



Ministry of Health & Family Welfare  
Government of India

# NATIONAL ACTION PLAN ON HEAT RELATED ILLNESSES



JULY 2021



National Programme  
on Climate Change  
and Human Health



National Centre  
for Disease Control  
Government of India

National Programme on Climate Change and Human Health  
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मनसुख मांडविया  
MANSUKH MANDAVIYA



स्वास्थ्य एवं परिवार कल्याण  
व रसायन एवं उर्वरक मंत्री  
भारत सरकार  
Minister for Health & Family Welfare  
and Chemicals & Fertilizers  
Government of India

### Message

India is amongst the most vulnerable countries to the impacts of climate change. Recent reports signal escalating climate change indicators and their worsening impacts on health. Prevention and mitigation of climate sensitive illnesses with incorporation of environment friendly practices into healthcare sector will contribute significantly to achieve Sustainable Development Goals on health and climate action by 2030.

Frequent and severe heat-waves affect human health in multiple ways,. The Ministry of Health and Family Welfare is resolved to reduce heat-related illness (HRI) burden by equipping stakeholders, health care workers and facilities to track, prepare and manage HRI cases. Development and implementation of the National Action Plan on Heat Related Illnesses is appreciable step in this direction. I am confident that this action plan will be useful managing and monitoring the health impact and shape our future course of action in building climate resilience.

(Mansukh Mandaviya)







डॉ. भारती प्रविण पवार  
Dr. Bharati Pravin Pawar



स्वास्थ्य एवं परिवार कल्याण राज्य मंत्री  
भारत सरकार

MINISTER OF STATE FOR  
HEALTH & FAMILY WELFARE  
GOVERNMENT OF INDIA

सर्वेसन्तु निरामया



## MESSAGE

Environment surrounding us profoundly impacts our health. As India is expected to witness increasing temperatures, there is an urgent need to develop effective policies and interventions to protect people's health. A well-prepared health system is fundamental in alleviating impact of climate change on a population.

Health departments across the country are continuously working to improve health of vulnerable groups by taking a preventive and curative approach. The National Action Plan on Heat Related Illness is a step in the same direction. I congratulate The National Programme on Climate Change and Human Health for developing this document that highlights preventive and curative actions needed to save human lives during extreme heat events.

(Dr. Bharati Pravin Pawar)

“दो गज की दूरी, मास्क है जरूरी”





राजेश भूषण, आईएएस  
सचिव

RAJESH BHUSHAN, IAS  
SECRETARY



भारत सरकार  
स्वास्थ्य एवं परिवार कल्याण विभाग  
स्वास्थ्य एवं परिवार कल्याण मंत्रालय  
Government of India  
Department of Health and Family Welfare  
Ministry of Health and Family Welfare



### Message

The **National Action Plan on Heat Related Illnesses**, developed with inputs from various governmental and non-governmental experts, is intended to be used by government and private health care facilities, health departments, and policymakers tasked with strengthening health facilities and emergency response. This document provides guidance to manage severe heat-related illnesses and to report them under National Heat Related Illness surveillance.

I take this opportunity to acknowledge the contributions from the technical group and health experts in shaping the document and express my gratitude for their hard work. I am sure The National Centre for Disease Control will successfully implement the plan until the last mile of the health system.

(Rajesh Bhushan)



प्रो.(डॉ.) सुनील कुमार

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स्वास्थ्य एवं परिवार कल्याण मंत्रालय  
स्वास्थ्य सेवा महानिदेशालय  
Government of India  
Ministry of Health & Family Welfare  
Directorate General of Health Services



### MESSAGE

Heatwaves may be local, state-wide or even national. There are also likely to be different severity of heatwave across different geographic regions within a State or even district. Thus, it makes it challenging to respond to the medical needs of affected regions. To address such challenges, the National Action Plan on Heat-Related Illness has been developed that outlines the basics of heat wave, heat-related illnesses and their management from primary to tertiary level, preparedness plan before, during and after summer season, and the standard operating procedures for surveillance of heat stroke cases and deaths.

I am hopeful that this action plan will be able to guide the State and District nodal officer climate change and the nodal officers in the health facility from primary to tertiary level. With this I would like to congratulate the team at National Programme on Climate Change and Human Health programme division and acknowledge the contribution of all the expert members from the various institutions including National Centre for Disease Control.

  
23/July/2021  
(Sunil Kumar)



# Acknowledgement

National Action Plan on heat-related Illnesses is prepared under National Programme on Climate Change and Human Health. The action plan was conceptualized under the vision and leadership of Mr. Rajesh Bhusan, Secretary, MoHFW. It was completed and approved under the guidance of Mrs. Aarti Ahuja, Additional Secretary, Ministry of Health and Family Welfare. The continual support and keen interest of Mr. Lav Agarwal, Joint Secretary (PH), MoHFW, facilitated the development of the plan. Through his encouragement and direction, Dr. Sujeet Kumar, Director of National Centre for Disease Control, steered the NPCCHH team to deliver their best.

The development of the document was made possible by continuous contributions from members of the expert group on heat and human health. We especially thank all the stakeholders and partners who provided their valuable inputs and suggestion.

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# Executive Summary

Climate Change is expected to increase the Heatwave frequency (HWF) and Heatwave duration (HWD) in India by 0.5 events per decade and 4-7 days per decade, respectively. Heatwaves increase the incidences of illness and death – particularly among vulnerable population groups such as older people, people with pre-existing medical conditions, people with disability, and those working in conditions that expose them to additional heat stress like construction workers, industrial labours etc. In 2015, the Ministry of Health and Family Welfare (MoHFW) issued “Guidelines on prevention and management of Heat-Related illnesses”. “National Action Plan on Heat-Related Illness, July 2021” is prepared with the addition of a chapter on HRI in paediatric age group, hospital preparedness plan, new surveillance formats and its standard operating procedures and guidelines for investigation of suspected HRI deaths.

Since 2015, Integrated Disease Surveillance Programme (IDSP), MoHFW is collecting and compiling the data on HRI and deaths due to HRI from April – July (now March to July since 2019) every year from 17 heat vulnerable states (now 23 states since 2019), i.e., Andhra Pradesh, Bihar, Chhattisgarh, Delhi, Gujarat, Haryana, Jharkhand, Karnataka, Maharashtra, Madhya Pradesh, Odisha, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, Kerala, Goa, Uttarakhand, Jammu & Kashmir, West Bengal, Arunachal Pradesh and Himachal Pradesh. The surveillance formats are revised to capture heatstroke cases instead of HRI and capture deaths due to suspected/confirmed heatstroke, deaths due to cardiovascular diseases (CVD) and all-cause deaths instead of suspected/confirmed HRI deaths.

MoHFW constituted an internal expert committee at the National Centre for Disease Control (NCDC) followed by an expert group under the chairmanship of Director NCDC comprising of representative from the medicine and paediatrics departments from central government hospitals, National Disaster Management Authority (NDMA), National Institute of Disaster Management (NIDM), India Meteorological Department (IMD), World Health Organization (WHO), Emergency Medical Relief (EMR), Integrated Disease Surveillance Programme (IDSP), Indian Institute of Public Health, Gandhinagar and Public Health Foundation of India (PHFI) to build consensus on the content of the “National Action Plan on Heat-Related Illnesses, July 2021”.





# 1

## Heat Related Illnesses (HRI) and Heatwaves: Introduction

The HRI encompass a spectrum of disorders from heat syncope, muscle cramps, and heat exhaustion to a life-threatening emergency such as heatstroke. These illnesses arise when there is a disruption in regulating the body's temperature because heat input from the environment and body metabolism is increased compared with output from the skin via radiation, evaporation, and convection.

In India, a significant number of deaths occur every year due to HRI. Integrated Disease Surveillance Programme (IDSP) at National Centre for Disease Control (NCDC) under the Ministry of Health & Family Welfare, Government of India, collects and reports the morbidity and mortality data of HRI from heat vulnerable states since year 2015. A total of 3,775 deaths were reported during 2015-2019 (2,040 deaths in 2015, 1,111 deaths in year 2016, 384 deaths in year 2017, 25 deaths in the year 2018, and 215 deaths in 2019).

These deaths mainly occurred during the heatwave period in India, i.e., from March to July. In the context of global warming, extreme weather events are on the rise and heatwaves are projected to increase in number, intensity, and duration with consequent health risk.

In India, heatwave is considered if the 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 a Heatwave:

**A. Based on Departure from Normal**

- *Heatwave*: Departure from normal is 4.5°C to 6.4°C
- *Severe Heatwave*: Departure from normal is >6.4°C

**B. Based on Actual Maximum Temperature (for plains only)**

- *Heatwave*: When actual maximum temperature  $\geq 45^{\circ}\text{C}$
- *Severe Heatwave*: When actual maximum temperature  $\geq 47^{\circ}\text{C}$

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

# 2

## Clinical Manifestation and Summary of the Spectrum of HRI

### Clinical Manifestations of HRI

Clinical Entity	Cardinal Symptoms	Cardinal / Important Signs	Pertinent Negative findings
Heat rash/ Prickly heat/ Miliaria	<b>Itchy Rash</b> with <b>Small Red BUMPS</b> at pores in the skin. Seen in the setting of heat exposure; bumps can sometimes be filled with clear or white fluid	<b>Diffused Red Colour Skin Or Vesicular Rash</b> , itching of the skin without visible eruption	<b>Not Focally Distributed</b> like a contact dermatitis
Heat Cramps	<b>Painful Spasms</b> of large and frequently used muscle groups	Uncomfortable appearance may have <b>Difficulty in Fully Extending Affected Limbs/Joints</b>	No contaminated wounds/tetanus exposure; no seizure activity
Heat Exhaustion	Feeling overheated, lightheadedness, <b>Exhausted And Weak</b> , unsteady, feeling of <b>Vomiting, Sweaty And Thirsty</b> , inability to continue activities	<b>Sweaty</b> /diaphoretic; flushed skin; hot skin; <b>Normal Core Temperature</b> ; +/- dazed, +/- generalised weakness, slight disorientation	No coincidental signs and symptoms of infection; no focal weakness; no difficulty in swallowing food or speech; no drug/overdose history
Heat Syncope	Feeling hot and weak; lightheadedness followed by a <b>Brief Loss Of Consciousness</b>	Brief, generalised loss of consciousness in a hot setting, short period of disorientation, if any	<b>No Seizure Activity</b> , no loss of bowel or bladder continence, no focal weakness, no difficulties in swallowing or speech
Heatstroke	Severe overheating; profound weakness; <b>Disorientation, Not Fully Alert, Convulsion, Or Other Altered Mental Status</b>	Flushed, <b>Dry Skin</b> (not always), <b>Core Temp <math>\geq 40^{\circ}\text{C}</math> OR <math>\geq 104^{\circ}\text{F}</math></b> ; altered mental status with disorientation, incoherent behaviour, <b>Coma, Convulsion</b> ; tachycardia; +/- hypotension	No coincidental signs and symptoms of infection; no focal weakness; no difficulties in swallowing or speech, no drug/overdose history



## Summary of Spectrum of HRI

Heat-Related Illness	Clinical Presentation	Treatment
<b>Heat oedema</b>	<ul style="list-style-type: none"> <li>Mild swelling of feet, ankle and hands</li> <li>It appears in a few days of exposure to the hot environment</li> <li>Does not progress to pretibial region</li> </ul>	<ul style="list-style-type: none"> <li>Usually resolves spontaneously within days to 6 weeks</li> <li>Elevate leg</li> <li>Compressive stocking</li> <li>Diuretics are not effective</li> </ul>
<b>Prickly Heat</b>	<ul style="list-style-type: none"> <li>Pruritic, maculopapular, erythematous rash typically over covered areas of body</li> <li>Itchiness</li> <li>Prolonged or repeated heat exposure may lead to chronic dermatitis</li> </ul>	<ul style="list-style-type: none"> <li>Antihistamine</li> <li>Wear clean, light, loose-fitting clothing</li> <li>Avoid sweat generating situations</li> <li>Chlorhexidine is a light cream or lotion base</li> <li>Calamine lotion</li> </ul>
<b>Heat Cramps</b>	<ul style="list-style-type: none"> <li>Painful, involuntary, spasmodic contractions of skeletal muscle (calves, thighs and shoulder)</li> <li>Occur in individuals sweating profusely and only drinking water or hypotonic solutions</li> <li>Limited duration</li> <li>Limited to specific muscle group</li> </ul>	<ul style="list-style-type: none"> <li>Fluid and salt replacement (IV or oral)</li> <li>Rest in a relaxed environment</li> </ul>
<b>Heat Tetany</b>	<ul style="list-style-type: none"> <li>Hyperventilation</li> <li>Extremity/s and circumoral paresthesia</li> <li>Carpopedal spasm</li> </ul>	<ul style="list-style-type: none"> <li>Calm the patient to reduce respiratory rate</li> <li>Remove from hot environment</li> </ul>
<b>Heat Syncope</b>	<ul style="list-style-type: none"> <li>Postural hypotension</li> <li>Commonly in non-acclimatized elderly</li> </ul>	<ul style="list-style-type: none"> <li>Rule out other causes of syncope</li> <li>Removal from the hot environment</li> <li>Rest and IV drip</li> </ul>
<b>Heat Exhaustion</b>	<ul style="list-style-type: none"> <li>Headache, nausea, vomiting</li> <li>Malaise, dizziness</li> <li>Muscle cramps</li> <li>Temperature less than 40°C or normal</li> <li>May progress to heatstroke if fails to improve with treatment</li> <li>No CNS involvement</li> </ul>	<ul style="list-style-type: none"> <li>Remove the patient from the heat stress area</li> <li>Volume replacement</li> <li>If there is no response to treatment in 30 minutes, then aggressively cool the patient to a core temperature of 39°C</li> </ul>
<b>Heatstroke</b>	<ul style="list-style-type: none"> <li>Core body temperature greater than 40°C</li> <li>Signs of CNS dysfunction: Confusion, delirium, ataxia, seizures, coma</li> <li>Other late findings: anhidrosis, coagulopathy, multiple organ failure</li> </ul>	<ul style="list-style-type: none"> <li>Remove the patient from the heat stress area</li> <li>Volume replacement</li> <li>If there is no response to treatment in 30 minutes, then aggressively cool the patient to the core temperature of 39°C (further details later in document)</li> </ul>

# 3

## Heatstroke Workup

There is no diagnostic test for heatstroke. However, laboratory tests are available to detect end-organ damage secondary to the metabolic derangement and rule out other differential diagnoses of hyperthermia and CNS dysfunction. The following laboratory investigations need to be done

S.No	Laboratory investigation	Rationale
1	Arterial Blood Gases (ABG)	To detect hypoxaemia in a patient with continuous seizure or inadequate respiration secondary to brain injury. Metabolic acidosis (due to lactic acidosis) can occur secondary to acute renal impairment.
2	Random Blood Sugar	Exclude diagnosis of hypoglycaemia in unconscious patient and also hyperglycaemia in a patient with underlying diabetes or undiagnosed diabetes
3	Serum Electrolytes	<p><b>Sodium</b> Detection of hypernatremia or hyponatremia due to reduced intake of fluid and dehydration, and guide the choice of fluid for resuscitation</p> <p><b>Potassium</b> To detect hypokalemia or hyperkalemia that occurs in early phases of heatstroke, muscle damages and during treatment</p> <p><b>Calcium</b> Hypocalcaemia occur due to the binding of calcium to damaged muscles</p>
4	Liver Function Test (LFT)	Hepatic injury is a consistent finding in patients with heatstroke. Aspartate aminotransferase [AST] and Alanine aminotransferase [ALT] levels commonly rise to thousands during the early phases of heatstroke and peak at 48 hours. However, sometimes they may take as long as 2 weeks to peak. Jaundice may be striking and maybe noted 36-72 hours after the onset of liver failure.
5	Coagulation Studies	Direct thermal injury also leads to the denaturation of proteins exhibited by dysfunctional enzymes. Any derangement of coagulation is a sign of poor prognosis.



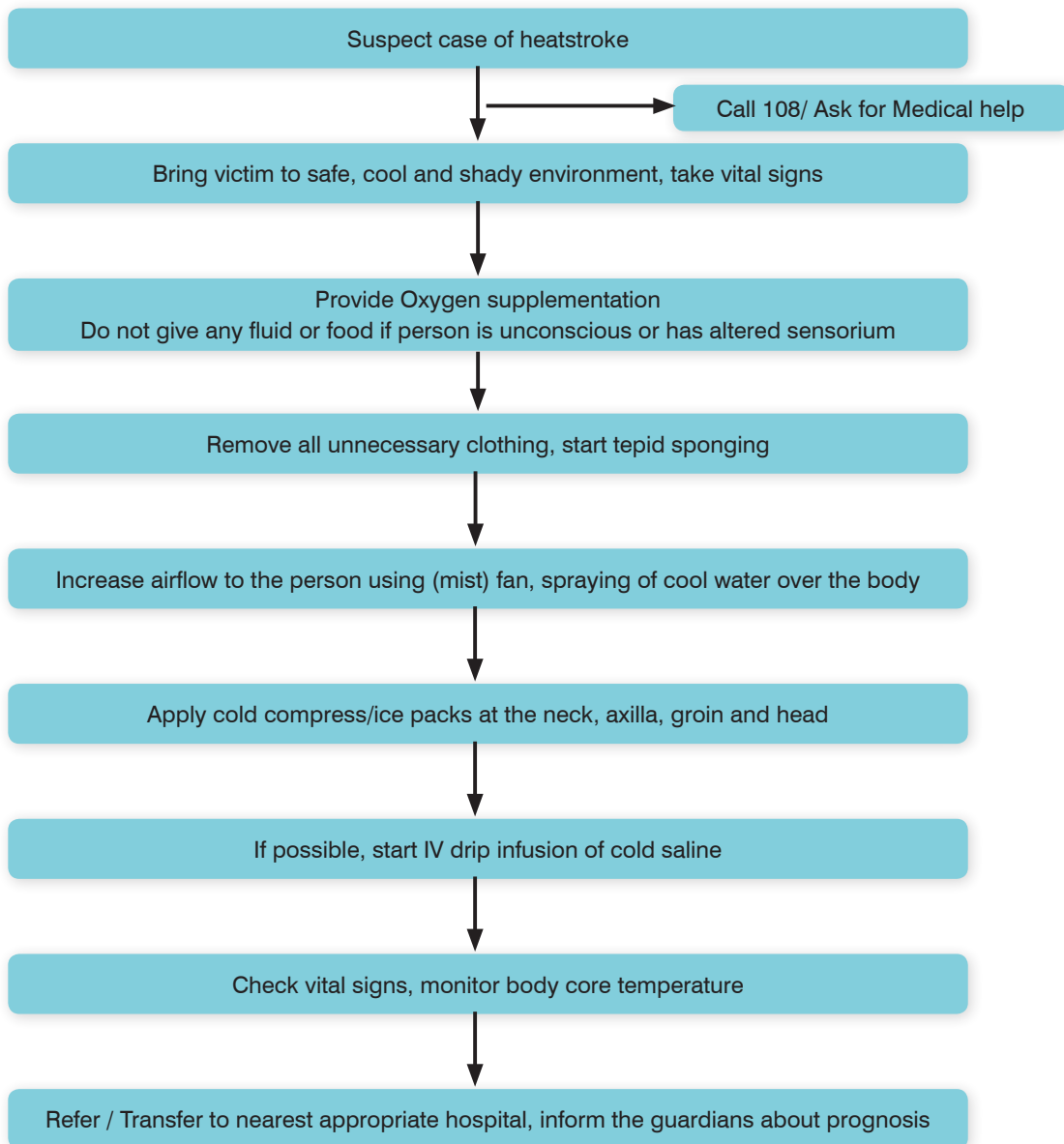
6	Complete Blood Count	Thermal injury to vascular endothelium causes platelet aggregation and deactivation of plasma protein leading to platelet aggregation and decreased clotting factor. Total white cell count (as high as 40,000/ $\mu$ L) may be elevated due to infection and thrombocytopenia. Also, there is haemo concentration which is indicated by elevated PCV and Hb.
7	Renal Function Test (RFT)	Acute kidney injury may be due to inadequacy of volume, dehydration, rhabdomyolysis, or direct thermal injury to renal parenchyma. Elevations in serum uric acid levels, blood urea nitrogen, and serum creatinine are standard in patients whose clinical course is complicated by renal failure.
8	Cerebrospinal Fluid Analysis	Cerebrospinal fluid (CSF) cell counts may show a nonspecific pleocytosis, and CSF protein levels may be elevated as high as 150 mg/dL. This test may be considered in patients with whom CNS infection has been kept as a possibility.
9	Muscle Function Tests	Creatinine kinase (CK), Lactate dehydrogenase (LDH), Aldolase, and Myoglobin are commonly released from muscles when muscle necrosis occurs. CK levels exceeding 100,000 IU/mL are typical in patients with exertional heatstroke. Elevations in myoglobin may not be noted despite muscle necrosis because myoglobin is metabolised rapidly by the liver and excreted rapidly by the kidneys.
10	Electrocardiography (ECG)	Arrhythmias is one of the complications of heatstroke. Also, rule out underlying cardiac disease / myocardial injury
11	Imaging studies	<p><b>Chest X-ray</b></p> <p>CXR carried out to detect the presence of atelectasis, pneumonia, pulmonary infarction and pulmonary oedema, complementing clinical examination</p> <p><b>CT Scan</b></p> <p>CT scan can be performed once the patient is hemodynamically stable and is helpful to rule out intracranial bleeding in a patient who does not show improvement in neurological signs</p>



# 4

## Management Workflow

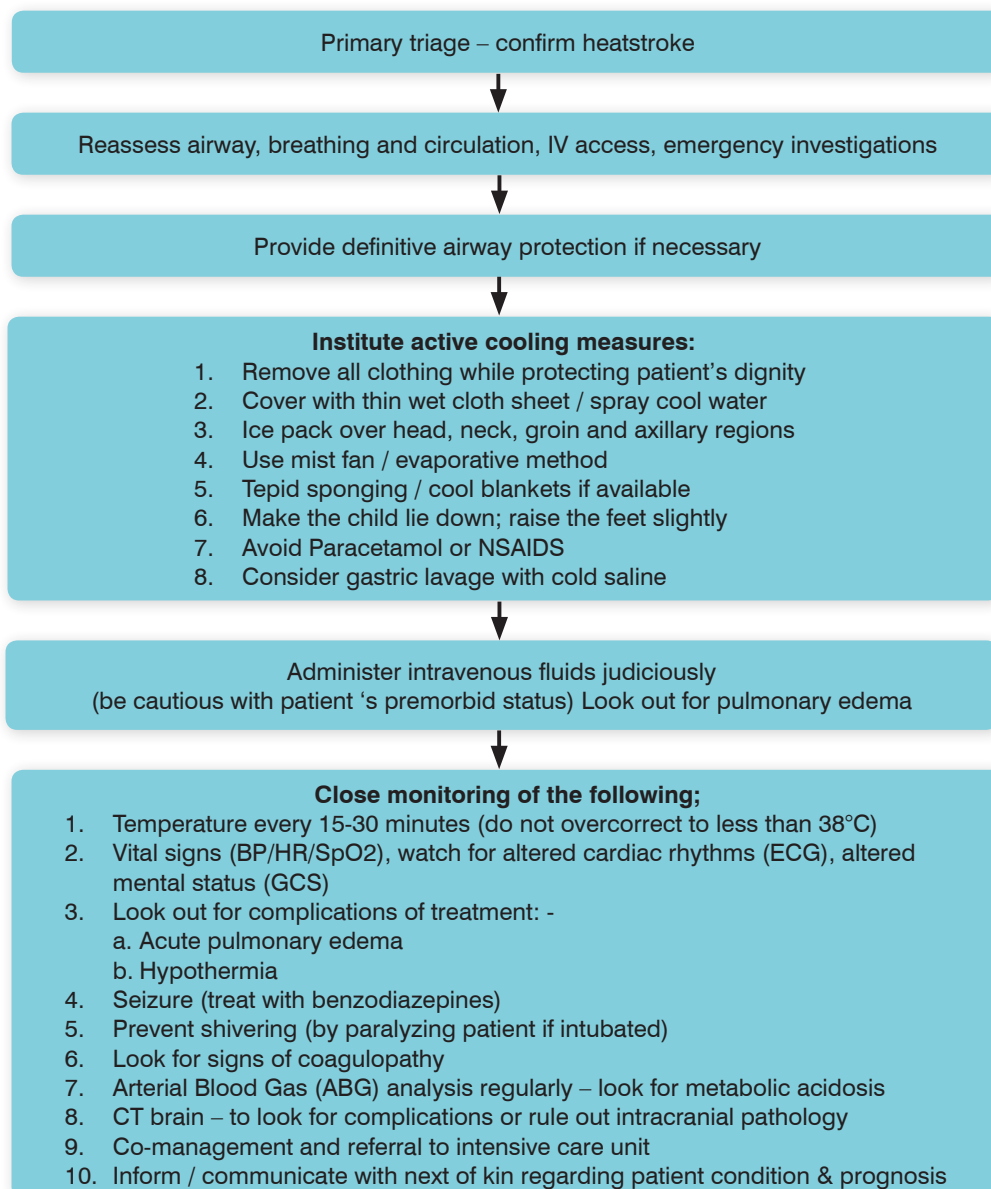
### A. Management workflow of Suspected Heatstroke victims at PHC level before referral to higher centre



### Consider heat illness in differential diagnosis if:

- a. Presented 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 deconditioning, 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. Anticholinergic drugs
    3. Barbiturates
    4. Diuretics
    5. Alcohol
    6. Beta-blockers

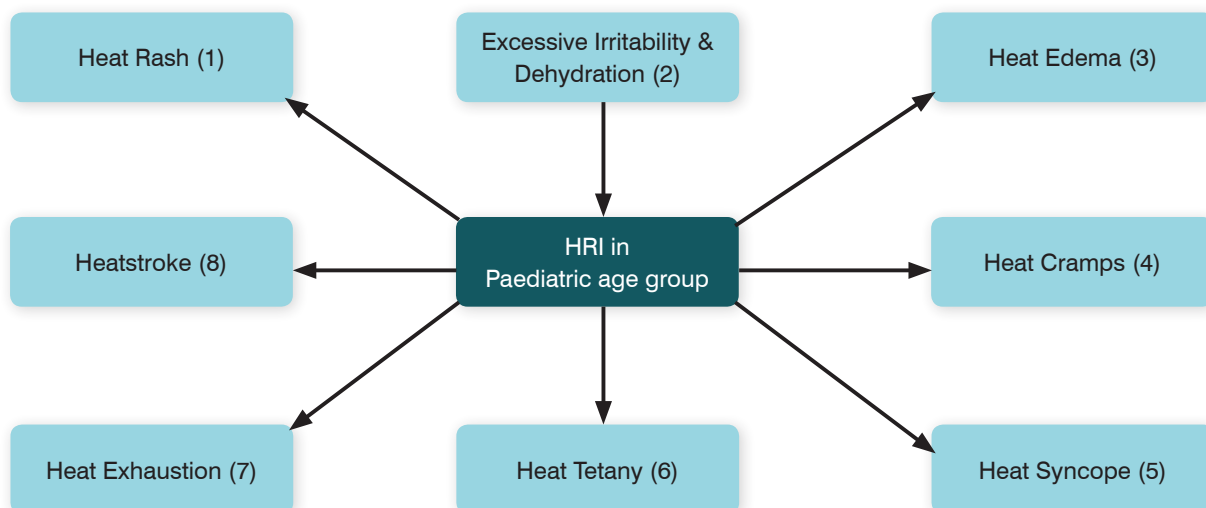
### B. Management Workflow in Emergency Department for Management of Heatstroke Patient at tertiary level



# 5

## Heat-Related Illnesses in Paediatric Age Group

Heat Related Illnesses (HRI) in the paediatric age group encompass a spectrum of disorders from heat rash, heat syncope, and heat exhaustion to a life-threatening emergency such as heatstroke.



The treatment and preventive measure for HRI in a paediatric age group are as follows:

1. Heat Rash/Milia Rubra/Prickly Heat
  - Treatment:
    - i. Place in a cool environment
    - ii. Remove excess clothing
    - iii. Avoid application of lotions
  - Prevention:
    - i. Use loose-fitting clothing & remove excess cloth
    - ii. Avoid direct sunlight
    - iii. Avoid excessive heat
    - iv. Frequent breastfeeding/fluids

2. Excessive irritability & dehydration
  - Treatment
    - i. Place in a cool environment
    - ii. Remove excess clothing
    - iii. Frequent breastfeeding/fluids
3. Heat Edema (more common in adults): swelling of feet/ankle/hands
  - Treatment
    - i. Remove from hot environment & place in a cool environment
    - ii. Elevate the affected extremity
4. Heat Cramps: common in young athletes
  - Painful, involuntary, spontaneous contraction of muscle group of legs/calf/groin
  - Treatment
    - i. Remove from hot environment
    - ii. Rehydration (frequent oral fluids), if persist then intravenous fluid may help
5. Heat Syncope
  - It is seen with prolonged standing in hot environments that causes vasodilatation, and a fall in blood pressure due to venous pooling in the legs (which causes a decrease in venous return to the heart, causing a fall in cardiac output), resulting in fainting or feeling light-headed.
  - Remove the child from a hot environment
  - Oral rehydration with salt-containing fluids (ORS/Lassi/Nimbupani/Lime water with salt and sugar/ Rice water/ *Dal water*/ Coconut water/*Sattu* etc.)
6. Heat Tetany
  - It can be differentiated from heat cramps by the fact that there is very little pain or cramps in the muscle.
  - Treatment
    - i. Remove the child from a hot environment
    - ii. Calm the child to decrease hyperventilation
    - iii. Intravenous calcium after admission
7. Heat Exhaustion
  - After prolonged heat exposure, the body temperature rises up to 104°F and leads to dehydration, tachycardia, vomiting, fatigue and headache with normal mental status (sometimes mild confusion may present).
  - It requires admission and specialist care
  - Treatment
    - i. Remove the child from a hot environment
    - ii. Oral rehydration with salt-containing fluid
    - iii. Look for dyselectrolytemia
    - iv. Intensive care monitoring and intravenous rehydration
    - v. Rule out sepsis

## 8. Heatstroke

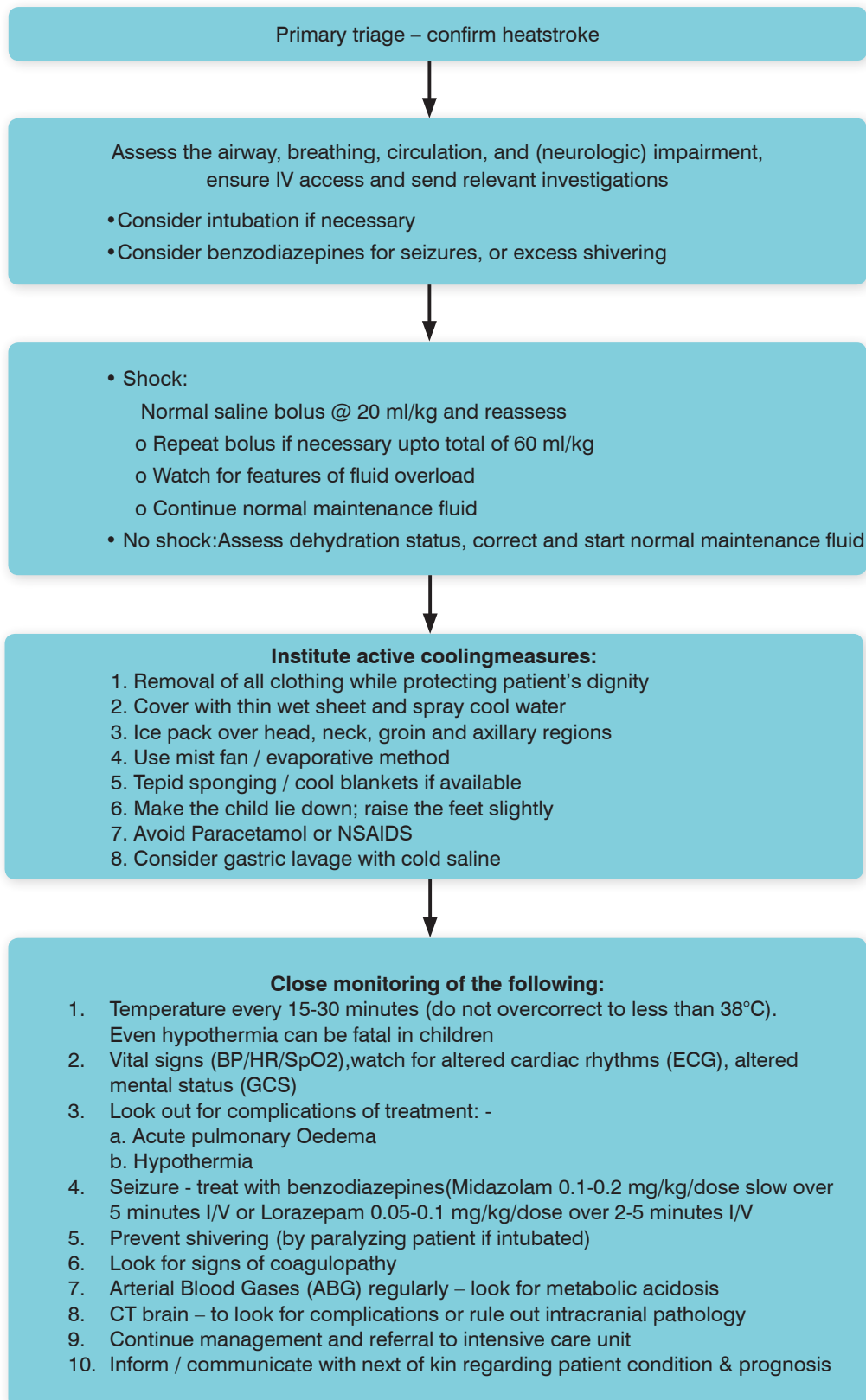
- Prolonged exposure to heat leads to core body temperature rising to  $\geq 40^{\circ}\text{F}$
- Patient presents with stupor/coma/drowsiness/confusion/delirium/hallucination/seizures/ataxia
- Anhidrosis
- Coagulopathy
- Multi-organ dysfunction
- Treatment
  - i. Admission
  - ii. Check airway, breathing, circulation
  - iii. Give oxygen, intravenous fluid connection
  - iv. Do random blood sugar (RBS), arterial blood gas (ABG), electrolytes (Na/K/Ca), liver function test (LFT), renal function test (RFT), coagulation profile, neuroimaging to rule out CNS bleed, etc.

### **Danger signs**

- Refusal to feed
- Excessive irritability
- Decreased urine output
- Dry oral mucosa & absence of tear/sunken eyes
- Lethargy/altered sensorium
- Seizures
- Bleeding from any site → seek immediate medical help if danger signs are present



## Clinical Workflow in Emergency Department for Management of Heatstroke in children



## Guidelines for children going for sports activity during summer season

Children who come from a cooler climate to a hotter climate, especially during the heatwave season, are at risk. They should be advised not to move out in the open for one week. This helps the body get acclimatized to heat. They should also be advised to drink plenty of water. Acclimatization is achieved by gradual exposure to the hot environment during a heatwave.

American Academy of Paediatrics, National Collegiate Athletic Association, and the National Athletic Trainer's Association recommendations for prevention of exertional heatstroke in children

### 1. Screening

- a. All athletes to be screened by coaches/ doctors to identify any health conditions or medications that may predispose them to HRI.
- b. Athletes with recent or current history of fever or gastrointestinal illnesses should not be permitted to participate

### 2. Acclimatization (changing zones for sports activities from cooler area to warmer area)

- a. Athletes should acclimatize to warm weather and increase activity over 1 to 2 weeks.
- b. Physical activity in hot weather should be increased slowly.
- c. Exercise sessions be shortened and made easier when it is hot

### 3. Athletic Gear and Garb

- a. Athletes should wear light coloured garments that are lightweight and loose-fitting.
- b. Uniforms and practice gear should be made from open-weave or sweat-wicking materials to facilitate evaporative heat loss.
- c. Sweat-saturated garments should be removed promptly.
- d. The amount of athletic equipment should be worn in incremental steps

### 4. Hydration

- a. Athlete to be adequately hydrated before, during, and after physical exertion

### 5. Scheduling

- a. When the weather is extremely hot, practices should be scheduled for mornings and evenings, when temperatures are generally cooler.
- b. Contingency plans should be in place to reschedule practices or games if heat or humidity is expected to be severe.

### 6. Preparation

- a. Medical equipment and resources for rapid cooling (cold-water tubs, ice towels) should be available at athletic events.
- b. An emergency action plan should be in place should any athlete develop signs or symptoms of heat exhaustion or heatstroke.

### Suggested reading:

Mangus CW, Canares TL. Heat-Related Illness in Children in an era of extreme temperature. *Pediatr Rev.* 2019 Mar;40(3):97-107. doi: 10.1542/pir.2017-0322. Epub 2019 01st March. Review. Pub PMID: 30824495



## First Aid Instructions on Heat Exhaustion and Heatstroke in Children

The symptoms may develop after being in high temperatures (such as Heatwaves) or after hard work or sports during hot weather

Symptoms of Heat Exhaustion	Symptoms of Heatstroke
<ul style="list-style-type: none"> <li>• Increased thirst</li> <li>• Weakness and extreme tiredness</li> <li>• Fainting</li> <li>• Muscle cramps</li> <li>• Nausea and vomiting</li> <li>• Irritability</li> <li>• Headache</li> <li>• Increased sweating</li> <li>• Cool, clammy skin</li> <li>• Body temperature rises, but less than 105°F (40.5°C)</li> </ul>	<ul style="list-style-type: none"> <li>• Severe headache</li> <li>• Weakness, dizziness</li> <li>• Acts or talks confused</li> <li>• Fast breathing and rapid heartbeat</li> <li>• Hard to wake up or can't wake up</li> <li>• Seizures</li> <li>• Flushed, hot, dry skin</li> <li>• Body temperature rises to 105°F (40.5°C) or higher</li> </ul>

If the child has symptoms of heatstroke **Call for ambulance and take to the nearest hospital**

For cases of **heat exhaustion or while awaiting help for a child** with possible heatstroke:

- Bring the child indoors or into the shade immediately
- Remove the clothing of the child while maintaining the dignity of child
- Have the child lie down; raise the feet slightly
- Increase airflow to child using fan
- Spray normal tap water or do tepid sponging
- If the child is alert and awake, give frequent sips of cool, clear fluids
- If the child is vomiting, turn onto their side to prevent choking
- If child is unconscious, don't give them anything to drink/ eat

### Prevention:

- Lookout for weather warnings issued by India Meteorological Department
- Teach kids to always drink plenty of liquids before and during any physical activity in hot, sunny weather even if they aren't thirsty
- Make sure kids wear light-colored, loose clothing in warm weather
- Remind kids to look for shaded areas and rest often, while outside
- Avoid activities during peak summer hour i.e., 12:00 noon to 03:00 pm
- Don't let kids participate in heavy activity outdoors during the hottest hours of the day
- Teach kids to come indoors immediately whenever they feel overheated
- Never leave a child alone, non- accompanied, inside a parked closed vehicle (look before you lock)





# 6

## Hospital Preparedness Plan

The hospital preparedness plan aims to provide a baseline framework for preparing, implementing, coordinating, and evaluating extreme heat response activities in health facilities in states.

There are three tables for planned activities during three different seasons, i.e., pre-heat season, during heat season and post-heat season.

The activities are divided into three broad categories, i.e., infrastructure and logistics, capacity building and IEC/awareness for three different levels of health facilities, i.e., primary health centre (PHC), Community Health Centre (CHC) and District Hospital (DH)/Medical College (MC).

**Table 1. Hospital Preparedness Chart-Pre Heat Season**

INFRASTRUCTURE AND LOGISTICS			CAPACITY BUILDING			IEC/AWARENESS		
PHC	CHC	DH/MC	PHC (MOs, nursing staff, paramedics, ASHA, ANM)	CHC (MOs, nursing staff, paramedics, ASHA, ANM, MPHw)	DH/MC (MOs, nursing staff, paramedics, MPHw)	PHC	CHC	DH/MC
<ul style="list-style-type: none"> <li>• Check inventories for basic equipment and medicines required as listed in annexure A</li> <li>• Ensure adequate arrangement of staff</li> <li>• Explore creation of ice pack dispensaries to increase access to vulnerable communities</li> <li>• Adopt long term measures such as cool roofs and improving green coverage of health facility.</li> <li>• Identify Rapid Response Team (RRT) to respond to any exigency call outside the hospitals</li> <li>• Try to establish outreach clinics at various locations easily accessible to the vulnerable population</li> </ul>			<ul style="list-style-type: none"> <li>• Prepare a detailed action plan to tackle HRI (updated annually)</li> <li>• Organize fresher/refresher targeted training course—maintaining hospital records, improve expedience of recording of cause of death, heat illness examination procedures</li> <li>• Community involvement of trained staff to create awareness.</li> </ul>			<ul style="list-style-type: none"> <li>• Prepare targeted IEC-boards, banner, poster, leaflets, factsheets, information cards, media, mic announcements, rallies, song/drama activities, street plays</li> <li>• Plan for dissemination as per assessment of vulnerable area/communities</li> <li>• Conduct sensitisation meetings</li> <li>• Prepare handouts for health staff about heat illness</li> <li>• Ensure the availability of funds for above activities</li> </ul>		
			<ul style="list-style-type: none"> <li>• Map susceptible villages (identify areas/ population that are vulnerable)</li> </ul>	<ul style="list-style-type: none"> <li>• Map susceptible PHCs (identify areas/ population that are vulnerable)</li> </ul>	<ul style="list-style-type: none"> <li>• Map susceptible of susceptible blocks (identify areas/ populations that are vulnerable)</li> </ul>			



**Table 2. Hospital Preparedness Chart-Heat Season**

INFRASTRUCTURE AND LOGISTICS		CAPACITY BUILDING			IEC/AWARENESS			
PHC	CHC	DH/MC	PHC (MOs, nursing staff, paramedics, ASHA, ANM)	CHC (MOs, nursing staff, paramedics, ASHA, ANM, MPH)	DH/MC (MOs, nursing staff, paramedics, MPH)	PHC	CHC	DH/MC
<ul style="list-style-type: none"> <li>Ensure adequate medical supplies available as indicated in Annexure A</li> <li>Identify surge capacities and mark the beds dedicated to treat the heatstroke victims and enhance emergency department preparedness to handle more patients</li> </ul>	<ul style="list-style-type: none"> <li>Increase ASHA/ANM/MPHW outreach in at-risk PHC during a heat alert, if feasible.</li> <li>Ensure dedicated bed availability</li> <li>Ensure ambulance availability</li> </ul>	<ul style="list-style-type: none"> <li>Increase MPHW outreach in at-risk blocks during a heat alert, if feasible.</li> <li>Ensure dedicated bed availability</li> <li>Ensure ambulance availability</li> <li>Dedicated heat corners</li> <li>Increase staffing at DH/MCs to attend to the influx of patients during a heat alert, if feasible.</li> <li>Organize DNO-CC/SNO-CC visit to CHCs to confirm proper preparation has been made for HRI and conduct case audits during heat season.</li> </ul>	<ul style="list-style-type: none"> <li>Referral of patients to the higher facility only after ensuring adequate stabilization and basic definitive care (cooling and hydration)</li> </ul>	<ul style="list-style-type: none"> <li>Prepare weekly reports of health impact for nodal officer</li> <li>Conduct case review during heat season</li> </ul>	<ul style="list-style-type: none"> <li>Prepare weekly reports of health impact for nodal officer</li> <li>Conduct case review during heat season</li> </ul>	<ul style="list-style-type: none"> <li>Ensure IEC dissemination</li> <li>Target the vulnerable area/communities followed by other areas.</li> </ul>		
<ul style="list-style-type: none"> <li>Increase ASHA/ANM/MPHW outreach in at-risk villages during a heat alert, if feasible.</li> <li>Ensure dedicated bed availability</li> <li>Ensure ambulance availability</li> </ul>			<ul style="list-style-type: none"> <li>Ensure reporting of HRI cases daily</li> <li>Adopt HRI treatment and prevention protocols</li> <li>Expedite recording of cause of death due to HRI</li> </ul>	<ul style="list-style-type: none"> <li>Prepare weekly reports of health impact for nodal officer</li> <li>Conduct case review during heat season</li> </ul>	<ul style="list-style-type: none"> <li>Prepare weekly reports of health impact for nodal officer</li> <li>Conduct case review during heat season</li> </ul>	<ul style="list-style-type: none"> <li>Ensure IEC dissemination</li> <li>Target the vulnerable area/communities followed by other areas.</li> <li>Plan activities as per the Heatwave alert issued by IMD</li> </ul>		



**Table 3. Hospital Preparedness Chart-Post Heat Season**

INFRASTRUCTURE AND LOGISTICS			CAPACITY BUILDING			IEC/AWARENESS		
PHC	CHC	DH/MC	PHC (MOs, nursing staff, paramedics, ASHA, ANM)	CHC (MOs, nursing staff, paramedics, ASHA, ANM, MPHWH)	DH/MC (MOs, nursing staff, paramedics, MPHWH)	PHC	CHC	DH/MC
<ul style="list-style-type: none"> <li>Review to assess/identify gaps-if any, e.g.,                             <ul style="list-style-type: none"> <li>Any shortage of equipment, medicine, staff.</li> <li>Any long term measures adopted and maintained</li> </ul> </li> <li>Enlist/document the lessons learnt for the next season</li> </ul>			<ul style="list-style-type: none"> <li>Review to assess/identify gaps-if any, e.g.,                             <ul style="list-style-type: none"> <li>Any flaw/fault in reporting channel/format/efficiency</li> <li>Number of deaths reviewed</li> </ul> </li> <li>Enlist/document the lessons learnt for the next season</li> </ul>			<ul style="list-style-type: none"> <li>Review to assess/identify gaps-if any e.g.,                             <ul style="list-style-type: none"> <li>IEC messages</li> <li>Dissemination area/community</li> <li>Efficient use of resources</li> </ul> </li> <li>Enlist/document the lessons learnt for the next season</li> </ul>		



## **Basic equipment and medicines required as a part of Hospital preparedness for heat season**

Primary Health Centre (PHC), Community Health Centre (CHC), District Hospital (DH) and Medical Colleges should ensure the following requirements before the start of heat season:

1. Dedicated bed for HRI patients in cooler area of hospital,
2. Thermometer, ORS packets, ice packs, BP apparatus,
3. Silver sulphadiazine cream, Calamine lotion, Chlorhexidine in a light cream or lotion base,
4. Cold IV normal saline (0.9%), dextrose 50% in water solution (D50W),
5. Glucometer and testing strips,
6. ECG equipment: ECG machine, Gel, electrodes, ECG paper,
7. Cooling equipment: AC, cooler, fan as per requirement,
8. Water cooler,
9. Medicines: Lorazepam, diazepam,
10. Ambulance with ice packs and cold water.

# 7

## Guidelines for Investigation of Suspected Heat Related Illness Death

### Guidelines for Investigation of Suspected Heat Related Illness Death

(To be filled by an epidemiologist/medical officer)

Unique ID:

Respondent's Name:

Relationship of respondent with deceased:

Residential address of respondent:

#### Section A: Deceased's identifier details

A.1. Name of deceased:	A.2. Age (in completed years & months):	Y	Y	M	M
A.3. Sex: Male / Female/Transgender:	A.4. Father's/Mother's/Spouse's name:				
A.5. Residential Address of deceased					
A.5.1 State:	A.5.2. District:				
A.5.3. Block/Taluka:	A.5.4. Ward/village:				
A.6. Does the deceased have the following socio-economic card	i. BPL ii. Antayodya iii. Annapurna iv. Other or equivalent (mention)..... v. None				
A.7. What was the last occupation of the deceased:					

#### Section B: Death detail

No.	Questions	Coding categories	If no, Skip to
B.1	Was the deceased found unconscious or dead?	Yes.....1 No.....2 I don't Know.....3	B.3
B.2	Place where deceased was found unconscious or dead?	At home.....1 At workplace.....2 At social gathering...3 On-road.....4 Other (specify).....	
B.3	Location where deceased was found unconscious or dead		



	B.3.1 State:	B.3.2. District:			
	B.3.3. Block/Taluka:	B.3.4. Ward/village:			
B.4	Name of hospital and address where deceased was brought dead or died:				
B.5	Date and time of the death: (from medical record)	DD	MM	YYYY	HH MM

### Section C: Clinical history in past 24 hr before death (from medical record followed by respondent)

C.1. Symptoms at the time of onset of illness:						
C.1.1. Was the skin hot and dry? (a. From Medical Record b. From Respondent c. both)				Yes.....	1	
				No.....	2	
				I don't Know.....	3	
C.1.2 Was the deceased in altered mental sensorium? (a. From Medical Record b. From Respondent c. both)				Yes.....	1	
				No.....	2	
				I don't Know.....	3	
C.1.3. What was the core body temperature? (from medical record only):						
C.1.4. What was the deceased's vitals? (from medical record only):						
a. Pulse rate:		b. Respiratory rate:		c. Blood pressure:		
C.2. Date and time of onset of the first symptom of heat illness:	DD	MM	YYYY	HH	MM	
C.3. Place of onset of first symptom:			At home.....	1		
			At workplace.....	2		
			At social gathering.....	3		
			On-road.....	4		
			School/college.....	5		
			Other (specify).....			
C.4. Location of onset of symptoms						
C.4.1 State:			C.4.2. District:			
C.4.3. Block/Taluka:			C.4.4. Ward/village:			
C.5. Did the deceased have an alcoholic beverage within a day of onset of illness?				Yes.....	1	
				No.....	2	
				I don't Know.....	3	

### Section D: Outdoor activities just before the onset of illness

No.	Questions	Coding categories	If no, Skip to
D.1	Just before the onset of illness, was the deceased present outdoors?	Yes.....1 No.....2 I don't Know.....3	E.1
D.2	Was the deceased engaged in outdoor occupational activities?	Yes.....1 No.....2 I don't Know.....3	D.3

D.3	Was the deceased working under direct sunlight?	Yes.....1 No.....2 I don't Know.....3	
D.4	Was the deceased working in peak hours of the day, i.e. 11 AM to 4 PM?	Yes.....1 No.....2 I don't Know.....3	
D.5	Was the deceased working near heat sources.e., hot furnace, stove, gas fire, wood fire, steam, hot engines/ machines?	Yes.....1 No.....2 I don't Know.....3	D.7
D.6	If yes to D.5, the type of heat source was:	Fire (hot furnace, stove, gas fire, hot engines).....1 Steam .....2	
D.7	Was the deceased doing any physical exertional activity?	Yes.....1 No.....2 I don't Know.....3	D.8
D.8	Was the deceased sitting in a vehicle?	Yes.....1 No.....2 I don't Know.....3	D.12
D.9	If yes to D.8, was the vehicle parked in a shaded area?	Yes.....1 No.....2 I don't Know.....3	
D.10	If yes to D.8, what was the approx. duration of sitting in vehicle?	0-1 hr.....1 >1 hr .....2	
D.11	If yes to D.8, was the air-conditioner working in vehicle?	Yes.....1 No.....2 I don't Know.....3	
D.12	Remarks on outdoor activity, if any:		

### Section E. Indoor conditions just before the onset of illness.

E.1	Was the deceased INDOORS?	Yes.....1 No.....2 I don't Know.....3	F1
E.2.	If yes to E.1, were the following items, i.e., ceiling fan, desert cooler, air conditioner present?	Yes.....1 No.....2 I don't Know.....3	
E.3	If yes to E.2, describe the item, its working condition and whether it was switched on or not? Description:		
E.4	Type of house/Room where decease was found	Pucca house (house-made with high-quality materials throughout, including the floor, roof and exterior walls).....1 Katcha house (House made from mud, thatch, or other low-quality materials).....2	



E.5	Windows in rooms	Yes.....1 No.....2 I don't Know.....3	
E.6	If there were windows in the room, were they open at the time of onset of symptoms	Yes.....1 No.....2 I don't Know.....3	

### Section F: Medical conditions recorded at first medical contact (as per medical record)

No.	Questions	Coding categories	If no, Skip to
F.1	Was the deceased suffering from any chronic medical condition?	Yes.....1 No.....2 I don't Know.....3	
F.2	Was the deceased suffering from any acute medical conditions before the onset of the current illness?	Yes.....1 No.....2 I don't Know.....3	F.4
F.3	If yes to F.2, list the illness and duration of suffering-		
F.4	Was the deceased taking any medications before the onset of current illness?	Yes.....1 No.....2 I don't Know.....3	Section -G
F.5	If yes to F.4, list the medication and duration since taking-		

### Section G: Weather data from the India Meteorological Department

No.	Questions and Filters	Coding categories/Response	If no, Skip to
G.1	What was the maximum temperature (Tmax) of the day in the area at/ around the onset of illness/death (if onset unknown)?		
G.2	What was the maximum temperature (Tmax) for each day of the past 3 days from the date of patient death?:	a. One day back: b. Two days back: c. Three days back:	
G.3	Was there a heatwave affecting the area/region on the date of onset of illness?	Yes.....1 No.....2 I don't Know.....3	
G.4	Was there a heatwave in the previous 3 days in the area where the onset of illness occurred?	Yes.....1 No.....2 I don't Know.....3	



G.5	What was the relative humidity of the area at/around the onset of illness(or at time of death if onset unknown)?:		
G.6	What was the relative humidity for each day of the past 3 days from the patient's date of death?:	a. One day back: b. Two days back: c. Three days back:	

Form filled by:

Name: .....

Signature:

Designation:.....

Date:



## Guidelines to fill HRI death investigation form

1. Any of the following should fill the HRI and death investigation form:
    - a. Medical officer of Primary Health Centre or Community Health Centre.
    - b. Doctor on duty in health facility/hospital where the suspected case of HRI died.
    - c. Epidemiologist doing HRI death investigation.
  2. Data sources to fill the form are as follows:
    - a. Deceased's photo ID record: aadhar card/pan card/voter ID/ration card/driving licence, etc.
    - b. Respondent's photo ID record: aadhar card/pan card/voter ID/ration card/driving licence, etc.
    - c. Past medical records.
    - d. Hospital medical record
    - e. Interview with the relatives/caretakers/neighbour/person brought or saw the ill or suspected deceased.
    - f. Weather record from Indian Meteorological Department (IMD) website or IMD office.
  3. Unique ID:
    - a. The unique ID will be as local government directory available at <https://lgdirectory.gov.in/>
  4. Section A: deceased's details
    - a. Section A.1 to A.6.: The name, age, sex, father's/spouse's name, residential address should be as per valid government ID. The information taken from government ID or relative or some other source should be mentioned in the remarks box.
    - b. Section A.7: Current occupation: Within a week of death.
- Note:* The activities/occupational activities just before death/onset of symptoms will be mentioned in section D.
5. Section B: Death detail
    - a. Section B.2.: Place the deceased found: The purpose of getting information on the place where the decedent was found dead is to know the circumstances in which the death of person occur and to correlate it with the weather condition of that area (*the weather condition will be recorded in section H*).
    - b. The name of the hospital where the deceased was brought dead or declared dead is for record purpose.
  6. Section C: Clinical history in the past 24 hr before death (from medical record and relatives)
    - a. The answers for this section should be extracted from medical records. If the information is not available from medical records, then it should be sought from respondents/relatives.
    - b. Symptoms at the time of onset of illness: for diagnosis purpose
    - c. Date and time of onset: for correlating with climate variables of that day and time.
    - d. Place of onset of symptoms: for correlating with climate variables of that place.
    - e. Did the deceased have an alcoholic beverage within a day of onset of illness?: for contributing factors

7. Section D: Outdoor activities just before the onset of illness:
  - a. Section D. requires the details of whether the decedent was outdoor/indoor before/during the onset of symptoms.
8. Section E: Indoor conditions just before the onset of illness
9. Section F: Other non-Heat-Related questions, i.e., chronic, acute and medication history.
  - a. Medical record: Any public or private facility or pharmacy note
10. Section H: Weather data from the India Meteorological Department
11. At the bottom of the form, give the details of the person filling the form with his/her name, designation, signature and date of signing. The form should be filled as by the person mention in the first point.



# 8

## Surveillance of Heat Related Illnesses (Formats with Standard Operating Procedures)

### Revised Formats

#### FORMAT 1 (A): HEALTH FACILITY FORMAT

##### Daily line List of Suspected Heatstroke CASES# at Health Facility

(From Medicine, Paediatrics and Casualty/Emergency department)

(To be kept at health facility for record)

Name of health facility: _____ Block: _____ District: _____						Date of reporting: _./_./_._					
Type of health facility (Circle the applicable): 1. PHC 2. CHC 3. Taluka/Rural Hospital/Block Hospital 4. Sub-district 5. District Hospital/Civil Hospital 6. Medical College & Hospital 7. Private hospitals with emergency facility 8. Other.....											
(A). Total no. of patients in department (Casualty/Emergency of Medicine + Paediatrics):											
Daily line List of Suspected Heatstroke CASES# at Health Facility											
S. No	Hospital Registration No.	Name	Age*	Sex (M/F)	Address		Outcome within date of reporting (tick the box)				Re-remarks
					Block	District	Admitted	Died	Referred	Recovered	
<b>Total</b>											

\*Age in completed years

Name of person filling the form:

Name of Facility In-Charge:

Designation:

Signature of Facility In-Charge:

Signature:

Date:

**#Suspected Heatstroke:** Altered mental status (including disorientation, delirium, seizure, obtundation) with elevated core body temperature  $\geq 40\text{ }^{\circ}\text{C}/\geq 104\text{ }^{\circ}\text{F}$ , without signs of stroke, history of infection, or signs of medication overdose **OR** Altered mental status (including disorientation, delirium, seizure, obtundation) with hot and dry skin and deranged vitals, i.e., tachycardia, tachypnoea and wide pulse pressure without signs of stroke, history of infection, or signs of medication overdose. (definition is applicable during heatwave season, i.e., March to July)



## Standard Operating Procedures: Format 1(A)

1. **Format 1 (A)** is a daily line list format of **suspected heatstroke cases** to be filled at health facility.
2. It will be kept at health facility for record purpose.
3. It will be **used to compile line list Format 1(B) and daily reporting Format 2.**
4. **Suspected heatstroke (Case definition):** Altered mental status (including disorientation, delirium, seizure, obtundation) **with elevated core body temperature  $\geq 40^{\circ}\text{C}/\geq 104^{\circ}\text{F}$** , without signs of stroke, history of infection, or signs of medication overdose **OR** Altered mental status (including disorientation, delirium, seizure, obtundation) with hot and dry skin and deranged vitals i.e., tachycardia, tachypnoea and wide pulse pressure without signs of stroke, history of infection, or signs of medication overdose. (*definition is applicable during Heatwave season i.e., March to July*)
5. **Institute and department who will compile suspected heatstroke cases:**
  - a. All public hospitals with casualty/emergency.
  - b. All private hospitals with casualty/emergency.
  - c. Reporting Departments will be casualty/emergency of medicine and paediatrics.
6. **Data collection period:** In standard it will be from **01st March to 31st July, every year**. Further direction will be communicated at the start of the year if required.
7. **Case identification:**
  - a. **Person who will diagnose:** A qualified medical doctor will diagnose HRI case as per case definition.
  - b. **Where will the data be recorded:** A qualified medical practitioner will write the provisional diagnosis in the casualty/emergency register as suspected heatstroke.
  - c. **Data collecting person:** Pharmacist, multipurpose health worker-male (MPHW-M), staff nurse -either of the employee will collect the data of suspected heatstroke cases that were diagnosed on previous day from emergency/casualty of medicine and paediatrics departments every day.
8. **Day of diagnosis and recording:** The date of diagnosis will be considered as day zero. Cases diagnosed on day Zero should be recorded on the following day, i.e., day One in **FORMAT 1 (A)**. Example: Cases diagnosed on Sunday (Day Zero) will be recorded on Monday (Day One).
9. **Data compilation:** A hard copy of each completed and signed **Format 1(A)** should be stored in a file **daily** in a proper order. A soft copy of the line list should be maintained as a single excel sheet which should be updated **weekly** to include all Heatstroke cases. It should be ready to be submitted to DSU or SSU as per request.
10. **Reporting after a holiday:** A report which should have been prepared on holiday (e.g. Sunday or gazetted holiday) must be compiled and filed on the next working day. For example, cases diagnosed on Saturday (Day Zero) must be recorded on **Format 1 (A)** on Monday (Day Two) along with a separate daily **Format 1 (A)** report of cases diagnosed on Sunday (Day One).
11. **Nil reporting is mandatory in the prescribed format.** No columns will be left blank; in case of nil reporting, “0” should be written.



## FORMAT 1 (B): HEALTH FACILITY FORMAT

Daily line List of Suspected Heatstroke DEATHS# and Confirmed CVD DEATHS\*

(From Medicine, Paediatrics and Casualty/Emergency department)

(To be kept at health facility for record)

Name of health facility: _____ Block: _____ District: _____						Date of reporting: _./_./_.		
Type of health facility (Circle the applicable): 1. PHC 2. CHC 3. Taluka/Rural Hospital/Block Hospital 4. Sub-district 5. District Hospital/Civil Hospital 6. Medical College & Hospital 7. Private hospitals with emergency facility 8. Other.....								
(A). Total no. of all-cause deaths in health facility (Casualty/emergency of Medicine and Paediatrics):								
Daily line List of Suspected Heatstroke DEATHS and Confirmed CVD DEATHS								
S.No	Registration number	Name	Age	Sex (M/F)	Address		Deaths (tick the box)	
					Block	District	Suspected Heatstroke death##	Confirmed CVD death
Total								

Name of person filling the form:

Name of Facility In-Charge:

Designation:

Signature of Facility In-Charge:

Signature:

Date:

**#Suspected Heatstroke:** Altered mental status (including disorientation, delirium, seizure, obtundation) **with elevated core body temperature  $\geq 40^{\circ}\text{C}/\geq 104^{\circ}\text{F}$** , without signs of stroke, history of infection, or signs of medication overdose **OR** Altered mental status (including disorientation, delirium, seizure, obtundation) with hot and dry skin and deranged vitals, i.e., tachycardia, tachypnoea and wide pulse pressure without signs of stroke, history of infection, or signs of medication overdose. *(definition is applicable during Heatwave season, i.e., March to July)*

**##Suspected Heatstroke Death:** This is a death on account of suspected heatstroke patient.

**\*Cardiovascular death** includes death resulting from an acute myocardial infarction (MI) or sudden cardiac arrest or heart failure (HF) or cardiovascular (CV) procedures or CV haemorrhage or death due to other CV causes.



### Standard Operating Procedures: Format 1 (B)

1. **Format 1 (B)** is a daily line list of **suspected heatstroke deaths** and **confirmed cardiovascular disease (CVD) deaths**.
2. The total number of all-cause deaths in a health facility (casualty/emergency of medicine and paediatrics) should also be recorded.
3. **Institute and department who will report suspected heatstroke cases:**
  - a. All public hospitals with OPDs & casualty/emergency.
  - b. All private hospitals are having casualty/emergency.
  - c. Reporting departments will be casualty/emergency of medicine and paediatrics.
4. **Date of death and recording:** Date of death will be considered as day zero. Cases that died on day Zero should be recorded on the following day, i.e., day One in FORMAT 1 (B). Example: Cases diagnosed on Sunday (Day Zero) will be recorded on Monday (Day One).
5. **Data compilation:** A hard copy of each completed and signed **Format 1 (B)** should be stored in a file **daily** in a proper order. A soft copy of the line list should be maintained as a single excel sheet which should be updated **weekly** to include all suspected heatstroke deaths and confirmed CVD deaths. It should be ready to be submitted to the district or state nodal unit as per request.
6. **Nil reporting is mandatory in the prescribed format.** No columns will be left blank; in case of nil reporting, “0” should be written.



## FORMAT 2: HEALTH FACILITY FORMAT FOR SENDING TO DISTRICT

Daily numbers of Suspected Heatstroke CASES<sup>#</sup> and All cause DEATHS\*

(Compilation of Format 1, A & B)

(To be sent to District Nodal Unit daily)

Name of health facility: _____ Block: _____ District: _____			Date of reporting: __/__/__				
Type of health facility (Circle the applicable): 1. PHC 2. CHC 3. Taluka/Rural Hospital/Block Hospital 4. Sub-district 5. District Hospital/Civil Hospital 6. Medical College & Hospital 7. Private hospitals with emergency facility 8. Other.....							
Department (Circle the applicable): 1. Emergency Medicine 2. Emergency Paediatrics 3. Casualty							
Date	Total patients in the department	New Suspected Heatstroke Cases (A)	Total Suspected Heatstroke cases since 1st March 2020 (B)	All-cause deaths**			
				Suspected Heatstroke deaths### (a)	Confirmed CVD deaths (b)	Others including unknown (c)	Total deaths (a+b+c)
01-03-20							
02-03-20							

Form filled by (Name):

Name of Facility In-Charge:

Designation:

Signature of Facility In-Charge:

Signature:

Date:

**\*\*All-cause death:** All of the deaths in casualty/emergency medicine plus paediatrics, regardless of cause.

**#Suspected Heatstroke:** Altered mental status (including disorientation, delirium, seizure, obtundation) with elevated core body temperature  $\geq 40\text{ }^{\circ}\text{C}/\geq 104\text{ }^{\circ}\text{F}$ , without signs of stroke, history of infection, or signs of medication overdose **OR** Altered mental status (including disorientation, delirium, seizure, obtundation) with hot and dry skin and deranged vitals, i.e., tachycardia, tachypnoea and wide pulse pressure without signs of stroke, history of infection, or signs of medication overdose. (*definition is applicable during Heatwave season i.e., March to July*)

**###Suspected Heatstroke Death:** This is a death on account of suspected heatstroke patient.

**\*Cardiovascular death** includes death resulting from an acute myocardial infarction (MI) or sudden cardiac arrest or heart failure (HF) or cardiovascular (CV) procedures or CV haemorrhage or death due to other CV causes.





## Standard Operating Procedures: Format 2

(Health facility format for sending to DISTRICT)

1. **Format 2** will be compiled from data of **Format 1 (A)** and **Format 1 (B)** by the nodal person at the health facility daily.
2. **Institute and department who will report HRI:**
  - b. All public hospitals with casualty/emergency.
  - c. All private hospitals are having casualty/emergency.
  - d. Reporting Departments will be medicine, paediatrics and casualty/emergency.
3. **Time of reporting to district nodal unit: Format 2 compiled from Format 1 (A) should be reported to District nodal unit on the following day (day one) by 12.00 hr ( i.e. noon).**
4. **Reporting person:** A nodal person identified for the health facility will prepare the report.
5. **Data compilation:** A soft copy in the form of an excel sheet shall be e-mailed **daily** to the district nodal unit through a proper channel. In places where the internet facility is not available, the report can be communicated by any possible means. A hard copy of each **Format 2** should be kept in a designated file daily at the institutions/health facility.
6. **Data collection period:** In standard, it will be from **01st March to 31st July every year**. Further direction will be communicated during the start of the year if required.
7. **Nil reporting is mandatory in the prescribed format.** No columns will be left blank; in case of nil reporting, “0” should be written.
8. **If not submitted on time:** Late report must be submitted within 48 hrs.



### FORMAT 3 (A): DISTRICT FORMAT FOR DAILY COMPILATION

Daily numbers of Suspected Heatstroke CASES<sup>#</sup> and All cause DEATHS\*

(Compiled from Format 2)

(To be kept at District for record)

Cases and deaths due to HRI- District name 2020					Date of reporting: _./_./_.				
S. No.	Name & type of Health Facility	Total patients of the day (Emergency Medicine + Emergency Paediatrics + Casualty)	New Suspected Heatstroke cases (A)	Total Suspected Heatstroke cases since 1st March, 2020 (B)	All-cause deaths**				Re-remarks
					Suspected Heatstroke deaths## (a)	Con-confirmed CVD deaths (b)	Others including unknown (c)	Total deaths (a+b+c)	
	PHC1								
	PHC2								
	CHC								
	CH/DH								
	PVT1								
	PVT2								
	PVT3								
<b>Total for District 1</b>									

**Total number of New Confirmed Heatstroke Deaths\*\*\* in the District on \_./\_./\_.**

**Total number of Confirmed Heatstroke Deaths in the District since 1<sup>st</sup> March 2020:**

*[confirmed by death committee (heat death committee/three men committee)]*

Name of person filling the form:

Name of nodal officer:

Designation:

Signature of nodal officer:

Signature:

Date:

**\*\*All-cause death:** All of the deaths in casualty/emergency medicine plus paediatrics, regardless of cause.

**#Suspected Heatstroke:** Altered mental status (including disorientation, delirium, seizure, obtundation) **with elevated core body temperature  $\geq 40\text{ }^{\circ}\text{C}/\geq 104\text{ }^{\circ}\text{F}$** , without signs of stroke, history of infection, or signs of medication overdose **OR** Altered mental status (including disorientation, delirium, seizure, obtundation) with hot and dry skin and deranged vitals, i.e., tachycardia, tachypnoea and wide pulse pressure without signs of stroke, history of infection, or signs of medication overdose. *(definition is applicable during heatwave season, i.e., March to July)*

**##Suspected Heatstroke Death:** This is a death on account of a suspected heatstroke patient.



**\*Cardiovascular death** includes death resulting from an acute myocardial infarction (MI) or sudden cardiac arrest or heart failure (HF) or cardiovascular (CV) procedures or CV haemorrhage or death due to other CV causes.

**\*\*\*Confirmed Heatstroke Death:** A suspected heatstroke death confirmed by the death committee (heat death investigation committee/three-person committee) at the district level.

### **Standard Operating Procedures: Format 3 (A)** (District format for compilation from health facility)

1. **Format 3(A)** will be compiled by a nodal officer **daily** at District nodal unit.
2. **Format 3 (A)** will be compiled from **Format 2** from all health facility.
3. **Format 3 (A) adaptation:** Modify relevant fields (in grey italic fonts) in given Format 3 (A) to add the name of your district, to list **all** the government facilities and private reporting units in a proper order- from the primary health centre (PHC), Community Health Centre (CHC), District Hospital (DH), Civil Hospital (CH) to Private. This will be the **standard Format 3(A)** for your district for daily data compilation during the whole reporting period of a year.
4. **Total patient of the day:** Against each health facility, write the total patient of the day from emergency medicine, emergency paediatrics and casualty.
5. **Data compilation:** District nodal unit should receive Format 2 from health facilities by **12.00 hr (i.e. 12.00 noon) daily**. Format 3 (A) should be compiled daily from all submitted Format 2 reports. A date-wise soft copy of each daily Format 3 (A) report should be maintained digitally in a designated folder. A hard copy of the same should be printed and filed daily at the district level.
6. **Data collection period:** In standard, it will be from **01st March to 31st July every year**. Further direction will be communicated during the start of the year if required.
7. No reporting by health facility:
  - a. If a health facility report (**Format 2**) is not received on time, write “delayed” in the row for that facility.
  - b. If the facility reports to the district after the deadline of 12:00 noon, **Format 3 (A)** should be updated to reflect the change. Format 3 (A) for the given reporting period can be updated till 48 hrs and should show the updated date of reporting, if applicable.
  - c. If the health facility does not submit **Format 2 at all or** submits it after 48 hrs of reporting deadline, Format 3 of that reporting period should be updated; “delayed” should be changed to “not available”.
8. **Reporting after a holiday: Format 3 (A)** which should have been prepared on holiday (e.g. Sunday) must be compiled and prepared on the next working day. For example, facility reports (Format 2) submitted to the district on Saturday must be compiled on **Format 3(A)** on Monday, along with a separate **Format 3(A)** for facility reports submitted to the district on Sunday.
9. **Nil reporting is mandatory in the prescribed format.** No columns will be left blank; in case of nil reporting, “0” should be written.
10. **Confirmed heatstroke death:** a suspected heatstroke death is to be reported as and when the death is confirmed by the death investigation committee (heat death committee/three men committee) at the district level.



### FORMAT 3 (B): DISTRICT FORMAT FOR SENDING TO STATE

Daily numbers of Suspected Heatstroke CASES<sup>#</sup> and All-cause DEATHS\*

(Compiled from Format 3 A)

(To be sent to State Nodal Unit daily while keeping a copy for record)

Cases and deaths due to heatstroke- District name 20__				Date of reporting: __/__/__					
Date	Total patients of the day (Emergency Medicine + Emergency Paediatrics + Casualty)	New Suspected Heatstroke Cases (A)	Total Suspected Heatstroke cases since 1st March, 20__ (B)	All-cause deaths**				New Confirmed Heat-stroke Deaths***	Total Confirmed Heat Deaths since 1st March 20__
				Suspected Heatstroke deaths## (a)	Confirmed CVD deaths (b)	Others including unknown (c)	Total deaths (a+b+c)		
01-03-2020									
02-03-2020									

Name of person filling the form:

Name of nodal officer:

Designation:

Signature of nodal officer:

Signature:

Date:

**\*\*All-cause death:** All of the deaths in casualty/emergency medicine plus paediatrics, regardless of cause.

**#Suspected Heatstroke:** Altered mental status (including disorientation, delirium, seizure, obtundation) **with elevated core body temperature  $\geq 40\text{ }^{\circ}\text{C}/\geq 104\text{ }^{\circ}\text{F}$** , without signs of stroke, history of infection, or signs of medication overdose **OR** Altered mental status (including disorientation, delirium, seizure, obtundation) with hot and dry skin and deranged vitals i.e., tachycardia, tachypnoea and wide pulse pressure without signs of stroke, history of infection, or signs of medication overdose. *(definition is applicable during heatwave season, i.e., March to July)*

**##Suspected Heatstroke Death:** This is a death on account of suspected heatstroke patient.

**\*Cardiovascular death** includes death resulting from an acute myocardial infarction (MI) or sudden cardiac arrest or heart failure (HF) or cardiovascular (CV) procedures or CV hemorrhage or death due to other CV causes.

**\*\*\*Confirmed Heatstroke Death:** A suspected heatstroke death confirmed by the death investigation committee (heat death committee/three men committee) at the district level.



## Standard Operating Procedures: Format 3 (B)

(District format for sending to State)

1. **Format 3 (B)** will be compiled by a nodal officer **daily** at District nodal unit.
2. **Format 3 (B)** will be compiled from the end row of **Format 3 (A)**.
3. **Time of reporting to state nodal unit:** Format 3 (B) compiled from Format 3 (A) should be reported to the state nodal unit on the following day (**day one**) by **04.00 PM**.
4. **Reporting after a holiday: Format 3 (B)** which should have been prepared on holiday (e.g. Sunday) must be compiled and prepared on the next working day. For example, facility reports (Format 2) submitted to the district on Saturday must be compiled on **Format 3(B)** on Monday, along with a separate **Format 3(B)** for facility reports submitted to the district on Sunday.
5. **Nil reporting is mandatory in the prescribed format.** No columns shall be left blank; in case of nil reporting, “0” should be written.
6. **Confirmed heatstroke death:** a suspected heatstroke death is to be reported as and when the death is confirmed by the death committee (heat death committee/three-man committee) at the district level.



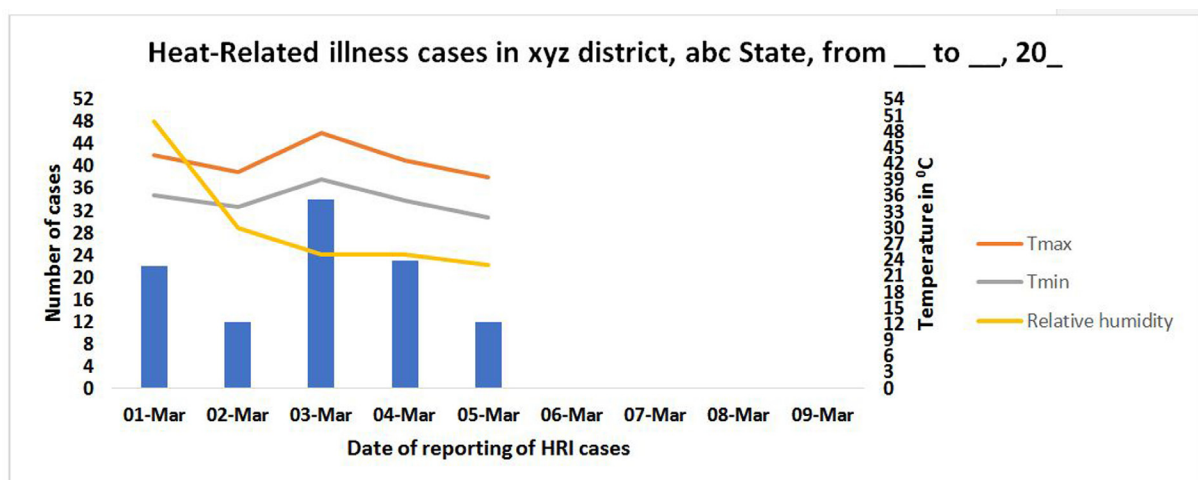
## Guidelines for analysis of suspected Heatstroke cases and deaths

- Analysis should be done at the District Surveillance Unit by the nodal officer.
- Periodicity of analysis will be weekly. Data from the previous week, i.e. Monday to Sunday, should be analysed by Tuesday of the current week.
- Analysed report should be e-mailed to State Surveillance Unit by Tuesday evening by 04:00 PM.
- Analysis is to be done on time, place and person indicators as shown below.
- Use the following formats depending on the analysis type required.

Analysis Type	Presentation	Data Source
1. Time distribution of HRI cases	Graph	<ul style="list-style-type: none"> <li>Format 1- line list submitted by health facilities</li> <li>Temperature maximum and minimum data from Indian Meteorological department</li> </ul>
2. Place distribution of HRI cases and deaths	Map	<ul style="list-style-type: none"> <li>Format 3 prepared at district level</li> <li>District map with block (equivalent unit) boundaries</li> </ul>
3. Age (person) distribution of heatstroke cases and deaths	Table or Bar Diagram	<ul style="list-style-type: none"> <li>Format 1- line list submitted by health facilities</li> </ul>

- Time distribution of HRI cases:
  - Coordinate with the Indian Meteorological Department at the district level to get data for daily temperature (maximum and minimum) and relative humidity.
  - Plot temperature (maximum and minimum) against the number of cases for your district.
  - Prepare the time distribution graph, as shown below. You can prepare such a graph yourself. If you would like to use a preformatted graph template, follow the steps explained below

**Figure X. Distribution of HRI cases with Temperature (maximum & minimum) over a time period (--/--/20—to --/--/20--) in .....(Name of District)**

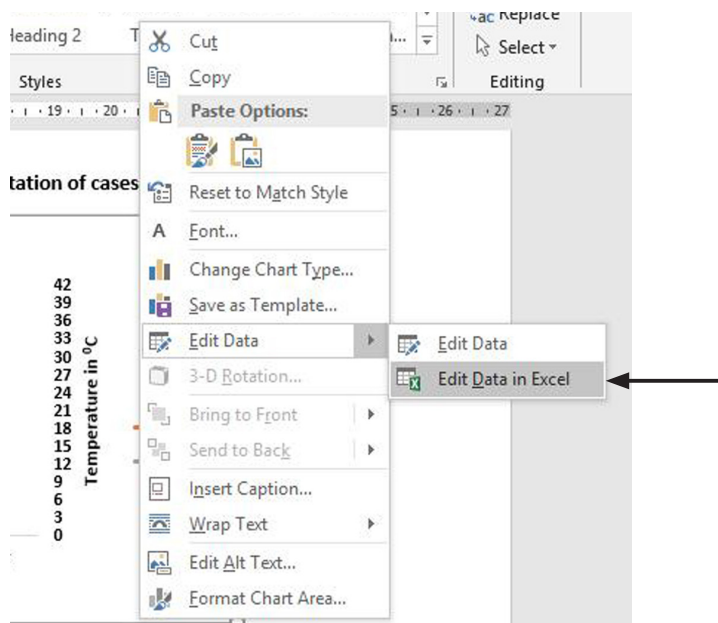


## Steps for creating/ updating time distribution graph

- A. Use the Graph template to show the time distribution of cases or you can insert your own graph.

If using the same template:

- i. Click the graph → right-click on outer border.
- ii. Choose Edit data → click “edit data in excel”.



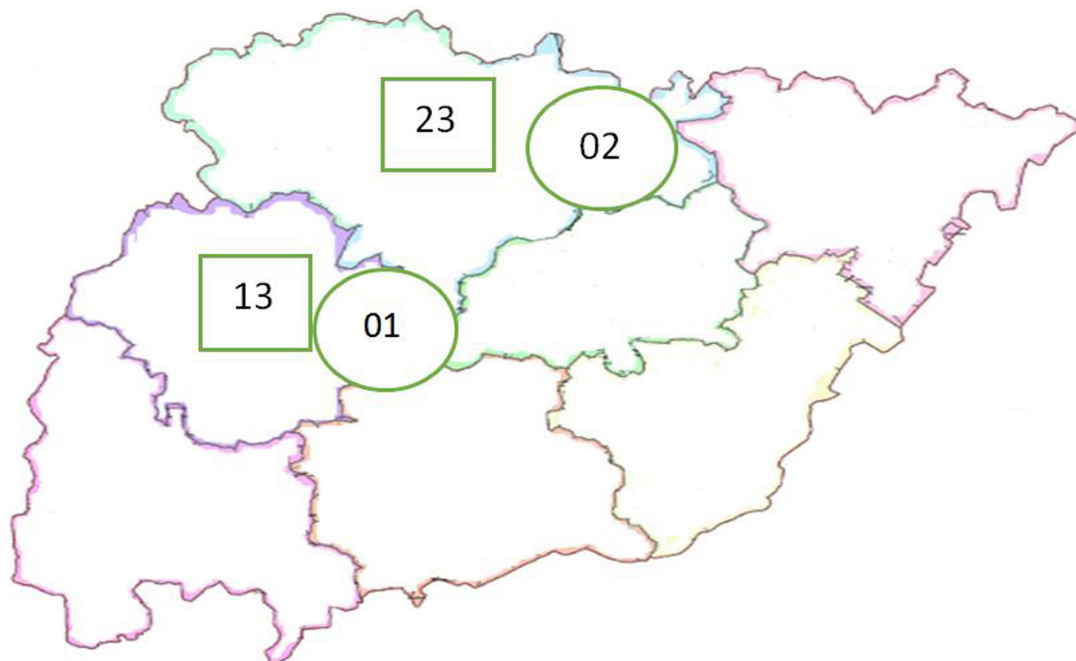
- iii. In the excel sheet, fill the number of HRI cases under the cases column according to the dates of their presentation (NOT by date of reporting).

	A	B	C	D
1		Cases	Tmax	Tmin
2	01-Mar	22	42	36
3	02-Mar	12	39	34
4	03-Mar	34	46	39
5	04-Mar	23	41	35
6	05-Mar	12	38	32
7	06-Mar			
8	07-Mar			
9	08-Mar			
10	09-Mar			

- iv. Fill the maximum and minimum temperature under Tmax and Tmin and relative humidity.
  - v. The graph will automatically update to reflect the inserted data.
  - vi. Save the excel file and keep adding new data to generate weekly reports.
2. Place distribution of cases and deaths in the district map (weekly report)  
 Show a weekly total of cases and **confirmed** deaths in your district for each block.  
 Write a total number of cases in a box and the number of deaths in a circle shape, as

shown in the example below. Make sure that the total number of cases include those cases who have died. For example, 23 cases in a square also includes two cases who are dead, which shows that out of 23 cases, two cases died (confirmed of HRI) in that block in a reporting week. You can prepare this map either digitally or on a hard copy and attach it to the report accordingly.

Example: Block-wise Distribution of HRI Cases and Deaths in Tarn Taran district, Punjab, from xx/xx to xx/xx, 20xx



3. Age distribution of heatstroke cases and deaths in a reporting week. Use age groups mentioned below to analyse line list details for cases and deaths diagnosed with heatstroke

Age group	No of Heatstroke Cases	No of Heatstroke Deaths	Total
<1 year			
1-5 years			
6-15 years			
16-60 years			
≥ 61 years			
<b>Total</b>			



**FORMAT 4 (A): STATE FORMAT FOR DAILY COMPILATION (district wise)**

Daily numbers of Suspected Heatstroke CASES<sup>#</sup> and all-cause DEATHS\*

(To be sent to Central Nodal Unit daily while keeping a copy for record)

Cases and deaths due to Heatstroke- State name 2020						Date of reporting: _./_./_._				
S. No.	Name of District	Total patients of the day (Medicine + Paediatrics + Casualty/ Emergency)	New cases of Heat-stroke (A)	Cumulative total of Heatstroke cases since 1st March 2020 (B)	All-cause deaths**				New Confirmed Heat-stroke Deaths***	Total Confirmed Heatstroke Deaths since 1st March 2020
					Suspected Heatstroke deaths## (a)	Con-firmed CVD deaths* (b)	Others including unknown (c)	Total deaths (a + b + c)		
1	District 1									
2	District 2									
3	District 3									
	<b>Total</b>									

Name of person filling the form:

Name of nodal officer:

Designation:

Signature of nodal officer:

Signature:

Date:

**\*\*All-cause death:** All of the deaths in casualty/emergency medicine plus paediatrics, regardless of cause.

**#Suspected Heatstroke:** Altered mental status (including disorientation, delirium, seizure, obtundation) **with elevated core body temperature  $\geq 40^{\circ}\text{C}/\geq 104^{\circ}\text{F}$** , without signs of stroke, history of infection, or signs of medication overdose **OR** Altered mental status (including disorientation, delirium, seizure, obtundation) with hot and dry skin and deranged vitals, i.e., tachycardia, tachypnoea and wide pulse pressure without signs of stroke, history of infection, or signs of medication overdose. (*definition is applicable during heatwave season, i.e., March to July*)

**##Suspected Heatstroke Death:** This is a death on account of a suspected heatstroke.

**\*Cardiovascular death** includes death resulting from an acute myocardial infarction (MI) or sudden cardiac arrest or heart failure (HF) or cardiovascular (CV) procedures or CV haemorrhage or death due to other CV causes.

**\*\*\*Confirmed Heatstroke Death:** A suspected heatstroke death confirmed by the death investigation committee (heat death committee/three-person committee) at the district level.



## Standard Operating Procedures: Format 4 (A)

(State format for sending to centre)

1. **Format 4** will be compiled from data reported by all districts by nodal officer at the state nodal unit daily.
2. **Districts** will report health facility-wise aggregate number of cases due to suspected heatstroke. Also, the aggregate number of all-cause deaths with segregation of suspected heatstroke deaths confirmed CVD deaths and others.
3. **Time of reporting:**
  - a. Health facility to district nodal unit: **Cases diagnosed on day zero** (from 00.01 hr to 24.00 hr of a day) at health facilities to be reported to district nodal unit on day 1 (i.e. next day) at 12:00 noon **in Format 2**. The daily compiled report from the district nodal unit (**Format 3**) should be submitted to Integrated Disease Surveillance Programme (IDSP) at the district Surveillance unit (DSU) through the proper channel by **01:00 PM** on day 1 (i.e. next day).
  - b. District to State: by **04:00 PM** the **day 1**.
  - c. State to centre: by **05:00 PM** the **day 1**.
4. **Data compilation:** A soft copy of **Format 4** in the form of an excel sheet shall be e-mailed **daily** to the Central unit through the proper channel. A date-wise soft copy of each daily **Format 4** report should be maintained digitally in a designated folder. A hard copy of **Format 4** should be kept daily in a designated file at the state level.
5. **Data collection period:** In standard, it will be from **01st March to 31st July every year**. Further direction will be communicated during the start of the year if required.
6. No report by a district:
  - a. If a **Format 3** from a district is not received on time, write “**delayed**” in the row for that district.
  - b. If the district reports to the state State after the deadline of 4.00 PM, **Format 4** should be updated to reflect the change. **Format 4** for the given reporting period can be updated till 48 hrs and should show an updated date of reporting, if applicable.
  - c. If a district does not submit **Format 3 at all or** submit it after 48 hrs of reporting deadline, **Format 4** of that reporting period should be updated, i.e., “**delayed**” should be changed to “**not available**” for that district.
7. **Changing a filed report:** A submitted **Format 4** can be changed only if an update is generated by a health facility and communicated to the District within 48 hrs of reporting deadline. Updated **Format 4** for that reporting period should be submitted again to the Central unit with a new date of reporting if applicable.
8. **Reporting after a holiday:** A **Format 4**, which should have been prepared on holiday (e.g. Sunday), must be compiled and submitted on the next working day. For example, **Format 4** for Saturday must be compiled on Monday along with a separate **Format 4** for Sunday.
9. **Nil reporting is mandatory in the prescribed format.** No columns shall be left blank; in case of nil reporting, “**0**” should be written.
10. **If not submitted on time:** Late report must be filed within 48 hrs with the correct date of reporting.
11. **Analysis:** Analysis of the data should be done every week according to the guidelines provided here.

## FORMAT 4 (B): STATE FORMAT FOR DAILY COMPILATION (day wise)

Daily numbers of Suspected Heatstroke CASES<sup>#</sup> and all-cause DEATHS\*

(To be kept at State for record)

Cases and deaths due to Heatstroke- State name 2020					Date of reporting: _./_./_.				
Date	Total patients of the day (Medicine + Paediatrics + Casualty/ Emergency)	New cases of Heat-stroke (A)	Cumulative total of Heatstroke cases since 1st March, 2020 (B)	All-cause deaths**				New Confirmed Heatstroke Deaths***	Total Confirmed Heatstroke Deaths since 1st March 2020
				Suspected Heatstroke deaths## (a)	Confirmed CVD deaths* (b)	Others including unknown (c)	Total deaths (a+b+c)		
01-03-20									
02-03-20									
<b>Total</b>									

Name of person filling the form:

Name of nodal officer:

Designation:

Signature of nodal officer:

Signature:

Date:

**\*\*All-cause death:** All of the deaths in casualty/emergency medicine plus paediatrics, regardless of cause.

**#Suspected Heatstroke:** Altered mental status (including disorientation, delirium, seizure, obtundation) **with elevated core body temperature  $\geq 40\text{ }^{\circ}\text{C}/\geq 104\text{ }^{\circ}\text{F}$** , without signs of stroke, history of infection, or signs of medication overdose **OR** Altered mental status (including disorientation, delirium, seizure, obtundation) with hot and dry skin and deranged vitals, i.e., tachycardia, tachypnoea and wide pulse pressure without signs of stroke, history of infection, or signs of medication overdose. *(definition is applicable during heatwave season, i.e., March to July)*

**###Suspected Heatstroke Death:** This is a death on account of a suspected heatstroke.

**\*Cardiovascular death** includes death resulting from an acute myocardial infarction (MI) or sudden cardiac arrest or heart failure (HF) or cardiovascular (CV) procedures or CV haemorrhage or death due to other CV causes.

**\*\*\*Confirmed Heatstroke Death:** A suspected heatstroke death confirmed by the death investigation committee (heat death committee/three-man committee) at the district level.



## Guidelines for analysis of HRI Cases and Deaths

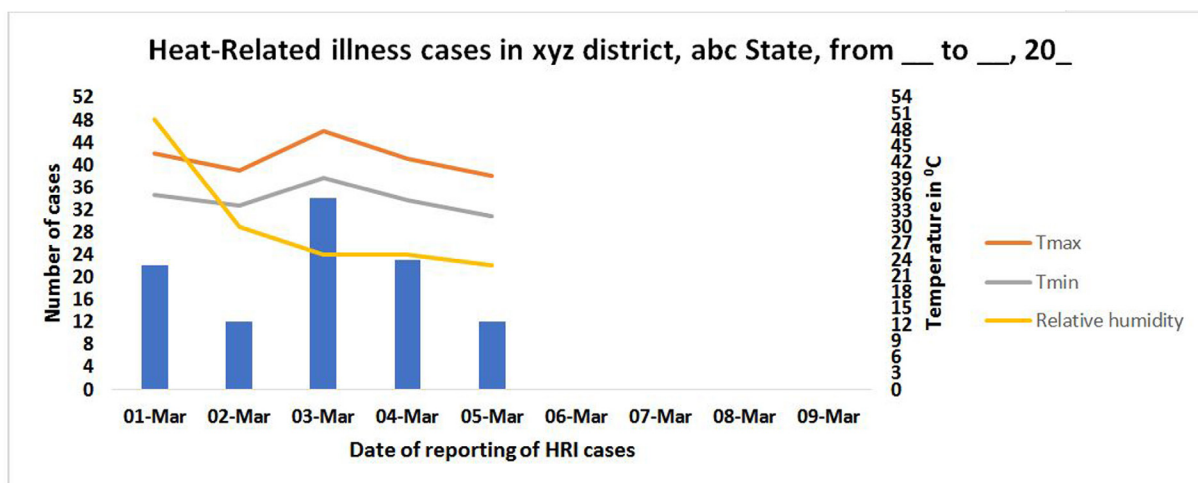
- Analysis should be done at State Surveillance Unit by the nodal officer.
- Periodicity of analysis will be weekly. Data from the previous week, i.e. Monday to Sunday, should be analysed by Tuesday of the current week.
- Analysed weekly report is to be kept at State Surveillance Unit.
- Analysis is to be done on time and place indicators, as shown below.
- Use the following formats depending on the analysis type required.

Analysis Type	Presentation	Data Source
1. Time distribution of HRI cases	Graph	<ul style="list-style-type: none"> <li>Format 4 submitted by districts</li> <li>Temperature maximum and minimum data from Indian Meteorological department</li> </ul>
2. Place distribution of HRI cases and deaths	Map	<ul style="list-style-type: none"> <li>Format 5 prepared at the state level</li> <li>State map with district boundaries</li> </ul>

### 1. Time distribution of HRI cases:

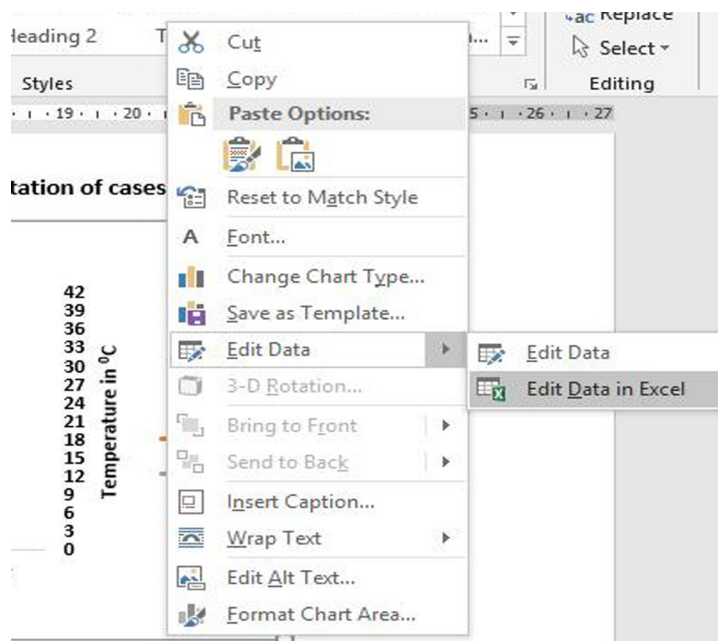
- Coordinate with the Indian Meteorological Department at the state level to get data for Temperature (maximum and minimum) and relative humidity.
- Plot temperature (maximum and minimum) against a number of cases for your district.
- Prepare the time distribution graph, as shown below. You can prepare such a graph yourself. If you would like to use a preformatted graph template, follow the steps explained below

**Figure X. Distribution of HRI cases with Temperature (maximum & minimum) over a time period (---/---/20--- to ---/---/20---) in .....(Name of State).**



## Steps for creating/ updating time distribution graph

- i. Click the graph → right-click on the outer border.
- ii. Choose Edit data → click “edit data in excel”.



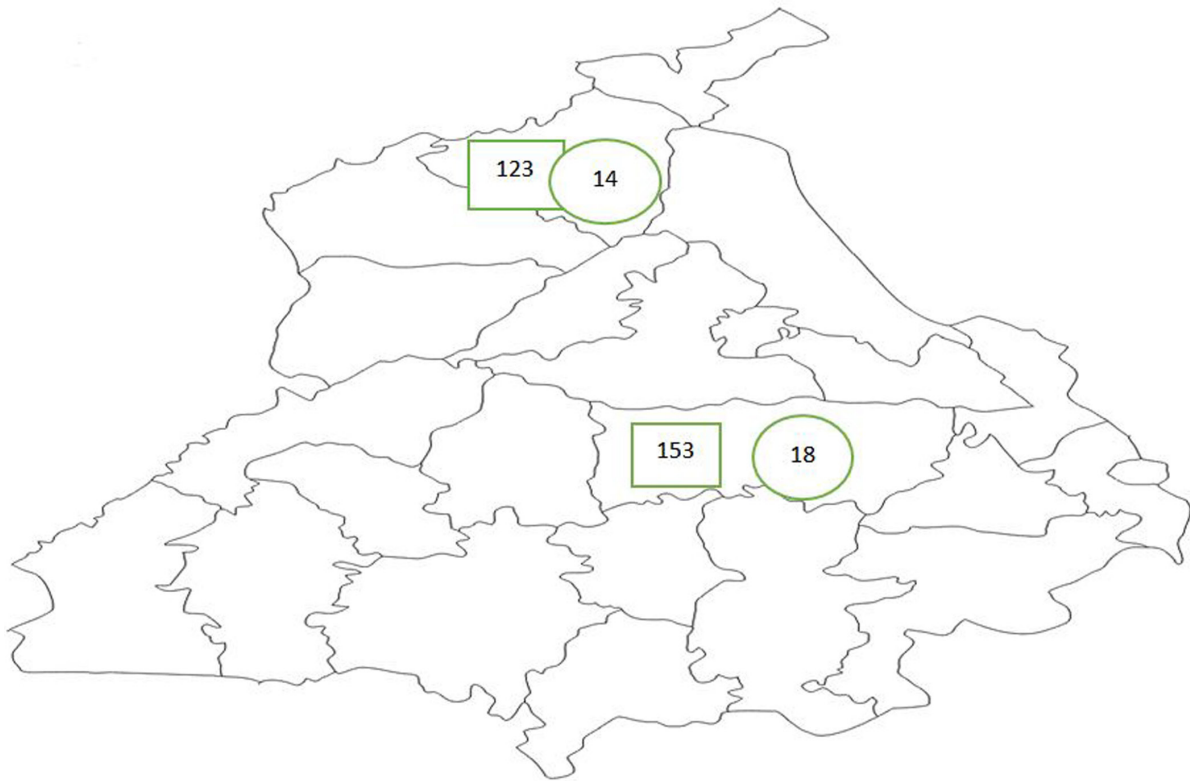
- iii. In the excel sheet, Fill the number of HRI cases under the cases column according to the dates of their presentation (NOT by date of reporting).

	A	B	C	D
1		Cases	Tmax	Tmin
2	01-Mar	22	42	36
3	02-Mar	12	39	34
4	03-Mar	34	46	39
5	04-Mar	23	41	35
6	05-Mar	12	38	32
7	06-Mar			
8	07-Mar			
9	08-Mar			
10	09-Mar			

- iv. Fill the maximum and minimum temperature under Tmax and Tmin.
  - v. The graph will automatically update to reflect the inserted data.
  - vi. Save the excel file and keep adding new data to generate weekly reports
2. Place distribution of cases and deaths in the state map (weekly report)
- Show a weekly total of cases and **Confirmed** deaths in your state for each district. Write a total number of cases in a box and the number of deaths in a circle shape, as shown in the example below. Make sure that the total number of cases include those

cases who have died. For example, 123 cases in a square also includes 14 cases who are dead, which shows that out of 123 total cases, 14 died (confirmed of HRI) in that district in a reporting week. You can prepare this map either digitally or on a hard copy and attach it to the report accordingly.

**Example: District-wise Distribution of HRI Cases and Deaths in Punjab, from --/--/20—to --/--/20—**



# 9

## References

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4. Ahmedabad heat action plan 2017. Guide to extreme heat planning in Ahmedabad, India. Amdavad Municipal Corporation. Available at: <https://www.nrdc.org/sites/default/files/ahmedabad-heat-action-plan-2017.pdf>
5. Heat action plan for Odisha 2019. Available at: <https://www.osdma.org/preparedness/one-stop-risk-management-system/heat-wave/> .
6. World Health Organization. Public Health Advice on preventing health effects of heat. Available at: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0007/147265/Heat\\_information\\_sheet.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0007/147265/Heat_information_sheet.pdf?ua=1)



