



# Bhavnagar Municipal Corporation



## Heatwave Plan-2020



**Gujarat State Disaster Management Authority  
And  
Bhavnagar Municipal Corporation**

## Prologue



Climate change is leading to average temperatures and also increased possibilities of severe heat waves. Extreme heat can lead to dangerous, even deadly health consequences including heat stress and heatstroke.

Across India, higher daily peak temperatures and longer, more intense heat waves are becoming increasingly frequent globally due to climate change. The deadly extreme heat events already impacting Gujarat state too and expected to increase in intensity, length, and frequency in the coming decade. According to the National Disaster Management Authority, Heat Wave as an extreme weather event has recently has become a concern for disaster management in India due to widespread and severe impact on health and environment. Bhavnagar city faced heat wave in last summer time and it was a wakeup call that inter governmental agency action, preparedness, and community outreach needed to save lives.

This Heat Action Plan is a comprehensive early warning system and preparedness plan for extreme heat events in area of Municipal Corporation Bhavnagar. The Plan presents immediate and longer-term actions to increase preparedness, information-sharing, and response coordination to reduce the health impacts of extreme heat on vulnerable populations.

**M.A. Gandhi (IAS)**  
**Commissioner**  
**Municipal Corporation**  
**Bhavnagar**

## INDEX

Sr. No.		Description	Page No.
1		Introduction	
	A	What is a Heat Wave?	
	B	Factors of Heat wave	
	C	Criteria for Heat Wave	
2		Heat Wave in Indian Context	
3		Aims of Heat Action Plan	
4		Heat wave Action Plan (HAP)	
	A	Rationale for Heat Wave Action Plan	
	B	Color Signals for Heat Alert	
	C	How the HAP is organized and implemented	
	D	Key stakeholders who helped to develop HAP	
	E	Launching the Heat Action Plan	
5		Heat Wave Incident Commander	
6		Phases of Heat wave	
	A	Phase 1: Pre-Heat Season (Annually from January through March)	
	B	Phase 2: During the Heat Season (Annually from March through July)	
	C	Phase 3: Post-Heat Season (Annually in July through September)	
7		Heat Illness	
	A	Case Definitions	
	B	Identification of Heat-Wave illness and recordings of casualties	
	C	Treatment Protocol	
	D	Prevention of Heat Related Illness	
	E	Acclimatization	

	F	Symptoms and First Aid for various Heat Disorders	
8		Heat wave and Disaster Management	
	A	Past experience on Heat-wave plan implementation in City	
	B	Steps taken by other states	
9		Agency Action Checklist	
	A	Checklist for Nodal Officer of Bhavnagar Municipal Corporation	
	B	Checklist for Medical Colleges and Hospitals	
	C	Checklist for Public Health Manager	
	D	Checklist for Urban Health Centers and Link Workers	
	E	Checklist for BMC Press Officer	
	F	Checklist for Labor Department	
	G	Checklist for 108 Emergency Service	
10		Roles and responsibilities for managing Heat wave	
	A	Need for Data and Analysis	
	B	Prevention, Preparedness and Mitigation Measures (Table: Roles and Responsibilities for Managing Heat Wave)	
11		Do's and Don'ts of Heat Wave	
12		Campaign done by Bhavnagar Municipal Corporation	
13		Contact Directory	

## 1. Introduction

Heat Wave is an extreme weather event recently has become a concern for disaster management in India due to widespread and severe impact on health and environment. For last few years, heat wave during the summer season is increasingly affecting morbidity and mortality in the country. Looking at the current scenario, effective response is important for saving peoples life and health, besides evolving strategies for future risk mitigation and management of heat waves conditions. Extreme weather conditions have become so obvious and impacted lives all across the world particularly over the last decade and more. Hence, ways and means to understand and cope with extreme heat events have become essential to coping strategies for communities.



Heat waves are known to be “Silent killers” amongst the natural disasters of hydro-meteorological origin. Impact of rising temperatures and increasing frequency, duration and intensity of hot spells poses challenge to human safety and sustainability. Governments and communities need to effectively prepare for responding and adapting to climatic risks in a systematic but proactive way. Countering heat waves and climate change is a major social challenge and will require both rapid mitigation of carbon emissions and wide spread adoption of urban climate adaptation strategies at personal, business and government levels about which we keep harping time and again.

The death toll due to heat waves is crossing a certain mark and the situation has tightened its grip on many states of India. The question remains whether we are adequately preparing to deal with such eventualities. From the view of hazard mitigation, rising number of heat wave related deaths is expected to serve as danger signal and corroborate the need to develop innovative methods to control summer-time losses.

## A. What is a Heat Wave?

Heat wave as a hazard causing disaster scenario, is little more than the physical phenomenon of high heat conditions, and is characterized as a complex of hydro-climatic risks coupled with social, occupational and public health risks. 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. As such there is no universal definition for heat wave. It is generally defined as a prolonged period of excessive heat.



## **B. Factors of Heat wave**

The level of heat discomfort is determined by a combination of factors:

- Meteorological - air temperature, humidity, wind and direct sunshine;
- Cultural - clothing, occupation and accommodation; and
- Physiological - health, fitness, age and the level of acclimatization (ability to adapt) Therefore, it becomes imperative to conduct vulnerability assessment so as to:
  - Collect reliable data on morbidity
  - Understand the practices and cultural behavior for designing appropriate strategy
  - Mapping of community level capacities and resources for intervention in designing
  - Understanding the perception and utilization of different actions initiated by Government
  - Identifying the most vulnerable population and development of targeted action plans
  - Mitigation and Preparedness measures for vulnerable population



- Redesigning the appropriate livelihood or working environment for vulnerable Population during summer
- 'Heat friendly' city planning methods and measures



### **C. Criteria for Heat Wave**

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

Heat Wave need not be considered till maximum temperature of a station reaches at least 40°C for Plains and at-least 30°C for Hilly regions

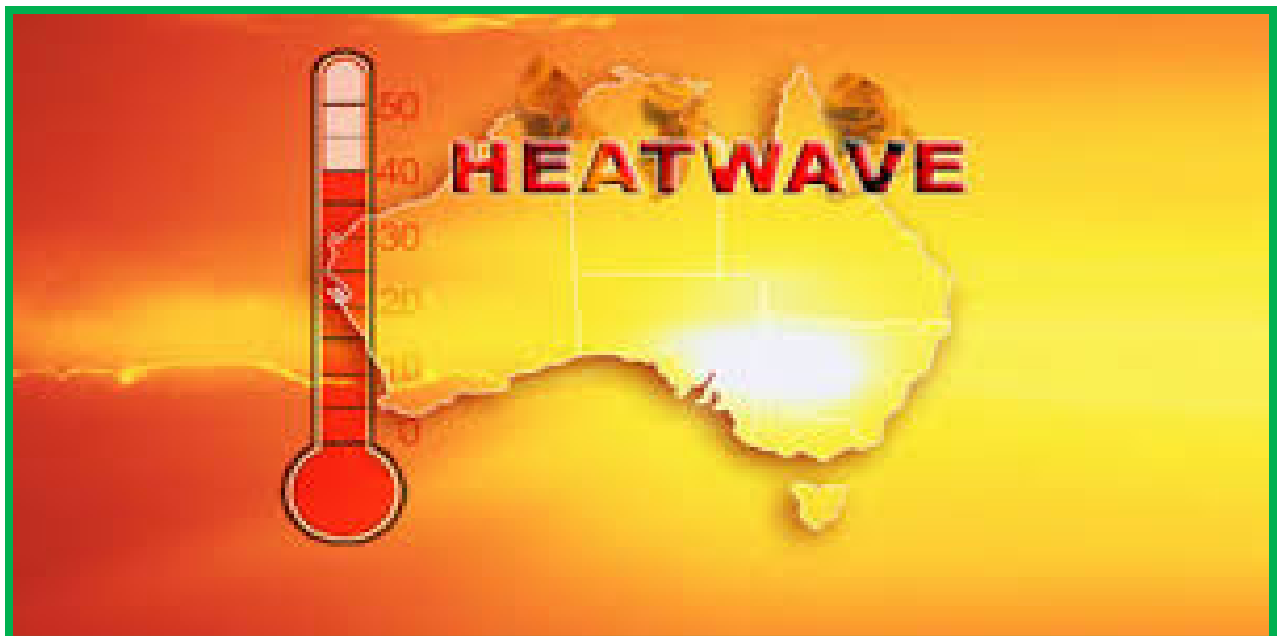
**When normal maximum temperature of a station is less than or equal to 40° C**

- 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

**When actual maximum temperature remains 45°C or more irrespective of normal maximum temperature, heat wave should be declared.**



## **2. Heat Wave in Indian Context**

India, with approximately 1.32 billion people is the second most populous country in the world with considerably high levels of population density. India is among the worst disaster prone countries of the world. As per 2011 census, 31% of India's population live in urban areas and 69% live in rural areas. The trend shows that the number of persons living in urban areas will continue to grow at a faster rate than the population in the rural areas due to migration and increasing urbanization.

The World Meteorological Organization (WMO) statements on global climate during 2011 and 2012 indicate that the global temperatures are continuing to increase. Heat-waves are projected to increase in number, intensity and duration over the most land area in the 21st century. This is directly affecting the communities, undermining their livelihoods through gradual, insidious changes in temperature and rainfall patterns, and resulting in increased frequency and intensity of hazards such as floods, cyclones, droughts, unseasonal rains and hailstorms, causing extensive damage to crops and agro-rural economy.



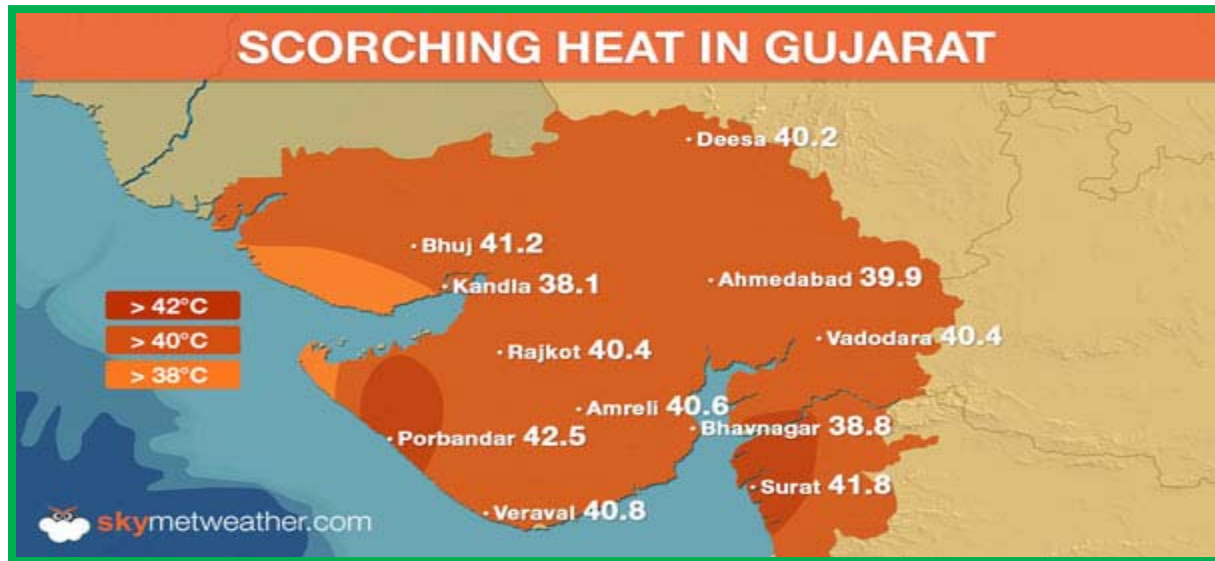
Heat wave is a period of abnormally high temperatures, more than the normal maximum temperature that occurs during the pre-monsoon (April to June) summer season. Heat -waves typically occur between March to June, and in some rare cases even extend till July. Heat waves are more frequent over the Indo-Gangetic plains of India. On an average, 5-6 heat wave events occur every year over the northern parts of the country. The most notable amongst the recent ones are Hyderabad (Andhra Pradesh) 46 °C, Khammam 48 °C , Jharsuguda (Odisha) 45.4°C, Bhubaneshwar (Odisha) 44°C, Allahabad (Uttar Pradesh) 47.8°C , Delhi 46.4°C, Jashpur

(Chattisgarh) 44.5°C, Kolkatta (West Bengal) 44.5°C, Gaya (Bihar) 46.3°C, Nagpur (Vidarbha region in Maharashtra) 47.1°C, Kalburgi (Karnataka) 44.1°C and Churu (Rajasthan) 48.0°C in 2015.

The extreme temperatures combined with high humidity and resultant atmospheric conditions adversely affect people living in these regions leading to physiological stress, sometimes even death. This unusual and uncomfortable hot weather can impact human and animal health and also cause major disruption in community infrastructure such as power supply, public transport and other essential services.

Higher daily peak temperatures and longer, more intense heat waves are becoming increasingly frequent globally due to climate change. India too is feeling the impact of climate change in terms of increased instances of heat waves which are more intense in nature with each passing year, and have a devastating impact on human health thereby increasing the number of heat wave casualties.

## ❖ Gujarat Heat wave Effect



However, it is likely that the death figure is much higher as heat related illness is often recorded inaccurately and figures from rural areas are hard to attain. The combination of exceptional heat stress and a predominantly rural population makes India, vulnerable to heat waves. Vegetable vendors, auto repair mechanics, cab drivers, construction workers, police personnel, road side kiosk operators and mostly weaker sections of the society have to work in the extreme heat to make their ends meet and are extremely vulnerable to the adverse impacts of heat waves such as dehydration, heat and sun strokes. Therefore, it is not surprising that these workers, homeless people and the elderly constitute the majority of heat wave casualties in India. It is time to devise a national level strategy and plan to combat this disaster.

A comprehensive heat preparedness and response requires. Involvement from not only government authorities but also non-governmental organizations and civil society. The local authorities should carry out a vulnerability assessment in order to identify these areas.

<i>Year</i>	<i>Number of Deaths</i>
1992	612
1993	631
1994	773
1995	1677
1996	434
1997	393
1998	1016
1999	628
2000	534
2001	505
2002	720
2003	807
2004	756
2005	1075
2006	754
2007	932
2008	616
2009	1071
2010	1274
2011	793
2012	1247
2013	1216
2014	1677
2015	2422

### 3. Aims of Heat Action Plan

This Heat Action Plan aims to provide a framework for the implementation, coordination, and evaluation of extreme heat response activities in Bhavnagar Corporation that reduce the negative health impacts of extreme heat. The Plan's primary objective is to alert those populations most at risk of heat-related illness that extreme heat conditions either exist or are imminent, and to take appropriate precautions.

The Heat Action Plan aims to implement four key strategies:

- *Building Public Awareness and Community Outreach* to communicate the risks of heat waves and implement practices to prevent heat-related deaths and illnesses. Disseminating public messages on how to protect people against extreme heat through media outlets and informational materials such as pamphlets and advertisements on heat stress prevention. Efforts also include the use of social media such as SMS, text messages, email, radio and mobile applications such as WhatsApp. Special efforts are made to reach vulnerable populations through inter-personal communication as well as other outreach methods.

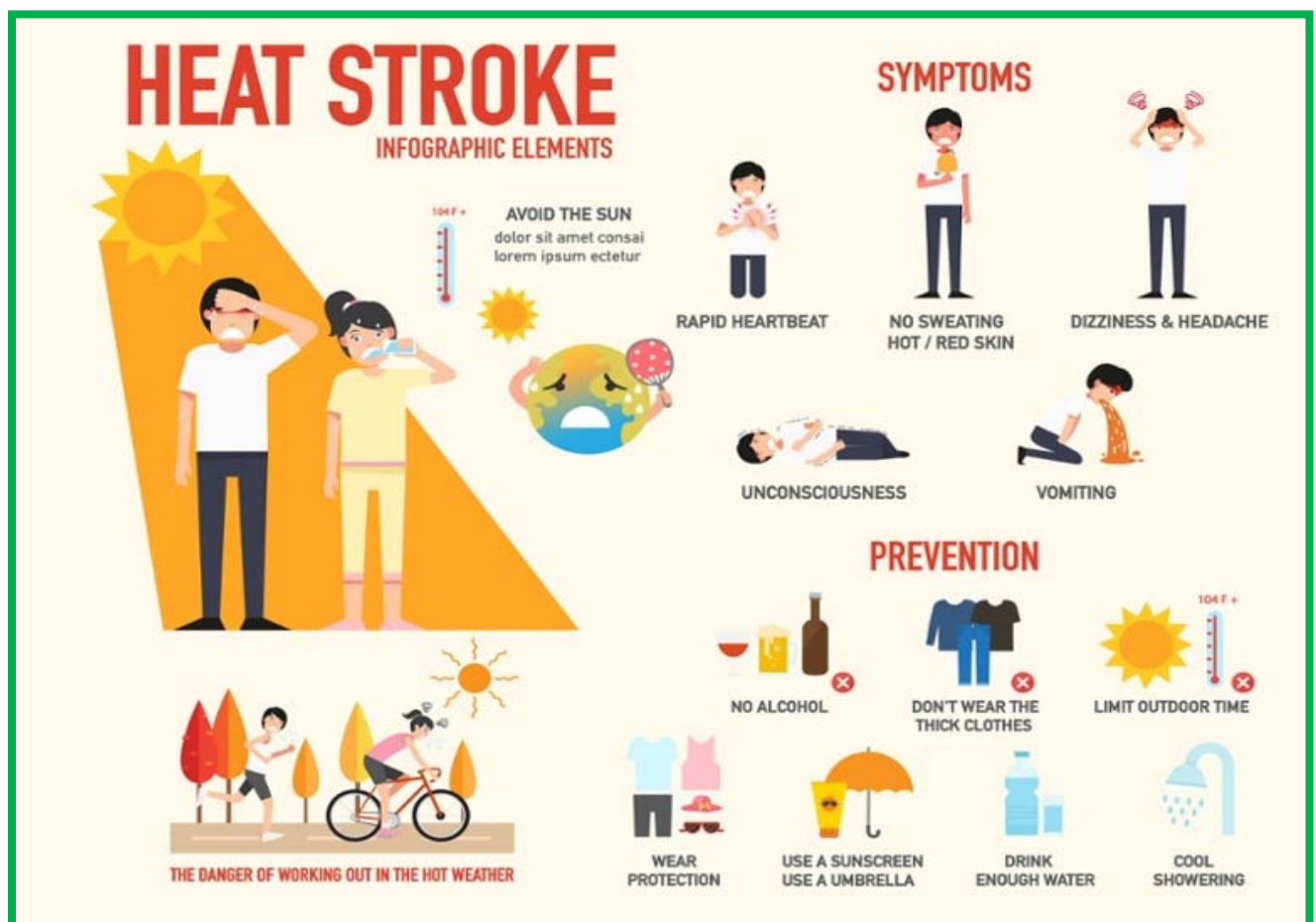


- *Utilizing an Early Warning System and Inter-Agency Coordination* to alert residents of predicted high and extreme temperatures. The Indian Meteorological Department shares a daily five-day forecast with the Heat Action Plan Nodal Officer during the heat season. The Medical Office Health Branch Bhavnagar Municipal Corporation has created formal communication channels to alert governmental agencies, the Met Centre, health officials and hospitals, emergency responders, local community groups, and media outlets of forecasted extreme temperatures.
- *Capacity Building among Health Care Professionals* to recognize and respond to heat-related illnesses, particularly during extreme heat events. Such trainings focus on primary medical officers and other paramedical staff, and community health staff so they can effectively prevent and manage heat-related cases so as to reduce mortality and morbidity.

- *Reducing Heat Exposure and Promoting Adaptive Measures* by undertaking new efforts including mapping of high-risk areas of the city, increasing outreach and communication on prevention methods, access to potable drinking water and cooling spaces during extreme heat days. Collaboration with non-governmental organizations is also identified as a means to expand outreach and communication with the city's most at-risk communities.

## Extreme heat planning includes:

- Identifying vulnerable populations and the health risks specific to each group;
- Developing effective strategies, agency coordination, and response planning to shape a Heat Action Plan that addresses heat-health risks;
- Implementing the Heat Action Plan and activating heat alerts; and
- Evaluating and updating the Heat Action Plan regularly



#### **4. Heat wave Action Plan (HAP)**

Successful implementation of a Heat Action Plan in Bhavnagar requires Coordinated action between many diverse stakeholders, including government Departments; health care professionals including emergency medical personnel, Health center staff, and hospital staff; and community groups. Following the Forecasting of an extreme heat event, immediate notification of the public and all those participating in the response is critical to ensure the plan is activated.

##### **A. Rationale for Heat Wave Action Plan**

National Disaster Management Authority had issued revised Guidelines for Preparation of Action Plan- Prevention and Management of Heat-Wave' in 2017 for addressing the issues at broader level undertaking activities by all stakeholders in their respective areas to reduce the negative impact of extreme heat-wave conditions. The role of District Administration in mitigating the effect of a heat wave has been described in this action plan as per the guidelines given by NDMA.

## B. Color Signals for Heat Alert

The Disaster management of BMC will issue heat alerts, based on thresholds determined by the IMD, by using the following color signal system.

<b>Red Alert (Severe Condition)</b>	<b>Extreme Heat Alert for the Day</b>	<b>Normal Maximum Temp. increase 6°C to more</b>
<b>Orange Alert (Moderate Condition)</b>	<b>Heat Alert Day</b>	<b>Normal Maximum Temp. increase 4° C to 5°C</b>
<b>Yellow Alert (Heat-Wave Warning)</b>	<b>Hot Day</b>	<b>Nearby Normal Maximum Temp.</b>
<b>White (Normal)</b>	<b>Normal Day</b>	<b>Below Normal Maximum Temp.</b>

### **C. How the HAP is organized and implemented**

As the lead agency, the Municipal Corporation's Health Department has the overarching responsibility for the coordination of heat wave related health activities. This includes monitoring forecasts and sending heat health alerts and disseminating public health messages to local departments and community service providers, as well as working with the Municipal Corporation press office to increase media around preparedness.

The Plan serves to focus attention on those individuals who are most at risk during heat waves, including slum communities, outdoor workers, elderly and children. The Plan also focuses on individuals and organizations, such as Primary Health Centers (PHCs) and link workers, who frequently work with at-risk populations and can provide early diagnosis of heat-related illnesses and preliminary treatment.

Individuals, community groups, and the media are also essential in fighting the effects of extreme heat. Individuals can take specific preventative steps to protect themselves, their families, and their communities from harmful heat waves including

learning about early signs of heat exhaustion, limiting heavy work during extreme heat, drinking water, staying out of the sun; wearing light clothing, checking on neighbors, and informing their fellow community members about how to keep cool and protect themselves from heat. The media is vital in spreading the word about the harm heat poses to health, and protecting people against dangerous heat waves. The media plays an essential awareness-building role by sharing news about health threats, and increases public protection by running ads and providing local resources information.

#### **D. Key stakeholders who helped to develop HAP**

The Heat Action Plan is part of a broader collaboration between Corporations, public health and policy experts at the Indian Institute of Public Health. Public Health Foundation of India, Natural Resources Defense Council, India Meteorological Department, University of Washington, Icahn School of Medicine at Mount Sinai, and supported in part by the Climate and Development Knowledge Network. This network of partnering institutions was formed following the deadly May 2010 heat wave to develop local responses to extreme heat. Additional activities

have been supported by the Indo-US Science and Technology Forum.

To share lessons from Municipal Corporation, developed a set of resources, including a City Resilience Toolkit, How to Manual, of four issue briefs titled Rising Temperatures, Deadly Threat issue briefs. These resources outline key strategies and policy interventions that form the basis for the Heat Action Plan, focusing on the most vulnerable groups. Temperatures-deadly-threat-preparing-communities-india-extreme-heat-events From start to finish, this project is about saving lives and helping the people of Corporation/City to create healthier communities, more secure from the dangers of extreme heat, even as climate change bears down in cities of states like Gujarat, all around the world. It is hoped that this action plan will guide other cities and rural areas in India and other developing countries to adapt and develop their own heat action plans. Through preventative action such as the HAP, countless lives can be saved as the weather becomes increasingly hot and more extreme.



### **E. Launching the Heat Action Plan**

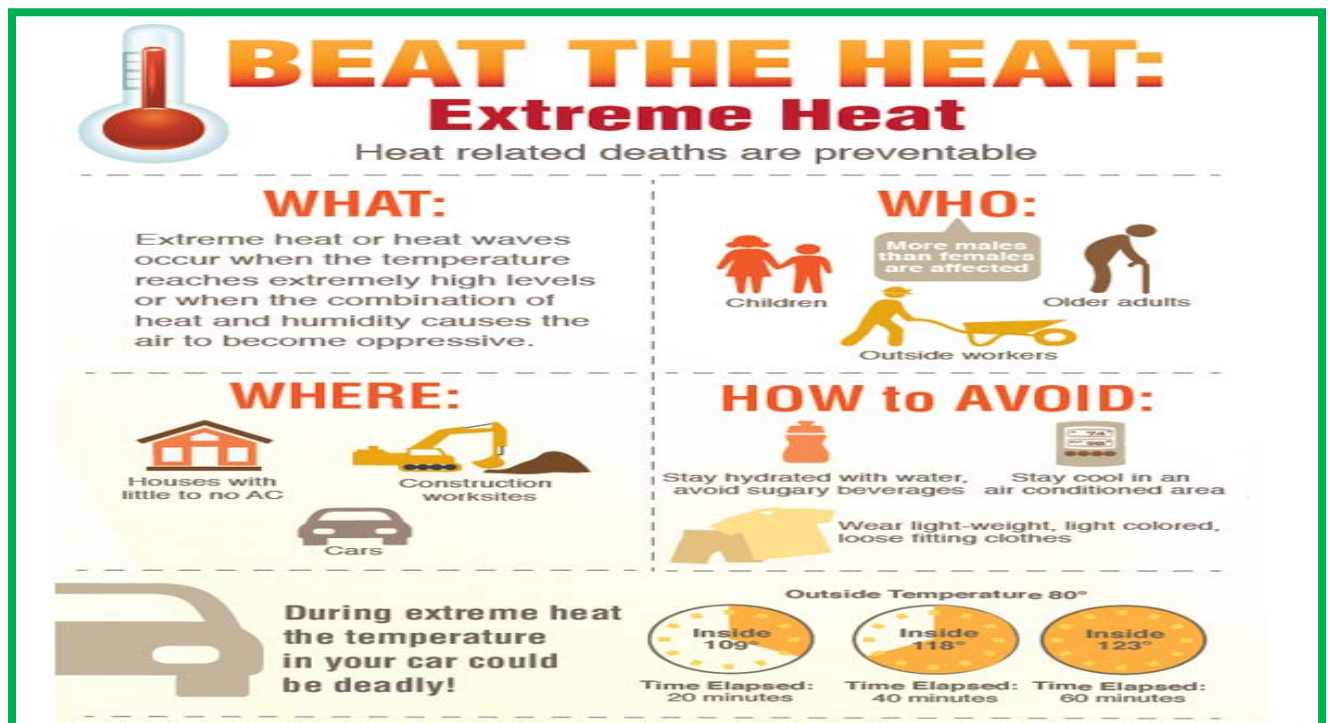
Nodal Officer is appointed to head the Heat Action Plan. The appointed nodal officer is responsible for coordinating and communicating ahead of, and during, extreme heat events, and provides support staff through the Nodal Office as necessary. The Nodal Officer is considering adopting the following preparations under the 2019 Heat Action Plan.



## 5. Heat Wave Incident Commander


Relief commissioner as the Incident Commander for the heat waves is Responsible to implement necessary action and strategic management of the incident at the state level. The Municipal Commissioner of Bhavnagar city is the Incident Commander at Corporation level.

Medical officer of BMC, health department has to head the coordination stakeholders and ensure the successful implementation of Heat Wave Action Plan. He is also responsible for co-ordination with stakeholders and Communicating actions ahead of, and during, extreme heat events, and provides Support staff for Heat Wave Action Plan functions through the Nodal Office as necessary.



## 6. Phases of Heat wave

### A. Phase 1: Pre-Heat Season (Annually from January through March)

 Nodal Officer/Incident Commanders/Medical officer/BMC  
Nodal Officer:

- Convene key agency leaders to respond to extreme heat events.
- Re-engage state and local agencies to facilitate internal communications.
- Organize preventative training and outreach efforts for health workers, link workers, school children, and the local community with the Health Department.
- Distribute multilingual pamphlets and posters with tips to prevent heat stress to hospitals, schools, and professional associations.
- Create a list of the high-risk areas of the city vulnerable to heat waves for more focused activities on heat prevention.

#### Media and Press Officer:

- Increase public communication including distributing the multilingual pamphlet and advertisements on heat stress prevention and tips for health protection during extreme heat events Focus outreach efforts in identified high-risk areas.
- Provide information and heat communication materials of the public.
- Increase the number of installed LED screens with rolling updated temperature forecasts available to the public.

#### Health Department and Medical Professionals:

- Enhance targeted training programs, capacity building efforts and communication on heat illness for medical staff at local hospitals and Health Centers based on the Framework of Health Dept/ BMC Medical Professionals and Health Workers. These efforts should include nursing staff, paramedics, field staff and link workers, and consider the susceptibility of particular wards.
- Have hospitals update their admissions and emergency case records to track heat-related morbidity and mortality. Train hospitals to improve expedience of recording of cause of death

certificates. Explore creation of simple, user-friendly means to track daily heat-related data and behavioral change impacts. The training could also include recording information education & communication (IEC) efforts.

- Adopt heat-focused examination procedures at local hospitals and urban health centers.
- Purchase and distribute reusable soft plastic ice packs for the citywide UHCs, 108 emergency centers, ambulances and hospitals.
- Explore creation of ice pack dispensaries to increase access to vulnerable communities.

#### Labor & Employment Department:

- Organize training for employers, outdoor laborers and workers regarding health impacts of extreme heat and recommendations to protect themselves during high temperatures.
- Utilize maps of construction sites to identify more high-risk outdoor workers. Potentially overlay with irradiation map from IMD or heat island map. Conduct publicity campaigns during high-risk days to these specific areas.

### 108 Emergency Service:

- Create displays on ambulances during local events to build public awareness
- Identify at-risk areas of vulnerable populations, in part by utilizing the list of high-risk areas.

### Community Groups and Individuals:

- Lead child-friendly educational preventative trainings and distribute heat protection materials at local schools. For example, potentially design a “Teach the Teachers” workshop designed to equip teachers with knowledge with heat protection tips and materials that they can disseminate in classrooms on heat protection, and activities that can engage students on health dangers of extreme heat.
- Conduct training workshops and outreach sessions with community groups and mobilizes such as Mahila Arogya Samiti, Self-Employed Women's Association (SEWA), ASHA workers, Aanganwadi workers, and municipal councils to help inform and get vulnerable communities more actively involved. Incorporate other sectors such as higher education, nonprofits, and community leaders to increase reach to communities.

- Encourage individuals to discussion of the early signs of heat exhaustion with their local doctor or Urban Health Centre.
- Inform fellow community members about how to keep cool and protect oneself from heat.

## **B. Phase 2: During the Heat Season (Annually from March through July)**

### Nodal Officer:

- Activate a heat alert and the local response citywide when extreme heat events are forecast by notifying the key agency leaders, BMC Deputy Municipal Commissioners and the Gujarat state agencies in accordance with the Communication Plan above.
- Monitor and increase the heat alert level when necessary to match the severity of the forecast and threshold established, and have the Municipal Commissioner convene a special meeting with key agency leaders.
- Activate “cooling centers,” such as temples, public buildings, malls, during a heat alert and/or Government-run temporary night shelters for those without access to water and electricity.

- Expand access to shaded areas for outdoor workers, slum communities, and other vulnerable populations. For example, confirm that night shelters stay open all day for migratory populations during a heat alert.
- Hold a frequent, possibly daily, conference call to discuss reports and breaking developments during a heat alert, and ensure that communication channels remain operational.
- Identify and set up public displays of temperature and forecasts, such as LED electronic scrolling boards.
- Continue surveillance of temperature data and forecasts.
- Communicate the suspension of all non-essential uses of water (other than drinking, keeping cool) via the Water Project's protocol procedures during any water shortage.
- Increase efforts to distribute fresh drinking water to the public. For example, expand potable water access during a heat alert at religious spaces including temples and mosques, Bus/Railway stations, pouch handouts to the poor and high-risk areas (identified by the mapping of high-risk areas).
- Communicate the local utility protocol to prioritize maintaining power to critical facilities (such as hospitals and UHCs).
- Notify the Steering Committee and relevant agencies when the heat alert is over.



## Media and Press Officer:

- Commence public messaging to the public about the dangers of heat-related illness with the Nodal Officer via press conferences.
- Circulate warnings via text alerts or WhatsApp mobile messages, in collaboration with private sector telecom companies utilizing centralized mobile databases, in addition to traditional media during a heat alert.
- Circulate warnings in bulk to the public via centralized email databases during a heat alert.
- Develop an SMS alert system to send direct messages to private practitioners in addition to the medical professionals at public hospitals and UHCs.
- Utilize local radio FM broadcasts to disseminate heat protection tips and high temperature warnings to the city's at-risk populations during a heat alert.
- Explore other means of communications, such as broader use of social media, for example, Face book and the WhatsApp mobile application.

### Health Department and Medical Professionals:

- Post heat-related illness prevention tips and how to stay cool around hospitals and UHCs. Ensure adequate medical supplies available.
- Produce weekly reports of the public health impact for Nodal Officer during a heat alert.
- Increase staffing at hospitals and UHCs to attend to the influx of patients during a heat alert, if feasible.
- Increase link worker and community health worker outreach in at-risk neighborhoods during a heat alert, if feasible.
- Have zonal health officer visit UHCs to confirm proper preparation has been made for heat related illness and conduct case audits during heat season.

### 108 Emergency Service:

- Ensure adequate supply of ice packs and IV fluids.
- Disseminate SMS text messages to warn local residents during a heat alert.

### Labor & Employment Department:

- Encourage employers to shift outdoor workers 'schedules away from peak afternoon hours (1pm – 5pm) during a heat alert.
- Provide emergency ice packs and heat-illness prevention materials to traffic police, Bus driver and construction workers.

### Community Groups and Individuals:

- Keep cool and hydrated during the heat season by drinking water, staying out of the sun, and wearing light clothing.
- Check on vulnerable neighbors, particularly during a heat alert.
- Limit heavy work in direct sun or indoors if poorly ventilated, especially during a heat alert.

### C. Phase 3: Post-Heat Season (Annually in July through September)

#### Nodal Officer:

- Organize an annual Heat Action Plan evaluation meeting with key agency leaders and relevant stakeholders.
  - Evaluate the Plan process based on performance and revise accordingly.
  - Evaluate the reach and impact of the Plan and revise accordingly.
  - Post the revised Plan to the official website ahead of the next heat season for stakeholders.
1. Build on the “Green Cover” activity to establish tree-plantation campaign in hotspot areas such as roadsides and during plantation festival in June. Incorporate student volunteers or incentivize builders to plant trees to help effect this effort.
- Discuss establishing cooling center facilities in high-risk areas around city.

## Health Department and Medical Professionals:

- Perform an epidemiological case review of heat-related mortalities during the summer.
- Conduct and gather epidemiological outcomes from the data on heat risk factors, illness and death, based on average daily temperatures.
- Incorporate data and findings into future versions of the Heat Action Plan.
- Measure mortality and morbidity rates based on data before and after the Plan's interventions.

## 7. Heat Illness

### A. Case Definitions

Clinical	Case Definition
<b>Heat rash</b>	Diffuse, pruritic, maculopapular or vesicular rash in the setting of heat exposure, often with insulating Clothing or swaddling.
<b>Heat cramps</b>	Painful contractions of frequently used muscle groups in the setting of heat exposure, often with exertion
<b>Heat exhaustion</b>	Syndrome of generalized weakness and or exhaustion, often with lightheadedness, limiting functioning in a Hot environment, without history of recent infection. May or may not be exertional.
<b>Heat syncope</b>	Brief loss of consciousness in the setting of heat exposure without evidence of seizure activity, stroke, or medication overdose.
<b>Heat stroke</b>	Altered mental status (including disorientation, delirium, seizure, and obtundation) with elevated core body temperature $\geq 40^{\circ}\text{C}$ in the setting of heat exposure, without signs of stroke, history of infection, or signs of medication overdose. May or may not be exertional.

## **B. Identification of Heat-Wave illness and recordings of casualties**

In the past, when the Government declared *ex-gratia* compensation for heat-wave affected families, it was observed that some people who were aware of the provision of direct cash relief reported natural deaths as the heat wave deaths. In the event of false reporting, the following procedures can be used for verifying and ascertaining the real cause of death.

- ❖ Recorded maximum temperature on the particular time periods and place.
- ❖ Recording incidents, panchnama or others witnesses, evidence or verbal – autopsy.
- ❖ Postmortem/medical checkup report with causes.
- ❖ Local authority or Local body enquiry/verification report.

## **C. Treatment Protocol**

Recognizing that treatment protocols may vary slightly according to the setting (EMS, health center, clinic, hospital emergency department, etc.), the following should apply generally to any setting and to all patients where there is a

potential concern for heat illness. Special thanks to Drs. Arthur Yancey and Nee-Kofi Mould-Milkman of Grady Emergency Medical Services, Emory University Department of Emergency Medicine, Atlanta, GA USA

1. Initial patient assessment – primary survey (airway, breathing, circulation, disability, and exposure), vital signs, including temperature
2. Consider heat illness in differential diagnosis if:
  - a. Presenting with suggestive symptoms and signs
  - b. Patient has one or more of the following

Risk factors:

- i.** Extremes of age (infants, elderly)
- ii.** Debilitation/physical reconditioning, overweight or obese
- iii.** Lack of acclimatization to environmental heat (recent arrival, early in summer season)



**iv.** Any significant underlying chronic disease, including psychiatric, cardiovascular, neurologic, hematologic, obesity, pulmonary, renal, and respiratory disease

**v.** Taking one or more of the following:

1. Sympathomimetic drugs
2. Ant cholinergic drugs
3. Barbiturates
4. Diuretics
5. Alcohol
6. Beta blockers

3. Remove from environmental heat exposure and stop physical Activity

4. Initiate passive cooling procedures

- a. Cool wet towels or ice packs to maxillae, groin, and around neck; if patient is stable, may take a cool shower, but evaluate risk of such activity against gain and availability of other cooling measures
- b. Spray cool water or blot cool water onto skin
- c. Use fan to blow cool air onto moist skin

5. If temperature lower than 40°C, repeat assessment every 5 minutes; if improving, attempt to orally hydrate (clear liquids, ORS can be used but not necessary; cool liquids better than cold) and observe.
6. If temperature 40°C or above, initiate IV rehydration and immediately  
Transport to emergency department for stabilization

#### **D. Prevention of Heat Related Illness**

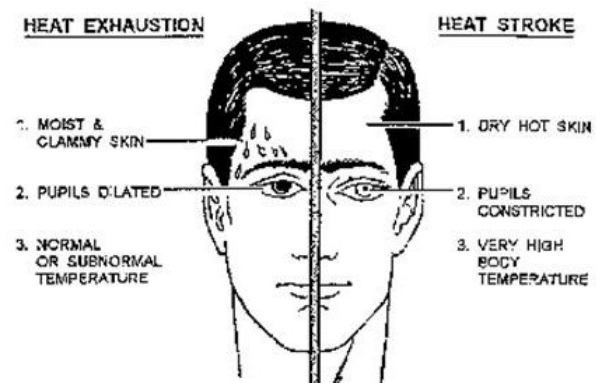
Heat-related illness is largely avoidable. The most crucial point of intervention concerns the use of appropriate prevention strategies by susceptible individuals. Knowledge of effective prevention and first-aid treatment, besides an awareness of potential side-effects of prescription drugs during hot weather is crucial for physicians and pharmacists.

## E. Acclimatization

People at risk are those who have come from a cooler climate to a hot climate. When such visitors arrive during the heat wave season, they should be advised not to move out in open for a period of one week till the body is acclimatized to heat and should drink plenty of water. Acclimatization is achieved by gradual exposure to the hot environment during heatwave.

### Heat Stroke

- Least common, a **MEDICAL EMERGENCY**
  - Untreated heat stroke will result in death
- **Signs and symptoms**
  - Hot, dry and flushed skin
  - May be confused
  - Unresponsive
  - Seizures
  - Falling blood pressure
  - Temp of 106°F or more



## F. Symptoms and First Aid for various Heat Disorders

Heat Disorder	Symptoms	First Aid
Sunburn	Skin redness and pain, possible swelling, blisters, fever, headaches.	Take a shower, using soap, to remove oils that may block pores preventing the body from cooling naturally. If blisters occur, apply dry, sterile dressing and get medical attention.
Heat Cramps	Painful spasms usually in leg and abdominal muscles or extremities Heavy sweating.	Move to cool or shaded place. Apply firm pressure on cramping muscles or gentle massage to relieve spasm. Give sips of water. If nausea occurs discontinue
Heat Exhaustion	Heavy sweating, weakness, skin cold, pale, headache, and clammy. Weak pulse. Normal temperature possible. Fainting, vomiting	Get Victim to lie down in a cool place. Loosen clothing. Apply Cool, wet cloth, Fan or move victim to air-conditioned place. Give sips of water slowly. If vomiting occurs, seek immediate medical attention. Or call 108.
Heat Stroke (Sun Stroke)	High body temperature (106°F). Hot dry skin. Rapid, Strong pulse. Possible unconsciousness. Victim will likely not sweat.	Heat Stroke is a severe medical emergency. Call 108 or take victim to a hospital immediately. Delay can be fatal. Try to cool bath or sponging to reduce body temperature. <b>DO NOT GIVE FLUIDS</b>

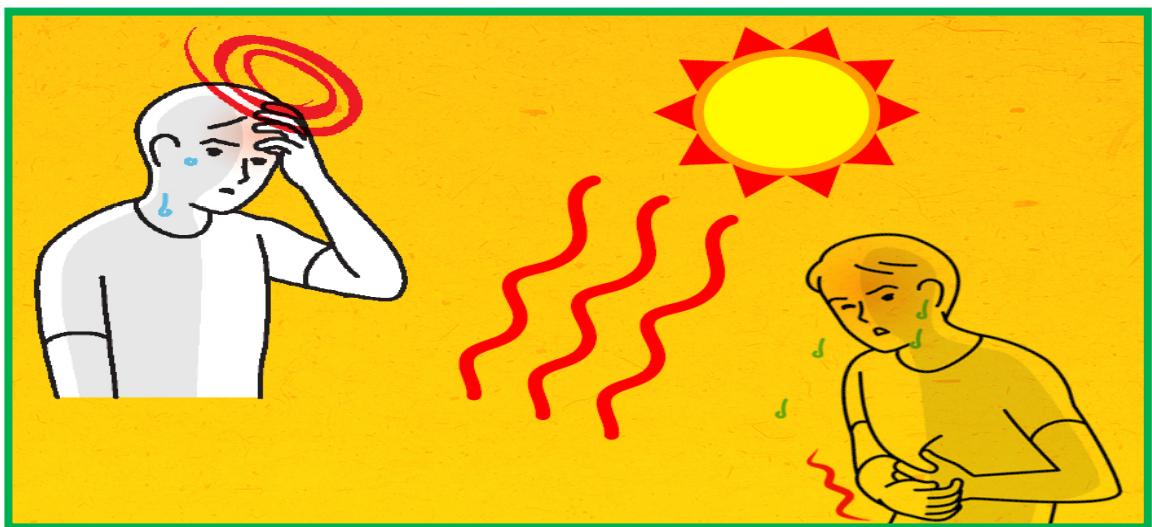
## **8. Heat wave and Disaster Management**

Section 2 (d) of the National Disaster Management Act 2005 defines “disaster” as a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes, and is of such a magnitude to be beyond the coping capacity of the affected area. Heat- wave has not been notified as a disaster by Government of India yet. But the data of the casualties it has been causing suggests that it is time that the various stakeholders realize the damaging repercussions that heat wave can cause to the health of humans and animals. Heat wave is not notified in the list of twelve disasters eligible for relief under National/ State Disaster Response Fund norms. However, a State Government may use up to 10 per cent of the funds available under the SDRF for providing immediate relief to the victims of natural disasters that they consider to be Disasters within the local context in the State and which are not included in the notified list of disasters of the Ministry of Home Affairs subject to the condition that the State Government has listed the State specific natural disasters and notified clear and transparent norms and guidelines for such disasters with the approval of the State Authority.

## A. Past experience on Heat-wave plan implementation in City

This plan provides a framework for other Indian cities to emulate and help protect their citizens from the extreme heat. The Heat Wave Action Plan of Bhavnagar Corporation concluded that Smart Cities are Heat wave Safe Cities. The following are key lesson learnt from Bhavnagar Heat Wave Action Plan:

- Recognize Heat Wave as a major Health Risk.
- Map out the 'High Risk' Communities.
- Setting up of 'Public Cooling Places'.
- Issue Heat wave alerts through different media.



## **B. Steps taken by other states**

### **Odisha State Disaster Management Authority is taking steps proactively such as**

- Early warning systems: Temperature and humidity levels, considered together, will determine the threshold for heat wave alerts. Bhubaneswar experiences up to 85 percent humidity in the summer, with Odisha's coastal regions facing even higher humidity.
- Public outreach: Temperature forecasts and heat alerts will be sent as bulk messages on mobile phones, including to the media for wider broadcast and Electronic screens at busy traffic intersections and market places will also display the information. It is also developing a website and a mobile phone app that would not only provide heat alerts but also help users identify, via maps, heat shelters and drinking water availability along Highways through the state.

- Medical up gradation and administrative measures- Heat treatment wings also are planned in hospitals, and heat alerts would trigger early morning shifts for schools and offices.

SOME ALARMING FACTS FOR 2019	
<p>➤ Combined effect of climate change and an evolving El Niño could make 2019 the hottest year ever</p>	<p>➤ Heatwave spells will occur early in the summer this year</p>
<p>➤ A recent report by IPCC shows that in the Indian subcontinent, global warming impacts have come sooner and hit harder than predicted</p>	<p>➤ IMD has developed a model that can predict heatwave at least two weeks in advance with 70%-plus accuracy</p>
<p>➤ This year, it is drought-like situation before the occurrence of heatwave spell, so the situation will be worsening</p>	<p>➤ Early prediction will bring much-needed relief as health, power and agriculture sector can be prepared</p>



## **9. Agency Action Checklist**

### **A. Checklist for Nodal Officer of Bhavnagar Municipal Corporation**

#### ***Pre-Summer***

- Designate heat health point of contact for each department
- Reengage key agencies to facilitate communications and Schedule monthly meetings
- Establish heat mortality tracking system and update datasets
- Establish Heat Action webpage on Corporation's website
- Educate school children and send home age-appropriate pamphlets about the heat season
- Create list of high-risk areas of city heat-wise

#### ***During Heat Event***

- Contact point person in each department announcing Heat event at least five days in advance
- Maintain contact with department points of contact for updates on conditions
- Ensure staff presence and availability of supplies with each department – including distributing fresh drinking water
- Communicate locations of emergency facilities and cooling centers/shaded areas with each department
- Monitor heat alert and increase level when severe forecast

#### ***Post-Summer Evaluation***

- Review quantitative and qualitative data for process evaluation and improvements
- Call meeting for annual evaluation of heat plan with key Agency leaders and community partners
- Post revised heat action plan online for stakeholders

## **B. Checklist for Medical Colleges and Hospitals**

### ***Pre-summer***

- **Adopt heat-focused examination materials**
- **Get additional hospitals and ambulances ready**
- **Update surveillance protocols and programs, including tracking daily heat-related data**
- **Establish more clinician education**
- **Continue to train medical officers and paramedics**

### ***During Heat Event***

- **Adopt heat-illness related treatment and prevention protocols**
- **Equip hospitals with additional materials**
- **Deploy all medical staff to be on duty**
- **Keep emergency ward ready**
- **Monitor water borne diseases, malaria and dengue**
- **Keep stock of small reusable ice packs to apply to PULSE areas**
- **Report heat stroke patients to Corporation daily**
- **Expedite recording of cause of death certificates**

### ***Post-summer Evaluation***

- **Participate in annual evaluation of heat action plan**
- **Review revised heat action plan**

## C. Checklist for Public Health Manager

### *Pre-summer*

- Check inventories of medical supplies in health centers
- Check inventories of medical supplies in health centers
- Identify cooling centers and barriers to access cooling centers
- Community involvement for workers and trainers' education

### *During Heat Event*

- Prepare rapid response team
- Distribute "Dos and Don'ts" to community
- Effectively send a "Don't Panic!" message to community
- Ensure access to Medical Mobile Van in the Red Zone
- Ensure additional medical vans available

### *Post-summer Evaluation*

- Participate in annual evaluation of heat action plan
- Review revised heat action plan

## **D. Checklist for Urban Health Centers and Link Workers**

### ***Pre-summer***

- **Distribute pamphlet and other materials to community**
- **Sensitize link workers and community leaders**
- **Develop and execute school health program**
- **Dissemination of materials in slum communities**
- **Coordinate outreach efforts with other community Groups, non-profits, and higher education**

### ***During Heat Event***

- **Recheck management stock**
- **Modify worker hours to avoid heat of day**
- **Visit at-risk populations for monitoring and prevention**
- **Communicate information on tertiary care and 108 services**

### ***Post-summer Evaluation***

- **Participate in annual evaluation of heat action plan**
- **Review revised heat action plan**

## **E. Checklist for BMC Press Officer**

### ***Pre-Summer***

- **Secure commercial airtime slots for public service announcements**
- **Identify areas to post warnings and information during heat season**
- **Organize training for health workers and medical professionals**
- **Activate telephone heat hotline**
- **Begin placing temperature forecasts in newspapers**
- **Increase installed LED screens with scrolling temperature data**

### ***During Heat Event***

- **Issue heat warnings in heat and electronic media**
- **Contact local FM radio and TV stations for announcements**
- **Use SMS, text and WhatsApp mobile messaging and Centralized mobile databases to send warnings**
- **Contact transport department to place warnings on buses**

### ***Post-Summer Evaluation***

- **Evaluate reach of advertising to target groups and other means of communication such as social media**
- **Participate in annual evaluation of heat action plan**
- **Review revised heat action plan**

## **F. Checklist for Labor Department**

### ***Pre-Summer***

- **Heat illness orientation for factory medical officers and general Practitioner**
- **Generate list of factory medical officers and contractors to Include in heat action communications from Nodal Officer**
- **Communicate directly about heat season with non-factory workers**
- **Utilize maps of construction sites to identify more high- risk outdoor workers.**
- **Conduct publicity campaigns during high-risk days in identified high-risk areas**

### ***During the Heat Season***

- **Provide water at work sites**
- **Request use of A/C at factory facilities**
- **Extended hours at Occupational Health Centers**
- **Consider extended afternoon break or alternate working hours for Workers**

### ***Post-Summer Evaluation***

- **Participate in annual evaluation of heat action plan**
- **Review revised heat action plan**
- **Pilot project to provide emergency ice packs and heat-Illness Prevention materials to traffic police, Transport staff and construction workers**

## **G. Checklist for 108 Emergency Service**

### ***Pre-Summer***

- **Prepare handouts for paramedics about heat illness**
- **Create displays on ambulances to build public awareness during major spring events Establish Dynamic Strategic Deployment Plan for ambulances**
- **Ensure adequate supply of IV fluids**
- **Identify at-risk areas**
- **Prepare SMS messages to disseminate during emergencies**
- **Identify media point of contact**

### ***During the Heat Season***

- **Ready medicine stocks**
- **Keep accurate records of pre-hospital care**
- **Send messages to all employees alerting them regarding HAP**
- **Activate Dynamic Strategic Deployment Plan**
- **Staff surplus employees and restrict leave**

### ***Post-Summer Evaluation***

- **Provide data to key agency leader**
- **Participate in annual evaluation of heat action plan**
- **Review revised heat action plan**

## 10. Roles and responsibilities for managing Heat wave

### A. Need for Data and Analysis

As Heat Wave is not a notified disaster at the National level, accurate information and data related to heat wave deaths and illnesses are not available. In order to prepare, and take necessary imitative action we need data on the age group, sex and occupation of those who die of heat wave. We also need to collect data on whether the deaths occurred indoor or outdoor, and also about the economic status of the people who died.

### Temperature / Humidity Index

Relative Humidity %	Temperature °C																
	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
40	27	28	29	30	31	32	34	35	37	39	41	43	46	48	51	54	57
45	27	28	29	30	32	33	35	37	39	41	43	46	49	51	54	57	
50	27	28	30	31	33	35	36	38	41	43	46	49	52	55	58		
55	28	29	30	32	34	36	38	40	43	46	48	52	54	58			
60	28	29	31	33	35	37	40	42	45	48	51	55	59				
65	28	30	32	34	36	39	41	44	48	51	55	59					
70	29	31	33	35	38	40	43	47	50	54	58						
75	29	31	34	36	39	42	46	49	53	58							
80	30	32	35	38	41	44	48	52	57								
85	30	33	36	39	43	47	51	55									
90	31	34	37	41	45	49	54										
95	31	35	38	42	47	51	57										
100	32	36	40	44	49	56											

	Caution		Extreme Caution		Danger		Extreme Danger
--	---------	--	-----------------	--	--------	--	----------------

Source: Calculated °F to °C from NOAA's National Weather Service



## B. Prevention, Preparedness and Mitigation Measures

Prevention, preparedness and mitigation measures for various stakeholders are enumerated in the following Table.

**Table: Roles and Responsibilities for Managing Heat Wave**

Sr.	Tasks/	Central/ State Agencies & Their Responsibilities			
No	Activities	Centre	Responsibility	State	Responsibility
1.	Preparation Heat Wave Action Plan	NDMA	Guideline on preparing a Heat Wave Action	SDMA/ DDMA/ Panchayat and Bodies	Preparing a Wave Action Plan and
2.	Early	IMD	Issue Heat alerts and weather on Short / Medium / range	State Government District Administrat	To disseminate the received from IMD to the at large
3.	Mitigating Heat Wave	Ministry of Urban Developme Department of Drinking Water and Sanitation, Ministry of Surface Transport	To construct shelters/ bus stands provide water points worksites.	Public and Engineering Department	To construct shelters/ bus stands and provide water points in cities,
4.	HAP	Ministry of Health and Family Welfare	Stockpiling of ORS, creating Medical posts at places of mass gathering, Training of Human Resources	Department of Health	Stockpiling of ORS , creating Medical posts at places of mass gathering

5.	Monitoring and Response	Ministry of Health and Family Welfare	<input type="checkbox"/> Surveillance <input type="checkbox"/> deployment of Rapid Response Teams <input type="checkbox"/> specific care for vulnerable	Health Department	<input type="checkbox"/> Surveillance <input type="checkbox"/> deployment of Rapid Response Teams <input type="checkbox"/> specific care for vulnerable
6.	Occupational Support and advisories	All Ministries / Departments	Take necessary measures as suggested in	All Departments	Take necessary measures as suggested in
7.	Media campaign and IEC activities	Ministry of Information and Broadcasting	Extensive IEC campaigns to create awareness through print, electronic and social media	Department of Information and Broadcasting/ SDMAs/ Commissioners of Relief/ State Govt./	Extensive IEC campaigns to create awareness through print, electronic and social media
8.	Documentation	Ministry of Health & Family Welfare through IDSP	Collecting Data from States as per Annexure 2 and maintaining national	Revenue Departments/ SDMAs/ DDMA's/ Health Deptt.	Collecting Data and Information as per Annexure 2
9.	Long Term Measures	Ministry of Urban Development, Ministry of Environment Forests and Climate Change	Improving the forest coverage and green areas	Forest Department/ SDMAs and other concerned Department	Improving the forest coverage and green areas

## **11. Do's and Don'ts of Heat Wave**

Heat Wave conditions can result in physiological strain, which could even result in death. To minimize the impact during the heat wave and to prevent serious ailment or death because of heat stroke, the following measures are useful:

### **DO's**

- ❖ Listen to Radio, watch TV, read News paper for local weather forecast to know if a heat wave is on the way
- ❖ Drink sufficient water and as often as possible, even if not thirsty
- ❖ Wear lightweight, light-colored, loose, and porous cotton clothes. Use protective goggles, umbrella/hat, shoes or chappals while going out in sun.
- ❖ While travelling, carry water with you.
- ❖ If you work outside, use a hat or an umbrella and also use a damp cloth on your head, neck, face and limbs.
- ❖ Use ORS, homemade drinks like lassi, torani (rice water), lemon water, buttermilk, etc. which help to re-hydrate the body.

- ❖ Recognize the signs of heat stroke, heat rash or heat cramps such as weakness, dizziness, headache, nausea, sweating and seizures. If you feel faint or ill, see a doctor immediately.
- ❖ Keep animals in shade and give them plenty of water to drink.
- ❖ Keep your home cool, use curtains, shutters or sunshade and open windows at night.
- ❖ Use fans, damp clothing and take bath in cold water frequently.
- ❖ Provide cool drinking water near work place.
- ❖ Caution workers to avoid direct sunlight.
- ❖ Schedule strenuous jobs to cooler times of the day.
- ❖ Increasing the frequency and length of rest breaks for outdoor activities.
- ❖ Pregnant workers and workers with a medical condition should be given additional attention.

## DONT's

- ❖ Do not leave children or pets in parked vehicles.
- ❖ Avoid going out in the sun, especially between 12.00 noon and 3.00 p.m.
- ❖ Avoid wearing dark, heavy or tight clothing.
- ❖ Avoid strenuous activities when the outside temperature is high. Avoid working outside between 12 noon and 3 p.m.
- ❖ Avoid cooking during peak hours. Open doors and windows to ventilate cooking area adequately.
- ❖ Avoid alcohol, tea, coffee and carbonated soft drinks, which dehydrates the body.
- ❖ Avoid high-protein food and do not eat stale food.

## 12. Campaign done by Bhavnagar Municipal Corporation

### Heat Wave Safety Leaflet

### ગરમીમાં લૂ લાગવા (હીટ વેવ) થી બચવા આટલું કરીએ

### નાગરીકોને નમ્ર અપિલ

**: આરોગ્યલક્ષી સુચનો :**

- હીટ વેવ દરમિયાન બહાર નીકળવાનું ટાળવું, આખું શરીર અને માથું ઢંકાઈ તે રીતે સફેદ સુતરાઉ ખૂલતા કપડાં પહેરવા ટોપી, ચશ્માં, છત્રીનો ઉપયોગ કરવો.
- નાના બાળકો, સગર્ભા માતાઓ, વૃદ્ધો તથા અશક્ત અને બીમાર વ્યક્તિઓએ તકકામાં વિશેષ કાળજી લેવી. સીધા સૂર્ય પ્રકાશથી બચવું.
- ભીના કપડાથી માથું ઢાંકી રાખવું અવાર નવાર ભીના કપડાંથી શરીર લુંછવું, વારંવાર ઠંડુ પાણી પીવું.
- લીનું સરબત, મોળી છાસ, તાડકળી અને નારિયેળનું પાણી, ખાંડમીઠાનું દ્રાવણ, ઓ.આર.એસ. વગેરે પુષ્કળ પ્રમાણમાં લેવા.
- બાળકો માટે કેસુડાના ફૂલ તથા લીમડાના પાનનો નહાવામાં ઉપયોગ કરવો.
- ગરમીમાં બહારથી ઘરે આવ્યા બાદ શરીરનું તાપમાન નીચું આવે ત્યારબાદ જ નહાવું. શક્ય હોય તો ઘરના બારી અને બારણા સાથે ખસની ટફ્ટી પાણી છાંટી બાંધી રાખવી.
- દિવસ દરમિયાન ઝાડ નીચે ઠંડક અને છાંયામાં રહેવું.
- બજારમાં મળતો ખુલ્લો, વાસી ખોરાક ખાવો નહીં, બજારમાં મળતા બરફનો ઉપયોગ ટાળવો, લગ્ન પ્રસંગે દૂધ, માવના આઈટમ ખાવી નહીં.
- ઉપવાસ કરવાનું ટાળવું, સવારનું ભોજન ૧૨ વાગ્યા સુધીમાં જમી લેવું.
- ચા-કોફી અને દારૂના સેવનથી લૂ લાગવાની શક્યતા વધે છે, તેથી તેનું સેવન ટાળવું.


**હીટ વેવની ચેતવણીનાં દિવસોમાં બપોરે બે વાગ્યાથી ચાર વાગ્યા સુધી બહાર નીકળવાનું ટાળવું.**

**: લૂ લાગવા (હીટ વેવ)ના લક્ષણો :**


- માથું દુઃખવું પગની પિંડીઓમાં દુઃખાવો થવો.
- શરીરનું તાપમાન વધી જવું.
- ખુબ તરસ લાગવી.
- શરીરમાંથી પાણી ઓછું થઈ જવું.
- ઉલ્ટી થવી, ઉબકા આવવા, ચક્કર આવવા, આંખે અંધારા આવવા.
- બેભાન થઈ જવું.
- સુધ બુધ ગુમાવી દેવી. (ગભરામણ)
- અતિ ગંભીર કિસ્સામાં ખેંચ આવવી.

વરિયાળી, કાચી કેરી, ગુલાબ, ખસ (વાળા) અને કાળી દ્રાક્ષનું શરબત લઈ સકાય. રાત્રે ૧૦ નંગ કાળી દ્રાક્ષ પાણીમાં પલાળી સવારે આ પાણી પીવું અને દ્રાક્ષ ખાવી, તરબૂચનો ઉપયોગ સવારે અને બપોરે કરવો.

લૂ લાગવાની અસર જણાય તો તાત્કાલીક નજીકના પ્રાથમિક આરોગ્ય કેન્દ્ર કે સરકારી દવાખાનાનો સંપર્ક કરવો.



**ભાવનગર મહાનગરપાલિકા - આરોગ્ય વિભાગ**  
મંગળસિંદ્રજી રોડ, ભાવનગર-૩૬૪૦૦૧.



NATIONAL RURAL HEALTH MISSION  
સુખ સ્વસ્થ ભારત

### **13. Contact Directory**

#### **Name of state stake holders**

Key Members	Reporting Place	Contact Number
Relief Commissioner – RD - Gujarat	GANDHINAGAR	23221509, 26301728
Relief Director– RD – Gujarat	GANDHINAGAR	23251611, 23251612
CEO–GSDMA - Gujarat	GANDHINAGAR	23259503
Director–GSDMA - Gujarat	GANDHINAGAR	23259220



### Contact detail of BMC Officers (District Code No. 0278)

Sr. No	Name	Designation	Contact Number	
			Office	Mobile
1	Shri M.A.Gandhi	Municipal Commissioner	2510532 2439900	9978403000
2	Shri D.M.Gohil	Dy.Commissioner (Admin)	2439292	9409390773
3	Shri M.R.Kukadiya	Dy.Commissioner (General)	2439797	9712975522
4	Shri F.M.Shah	Ass.Commissioner	-	9979945333
5	Shri S.J.Chandarana	City Engineer	2511605	9925855999
6	Dr.R.K.Sinha	Medical Officer, Health	2430249	9727776890
7	Dr.Akshay B.Pandaya	Biologist, UMD	2424820	9426162158
8	Shri Mahesh Hirapara	Chief Fire Officer	2424814	9727712177
9	Shri Dimpal M.Teraiya	PO-GSDMA (I/C)	-	9824438275 9265755998
10	Shri Ajitsinh Solanki	Flood Cell	-	9925232292
11	Shri M.D.Asari	PRO	-	9429164093
12	Shri Bhanuben Parmar	Legal Officer	-	9328627344



13	Shri M.V.Kureshi	Election Cell	-	9727776884
14	Shri Jaimin Kakadiya	Mamlatdar, MDM	2433881	7874550833
15	Shri Yogeshbhai Bhatt	Shashnadhikari	2515646	9428108686
16	Shri Savitriben Nathaji	PO-ICDS, BMC	2424044	9824458602
17	Shri Nitaben Bhatt	CDPO-1	2561711	6359924339
18	Shri Madhuriben Dodiya	CDPO-2	2421111	8866598699
19	Shri Alkeshbhai Patel	Chief Auditor	2515540	9879565696
20	Shri R.R.Maheta	Chief Account Officer	2514300	9979084655
21	Shri Devangi Maheta	Administration Officer	-	7575864545
22	Shri Girishbhai Patel	Secretary	2422652	9879241493
23	Shri V.N.Pandit	Executive Engineer (Estate)	-	9825419008
24	Shri Hareshbhai Vyas	Executive Engineer (Transport)	2424817	9909919091
25	Shri R.G.Shukla	Executive Engineer (SWM)	-	9909911616
26	Shri P.J.Chudasama	Executive Engineer (Yojana)	-	9925009293

27	Shri M.D.Makwana	Executive Engineer (Roads)	-	9909911910
28	Shri R.G.Parikh	Executive Engineer (Drainage)	2430256	9426993785
29	Shri V.N.Pandit	Executive Engineer (Building)	-	9825419008
30	Shri Dharmesh Kevadiya	Executive Engineer (Light)	2512929	8460442066
31	Shri Bhavesh Vyas	Executive Engineer (Filter)	2424811 /16	9825604242
32	Shri C.C.Devmurari	Executive Engineer (WW)	2430247	9879525199
33	Shri K.K.Gohil	Garden Superintendent	-	9898491914
34	Shri Rajesh Solanki	PA to Commissioner shri	2510532	9825780702

## Contact detail of BMC PRI Members (District Code No. 0278)

Sr. No .	Name	Designation	Contact Number	
			Office	Mobile
1	Shri Manharbhai Mori	Mayor	2511600	9825504150
2	Shri Ashokbhai Baraiya	Dy. Mayor	2424840	9824390971
3	Shri Uvrajsinh Gohil	Chairman-Standing Committee	2424843	9825117210
4	Shri Pareshbhai Pandaya	Minister-BJP	2513936	8530603070
5	Shri Jaydipsinh Gohil	Minister-Congress	2424839	9998009007
6	Shri Urmilaben Bhaal	Chairman- Public works Committe		9979306913 9879647142
7	Shri Rajubhai Rabadiya	Chairperson- Public Health Committee		9825206747
8	Shri Hareshbhai Makwana	Chairman- Drainage Committee		9426211530
9	Shri Jalvikaben Gondaliya	Chairman- Water works Committee		9824450877

10	Shri Kishorbhai Gurumukhani	Chairperson-Town planning & city improvement committee		9375406400
11	Shri Divyaben Vyas	Chairperson-Social welfare & Culture committee		9913666466
12	Shri D.D.Gohil	Chairman-Garden committee		9825137013
13	Shri Bharatiben Baraiya	Chairperson-Legal committee		9904440504
14	Shri Nileshbhai Raval	Chairman-City primary education committee		9898373345

### Contact detail of MO-UPHC of BMC

Sr. No.	MO Name	UPHC Name	Contact No.
1	Dr. Rupal Jethava	UPHC, Subhashnagar	9712975818
2	Dr. Ranjit Parmar	UPHC, Fulsar	8128015889
3	Dr. Bhavesh Valiya	UPHC, Bharatnagar	9662824813
4	Dr. Krutika Goyani	UPHC, Kunbharvada	9428590209
5	Dr. Devenkumar Trivedi	UPHC, Vadava voshing ghaat	9427546099
6	Dr. Shaktisinh Gohil	UPHC, Karachaliyapara	9725176967
7	Dr. Hitesh Gurjar	UPHC, Bortalav	8238532415
8	Dr. Dhruti Panara	UPHC, Kanabivaad	9558763124
9	Dr. Krishna Jasani	UPHC, Bordi gate	9099093697
10	Dr. Nirali Palan	UPHC, Prabhudas talav	8866582172
11	Dr. Divyarajsinh Chudasama	UPHC, Kaliyabid	9099888404
12	Dr. Mahesh Yadav	UPHC, Bhilvada	9978653514
13	Dr. Vidhya Kakrecha	UPHC, New kumbharvada	8320799624

## Gujarat State Disaster Management Authority



Disaster Management  
Bhavnagar Municipal Corporation  
Bhavnagar