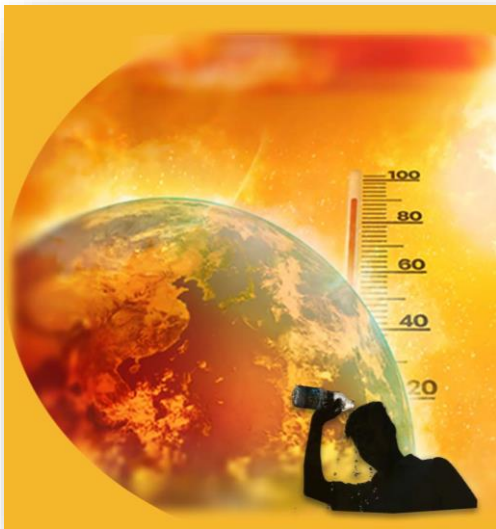




National Programme
on Climate Change
and Human Health

REPORT



National Workshop on Health Sector Measures to Mitigate and Adapt to Impact of Extreme Heat

June 9-10, 2022 | Ahmedabad, Gujarat



In 2022, India witnessed early, frequent, and longer heatwaves in many states, posing an unprecedented threat to the health and wellbeing of our population. Yet, the lack of visible signs of damage leads to this “silent killer” often being neglected in health-oriented response and action. According to a recent report, India observed some of the biggest absolute increases in heat-related mortality, between 2018 and 2019. Heatstroke is not the only presentation of heat-induced morbidity and mortality. It also leads to an increase in overall mortality by a major increase in cardiovascular, cerebrovascular, respiratory, and renal diseases. It also increases the risk of stroke and pre-term birth. Considering increasing heatwaves, special attention should be given to the health impact of extreme heat and the need for urgent climate action at various levels to reduce further global warming (mitigation) and its impact (adaptation).

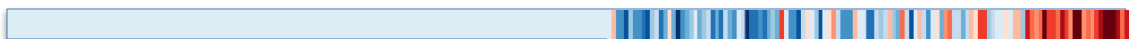
To highlight the vital role the health sector has to play in educating the population, informing decision-makers with health impact evidence, implementing prevention measures, and being prepared for clinical management and emergency response, a two-day workshop was organized by **National Programme on Climate Change and Human Health** (NPCCHH) on June 9-10, 2022. The event, **Health Sector Measures to Mitigate and Adapt to Impact of Extreme Heat** was organized in Ahmedabad, Gujarat, the city that developed and implemented South Asia’s first heat-health action plan. Efforts of Ahmedabad Municipal Corporation under the Ahmedabad Heat Action Plan (AHAP) are well-recognized and serve as a model globally. The event was for State Nodal Officers-Climate Change (SNO-CC) or State Health Department representatives to learn from the health sector and community level measures taken in Ahmedabad. (Annexure 1).

Day 1: Ahmedabad City Field Visit, June 9, 2022

On June 9, 2022, participants were taken to a curated tour of health facilities and locations where community level measures were being implemented.

- **Meeting at Head office, Ahmedabad Municipal Corporation**

The day began with a visit to Riverfront House, where Mr. Lochan Sehra, Ahmedabad Municipal Commissioner welcomed everyone and oriented with various activities and initiatives in Ahmedabad to reduce air pollution, traditional energy consumption and urban heat island and to increase green coverage. Dr. Tejas Shah, Deputy Health Officer and in-charge of Heat Action Plan



provided details on background of AHAP development, implementation of various measures and their impact on heat-related mortality.

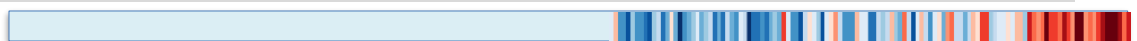
Following salient points were presented:

A. Since the beginning of implementation of the action plan in 2013 several actions have been taken to adapt to heat impact of health. Among some measures are

- Disseminating IEC on heat-health and cool roof programmes through digital/print display on major roads, print and news media, announcements and health facilities
- Temperature-based thresholds for color-coded early warning and response triggers
- Promoting health facility preparedness and health data collection
- Development of affordable housing for the poor and low-income groups by considering thermal comfort measures and new technologies.
- Installing water fountains on crossroads and main junctions.
- Allowing access to parks during noon-afternoon hours and provide drinking water provisions (stationary and mobile) at various high footfall areas.
- Ahmedabad's Mayor is currently reviewing the progress of the work weekly and proactively supporting the municipality to move things forward.

B. The city is also taking initiatives in mitigating climate change.

- The green area coverage of Ahmedabad city increased from 4.22% in 2012 to 12% in 2022 and AMC aims to raise it further to 15% by 2025.
- Using the Miyawaki technique, AMC corporation is creating 10 new urban jungles and 14 new gardens in all 7 zones in Ahmedabad by 2022-23. Through this technique, the plantation becomes 30 times denser than normal, grows 10 times faster and becomes maintenance-free after 3 years.
- Every year the corporation is planting 10 lakhs trees, including roadside plantation drive. By using a mobile App called "Plantation on Demand" to monitor trees, it was found that the survival rate of trees is 60%. Therefore, next year AMC plans to plant 15 lakhs trees.
- Developing a dense forest on the 45-acre landfill sites in the outskirts of Ahmedabad.
- Encouraging the citizens to install rooftops photovoltaic systems and the local government to give a 10% rebate in property tax for consumers installing PV projects.



A study conducted by IIM identified Ahmedabad city as the highest potential area for solar rooftops in the country.

- Implementing a project interlinking lakes and encouraging societies to create percolation wells for rainwater.
- Covering all of its public transport to CNG and Electric by December 2022.
- Promoting e-mobility and implementing a PPP project to install 300 charging stations across Ahmedabad city.

Some of the challenges identified are; increasing urban health island effect outpacing the efforts and lack of hotspot assessment affects the targeted impact of solutions and challenges in implementing some nature-based cooling solutions, due to regulatory hurdles. The concluding remarks from the commissioner highlighted, a multi sectoral and multi stakeholder approach should be considered.



Image 1: Meeting at Ahmedabad Municipal Commissioner's office and brief session on Ahmedabad Heat Action Plan

- **Visits of Health facilities**

In **L.G. Hospital, Maninagar**, participants were taken to the pediatrics-maternity ward to show case 'DOME' (Damp cloth Over Mosquito net) method where an infant is kept under a mosquito net dome covered by a wet cloth. It helps cool down the air around the baby and offers some comfort in scorching heat. Dr. Khyati Kakkad displayed the technique and narrated its benefits. Mothers were advised regarding health hazards of heat, keeping neonates away from sunlight, the importance of breastfeeding & hydration, as well as methods & instructions regarding the DOME technique. Participants also visited Heat-Illness Ward where case identification, case registering and surveillance reporting was discussed with the Doctors from the Medical Unit. Hospital preparedness in terms of medicine to treat HRI and cooling measures was also showcased. The ward had 20-beds allotted to any suspected HRI case, and white ceramic tiles and air conditioning to keep it cool.



Image 2: Showcasing 'Dome' technique for cooling infants at L.G Hospital, Ahmedabad

Community Health Centre, Vatva showcased many measures taken to prevent and manage HRI in the community. Participants saw various IEC in and around the facility, ORS corner, ORS registers, and emergency room preparedness to stabilize severe HRI. There was a Heat Illness Ward in a well-ventilated room with six beds where a cooler was placed and a fan over each bed was also provided. Participants also had interactions with ASHA workers about their training and IEC dissemination in the community.



Image 4: ORS corner, ORS registers and IEC poster on health impact of heat, CHC Vatva, Ahmedabad

The CHC arranged cool water provision in the premises during summer. The medical officer also trained Anganwadi workers to spread messages on the prevention of heat stress to parents of the attending children and making ORS.



Image 3: Inside Heat Illness Ward displaying clinical management protocol of HRI and offering adequate ventilation and cooling in CHC Vatva, Ahmedabad

- **Drinking water distribution at a major bus terminus of Ahmedabad Municipal Transport Services, Sarangpur**



Image 5-7: Free drinking water and buttermilk distribution in high-foot fall areas by public and NGO stakeholders, AMC bus terminus, Ahmedabad

AMC identifies places and work sites with high-footfall in the city to construct cool shelters/sheds at public places, bus stands, etc. Various departments with support from local self-help groups/NGOs, are providing drinking water facilities and butter milk distribution facilities free of cost at crowded places like bus stands as water and butter milk are some of the best replenishment fluids preventing heat stress.

- **Community-level cool-roof measures**

Participants were taken to a community near Shahibaug area where white-washing of tin roofs and white china-mosaic application on concrete terraces were done to reflect sunlight and reduce temperatures in the residences.



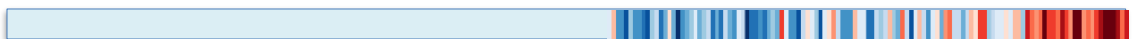
Image 8-9: White painted cool roof and visit to low-income houses that have adopted cool-roof measures, Shahibaugh, Ahmedabad

▪ **Met Centre, Ahmedabad**

The participants visited India Meteorological Department's Ahmedabad Airport Met Centre in the afternoon. Where they witnessed weather balloon launch, various mechanisms IMD uses to measure different weather parameters.



Image 10-11: Displaying balloon release for weather parameters measurements and heat threshold and early warning mechanisms at Met Center, Ahmedabad



Day 2: Symposium, June 10, 2022

▪ Inaugural session

The event on day 2, symposium, began with a welcome address and messages from Dr. Sujeet Singh, Director, NCDC. He praised the great importance of Gujarat state's organizations taking part in the workshop. He highlighted various health impact of heat and encouraged implementation of action plans at state level. Mr. Atul Bagai, UNEP-India Head pointed out role of urban bodies and communities in implementing adaptation measures as global warming increases. Access to sustainable cooling is an urgent necessity in tackling extreme heat. Cooling is inter-linked with numerous Sustainable Development Goals, in particular its role in human health and well-being, productivity, and keeping food and medicines viable.

Dr. R. B. Patel, Deputy Director (Epidemics), Health & Family Welfare Department in Gujarat, welcomed the workshop participants. Dr. Patel stressed on climate change and poor socio-economic conditions increasing heatwaves vulnerability for certain individuals. Similarly, extreme heat's impacts may not be uniform across the country.



Image 13: Inaugural session on Day 2 of the workshop, June 10, 2022, Ahmedabad

Prof. Dileep Mavlankar, Director, IIPH identified the challenges for developing and implementing effective Heat Action Plans. They said the state and district administration often do not have reliable data on morbidity and causes of death. Dr. Chandana Dey, Regional Director, Regional

Office of Health & Family Welfare highlighted importance of including climate change in health care delivery.

Mr. Lav Agarwal, Joint Secretary (Public Health), Ministry of Health and Family Welfare inspired participants to keep health at the center of climate response, take all necessary health sector adaptation and mitigation measures and also take individual actions. Dr. Aakash Shrivastava, Addl. Director and HoD Centre for Environment and Occupational Health, Climate Change and Health, NCDC thanked the speakers, organizers and participants of the workshop. He said state and district health departments should play a serious and active role taking NPCCHH implementation forward.

- **Technical session 1**
Health sector actions under NPCCHH

Dr. Purvi Patel, Sr. Consultant began morning session with a presentation on NPCCHH's action on heat. Specific attention was given to surveillance formats: case identification and reporting in updated formats of National Action Plan on Heat-Related Illnesses (NAPHRI). This was followed by demonstration of digital version of

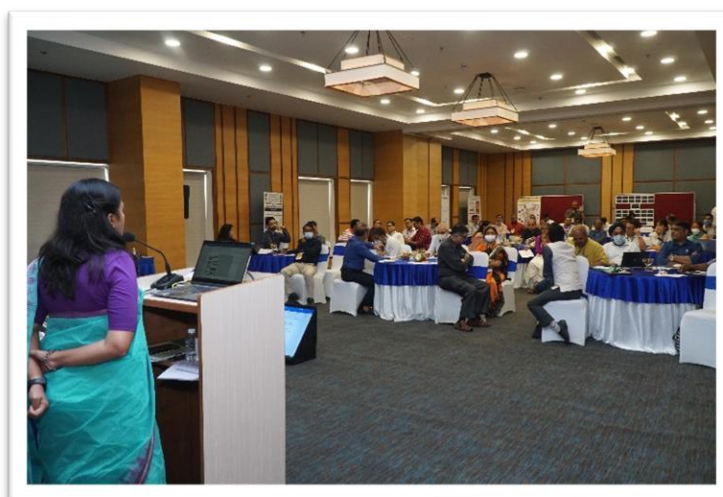


Image 14: Demonstration of digital HRI surveillance and discussion, Ahmedabad

HRI data collection formats on IHIP platform. Queries of state representatives and other participants regarding digital surveillance were answered by teams from NPCCHH and IIPH-G. Dr. Mahaveer from IIPH-G presented on challenges of heat action plan implementation. This was followed by a short quiz session, where participants were presented with various important clinical and public health aspects of health impact of heat. All the participants enthusiastically participated in answering the questions.

Poster and PPT presentation by State SNO's on health sector measures

State representatives were asked to present activities they have done in relation to heat during this summer. States of Assam, Haryana, Maharashtra, Rajasthan, Tamil Nadu, Andhra Pradesh, Kerala and UT of Div, Daman and Dadra, and Nagar Haveli presented activities conducted in their state/UT. This was followed by a session on an appraisal of State Action Plan on Climate Change and Human Health (SAPCCHH) under the programme. State of West Bengal presented their SAPCCHH poster. After a review of



Image 15: SNO-CC of Tamil Nadu presenting state activities on heat in 2022, Ahmedabad

updated action plans submitted by Punjab, Maharashtra, Assam, Tamil Nadu, and Utter Pradesh, NPCCHH officers identified major areas in the chapter of heat that needed attention. Specific recommendations were provided to all state representatives on how to approach those sections and where to get relevant information and technical support.

▪ **Technical session 2**

Afternoon session of the day 2 included talks from experts, panel discussion and question-answer session. Participants listened to Ms. Eleni Myrivili, chief heat officer, Athens, Greece. She highlighted urgency and importance of heat adaptation in terms awareness, preparedness and redesign. Naming of heatwaves like hurricanes makes them more visible as threats to increase awareness and preparedness in the population. She shared that thick wall with small openings, well-placed windows pulling cool air from the lower parts of the building up and out, external shutters, shady and verdant internal courtyards with fountains, and outside walls whitewashed every spring to best reflect the hot summer heat. Compare that with the concrete glass and steel air-conditioned buildings – the ones with sealed windows which are making our cities heat traps, compounding the problem rather than solving it. She highlighted need to radically rethink build environments and urban design to reduce dependence on air-conditioning and to increase use of

natural, conventionally tested solutions. Need for understanding of individual risk due to heat in real-time and knowledge of nearest cooling location were some of the ideas highlighted.

Mr. B Gautham Baliga from Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE) talked on Infection Control & Heat-Resilient Measures in Air-conditioning of Healthcare Spaces.



Image 16: Panelists Ms. Eleni Myrivili and Mr. B Gautham Baliga presenting their talks during the technical session, Ahmedabad

He shared various air conditioning and ventilation options based on the type of the hospitals and their infection control requirements. He also shared information on structural cooling through natural resources like wind and water with geothermal heat pump. Mr. Polash Mukharjee from Natural Resource Defense Council (NRDC) discussed various cool-roof and pavement solutions that can be adopted by health facilities easily to reduce indoor heat by up to 5-7°C, conserve energy and reduce carbon emissions. He highlighted that some of the highest cooling demands in the world are recorded in Indian cities. Ahmedabad and Hyderabad have shown leadership by proactively including cool roofs

within the city's heat action plan and developing cool roof policy and governance framework for implementation of cool roof technologies.

The steps taken by Ahmedabad and Hyderabad include implementing cool roofs on municipal buildings, promote incentive mechanisms for cool roofs in private buildings, incorporate cool roofs projects into the cities' building codes as a voluntary or mandatory initiative, along with budget and financing considerations. Both cities leverage different types of financial mechanisms: 1.

utilizing public funds (national and state) under smart city or energy efficiency schemes and 2. utilizing Corporate Social Responsibility (CSR) funds for cool roof installations in low income and vulnerable housings. The city of Ahmedabad is likely to resume its target to paint 15,000 slum roofs with cool paint. Many local real estate developers have already expanded cool roofs to private buildings on a voluntary basis.

Ms. Bhavna Maheriya from Mahila Housing Trust (MHT), explained how cool-roof solutions are offered and implemented in the community. MHT has been present in 6-7 states and helping poor communities to adopt various cool-roof solutions as per their requirement and feasibility. They are empowering women to take up the task implement the measure and monitor the changes in indoor environment in first few days.

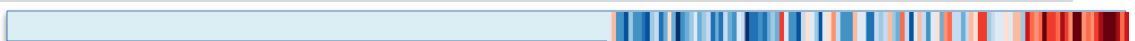
Participants asked questions on the logistics and impact of various options and showed interest in taking-up some of those to their states/UT.

She shared that inter-agency coordination and financing are two challenges that need to be addressed to move from a pilot project to an implementable city-wide programme. Mr. Manjeet Saluja, Environment and Public Health officer, WHO-India moderated the session. Dr. Aakash Shrivastava gave concluding remarks and way forward.

In this two-day workshop, representatives from 22 states/UT (23) participated with organizers: NPCCHH team (7), AMC (5), IIPH-G (2), UNEP (2), and NRDC (1). The event ended with a high note and state representatives appreciated the learning experience they had.

Lessons learned from Ahmedabad city's Heat Action Plan

- A key component of successful development and implementation of the Ahmedabad Heat Action Plan (HAP) was engagement of health department by appointing a health officer as in-charge of implementation of HAP and continued health sector engagement in identification and implementation of any new ad-hoc strategy to reduce heat impact on the population
- The city nodal officer for HAP implementation must be very dynamic and must proactively push all departments to align their activities, raising awareness and coordinating the efforts. Ahmedabad city maintained the same nodal officer for 10 years whose experience has ensured proper implementation of HAP and action based on learnings from earlier efforts.

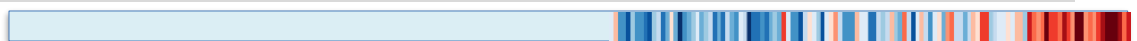


- Capacity building for all the stakeholders especially vulnerable occupational groups involved was also an important step.
- Consistent communication and coordination channels are key to the Heat Action Plan's success.
- HAP preparation is an iterative process. Hence, monitoring of heat-related illnesses is a crucial way to understand impact of implemented strategies and planned for new solutions.
- Cities hold sufficient planning powers to successfully promote health sector measures to mitigate and adapt to extreme heat. They can also promote urban cooling through masterplans and leverage their experience in a range of sustainable practices that can be scaled up quickly in extreme heat scenarios.
- Significant political will is a key to implement new policies, provide incentives and adopt best practices to ensure cities lead on solutions for extreme heat through suitable health sector measures.

Way forward

States should adopt learnings developed from city-level heat action plans along with existing NPCCHH guidelines on health sector response to extreme heat

- Understand heat impact on urban population through available assessments or use city level mortality data to correlate with observed daily temperatures and identify temperature thresholds for response, adopt various measures outlined and formalize intersectoral coordination.
- Finalizing heat-health action plan under SPCCHH is the key to integrated response to heat
- Engage with all stakeholders: IMD for weather data, health facilities for preparedness and health data, emergency response agencies, state disaster management authorities, media partners, civic society organizations, corporate partners and city government for various actions
- Ensure robust heat-related illness surveillance by daily reporting of emergency visits, all-cause deaths, suspected heatstroke cases and deaths from heat vulnerable states. Report on death investigation form in case of suspected heatstroke deaths as per National Action Plan on Heat Related Illnesses



- Conduct IEC activities and training of health care professions on identification and treatment of HRI, regardless of state/UT's heat vulnerable status because average annual temperatures of all the states have increased over last decade and population is and will be exposed to higher level of heat than they are adapted to.
- Involve local and national academic institutions/experts to facilitate local, applied research and monitoring of HAP implementation
- Expand the initiative, partners, and national governments' support beyond a single pilot – providing grants, capacity support and training.
- Implement environmentally friendly and heat resilient measures in health facilities and support implementation of such measures at community level through various funding and implementation partnerships
- Measure HAP implementation progress and impacts through various outcome indicators including mortality and morbidity.



Image 16: Participants of workshop Health Sector Measures to Mitigate and Adapt to Impact of Extreme Heat by NPCCHH, NCDC at Ahmedabad, June 10, 2022



World Environment Day 2022 event by
National Programme on Climate Change and Human Health
on **June 9-10, 2022** at **Ahmedabad, Gujarat**

Agenda

All SNO arrive by evening June 8, 2022 and have a night halt at Ahmedabad		
Thursday, June 9, 2022 (Field visit)		
7:30am-6:30pm	Pick up at/around Fairfield by Marriot, Ahmedabad	
	<ol style="list-style-type: none"> Ahmedabad Municipal Corporation office, Riverfront, Ahmedabad 	
	Tea break	
	<ol style="list-style-type: none"> LG hospital, Maninagar, Ahmedabad CHC Vatva, Ahmedabad AMC heat mitigation and awareness measures showcase 	
	Lunch on the way	
	<ol style="list-style-type: none"> Community-level heat mitigation: Implementing cool-roof programmes Meteorological Centre (IMD), Ahmedabad Emergency Preparedness: 108 emergency unit Urban forest 	
	Dinner at Fairfield by Marriot, Ahmedabad	
Friday, June 10, 2022 (Symposium) at Fairfield by Marriott, Ahmedabad		
9:00-9:15am	Welcome address	Director, NCDC
9:15-9:25am	Message from UNEP	Head, UNEP-India
9:25-9:35am	Address from Health & Family Welfare Department, Gujarat	Addl. Director (PH), HFWD, Gujarat
9:35-9:45am	Message from IIPH-G, CoE NPCCHH	Director, IIPH-G
9:45-9:55am	Message from Ministry of Health and Family Welfare, GoI	JS (PH), MoHFW, GoI
Tea/Coffee break (10:00-10:30am)		
10:30-11:15am	Health sector response to extreme heat under NPCCHH	NPCCHH
11:15-11:30am	Challenges in implementing heat action plans	IIPH-G
11:30-1:30pm	Poster and PPT presentation on health sector measures taken in response to extreme heat in State/UT	Representative: States/UTs
Lunch break (1:30-2:30pm)		
2:30-3:30pm	Appraisal of State Heat Health Action Plans	Representative: Selected States/UTs
3:30-4:45pm	Panel Discussion (Moderated by WHO-India)	
	Coordinated Health and City Responses to Extreme Heat: Experiences from Athens and Internationally	UNEP/City of Athens
	Infection Control & Heat-Resilient Measures in Air-conditioning of Healthcare Spaces	UNEP/ISHRAE
	Cooling Measures in Health Facilities & Communities	NRDC
	Implementing Cooling Solutions in Communities	Mahila Housing Trust
	Question-Answer session	
4:45-5:00pm	Concluding remarks	NPCCHH, NCDC
High Tea (5:00-5:15pm)		
All SNO-CC/state representatives leave for their respective State/UT		