs highlight the environmental strain. Averaging 2,000 annual fatalities, heatwaves disproportionately impact those without cooling resources, such as outdoor laborers and underprivileged inhabitants in substandard housing, underscoring the urgent necessity for comprehensive mitigation strategies.

Minimizing heatwave fatalities demands a detailed examination of temperature fluctuations and past occurrences to understand changing death patterns. Dedicated research on the public health outcomes of heatwaves and thorough tracking of health data is critical to identifying vulnerable areas and developing targeted safeguards. Strategies to reduce mortalities involve bolstering advanced alert systems, raising awareness among high-risk groups via public health campaigns, and implementing government initiatives—such as the Jal Jeevan Mission—to ensure water availability, which is crucial during extreme heat events.

Recent nationwide research by the All India Disaster Mitigation Institute identifies the following fundamental research and

innovation needs to prevent heatwave-related deaths in India.

1. **Heatwave prediction and monitoring:** Funding advanced research for sophisticated meteorological models can lead to precision in predicting heatwaves. This specificity enables timely alerts, which is crucial for early warning systems to function effectively.
2. **Effective early warning systems:** Incorporate mobile technology and local broadcasting for widespread alert distribution, develop community-based alert systems, and create localized, actionable messaging to improve last-mile connectivity in early warning systems through research and innovation.
3. **Urban heat mitigation:** By employing innovative urban designs, such as incorporating reflective materials and green roofs, cities can significantly reduce heat retention. Strategic placement of shade can also play a vital role in cooling urban areas.
4. **Healthcare preparedness:** Crafting heatwave-specific medical protocols and training healthcare providers ensures swift recognition and treatment of heat-induced illnesses, delivering an agile healthcare response during critical heat events.
5. **Public awareness campaigns:** Designing awareness campaigns that speak to the diverse cultural and linguistic landscape can improve public understanding of the dangers of heat waves and motivate adopting preventive behaviors.
6. **Water management strategies:** Investigating sustainable water management, including drought-resistant sources and efficient distribution, is essential to maintaining water supply during the water-scarce periods typical of heatwaves.
7. **Protective labor regulations:** Researching and developing labor policies that protect workers from extreme heat exposure is integral. These findings need to be translated into laws safeguarding outdoor and at-risk workers.
8. **Cooling centres and infrastructure:** Establishing accessible public cooling centres or shelters is critical, especially for at-risk groups such as older adults and people without housing, to provide relief from extreme temperatures and prevent heat-related health issues.

Mitigating heatwave mortality in India requires multidisciplinary research and innovation, focusing on enhanced early warning systems, community resilience, and sustainable technologies to adapt effectively to the increasing threat of extreme heat events. ■

Use of Appreciative Inquiry to Avoid Heatwave Deaths: A Case of Small-Scale Women Cotton Farmers

By *Kshitij Gupta, AIDMI, India*

In recent years, the impact of climate change has become increasingly evident, with heatwaves emerging as a significant threat to human health, agricultural yields and economic productivity. Small-scale women cotton farmers in the states of Gujarat, Maharashtra, and Madhya Pradesh have been particularly vulnerable to the adverse effects of these extreme weather events such as heatwaves. Recognizing the importance of addressing this issue, the All India Disaster Mitigation Institute (AIDMI) has employed a unique approach called Appreciative Inquiry to assess the vulnerability of these farmers and explore potential solutions.

Appreciative Inquiry is a strength-based approach that focuses on identifying and leveraging the positive aspects of a situation rather than dwelling on problems. Instead of highlighting deficiencies, it seeks to uncover existing strengths, best practices, and success stories that can be built upon (Cooperrider & Whitney, 2005). In this context, AIDMI conducted a series of consultations and Key Informant Interviews (KIIs) with small-scale women cotton farmers and members of the Self-Employed Women's Association (SEWA).

Through these interactions, AIDMI gained valuable insights into the challenges faced by these farmers during heatwaves. Heatwaves have disrupted farming cycles, adversely

impacting their health and crop yields. However, the study also revealed the traditional wisdom and coping mechanisms employed by these women to mitigate the effects of heatwaves. For instance, they have adopted practices such as consuming onions, wearing light-coloured clothing, and limiting outdoor activities during extreme heat.

While these traditional methods have provided some relief, the study highlighted the lack of a structured and standardized approach to deal with heatwave situations in rural areas. The dissemination of information and guidelines from government sources has been hampered by the unavailability of network coverage and access to phones, leaving many farmers without the necessary resources to effectively prevent avoidable deaths.

By employing Appreciative Inquiry, AIDMI has been able to identify the existing strengths and resilience of these women farmers while also recognizing the gaps in their coping mechanisms. This approach has the potential to empower these communities by leveraging their traditional knowledge and integrating it with modern scientific practices and interventions.

For example, the appreciative inquiry process could lead to developing community-based early warning systems that incorporate traditional indicators and knowledge, coupled with modern

weather forecasting techniques. Additionally, it could facilitate the creation of localized heat action plans that involve the active participation of women farmers, ensuring that the solutions are tailored to their specific needs and culturally appropriate.

Furthermore, the use of Appreciative Inquiry can foster collaborations between government agencies, non-governmental organizations (NGOs), and local communities. By recognizing the strengths and capabilities of each stakeholder, this approach can facilitate the co-creation of sustainable solutions that address the multifaceted challenges posed by heatwaves.

In conclusion, the use of Appreciative Inquiry by AIDMI in assessing the vulnerability of small-scale women cotton farmers to heatwaves has shed light on the importance of incorporating traditional knowledge and involving local communities in developing effective solutions. By leveraging their strengths and building upon their resilience, this approach has the potential to reduce the risk of heatwave-related deaths and enhance the overall well-being of these marginalized communities.

Reference:

1. Cooperrider, D. L., & Whitney, D. (2005). *Appreciative inquiry: A positive revolution in change*. Berrett-Koehler Publishers. ■

Extreme Heat: What can be done to stop this ‘silent killer’

By *Colin Fernandes*, Preparedness Lead; and *Manish A. Tewani*, Response Lead;
Asia Pacific Division, American Red Cross, Thailand

It is an established fact that climate change is exacerbating extreme heat and heatwaves will increase. According to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), human-caused climate change has increased the frequency and intensity of heatwaves since the 1950s and additional warming will further increase their frequency and intensity. The report also states that, with high confidence, heatwaves in cities have intensified and impacts will be concentrated amongst **economically and socially marginalized** urban residents, e.g., those living in **informal settlements and urban poor**. Heatwaves are also expected to add pressure on urban infrastructure and systems, especially energy, water and health⁶.

There is an urgent need to reduce emissions, end our dependence on fossil fuels, and ramp up renewable energy sources. Even with this scenario, there would still need to continue preparing and coping for extreme heat events and heatwaves. It is estimated that 74% of the global population will be exposed to lethal



Nepal Red Cross Society - A water ATM kiosk as one of the Nepalgunj ideas for the heat season.

heatwaves worldwide by 2100 if carbon emissions continue to increase at existing rates⁷. Heat is considered a "silent killer" because it is and can be deadlier than all other disasters, yet it leaves behind no visual clues as to the scale of its devastation. In 2022, several geographic regions experienced heatwaves such as India-Pakistan (2022), which stressed energy supply⁸, while Japan experienced its worst heatwave in 150 years⁹.

In recent years, there has been immense advancement in technology for improving weather and climate modelling and forecasting, which should have a

cascading effect on reducing fatalities from heatwaves. There is necessary innovation and technology that is able to give more accurate and even hyper-local information and forecasts on weather, but this information is only effective when it can be transformed into understandable, contextualized, actionable messaging which is accessed easily. These principles were enshrined as early as 1997 during the International Decade for Natural Disaster Reduction¹⁰.

The Red Cross Red Crescent Movement is the world's largest humanitarian organization and is cognizant of this and has been taking relevant steps to ensure that its National Societies have the relevant knowledge, tools and resources to prepare for and respond to such events. National Societies have responded to extreme heat events particularly to support affected vulnerable communities in several countries such as Bangladesh, Indonesia, Nepal, and Vietnam, to name a few. In addition to helping people with cool/weather-controlled shelter, drinking water,

⁶ Synthesis Report of the IPCC Sixth Assessment Report (AR6) https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_LongerReport.pdf

⁷ Urban climate risks and the role of social protection https://www.climatecentre.org/wp-content/uploads/RCCC_Urban-climate-risks-briefing-note.pdf

⁸ India sweats over worst power cuts in six years during extreme heat <https://www.reuters.com/world/india/indian-heat-wave-disrupts-industrial-activity-power-demand-soars-2022-04-28/>

⁹ Japan swelters in its worst heatwave ever recorded <https://www.bbc.com/news/world-asia-61976937>

¹⁰ Guiding Principles for Effective Early Warning <https://www.unisdr.org/2006/ppew/whats-ew/pdf/guiding-principles-for-effective-ew.pdf>

transportation to medical facilities. National Societies in several countries have finalized or are working on Early Action Protocols (EAPs) for extreme heat events. Such EAPs will enable the National Societies to implement anticipatory action and therefore reach the most vulnerable parts of the community before the negative impact of heatwaves materializes.

As mentioned in the IPCC report, the most vulnerable and with the least resources will be impacted the most – so how do we protect those who will be the most affected? There needs to be a holistic societal approach to address this need by working across policy, practice, and program levels. Cities need to plan or replan differently, increasing their green coverage or stopping the conversion of green spaces for lucrative real-estate development, which could benefit a tiny proportion of the population. There is an increasing number of cities which are revitalizing green spaces within their urban plans which not only helps in temperature reduction

but also increases biodiversity and has a positive impact on mental health. Cities are developing their Heat Action Plans, supported by Red Cross Red Crescent National Societies and other stakeholders in Nepal, Bangladesh, and Vietnam.

Social legislation, which has a strong focus on social protection for the most at-risk members of our society, is another key strategy for reducing heat impacts. Housing, livelihoods and health are some issues the economically and socially marginalized sections face, which will further worsen with heatwaves. Affordable housing programs with corresponding information and technical support need to be devised that would assist low-income households in improving their housing condition and reducing indoor temperature. Attention should also be given to culture and context-specific design and materials used in such housing programs, so they are better adapted to local climate and increasing temperatures. Similarly, access to equitable health care services should be scaled up as

cases are expected to grow due to increasing temperature, especially among vulnerable groups¹¹. Government and non-profit organizations should design new programs and services that provide critical and urgent healthcare solutions for affected populations in urban areas. Education curriculum and First Aid modules need to integrate the issue of heat and ways to combat it that will contribute to creating a culture rather than a seasonal reaction. Greater awareness among the population on recognizing an extreme heat event, preparedness measures for dealing with such an event and response actions to help those affected by extreme heat will be achieved by the continued and expanded spread of these integrated education curricula and first aid training.

It is said that earthquakes do not kill people, but badly constructed buildings do; the same corollary should be used for heatwaves – they should not kill when we have the necessary measures and protection in place. ■



Bangladesh Red Crescent Society - heat action day field activity, June 2, 2023.

¹¹ Heat and Health <https://ghhin.org/heat-and-health/>

Mitigating Heatwave Impacts: Sustainable Solutions for Urban Environment

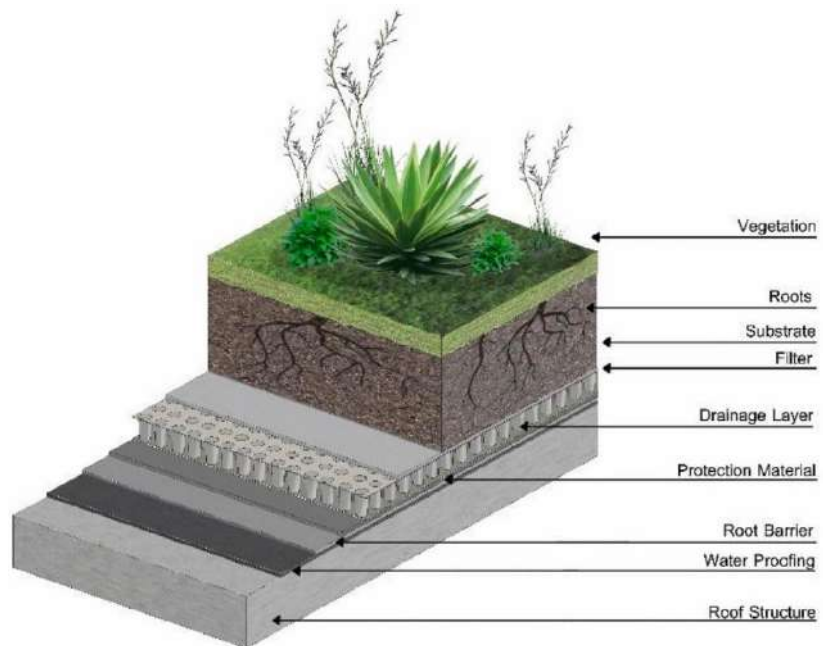
By *Jianying Liao and Dr. Samuel Cai*, Lecturer in Environmental Epidemiology, Health Sciences Department, University of Leicester, UK

Introduction

Due to climate change, record-breaking summer temperatures are increasingly reported across the world in recent years. Heatwaves have become more frequent and intense in some parts of the world, especially in urban areas, posing significant health risks. In summer 2022, 61,672 heat-related deaths (Ballester et al., 2023) were estimated in Europe. Globally, the year 2023 was the hottest year on record to date. While active cooling strategies such as air conditioning can potentially protect health from extremely hot weather, it will also cause a sharp increase in energy demand and, therefore, may contribute to the global warming effects. Moreover, there are accessibility and inequality issues here as not every household will be able to afford to air conditioning at home. Therefore, it is important to find sustainable, and potentially scalable, solutions to mitigating the adverse health impacts of extremely hot weather in the cities.

Nature-Based Solutions

As suggested in the 2023 Heat Resilience and Sustainable Cooling Report published by the UK Environmental Audit Committee, nature-based solutions (NBS) such as parks, trees, water bodies, and green infrastructure (e.g., green/reflective roofs, and shade provision) have significant cooling effects and potentially decrease heat-related deaths on a population level. For instance, green roofs provide thermal resistance to buildings



Typical green roof layers. Source:

<https://www.sciencedirect.com/science/article/pii/S1364032123001624#bib56>

during heatwave, cooling indoor temperatures by up to 15°C (Mihalakakou et al., 2023). Moreover, NBS can moderate factors that are potentially associated with heat-related deaths, including absorbing dust and particles in the air and improving air quality, absorbing sound waves and reducing noise levels, as well as boosting mental health and reducing psychological stress. However, challenges like long-term maintenance and high initial costs have hindered NBS promotion in some countries. Evidence from locally derived research is crucial to inform targeted NBS policies to reduce heat-related deaths through NBS.

Timely and Targeted Heatwave Warning Systems

Although mitigation measures such as NBS can reduce the deadly impacts of heatwave, these measures require time to implement at scale. A timely, targeted heatwave warning system for the whole population, especially vulnerable groups, is critical to preventing the immediate health impacts of heatwaves. Children, the elderly, and people who are chronically ill, or of low-socioeconomic-status were identified as vulnerable to the adverse impacts of a heatwaves (Arsad et al., 2022). For these groups, providing bespoke messages is more effective in protecting their health during heatwave than issuing general heatwave warnings. This,

however, would require intensive research in each of the subgroups among the populations to generate robust evidence to inform the warning system.

Community Engagement and Education

Reducing misinformation could save lives. Providing effective education on avoiding heat stress is a sustainable measure to significantly reduce avoidable deaths from heatwave. Public engagement and education should focus on directly communicating the threat of heatwave to health. Suggestions at the individual level should remain clear and simple, such as drinking enough water before feeling thirsty, wearing light-coloured clothes, and avoiding direct sunlight. The Heatwave Action Plan in western Sydney, Australia, calls for leaders of all levels of organizations to work together to raise awareness of urban heat issues and promote behaviour changes, supporting community engagement, education, and preparedness efforts (UN Environment Programme, 2021). By

empowering individuals with knowledge and resources, we can significantly decrease avoidable deaths from heatwaves, fostering a more sustainable and resilient society.

Conclusion

In order to combat the escalating threat of heatwaves exacerbated by climate change, sustainable solutions offer promising ways to mitigate its adverse impacts in urban environments. Adopting nature-based solutions, implementing timely and targeted warning systems, and promoting community engagement and education are critical steps towards creating heatwave-resilient societies. By prioritising these measures, we can proactively address heatwave vulnerability and move towards a more sustainable future.

References:

1. Arsad, F. S., Hod, R., Ahmad, N., Ismail, R., Mohamed, N., Baharom, M., Osman, Y., Radi, M. F. and Tangang, F. (2022) 'The Impact of Heatwaves on Mortality and Morbidity and the Associated

Vulnerability Factors: A Systematic Review', *International Journal of Environmental Research and Public Health*, 19(23). doi: 10.3390/ijerph192316356.

2. Ballester, J., Quijal-Zamorano, M., Méndez Turrubiates, R. F., Pegenaute, F., Herrmann, F. R., Robine, J. M., Basagaña, X., Tonne, C., Antó, J. M. and Achebak, H. (2023) 'Heat-related mortality in Europe during the summer of 2022', *Nature Medicine*, 29(7), pp. 1857-1866.
3. Mihalakakou, G., Souliotis, M., Papadaki, M., Menounou, P., Dimopoulos, P., Kolokotsa, D., Paravantis, J. A., Tsangrassoulis, A., Panaras, G., Giannakopoulos, E. and Papaefthimiou, S. (2023) 'Green roofs as a nature-based solution for improving urban sustainability: Progress and perspectives', *Renewable and Sustainable Energy Reviews*, 180, p. 113306.
4. UN Environment Programme (2021) *Beating the Heat: A Sustainable Cooling Handbook for Cities*. Available at: <https://www.unep.org/resources/report/beating-heat-sustainable-cooling-handbook-cities> (Accessed: 23 March).

AIDMI Resources

1. Urgency of Heatwave Risk Management, Southasiadisasters.net, Issue No. 209, March 2024
2. Building Adaptation and Resilience to Heatwaves, Southasiadisasters.net Issue No. 204, January 2023
3. Local Heatwave Action Planning, December 2022
4. Adapting Humanitarian Action to the Effects of Climate Change: An ALNAP Lessons Paper, 2021
5. Rising Risk of Heatwaves in Asia, Southasiadisasters.net, issue No. 174, October 2018
6. Heatwave in Urban India, July 2018
7. Urban Resilience and Children in India's Urban Centers, Experience Learning Series No. 69, October 2016
8. A Study Report, Mitigation of Heat Impacts on Children as a Priority of India's Climate Change Agenda, Experience Learning Series No. 68, July 2016
9. Expert Committee Recommendations for a Heat Action Plan based on the Ahmedabad Experience, 2016
10. The Impact of Heat Waves on Vulnerable Communities of Ahmedabad, July 2015
11. Local Level Planning to Cope with Heat Waves in India, Southasiadisasters.net, issue No. 132, June 2015

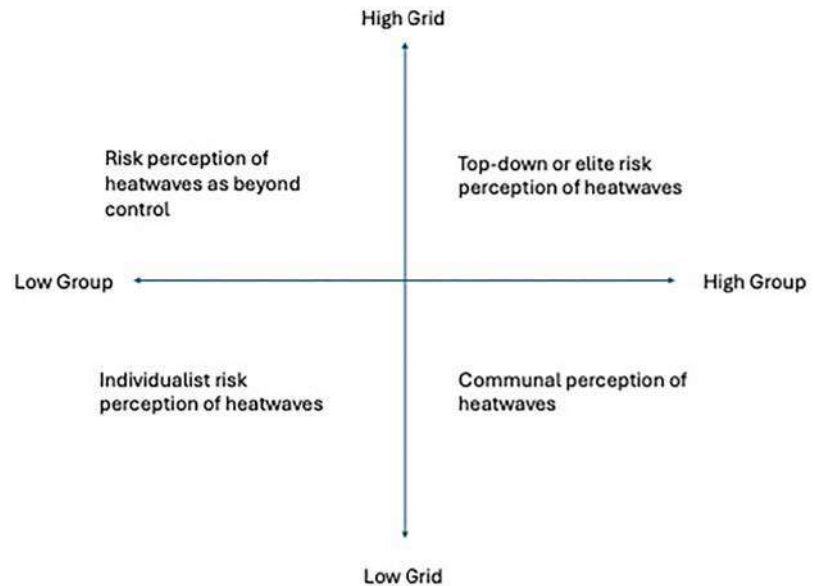
for more information contact: support@aidmi.org

The Cultural Theory of Risk and its Application to Heatwaves in South-East Asia

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Addressing the risk of heatwaves appears to be a very objective risk, as the rise in temperatures can be measured, and it is known that sudden spikes in temperatures or prolonged periods of heatwaves increase the risk of death. Owing to the basic physical characteristics of human beings, this seems to be relevant for all of humanity. However, while it appears to be a common risk, considerable research indicates that the perception of this risk varies greatly not only across the globe but also within South-East Asia. One of the key factors to explain such variations is to consider them from the perspective of the Cultural Theory of Risk as developed by Mary Douglas and Aron Wildavsky (1983, see also Thompson et al. 1990). Their approach suggests that avoiding deaths from heatwaves requires not simply considering solutions in terms of physical infrastructure, for instance, access to shelter or water, but understanding how and under what circumstances heatwaves are perceived as a risk, so that people take action or not. This is important for policymakers, because not taking this cultural dimension of risks into account ignores the understandings and needs of people who share these views (Dake 1991). A risk strategy needs to be co-developed with them based on their cultural perceptions of risks.

The Cultural Theory of Risk introduces the concepts of “group” and “grid” to describe the competing structures of social organisation. The group dimension refers to the extent of collective control within a society.



A “high group” society exhibits strong collective control and communal responsibilities, whereas a “low group” society emphasises individual autonomy and self-sufficiency. The grid dimension pertains to the degree of stratification within a society. A “high grid” society is characterised by conspicuous, durable hierarchies and role differentiation, while a “low grid” society features more egalitarian social relations. Based on these different cultural values, Cultural Theory as developed by Douglas and Wildavsky posits that the group-grid dimensions give rise to distinct ways of life, each associated with specific risk perceptions. These ways of life include egalitarian, collectivist societies (“low grid”, “high group”) that are more inclined to perceive environmental disasters as significant threats, justifying the need for restrictions on behaviours

that produce inequality. In contrast, individualistic (“low group”) and hierarchical (“high grid”) societies are more likely to downplay environmental risks to prevent interference with established social orders and protect commercial and governmental elites.

In Southeast Asia, societies with a “high group” orientation (Karen People of Thailand and Myanmar; the Minangkabau of West Sumatra or Toraja of Sulawesi), where community bonds and collective responsibilities are strongly emphasised, may perceive the risk of heatwaves as a collective challenge that requires communal action. In these communities, heatwaves are seen not only as a physical threat but also as a social one, potentially disrupting the harmony and well-being of the community (see Mercer et al. 2008). To address this cultural need, a more collective response to

heatwaves is required, for instance, some societies in South-East Asia have adopted the concept of cooling centres as a formalised public health response to heatwaves. These actions reinforce the societal structure by promoting cohesion and mutual aid in the face of environmental threats.

Cities like Singapore, Kuala Lumpur (Malaysia), Bangkok (Thailand), and Jakarta (Indonesia) exhibit characteristics of "low group" societies due to their urbanisation and cosmopolitan nature, approaching the risk of heatwaves differently. Individuals in these societies prioritise personal adaptation strategies, such as the use of air conditioning or personal cooling devices, reflecting a more individualistic approach to risk management (Norgaard 2006; Luber & McGeehin 2008). This response aligns with the Cultural Theory's suggestion that individualistic societies are more likely to downplay collective risks in favour of personal freedom and autonomy.

The "grid" dimension further complicates the perception and management of heatwave risks in South-East Asia. The royal and aristocratic traditions in Thailand, the ethnic stratification in Malaysia (Bumiputera policy), or certain regions in the Philippines exhibit "high grid" characteristics, where social roles and hierarchies are well-defined and rigid. The response to heatwaves might be structured around the existing power dynamics. Authorities in such societies typically implement top-down measures to manage heatwave risks, such as issuing heat alerts or mandating work stoppage during extreme temperatures (Bankoff 2003). These measures reflect and reinforce the stratified nature of the society, where adherence to roles

and respect for authority are paramount.

In contrast, some indigenous and tribal communities in Southeast Asia demonstrate "low grid" characteristics, for instance, the Semai people of Peninsular Malaysia, but also social movements and advocacy groups are characterised by more egalitarian social structures, fostering a more participatory approach to managing heatwave risks (Ebi & Semenza 2008). Community-led initiatives, collaborative planning, and shared decision-making processes may prevail, reflecting a collective belief in the equal distribution of responsibility and authority. For instance, in Malaysia, local communities are involved in 'gotong-royong' activities, a traditional communal work practice, to clean up and maintain local rivers and lakes that contribute to cooling the environment. This approach not only addresses the immediate risk posed by heatwaves but also reinforces the societal value placed on egalitarianism and collective action (see Lefale 2010).

The Cultural Theory of Risk elucidates the complex interplay between societal structures and the perception of environmental threats like heatwaves. In Southeast Asia, this interplay manifests in diverse responses to heatwaves, shaped by the underlying cultural values and social organisation. Understanding these dynamics is crucial for developing effective, culturally sensitive strategies for heatwave mitigation and adaptation in the region. It highlights the importance of tailoring responses to fit the societal context, leveraging communal bonds in "high group" societies, and respecting individual autonomy in "low group" settings, all

while navigating the challenges posed by social stratification in "high grid" environments and fostering participatory approaches in "low grid" contexts. By applying the Cultural Theory of Risk, policymakers and communities can better understand and harness the social and cultural dynamics at play in managing the risks associated with heatwaves in Southeast Asia.

References:

1. Bankoff, G. (2003). *Cultures of Disaster: Society and Natural Hazard in the Philippines*. Routledge.
2. Dake, K. (1991). Orienting dispositions in the perception of risk: An analysis of contemporary worldviews and cultural biases. *Journal of Cross-Cultural Psychology*, 22(1), 61.
3. Douglas, M., & Wildavsky, A. B. (1982). *Risk and Culture: An essay on the selection of technical and environmental dangers*. Berkeley: University of California Press.
4. Ebi, K.L., & Semenza, J.C. (2008). Community-Based Adaptation to the Health Impacts of Climate Change. *American Journal of Preventive Medicine*, 35(5), 501-507.
5. Lefale, P.F. (2010). Ua 'afa le Aso Stormy weather today: Traditional ecological knowledge of weather and climate. The Samoa experience. *Climatic Change*, 100(2), 317-335.
6. Luber, G., & McGeehin, M. (2008). Climate Change and Extreme Heat Events. *American Journal of Preventive Medicine*, 35(5), 429-435.
7. Mercer, J., Kelman, I., Lloyd, K., & Suchet-Pearson, S. (2008). The potential for combining indigenous and western knowledge in reducing vulnerability to environmental hazards in small island developing states. *Environmental Hazards*, 7(4), 245-256.
8. Norgaard, K. M. (2006). "People want to protect themselves a little bit": Emotions, denial, and social movement non-participation. *Sociological Inquiry*, 76(3), 372-396.
9. Thompson, M., Ellis, R., & Wildavsky, A. (1990). *Cultural Theory*. Boulder Colo.: Westview Press: Westport, Conn.: Praeger.

Global Overview of Heatwave and Avoidable Deaths

By Dr Winifred Ekezie, Co-Director of Centre for Health and Society, Aston University, UK; Evidence Synthesis Coordinator, Avoidable Death Network, UK

Content

Climate change is increasing the frequency, intensity, and duration of heat extremes and directly impacting health in several ways, including leading to deaths and illness, which are often avoidable (GHHIN, n.d.). As climate change progresses, related negative health impacts worsen with progressive global temperature warming.

Heatwave is defined in different ways. Generally, people can manage during low-intensity heatwaves, but increased heatwave has severe health implications. Heatwaves amplify many health and economic risks, including increased deaths, drought, wildfire, agricultural losses and reductions in worker productivity. Heat-related deaths start at relatively moderate warm temperatures, with thousands of deaths yearly even without temperatures high enough to trigger a 'heatwave alert'.

Some populations are more vulnerable than others to an increased risk of death from heat exposure. Age, gender, pre-existing medical conditions and social deprivation are critical factors related to how people experience heat-related health outcomes. Over the past 20 years, heat-related mortality globally in people older than 65 years has reached about 300,000 deaths in 2018, the majority occurring in Japan, eastern China, northern India, and central Europe (Watts et al., 2020).

Consequently, heatwaves are one of the most dangerous natural weather hazards that contribute to avoidable deaths. Population exposure to heatwaves continues to increase with additional temperature warming, and there are strong geographical differences in heat-related mortality, mainly affecting locations with the least resources, interventions and adaptations. Heat outcomes are intensified in urban cities,

overpopulated regions, and areas with worsening air pollution and poor key infrastructures for mitigating and managing heat effects (GHHIN, n.d.). About half of the global population and more than 1 billion workers are exposed to high heat and about 30% of exposed workers experience negative health effects. The excess heat-related deaths are avoidable with appropriate heat action plans and strategies (Ebi et al., 2021). However, people still suffer and die unnecessarily due to heat, as population health needs and community vulnerability are often unrecognised.

Extended exposure to significantly higher-than-average temperatures compromises the body's ability to regulate temperature and can result in various illnesses, including heat exhaustion, heatstroke, hyperthermia, and dehydration. Other indirect effects include worsening chronic conditions, such

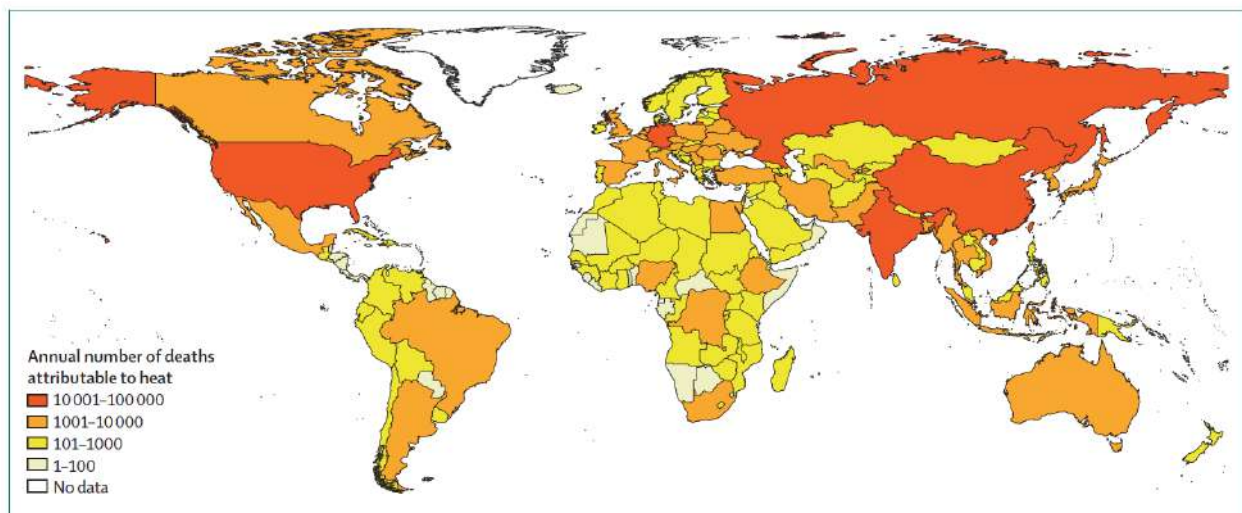


Figure 1: Annual heat-related mortality in the population older than 65 years averaged from 2014 to 2018 (Watts et al. 2021).

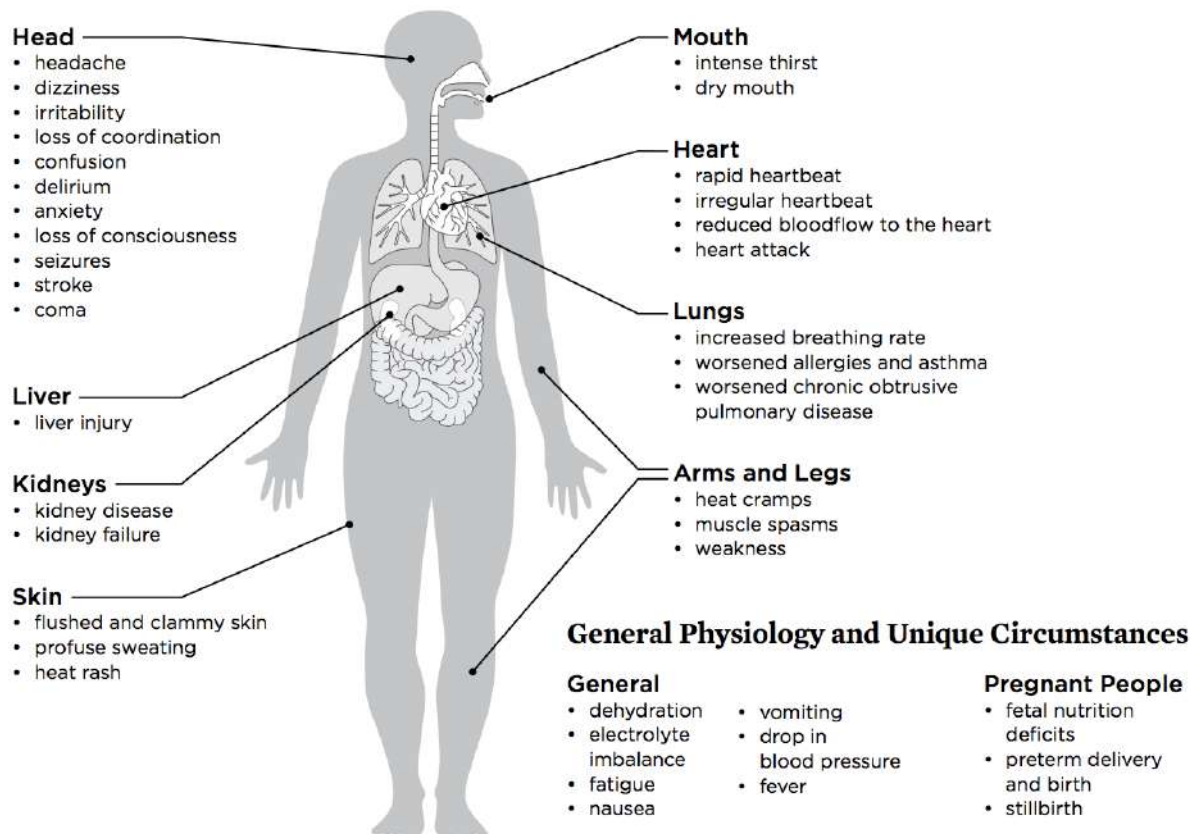


Figure 2: How heat affects our bodies (Dahl et al. 2019).

as cardiovascular, respiratory, cerebrovascular, kidney diseases and diabetes-related conditions. An overview of how heat affects different parts of our bodies is shown in Figure 2. Heat health effects also result in deaths and hospitalisations when care is delayed or not provided, but the outcomes can be managed to minimise avoidable deaths.

Heat-related health impacts are projected to increase with climate change without strong adaptation and mitigation efforts, particularly in low- and middle-income countries (LMICs) (Ebi et al., 2021). Under a high-warming scenario with no appropriate climate adaptation, there will be hundreds of thousands more heat-related deaths each year in the next few decades. Overall, heat

death prevention requires actions at different levels. To minimise heat-related avoidable deaths, there is a need for early identification of who needs to be reached and how best to do so, particularly those most at-risk, like older adults, those with chronic illnesses, and those who work in high-temperature conditions. Therefore, understanding the intensity and impact of heatwaves is crucial to being better prepared and protecting people’s lives.

References:

1. Dahl, K., Spanger-Siegfried, E., Licker, R., Caldas, A., Abatzoglou, J., et al. (2019). Killer heat in the United States: climate choices and the future of dangerously hot days. <https://www.ucsusa.org/sites/default/files/attach/2019/07/killer-heat-analysis-full-report.pdf>

2. Ebi, K. L., Capon, A., Berry, P., Broderick, C., de Dear, R., Havenith, G., Honda, Y., et al. (2021). Hot weather and heat extremes: health risks. *Lancet*, 398(10301), 698–708. [https://doi.org/10.1016/S0140-6736\(21\)01208-3](https://doi.org/10.1016/S0140-6736(21)01208-3)

3. GHIN (n.d.). Heat & Health. Global Heat Health Information Network. <https://ghin.org/heat-and-health/>. Accessed 30 March 2024.

4. Watts, N., Amann, M., Arnell, N., Ayeb-Karlsson, S., Beagley, J., Belesova, K., et al. (2021). The 2020 report of The Lancet Countdown on health and climate change: responding to converging crises. *Lancet*, 397(10269), 129–170. [https://doi.org/10.1016/S0140-6736\(20\)32290-X](https://doi.org/10.1016/S0140-6736(20)32290-X)

5. WMO (n.d.). Heatwave. World Meteorological Organization. <https://wmo.int/topics/heatwave>. Accessed 30 March 2024. ■

Heatwave Displacement is Avoidable, and thus Death Due to Displacement

By *Ashish Ghadiali*, Director at Radical Ecology and Visiting Research Fellow at the University of Exeter, UK

Our 2023 study, quantifying the human cost of global warming (Lenton et al.)¹², connected projected temperature changes with corresponding population data to demonstrate the scale of impact that carbon reduction can have on extreme heat exposure through to the year 2100.

This new data shows that in the scenario where carbon emissions continue to rise, leading to global warming of +3.6°C or even +4.4°C above pre-industrial atmospheric temperatures, we could expect to see half the world's population exposed to unprecedented levels of heat, a scenario that leading climate scientists have dubbed "existential".

In the situation where current decarbonisation commitments play out, leading to a mean temperature rise of +2.7°C, this reduces to one-fifth of the world's population exposed – two billion people of which 600 million people in India and 300 million in Nigeria are projected to be displaced outside the human climate niche by 2100, while in a situation where carbon emissions reduction succeeds in limiting global warming to +1.5°C, this figure is reduced to 5% of the world's population exposed.

Rapid decarbonisation/mitigation, is therefore the primary goal for avoiding heatwave deaths as we move deeper into the 21st century. It demands a sea-change in

international cooperation and diplomacy as well as in the mechanisms for climate and development finance that could adequately fund a just transition away from the fossil-fuel economy.

Professor Avinash Persaud, an architect of the Bridgetown Initiative, has called on the IMF to draw down \$500 billion in special drawing rights that could leverage up to \$5 trillion in private finance for mitigation¹³. However, in a context where escalating climate vulnerability makes access to finance increasingly difficult for developing countries, increased scale of mitigation funding must also be supported by a paradigm shift in the global financial architecture that,

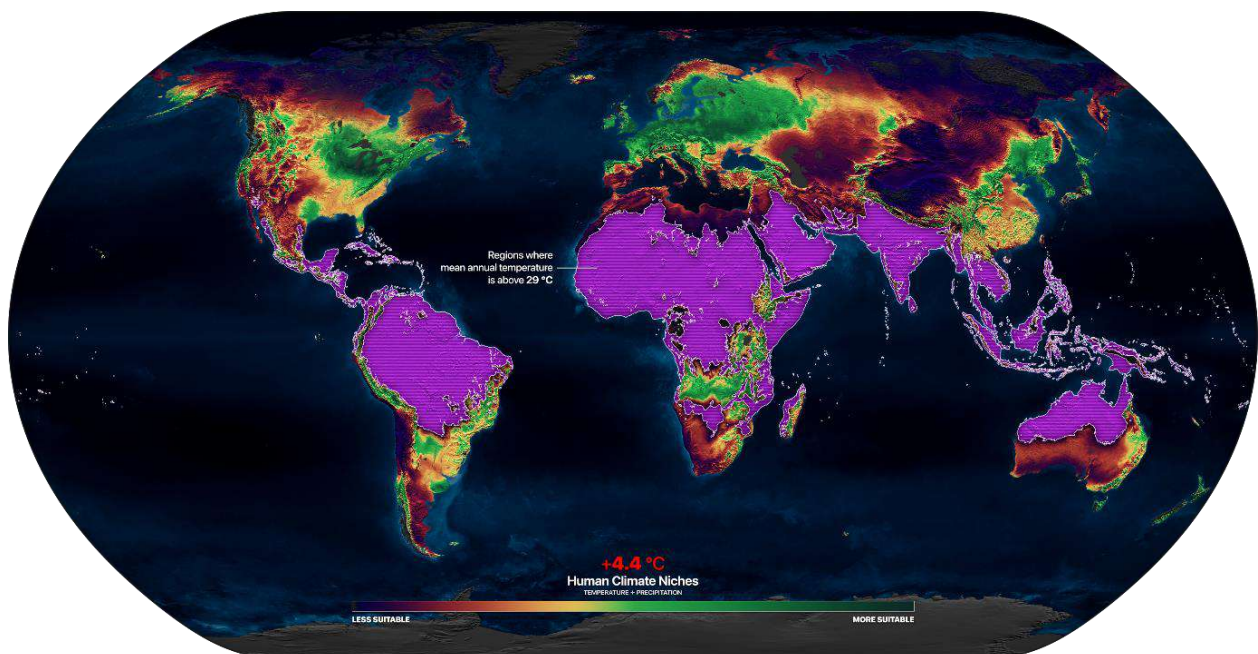


Photo credit: Globaia.

¹² https://www.nature.com/articles/s41893-023-01132-6?utm_campaign=related_content&utm_source=EARTHENV&utm_medium=communities

¹³ <https://unclimatesummit.org/opinion-the-bridgetown-initiative/>

instead of penalising vulnerability, acknowledges the value in investing directly into it.

At the local level, planning and preparedness that is also supported by adequate budgetary provision can significantly reduce levels of heatwave mortality. Measures, including the development of early warning systems and communication networks, can help to ensure that vulnerable

populations are informed and resourced in the face of heatwave impacts.

Investment in the adaption of the built environment through improved ventilation and urban forests and in labour conditions through flexible working times, and the provision of drinking water and food, rest arrangements and emergency medical services can support the resilience of outdoor

workers and community stakeholders.

Blended finance, microinsurance, and debt suspension can all serve as instruments that will save those most adversely impacted by heatwaves from debilitating poverty cycles, where chronic poverty is, above all, the leading driver of heatwave mortality.¹⁴ ■

AIDMI Actions with Schools in 2024
School Kit for Safety Against Heatwaves

No.	Items
1.	Educational materials on Heatwaves Risk Management for Schools
2.	First Aid Kit
3.	Outreach Poster for Parents and Family Members
4.	Guideline for Precautions
5.	Do's and Don'ts for Cool Roof (White Wash)

No.	Items
6.	Sun Screen
7.	Ice Packs
8.	ORS Packets
9.	Thermometer
10.	Glucose
11.	Some Liquid Stock (Lime water, Jaggery water, Butter milk, etc.)

Display Kit

 Water Bottle	 Ice Pack	 First Aid Kit	 Liquid Items for being Hydrated	 Sunscreen	 Umbrella
 Cap	 Light Clothing	 Sunglasses	 Hand Fan	 Hand Towel	 Arm Sleeves

ALL INDIA DISASTER MITIGATION INSTITUTE

Does your school wants to have a session on "Heatwave Risk Education" for students?
 Contact Nikeeta Prajapati at support@aidmi.org

¹⁴ Valuing the Global Mortality Consequences of Climate Change Accounting for Adaptation Costs and Benefits <https://www.nber.org/papers/w27599>

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