

# **Past Learning and Next Generation City Heat Action Plan**

**National Workshop on Heat Wave 2024, Vigyan  
Bhawan, New Delhi 13-14 Feb, 2024**

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Health-Gandhinagar**

# Hey Bhagwan!

## Bahut garmi hai...Utha le



## Aur patak de Switzerland ya Paris mein

# IIPH-Gandhinagar- Heat Health Journey

- **IIPH-Gandhinagar in collaboration with local city government, NRDC, USA, University of Washington has developed and implemented South Asia’s first Heat Action Plan in the city of Ahmedabad in 2013**
- **This action plan was major impetus of heat health related work in India**
- **NDMA has taken a lead role in prioritising heat health in the country**
- **A model national guideline has been developed for development and implementation of heat action plan by the NDMA**
- **IIPH-Gandhinagar has provided technical support to several states and municipal corporation for effective implementation of heat action plan- it has helped in prevention and management of heat related illnesses**
- **There are many lessons learned so far in the last decade of implementation and that can guide the next generation of heat action plans**

# Governance and Leadership/Stakeholder engagement

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- **Political and Administrative Leadership-**
  - Its very essential for setting the priority for heat health
  - Commitment and political and administrative will- Ahmedabad Mayor and commissioner
  - Enhancing understanding about climate change and health, Env Public Health etc.
- **Municipal Corporation Officials-** continuity of service- HAP nodal officer, institutional memory- Ahmedabad- since the beginning of the HAP- the nodal officer remain same
- **Inter-agency coordination and clear-cut roles and responsibilities** of line departments- most of the municipal corporations and districts lack of inter-agency coordination, in some of the state revenue department is nodal agency, in some SDMA and in some of the state health department is nodal agency
- There is an urgent need to define clear cut roles, responsibilities and accountability of each agency at various levels (national, state, district and municipal)

# Governance and Leadership/Stakeholder engagement

- **Localised governance**
  - Ward-wise heat stress management committees- Nagpur- more localised actions
  - Regular monitoring of actions taken at micro level
- **Engagement with religious leaders/organisations, NGOs/CSOs-** Ahmedabad and Rajkot- Religious organisations and NGOs involvement ensure availability of water in heat hotspots and vulnerable areas and also supported in public awareness
- **Urban Planning Department involvement-** sustainable and heat resilient buildings, promoting cool roof, in most of cities urban planning department is not on board
- **Division of urban environment** in the forest department- currently major focus is on wild animals, conservations of forests (largely in rural areas)

# Data and Measurement

- **Availability of all-cause mortality data- improve heat health surveillance**
  - Necessary to correlate all-cause mortality data with temperature- establish the link between extreme heat and human health- lead to prioritization- Ahmedabad HAP
  - About 50 years of Temperature data available from IMD, but from health department/RBD- all-cause daily mortality data is not easily available (1660-London)
  - If all-cause mortality data is not available then IPD/OPD/108 ambulance call data can be used
- **Identification of heat hotspot within city and district- (Rajkot, IRADe-IIPH-G)**
  - More localised and area specific actions
- **City specific threshold determination- Rajkot-Nagpur-DST HAP Project/NDMA**

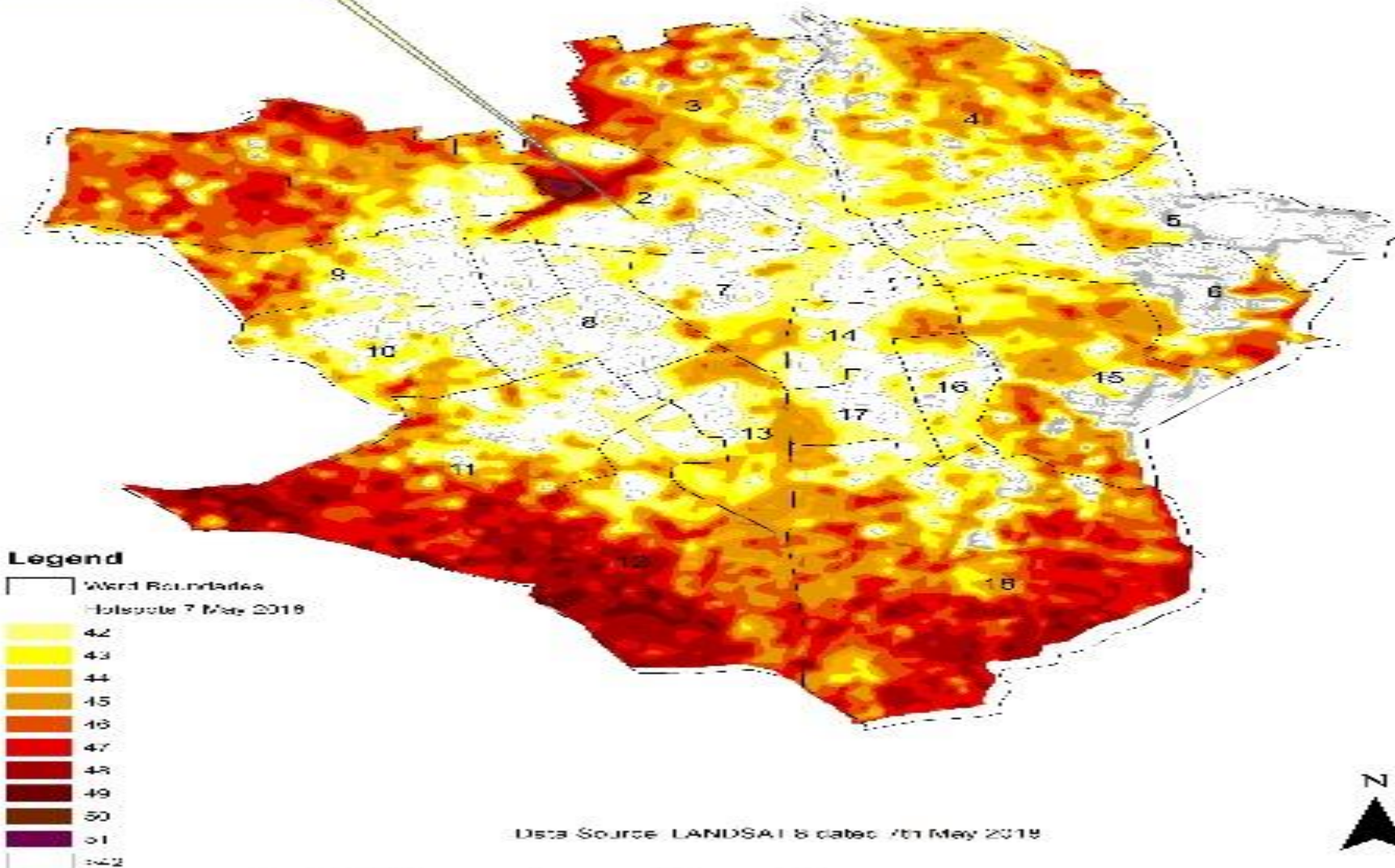
# Temperature Map of Rajkot City- 7th May 2018



INDIAN  
INSTITUTE  
of PUBLIC  
HEALTH  
GANDHINAGAR

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IMD Station- Max Temp.  
7th May 2018- 41.8 Deg C



### Legend

- Ward Boundaries
- Hotspot 7 May 2018
- 42
- 43
- 44
- 45
- 46
- 47
- 48
- 49
- 50
- 51
- 52

Data Source: LANDSAT 8 dated 7th May 2018

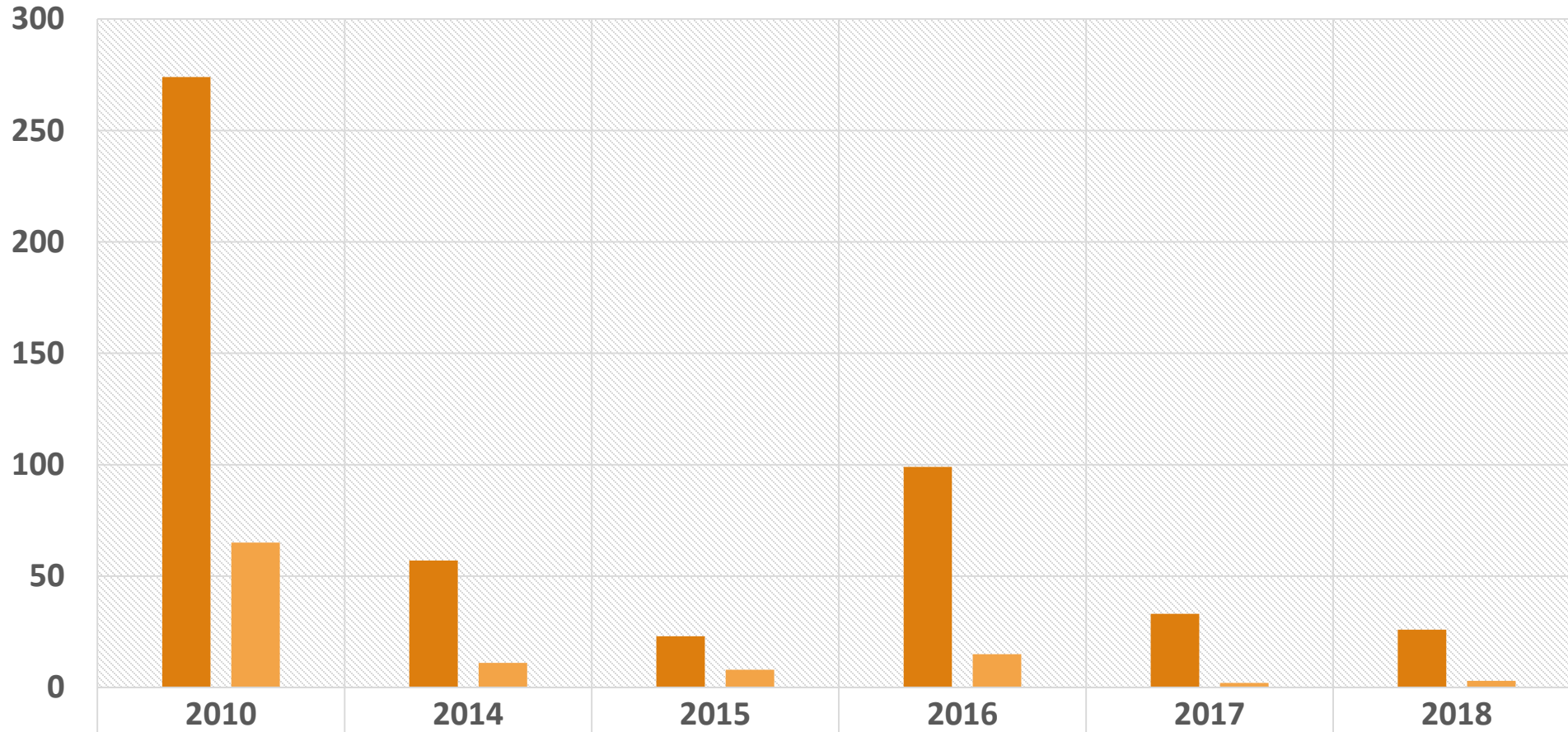


# Data, Measurement and Research

- **Evaluation of impact of HAP on mortality and morbidity**
  - Many cities have implemented the HAP- however, very few have analysed the impact of HAP on Human Health-reduction in number of heat related illnesses and deaths- lead to priority setting for heat health
  - Economics Evaluation: NDMA/competent authority should fund the study to understand economic impact of HAP implementation- how much deaths been averted and economic gain in terms of QALY gained and DALY averted
  - Each USD invested in HAP- minimum 1000 times returns (to be investigated through economic evaluation)
  - Further, research on heat health should be promoted- **a special call for research from ICMR, DST require**
  - **Monitoring and Evaluation of district level activities and ranking- UPSDMA-Uttar Pradesh**



# Year wise Heat Stroke cases: Ahmedabad 5 major Municipal hospitals mortality and morbidity surveillance



Heat Stroke Cases	274	57	23	99	33	26
Heat Stroke Deaths	65	11	8	15	2	3

## HR-availability, Capacity Building and Training

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- Nodal person for HAP implementation, monitoring and evaluation- Ahmedabad and Nagpur (Nodal person at municipal level for all heat health activities)
- Disaster expert at district level in the State of Uttar Pradesh
- NDMA/competent authorities can fund capacity building of Officials in the area of Environment Public Health (IIPHG and IIT-B can collaborate for joint program) (NHM-PGDPHM for state health department officials)
- Similarly short term 1-3 months training can also be organized
- Heat Health Officers at State Level/Regional Level under NHM Program
- NHM also have provision of DPC for NPCCHH

# Blue Green Infrastructure

- Riverfront- Significant reduction in temperature in surrounding areas



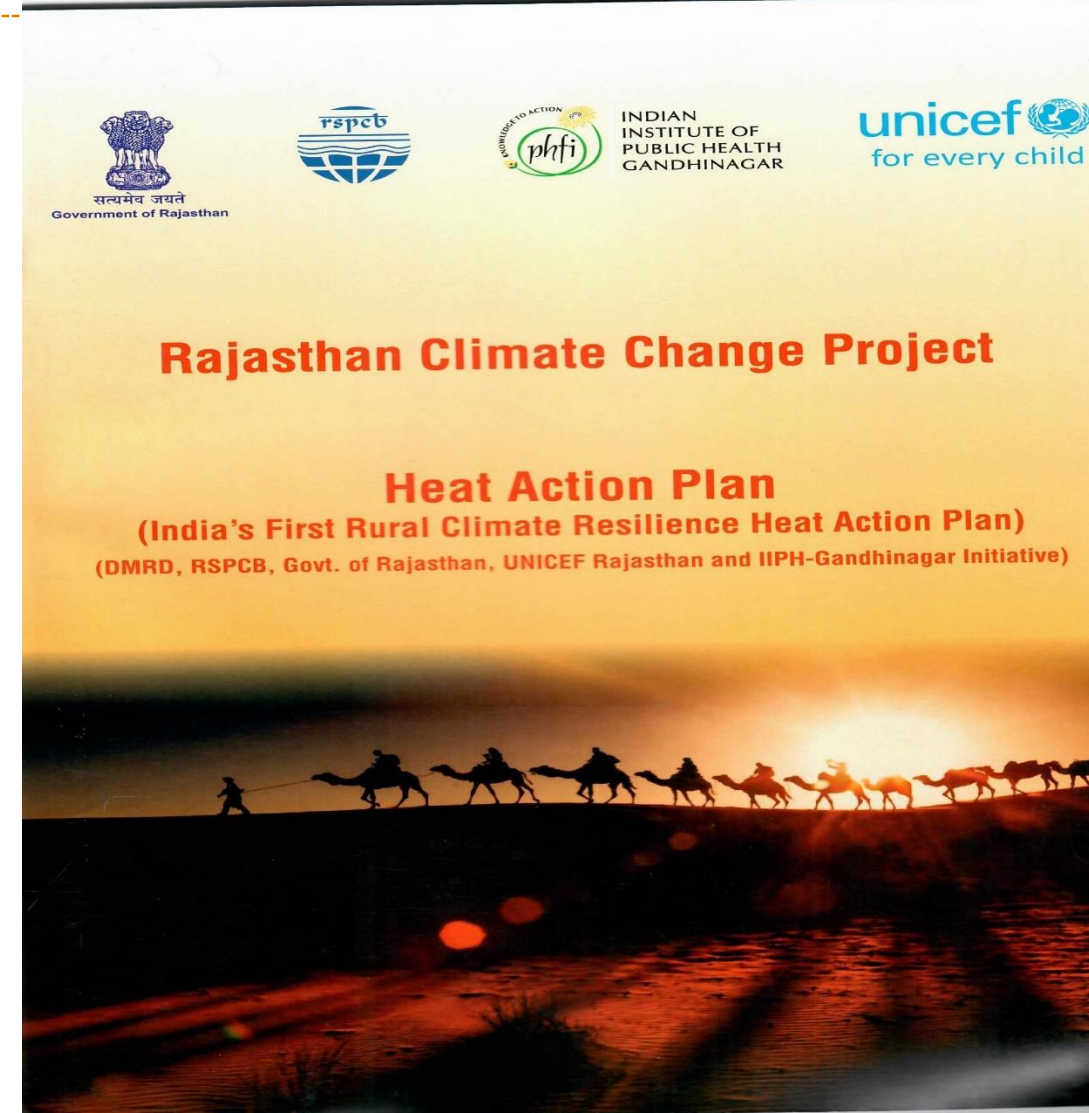
- Urban Forest: Jadeshwar Forest- built on a 'dumping site





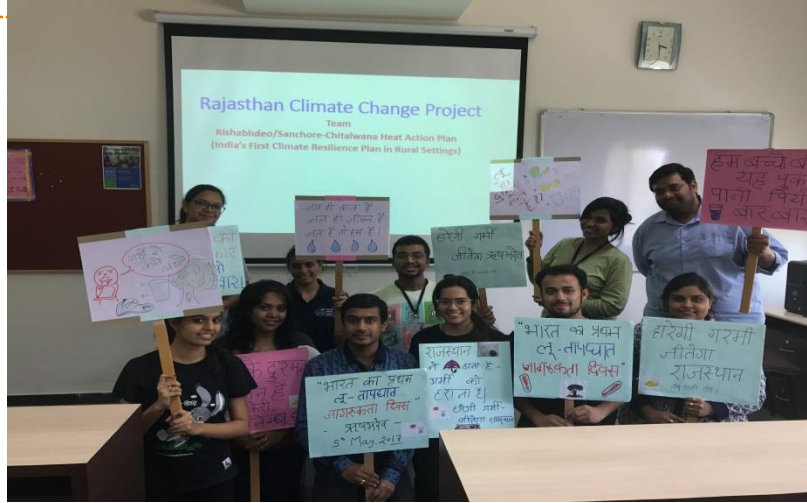
## Heat Action Plan for Rural Areas

- Heat Action Plan main focus is on urban areas
- Rural areas are also facing many challenges due to extreme heat events
- Under Rajasthan Climate Change Project- Developed and implemented country's first heat and cold action plan for rural settings in 3 blocks of Rajasthan



# Heat Awareness Day:

## India's first Heat Awareness Day, 5th May, 2017: Rishabhdeo block, Udaipur, Rajasthan



# Heat Related Illnesses Prevention and Management Awareness in Schools



## Private Sector Engagement

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- More than 60% of hospitals, more than 70% of doctors and more than 50% people avail health services from Private Sector
- In existing scenario- very minimal role of private sector
- Standardizing the treatment and care pathway for heat related illnesses treatment
- Developing protocols for underlying cause of death for heat stroke
- Molecular, pathological biomarkers

# Save your LPG Cylinder







Environmental Research

Volume 198, July 2021, 111232





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RESEARCH ARTICLE

## Heat-Related Mortality in India: Excess All-Cause Mortality Associated with the 2010 Ahmedabad Heat Wave






Gulrez Shah Azhar , Dileep Mavalankar, Amruta Nori-Sarma, Ajit Rajiva, Priya Dutta, Anjali Jaiswal, Perry Sheffield, Kim Knowlton, Jeremy J. Hess, on behalf of the Ahmedabad HeatClimate Study Group Published: March 14, 2014 • <https://doi.org/10.1371/journal.pone.0091831>

## Assessing mortality risk attributable to high ambient temperatures in Ahmedabad, 1987 to 2017

Yaguang Wei , Abhijant Suresh Tiwari , Longxiang Li , Bhavin Solanki , Jayanta Sarkar , Dileep Mavalankar , Joel Schwartz International Journal of  
Environmental Research and  
Public Health  
ISSN 1660-4601  
[www.mdpi.com/journal/ijerph](http://www.mdpi.com/journal/ijerph)
















Article

## Development and Implementation of South Asia's First Heat-Health Action Plan in Ahmedabad (Gujarat, India)

Kim Knowlton , Suhas P. Kulkarni , Gulrez Shah Azhar , Dileep Mavalankar Anjal Bhasi Perry   
Hindawi  
Journal of Environmental and Public Health  
Volume 2018, Article ID 7973519, 8 pages  
<https://doi.org/10.1155/2018/7973519>

Research Article

## Building Resilience to Climate Change: Pilot Evaluation of the Impact of India's First Heat Action Plan on All-Cause Mortality

Jeremy J. Hess , Sathish LM, , Kim Knowlton, , Shubhayu Saha, , Priya Dutta, , Parthasarathi Ganguly, , Abhijant Tiwari , Anjali Jaiswal, , Perry Sheffield , Jayanta Sarkar, , S. C. Bhan, , Amit Begda, , Tejas Shah, , Bhavin Solanki, , and Dileep Mavalankar 

## An Early Warning System and Inter-Agency Coordination Framework for Better Preparedness and Prevention of Heat-related Illnesses in Urban India: Development and Implementation of Nagpur Heat Action Plan

Mahaveer Golechha\*, Priyanka Shah\*\*, Sonalini Khetrpal\*\*\* and Dileep Mavalankar\*\*\*\*

66 Disaster Governance in India-Series - 7

[Indian J Occup Environ Med.](https://doi.org/10.4103/ijocem.IJOEM_125_18) 2018 Sep-Dec; 22(3): 144-151.doi: [10.4103/ijocem.IJOEM\\_125\\_18](https://doi.org/10.4103/ijocem.IJOEM_125_18)

PMCID: PMC6309351

PMID: 30647516

Effects of Occupational Heat Exposure on Traffic Police Workers in Ahmedabad, Gujarat

[Anee Raval](#), [Priya Dutta](#), , [Abhijant Tiwari](#), , [P. S. Ganguly](#), , [L. M. Sathish](#), , [Dileep Mavalankar](#),  and [Jeremy Hess](#) 

Urban Climate

Volume 39, September 2021, 100934



## Threshold determination and temperature trends analysis of Indian cities for effective implementation of an early warning system

Mahaveer Golechha , Priyanka Shah, Dileep Mavalankar

## Chapter 13




INDIA'S HEAT ACTION PLAN:  
A SUCCESSFUL PUBLIC HEALTH  
POLICY RESPONSE TO EXTREME  
HEAT EVENTSMahaveer Jain Golechha, Priyanka Shah,  
Sujata Saunik and Dileep Mavalankar

HEALTH ADAPTATION AND RESILIENCE TO CLIMATE CHANGE AND RELATED DISASTERS (A Compendium of Case Studies)

International Journal of  
Environmental Research  
and Public Health

Article

## Heat Wave Vulnerability Mapping for India

Gulrez Azhar , Shubhayu Saha , Partha Ganguly , Dileep Mavalankar  and Jaime Madrigano 



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