

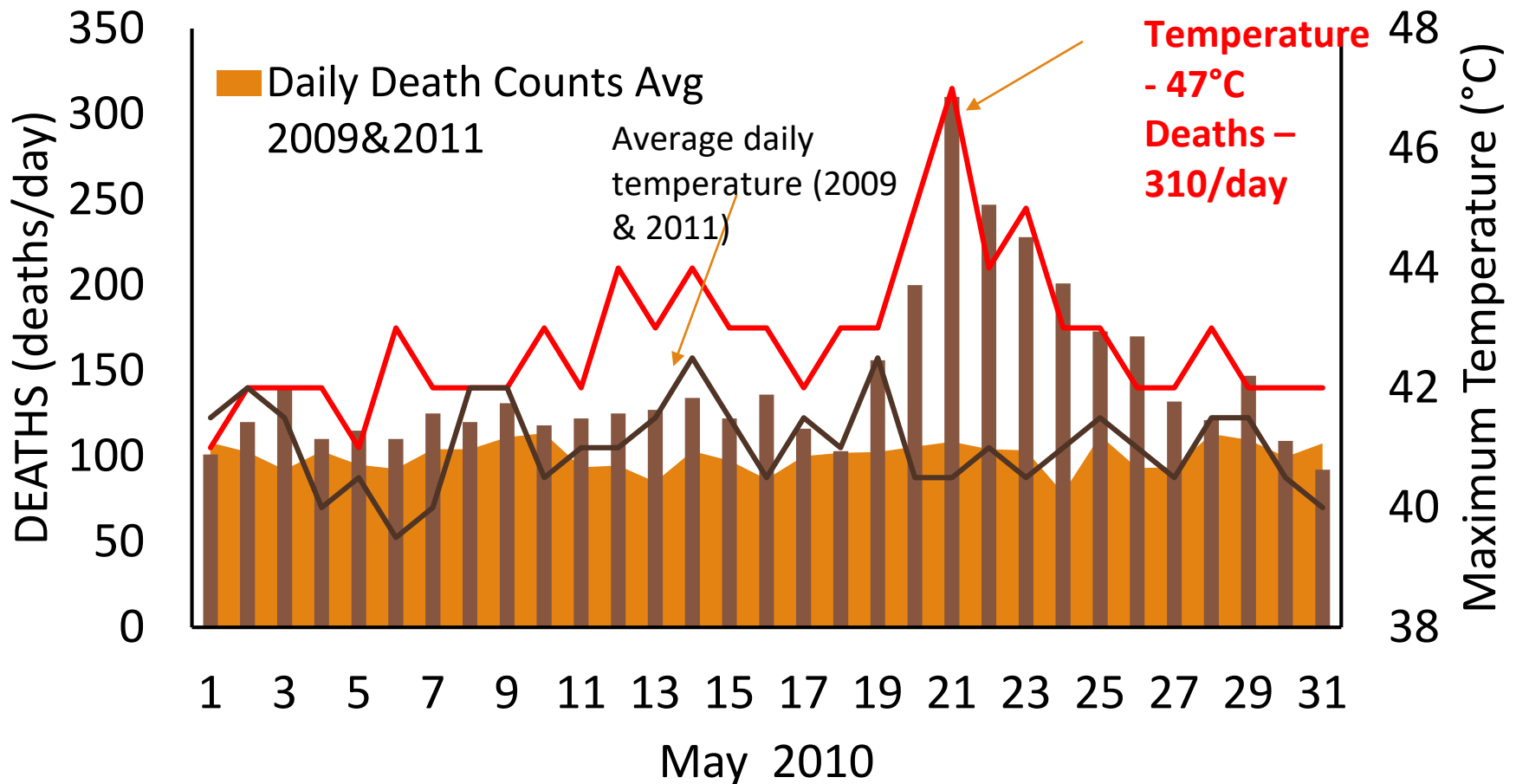


Heat Action Plan for Ahmedabad city: Development and lessons

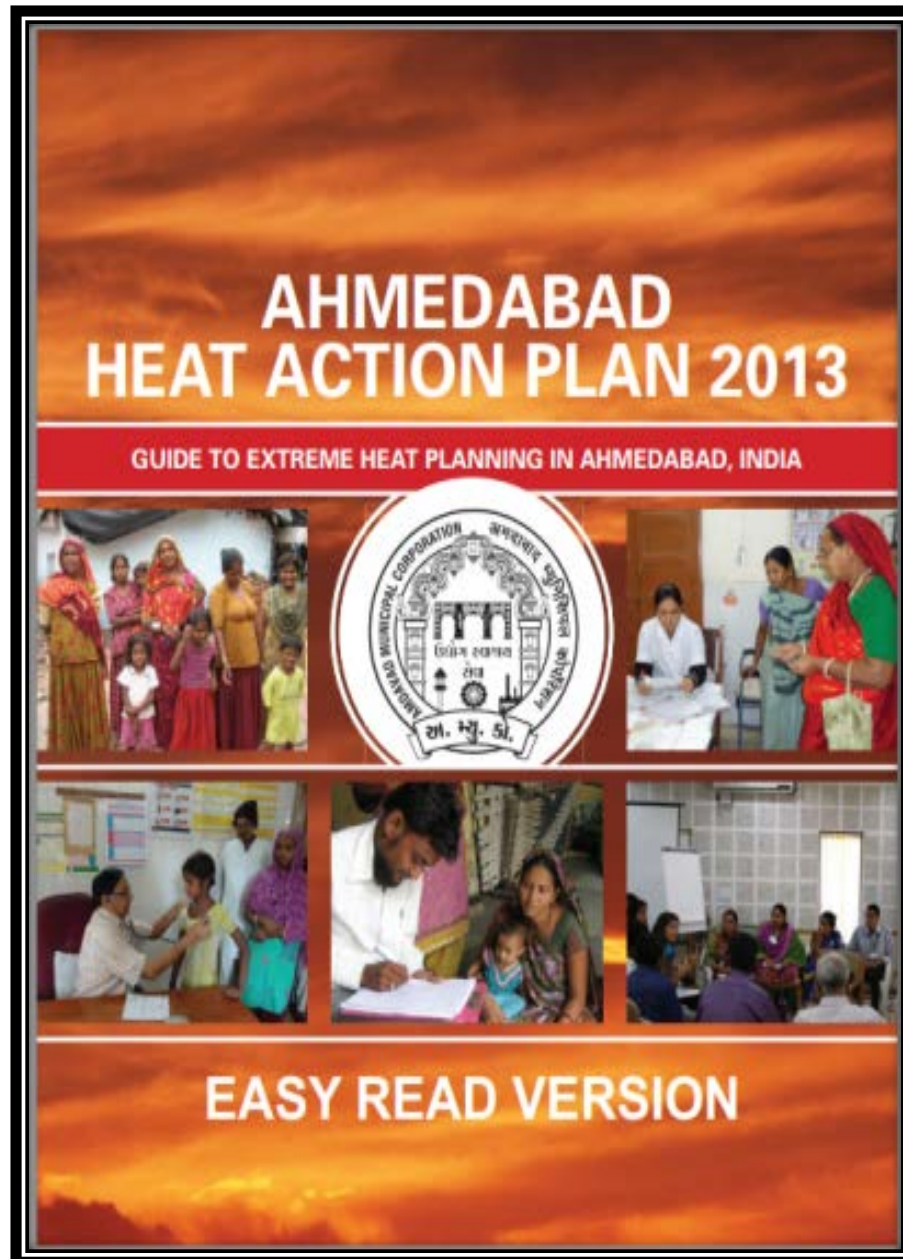
By Dr. Dileep Mavalankar
Director
Indian Institute of Public Health
Gandhinagar, India

2010 Ahmedabad heat wave :

May 20-27th – excess deaths 800 in one week and 1344 excess deaths in May 2010.



Pilot AHMEDABAD HEAT ACTION PLAN in 2013



Key steps in developing HAP

- City government engagement
- Background data & analysis – weather and mortality / health
- Understanding city and vulnerable groups
- Early warning system and setting thresholds
- Feasible interventions and detailing them
- Writing the plan and disseminating
- Implementing and monitoring the impact
- Revising the plan and scaling it up

HAP COMPONENTS



EARLY WARNING SYSTEM & INTER AGENCY EMERGENCY RESPONSE PLAN

Alert residents of predicted high and extreme temperatures & formally communication channels to alert governmental agencies



PUBLIC AWARENESS & COMMUNITY OUTREACH

Communicate the risks of heat waves and implement practices to prevent heat-related deaths and illnesses



CAPACITY BUILDING OF MEDICAL PROFESSIONALS

Training focus on primary medical officers and other paramedical staff, and community health staff

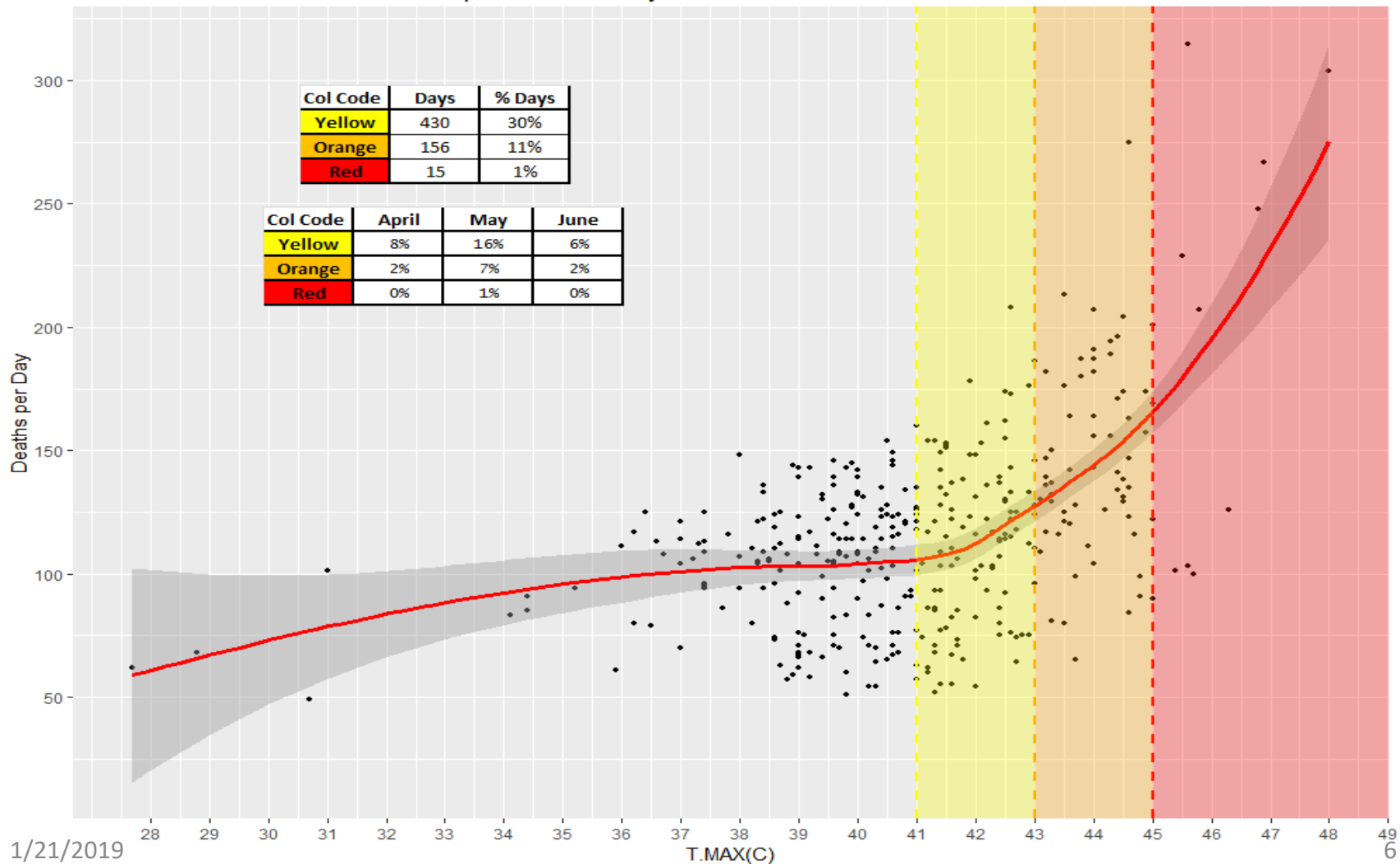


REDUCING HEAT EXPOSURE AND PROMOTING ADAPTIVE MEASURES

Access to potable drinking water and cooling spaces during extreme heat days & promote adaptive measures.

Temperature Mortality scatter plot and fitted Curve – Setting the Thresholds

Temperature Mortality Curve - Ahmedabad Colour Code



Intervention – 1 *Early Warning System & Inter-Agency Emergency Response Plan*

भारत सरकार
पृथ्वी विज्ञान मंत्रालय
भारत मौसम विज्ञान विभाग
मौसम केंद्र,
आर एस/आर इन्टरनल भवन,
हवाई अड्डा, अहमदाबाद-382,475
फोन नं. 079 22865012



Government of India
Ministry of Earth Sciences
India Meteorological Department
Meteorological Centre,
RS/RW Building, Airport,
Ahmedabad-382 475.
Phone: 079-22865012
Fax: 079-22865449

Issuing Office: Meteorological Centre, Ahmedabad
Time of Origin : 1200 Hrs. IST
Date : 09/05/2016
HAP2016050901

Five days City weather forecast (Maximum temperature forecast) for Ahmedabad

Maximum Temperature forecast	Maximum temperature in deg Celsius	Probability of occurrences	High Temperature Warning
Day1 (Valid from time of origin to 0830 Hrs. IST of 10/05/2016)	43	Most likely	
Day2(Valid from 0830 Hrs. IST of 10/05/2016 to 0830 Hrs. IST of 11/05/2016)	43	Most likely	
Day3(Valid from 0830 Hrs. IST of 11/05/2016 to 0830 Hrs. IST of 12/05/2016)	43	Very likely	
Day4(Valid from 0830 Hrs. IST of 12/05/2016 to 0830 Hrs. IST of 13/05/2016)	44	Likely	
Day5(Valid from 0830 Hrs. IST of 13/05/2016 to 0830 Hrs. IST of 14/05/2016)	44	Likely	

Legend: Probability of occurrences **Levels:**

Unlikely: less than 25 % Yellow: 41.1- 43 deg Celsius

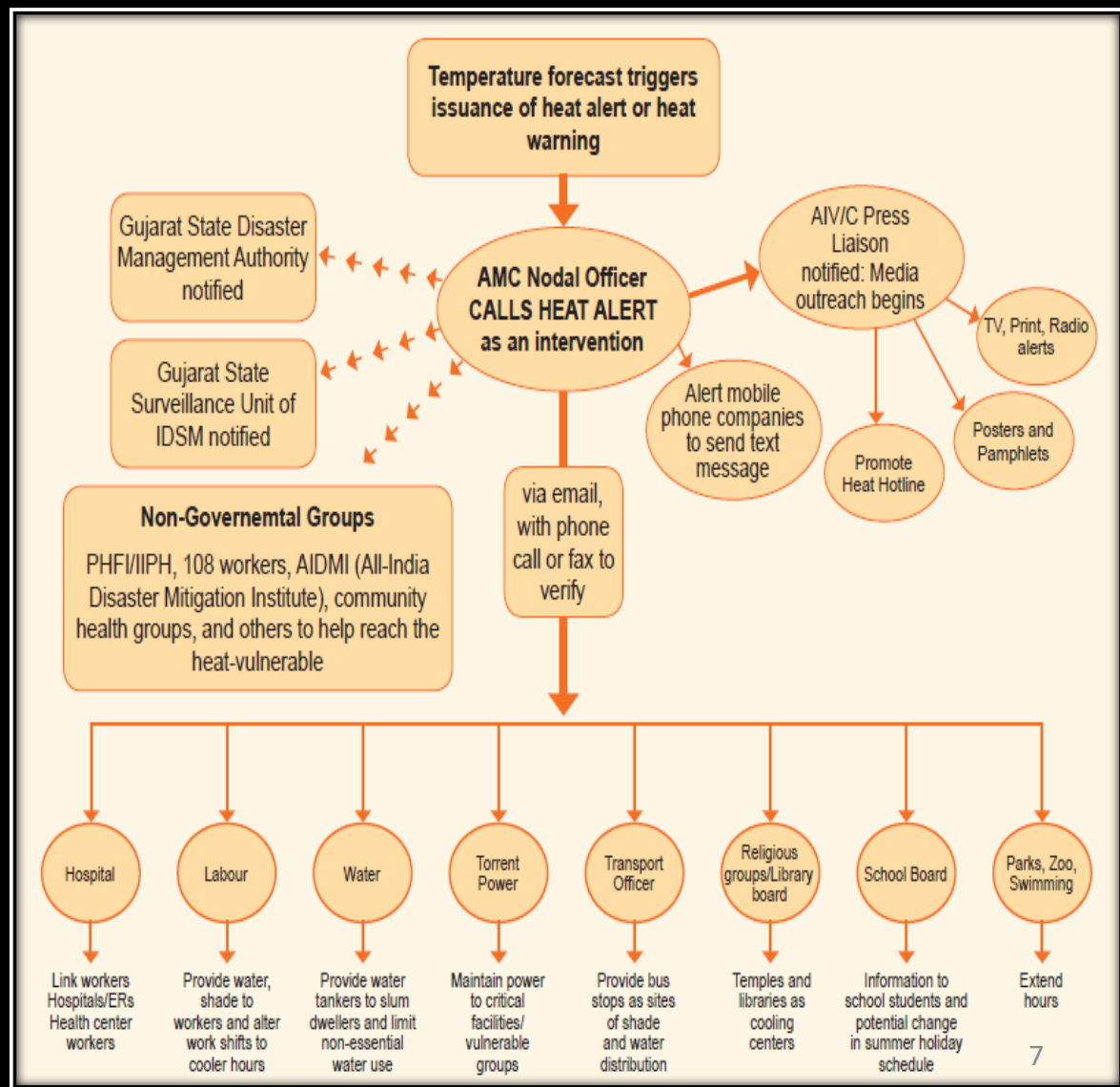
Likely: 25 to 50 % Orange: 43.1- 44.9 deg Celsius

Very likely: 50 to 75 % Red: ≥45.0 deg Celsius

Most likely: 75 to 100 %

For Director In-charge
Meteorological Centre
Ahmedabad

1/21/2019



Intervention – 2

Public Awareness & Community Outreach



Community Outreach

HOW TO SAVE YOURSELF FROM HEAT WAVES

NRDC INDIAN INSTITUTE OF PUBLIC HEALTH GANDHINAGAR

- Drink water, chaas, and other liquids (no soft drinks)
- Stay out of the sun
- Find a place to cool down
- Wear light clothing
- Check in with friends & family

DRINK MORE WATER

In case of an emergency, CALL 108



ગરમીથી તમે કેવી રીતે બચશો

NRDC INDIAN INSTITUTE OF PUBLIC HEALTH GANDHINAGAR

- પાણી, છાશ અથવા અન્ય પ્રવાહી પીવો (ઠંડા પીણા નહીં)
- તડકામાં ન રહો
- ઠંડાવા રંગના કપડાં પહેરો
- ઠંડક વાળુ કોઈ સ્થળ સોધી કાઢો
- મિત્રો અને કુટુંબીજનોની સંભાળ રાખો

પાણી વધુ પીવો

ઈમરજન્સીમાં ૧૦૮ પર ફોન



હીટ એલર્ટ

ગરમીથી તમે કેવી રીતે બચશો

- પાણી, છાશ અથવા અન્ય પ્રવાહી પીવો (ઠંડા પીણા નહીં)
- તડકામાં ન રહો
- ઠંડાવા રંગના કપડાં પહેરો
- ઠંડક વાળુ કોઈ સ્થળ સોધી કાઢો
- મિત્રો અને કુટુંબીજનોની સંભાળ રાખો

ધ્યાન આપવા લાયક લક્ષણો:

- ગરમીની ભાવનાઓ કે તાવ
- ખુબ પસેલો થવો અને અકર્મિત થવો
- બાથમાં ડુબાડી થવો અને ઊંચાડી આવવો



HEAT ALERT

Dos & Don'ts DURING HEAT WAVES

- Drink water, chaas, and other liquids (no soft drinks)
- Stay out of the sun
- Find a place to cool down
- Wear light clothing
- Check in with friends & family

Symptoms to watch for:

- Heat rash or cramps
- Heavy sweating and weakness
- Headache and nausea
- Lack of sweating despite the heat
- Red, hot, and dry skin
- Muscle weakness or cramps
- Nausea and vomiting

DRINK MORE WATER

People at high risk: children, elders, and pregnant women

In case of an emergency, CALL 108

NRDC INDIAN INSTITUTE OF PUBLIC HEALTH GANDHINAGAR




Intervention – 3

Building Capacity of medical community



Case Definitions

Heat Illness - Typical Presentations

Clinical Entity	Age Range	Setting	Cardinal Symptoms	Cardinal Signs	Pertinent Negatives	Prognosis
Heat rash	All, but frequently children	Hot environment; +/- insulating clothing or swaddling	Itchy rash with small red bumps at pores in setting of heat exposure; bumps can sometimes be filled with clear or white fluid	Diffuse maculopapular rash, occasionally pustular, at hair follicles; pruritic	Not focally distributed like a contact dermatitis; not confluent patchy; not petechial	Full recovery with elimination of exposure and supportive care
Heat cramps	All	Hot environment, typically with exertion, +/- insulating clothing	Painful spasms of large and frequently used muscle groups	Uncomfortable appearance, may have difficulty fully extending affected limbs/joints	No contaminated wounds/tetanus exposure; no seizure activity	Full recovery with elimination of exposure and supportive care
Heat exhaustion	All	Hot environment; +/- exertion; +/- insulating clothing or swaddling	Feeling overheated, lightheaded, exhausted and weak, unsteady, nauseated, sweaty and thirsty, inability to continue activities	Sweaty/diaphoretic; flushed skin; hot skin; normal core temperature; +/- dazed, +/- generalized weakness, slight disorientation	No coincidental signs and symptoms of infection; no focal weakness; no aphasia/dysarthria; no overdose history	Full recovery with elimination of exposure and supportive care; progression if continued exposure
Heat syncope	Typically adults	Hot environment; +/- exertion; +/- insulating clothing or swaddling	Feeling hot and weak; lightheadedness followed by brief loss of consciousness	Brief, generalized loss of consciousness in hot setting, short period of disorientation if any	No seizure activity, no loss of bowel or bladder continence, no focal weakness, no aphasia/dysarthria	Full recovery with elimination of exposure and supportive care; progression if continued exposure
Heat stroke	All	Hot environment; +/- exertion; +/- insulating clothing or swaddling	Severe overheating; profound weakness; disorientation, obtundation, seizures, or other altered mental status	Flushed, dry skin (not always), core temp $\geq 40^{\circ}\text{C}$; altered mental status with disorientation, possibly delirium, coma, seizures; tachycardia; +/- hypotension	No coincidental signs and symptoms of infection; no focal weakness; no aphasia/dysarthria; no overdose history	25-50% mortality even with aggressive care; significant morbidity if survive

Intervention – 4 *Reducing Heat Exposure & Promoting Adaptive Measures – Drinking water, cooling centers*



Reducing Heat Exposure: cool roof initiative 2017

- Goal 3,000 low income households to get roof painting – cool roof
 - Strong political support: Initiative was inaugurated by the Mayor by painting of the slum roofs
 - Public city through advertisements done for cool roof.

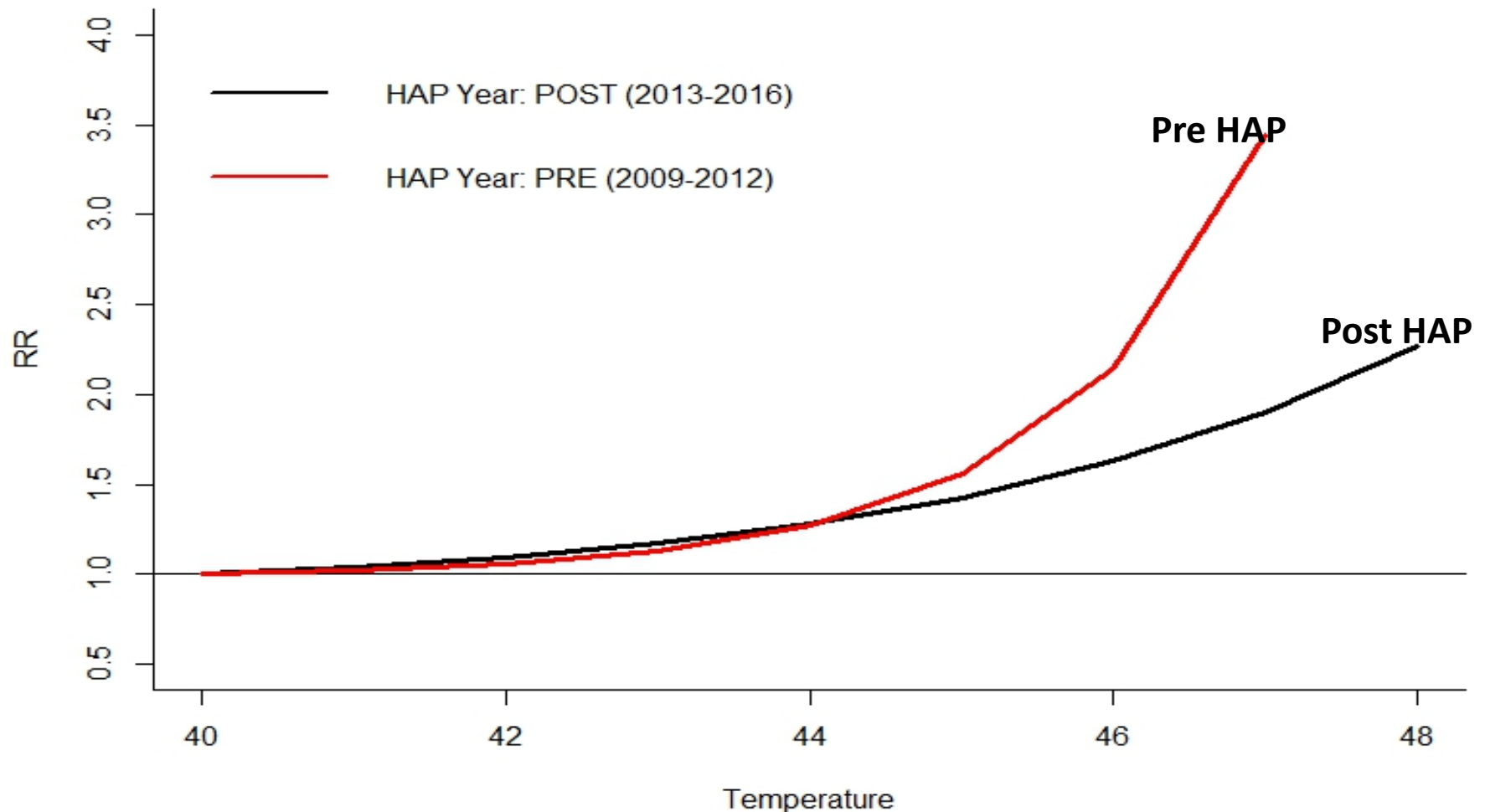


Impact of Heat Action Plan

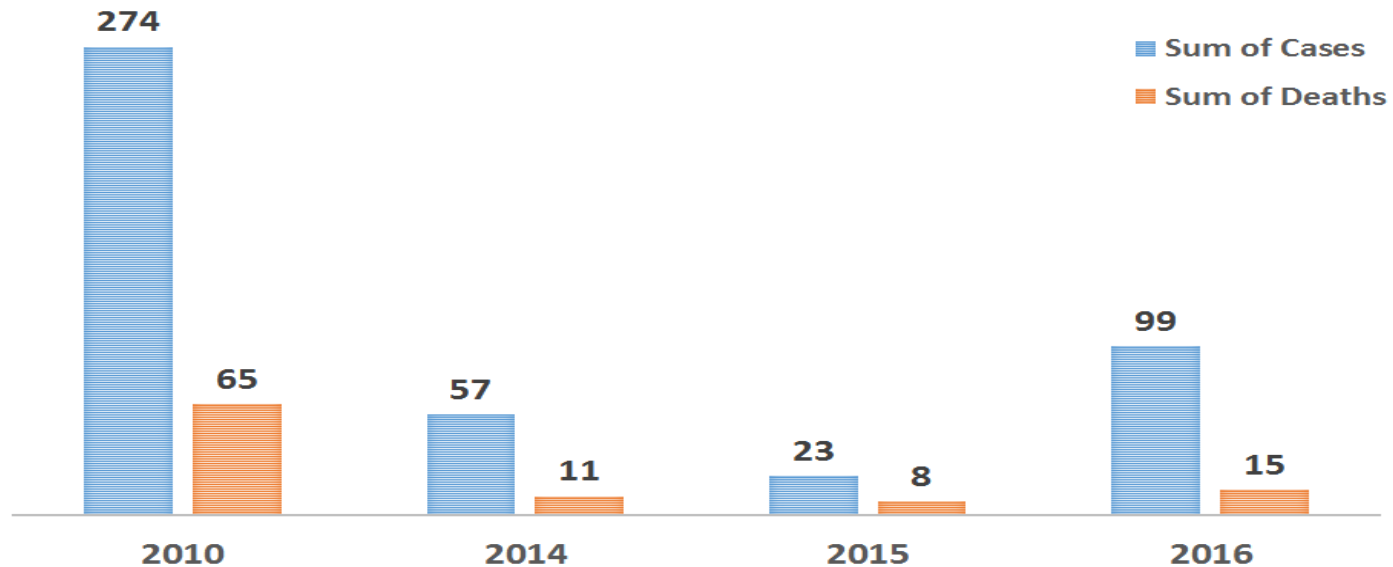
- Reduction in all cause of mortality during heat waves
- Decrease in heatstroke cases and deaths in sentinel hospitals in the city

Relative Risk of Death with max temperature – Ahmedabad Pre & Post HAP

Ahmedabad - PRE & POST HAP Comparison



Heat Stroke Mortality and Morbidity before and after HAP on Selected 5 Municipal Hospitals of AMC



Engaging with Policy stakeholders

Policy Papers: Issue Briefs

NRDC ISSUE BRIEF

JANUARY 2012
IB-12-01-A

Preventing Harmful Effects of Extreme Heat: Recommendations for Slum Communities in Ahmedabad

PREPARED BY
Indian Institute of Public Health, Gandhinagar
Natural Resource Defense Council



NRDC ISSUE BRIEF

JANUARY 2012
IB-12-01-A

Preventing Harmful Effects of Extreme Heat: Recommendations for Outdoor Workers in Ahmedabad

PREPARED BY
Indian Institute of Public Health, Gandhinagar
Natural Resource Defense Council



NRDC ISSUE BRIEF

JANUARY 2012
IB-12-01-B

Preventing Harmful Effects of Extreme Heat: Recommendations for Ahmedabad's Government Officials

Indian Institute of Public Health, Gandhinagar
Natural Resource Defense Council



COOL ROOFS

Protecting Local Communities
and Saving Energy

ISSUE BRIEF,
MAY 2018



Available online from:

<http://www.nrdc.org/international/india/extreme-heat-preparedness/>

Engaging with National Disaster Management Authority (NDMA)



NDMA

National Disaster Management Authority
Government of India

BETA
VERSION RELEASED

Skip to Main Content | -A A +A



[Home](#) [About NDMA](#) [Capacity Building](#) [Policy and Plan](#) [Media and Public Awareness](#) [Programmes](#) [Hazard, Risk and Vulnerability](#) [Contact Us](#)

सुरक्षा किट

- एक रेडियो और टोर्च तथा अतिरिक्त बैटरियां
- पेय जल, क्लोरिन गोलिएयां और खाद्य पदार्थ
- मोमबतियां और एक माचिस
- बुखार, सर दर्द, आदि जैसी सामान्य बीमारियों के लिए दवाइयां
- आपात दूरभाष नंबर और पत्तों की सूची
- पेय जल लाने के लिए प्लास्टिक की बाल्टी
- सभी चीजे ले जाने के लिए एक वाटर प्रूफ थैला
- राशन कार्ड और पहचान- पत्र जैसे महत्वपूर्ण दस्तावेज



Alert

WEATHER WARNING:- 27 September (Day 1): ♦ Heavy

Search...

Go

Heat Wave

[Information](#)[Do's and Don'ts](#)[Recover and Build](#)[Emergency Kit](#)

Information

A Heat Wave is a period of abnormally high temperatures, more than the normal maximum temperature that occurs during the summer season in the North-Western parts of India. Heat Waves typically occur between March and June, and in some rare cases even extend till July. The extreme temperatures and resultant atmospheric conditions adversely affect people living in these regions as they cause physiological stress, sometimes resulting in death.

The Indian Meteorological Department (IMD) has given the following criteria for Heat Waves :

- Heat Wave need not be considered till maximum temperature of a station reaches atleast 40°C for Plains and atleast 30°C for Hilly regions
- When normal maximum temperature of a station is less than or equal to 40°C Heat Wave Departure from normal is 5°C to 6°C Severe Heat Wave Departure from normal is 7°C or more
- When normal maximum temperature of a station is more than 40°C Heat Wave Departure from normal is 4°C to 5°C Severe Heat Wave Departure from normal is 6°C or more

1/21/2019

THE ASIAN AGE

Delhi | Mumbai | Kolkata | London

Published on *The Asian Age* (<http://www.asianage.com>)

[Home](#) > [India](#) > 'UP, Bihar must follow Gujarat'

'UP, Bihar must follow Gujarat'

By editor

Created 11 Jun 2014 - 00:00

Vardhan slams states' action in battle against encephalitis

Bihar CM Nitish Kumar and Uttar Pradesh ruling party chief Mulayam Singh Yadav may not be publicly subscribing to Prime Minister Modi's style of functioning, the Centre has suggested the two states to subscribe the Gujarat model in dealing with menacing encephalitis, that has resulted in 500-600 deaths this year so far.



[1]

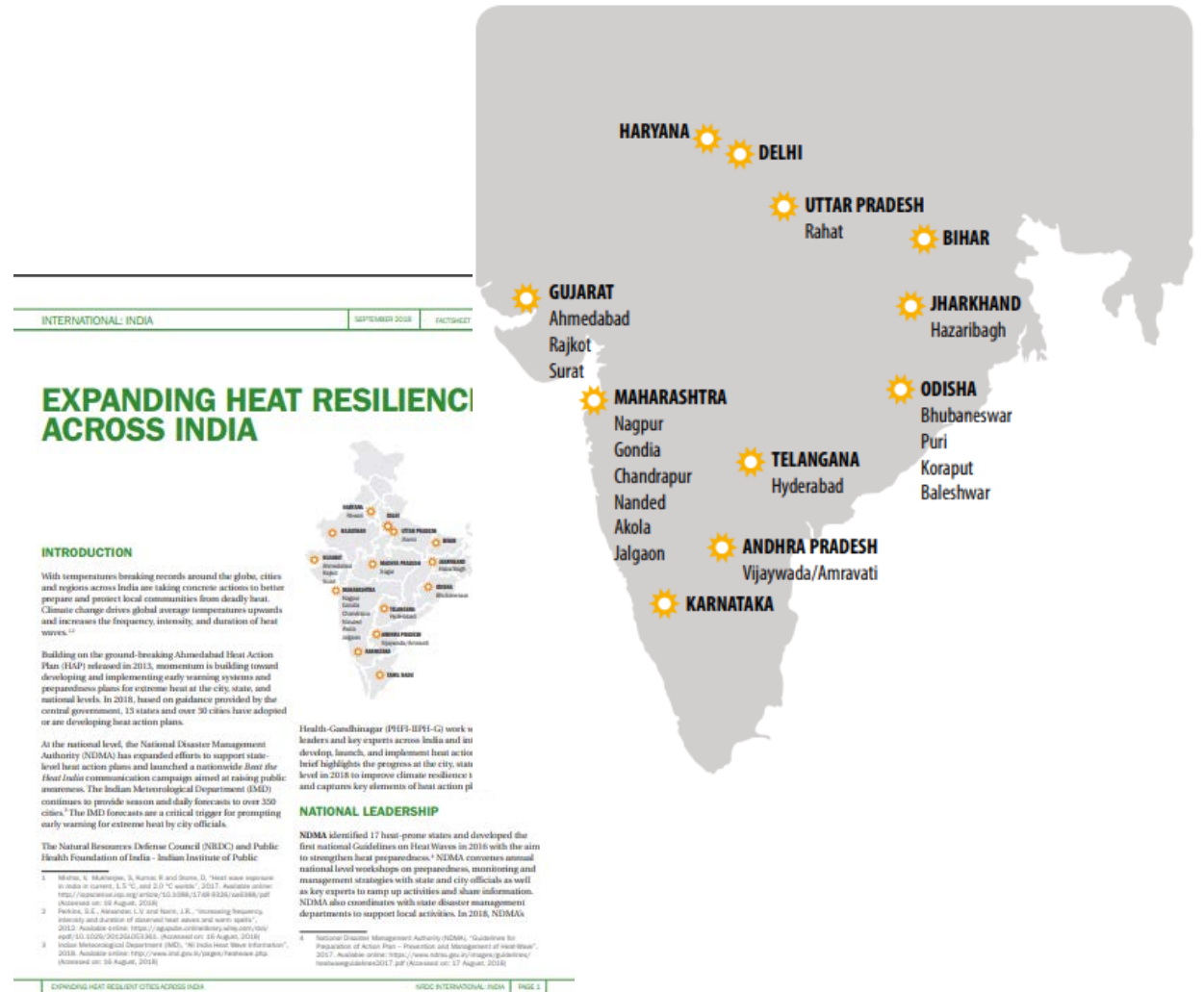
In a meeting held today Dr Harsh Vardhan asked both UP and Bihar officials to

Harsh Vardhan at a meeting to review encephalitis cases in Uttar Pradesh and Bihar

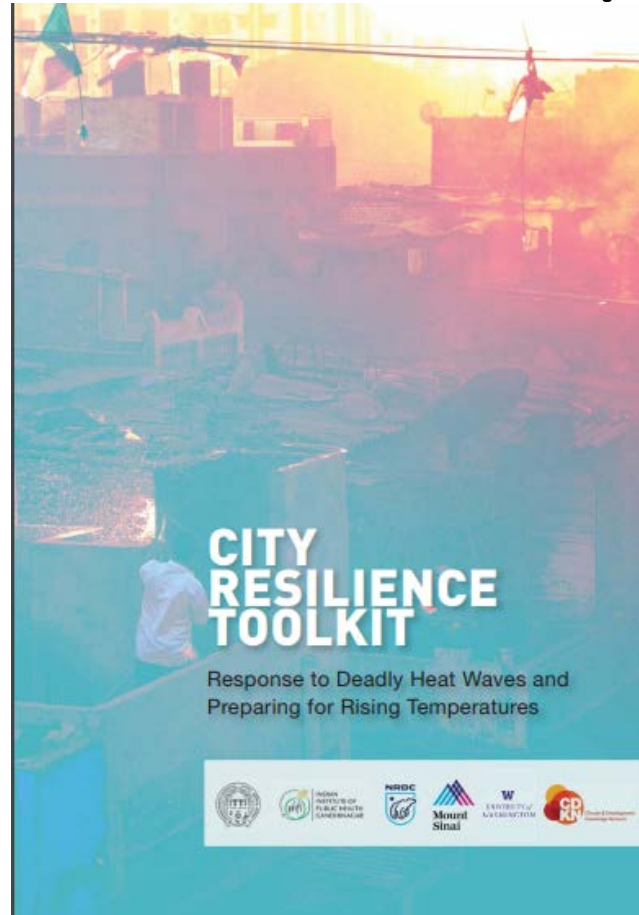
replicate the "early warning system" installed in Ahmedabad. The minister asked the officials to approach the Natural Resources Defence Council and the Indian Institute of Public Health to replicate the existing system of Ahmedabad. "The government of Gujarat gets support from local health and environment groups to prepare local communities to the onset of extreme heat so that they can take all the necessary steps to protect themselves. My ministry will be happy to extend all possible assistance to put in place a preparedness plan," he said during a high-level meeting held Tuesday, following recent deaths of over 40 children in Bihar due to encephalitis.

Engaging with States governments and National authorities for Scaling up

- States with HAP
 - Haryana
 - Odhisa,
 - Telangana,
 - Andhra Pradesh,
 - Uttar Pradesh
 - Bihar
 - Karnataka
- HAP as a part of State Disaster Management Plan
 - Gujarat
 - Rajasthan



City Resilience toolkit and How to Manual- Guide for other cities and state of India to develop HAP



Key lessons on development of HAP at local level

- **Involvement of Local city or district administrative and health and political leadership**
- **Engagement with all stakeholders: IMD for weather data, Health data for analysis, city govt for various actions.**
- **Facilitation by local and national institutions / experts – universities**
- **Learning and adapted HAP developed in other countries / cities**
- **Measurement of process of implementation and Impact on mortality and morbidity**



Thank You from all the partners