

# **HEAT WAVE ACTION PLAN - 2019**

**Commissionerate of Revenue Administration and  
Disaster Management  
Chepauk, Chennai 600005**

## **1. Background**

Tamil Nadu with 7.21 crore people is the seventh most populous state in the Country with considerably high level of population density (555 per Sq. KM). As per 2011 census, 51.60 % of Tamil Nadu's population lives in urban areas and 48.40 % lives 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. Tamil Nadu, is located in the vulnerable part of the Indian Peninsula, is subjected to climate and geological related disasters viz., cyclone, flood, earthquakes, tsunami and drought to varying degrees. In the recent years, due to rising temperatures during the summer/ pre-monsoon months several places are prone to 'Heat wave' conditions.

## **2. Understanding Heat Wave and its impact**

As per the World Meteorological Organization (WMO) 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 21<sup>st</sup> 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 temperature, 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, Bhubaneswar (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 temperature 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.

Heat wave is also called a "silent disaster" as it develops slowly and kills and injures humans and animals nationwide. Higher daily peak temperature of longer duration and 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 wave with each passing year.

## Heat wave

Heat-wave is a condition of atmospheric temperature that leads to physiological stress, which sometimes can claim human life. Heat-wave is defined as the condition where maximum temperature at a grid point is 3°C or more than the normal temperature, consecutively for 3 days or more. World Meteorological Organization defines a heat wave as five or more consecutive days during which the daily maximum temperature exceeds the average maximum temperature by five degrees Celsius. If the maximum temperature of any place continues to be more than 45° C consecutively for two days, it is called a heat wave condition.

## Heat Index

There will be no harm to the human body if the environmental temperature remains at 37° C. Whenever the environmental temperature increases above 37° C, the human body starts gaining heat from the atmosphere. If humidity is high, a person can suffer from heat stress disorders even with the temperature at 37°C or 38°C. To calculate the effect of humidity we can use Heat Index Values\*. The Heat Index is a measure of how hot it really feels when relative humidity is taken into account with the actual air temperature. As an example, if the air temperature is 34°C and the relative humidity is 75%, the heat index--how hot it feels--is 49°C. The same effect is reached at just 31°C when the relative humidity is 100 %.

\* Source – NDMA Guidelines for preparation of action plan – Prevention and Management of Heat wave 2017

The Temperature vs Humidity chart and the temperature actually felt is presented below:

**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
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The brief for Policy Makers of India, issued by Lancet Countdown on Health and Climate Change 2018, focuses on the linkages between health and climate change, and their implications for India's policy commitments. Developed in conjunction with the Public Health Foundation of India and their Center for Environmental Health, this brief serves to provide strategic direction for policy makers in four key areas:

- Health effects of heat waves and change in labour capacity due to heat
- Premature mortality from ambient air pollution by sector
- Sustainable travel infrastructure and uptake
- Media coverage of health and climate change

### **3. Early Warning Systems on Heat Wave**

The Indian Meteorological Department issues a Weekly Bulletin with the Current Temperature Status and Warning for next five days. The Commissionerate of Revenue Administration and Disaster Management instantly shares this info to the District Disaster Management Authorities (DDMAs). The District Administration communicates this in multiple channels to the public.

The salient points of Analysis are:

Heat wave is considered if maximum temperature of a station reaches at least

- 40°C or more for Plains,
- 37°C or more for coastal stations and
- at least 30°C or more for Hilly regions.

Following criteria are used to declare heat wave:

1. Based on the Departure from Normal
2. Heat Wave: Departure from normal is 4.5°C to 6.4°C
3. Severe Heat Wave: Departure from normal is >6.4°C
4. Based on Actual Maximum Temperature (for plains only)
5. Heat Wave: When actual maximum temperature  $\geq 45^\circ\text{C}$
6. Severe Heat Wave: When actual maximum temperature  $\geq 47^\circ\text{C}$

To declare heat wave, the above criteria should be met at least in 2 stations in a Meteorological sub-division for at least two consecutive days and it will be declared on the second day.

## Heat Wave Warning

<b>Green (No action)</b>	<b>Normal Day</b>	<b>Maximum temperatures are near normal</b>
<b>Yellow Alert (Be updated)</b>	<b>Heat Alert</b>	<b>Heat wave conditions at district level likely to persist for 2 days</b>
<b>Orange Alert (Be prepared)</b>	<b>Severe Heat Alert for the day</b>	<b>(i) Severe heat wave conditions persist for 2 days. (ii) With varied severity, heat wave is likely to persists for 4 days or more</b>
<b>Red Alert (Take Action)</b>	<b>Extreme Heat Alert for the day</b>	<b>(i) Severe heat wave persists for more than 2 days. (ii) Total number of heat/severe heat wave days likely to exceeds 6 days.</b>

Source: IMD – Heat wave Bulletins

### 4. Heat Wave Action Plan:

The ultimate objective of heat-wave action plan is to mobilize individuals and communities to help protect their neighbours, friends, relatives, and themselves against avoidable health problems during spells of very hot weather with a focus on the vulnerable people.

Severe and extended heat-waves will cause disruption to general, social and economic services and Government departments have a critical role to play in communicating the alerts issued by IMD and preparing and responding to heat-waves at a local level, working closely with health and other related departments on long term strategic plan.

This Heat Wave Action Plan is a compilation of those Guidelines and Action Points issued for adoption by all the urban and Rural Local bodies and other departments

## 5. Roles and Responsibilities of Managing Heat Wave

Roles	Responsibilities	
	State Level	District Level
Preparation of Heat Wave Action Plan	Commissionerate of Revenue Administration, Municipal Administration, Director of Town Panchayats, Director of Rural Development& Panchayat Raj Departments, Director of Public Health, Director Labour & Employment, Director of Agriculture, Director of Animal Husbandry, Chief Conservator of Forests, Director of School Education, Commissioner of Food Safety and Drug Administration, Director of Industrial Safety, Commissioner HR&CE, Director of Tourism	DDMA and respective line departments
Early Warning	IMD, SEOC, through DEOC, Media including Social Media	DDMA, DEOC, through Media including Social Media
Mitigating Heat Waves	Municipal Administration, Director of Town Panchayats, Director of Rural Development& Panchayat Raj Departments, Director of Public Health, Director Labour & Employment, Director of Agriculture, Director of Animal Husbandry, Chief Conservator of Forests, Director of School Education, Commissioner of Food Safety and Drug Administration, Director of Industrial Safety, Commissioner HR&CE, Director of Tourism.	DDMA, and respective line departments
Monitoring	Commissionerate of Revenue Administration, Municipal Administration, Director of Town Panchayats, Director of Rural Development& Panchayat Raj Departments, Director of Public Health.	DDMA, and respective line departments
Capacity Building	Commissionerate of Revenue Administration, Municipal Administration, Director of Town Panchayats, Director of Rural Development& Panchayat Raj Departments, Director of Public Health.	DDMA, and respective line departments

Response	Commissionerate of Revenue Administration, Municipal Administration, Director of Town Panchayats, Director of Rural Development& Panchayat Raj Departments, Director of Public Health,	DDMA, and respective line departments
Media Campaigns	Commissionerate of Revenue Administration, Municipal Administration, Director of Town Panchayats, Director of Rural Development& Panchayat Raj Departments, Director of Public Health,	DDMA, and respective line departments
Documentation	Commissionerate of Revenue Administration, Municipal Administration, Director of Town Panchayats, Director of Rural Development& Panchayat Raj Departments, Director of Public Health,	DDMA, and respective line departments
Long Term Mitigation Measures	Commissionerate of Revenue Administration, Municipal Administration, Director of Town Panchayats, Director of Rural Development& Panchayat Raj Departments, Director of Public Health, Director Labour & Employment, Director of Agriculture, Director of Animal Husbandry, Chief Conservator of Forests, Director of School Education, Commissioner of Food Safety and Drug Administration, Director of Industrial Safety, Commissioner HR&CE, Director of Tourism	DDMA, and respective line departments

### Early Warning

- ❖ Establish Early Warning System and Inter-Department Coordination to alert residents on predicated high and extreme temperatures. Who will do what, when, and how is made clear to individuals and units of key departments, especially for health.
- ❖ Activate the DEOC with inter-departmental personnel with vide publicity of Toll Free No: 1077.
- ❖ Issue of heat alert when extreme heat events are forecast by IMD to all key Departments / Agencies through DEOC.
- ❖ Dissemination of heat alerts/advisories through local print, electronic and social media

## **India Meteorological Department (IMD) criteria for Heat Wave and Severe Heat Wave:**

Heat wave is considered only after maximum temperature of a station reaches at least 40° C or more for plains, at least 30° C or more for hilly regions and 37° C or more in sea shore areas.

### **High Risk Groups**

- Children, Pregnant women & Senior citizens
- Labourers including those at construction sites / Outdoor workers / Farmers / MNREGS workers
- Police personnel / security staff
- Industrial workers working at High Temperatures
- Street hawkers / Salesmen
- Riksha pullers / auto drivers / Travellers / bus drivers
- Coolies / Slum residents / Beggars / Homeless
- Chronic sick / indoor cases
- Patients on drug treatment
- Addicts (Alcohol, drugs etc)

The above list is only indicative and not exhaustive. Hence, District Collectors are advised to update the above list of the groups/localities that are vulnerable to heat wave based on local situation.

### **Heat-wave Management:**

The following measures have to be initiated by the DDMA's to tackle the Heat wave conditions and its effect during summer 2019. In addition, any additional measures that may be required based on the past experience in the district should also be put in place.

### **Preparedness measures:**

- ❖ Ensure drinking water supply to all habitations.
- ❖ Local bodies shall identify the areas to provide shelters and drinking water during heat alert period such as bus depots/stops, markets, railway stations, pilgrimage, tourist, industrial areas etc.
- ❖ District Administration have to prioritize maintaining power to critical facilities such as hospitals and UHCs.
- ❖ Checking of inventories of medical supplies including IV fluids, cooling packs or ice, ORS powder in PHCs, UHCs, and 108 emergency ambulances.
- ❖ Adequate arrangements for treatment of heat stroke patients round the clock.
- ❖ Display of prevention measures to overcome HEAT WAVES.
- ❖ Ensure the services of 108 / 104 Emergency Service with adequate supply of IV fluids.



- ❖ Establish mobile Health teams to cover major bus stands / Terminals, pilgrimage, tourist centres and other public places.
- ❖ Keep open the parks in afternoon and for a longer duration during evenings.
- ❖ Labour department to enforce better working conditions for workers such as provision of sheds, safe drinking water, bathing facilities etc as per the Labour Act.
- ❖ Fire and Rescue Services Department has to ensure the readiness of vehicles and firefighting equipment to face any emergency.
- ❖ Police personnel on duty in the open, to be educated on precautionary measures to be taken during heat wave.
- ❖ Shelters for traffic police may be provided, wherever feasible.
- ❖ Children in anganwadis and schools may be advised to ensure that they are not exposed in the sun.
- ❖ To collect information on the works sanctioned under MGNREGS programme in High risk areas to plan for mitigation effort during heat period.
- ❖ MGNREGS workers shall be educated in following the do's and don'ts. Adequate water, shelter should be provided as per the rules prescribed under MGNREGS. It is to be ensured that the children of MGNREGS workers are also adequately taken care of and not exposed to sun.
- ❖ Rescheduling of Working hours to avoid intense heat timings in all the works

## **Veterinary Measures**

### **Animal care**

- ❖ Poultry and cattle will also be adversely affected during heat wave. Cattle and poultry owners to be cautioned accordingly.
- ❖ Ensure adequate stock of medicines in all veterinary hospitals for treatment of cattle /poultry birds.
- ❖ Ensure provision of water in veterinary dispensaries

### **Wild life**

- ❖ Provision of water supply to animals in reserved / protected areas and in zoos

## **Public Awareness and community outreachmeasures:**

- ❖ **Public Awareness and Community outreach:** - Disseminating public awareness messages on how to protect against the extreme heat-wave through print, electronic and social media and Information, Education and Communication (IEC) materials such as pamphlets, posters and advertisements and Television Commercials (TVCs) on Dos and Don'ts about heat wave and treatment measures for heat related illnesses.

- ❖ Utilize local radio, FM broadcasts, cinema theatres, print and social media to disseminate heat protection tips and high temperature warnings to the vulnerable sections.
- ❖ Preparation of Posters & pamphlets with tips to take care of cattle and poultry during heat waves.
- ❖ Local bodies to take a lead role in creating awareness.
- ❖ Public should be cautioned not to venture into the forests without permits, since forests are prone to fires during summer

### **Capacity Building/ Training programmes:**

- ❖ Capacity Building / Training Programme for health care professionals at local level to recognize and respond to heat-related illnesses, particularly during extreme heat events.
- ❖ These Training Programmes should focus on medical officers, paramedical staff and community health staff so that they can effectively prevent and manage heat-related medical issues to reduce mortality and morbidity.
- ❖ Training of school teachers to equip them with knowledge of heat protection tips and activities which they can disseminate in classrooms.

### **Involvement of Governmental and Non-Governmental Organizations:**

- ❖ Collaboration with Civil Society and Non-Governmental Organizations to improve Bus stands, Building Temporary Shelters wherever necessary, improved water delivery systems in public areas and other innovative measures to tackle Heat wave conditions.
- ❖ Actively involve NGOs / Rotary Clubs / Lions Clubs and Corporate houses as part of Corporate Social Responsibility to provide shelters, drinking water (Thaneerpandal) during heat days.

### **Forest fires:**

Forest fires are caused especially during summer due to extreme dry conditions and also are man-made.

#### **Causes of forest fires: -**

- **Natural causes-** Many forest fires start from natural causes such as lightning which set trees on fire. High atmospheric temperatures and dryness (low humidity) offer favorable circumstance for a fire to start.
- **Environmental causes** are largely related to climatic conditions such as temperature, wind speed and direction, level of moisture in soil and atmosphere and duration of dry spells.

- **Man made causes-** These can be intentional or unintentional. Fire is caused when a source of fire like naked flame, cigarette or bidi, camp fires, electric spark or any source of ignition comes into contact with. Intentionally forest fires can be caused due to the old practice of shifting cultivation, the use of fires by villagers to ward off wild animals, fires lit intentionally by people living around forests for recreation, fires started accidentally by careless trekkers/visitors to forests who discard cigarette butt etc.,
- **Hence, public shall be adequately educated on the causes of forest fire and may be advised not to venture into forests during summer**

The list of Do's and Don'ts related to heat wave is enclosed in Annex-1 and the Symptoms and First Aid for various Heat Disorders is enclosed in Annex-2. In addition to the above, NDMA Guidelines for preparation of Action Plan-Prevention and Management of the Heat wave may also be referred for necessary action.

The District Collectors besides taking necessary action have to monitor the situation closely in the event of Heat wave and send regular updates, shall not hesitate to escalate the problem to State level as and when the situation warrants by bringing it to the notice of Principal Secretary/ Commissioner of Commissionerate of Revenue Administration, so that assistance can be strengthened from the State level.

## 6. Long Term Strategies

The Urban Local Bodies may adhere to the Policy guidelines issued by the Ministry of Urban Development for strengthening Urban Greens (**Urban Greening Guidelines 2014**)

- **The Energy Conserving Building Code 2017** issued by the Ministry of Power may be followed while new construction/ renovation of existing buildings are taken up.
- The Greater Chennai Corporation, Other Corporations in Tamil Nadu, the Municipalities, Town Panchayats, and Village Panchayats, may have to promote establishment of Bio Shields in their area and increase the Green Cover.
- The National Highways, State Highways, and the Rural Development Department may have to promote Tree planting along the Roads.
- The Educational Institutions both Govt and Private, Govt/Private Office premises, all Industrial Units, Hospitals Temples and places of Worship, may have to establish Green Cover through Tree planting.
- Greater Chennai Corporation, Other Corporations in Tamil Nadu, the Municipalities, Town Panchayats, and Village Panchayats, may have to enhance the storage Capacity of Water bodies in their jurisdiction and increase the Water availability which indirectly helps mitigation of the adverse impacts of Heat Wave.

- Solid Waste Management and removal of dumped wastes can reduce the intensity of heat waves. The Local bodies must ensure such dumping yards in the vicinity of public places and residential colonies are removed.
- **Cool Roofs and their extensive benefits may be popularized among people**
- In order to reduce the intensity of radiation, the Govt/Private Buildings, Educational Institutions, Hospitals, Temple Premises etc shall provide Chemical Coating of Roof tops, exposed walking areas with a Chemical Coating.
- The Local bodies may provide shelters in public places with facilities of drinking water.
- The Forest Department may continue to increase the green cover through the various Programmes in collaboration with the Local bodies.
- Establishing Bio Shields, enhancing the storage of water bodies are the other Long-term mitigation strategies.

## **7. Advisory to People**

The adverse impact of heat wave is preventable by educating the public on the preventive actions, following the Do's and Don'ts, reporting early to health facilities and timely diagnosis and treatment. Government of Tamil Nadu has been issuing these advisory since 2017. The Guidelines issued to the District Administration and Advisory to public are presented in Annexure 3.

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State Relief Commissioner

## **ANNEX-1** **DOs & DON'Ts**

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**

#### **Outdoors**

- ✓ While travelling, carry water with you.
- ✓ Drink sufficient water and as often as possible, even if not thirsty.
- ✓ If you work outside, use a hat or an umbrella and also use a damp cloth on your head, neck, face and limbs.
- ✓ Recognize the signs of heat stroke, heat rash or heat cramps such as weakness, dizziness, headache, nausea, sweating and seizures. If you feel dizzy or ill, see a doctor immediately.
- ✓ Wear light weight, light-coloured, loose, and porous cotton clothes. Use protective goggles, umbrella/hat, shoes or chappals while going out in sun.

#### **Indoors**

- ✓ Keep your home cool, use curtains, shutters or sunshade and open windows at night.
- ✓ Listen to Radio, watch TV, read Newspaper for local weather forecast to know if a heat wave is on the way.
- ✓ Use fans, damp clothing and take bath in cold water frequently.
- ✓ Use ORS, coconut water homemade drinks like lassi, torani (rice water), lemon water, buttermilk, etc. which help to re-hydrate the body.
- ✓ Urine in darker yellow or orangish yellow indicates severe dehydration.

#### **Workers**

- ✓ 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:**

### **Outdoors**

- ✓ Do not leave children in parked vehicles.
- ✓ Avoid strenuous activities when the outside temperature is high. Avoid working outside between 12 noon and 3 p.m.
- ✓ Avoid wearing dark, heavy or tight clothing.

### **Indoors**

- ✓ Avoid going out in the sun, especially between 12.00 noon and 3.00 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.

### **Animals**

- ✓ Keep animals in shade.
- ✓ Give them plenty of water to drink.
- ✓ Do not leave pets in parked vehicles

## ANNEX-2

### Symptoms and First Aid for various Heat Disorders

Heat Disorder	Symptoms	First Aid
<b>Sunburn/ Heat rash</b>	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 dressings and get medical attention.
<b>Heat Cramps</b>	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.
<b>Heat Exhaustion</b>	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 and If nausea occurs, discontinue. If vomiting occurs, seek immediate medical attention. Or call 108 and 102 for Ambulance
<b>Heat Stroke (Sun Stroke)</b>	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 and 102 for Ambulance for emergency medical services or take the victim to a hospital immediately. Delay can be fatal. Move victim to a cooler environment. Try a cool bath or sponging to reduce body temperature. Use extreme caution. Remove clothing. Use fans and/or air conditioners. <b>DO NOT GIVE FLUIDS.</b>

## **EMERGENCY TREATMENT**

If Heat Stroke is suspected, call 108 immediately. While waiting for the ambulance:

- ✓ Make the victim lie down
- ✓ Take the person's temperature.
- ✓ If possible move the affected person to somewhere cooler / shaded area.
- ✓ Apply cold compresses
- ✓ Elevate feet
- ✓ Give a cool shower by sprinkling with water or Wrapping in a damp sheet and using a fan to create an air circulation.
- ✓ Encourage to drink fluids, if they are conscious.
- ✓ Do not give aspirin or paracetamol.



## **ANNEX-3**

### **Directorate of Public Health and Preventive Medicine Health Advisory Prevention and Management of Heat Related Illnesses**

The normal body temperature is about 37<sup>0</sup>C (36.1 -37.8<sup>0</sup>C). When people are exposed to high temperature heat related disorders occur. Conditions of extreme heat and excessive sweating results in salt and water depletion

People aged 65 and older, infants and young children, pregnant women, people with chronic medical conditions, outdoor workers are more susceptible to heat related illnesses.

#### **1. Heat Related Illnesses**

##### **1.1. Minor Heat Related Illnesses**

- Heat Rash
- Heat edema
- Heat tetany
- Heat Cramps
- Heat Syncope

##### **1.2. Major Heat Related Illnesses**

- Exertion associated collapse
- Heat Exhaustion
- Heat stroke

#### **2. Symptoms of Heat Related Illness:**

- Hot and Dry skin
- Thirst
- Nausea / Vomiting
- Headache
- Malaise
- Weakness
- Profuse/ Absent sweating
- Muscle cramps
- Light Headedness / Dizziness
- Tachycardia
- Tachypnoea
- Oliguria
- Syncope/ Collapse
- Convulsions

### 3. General precautions:

- **Drink plenty of fluids:** Drink sufficient water as often as possible even if you are not thirsty. Drink water to the point where your urine is light yellow colour. Avoid hot drinks. Drink plenty of buttermilk, rice kanji with salt and buttermilk, tender coconut, lemon juice with salt.
- **Protect yourself outside:** While travelling carry water. Avoid unnecessarily going out in the sun especially between 12 noon and 3 PM. Avoid exercising/ strenuous outdoor activities under hot sun
- **Light clothing:** To help evaporation of sweat, wear light weight, light coloured, loose, porous cotton cloths. Cover the head with cotton cloth/ towel while working will be useful.
- **Keep cool indoors:** Keep your home cool with curtains, shutters on the sunny sides and leave windows open at night. Take bath in cool water.
- **Oral Rehydration Solution:** Drink ORS if one feels exhausted due to hot sun. One packet of ORS should be mixed with one litre of clean water and stirred well till the sediments disappear. Freshly prepared solutions should be used within 24 hours.

### 4. While at Work:

- The duration of exposure to a hot environment should be minimised.
- Avoid strenuous physical activity under hot sun.
- There should be periods of rest in between work in hot climate. The frequency and length of rest breaks should be increased.
- Cool drinking water should be provided near the working place. Water should be consumed every 20 minutes or more frequently to stay hydrated.
- The temperature and the humidity in the work environment may be controlled by proper ventilation.
- If signs, such as headache and dizziness appear, the person should be removed to a cooler environment, and the necessary treatment including adequate fluids should be given.

### 5. Onsite Management of Heat Related Illness:

- Try to get help if you feel dizzy, weak, anxious or have intense thirst, headache and any painful muscular spasms, most often in the legs, arms or abdomen
- Move to a cool place as soon as possible and drink water /fruit juice / Oral rehydration solutions containing electrolytes.
- Medical attention is needed if heat cramps are sustained for more than one hour.

- If one of your family members or public presents with hot dry skin and delirium, convulsions and/or unconsciousness, consult the doctor/ call 108 ambulance immediately.
- Unconscious persons to be positioned on their side. Check airway, breathing and pulse.
- While waiting for the doctor/ambulance move him/her to a cool place and put him/her in a horizontal position and elevate legs and hips, remove clothing and initiate external cooling with cold packs on the neck, axilla and groin, continuous fanning and spraying the skin with water at 25-30 C.
- Measure body temperature. Do not give Aspirin or Paracetamol.

**6. For Further Information/Emergencies Contact:**

- Ambulance Service - 108
- Health Helpline - 104
- 24 x 7 Control Room (Public Health)  
Landline: 044- 24350496, 044- 24334811

**References:**

1. NDMA Guidelines for Preparation of Action Plan – Prevention and Management of Heat-Wave 2017.
2. Lancet Countdown 2018 Report: Briefing for Indian Policy Makers November 2018
3. Energy Conservation Building Code 2017- Ministry of Power
4. Urban Greening Guidelines, 2014- Ministry of Urban Development.

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