स्वास्थ्य एवं
परिवार कल्याण मंत्रालय
MINISTRY OF
HEALTH AND
FAMILY WELFARE

सत्यमेव जयते

MAHARASHTRA

STATE ACTION PLAN 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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2022-27

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PART I

Climate Change and its Health Impacts

CHAPTER 1
Introduction

Climate change is defined as: "*a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods*." It affects social and environmental determinants of health like –clean air, safe drinking water, sufficient food and secure shelter.

Climate change may negatively affect human health through a number of ways, but the commonly experienced are increased frequency and intensity of heat waves leading to rise in heat related illnesses and deaths, increased precipitation, floods, droughts and desertification costing lives directly. High temperature is known to increase the level of 'ground level ozone' and other 'climate altering pollutants' other than carbon dioxide, which further exacerbate cardio-respiratory and allergic diseases and certain cancers. Beside these, there is increase in transmission and spread of infectious diseases, changes in the distribution of water-borne, food borne and vector-borne diseases and effects on the risk of disasters and malnutrition.

The *United Nations Framework Convention on Climate Change (UNFCCC)* came into force on 21st March 1994. Since then many steps were initiated to reduce the effect of climate change at meetings like "Rio Convention 1992", *Kyoto protocol 1997", "Male' Declaration 1998",* "Convention of Parties", "*Cancun Agreement 2010", "Durban Platform 2011", "* Nationally Determined Contributions" (NDCs) at Conference of Parties 21.

India is signatory to "*Male' Declaration"* wherein health sector has to be strengthened so as to make it climate resilient. According to Male' Declaration, it is desired that health-care facilities should be prepared & made climate-resilient, particularly in ensuring that these facilities are able to withstand any climatic event, and that essential services such as water, sanitation, waste management and electricity are functional during such events. Further, for being climate resilient, the health department has to undertake measures to initiate the greening of the health sector by adopting environment-friendly technologies, and using energy-efficient services.

Initiatives undertaken by Government of India are: a) Identification of Ministry of Environment, Forest & Climate Change (MOEF&CC) as nodal ministry; b) Formulation of National Environmental Policy 2006; c) Formulation of Prime Minister's Council on Climate Change for matters related to Climate Change.

MoEFCC has developed National Action Plan on Climate Change with eight missions. Later on four new missions (including Health Mission) were identified. The *Health Mission* aims to reduce climate sensitive illnesses through integration with other missions under National Action Plan for Climate Change (NAPCC) as well as through programmes run by various ministries. As a follow-up action, Ministry of Health and Family Welfare (MoHFW) constituted a National Expert Group on Climate Change & Health (NEGCCH) to prepare National Action Plan on Climate Change and Human Health (NAPCCHH) and recommend strategies for indicators, mitigation, capacity building etc.

National Centre for Diseases Control (NCDC) is identified as the 'technical nodal agency' by MoHFW for the proposed National Mission on Health. The Centre for Environmental and Occupational Health Climate Change & Health (CEOH&CCH), NCDC, is implementing the National Programme of Climate Change and Human Health (NPCCHH), under which the Maharashtra has prepared its State Action Plan on Climate Change and Human Health (SAPCCHH). Since the inception of the programme i.e. 2019, the SAPCCHH is a long-term vision and planning document prepared by the Department of Health & Family Welfare, Maharashtra, applicable for up till year 2027. Based on this document, district specific action plans will also be prepared. The Maharashtra SAPCCHH highlights the current and future vulnerabilities to climate change in the state, the disease burden and the initiatives to be undertaken by the state to reduce the disease burden and develop a climate responsive and sustainable healthcare ecosystem in the state.

CHAPTER 2

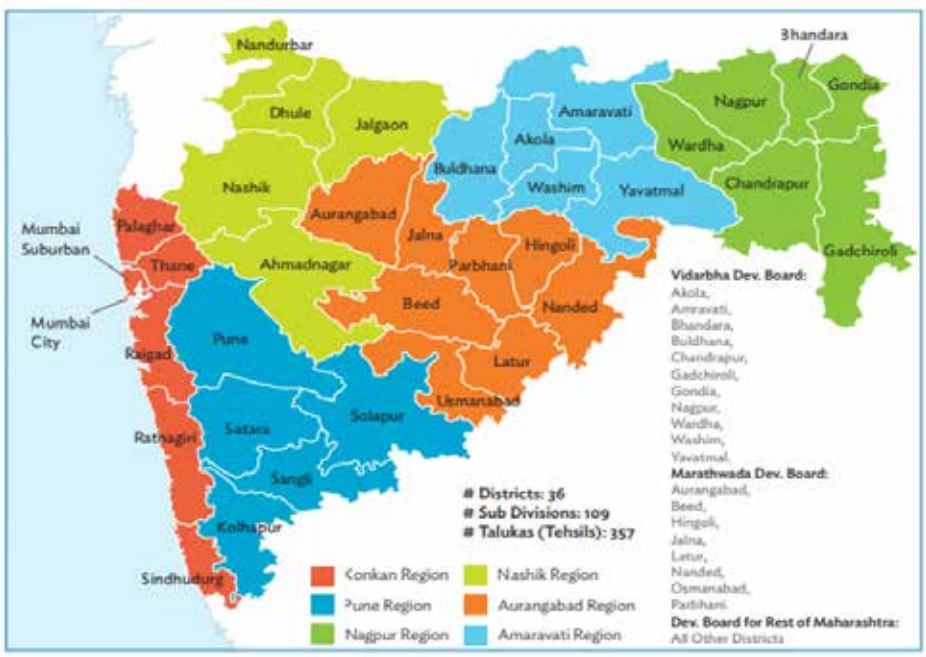
Climate Vulnerability in the State

Geographical Area, Population, and Income

Maharashtra is the third largest state in India with an area of 308,000 sq km. This is the second most populous state in India. As of the 2011 census, Maharashtra's population was at 112.3 million, and is projected to have increased to 123 million by 2020. Maharashtra is among the high-income states of India with an estimated per capita income of $2,732 per year.

Maharashtra consists of three distinct geopolitical entities; (i) West Maharashtra and Konkan, officially identified as "Rest of Maharashtra" (ROM), (ii) Marathwada, and (iii) Vidarbha regions.

Figure 1: Map of Maharashtra with Regions



Notes:
1. Map from Government of Maharashtra.
2. Data for districts under Development Boards are from Table 3.1 in Planning Commission (2003).
3. Data on number of administrative divisions and subdivisions are from Maharashtra Industrial and Economic Development Association.

Sources: Government of Maharashtra. https://www.maharashtra.gov.in/1128/Districts; Government of India, Planning Commission. 2003. Performance Evaluation of Statutory Development Boards (SDBs) in Maharashtra, New Delhi; Program Evaluation Organization; Maharashtra Industrial and Economic Development Association. Doing Business in Maharashtra. http://www.doingbusinessinmaharashtra.org/Districts_in_Maharashtra.aspx.

Table 1: Maharashtra Statistics

Particulars	Details
Capital	Mumbai
Area	307,713 sq. km.
Districts	36
Density	365
Revenue Divisions	6
Municipal Corporations	27
Zilla Praja Parishads	34
Gram Panchayats	28813
Households	24.4 million
Household size	6.12
Population	11.24 crores
Male	58,243,056
Female	54,131,277
Sex Ratio (Female per 1000 Males)	929
Decadal Growth Rate (2001-2011)	15.99
Rural Population	61,556,074
Rural Population Male	31,539,034
Rural Population Female	30,017,040
Rural to Total Population	54.78 %
Urban Population	50,818,259
Urban Population Male	26,704,022
Urban Population Female	24,114,237
Urban to Total Population	45.22%
Child Population (0-6 years)	13,326,517
Child Population (0-6 years) Male	7,035,391
Child Population (0-6 years) Female	6,291,126
Child Sex Ratio (Female per 1000 Males)	929
Literates	81,554,290
Literates Male	45,257,584
Literates Female	36,296,706
Literacy Rate	82.34 %
Literacy Rate Male	88.38 %
Literacy Rate Female	75.87 %
Main Workers	43,762,890

Geography and Climate

Maharashtra state is vulnerable to extreme weather events like floods, droughts, and cyclone. Twelve per cent of land is prone to floods and river erosion; Maharashtra state has about 720 km long indented coastline, which is prone to cyclones and tsunamis; 68 per cent of the cultivable area and is vulnerable to drought and hilly areas are at risk from landslides. Heightened vulnerabilities to disaster risks can be

related to expanding population, urbanization and industrialization, development within high-risk zones, environmental degradation and climate change.

Following hotspot districts are identified each event:

- **Drought:** Sangli, Ahmadnagar, Solapur, Dhule, Buldhana, Hingoli, Jalgaon, Osmanabad, Nandurbar, Nagpur, Satara, Akola, Nanded, Aurangabad,Pune, Amravati, Nashik, Jalna, garchiroli, Raigad, Chandrapur, Gondia, Wardha, Yavatmal.
- **Flood:** Mumbai, Jalgaon, Aurangabad, Pune, Nagpur, Amravati, Nashik, Ratnagiri, Wardha, Thane.
- **Cyclone:** Mumbai, Ratnagiri, Thane.

Table 2: District wise climate vulnerability in Maharashtra

Sl. No.	Rank	District	Event	Exposure	Sensitivity	Adaptive Capacity	Vulnerability Index	Vulnerability
1	1	Sangli	Drought	0.82	1	0.47	1	Very High
2	15	Ahmednagar	Drought	0.96	0.65	0.44	0.813	Very High
3	22	Solapur	Drought	0.82	0.75	0.47	0.75	Very High
4	27	Dhule	Drought	0.82	0.75	0.48	0.734	Very High
5	28	Mumbai	Flood & Cyclone	0.94	0.76	0.62	0.733	Very High
6	37	Buldana	Drought	0.82	0.65	0.44	0.694	Very High
7	49	Hingoli	Drought	0.76	0.52	0.37	0.612	Very High
8	49	Jalgaon	Flood & Drought	0.63	0.97	0.42	0.612	Very High
9	52	Osmanabad	Drought	0.96	0.55	0.51	0.593	High
10	61	Nandurbar	Drought	0.76	0.55	0.43	0.557	High
11	61	Nagpur	Drought	0.68	0.8	0.56	0.557	High
12	68	Satara	Drought	0.82	0.65	0.57	0.536	High
13	74	Akola	Drought	0.68	0.7	0.52	0.525	High
14	79	Nanded	Drought	0.76	0.46	0.4	0.501	High
15	87	Aurangabad	Flood & Drought	0.74	0.81	0.52	0.485	High
16	92	Nagaur	Flood & Drought	0.86	0.62	0.47	0.477	High
17	117	Pune	Flood & Drought	0.74	0.79	0.63	0.39	Moderate
18	135	Amravati	Flood & Drought	0.45	0.78	0.42	0.351	Moderate
19	148	Nashik	Flood & Drought	0.72	0.61	0.57	0.324	Moderate
20	150	Jalna	Drought	0.41	0.65	0.48	0.318	Moderate
21	151	Garhchiroli	Drought	0.68	0.39	0.48	0.317	Moderate
22	171	Ratnagiri	Flood & Cyclone	0.17	0.89	0.37	0.26	Moderate
23	187	Raigad	Drought	0.41	0.49	0.49	0.235	Moderate
24	191	Chandrapur	Drought	0.41	0.5	0.52	0.226	Moderate
25	196	Gondiya	Drought	0.41	0.42	0.46	0.215	Moderate
26	213	Wardha	Flood & Drought	0.28	0.72	0.51	0.166	Low
27	231	Yavatmal	Drought	0.41	0.27	0.51	0.124	Low
28	253	Thane	Flood & Cyclone	0.17	0.38	0.62	0.066	Low

Source: CEEW

CHAPTER 3

Climate Sensitive Issue/ Diseases Prevalent in the State

Human health has always been influenced by weather and climate. Changes in climate and climate variability, particularly changes in weather extremes, affect the environment that provides us with clean air, food, water, shelter, and security. Climate Change (CC), together with other natural and human-made health stressors, threaten human health and well-being in numerous ways.

Following are the major Climate Sensitive Diseases prevalent in Maharashtra:

- Acute Respiratory Illnesses attributed to Air Pollution
- Heat-related illnesses
- Vector-Borne Diseases (Dengue, Malaria, Chikungunya)
- Water-Borne Diseases (ADD, Cholera and AGE)
- Emerging and remerging diseases (H1N1 influenza, Covid 19, Scrub typhus)
- Disaster management - Extreme weather events (floods, cyclones, drought, etc.) affecting health

Vector Borne Diseases

The major vector borne diseases prevalent in Maharashtra are Dengue, Malaria and Chikungunya. The Dengue is more prevalent in urban and peri urban areas especially Pune, Kolhapur, Nagpur, Nashik, Mumbai, Thane cities and a few rural areas. Also, Chikungunya is prevalent in Pune, Satara and rural areas of Kolhapur and Sangli. The Malaria is prevalent in Gadchiroli, Gondia, Amravati Chandrapur, Mumbai, Thane and Raigad districts. Gadchiroli is a tribal district and more than 50 percent malaria cases of state are reported from here.

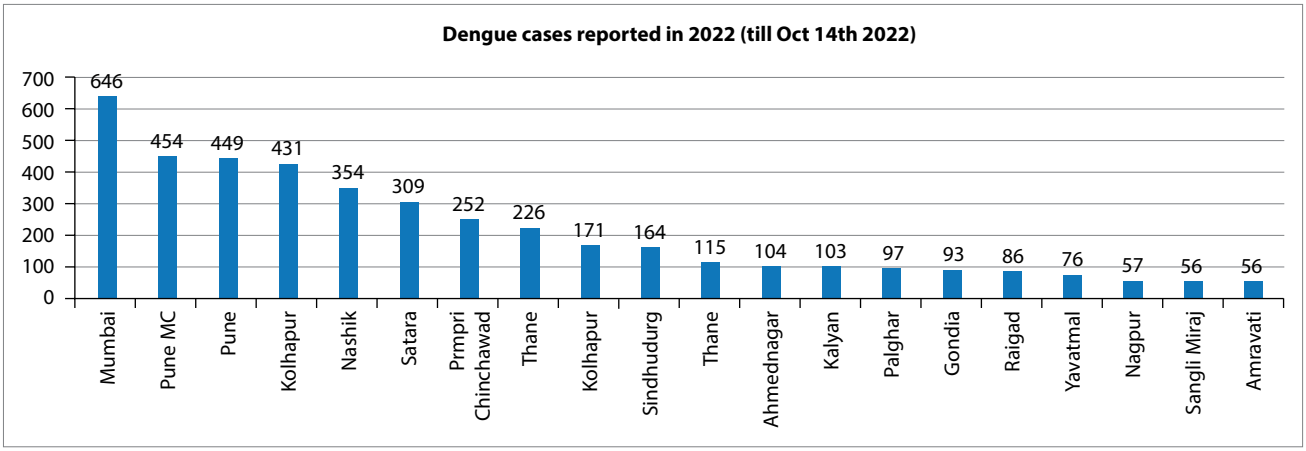
Table 3: Year wise incidence of major vector borne diseases in the state

Year	Dengue		Malaria		Chikungunya	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
2019	14888	29	11433	7	1646	0
2020	3356	10	19484	12	782	0
2021	12720	42	31160	14	2526	0
2022	5268	1	20579	16	787	0

Dengue

Maharashtra reported 14888 cases and 29 deaths in 2019. All these cases are IgM ELISA positive. The actual undiagnosed or rapid test positive cases are much more than the actual numbers. The diurnal temperature and humidity are more favourable for the mosquito survival and its density. Maharashtra is experiencing the extended monsoon till November which also result in the high density of mosquito in urban areas. The district and corporation wise dengue cases reported in 2022 are as follows:

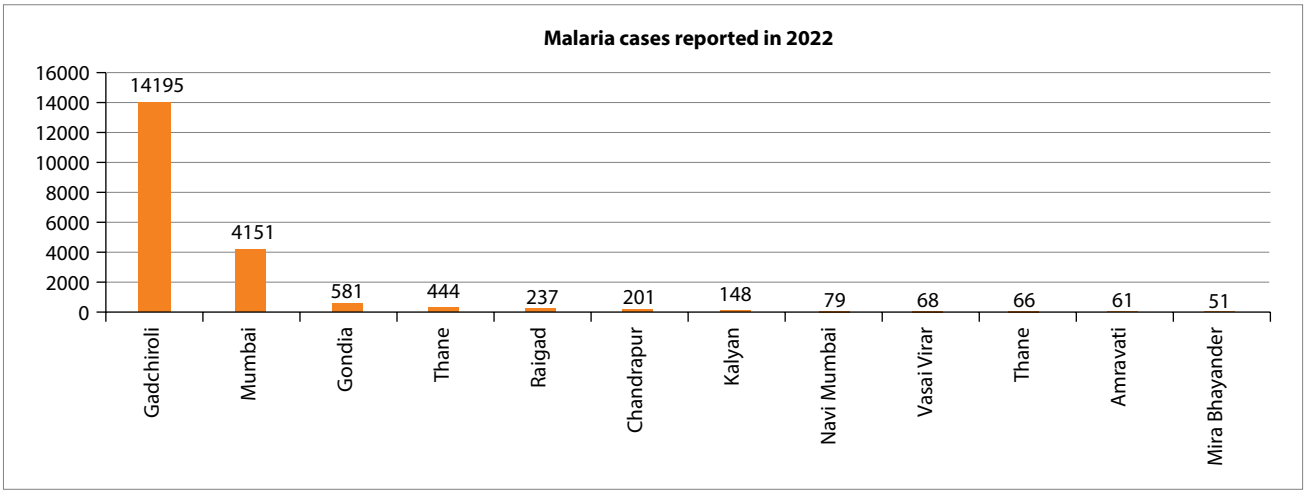
Figure 2: District wise dengue cases for the year 2022

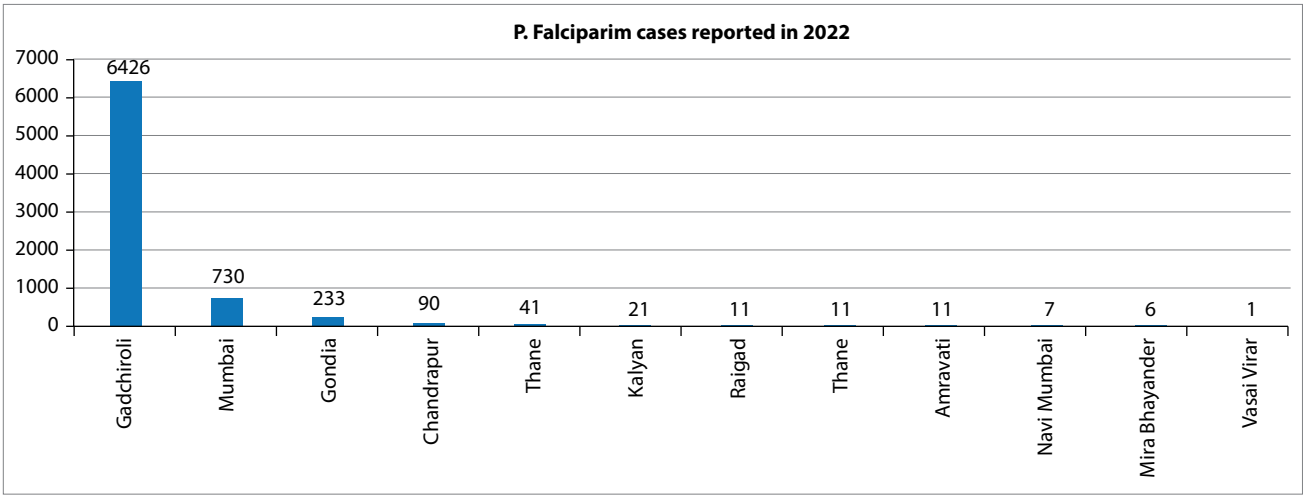


Malaria

Gadchiroli and Mumbai have maximum malaria cases reported in the state in 2022. More than seventy percent cases are from both these districts. The Maximum falciparum malaria cases are reported from Gadchiroli district followed by Mumbai.

Figure 3: District wise malaria cases for the year 2022





Water Borne Diseases

Maharashtra has reported many outbreaks of waterborne diseases especially Cholera, ADD etc. In 2022 almost 20 outbreaks of cholera reported in the state. Maximum outbreaks are reported from vidharbha region. During these outbreaks 18 deaths have been occurred.

Table 4: Incidence of water borne diseases in the state from 2020 to 2022

Name of Disease	2020			2021			2022		
	Outbreak	Cases	Deaths	Outbreak	Cases	Deaths	Outbreak	Cases	Deaths
Cholera	0	0	0	2	176	0	24	921	18
Gastro	2	104	0	3	444	0	1	19	0
ADD	9	1063	0	13	992	0	12	1654	1
Hepatitis	1	7	0	1	10	0	1	34	0
Typhoid	0	0	0	0	0	0	0	0	0
Total	**12**	**1174**	**0**	**19**	**1622**	**0**	**38**	**2628**	**19**

Leptospirosis

Leptospirosis is major concern in the Kokan belt of Maharashtra. Maximum Cases are reported from the Miumbai, Sindhudurg, Thane and Raigad. The main reason from the leptospirosis is water logging in Mumbai, Thane cities and paddy crops in Raigad and Sindhudurg districts.

Years	Cases	Deaths
2018	309	13
2019	684	15
2020	502	16
2021	347	10
2022	319	7

Acute Respiratory Infection/Influenza like illness and Influenza

Maharashtra state has reported maximum acute respiratory infection cases. Maximum ARI/ILI cases are reported from Pune, Nashik, Nagpur Satara, Kolhapur and Mumbai. The peak of ARI is July to October and December to April due to clod monsoon and winter season in the state.

Table 5: Incidence of ARI/ILI and Influenza in the state from 2016 to 2022

Details	2016	2017	2018	2019	2020	2021	2022
ARI/ILI	1823324	2202788	2496141	3269158	1620250	1106268	1020832
Suspected influenza Cases	18998	61206	50897	48618	20650	11888	18495
Influenza A	82	6144	2594	2287	121	387	3620
Total Deaths	**26**	**778**	**462**	**246**	**3**	**2**	**204**

Other Diseases

Scrub typhus is also reported from various districts especially from Vidharbha districts.

Year	2019	2020	2021	2022
Cases	216	7	5	75
Deaths	3	1	1	0

Kyasanur forest Disease also reported from Sindhudurg district which is more densely with forest which result in high burden of KFD cases in particular block.

Details	2017	2018	2019	2020	2021	2022
Cases	202	109	82	16	7	9
Deaths	12	3	4	4	1	0

Other vulnerability factors

Socioeconomic status of Maharashtra

Per Capita income of Maharashtra		
Year	Per Capita income at current prices ($)	Growth Rate at 2011/12 prices (%)
FY 2016	2234	7.2
FY 2017	2415	9.21
FY 2018	2732	7.54

Per capita income of Maharashtra state is 2732 in 2018 but growth rate is not as expected which leads to increases below poverty population and affecting the standard of living and health seeking behaviours.

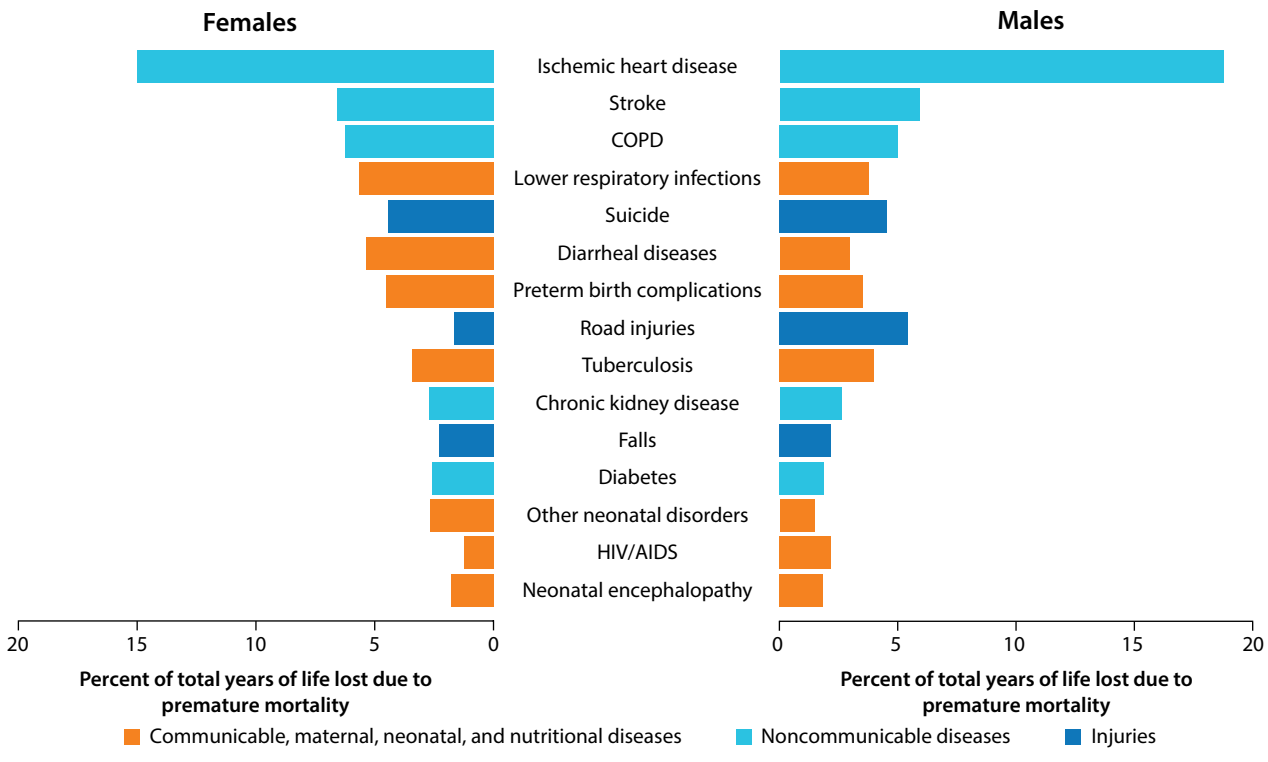
Urban and Rural Population

Maharashtra is the third most urbanized state in India, next to Tamil Nadu and Kerala. About 45% of the state's population live in urban areas. Almost half of Maharashtra's urban population reside in slums. Maharashtra has the largest urban population in the country, followed by Uttar Pradesh and Tamil Nadu. However, significant regional disparities in urbanization exist. There are five districts where the percentage of urban population is more than the state average of 45.2%. These are Mumbai (100%), Mumbai Suburban (100%), Thane (77%), Nagpur (68%), and Pune (61%). Four of these highly urbanized districts are in the rest of Maharashtra region. Nagpur is in Vidarbha. In Marathwada region, Aurangabad district has the highest level of urbanization at 43.8%, which is slightly below the state average of 45%. Some of the least urbanized districts are Gadchiroli (11%) in Vidarbha, Sindhudurg (12.6%) in Konkan, and Hingoli (15%) in Marathwada. Unplanned housing exists in areas where more population live in slums of urban areas eg: Mumbai, Pune, Nagpur and Aurangabad.

Health Status of Maharashtra

Almost all measures of mortality, life expectancy, and population health status have indicated gradual and steady improvement in Maharashtra over the last 50 years. On average, the health status in Maharashtra has been better than the all-India average According to latest available estimates, average life expectancy at birth in Maharashtra is about 72.5 years. Following are the top causes of years of life lost in Maharashtra.

Figure 4: Top 15 causes of years of life lost in Maharashtra (2016)



COPD = chronic obstructive pulmonary disorder.
Source: ICMR, PHFI, and IHME. 2017. India: Health of the Nation's States. New Delhi: The India State-Level Disease Burden Initiative.

Over the decade, population health status in Maharashtra has been better than the all-India average. However, improvement in Maharashtra's health status has failed to keep pace with faster rise in health status of the country. Epidemiological transition in Maharashtra has resulted in a higher burden of Non-communicable diseases. Dynamic interaction of emergent infectious diseases such as COVID-19 with NCD comorbidities calls for strengthening of health systems to deal with communicable and nutritional diseases as well as NCDs. Prevalent disease burden and emergent public health challenges require strengthening of specialist services, hospital infrastructure and epidemiological surveillance. Maharashtra is vulnerable to emerging infectious diseases, despite improvements in conventional and summary measures of population health. Targeted health systems strengthening is needed to improve access for the poor and build the state's resilience to deal with emerging public health challenges.

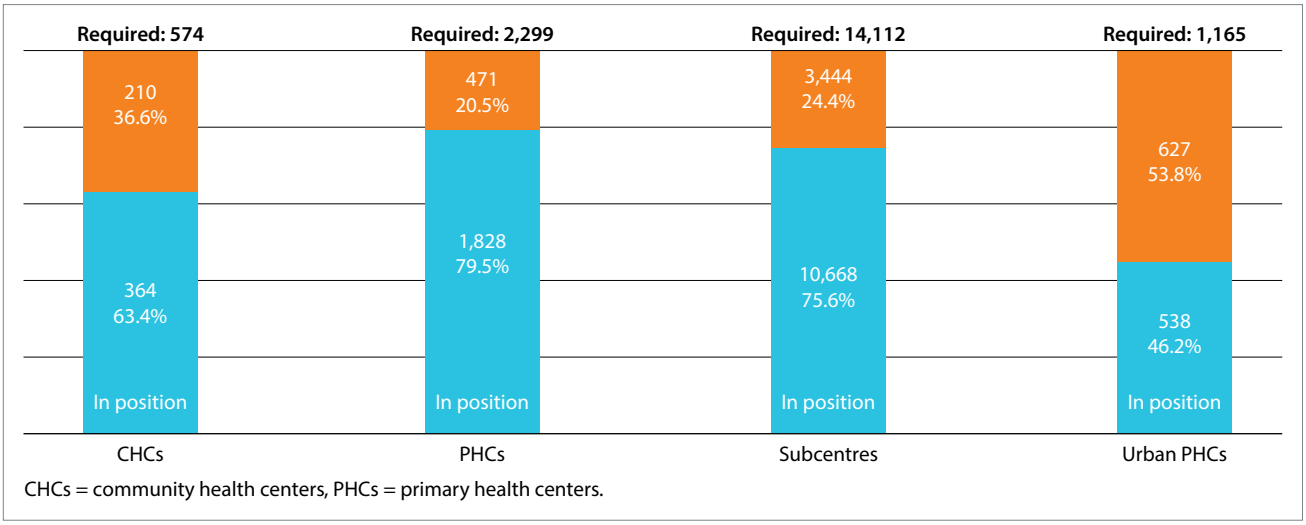
Public Health Infrastructure of Maharashtra

The Public Health Department (PHD) in Maharashtra manages mostly the primary and secondary level health care facilities consisting of the primary health centers (PHCs), subcentres, first referral units (FRUs) or secondary level hospitals, and a few specialty hospitals for disease control programs. Most of the tertiary care facilities in the public sector are managed by the Directorate of Medical Education and Research (DMER), as they are affiliated with medical colleges. Most of the public sector health care facilities in metropolitan cities like Mumbai are managed by their respective urban local bodies.

The district and general hospitals provide broad specialty services. The district hospitals are located in revenue district headquarters. Out of 36 revenue districts, 23 district hospitals are running as such and the remaining district hospitals are attached to medical colleges. There are eight general hospitals with similar broad specialty services located in urban areas other than the town district headquarters, or in addition to the district hospital in the same place. Each district or general hospital has about 200 or more beds. About 25 of these hospitals have additional 25 beds in trauma units. Total bed capacity in 23 district and 8 general hospitals, including the trauma units, is 9,593. There are 13 women (maternal and child health) hospitals with a total bed capacity of 1,584. Super specialty medical care is usually available in attached hospitals of medical colleges. However, in 2008, two free standing regional referral super specialty hospitals were established at Nashik and Amravati. There are four mental health institutions, one each at Nagpur, Pune, Ratnagiri, and Thane, with a total of 5,555 beds. The four tuberculosis hospitals at Pune (120 beds), Buldhana (100 beds), Amravati (50 beds), and Kolhapur (20 beds) have a total of 290 beds. Only one out of the four leprosy hospitals are functional, at Pune, with 350 beds. The remaining three leprosy hospitals, at Kolhapur, Osmanabad, and Ratnagiri have closed. A 50-bed orthopedic hospital is functioning at Parbhani.

As the 100- and 50-bedded sub-district hospitals are invariably located in sub-divisional headquarters, they are sometimes referred to as sub-divisional hospitals. Some of the 30 bedded rural hospitals are also located in sub-divisional headquarters and the remaining in Taluk or Block headquarters. In Maharashtra, the sub-district hospitals function as community health centers (CHCs), an upgraded primary health center with 30 beds and equipped to provide comprehensive emergency obstetric care and as first referral units. As of May 2020, there are 456 sub-district hospitals (100 beds = 31, 50 beds =61, 30 beds = 364) with a total of 17,070 beds.

Figure 5: Short Fall of Health Infrastructure in Maharashtra



CHCs = community health centers, PHCs = primary health centers.

Source: Government of India, Ministry of Health and Family Welfare. 2019. Rural Health Statistics, 2018-19, New Delhi.

The public health system in Maharashtra is characterized by deficiencies as well as inadequacy of optimal size health care facilities closer to the communities. Economy of scale with broader scope of services and appropriate case mix are critical to strengthening the trust of common man in public health care system. Urban local bodies contribute in major ways in Maharashtra, spending 7.8% of total expenditure on health, the main part of which are funded from their own resources (5.5% of total).

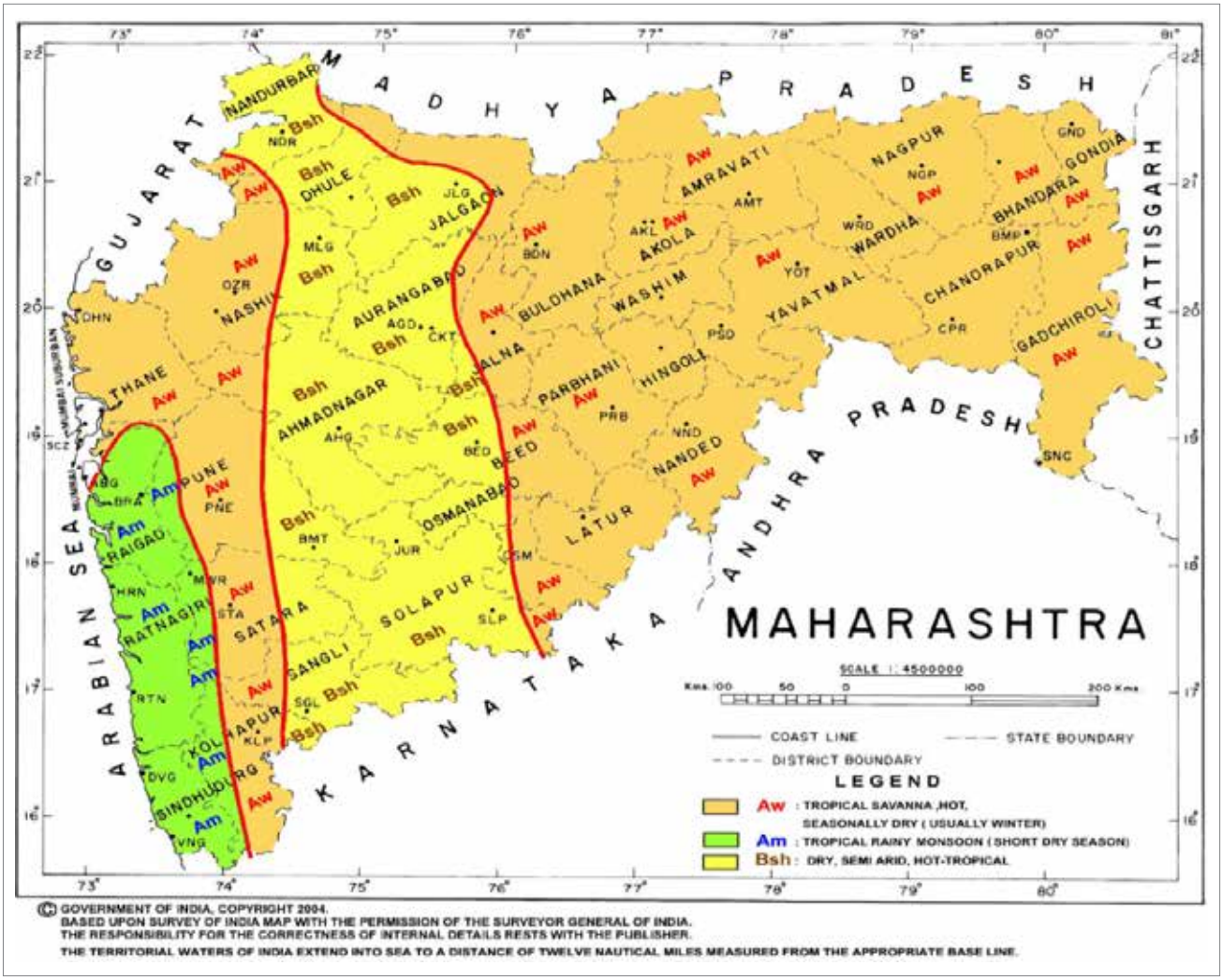
Drought Prone Areas in Maharashtra

Maharashtra is divided into three regions namely Vidharbha region, Marathwada region and rest of Maharashtra. Few districts from Vidarbha region like Akola, Washim and Yavatmal are drought prone. Large parts of the Marathwada region also are under drought prone.

Flood Prone Areas in Maharashtra

Districts from rest of Maharashtra like districts from Konkan region, Kolhapur and Sangli are flood prone.

Figure 6: **Geo-physical & Climate variables i.e., Area with highest maximum temperature (Tmax), as per IMD in previous 5 years**



© GOVERNMENT OF INDIA, COPYRIGHT 2004.
BASED UPON SURVEY OF INDIA MAP WITH THE PERMISSION OF THE SURVEYOR GENERAL OF INDIA.
THE RESPONSIBILITY FOR THE CORRECTNESS OF INTERNAL DETAILS RESTS WITH THE PUBLISHER.
THE TERRITORIAL WATERS OF INDIA EXTEND INTO SEA TO A DISTANCE OF TWELVE NAUTICAL MILES MEASURED FROM THE APPROPRIATE BASE LINE.

CHAPTER 4

Vision, Goal and Objectives

Vision: Strengthening of healthcare services for all the citizens of the state especially vulnerable like children, women, elderly, tribal and marginalized population against climate sensitive illnesses.

Goal: To reduce morbidity, mortality, injuries and health vulnerability due to climate variability and extreme weathers.

Objective: To strengthen health care services against adverse impact of climate change on health.

Specific Objectives

Objective 1: To create awareness among general population (vulnerable community), health-care providers and policy makers regarding impacts of climate change on human health.

Objective 2: To strengthen capacity of healthcare system to reduce illnesses/diseases due to variability in climate.

Objective 3: To strengthen health preparedness and response by performing situational analysis at state/district/below district levels.

Objective 4: To develop partnerships and create synchrony/synergy with other missions and ensure that health is adequately represented in the climate change agenda in the state in coordination with the Ministry of Health & Family Welfare.

Objective 5: To strengthen state research capacity to fill the evidence gap on climate change impact on human health.

CHAPTER 5
Organisational Structure

ORGANISATIONAL STRUCTURE

NATIONAL LEVEL

Key Nodal Agency
Head, NPCCHH
(NCDC, MoHFW)

- Prime Minister's Council on Climate Change
- Health Mission
- Ministry of Health and Family Welfare (MoHFW), Govt of India

STATE LEVEL

Key Nodal Point
(SNO-NPCCHH)

- State Governing Body - Environmental Health
- State Level Task Force - Environmental Health
- State Environmental Health Cell

DISTRICT LEVEL

Key Nodal Point
(DNO-NPCCHH)

- District Task Force - Environmental Health
- District Environmental Health Cell

A. State Level - Governing Body - Environmental Health

The state level governing body for policy level decision shall be working under the Chairpersonship of the Honourable State Health Minister. (**Annexure VII**)

B. State Level Task Force - Environmental Health

This task force shall be working under the guidance of Principal Secretary (Health) of the state. It shall be directly overseeing the implementation of the State Action Plan for Climate Change and Human Health (SAPCCHH) in their state/UT. It shall be working through Directorate of Health Services (DHS) of the state, which will be the implementing agency for SAPCCHH. (**Annexure VII**)

The Task force of the State/UT's Environmental Health Cell will coordinate with the Centre (MoHFW, NCDC) for execution of state/UTs SAPCCHH.

DHS will create an ***Environmental Health Cell*** within State Health Department, and will identify a ***Nodal Officer*** from Health department which preferably should be a senior Public Health Expert of the state. The proposed State Level Structure of Environmental Health Cell is as follows:

C. Structure at State/UT Environment Health Cell

Nodal Officer (Public Health Expert - State Health Department)	1
Consultant-Capacity building/Training/HR Management	1
Consultant-Environmental Health	1
Data Manager & Analyst	1
Secretarial Assistants cum Data entry Operator	1

D. Executive Members of EHC

State Nodal Officer- Climate Change	Chairperson
State Program Manager – NHM	Member
Additional Director Public Health/NCD	Member
Additional Director NVBDCP	Member
Additional Director Immunization/Family Welfare	Member
Additional Director Medical (Mental Health)	Member
State Surveillance Officer/Additional Director Epidemic	Member
Head, State Nutrition Bureau	Member
Consultant, SHSRC	Member
Additional Director, IEC/State Mass Media	Member
State Epidemiologist, IDSP	Member
State Veterinary Consultant	Member
Microbiologist, IDSP	Member

Roles and Responsibilities of the State Environmental Health Cell

- Preparation and Implementation of State Action Plan for Climate Change and Human Health
- Conduct Vulnerability assessment and risk mapping for commonly occurring climate sensitive illnesses in the state/UT.
- Assessment of needs for health care professionals (like training, capacity building) and organise training, workshop and meetings.
- Maintain State and District level data on physical, financial, epidemiological profile for climate sensitive illnesses.
- Ensure Convergence with NHM activities and other related programs in the State/District
- Monitor programme, Review meetings, Field observations.
- Timely issue of warning/alerts to health professionals and related stakeholders as well as general public through campaign or using mass media (Electronic or printed),
- Social mobilization against preventive measures through involvement of women's self-help groups, community leaders, NGOs etc.
- Advocacy and public awareness through media (Street Plays, folk methods, wall paintings, hoardings etc.).
- Conduction of operational research and evaluation studies for the Climate change and its impact on human health.

E. District Level

The DHS will appoint the District Medical Officer/Chief Medical Health Officer as the District Nodal Officer – Climate Change. A District Level Task Force will be constituted by the District Nodal Officer- Climate Change in consultation with the SNO-NPCCHH. District Nodal Officer, NPCCHH are listed. (Annexure)

Structure of District Level Task Force- Environmental Health

District Collector	Chairperson
Dean– Govt Medical College in the district/Head- Department of Community Medicine of the Medical College	Vice Chairperson
Chief Medical Officer/District Medical Officer/District Nodal Officer – Climate Change	Member Secretary
District Surveillance Officer	Member
District Programme Manager – NHM	Member
District Head, Department of Revenue (Disaster)	Member
District Head, Department of Agriculture	Member
District Head, Department of Water and Sanitation	Member
District Head, Department of Transport	Member
District Head, Department of Animal Husbandry	Member
District Head, Department of Environment and Forests	Member
District Head, Department of Women and Child Development/Social Justice	Member
District Head, Department of Science and Technology/Earth Sciences	Member

District Head, Department of Education	Member
District Head, Department of Food	Member
District Head, Department of Human Resource Development	Member
District Head, Department of Public Works Department	Member
District Head, Department of Power	Member
District Head, Department of Finance	Member
District Head, Department of Law	Member
District Head, Department of Panchayati Raj	Member

The District Environmental Health Cell will be constituted by the District Nodal Officer- Climate Change in consultation with the SNO-NPCCHH At District level, a District Environmental Health Cell shall be constituted; which shall be comprise of the following:

F) Structure at District Environment Health Cell

District Nodal Officer- Climate Change	Chairperson
District Veterinary officer	Member
District Surveillance Officer/District Epidemic Officer	Member
District RCH officer/FW Officer	Member
District Epidemiologist	Member
District Microbiologist	Member
District Immunisation Officer	Member
District Training Officer	Member
Data entry operator	Supporting Staff

Roles and Responsibilities of the District Environmental Health Cell

- Preparation and Implementation of District Action Plan for Climate Change and Human Health.
- Conduct Vulnerability assessment and risk mapping for commonly occurring climate sensitive illnesses in the district.
- Maintain and update district database of illnesses identified in the district.
- Assess needs for health care professionals and conduct sub-district/CHC level training/workshop and meetings for capacity building.
- Ensure appointment of contractual staff and engage them in the assigned task of data management under the NAPCCHH.
- Maintain District level data on physical, financial, epidemiological profile for these illnesses.

Community Health Centre Level

The proposed CHC Level Structure is as under:

Medical Superintendent (CHC Hospital)	Chairperson
Taluka Health Officer/Talukas Health Officer	Member Secretary
Health Education Officer/Similar	Member
Block Development Officer	Member
Health Supervisor	Member

Health Facility Level (PHC)

At the health facility, the responsibility for implementation will lie with the Medical Officer (In-charge) of the facility. The existing machinery of NHM will be utilised for the related activities. The Rogi Kalyan Samiti (RKS) would be reviewing and monitoring implementation at the health facility level. The ANM, ASHA and Anganwadi worker will assist in activities related to implementation of action plan at local level

PART II

Health Action Plans on Priority Climate Sensitive Health Issues

CHAPTER 6

Health Action Plan on Air Pollution Related Diseases

Air pollution is a major environmental risk to health. The formation, transport and dispersion of many air pollutants is determined partly by climate and weather factors such as temperature, humidity, wind, storms, droughts, precipitation and partly by human activities known to produce various air pollutants. It is thus logical to assume that climate change will influence the dynamics of air pollution. By reducing air pollution levels, states can reduce the burden of disease from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma.

Two major types of Air Pollution:

1. Ambient (Outdoor) Air Pollution
2. Household (Indoor) Air Pollution

Define Ambient (Outdoor) Air Pollution and Household (Indoor) Air Pollution

Outdoor air is often referred to as ambient air. The common sources of outdoor air pollution are emissions caused by combustion processes from motor vehicles, solid fuel burning and industry. Other pollution sources include smoke from bushfires, windblown dust, and biogenic emissions from vegetation (pollen and mould spores).

Just like outdoor air pollution, indoor air pollution can pose a risk to health. As we spend much time in our homes, it is important that the air is as clean as possible. Indoor air pollution can come from sources outside the home, such as emissions from transport or smoke from neighboring wood heaters, and from sources within homes.

Ambient (outdoor air pollution) in both cities and rural areas was estimated to cause 3.7 million premature deaths worldwide in 2012. Air pollution also affects health by causing acid rain; eutrophication due to nitrogen oxides, emission in air from power plants, cars, trucks, and other sources; Haze; toxic effects on wildlife; Ozone depletion; Crop and forest damage etc. Over 4 million people die prematurely from illness attributable to the household air pollution from cooking with solid fuels. 3.8 million premature deaths annually from non-communicable diseases including stroke, ischemic heart disease, chronic obstructive pulmonary disease (COPD) and lung cancer are attributed to exposure to household air pollution.

Prominent causes of Ambient Air Pollution in Maharashtra state:

1. Pollution by Automobiles
2. Industrial Emission

Prominent causes of Household Air Pollution in Maharashtra state:

1. Use of biomass, kerosene as fuel for cooking
2. Burning of waste, cow dung, coal

Other factors (if any) contributing to increase/decrease of Ambient/Household air pollution in the polluted cities in the (name) state:

1. Diesel Generators
2. Incomplete combustion

Health consequences of air pollution

Exposure to high levels of air pollution can cause a variety of adverse health outcomes. It increases the risk of respiratory infections, heart disease and lung cancer. Both short- and long-term exposure to air pollutants have been associated with health impacts. More severe impacts affect people who are already ill. Children, the elderly and poor people are more susceptible. The most health-harmful pollutants closely associated with excessive premature mortality – are fine PM2.5 particles that penetrate deep into lung passageways.

Air Pollution and Climate Change

Air pollution and climate change affect each other through complex interactions in the atmosphere. Air pollution is intricately linked with climate change because both problems come largely from the same sources, such as emissions from burning fossil fuels. Both are threats to people's health and the environment worldwide.

Climate change affects air quality, which in turn can lead to adverse health outcomes. Disruptions to weather patterns influence our air quality by increasing and distributing air pollutants, such as ground-level ozone, fine particulates, wildfire smoke, and dust. Changes to weather seasons also impact the production, distribution, and severity of airborne allergens.

Air pollution exposure is associated with oxidative stress and inflammation in human cells, which may lay a foundation for chronic diseases and cancer. In 2013, the International Agency for Research on Cancer of the World Health Organization (WHO) classified air pollution as a human carcinogen.

Air Quality Index

Air Quality Index is a tool for effective communication of air quality status to people in terms, which are easy to understand. It transforms complex air quality data of various pollutants into a single number (index value), nomenclature and colour.

Air Quality Index (AQI) Category	
Good	0-50
Satisfactory	51-100
Moderately Poor	101-200
Poor	201-300
Very Poor	301- 400
Severe	401-500

Number of AQI monitoring stations within state:

1. By Central Pollution Control Board (CPCB) - 36
2. BY State Pollution Control Board (SPCB)- 45
3. By System of Air Quality and Weather Forecasting and Research (SAFAR) – 20

- Enlist the probable causes of air pollution in the cities having AQI level (Highest AQI value available in the previous year) above 200:
  - Automobiles
  - Dust generated by construction industries and factories

Table 6: Priority City/District for Air Pollution Surveillance as per above AQI (Highest AQI value available in the previous year)

Sl. No.	Name of the city	Highest AQI value in previous year	Reasons for High AQI
1	Mumbai	Very unhealthy or worse category	Automobiles, Pollution from industries, Dust
2	Thane		
3	Pune		
4	Nagpur		
5	Aurangabad		
6	Raigad		

Names of Cities identified under National Clean Air Program (NCAP) in the Maharashtra

Akola, Amravati, Aurangabad, Badlapur, Chandrapur, Jalgaon, Jalna, Kolhapur, Latur, Mumbai, Nagpur, Nashik, Navi Mumbai, Pune, Sangli, Solapur, Thane, Ulhasnagar.

Vulnerability Assessment for Air Pollution

Following group of people having high risk towards hazards of air pollution.

Table 7: Vulnerable population for health impact of Air pollution for each district- STATE WISE

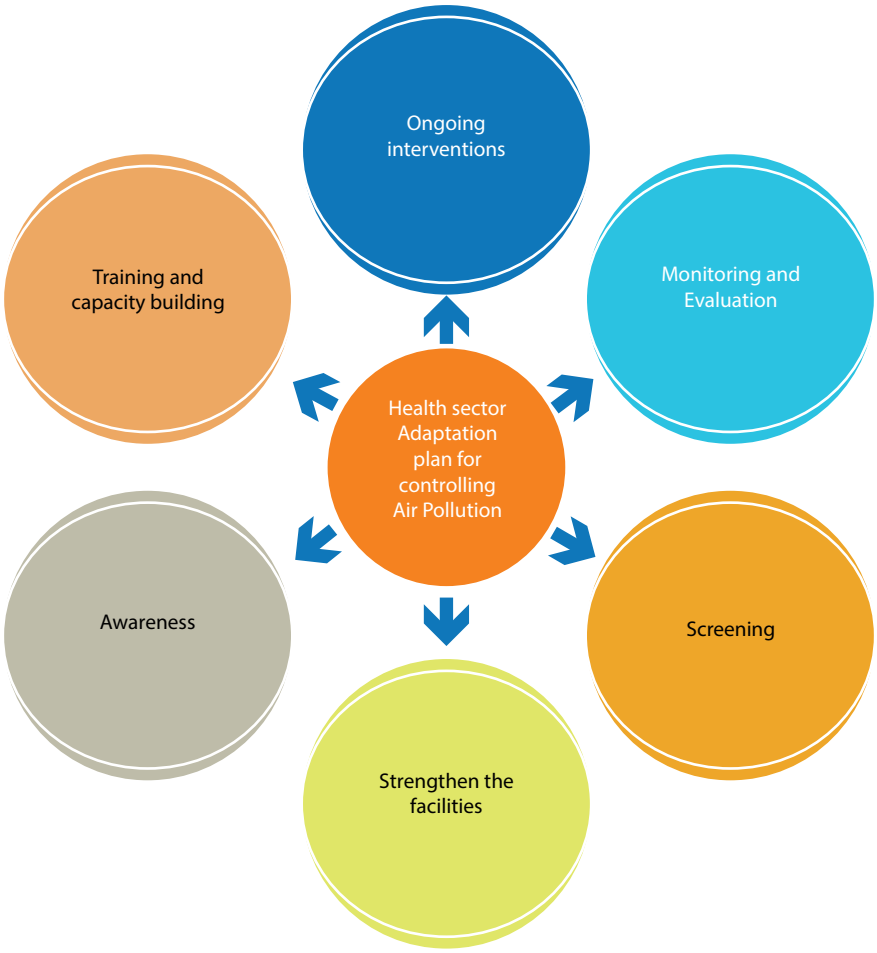
Sl. No.	Category of vulnerable population	Total count for the district
1	Elderly people age more than 60 years	9.9 % of the entire population
2	Children's below 5 years of age	13,326,517
3	Pregnant women	
4	Traffic policemen	2 lakhs
5	Road sweepers	
6	Auto-rickshaw drivers	5 lakhs
7	Rickshaw pullers	
8	Roadside vendors	
9	Construction Workers	13 lakhs
10	Women's not having clean fuel for cooking	
11	People having any pre-existing lung disease like asthma, COPD, Bronchitis, TB, lung cancer etc	15.4% in the age group 40 and above
12	Individuals with heart disease, coronary artery disease or congestive heart failure	40% in the age group 40 and above

Risk Mapping to identify the 'Hot spots' for vulnerable population with respect to health infrastructure and other resources for air pollution

- Identification of Vulnerable group of population living in areas with poor air quality
- Identifying the major sources of pollution
- Availability of healthcare services in high priority districts
- Building the capacity of health care personnel on managing diseases arising from polluted air
- Sensitizing the health system on the impact of air pollution
- Creating awareness among the vulnerable population on appropriate behaviour and preventive methods
- Advocacy for stronger regulations on industries and factories responsible for air pollution

Health Sector Adaptation plan for Air Pollution Control

Health action plan on 'Air Pollution and Health in Maharashtra State is being developed to protect, prevent control health problems and reduce morbidity and mortality due to illnesses related to air pollution.



Awareness Generation

- IEC dissemination
- Carry out mass media campaigns
- Promote a culture of risk prevention, mitigation, and better risk management
- Promote attitude and behaviour change in the awareness campaigns linking air pollution and climate change.
- Engage local and regional media (community radio, TV)

Table 8: Sensitisation Workshops

Various levels of Training	Topics	Timeline
Sensitization workshops for State Level officers	Introduction Air pollution its impact Role and responsibilities of state and regional level officers	October-November
Sensitization workshops for District Level officers	Introduction Air pollution its impact Role and responsibilities of District level officers	December
Panchayati Raj Institute Workshops	Prevention measures of Air pollution Role and responsibilities of PRI	January

Table 9: IEC Plan for next five years

Sl. No.	Indicator Statement	Indicator	Target 2022-23	Target 2023-24	Target 2024-25	Target 2025-26	Target 2026-27
1	IEC campaigns	Percentage of Districts implemented IEC campaign on Air pollution	50%	100%	100%	100%	100%
2	PRI and VHNC sensitization	Percentage of Districts included climate sensitive issues in the VHSNCs	25%	50%	75%	100%	100%
3	Community participation	Sensitization of rural population for Air pollution	Pilot study in one district	5 districts	50 %	75 %	100%

IEC activities for Air pollution

- At least 1-2 Wall Poster disseminated in all healthcare facilities.
- Social Media – active circulation of audio-video clips and poster slideshow in prominent social media handles.
- Radio jingles during March to July in high priority districts
- Sensitization workshops for district, state and regional level officers
- Community participation through meetings, heat related illness education in school, panchayati raj institutes and gram sabhas.

Table 10: IEC Dissemination Plan

Year	IEC Content	Districts	Dissemination Plan for 5 (Years)	Time Line	Budget (Lakh)
2022-23	Posters	All districts	At least 2 posters for each health facilities	September 22-February 23	30 lakh
	Radio Jingles	High Priority Districts Low Priority Districts	Radio Jingles during winter season		
	TV Spots	All Districts	TV spots		
2023-24	Posters	All districts	At least 2 posters for each health facilities	September 23-February 24	33 lakh
	Radio Jingles		Radio Jingles during winter season		
	TV Spots		TV spots		
2024-25	Posters	All districts	At least 2 posters for each health facilities	September 24-February 25	36.60 lakh
	Radio Jingles		Radio Jingles during winter season		
	TV Spots		TV spots		
2025-26	Posters	All districts	At least 2 posters for each health facilities	September 25-February 26	40.26 lakh
	Radio Jingles		Radio Jingles during winter season		
	TV Spots		TV spots		
2026-27	Posters	All districts	At least 2 posters for each health facilities	September 26-February 27	44.28 lakh
	Radio Jingles		Radio Jingles during winter season		
	TV Spots		TV spots		

Public Health Advisories

Health advisories (bit.ly/NPCCHHPrg) are issued to alert population of potential harmful impact of impending environmental phenomena like cold wave/frost, heat wave and elevated air pollution. Advisories are issued at central level and forwarded to Districts through State/UTs for public dissemination.

District will ensure timely dissemination of health advisories in locally acceptable language.

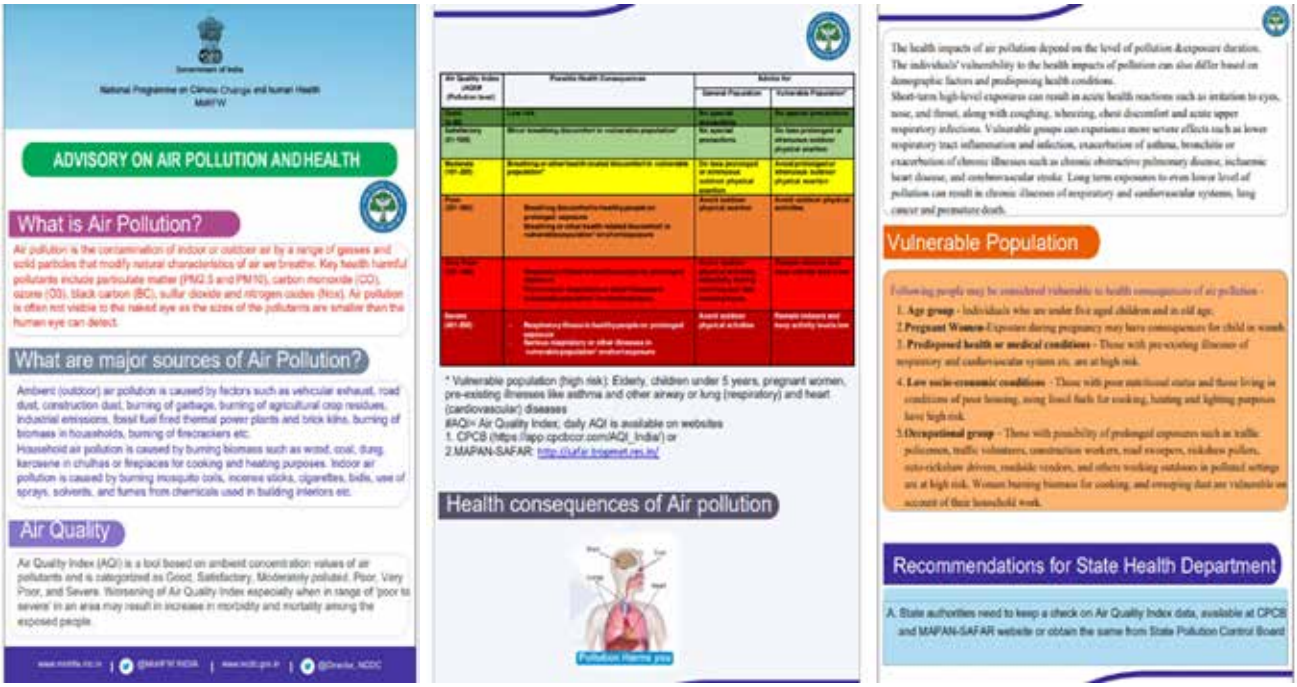


Table 11: Observation of the environment-health days

Day	Activities
World Environmental Day **Clean air for blue skies**	• IEC Campaigns • Workshops for district Nodal officers on Air pollution and its impact on health and strategies to reduce to impact of air pollution

Capacity Building

Table 12: Training Calendar

Type of Training	Participants	Content of Training	Timeline
State Level ToT	State Level officers, Regional level officers, District level officers	Air pollution its impact and Surveillance	August
District Level Training	District level supervisors, THO	Air pollution its impact and Surveillance	September
Medical Officer Training	Medical officers	Air pollution its impact and Surveillance	October
Paramedical staff training	MPW, ANM, LHV, etc	Air pollution its impact and Surveillance	November
Panchayat Raj Institute training	PRI members	Awareness generation	December

Table 13: Budget

Year	Priority Districts	Time of year	Content matter	Budget
2022-23	All district	September 22- February 23	Air Pollution and its impact on Health	37.5 lakh
2023-24		September 23- February 24		40 lakh
2024-25		September 24- February 25		44 lakh
2025-26		September 25- February 26		48 lakh
2026-27		September 26- February 27		52 lakh

ARI Surveillance Activity at State Level

State has identified 16 sentinel hospital from highly polluted cities of Maharashtra and they are reporting acute respiratory infection cases on monthly basis and these data are compared with air quality of particular city for inference.

ARI Surveillance at State - Data Flowchart

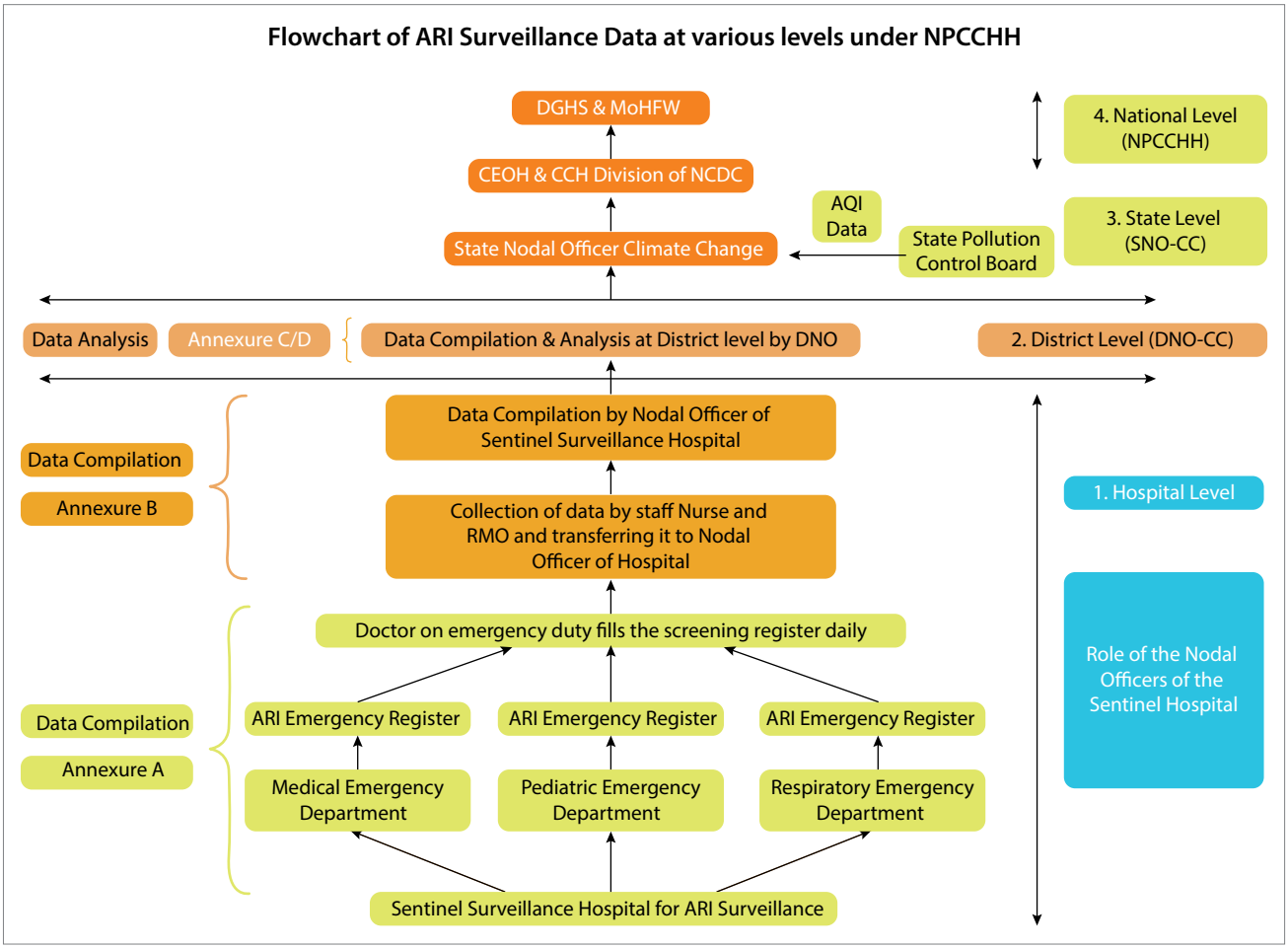


Table 14: Status of ARI Surveillance data collection in Maharashtra

Name of City	Name of Hospital	Capturing ARI data as per format of annexure 3 from different departments	Data compilation in format of annexure 4	Data is sent to state office on daily basis
Solapur	DR. V.S.Medical College Solapur	Yes	Yes	Yes
Mumbai	JJ Hospital	Yes	Yes	Yes
Nashik	District Hospital Nashik	Yes	Yes	Yes
Amravati	District Hospital Amravati	Yes	Yes	Yes
Sangli	GMC, Sangali	Yes	Yes	Yes
Jalgaon	GMC Jalgaon	Yes	Yes	Yes
Jalna	District Hospital, Jalna	Yes	Yes	Yes
Kolhapur	CPRH, Kolhapur	Yes	Yes	Yes
Latur	GMC Latur	Yes	Yes	Yes
Akola	GMC Akola	Yes	Yes	Yes
Badlapur	RH Badlapur	Yes	Yes	Yes
Ulhasnagar	Central Hospital Ulhasnagar	Yes	Yes	Yes
Aurangabad	GMC Aurangabad	Yes	Yes	Yes
Pune	B. J Medical College, Pune	Yes	Yes	Yes
Nagpur	GMC Nagpur	Yes	Yes	Yes
Chandrapur	GMC Chandrapur	Yes	Yes	Yes
New Mumbai	General Hospital Vashi	Yes	Yes	Yes

Roles and responsibility of a few key members of task force

	Responsibilities
SNO	• Finalization of IEC material and dissemination Plan • Organize IEC campaigns at state level on observance of important environment-health days • Organize training sessions for district level and surveillance nodal officer • Facilitate training of medical officers in clinical aspects of air pollution's health impact • Real time air quality data dashboard in Proposed cities • MonitorAQI levels in states especially in hotspots and NCAP cities • Ensure reporting from sentinel hospitals and DNO • Ensure necessary health facility preparedness • Review surveillance reporting and monthly report submission by DNO • Submit report of activities • Review implementation of IEC and surveillance activities at all levels • Evaluate and update relevant section of SAPCCHH with support from State Task Force • Liaison with State Pollution Control Board for AQI alerts and its dissemination

	Responsibilities
	• Liaison with Department of Environment for combined IEC campaigns and information sharing on health indicators for targeted air pollution reduction activities • Awareness and action plan input sharing with Ahmedabad Municipal corporation, Vadodara Municipal corporation and Surat Municipal corporation • Create organization support and strengthen Environmental Health cell to implement NPCCHH vision, Goal and Objectives • Organize sensitization workshops for other stakeholders and line departments • Organize Seminars on Air Pollution and Conference to share knowledge and action under NPCCHH. • Collaborate with academic institute/s for support in updating SAPCCHH, Surveillance activity monitoring, vulnerability assessment and applied research • Advocate for reduction in source of air pollution
DNO	• Ensure IEC dissemination to community level • Facilitate community level IEC activities • Conduct training for Block health officers, Medical officer, Sentinel hospital nodal officers with relevant training manuals • Conduct training of vulnerable groups: police officers, outdoor works, women, children • Organize IEC campaigns at district level on observance of important environment-health days • Collect and monitor AQI levels in states especially in hotspots and NCAP cities • Ensure daily reporting from Sentinel hospitals and compile the data • Analyze daily health data with AQI level to monitor trends and hotspot in health impacts • Submit analyzedmonthly report to SNO, NPCCHH, Hq and other departments for necessary action • Submit report of activities • Update DAPCCHH with support from District Task Force • Advocate for reduction in source of air pollution
Surveillance hospital nodal officer	• Train hospital staff and clinician responsible for daily reporting in case indentation and reporting flow • Compile daily reports for the health facility and submit it to DNO and NPCCHH, Hq
Block health officer	• Conduct community level IEC activities • Ensure training of medical officers • Organize PRI sensitization workshop and training for vulnerable groups
Medical officer	• Conduct health facility-based IEC activities • Support community level IEC activities • Be aware of AQI levels and health impact of air pollution • Ensure necessary health facility preparedness in early diagnosis and management of cases
Panchayati Raj Institutions	• Conduct community level IEC activities

CHAPTER 7

Health Action Plan on Heat Related Illnesses

Introduction

In India, 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 a heat wave:

a) Based on Departure from Normal

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

b) Based on Actual Maximum Temperature (for plains only)

- *Heat Wave:* When actual maximum temperature ≥45°C
- *Severe Heat Wave:* When actual maximum temperature ≥47°C

The Heat Index is a measure of how it really feels when relative humidity is factored in with the actual air temperature. If the temperature is 34 degree C and relative humidity is 75 %, the heat index i- how it feels – is 49-degree C. The same effect is reached at just 31 degree C when relative humidity is 100%. The adverse health effects of hot weather and heat-waves are largely preventable. Prevention requires a portfolio of actions at different levels, these actions can be integrated in a defined heat–health action plan.

National Disaster Management Authority (NDMA) prepared Guidelines for Preparation of Action Plan-prevention and management of Heat wave-2017, wherein the roles and responsibilities of various agencies were identified. Emergency Medical Relief (EMR), Ministry of Health and Family Welfare prepared detailed guidelines on prevention and management of heat related illnesses – 2015 wherein patho-physiology, risk factors, clinical manifestations, management, prevention and public health action plan for managing heat related illnesses has been explained. To declare a heat wave, the above criteria should be met at least at two stations in a Meteorological sub-division for at least two consecutive days. A heat wave will be declared on the second day.

Maharashtra State is one of the regions most affected by heat waves in India (NRDC 05/2020). Maharashtra developed a state-wide Heat Action Plan in 2017. The Nagpur Municipal Corporation developed their heat action plan in 2016 and updated its Heat Action Plan in 2019 along with five neighbouring districts. The Heat action plan consists of heat mitigation measures in accordance with the guidelines issued by NDMA. Prior

to the 2020 heat season, two out of seven municipal corporations in Maharashtra, Nagpur and Chandrapur, have implemented the mandatory Heat Action Plan. Nashik, Dhule, Jalgaon, Gondia and Wardha were yet to introduce the updated plan but several of these cities have earlier plans. Maharashtra is also observing higher temperatures in coastal cities, such as Mumbai, Dapoli, and Ratnagiri.

Different type of heat related illness includes

1. Minor heat related Illnesses: Heat rash, heat cramps, heat syncope
2. Major heat related Illnesses: Heat Exhaustion and heat Stroke

Table 15: Types of heat related illnesses

Clinical Entity	Age Range	Setting	Cardinal Symptoms	Cardinal/ Important Signs	Pertinent Negative findings
Heat rash/prickly heat/Miliaria	All, but frequently children	Hot environment; +/- insulating clothing or swaddling (wrap in tight clothes)	**ITCHY RASH** with **SMALL RED BUMPS** at pores in the skin. Seen in setting of heat exposure; bumps can sometimes be filled with clear or white fluid	**DIFFUSED RED COLOUR SKIN OR VESICULAR RASH**, itching of the skin without visible eruption	**NOT FOCALLY DISTRIBUTED** like a contact dermatitis
Heat cramps	All	Hot environment, **TYPICALLY WITH EXERTION**, +/- insulating clothing	**PAINFUL SPASMS** of large and frequently used muscle groups	Uncomfortable appearance, may have **DIFFICULTY FULLY EXTENDING AFFECTED LIMBS/JOINTS**	No contaminated wounds/tetanus exposure; no seizure activity
Heat exhaustion	All	Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)	Feeling overheated, light headedness, **EXHAUSTED AND WEAK**, unsteady, feeling of **VOMITING, SWEATY AND THIRSTY**, inability to continue activities	SWEATY/ diaphoretic; flushed skin; hot skin; **NORMAL CORE TEMPERATURE**; +/- dazed, +/- generalized weakness, slight disorientation	No coincidental signs and symptoms of infection; no focal weakness; no difficulty in swallowing food or speech; no overdose history
Heat syncope	Typically adults	Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)	Feeling hot and weak; light headedness followed by a **BRIEF LOSS OF CONSCIOUSNESS**	Brief, generalized loss of consciousness in hot setting, short period of disorientation, if any	**NO SEIZURE ACTIVITY**, no loss of bowel or bladder continence, no focal weakness, no difficulties in food swallowing or speech

Clinical Entity	Age Range	Setting	Cardinal Symptoms	Cardinal/ Important Signs	Pertinent Negative findings
Heat Stroke	All	Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)	Severe overheating; profound weakness; **DISORIENTATION, NOT FULLY ALERT, CONVULSION, OR OTHER ALTERED MENTAL STATUS**	Flushed, **DRY SKIN** (not always), **CORE TEMP ≥40°C OR 104°F**; altered mental status with disorientation, incoherent behaviour, **COMA, CONVULSION**; tachycardia; +/- hypotension	No coincidental signs and symptoms of infection; no focal weakness; no difficulties in swallowing food or speech, no overdose history

National Action Plan on Heat related illnesses is available at NCDC website - *https://ncdc.gov.in/WriteReadData/linkimages/NationActionplanonHeatRelatedIllnesses.pdf*

Public Health Advisory: Extreme Heat/Heatwave is available at NCDC website - *https://ncdc.gov.in/showfile.php?lid=847*

Table 16: Heat related illness Status in Maharashtra

Year	HRI Cases	Deaths
2015	28	2
2016	686	19
2017	297	13
2018	2	2
2019	9	9
2020	NA	NA
2021	NA	NA
2022	767	31*

*Suspected HRI deaths

Table 17: Priority Districts for Heat related illnesses (according to Prevalence since 2011-22)

High Priority Districts	Low Priority Districts	Very Low Priority Districts
Nagpur, Chandrapur, Akola, Wardha, Jalgaon, Dhule, Bhandara, Aurangabad, Parbhani, Jalna, Gondia, Osmanabad, Nanded, Amravati	Gadchiroli, Solapur, Thane, Mumbai, Raigad, Ratnagiri, Sindhudurg, Latur, Beed, Nashik, Ahmednagar, Palghar, Yavatmal, Washim and Nandurbar	Pune, Satara, Kolhapur, Sangli, Buldhana

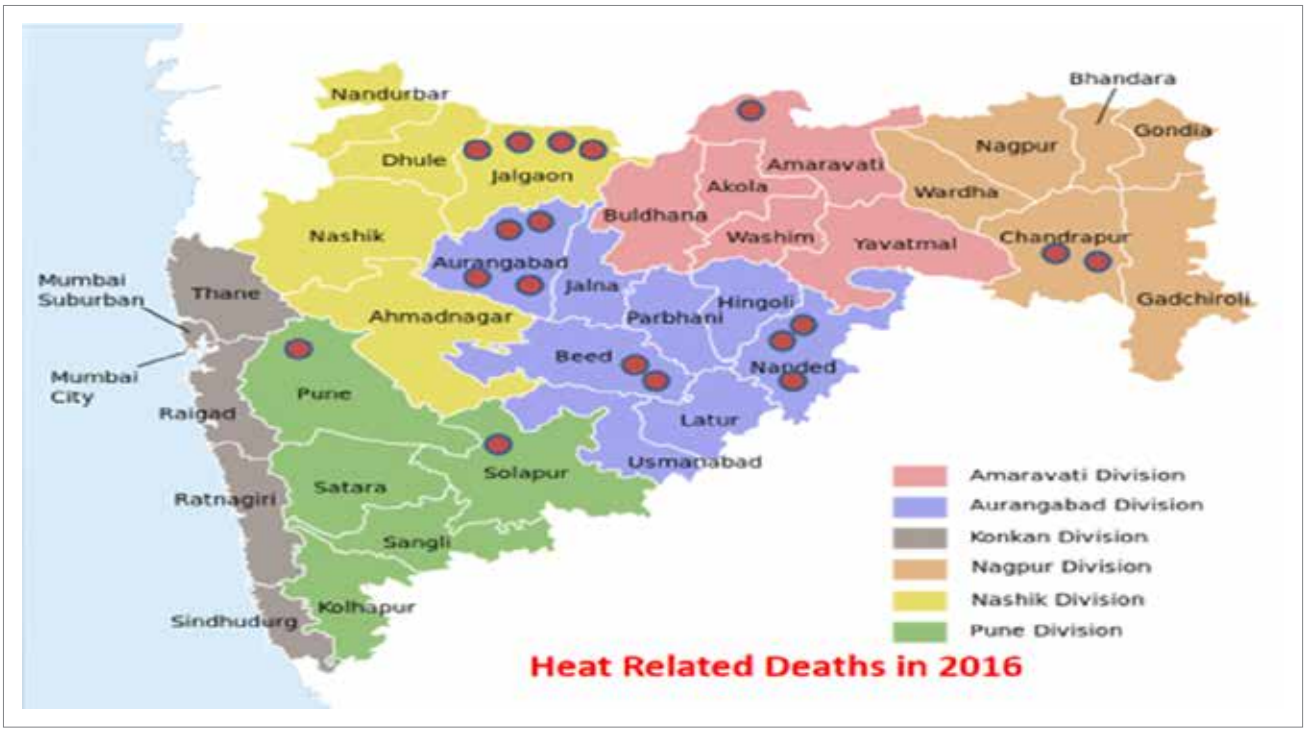
Vulnerability Population for Heat Related Illness

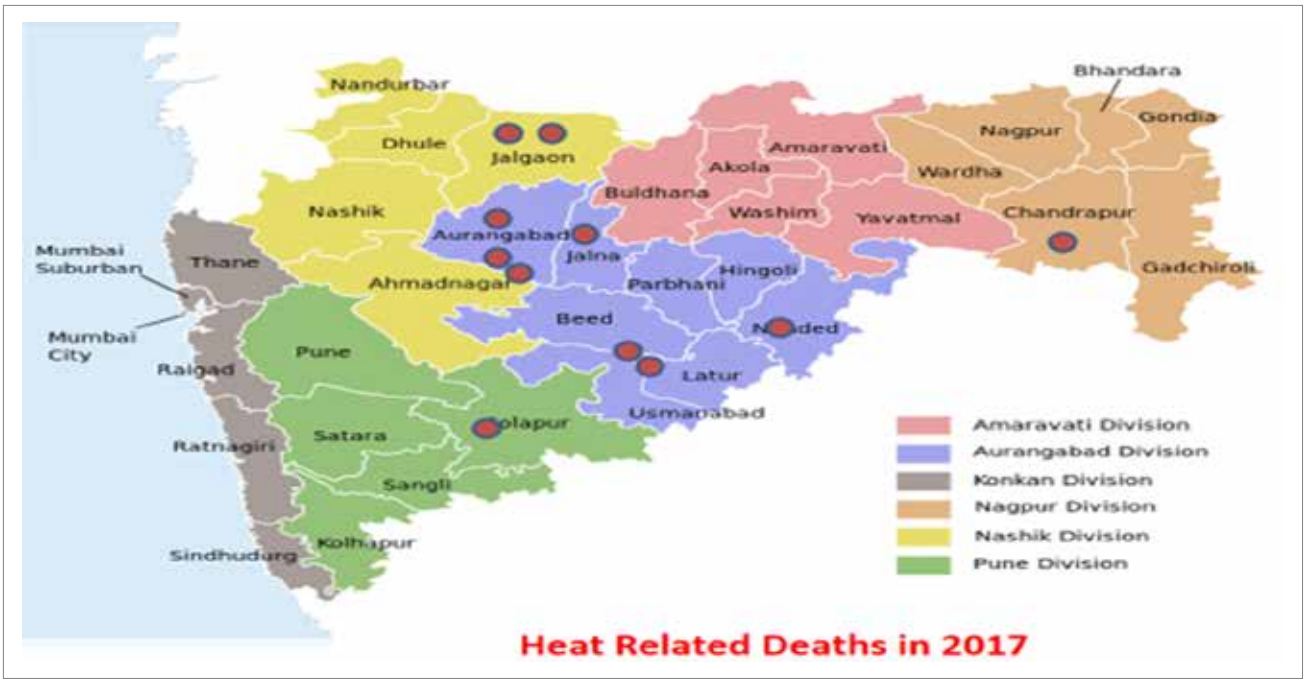
- Children below 5 years and elders above 65 years
- Pregnant women
- Labourers including those at construction sites/Outdoor workers
- Farmers/MNREGS workers
- Police personnel/security staff
- Industrial workers working at High Temperatures
- Street hawkers/salesmen
- Auto drivers/Travellers/Bus drivers
- Coolies/Slum residents/Beggars/Homeless
- Alcoholics, Smokers, Consuming hot drinks oftenly
- Persons suffering from chronic diseases like Cardiovascular, Renal, Skin, Liver, Diabetes, Obesity, debilated/malnourished etc.

Table 18: Data for population vulnerable to heat related illnesses in the State

Sl. No.	Category of vulnerable population	Total count (2011 census)
1	Elderly people age more than 60 years	1.11 Cr
2	Children's below 5 years of age	0.94 Cr
3	Pregnant women	0.20 Cr

Figure 7: Distribution of deaths in district wise map of State in the 2016, 2017 and 2022 year

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Ahmadnagar
Mumbai Suburban
Thane
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Pune
Satara
Ratnagiri
Sangli
Sindhudurg
Kolhapur
Solapur
Beed
Latur
Usmanabad
Parbhani
Hingoli
Nanded
Amaravati
Akola
Buldhana
Washim
Yavatmal
Wardha
Nagpur
Bhandara
Gondia
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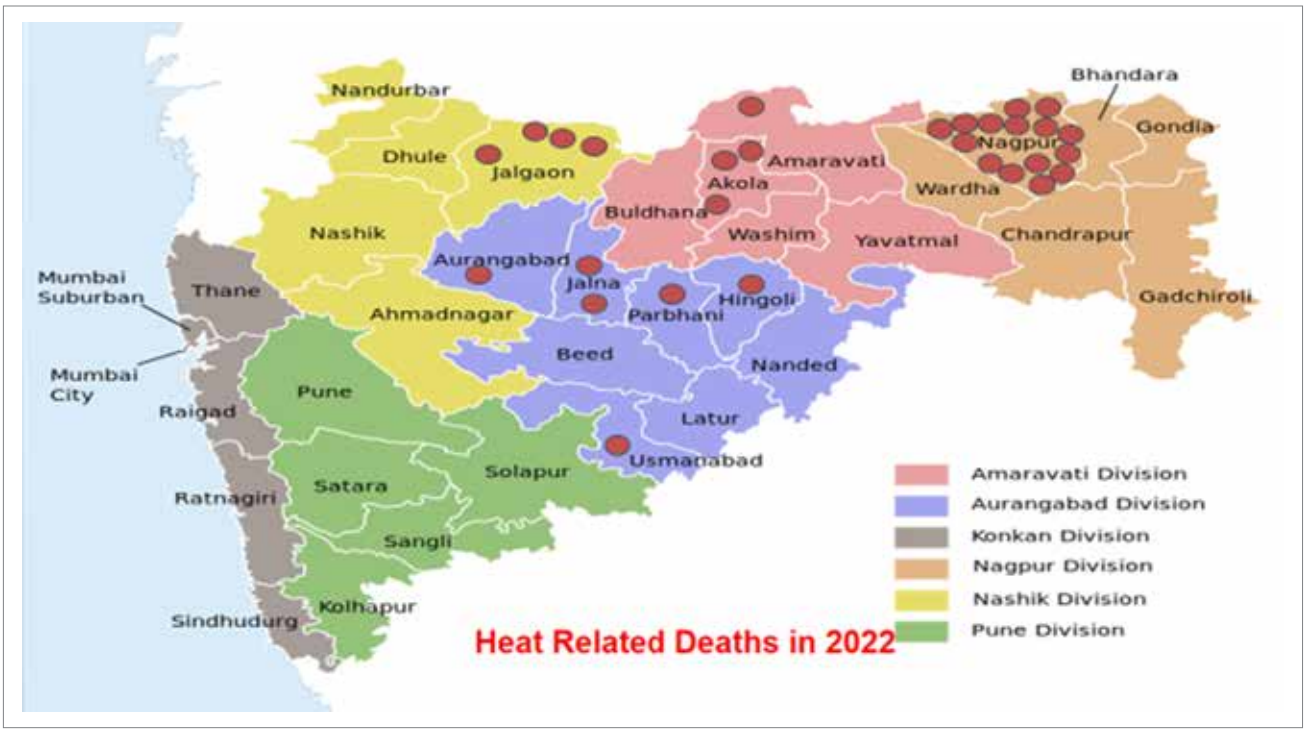
Aurangabad Division
Konkan Division
Nagpur Division
Nashik Division
Pune Division
Heat Related Deaths in 2017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Raigad
Pune
Satara
Ratnagiri
Sangli
Sindhudurg
Kolhapur
Solapur
Beed
Latur
Usmanabad
Parbhani
Hingoli
Nanded
Amaravati
Akola
Buldhana
Washim
Yavatmal
Wardha
Nagpur
Bhandara
Gondia
Chandrapur
Gadchiroli
Amaravati Division
Aurangabad Division
Konkan Division
Nagpur Division
Nashik Division
Pune Division
Heat Related Deaths in 2022

Figure 8: Heat Related Illnesses data of the State for year 2011-2022

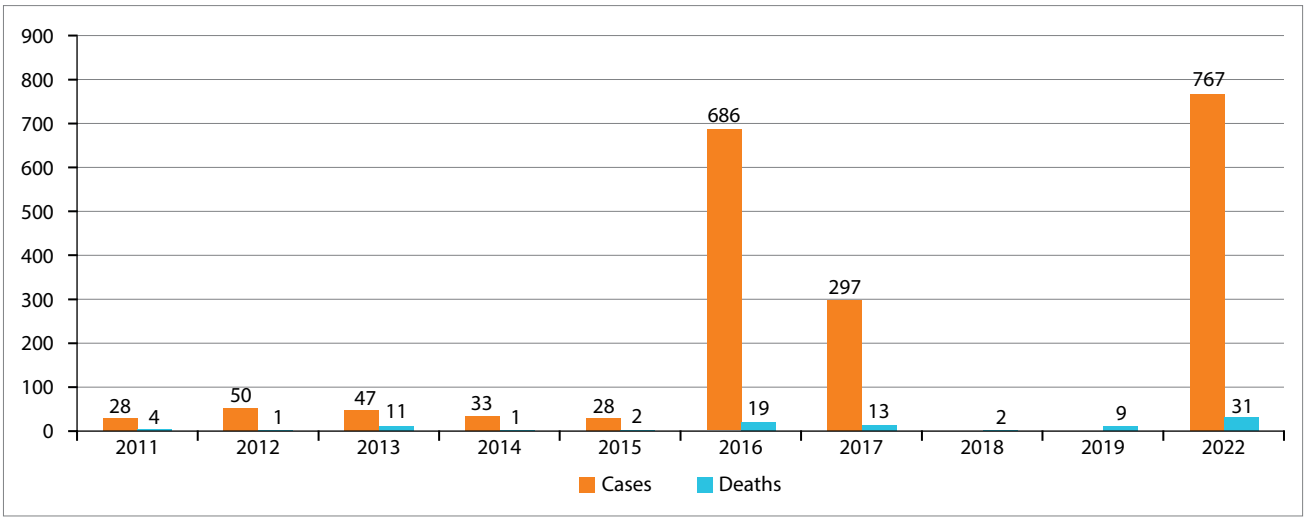


Figure 9: Age wise distribution of deaths due to heat related illnesses 2022

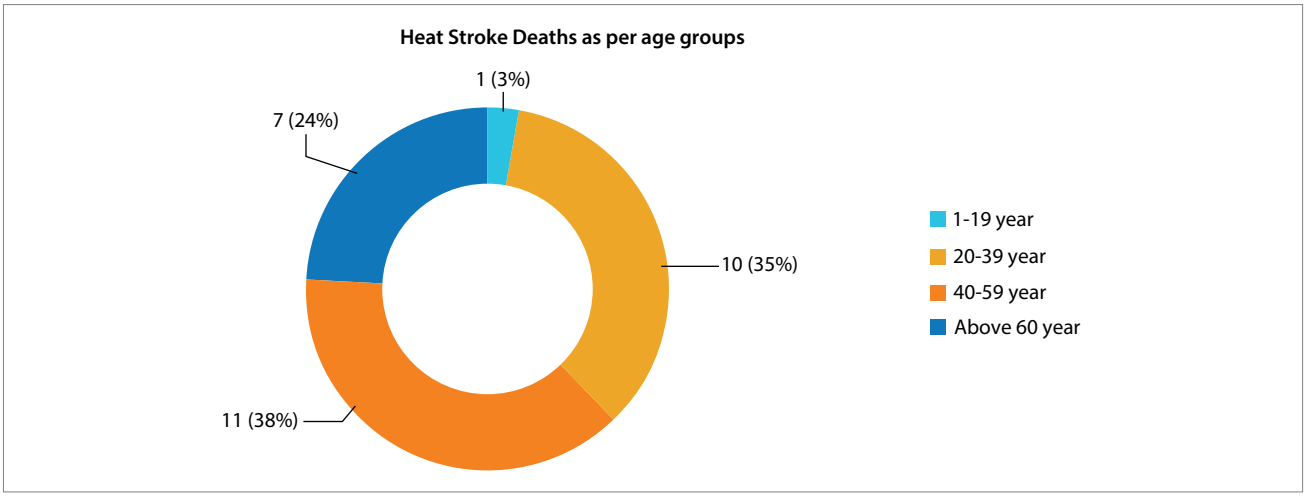


Figure 10: Occupational status of deaths due to heat related illnesses in 2022

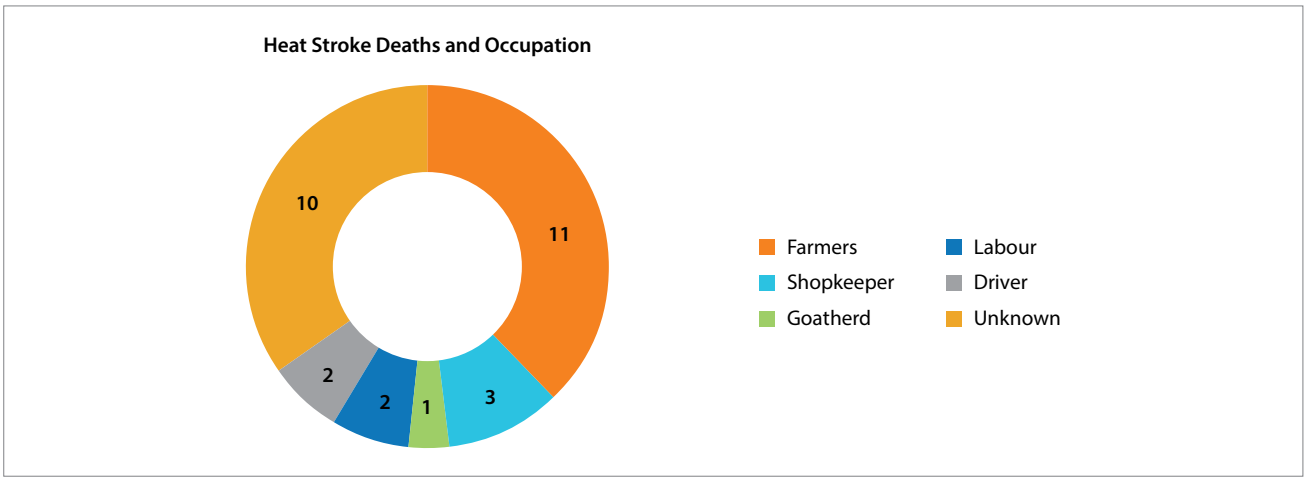
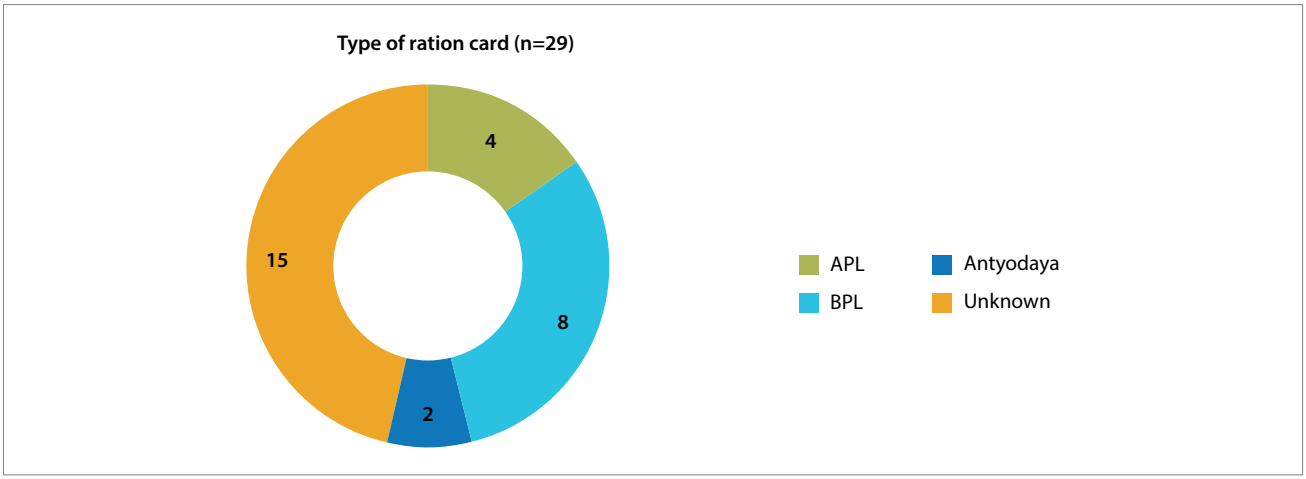


Figure 11: Socioeconomic status of cases and deaths due to heat related illnesses till date



Heat Wave Action Plan in Maharashtra

The Heat-Wave Action plan provides a framework for implementation, coordination and evaluation of extreme heat response activities in districts and cities in state that reduces the negative impact of extreme heat. The heat action plan's primary objective is to alert those populations at risk of heat-related illness in places where extreme heat conditions either exist or are imminent, and to take appropriate precautions, which are at high risk.

The heat-wave action plan is intended to mobilize individuals and communities to help protect their neighbours, friends, relatives, and themselves against avoidable health problems during spells of very hot weather. Broadcast media and alerting agencies may also find this plan useful. Severe and extended heat-waves can also cause disruption to general, social and economic services.

A. Awareness Activities

To increase general awareness among all the relevant stakeholders including people especially vulnerable communities, health-care providers and policy makers regarding impacts of heat and ways to address them.

Table 19: Sensitization workshop for State and District level Officers

Various levels of Training	Topics	Timeline
Sensitization workshops for State Level officers	• Introduction Heat related illness and its important • Role and responsibilities of state and regional level officers	January
Sensitization workshops for District Level officers	• Introduction Heat related illness and its important • Role and responsibilities of District level officers	February
Panchayati Raj Institute Workshops	• Prevention measures of Heat wave illness • Role and responsibilities of PRI	March

IEC Activities conducted in Maharashtra:

State has developed 5types of posters and distributed to all district and Municipal corporations (As per annexure). Aware generation about heat related illness on radio by state nodal officers and local news channel by District Nodal Officers. State has shared all health advisory time to time with all districts.

Table 20: IEC Plan for next five years

Sl. No.	Indicator Statement	Indicator	Target 2022-23	Target 2023-24	Target 2024-25	Target 2025-26	Target 2026-27
	IEC campaigns	Percentage of Districts implemented IEC campaign on heat related illnesses	50%	100%	100%	100%	100%
2	PRI and VHNC sensitization	Percentage of Districts included climate sensitive issues in the VHSNCs	25%	50%	75%	100%	100%
3	Community participation	Sensitization of rural population for HRI	Pilot study in one district	5 districts	50 %	75 %	100%

IEC activities for heat related illness

- At least 1-2 Wall Poster disseminated in all healthcare facilities.
- Social Media – active circulation of audio-video clips and poster slideshow in prominent social media handles.
- Radio jingles during March to July in high priority districts
- Sensitization workshops for district, state and regional level officers
- Community participation through meetings, heat related illness education in school, panchayati raj institutes and gram sabhas.

Year	IEC Content	Districts	Dissemination Plan for 5 (Years)	Time Line	Budget (Lakh)
2022-23	Posters	All districts	At least 2 posters for each health facilities	January-February 23	18 lakh
	Radio Jingles	High Priority Districts Low Priority Districts	Radio Jingles during winter season		
	TV Spots	All Districts	TV spots		
2023-24	Posters	All districts	At least 2 posters for each health facilities	January-February 24	20 lakh
	Radio Jingles		Radio Jingles during winter season		
	TV Spots		TV spots		
2024-25	Posters	All districts	At least 2 posters for each health facilities	January-February 25	22 lakh
	Radio Jingles		Radio Jingles during winter season		
	TV Spots		TV spots		
2025-26	Posters	All districts	At least 2 posters for each health facilities	January-February 26	25 lakh
	Radio Jingles		Radio Jingles during winter season		
	TV Spots		TV spots		

B. Capacity Building

- Clinical management training of HRI for all Physician, district nodal officer and district epidemiologist.
- Training for Surveillance of HRI and their reporting for district nodal officer, RMO outreach and district epidemiologist.
- Medical officer training for HRI Clinical management and Surveillance for HRI at district level.

Table 21: Training Calendar for HRI

Type of Training	Participants	Content of Training	Timeline
State Level ToT	State Level officers, Regional level officers, District level officers	Surveillance, Preventive Measures and Clinical Management	February
District Level Training	District level supervisors, THO	Surveillance, Preventive Measures and Clinical Management	March
Medical Officer Training	Medical officers	Surveillance, Preventive Measures and Clinical Management	April
Paramedical staff training	MPW, ANM, LHV, etc	Surveillance and Preventive measures	April
Panchayat Raj Institute training	PRI members	Awareness generation	April

Table 22: Budget

Year	Priority Districts	Time of year	Content matter	Budget
2022-23	All district	March-April	Heat related Illnesses	37.5 lakh
2023-24		March-April		40 lakh
2024-25		March-April		44 lakh
2025-26		March-April		48 lakh
2026-27		March-April		52 lakh

C. Surveillance Activities

The heat waves are generally experienced during the month of March to May in Maharashtra. The districts from Vidharbha, Marathwada, North Maharashtra and few districts from Konkan regions are mainly affected by heat waves. The daily reporting of heat stroke diseases starts from 1st March to 31st July every year. Every district is collecting information from their health facilities as per case definition.

- Daily monitoring of health-related illness by Joint Director of Health Services
- Report shared with NCDC & EMR division New Delhi
- Guidelines to all health facilities & district and municipal authorities on management of heat related illnesses – Establish heat stroke treatment room
- Efforts to develop Heat Action Plan
- Coordination with IMD to develop EWS
- IEC for public
- District Level Death Investigation Committee

It should be three member committee to confirm Heat Stroke Deaths.

This Committee will comprise of

1. District Civil Surgeon
2. District Surveillance Officer
3. Experts – Physician/Paediatrician either from GMC or Public health department.

Every suspected death should be investigated & confirmed by District Committee within 3 days of the death

State has conducted:

- Clinical management training of HRI for all physicians, district nodal officers, and district epidemiologist
- Training on Surveillance of HRI and their reporting for district nodal officers, RMO outreach and district epidemiologist.
- Medical officer training for HRI Clinical management and Surveillance for HRI at district level.

CHAPTER 8

Health Action Plan on Extreme Weather Event-Related Health Issues

Introduction

Maharashtra state is vulnerable to extreme weather events like floods, droughts, cyclone.12 per cent of land is prone to floods and river erosion; Maharashtra state has about 720 km long indented coastline, and is prone to cyclones and tsunamis; 68 per cent of the cultivable area is vulnerable to drought and hilly areas are at risk from landslides and avalanches. Heightened vulnerabilities to disaster risks can be related to expanding population, urbanization and industrialization, development within high-risk zones, environmental degradation, and climate change to ensuring clarity about roles and responsibilities of the State, District and local authorities.

Disasters disrupt progress and destroy the hard-earned fruits of painstaking developmental efforts in quest for progress. Maharashtra State has a profile of varied hazards and was first in India to start a Disaster Management Unit (DMU) after the Latur earthquake. Since 1993, Disaster Management (DM) in Maharashtra is fast evolving from a reactive response oriented to proactive strategy-based system. The state has witnessed the devastating disasters like Latur Earthquake in 1993, Mumbai Flood in 2005 and Cyclone Phyan in 2007.

Themes underpinning the Plan

- Vulnerability assessment of various disasters in the State
- Measures to be taken for prevention, mitigation, preparedness and response of disasters
- Steps that to be adopted for main streaming disaster in development plans/programmes/projects
- Importance of addressing capacity building and preparedness measures
- Clear delivery of role and responsibilities of each department of the government and of stakeholders

Following hotspot districts are identified each event

- **Drought:** Sangli, Ahmadnagar, Solapur, Dhule, Buldhana, Hingoli, Jalgaon, Osmanabad, Nandurbar, Nagpur, Satara, Akola, Nanded, Aurangabad,Pune, Amravati, Nashik,Jalna, garchiroli, Raigad, Chandrapur, Gondia, Wardha, Yavatmal.
- **Flood:** Mumbai, Jalgaon, Aurangabad, Pune, Nagpur, Amravati, Nashik, Ratnagiri, Wardha, Thane.
- **Cyclone:** Mumbai, Ratnagiri, Thane.

Health Adaptation Plan for Natural Disasters

Table 23: IEC dissemination plan for natural disasters under NPCCHH

IEC type	Material	Timeline	Mechanism
Advisory	bit.ly/NPCCHHPrg	Seasonal	By email to DNO for further dissemination to health facilities
Early warning	Bulletins/advisory by IMD (storm, cyclone), CWC (flood) sent by NPCCHH	Seasonal	• Health department/other government website/application • Digital display of temperatures on public places and health facilities
Posters	• 6 posters on various EWE and health impacts (English, Marathi) bit.ly/NPCCHHIEC • Posters on heat and health impacts	Seasonal, As needed	• Printing of copies for state-level dissemination at health facilities, public places/buildings • By email to DNO for printing at district level and dissemination to health facilities, schools and other public/government buildings
Hoardings	• Posters in Marathi (above)	Seasonal, As needed	• To be planned in High priority districts
Audio-Visual	• Audio Jingle • 5 Video messages (Marathi, English) bit.ly/NPCCHHIEC • Video message	Seasonal, As needed	• Played seasonally and around relevant extreme weather events
Digital display	5GIF Above mentioned video messages	Seasonal, As needed	Display in health facilities Public digital display boards in major cities
Social medial	All above material + Relevant activity updates	Seasonal, As needed	• Facebook and Twitter handle of state NPCCHH, NHM • WhatsApp groups (State DNO, Health facility group)

Strengthening Health Sector Preparedness

- **Early warning:** Dissemination of early warnings for Coldwave, Flood, Cyclone etc to health facility **level** and community level
- **Surveillance**
  - Post-disaster health impact assessment
  - Support post-disaster surveillance of communicable disease, health facility affected conducted by SDMA, IDSP or other agencies

Health Facility Preparedness

- Vulnerability assessment of health facility in context of climate change-extreme weather events
- Identify structural changes/retrofitting measures at the facility level to equip the healthcare facility
- Formalize disaster management plan and committee
- Emergency procurement arrangements & functioning of essential health services (safe water, immunization, maternal-child care etc)

- Post-disaster damage assessment and referral plan in case of health facility damage
- Ensure routine monitoring and maintenance of support functions (Water quality, waste management)
- Establish Sustainable procurement committee

Capacity Building

Table 24: Training Calendar

Type of Training	Participants	Content of Training	Timeline
State Level ToT	State Level officers, Regional level officers, District level officers	Preparedness Preventive Measures of disasters	December
District Level Training	District level supervisors, THO	Preparedness Preventive Measures and of disasters	January
Medical Officer Training	Medical officers	Preparedness Preventive Measures and of disasters	Jan- Feb
Paramedical staff training	MPW, ANM, LHV, etc	Surveillanceand Preventive measures, quick response teams	March
Panchayat Raj Institute training	PRI members	Awareness generation,	March

Budget

2022-23	All district	December-January	Preparedness and Capacity Building workshops	12 lakh
2023-24		January-March		12 lakh
2024-25		January-March		15 Lakh
2025-26		January-March		15 lakh
2026-27		January-March		18 Lakh

Roles and Responsibilities

	Responsibilities
SNO	• Disseminate early warnings to district level • Finalization of IEC material and dissemination Plan • Formalize intersectoral coordination for disaster planning, management and response with SDMA/IMD and other response departments • Organize training of district level officers • Facilitate assessment and implement of climate resilient measures in health facilities • Review implementation of IEC, training and surveillance activities at all levels • Evaluate and update relevant section of SAPCCHH with support from State Task Force • Create organizational support and strengthen Environmental Health cell to implement NPCCHH Vision, Goal and Objectives • Organize sensitization workshops for other stakeholders and line departments • Collaborate with academic institute/s for support in updating SAPCCHH, Surveillance activity monitoring, training of health care professionals, vulnerability assessment and applied research • Submit reports of activities on EWE and health under NPCCHH

	Responsibilities
DNO	• Disseminate early warning to block and health facility level • Ensure IEC dissemination to community level and facilitate community level IEC activities • Organize training for block health officers and MO • Formalize intersectoral coordination for disaster planning, management and response with SDMA/IMD and other response departments • Liaison with other departments for combined IEC campaigns, coordinated response and information sharing of health indicators for targeted action • Identification and communication of Evacuation routes &relief camps • Support planning and management of health care services in relief camps • Provide necessary IEC on health and sanitation in relief camps training for block health officers, medical officers, with relevant training manuals • Conduct sensitization of vulnerable groups: police officers, outdoor works, women, children etc. • Organize IEC campaigns at district level on observance of important environment-health days • Facilitate disaster vulnerability assessments in health facilities and maintain records of such assessment and health facility damage due to EWE • Update DAPCCHH with support from District Task Force • Submit reports of activities on EWE and health under NPCCHH
Block health officer	• Conduct community level IEC activities • Ensure training of medical officers • Organize PRI sensitization workshop and training for vulnerable groups • Facilitate disaster vulnerability assessments in health facilities and maintain records of such assessment and health facility damage due to EWE
Medical officer	• Conduct health facility-based IEC activities • Support community level IEC activities • Preparation of Disaster Management Plans and hospital safety plan • Assessment of health facility in context of climate change-extreme weather events • Identifying structural changes/retrofitting measures at the facility level to equip the healthcare facility • Ensuring routine monitoring and maintenance of support functions (Water quality, waste management) • Health facility preparedness for seasonal events
Panchayati Raj Institutions	• Conduct community level IEC activities • Community involvement in planning and demonstration of measure taken before-during-after an EWE

Observance of important environment-health days

Day	Activities on Heat-Health
International Day for Disaster Risk Reduction	IEC Campaigns • Audio-video spots broadcasting • Targeted awareness sessions: women, children, occupational groups • Mock drill, disaster response exercise • Sports events • Competition: poster, poem/essay, quiz Health facility level activities • Health facility-based patient awareness sessions • Conduct assessment of disaster vulnerability/energy/water conservation measures • Review of implementation of climate-resilient measures

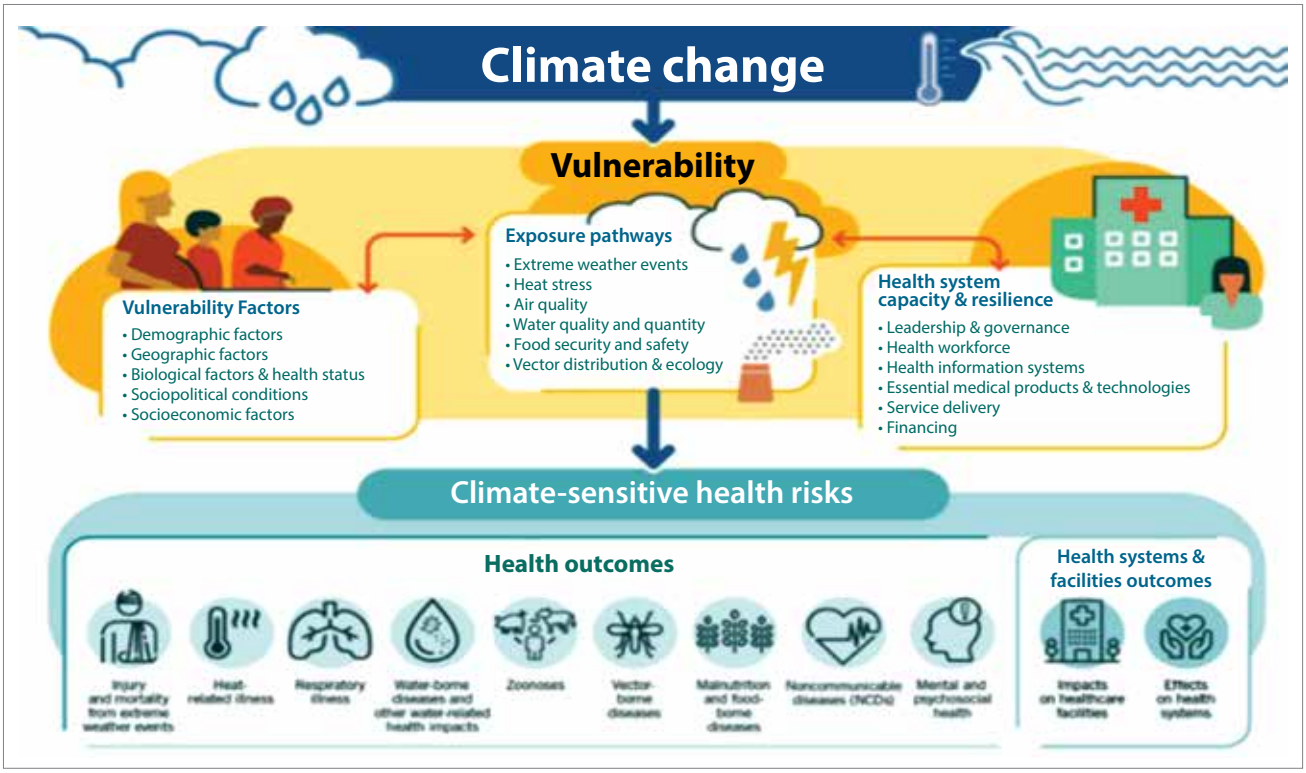
CHAPTER 9

Health Action Plan on Vector-borne Illnesses in Context of Climate Change

Introduction: Vector Borne diseases

Effect of variation in climate has been well established for illnesses which are spread through vectors or which are transmitted from animals to humans. According to World Health Organization (WHO) climate change is considered as one of the paramount threats to human health.

Direct impact of climate change on human health has been linked to long-term changes in rainfall and temperature, climatic extremes (heat-waves, hurricanes, and flash floods), air quality, sea-level rise in lowland coastal regions, and multifaceted influences on food production systems and water resources [2]. The negative impact of infectious diseases on health and well-being is intrinsically linked to a combination of multiple stressors or drivers such as poor sanitation, access to clean water and food, the quality of public health services, political instability and conflict, drug resistance, and animal and/or human population movements [3].



Reference [4]: https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health

The major vector for an infectious Vector Borne Diseases (VBDs) transmission is arthropods. The larval development stage generally requires the presence of humid conditions or availability of water bodies. Hence the sudden increase in the vector borne disease cases can be observed in rainy season. However adult arthropod serving as a vector in VBDs tends to have an increased biting rate with increase in temperature until temperature reaches up to an upper threshold, after which they decrease [5]. Apart from vector biting rate, the extrinsic incubation period or EIP also seemed to be accelerate, resulting into fast development and replication of pathogens transmitted within vectors at high temperatures [6]. Furthermore, vector development and survival are significantly affected by temperature conditions [7].

The entomological parameters affected by rainfall and temperature can be summarized using the maximum daily reproductive rate of the disease: the vectorial capacity [8]. The optimal temperature range for disease transmission varies depending upon the vector–pathogen combination being studied; however, vectorial capacities of the most harmful tropical VBDs consistently peak at relatively high temperatures [9].

The evidence suggests that future climate change, if not mitigated, will very likely impact the length of the transmission season and the geographical range of a significant proportion of infectious diseases [10].

Climate change can have an effect on the geographic spread, transmission dynamics, and re-emergence of vector-borne diseases through multiple pathways. The effects of climate change can be seen on the pathogen, the vector, non-human hosts and humans. Apart from these effects, climate change can alter complete ecosystem comprising multiple habitats including urban habitats, in which vectors or non-human hosts may flourish or fail.

As arthropods and other vectors are ectotherms, increase in the temperature is directly proportional to vector abundance, survival and feeding activity and the rate of development of the pathogen within the vector [11]. The major global vector-borne diseases identified by World Health Organization and are observed in India are malaria, dengue, chikungunya, Zika virus disease, Lymphatic Filaria, Leishmaniasis and Japanese Encephalitis (J.E.). However, in Maharashtra, Malaria, Dengue, Chikungunya, Lymphatic Filaria and J.E. these diseases are major vector borne diseases. Malaria, J.E. and Lymphatic Filaria are observed in specific regions of Maharashtra whereas Dengue is observed throughout the state.

Cases and Deaths due to Malaria, Dengue, Chikungunya for the year 2020

	Malaria			Dengue		Chikungunya	
	Positive cases	PF	Deaths	Positive Cases	Deaths	Positive Cases	Deaths
Corporation Total	5576	273	0	1639	4	297	0
District Total	7333	6302	12	1717	6	485	0
State Total	**12909**	**6575**	**12**	**3356**	**10**	**782**	**0**

Causes of different Vector Borne diseases in the state

i. Intermittent rains

ii. Traditional water storage practices

iii. Climatic condition variations

Factors contributing to increase of respective vector-borne diseases in the Maharashtra state

i. Increase in Vector density

ii. Increase in breeding sites

iii. Asymptomatic transmission

Priority Districts for Vector Borne diseases (according to Prevalence in the past years)

Vulnerability assessment

Weather variables: Temperature, rainfall, humidity, floods, drought, wind, daylight duration etc., Change in Vector/animal population due to change in growth, survival, feeding habits, seasonality, breeding sites, resistance etc., Change in interaction of vector/animal & pathogen due to change in susceptibility, Incubation period, or transmission, Change in demography, migration, land-usage practices, water projects, agricultural practices and Public health infrastructure and access to it.

Table 25: District wise Morbidity, Mortality and related statistics of Vector Borne diseases

District	Malaria		Dengue		Chikungunya	
	Morbidity	Mortality	Morbidity	Mortality	Morbidity	Mortality
Thane	39	0	66	1	11	0
Palghar	13	0	36	0	0	0
Raigad	68	0	4	0	2	0
Nashik	1	0	62	0	43	0
Dhule	13	0	48	0	0	0
Nandurbar	8	0	8	0	0	0
Jalgaon	3	0	116	0	2	0
Ahmednagar	3	0	7	0	30	0
Pune	2	0	79	2	72	0
Solapur	2	0	78	0	17	0
Satara	30	0	99	0	11	0
Kolhapur	13	0	194	1	118	0
Sangli	11	0	58	1	50	0
Sindhudurg	24	0	38	0	0	0
Ratnagiri	13	0	21	0	0	0
Aurangabad	2	0	36	0	1	0
Jalna	1	0	16	0	0	0
Parbhani	1	0	5	0	0	0
Hingoli	0	0	2	0	0	0
Latur	7	0	2	0	12	0
Osmanabad	1	0	18	0	16	0

District	Malaria		Dengue		Chikungunya	
	Morbidity	Mortality	Morbidity	Mortality	Morbidity	Mortality
Beed	4	0	39	0	40	0
Nanded	2	0	71	0	8	0
Akola	9	0	33	0	10	0
Washim	0	0	20	0	6	0
Amravati	11	0	132	0	15	0
Buldhana	5	0	22	0	3	0
Yawatmal	2	0	62	0	0	0
Nagpur	3	0	54	1	0	0
Wardha	0	0	110	0	0	0
Bhandara	14	2	8	0	0	0
Gondia	347	2	4	0	0	0
Chandrapur	196	3	153	0	18	0
Gadchiroli	6485	5	16	0	0	0
Total	**7333**	**12**	**1717**	**6**	**485**	**0**

Table 26: AES/J.E.: Morbidity & Mortality for the year 2020

State of Maharashtra AES/JE Report Year 2020					
Sl. No.	Districts	AES		JE	
		Cases	Deaths	Cases	Deaths
1	Wardha	6	0	0	0
2	Bhandara	5	0	0	0
3	Gondia	0	0	0	0
4	Chandrapur	1	0	1	0
5	Gadchiroli	0	0	1	1
Total		**12**	**0**	**2**	**1**

Risk Mapping to identify the 'Hot spots' for vulnerable population with respect to health infrastructure and other resources for Vector Borne diseases

1. Access to distant Health facility in tribal area
2. Geographical hurdles to implement entomological surveys in tribal areas

Sl. No.	Districts	Difficult to reach blocks
1	Nandurbar	Akkalkuwa, Akrani, Talode
2	Amrawati	Dharni, Chikhaldara, Achalpur
3	Gadchiroli	Bhamragad, Ittapalli, Allpalii, Sironcha
4	Palghar	Mokada, Jawahar

Table 27: Population density and burdened health facility in urban area

Sl. No.	Districts	Vulnerable urban hotspots
1	Mumbai	Mumbai
2	Thane	Bhiwandi, Shahapur, Kalyan, Ambarnath
3	Palghar	Vasai, Palghar

Awareness Generation

The state environmental health cell is closely working with state National Vector Borne Disease Control Programme (NVBDCP) division. The IEC activities for vector borne disease are jointly done by NVBDCP division and EHC:

a. Advertisement and promotion through IEC:
   i. Person to person communication method by ASHAs, MPWs and Insect collectors.
   ii. Messages to community through cultural programs and Street plays during Ganesh festival, Navaratri, etc
   iii. Pamphlets, Radio jingles, Hoards, billboards, as and other advertisement modes
b. Medical professional training:
   i. Expanded training of doctors and associate staff
   ii. Increased training of NGOs and Asha workers
c. Carry out mass media campaigns
d. Promote a culture of risk prevention, mitigation, and better risk management
e. Promote attitude and behaviour change in the awareness campaigns linking air pollution and climate change.
f. Engage local and regional media (community radio, TV)

Table 28: IEC Dissemination Plan

IEC type	Material	Timeline	Mechanism
Posters	• Posters on VBD and climate change (English, Marathi) • Adopt posters made by state NVBDC	Pre monsoon and Post monsoon	Collaborate with NVBDCP
Wall painting	Wall painting malaria endemic Districts	Seasonal	Government school, offices and Gram panchayat buildings
Hoardings		Seasonal	To be planned with hotspot Municipalities and District
Audio-Visual	• 3 Audio Jingles	Pre monsoon and Post monsoon	Radio Channels
Digital display	• Available GIF • Above mentioned video messages	Seasonal	Display in health facilities Public digital display boards in major cities
Social medial	All above material + Relevant activity updates		• Facebook and Twitter handle of state NPCCHH, NHM • WhatsApp groups (State DNO, Health facility group)

Observance of important environment-health days

Observance of following days may be recommended for awareness on climate change and vector-borne diseases.

Day	Activities on VBD in context of climate change
• World malaria day (April 25) • World mosquito day (August 20) • World Environmental Health Day (September 26)	IEC Campaigns • Targeted awareness sessions: urban slums, schools, women, children • Street plays and local cultural activities, Rallies • Clinical management training for Dengue • Dengue awareness week

Capacity Building

The state has been regularly conducting training for district level officers, medical officers and paramedical staff for surveillance and clinical management.

Table 29: Training plan

Training Programme for	Trainer	Topics	Timeline
District level (DNO-NPCCHH, trainers)	State Level Trainers SNO-NPCCHH, Consultant	• Role of climate change impact on VBD burden, prevention measures • Tracking of VBD and Integrating rainfall, humidity and temperature parameters with VBD surveillance • Post-disaster VBD surveillance, prevention, management	June-July
Health facility level (MO of DH/RH/PHC)	District Level Trainers DNO-NPCCHH	• Role of climate change impact on VBD burden, prevention measures • Strengthen surveillance reporting • Post-disaster VBD surveillance, prevention, management in community and at relief camps	July-August or after extreme weather events/ natural disasters
Community Health care workers (MPH, ASHA, ANM etc)	District Level Trainers, MO	• Role of climate change impact on VBD burden, prevention measures • Post-disaster VBD surveillance, prevention, management in community and at relief camps	
Panchayati Raj Institutions	District level trainers, MO, Health care workers	• Role of climate change impact on VBD burden, prevention measures	

Strengthening Health Sector Preparedness

- Integrate weather parameters with VBD surveillance under NVBDC at District level
- Surveillance training: included under capacity building section
- VBD prevention and control measures

- Planning of indoor residual spray a month before peak of malaria cases based on historical data
- Management of new foci of transmission in endemic areas
- Epidemic preparedness especially after extreme weather events or natural disasters

Roles and responsibilities (Govt & non- Govt)

NVBDCP, Maharashtra	Overall guidance and policy formulation	Guide and the state governments in resurgence and containment of any VBD
State Nodal Officer, Climate Change	To support the state govt. in control of VBDs particularly in climate sensitive states	• Oversee vector control measures • Oversee health sector preparedness • Oversee VBD surveillance, control in post-disaster situations in community and relief camps • Train DNO, DMO • Sensitization workshops to increase awareness on climate change and its impact on VBD
India Meteorological Department	To provide meteorological data as and when required	• To help the state govt. in collaboration with any research institute, in analysis of relationship between climatic factors and a particular VBD so as to forewarn the impending outbreaks.
NGO at state and district level for reach to community	Heath education at community level	• Conduct workshops for IEC activities for different level of staff in the identified areas in consultation with the state govts
State Programme Officer	Overall planning and execution of surveillance and intervention measures to control VBDs	• Supervise and guide the DMOs in control of VBDs
State Entomologist	To provide guidance in vector control.	• Generate data on fortnightly fluctuations in density of vector species so as to guide the state government in choosing appropriate time of IRS activities. To generate data on susceptibility status of disease vectors forusing appropriate insecticide forIRS/larvicide for vector control
Chief Medical Officer/ District Malaria Officer/ Disease Surveillance officer	Execution of task assigned by the SPO	• Supervise and guide surveillance and intervention measures for control of VBDs in the district.
Media	To be vigilant for report of any upsurge/outbreak of any VBD.	• Impart health education to masses through print and audiovisuals means

Surveillance

Mechanism of Generation of Alert system for the outbreak of Vector Borne diseases:

- State has developed daily reporting system for outbreaks
- District level Rapid Response teams are formed for prompt action.

- At state, staff from communicable disease sections, National vector Borne Diseases control and prevention (NVBDCP) and Integrated Disease Surveillance program (IDSP) all together formed a common section for Communicable diseases to strengthen Alert generation system for the outbreak through IHIP.
- Every member of this team shares news regarding vector borne diseases published in the various newspapers.
- State has also encouraged health department staff to generate an outbreak event on IHIP system.

CHAPTER 10

Action Plan for Green and Climate Resilient Health Care Facilities

Introduction

The aim of building climate resilient and environmentally sustainable health care facilities is: (a) to enhance their capacity to protect and improve the health of their target communities in an unstable and changing climate; and (b) to empower them to optimize the use of resources and minimize the release of pollutants and waste into the environment. Such health care facilities contribute to high quality of care and accessibility of services and, by helping reduce facility costs, also ensure better affordability.

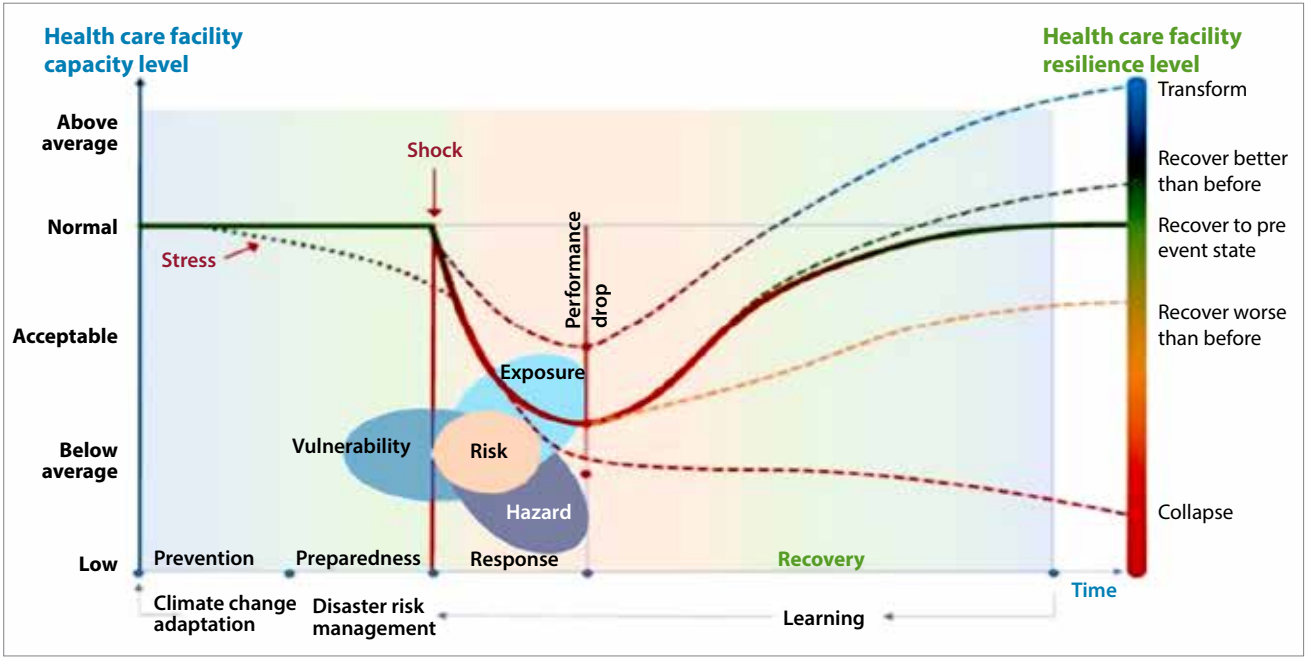
As the climate continues to change, risks to health systems and facilities—including hospitals, clinics, and community care centers—are increasing, reducing the ability of health professionals to protect people from a range of climate hazards. Health care facilities are the first and last line of defense to climate change impacts. They can be responsible for large emissions of greenhouse gases (GHGs), but also, provide the needed services and care to people harmed by extreme weather and other climate hazards. Health care facilities can also produce large amounts of environmental waste and contamination (GHGs and other contaminants) which may be infectious, toxic, or radioactive and therefore a threat to the health of individuals and communities. Health care facilities provide health treatments and related procedures to patients and vary in size from small health care clinics to very large hospitals. In many countries, they often lack functioning infrastructure, an informed and trained health workforce to address environmental challenges, and are subject to inadequate energy supplies, water, sanitation, and waste management services. Improving these is a priority and is key to building resilience and contributing to environmental sustainability.

Understanding Climate Resilience and Environmental Sustainability of healthcare facilities

There are several definitions that support our understanding of these subjects. Health systems include an ensemble of all public and private organizations, institutions and resources mandated to improve, maintain, or restore health as well as incorporate disease prevention, health promotion and efforts to influence other sectors to address health concerns in their policies. Health system resilience is the capacity of health actors, institutions, and populations to prepare for and effectively respond to crises; maintain core functions when a crisis hits; as well as stay informed through lessons learned during the crisis and reorganize if conditions require it. It is the ability to absorb disturbance, to adapt and to respond with the provision of needed services.

Climate resilient health care facilities are those able to anticipate, respond to, cope with, recover from and adapt to climate-related shocks and stress, so as to bring ongoing and sustained health care to their target populations, despite an unstable climate. Figure 12 illustrates the important dynamics affecting the climate resilience of health care facilities. Building on the concept of risk as a function of hazards, vulnerabilities and exposures (illustrated in the figure as a triangle, as defined by the Intergovernmental Panel on Climate Change (IPCC)), it depicts how hazards, in the form of a sudden event (a shock, such as a storm or sudden flood), or a slow-onset event (a stress, such as a drought, sea-level rise or high volume of cases of a climate-related disease), will reduce the health care facilities level of performance and capacity (left axis). This would occur through a combination of impacts on key facility elements (for example, increasing—or adding to—the vulnerability of the health workforce, its infrastructure, its water, sanitation and energy systems), and therefore increasing risks. The level of resilience (right axis) indicates whether the facility will recover its pre-event state, recover to a state worse than before (or even collapse and not recover) or recover and attain a level of resilience greater than before the event. The figure also highlights the risk management steps for prevention, preparedness, response, and recovery.

Figure 12: Climate Resilience in Health Care Facilities



Strengthening Climate Resilience and Environmental Sustainability:

Making HCFs climate resilient and environmentally sustainable would contribute to achieving SDGs related to climate change, sustainable consumption, water and sanitation, energy, employment, resilient infrastructure and health and well-being.

The National Programme on Climate Change and Human Health (NPCCHH) is engaging critically with strengthening the healthcare services and facilities to adapt to as well as mitigate the impacts of climate change. The key components recognized under the programme include:

1. Environmentally Sustainable (Green) Measures at Health Care Facilities:
    a. Energy Auditing

b. Installation of LED lighting at Health Care Facilities

c. Installation of Solar panels

d. Water Conservation Measures – Rain water Harvesting

2. Climate Resilient Infrastructure at Health Care Facilities including Retro Fitting of Existing Health Care Facilities.

1. Environmentally Sustainable (Green) Measures at Health Care Facilities

a. Energy Auditing

An energy audit identifies all energy end-users within the building, estimates how much energy is used in each department, and determines the amount of energy used in relation to the desired values.

The guiding principles in this respect include:

- The HCFs would develop a plan for the energy audit to assess the level of energy consumption.
- The responsibility for the energy audit would be of the IPC committee of the facility. If the healthcare facility lacks qualified staff, then the energy audit would be conducted by the state health department as well.
- The energy audit would also consider load management, poor maintenance aspects, and extreme temperature to avoid fire-related accidents. Audit would be conducted in the facility biannually.
- Installing sub-meters in the facility premises would be useful in understanding how much energy is used across the healthcare facility

b. Replacing the existing non-LED lights with LEDs

Replacing the incandescent bulbs with LEDs leads to 75% less energy consumption. Each LED light saves approximately INR 700-1400 over the course of a year.

The guiding principle in this respect would be:

- Healthcare facilities would have a policy on purchasing and using energy- efficient equipment and devices. The facilities would gradually phase out the incandescent bulbs with LEDs.

c. Installation of Solar panels

Healthcare facilities both in urban and rural areas consume a lot of energy throughout the day as the electrical equipment used directly or indirectly to treat patients requires uninterrupted power.

The guiding principle in this area would be:

- The state would, in a phased manner, install PV solar panels in unused spaces like the roof of the facility. This would reduce grid-based electricity consumption and decrease the peak demand of a facility, which means the organization has lower operating costs, and hence these saved costs can be utilized for better patient care.

d. Water conservation

In an HCF, sanitary fixtures consume 42 per cent of water while heating ventilation and air conditioning (HVAC) consumes 23 per cent of water, thus, major water-consuming area needs to be focused on reducing water consumption.

Rainwater harvesting for healthcare facilities has the potential to save thousands of liters of water every year. This in turn can result in substantial cost savings in addition to adopting climate-smart practices.

The guiding principles for water conservation in a HCF would be as follows:

- The healthcare facility would develop a strategy for the optimum usage of water.
- The HCFs would develop a plan for the conservation of water. e.g., water- efficient fixtures, dual flush mechanism, sensor operated urinals, waterless urinals, rainwater harvesting
- The HCFs would have a plan for the wastewater treatment. e.g., sewage treatment plant and effluent treatment plant at sites of generation of contaminated grey water, like pathology.
- The HCFs would develop a programme/plan for the conservation of water
- The HCFs would have a water management programme for the conservation of water by establishing a team, setting goals with timelines, conducting water audits, determining the cost of water and preparing an action plan
- The HCFs would have an ongoing educational programme for the efficient usage and conservation of water for all the stakeholders (staff, patient and visitors)
- The HCFs would have a plan to train the staff on water savings techniques
- The HCFs would develop a wide variety of methods to communicate through IEC materials, new and/ or revised operating guides and manuals.

Climate Resilient Infrastructure at Health Care Facilities including Retro Fitting of Existing Health Care Facilities

It is essential that HCF planning and designing should be responsive to local climate and hazard profile of the district. Strong focus should be given to designing all aspects of infrastructure and services as per relevant IS standards, building codes and local byelaws, and history of emergencies in the district to ensure patient safety and continuity of health service during emergencies. Few key interventions that would be undertaken to make the HCFs into green buildings would include:

New Buildings

- Climate risk assessment at the time of planning and designing the building.
- Use of high-performance glass on windows, doors, and roofs to prevent the heat inside and allows sunlight and fresh air to enter the room.
- Use double glazing glass on windows; it provides thermal and optical properties to the building and reduce the noise level.
- Insulation of building from inside and outside in colder regions of the country.
- Ensure the plinth level is above the high flood level as known locally or storm surge level (in costal districts) and make the building accessible with ramps and railing to create a barrier free environment.
- Installation of Rainwater Harvesting System
- Installation of alternative energy systems
- Installation of STP & ETP

Existing Infrastructure

- Introduction of electronic patient records in the facility to reduce the use of paper.
- Availability of 10-30 per cent area for the herbal garden in the facility.
- Floor and wall finishes are conducive for infection prevention control practices.
- Modifications in the critical care rooms to make them functional during disasters.
- Installation of Rainwater Harvesting System
- Installation of alternative energy systems
- Installation of STP & ETP

Guidelines from NPCCHH

- Guidelines for Green and Climate-Resilient Health Facilities (2023): https://ncdc.gov.in/showfile.php?lid=959
- Guidelines for Solar Powering Health Facilities (2023) https://ncdc.gov.in/showfile.php?lid=960

Sample interventions

	Objectives	Climate Resilience	Environmental Sustainability
Health workforce	**Human resources**	Identify minimum needs in terms of health care workers to ensure the operational sufficiency of every HCF department, in case of climate-related disaster or emergency	Increase human resources available to reduce or eliminate disease burden among vulnerable populations resulting from environmental hazards in HCFs
	Capacity development	Health workforce receives training and exercises for preparing for, responding to and recovering from extreme weather-related emergencies	Education and training provided to HCF staff and the community on environmental factors that contribute to the burden of disease
	Communication and awareness raising	Key messages for target audiences (such as patients, staff, public) drafted in preparation for the most likely extreme weather disaster scenarios	Increase knowledge and communication about the environmental impact of pharmaceuticals and their disposal
Water, sanitation and health care wastes	**Monitoring and assessment**	Develop climate resilient water safety plans	Implement and monitor a waste reduction program including waste management training for all staff
	Risk management	WASH climate risk management plan implemented	Wastewater is safely managed through use of on-site treatment or sent to a functioning sewer system
	Health and safety regulation	Sanitation technologies designed to be more resistant to climate hazards and able to operate under a range of climate conditions	Harvested rainwater or gray water is safely used to flush toilets, clean outdoor pavement areas and water plants when possible
Energy	**Monitoring and assessment**	Assess that location of energy backup or renewable energy infrastructure can withstand extreme weather events (such as strong winds, hail, floods)	Assess the HCF to determine how and where energy use can be reduced (or increased in energy poor areas)

	Objectives	Climate Resilience	Environmental Sustainability
	Risk management	Plan development for managing intermittent energy supplies or system failure	HCF fossil fuel consumption reduced by use of renewable energy sources, including solar (photovoltaic) power, wind power, hydro power and biofuels
	Health and safety regulation	Adequate lighting, communication refrigeration and sterilization equipment are available during climate-related disasters or emergencies	Developed an energy management plan to measure energy consumption
Infrastructure, technology, Products	**Adaptation of current systems and infrastructures**	HCFs built or retrofitted to cope with extreme weather events, ensuring their resilience, safety and continuous operation	New (or retrofitted) HCFs designed and constructed based on low-carbon approaches
	Promotion of new systems and technologies	HCF uses proven smart materials and applications, sensors, low-power electronics, telemedicine and similar health care-appropriate technology	Substitute mercury-containing thermometers and blood pressure-measuring devices for affordable, validated device alternatives
	Sustainability of HCF operations	Anticipate the impact of the most likely disaster events on the supply of water, food and energy	Implement a clear environmentally sustainable procurement policy statement or protocol for all types of product, equipment and medical devices used in the HCF

Capacity Building

Health workers have a key role in building climate resilience and environmental sustainability of HCFs. Health care workers are the main actors in ensuring that interventions are effective for their own roles and activities, as well as for other components of the framework. Because building climate resilience and environmental sustainability are relatively new approaches for health workers, building awareness, training and empowering health workers are key requirements for the successful implementation of interventions.

Table 30: Annual training plan for Climate resilience Hospitals, Maharashtra

Training Programme for	Trainer	Topics	Timeline
District level (DNO-NPCCHH, trainers)	State Level Trainers SNO-NPCCHH, Consultant	• Role Training on green and climate-resilient health care facilities in terms of climate impact • Assessments required for implementation • Coordination with supporting agencies	September
Health facility level (MO of DH/CHC/PHC)	District Level Trainers DNO-NPCCHH	• Role Training on green and climate-resilient health care facilities in terms of climate impact • Assessments required for implementation • Coordination with supporting agencies	September-October
Community Health care workers (MPW, ASHA, ANM etc.)	District Level Trainers, MO	• Role Training on green and climate-resilient health care facilities in terms of climate impact	October-November
Panchayati Raj Institutions	District level trainers, MO, Health care workers	• Role Training on green and climate-resilient health care facilities in terms of climate impact • Assembling support for implementation	December

Role and responsibility

	Responsibilities
SNO	• Disseminate early warnings to district level • Finalization of IEC material and dissemination Plan • Organize training sessions for district level officers and trainers • Identify health facilities for priority implementation based on disaster and health facility vulnerability • Identify relevant state and district level nodal agencies and collaborate with them for assessment of health facilities for implementation of measures • Facilitate and monitor necessary assessments at health facility level • Facilitate implementation of structural and functional measures at health facility level • Submit report of activities on heat-health under NPCCHH • Advocate for reduction in source of greenhouse gas emissions
DNO	• Conduct training for block health officers, medical officers, with relevant training manuals • Support conduction for following assessment at health facility level • Energy audit • Water audit • Disaster-vulnerability assessment • Support following functional measures at health facility level • Water committee • Sustainable procurement committee • Operational measures to make health facility functioning during disasters or power cut • Coordinate with other agencies for assessment and implementation of identified structural and functional measures • Update DAPCCHH with support from District Task Force • Submit report of activities on heat-health under NPCCHH
Block health officer	• Ensure training of medical officers • Organize PRI sensitization workshop • Coordinate with other agencies for assessment and implementation of identified structural and functional measures
Medical officer	• Conduct health facility assessment • Energy audit • Water audit • Disaster-vulnerability assessment • Lead following functional measures • Water committee • Sustainable procurement committee • Operational measures to make health facility functioning during disasters or power cut • Support community level IEC activities • Identify local funding opportunities: e.g., CSR initiative, NGO funding
Panchayati Raj Institution	• Support retrofitting and new health facilities with local funding source and community involvement

Plan of implementation of green measures in healthcare facilities 2022-2027

Green Measures in Healthcare facilities	Units						Budget
	2022-23	2023-24	2024-25	2025-26	2026-27	Total	
Replace existing Lighting Non-LED with LED in CHC	100	100	100	100	46	**446**	28 lakh
Replace existing Lighting Non LED with LED in PHC	400	400	400	400	211	**1811**	40 lakh
Installing Solar panels at CHC	75	75	75	75	50	**350**	350 lakh
Installing Solar panels at PHC	200	200	200	200	200	**1000**	750 lakh
Installing Rainwater harvesting System CHC	75	75	75	75	50	**350**	175 lakh
Installing Rainwater harvesting System PHC	200	200	200	200	200	**1000**	300 lakh

PART III

Budget

CHAPTER 11
Budget

Sl. No.	Activities	Indicator	BUDGET (in lakhs) for 5 years with 10 % increase every year					Target for five years 22-27				
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5
Programme Management												
1	Taskforce meeting to draft health sector plan for heat and air pollution	State Task Force Quarterly Meetings conducted in a year	4	4.5	5	5.5	6	25%	50%	75%	100%	100%
		Districts conducted quarterly District Task Force Meetings in a year						20%	40%	60%	80%	100%
2	Sensitization workshop/ meeting of the state programme Officers and District level Health Officers		16.21	16.21	20	23.5	27	50%	75%	100%	100%	100%
General Awareness												
3	Development of IEC material, campaigns, Innovative IEC/ BCC Strategies	% of Districts implemented IEC campaign on all climate sensitive issues	21.5	6	24.72	28.43	32.69	50%	100%	100%	100%	100%
Capacity Building												
4	Orientation/ Training/ capacity Building of healthcare staffs	% of Districts completed TOT	50	55	60.5	66.5	73	100%	100%	100%	100%	100%
		% of Medical Officers trained in Districts						50%	80%	100%	100%	100%

Sl. No.	Activities	Indicator	BUDGET (in lakhs) for 5 years with 10 % increase every year					Target for five years 22-27				
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5
		% of health workers and ASHA/AWW trained on NPCCHH in District						30%	50%	70%	100%	100%
		% of targeted sensitization trainings planned for vulnerable population in district (PRI Training)						30%	50%	70%	100%	100%
Strengthening of the Health System												
5	Adoption of Green/ Environment Friendly Measures in Health facilities	Energy Audit: % of healthcare facilities per district per year that have conducted energy audit	34.02	37.5	41.25	45.35	49.8	20% of district covering 20 % of healthcare facilities	35% of district covering 35 % of healthcare facilities	50% of district covering 50 % of healthcare facilities	75% of district covering 75 % of healthcare facilities	100% of district covering 100 % of healthcare facilities
		LED lighting: % of healthcare facilities per year that installed solar panel						10% of district covering 10 % of healthcare facilities	20% of district covering 20 % of healthcare facilities	50% of district covering 50 % of healthcare facilities	80% of district covering 80 % of healthcare facilities	100% of district covering 100 % of healthcare facilities
		Solar Panel: % of healthcare facilities per district per year that installed solar panel						20% of district covering 5 % of healthcare facilities	35% of district covering 10 % of healthcare facilities	50% of district covering 40 % of healthcare facilities	80% of district covering 70 % of healthcare facilities	100% of district covering 100 % of healthcare facilities
		Rain water harvesting: % of healthcare facilities per district per year that installed rain water harvesting system						10% of district covering 5% of healthcare facilities	30% of district covering 10 % of healthcare facilities	50% of district covering 20 % of healthcare facilities	80% of district covering 50 % of healthcare facilities	100% of district covering 100 % of healthcare facilities

Note: Year 1 = FY 2022-23; Year 2 = FY 2023-24; Year 3 = FY 2024-25; Year 4 = FY 2025-26; Year 5 = FY 2026-27.

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Annexures

Annexure 1: City wise List of Sentinel hospitals selected for ARI surveillance activity

Name of City	Name of the hospital	Name of the nodal person	Contact details of the nodal officer	Email ID
Solapur	Dr. V.S. Medical College Solapur	Dr. Abdul Latif Mohmadad Shaikh	8975858404	alms59@gmail.com
Mumbai	JJ Hospital	Dr. Usha Rangnathan	9022126068	ushamarul@gmail.com
Mumbai	JJ Hospital	Dr. Prashant	9869205117	prashanthowal@gmail.com
Nashik	District Hospital Nashik	Dr. Pramod Gunjal	9011928067	csnashik2015@gmail.com
Amravati	District Hospital Amravati	Dr. Satish Humane	9422978738	csamravati2016@gmail.com
Sangli	GMC, Sangali	Dr. Santosh Mali	9423551562	drsantoshsmali@gmail.com
Jalgaon	GMC Jalgaon	Dr. Dattatray Birajdar	7888217431	deangmcjalgaon@gmail.com
Jalna	District Hospital, Jalna	Dr. S P Kulkarni	7875900104	csjalna11@gmail.com
Kolhapur	CPRH, Kolhapur	Dr. Anita Saibannavar	9822087776	saibannavar@yahoo.co.in
Latur	GMC Latur	Dr. Abhijeet Yadav	9403862846	abhijeety1988@rediffmail.com
Latur	GMC Latur	Dr. AnandAdarwad	8668504063	anandmoya2000@yahoo.co.in
Akola	GMC Akola	Dr. GopalsingSolanke	7405524335	drgopalsing0@gmail.com
Badlapur	RH Badlapur	Dr. Sanjay Vathore	8169164960	rhbadlapur@gmail. commsrhbadlapur@gmail.com
Ulhasnagar	Central Hospital Ulhasnagar	Dr. SuhasMonalkar	9892026643	ulhasnagarcs@gmail.com
Aurangabad	GMC Aurangabad	Dr. Avinash Ramrao Lamb	9967731270	chesttba@gmail.com
Pune	B. J Medical College, Pune	Dr. Sanjay Gaikwad	9890423689	sangaiabdc@gmail.com
Nagpur	GMC Nagpur	Dr. Sushant Meshram	9860990379	drsushant.in@gmail.com
Chandrapur	GMC Chandrapur	Dr. Niwruttijiwane	9028380268/ 07172-277107	dr.niwrutti.n.jiwane@gmail. comgmcchandrapur@gmail.com
New Mumbai	General Hospital Vashi	Dr. Ujjawala Oturkar	9867262063	nmmc.ehc@gmail.com

Annexure 2: Role of different ministries in control of Air Pollution

Ministry of Health & Family Welfare

- Develop/adapt health micro-plan for Respiratory diseases (case management, resources required like logistics, drugs, vaccines, and laboratories' role).
- Map vulnerabilities: population at risk, geo-climatic conditions, seasonal variation, exposure to pollens or allergens by change in types of crops or flower plants, change in population demography, migration (in & out), available resources, healthcare infrastructure, laboratories, burden of chronic illnesses in the community.
- Strengthen/Initiate Sentinel surveillance, real-time surveillance, evaluation and monitoring system for respiratory and cardio-vascular illnesses, hospital admission as well as Enhance vaccination programs and 'Vaccination Campaign' for vaccine-preventable air borne and respiratory diseases.
- Develop or translate IEC in local language, and make a communication plan for dissemination of health-related alerts/education materials.
- Capacity building and increasing awareness for individuals, communities, health care workers through involvement of various media as well as campaigns and training workshops.
- Ensure adequate logistic support, including equipments and other treatment modalities and supplies for case management at all levels of health care and also under 'Emergency response Plan' in case of any disaster where air borne illnesses may occur as an outbreak.
- Inter-sectoral and stakeholders' coordination to monitor health outcomes with early warning system related to extreme weather events/Air Quality Index/ground level Ozone etc.

Ministry of Environment, Forests and Climate Change

- Ensure that State Pollution Control bodies set standards for industry-specific emission and effluent, monitor levels of pollutants and enforce penalties.
- Enforce strict air quality standards for pollution
- Strict implementation of Environment Impact Assessments (EIA) to minimize the adverse impact of industrial activities on the environment
- Effective implementation of 'National Green Tribunal' directives on trash burning/waste disposal from different sources
- Take strict measures for unregulated sectors (such as brick kilns, trash burning, stone crushing) which contributes to ambient air pollution

Ministry of Human Resource Development

- Regular screening of school children for early detection of diseases, this can be attributed to the existing air pollution.
- Inclusion of harmful health effects of environmental pollution (AAP and HAP) in the school curriculum (state board), including current policies and mitigation practices that are designed to reduce air pollution.
- Improve indoor air quality of educational institutions statewide.

- Improve walkability and access to educational institutions by non-motorised transport, thus minimizing the air pollution in the school surroundings
- Sensitize students and teachers on using the Air Quality Index in planning outdoor school activities

Ministry of Agriculture

- Policy in place to promote multiple uses of crop residues and prevent their on-farm burning.

Ministry of Rural Development

- Include health promotion (like clean air) guidelines as part of "Nirmal Gram Puraskar"/Model Villages evaluation criteria/create alternate awards with specific criteria based on air pollution at the state level.
- Under integrated rural development, develop and implement micro level planning policies/ schemes with Panchayati Raj Institutions to address the social determinants of health for reducing the hazards of air pollution (lack of education, unemployment, poverty, poor housing conditions, etc.)

Ministry of Urban Development

- Formulate/revise urban transport policy which reduces vehicular pollution
- Implement policies to reduce indoor air pollution (like disincentivizing diesel gensets and promoting clean cooking fuels thus 'making available clean and making clean available')
- Enforcement of ban on burning garbage or biomass (especially during winter months)
- Help cities develop air pollution alerts and emergency plans based on the Air Quality Index or CPCB continuous air monitoring data

Ministry of New & Renewable Energy

- Implement policies for truly clean cookstoves and support research and development.
- Research and development of other non-conventional/renewable sources of energy and programmes relating thereto, including locally generated power to supply cooking appliances;
- Support and strengthen Integrated Rural Energy Programme (IREP) with emphasis on indoor air pollution
- Create a consensus action plan for replacing biomass fuels with alternative clean fuels

Ministry of Petroleum & Natural Gas

- Expand new initiatives to increase the availability of LPG and other cleaner fuels to the rural & tribal areas
- Expand the piped natural gas network to reach out to a larger population

Ministry of Power

- Promote/develop more efficient cooking devices
- Evaluate the potential for electric cooking appliances to substitute for biomass and LPG

Ministry of Road Transport and Highways

- Ensure effective implementation of New Motor Vehicles Act, once approved
- Ensure proper engine checks for vehicles to assess pollution levels

Ministry of Information and Broadcasting

- Develop hard hitting, high impact and cost effective media plans, strategies and conduct activities for awareness generation on harmful effects of air pollution and options for their mitigation.
- Ensure enforcement of relevant provisions in the Cable Television Networks Act to regulate advertisements of tobacco etc.
- Involvement of Songs & Drama division; Department of Field Publicity to promote health promotion activity for air pollution and its impact on respiratory and NCD risk factors
- Develop policies to ensure that media houses allocate free airtime for health promotion messages as a corporate social responsibility activity

Ministry of Communications & Information Technology

- Use of mobile phones to encourage healthy choices and warn people about air pollution (both AAP and HAP, using Air Quality Index)
- Establish Telemedicine linkages between different levels of health care in the state

Ministry of Labour and Employment

- Regular health checkups for early screening of pollution related diseases.
- Frame guidelines and conduct workshops for health promoting workplaces, (guidelines on indoor air quality)
- Showcase and support companies which employ workplace policies that can reduce vehicular travel such as telecommuting, or placing the workplace in sites that are accessible through public transportation (eg. Metro) or non-motorised transport.

Ministry of Women and Child Development

- Advocate through Self Help Groups and Mahila Mandals for protection of women and children from significant exposure to smoke from biomass while inside the house.
- Awareness raising can be done to improve household ventilation to reduce smoke inhalation from lighting (ex. kerosene) or cooking fuel

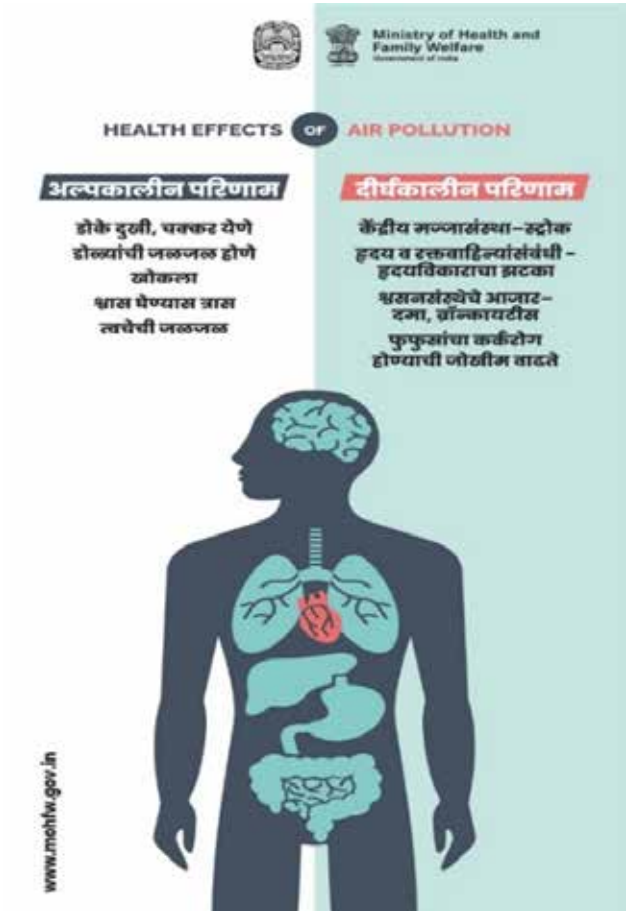
Ministry of Finance

- Analysis of the economic and financial implications of the health and other impacts of air pollution in the state

Ministry of Law and Justice

- Support enforcement on bans of burning trash for heating or as a way of disposal

Air Pollution IEC



Roles and Responsibility of Task Force Members

Sl. No.	Task force Member	Role and Responsibility for Air Pollution control in state
1	SNO-NPCCHH	Overall responsibility to co-ordinate activities of assessing impact of Air Pollution on health and to suggest measures to reduce the same. Co-ordinate with **Directorate of Medical Education to** • To collect and compile data of patients with respect to Air Pollution effects on human health. • To assist research on Air pollution impact on Health initiated by central/ state govt ministry, ICMR or any other agencies.
2	Director, from any research Institute	• To create evidence of Air Pollution impact on health by undertaking various studies, research for the same.
3	Director, Meteorological department of State/UT	• To provide timely data of temperature, rainfall, wind speed or any other relevant meteorological factors having relation with increase or decrease of air pollution for particular city/district. • To give inputs for reducing air pollution in relation to meteorological factors.
4	Chairperson, State Pollution Control Board	• To provide Air Quality Data for the cities identified under the Sentinel Surveillance for assessing impact of Air Pollution. • To undertake measures to reduce the Air pollution and improve quality of air. • To monitor the progress of activities undertaken for reduction of Air Pollution.
5	Chairperson, State Disaster Management Authority	• To monitor the situation of the Air Pollution in different cities of state.
6	State Surveillance Officers	• To take necessary actions in regular data collection and analysis of data. • To prepare and disseminate IEC on regular basis to the cities where air pollution is the big issue for public health.
7	Environmental Engineer/ Senior Scientist from MOEFCC	• To enlist & share probable causes of increase in air pollution within cities of the state. • To give necessary inputs to reduce air pollution as per the causes identified.
8	Secretary, State Agriculture Ministry	• Prevent on-farm burning of crop residue.

Annexure 3: Area wise distribution of Heat related illnesses, Maharashtra, 2022

Sl. No.	District	Total Cases	Total Suspected Deaths
1	Bhiwandi MC	3	0
2	THANE CIRCLE	3	0
3	Pune	2	0
4	Solapur MC	44	0
5	Pune Circle	46	0
6	Sangali	1	0
7	KOLHAPUR CIRCLE	1	0
8	Auranagabad	1	1
9	Jalna	13	2
10	Parbhani	4	1
11	Parbhani MC	4	1
12	Hingoli	1	1
13	Aurangabad MC.	1	0
14	Aurangabad Circle	24	6
15	Osmanabad	1	1
16	Latur Circle	1	1
17	Jalgaon	15	4
18	Ahamadnagar	2	0
19	Jalgaon MC	2	0
20	Nashik Circle	19	4
21	Akola	8	3
22	Amravati	4	1
23	Yavatmal	47	0
24	Akola Circle	59	4
25	Bhandara	9	1
26	Gondia	61	0
27	Chandrapur	246	0
28	Gadchiroli	34	0
29	Wardha	29	0
30	Nagpur	50	2
31	Chandrapur MC	12	0
32	Nagpur MC	173	13
33	Nagpur Circle	614	16
	State Total	**767**	**31**

Annexure 4: Roles and Responsibilities of health department and medical college in HRI

Roles and responsibilities of health department, medical colleges & hospitals, health centres and link workers

Department	Season	Roles and responsibilities
Health department State Nodal Officer	During **Pre-Heat** Season (Annually from January through March)	• Create list of high risk areas (heat-wise) of districts/block/cities • Update surveillance protocols and programs, including to track daily heat-related data • Develop/revise and translate IEC in local language • Make a communication plan for dissemination of heat related alerts or education materials • Check inventories of medical supplies in health centers • Identify cooling centers and barriers to access cooling centers • Capacity building of health care personnel to detect and treat heat related illnesses • Community involvement for workers and trainers' education • Issue health advisory to healthcare personnel based on IMD seasonal prediction or warning • Reassess 'Occupational Health Standards' for various types of Occupation. • Ensure Inter-sectoral convergence and coordination for improving architecture, design, energy efficient cooling and heating facility, increase in plantation i.e. Climate Resilient Green Building Design.
	During **Heat** Season (Annually from March through July)	• Ensure real-time surveillance and monitoring system in case of extreme event. • Prepare rapid response team • Distribute "Dos and Don'ts" to community • Effectively send a "Don't Panic!" message to community • Ensure access to Medical Mobile Van in the Red Zone • Ensure additional medical vans available • Ensure strict implementation of legislative/regulatory actions as per Occupational Health Standards. • Coordination with meteorological department for analysing cases and death data with meteorological variables like maximum temperature and relative humidity
	During **Post-Heat** Season (Annually from July through September)	• Participate in annual evaluation of heat action plan • Review revised heat action plan
Medical College and District Hospitals	During **Pre-Heat** Season (Annually from January through March)	• Adopt heat-focused examination materials • Get additional hospitals and ambulances ready • Update surveillance protocols and programs, including to track daily heat-related data • Establish more clinician education • Continue to train medical officers and paramedics

Department	Season	Roles and responsibilities
	During **Heat** Season (Annually from March through July)	• Adopt heat-illness related treatment and prevention protocols • Equip hospitals with additional materials • Deploy all medical staff to be on duty • Keep emergency ward ready • Keep stock of small reusable ice packs to apply to PULSE areas • Report heat stroke patients to DSU daily • Expedite recording of cause of death due to heat related illnesses
	During **Post-Heat** Season (Annually from July through September)	• Participate in annual evaluation of heat action plan • Review revised heat action plan
For health centres and link workers	During **Pre-Heat** Season (Annually from January through March)	• Distribute pamphlet and other materials to community • Sensitize link workers and community leaders • Develop and execute school health program • Dissemination of materials in slum communities • Coordinate outreach efforts with other community groups, non-profits, and higher education
	During **Heat** Season (Annually from March through July)	• Recheck management stock • Modify worker hours to avoid heat of day • Visit at-risk populations for monitoring and prevention • Communicate information on tertiary care and 108 service
	During **Post-Heat** Season (Annually from July through September)	• Participate in annual evaluation of heat action plan • Review revised heat action plan

Other department's roles and responsibilities

Department	Season	Roles and responsibilities
Meteorological Department	**Pre-Heat**	• Issue weather forecasts on Short/Medium/Long range duration
	Heat	• Issue Heat wave alerts • Coordination with health department for analysing cases and death data with meteorological variables like maximum temperature and relative humidity
	Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan
Department of Drinking water & Sanitation	**Pre-Heat**	Identify vulnerable places
	Heat	Provide drinking water points at identified places and worksites
	Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan
Public Health & Engineering Department	**Pre-Heat**	To construct cool shelters/sheds at public places, bus stands etc
	Heat	To maintain shelters/sheds, bus stands
	Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan

Department	Season	Roles and responsibilities
Municipalities	**Pre-Heat**	Review the heat preparation measures.
	Heat	Ensure implementation of guidelines of heat action plan
	Post-Heat	Review the heat preparation measures and make a note of the lessons learnt for the next season
Department of Education	**Pre-Heat**	Train and Sensitise teachers and students towards health impact of extreme events and disseminate health ministry approved prevention and first-aid measures
	Heat	• Rescheduling school timing during summer • During extreme events keep a check on outdoor activities • Close teaching institutes in case of issue of alert from Government
	Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan
Department of Labour & employment	**Pre-Heat**	• Reassess 'Occupational Health Standards' for various types of Occupation. • Utilize maps of construction sites to identify more high-risk outdoor workers • Heat illness orientation for factory medical officers and general practitioners • Communicate directly about heat season with non-factory workers
	Heat	• Encourage employers to shift outdoor workers' schedules away from peak afternoon hours (1:00 pm-5:00 pm) during a heat alert or consider extended afternoon break or alternate working hours for workers. • Provide water at work sites
	Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan
Department of Power supply	**Pre-Heat**	Maintenance of electrical lines
	Heat	Ensure uninterrupted supply of electricity
	Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan Participate in annual evaluation of heat action plan • Review revised heat action plan
Department of Forest & Climate change	**Pre-Heat**	Develop/encourage projects to decrease the 'Urban Heat Island effect'
	Heat	Ensure implementation of guidelines of heat action plan
	Post-Heat	Review the heat preparation measures and make a note of the lessons learnt for the next season

Annexure 5: District and Corporation wise information for the year 2020

District wise information for the year 2020							
District	Malaria			Dengue		Chikungunya	
	Positive cases	PF	Deaths	Positive Cases	Deaths	Positive Cases	Deaths
Thane	39	4	0	66	1	11	0
Palghar	13	1	0	36	0	0	0
Raigad	68	1	0	4	0	2	0
Nashik	1	0	0	62	0	43	0
Dhule	13	1	0	48	0	0	0
Nandurbar	8	1	0	8	0	0	0
Jalgaon	3	0	0	116	0	2	0
Ahmednagar	3	0	0	7	0	30	0
Pune	2	0	0	79	2	72	0
Solapur	2	1	0	78	0	17	0
Satara	30	0	0	99	0	11	0
Kolhapur	13	5	0	194	1	118	0
Sangli	11	2	0	58	1	50	0
Sindhudurg	24	0	0	38	0	0	0
Ratnagiri	13	1	0	21	0	0	0
Aurangabad	2	0	0	36	0	1	0
Jalna	1	0	0	16	0	0	0
Parbhani	1	0	0	5	0	0	0
Hingoli	0	0	0	2	0	0	0
Latur	7	3	0	2	0	12	0
Osmanabad	1	0	0	18	0	16	0
Beed	4	1	0	39	0	40	0
Nanded	2	0	0	71	0	8	0
Akola	9	2	0	33	0	10	0
Washim	0	0	0	20	0	6	0
Amravati	11	1	0	132	0	15	0
Buldhana	5	0	0	22	0	3	0
Yawatmal	2	1	0	62	0	0	0
Nagpur	3	1	0	54	1	0	0
Wardha	0	0	0	110	0	0	0
Bhandara	14	11	2	8	0	0	0
Gondia	347	317	2	4	0	0	0
Chandrapur	196	179	3	153	0	18	0
Gadchiroli	6485	5769	5	16	0	0	0
Total	**7333**	**6302**	**12**	**1717**	**6**	**485**	**0**

Corporation wise information for the year 2020							
Corporation	Malaria			Dengue		Chikungunya	
	Positive cases	PF	Deaths	Positive Cases	Deaths	Positive Cases	Deaths
Gr. Mumbai	5015	246	0	129	3	0	0
Navi Mumbai	27	0	0	0	0	0	0
Thane	299	14	0	84	0	0	0
Kalyan	126	6	0	16	0	0	0
Ulhasnagar	7	0	0	4	0	0	0
Meera Bhainder	29	2	0	0	0	0	0
Bhiwandi	15	2	0	15	0	0	0
Vasai Virar	42	0	0	10	0	0	0
Nashik	1	0	0	337	0	8	0
Malegaon	0	0	0	3	0	0	0
Dhule	0	0	0	14	0	0	0
Jalgaon	0	0	0	19	0	0	0
Ahmednagar	0	0	0	0	0	1	0
PCMC	3	0	0	20	0	2	0
PMC	0	0	0	183	0	74	0
Solapur	0	0	0	34	0	0	0
Kolhapur	2	0	0	380	0	136	0
Sangli, Miraj	2	2	0	57	0	54	0
Aurangabad	0	0	0	13	0	0	0
Parbhani	0	0	0	1	0	0	0
Latur	0	0	0	0	0	0	0
Nanded-Waghala	0	0	0	26	0	0	0
Akola	0	0	0	8	0	1	0
Amravati	2	0	0	128	0	21	0
Nagpur	6	1	0	107	1	0	0
Chandrapur	0	0	0	51	0	0	0
Corporation Total	**5576**	**273**	**0**	**1639**	**4**	**297**	**0**
District Total	**7333**	**6302**	**12**	**1717**	**6**	**485**	**0**
State Total	**12909**	**6575**	**12**	**3356**	**10**	**782**	**0**

Annexure 6: Quality Progress Report, National Programme for Climate Change and Human Health

Name of the State	Name of the State Nodal Officer (SNO)	Quarter Period
_____	_____	_____

O.M. of appointment of State Nodal Officer	Annexed: (Yes_____/No_____)
Postal Address of State Nodal Officer Phone (O) _____(M) _____ E-Mail ID: _____	

Consultant*	
No. of Consultant permitted	1 or 2
No. of Consultant appointed	
O.M. of appointment of Consultant	Annexed: (Yes_____/No_____)

	Programme Activities/Deliverable		
1	**Constitution of State Governing Body (SGB)**		
A	If **State Governing Body (SGB)** constituted?	Yes____/No_____	
B	If Yes, provide O.M. of constitution of SGB	Annexed: (Yes_____/No_____)	
C	SGB meeting held in past quarter	Yes____/No_____	
D	Minutes of last meeting held	Date of Meeting _____/_____	Annexed: (Yes_____/No_____)
2	**Formation of State Multisectoral Task Force (SMTF)**		
A	If **State Multisectoral Task Force (SMTF)** formed?	Yes____/No_____	
B	If Yes, provide O.M. of constitution of SMTF	Annexed: (Yes_____/No_____)	
C	SMTF meeting held in past quarter	Yes____/No_____	
D	Minutes of last meeting held	Date of Meeting _____/_____	Annexed: (Yes_____/No_____)
3	**Establishment of Environmental Health Cell (EHC)**		
A	If State has established **EHC**?	Yes_____/No_____	
B	If Yes, provide O.M. of establishment of EHC	Annexed: (Yes_____/No_____)	
C	If Yes, provide list of members	Annexed: (Yes_____/No_____)	
4	**State Action Plan on Climate Change and Human Health (SAPCCHH)**		
A	If State has submitted SAPCCHH?	Yes_____/No_____	
B	If Yes, version number of SAPCCHH	No.:	Month/Year _____/_____
5	**Designated District Nodal Officer -Climate Change (DNO-CC)**		
A	If State has identified DNO-CC in all districts?	Yes_____/No_____	
B	No of Districts in State/UT		
C	No of Districts appointed DNO-CC		
D	O.M. of appointment of DNO-CC's	Annexed: (Yes_____/No_____), If Yes, No. of Districts_____	

6	**Formation of District Multisectoral Task Force (DMTF)**			
A	If **District Multisectoral Task Force (DMTF)** formed?		Yes_____/No_____	
	No of Districts appointed DTF			
B	If Yes, provide O.M. of constitution of DMTF		Annexed: (Yes_____/No_____), If Yes, No. of Districts_____	
C	DMTF meeting held in past quarter		Yes_____/No_____, If Yes, No of Districts_____	
D	Minutes of meeting held in past quarter		Annexed: (Yes_____/No_____), If Yes, No. of Districts_____	
7	**Capacity Building of State & District Nodal Officers on Climate Change**			
A	Have the SNO attended the TOT?		Yes_____/No_____	
B	Have the Consultant/s attended the TOT?		Yes_____/No_____	
C	Whether the training has been conducted on Climate Change and Human Health in past quarter for		DNO-CC	Yes_____/No_____
			Medical Officer	Yes_____/No_____
			Health Workers	Yes_____/No_____
D	No of health care professionals trained in past quarter on Climate change and Human Health		Health care personnel	No of trained
			DNO-CC	
			Medical Officer	
			Health Workers	
E	**Training on Air pollution**		**Training on Heat Related Illnesses**	
	Health care personnel	**No of trained**	**Health care personnel**	**No of trained**
	DNO-CC		DNO-CC	
	Medical Officer		Medical Officer	
	Health Workers		Health Workers	
F	**Training on any other Climate issues**		**Health care personnel**	**No of trained**
			DNO-CC	
			Medical Officer	
			Health Workers	
G	No of Sensitization workshop/meeting at State level on CC&HH matters in past quarter		No.:	Report Annexed: (Yes_____/No_____)
H	No of Sensitization workshop/meeting at District level on CC&HH matters in past quarter		No.:	Report Annexed: (Yes___/No___) If Yes, No. _____
I	Training of Panchayat Raj Institutions in past quarter		No. of Blocks :	
			No. of activities held:	Report Annexed: (Yes___/No___) If Yes, No. _____

8	**IEC in past quarter**					
A	**At Block level in past quarter**					
	Pollution	**Total No.**	**Heat**	**Total No.**	**Other Climate issues**	**Total No.**
	No of audio		No of audio		No of audio	
	No of video		No of video		No of video	
	No of social media		No of social media		No of social media	
	No of posters		No of posters		No of posters	
B	**At District Level in past quarter**					
	Pollution	**Total No.**	**Heat**	**Total No**	**Other Climate -issues**	**Total No.**
	No of audio		No of audio		No of audio	
	No of video		No of video		No of video	
	No of social media		No of social media		No of social media	
	No of posters		No of posters		No of posters	
C	**At State level in past quarter**					
	Pollution	**Total No.**	**Heat**	**Total No**	**Other Climate issues**	**Total No.**
	No of audio		No of audio		No of audio	
	No of video		No of video		No of video	
	No of social media		No of social media		No of social media	
	No of posters		No of posters		No of posters	

9	**Observation of public health days related to Climate Change in past quarter**	
A	World Environment Day observed?	Yes_____/No_____ /Not Applicable_____
	If Yes, report submitted with details	Report Annexed Yes_____/No_____
B	International day of Clean Air and Blue Skies observed?	Yes_____/No_____ /Not Applicable_____
	If Yes, report submitted with details	Report Annexed Yes_____/No_____
C	Other events observed in past quarter	Yes_____/No____
	If Yes, report submitted with details	Report Annexed Yes_____/No_____
10	**Printing in past quarter**	
A	No of Training modules printed in past quarter	
B	IEC printed	
C	Others printed	Details: Yes_____/No____
D	Articles contributed to NPCCHH Newsletter for past quarter activities	Attached: Yes_____/No____

11	Budget							
A	Total budget sanctioned in ROP for Financial Year (Rs in lakhs)**							
B	Total received by SNO for expenses in FY							
C	Total budget spent till the end of past quarter (Rs. in lakhs)							
D	Total budget distributed to districts (for all the districts)			District-1		OM Annexed: Yes_____/No____		
				District-2		OM Annexed: Yes_____/No____		
	At the State level							
Sl. No.	**FMR code**	**Activities**	**Budget Received**	**Quarter I**	**Quarter II**	**Quarter III**	**Quarter IV**	**Total Expenditure**
1	3.3.3.3	Training of PRI						
2	5.1.1.2.13	Greening						
3	9.2.4.9	Training of MO's, Health workers, Programme Officer's						
4	10.2.14	Surveillance						
5	11.4.7	IEC						
6	12.17.3	Printing						
7	16.1.2.1.23	Task force Meeting						
8	16.1.2.1.24	Review of DNO-CCHH with SNO-CCHH						
9	16.4.1.5.2	Consultant-CCHH						
	Date of submission			**Signature of SNO**				

** The budget approved under ROP of all the States/UT is annexed in Annexure II.

Annexure 7

DIRECTORATE OF HEALTH SERVICES.
(MAHARASHTRA STATE)
Arogya Bhavan, St.George's Hospital Compound, P.D'Mello Road,
Mumbai-400 001.

Office: Director(Personal)	**Tel.No.** 22621031-36 22621006	Website : http://maha-arogya.gov.in Email : dhs_2005@rediffmail.com
		N0.DHS/Climate Change/Nodal Officer// D-6/913-917/2018, Date - 27/12/2018

To,
Dr. Aakash Shrivastava,
The HoD
Centre for Environmental and Occupational Health,
Climate Change & Health (CEOH & CCH)
National Centre for Disease Control ,
Directoreate General of Health Services,
Ministry of Health & Family Welfare,
New Delhi - 110054.

Sub : Conveying details of Nominated State Nodal Officer (Climate Change) for Maharashtra.

Ref : 1.Letter from Hon Under secretary.Maharstra State No.Misc-2018/C.No.481/ Aarogya-3 A, Public Health Deptt. Mumbai. Dtd.7 Dec 2018
2. Email from Dr.Aakash Shrivastava,The HoD,Centre for Environmental and Occupational Health,Climate Change & Health (CEOH & CCH) Delhi Dated 29/11/ 2018.

Sir,

With reference to above subject, we would like to inform you that, **Dr.Pradip Awate**, State Surveillance Officer ,IDSP,Pune is Nominated as a State Nodal Officer (Climate Change) for Maharshtra State.The details are as under;

Dr.Pradip Awate,
State Surveillance Officer ,
State Surveillance Unit, Integrated Disease Surveillance Programme.
Office of the Joint Director of Health Service (MF & WBD)
New Central Building, 1st Floor,
Pune-411 001. Maharshtra.

Mobile No. 9423337556
email-ID- dr.pradip.awate@gmail.com

Director of Health Services
Maharashtra, Mumbai

Copy to :- Joint Director of Health Service (MF & WBD) Pune -1
Dr.Pradip Awate, State Surveillance Officer , IDSP Pune.Pune-1

Copy submitted to :
Hon.Principal Secretary, Public Health Department, G.T.Hosp.Compound, Mantralaya, Mumbai.
Hon. Commissioner, Health and Mission Director ,National Health Mission, Mumbai

क्लायमेट चेंज व मानवी आरोग्य यासंदर्भात राज्याचा कृती आराखडा तयार करण्यासाठी राज्यस्तरीय गव्हर्निंग बॉडी तसेच टास्क फोर्स स्थापन करणेबाबत.

महाराष्ट्र शासन
सार्वजनिक आरोग्य विभाग
शासन निर्णय क्रमांकः एनसीडीसी-२०१८/प्र.क्र.१३५/आ-५,
गोकुळदास तेजपाल रुग्णालय आवार,
संकुल इमारत, ८ व १० मजला, नवीन मंत्रालय,
मुंबई- ४०० ००१.
दिनांक : २० ऑगस्ट, २०१९

वाचा : स्वास्थ एवं परिवार कल्याण मंत्रालय, निर्माण भवन नवी दिल्ली यांचे पत्र क्र. D.O. No.६७/CEOH/NCDC/२०१७-१८/SAPCCH II, दि.२ एप्रिल,२०१८

प्रस्तावना :

क्लायमेट चेंज व मानवी आरोग्य यासंदर्भात राज्याचा कृती आराखडा तयार करण्याकरीता राज्यस्तरीय गव्हर्निंग बॉडी तसेच टास्क फोर्स स्थापन करण्याची बाब शासनाच्या विचाराधीन होती.

शासन निर्णय :

वातावरणातील बदल आणि मानवी आरोग्या संदर्भात धोरणात्मक निर्णय घेण्याकरीता राज्यस्तरीय गव्हर्निंग बॉडी तसेच टास्क फोर्स स्थापन करण्यास याद्वारे शासन मंजुरी देण्यात येत आहे.

राज्यस्तरीय गव्हर्निंग बॉडी तसेच टास्क फोर्सची रचना

- मा आरोग्य मंत्री . - अध्यक्ष
- प्रधान सचिव (आरोग्य) - उपाध्यक्ष
- संचालकआरोग्य सेवा प्रमुख/ आरोग्य सेवा , - सदस्य सचिव
- संचालकवैद्यकीय शिक्षण व संशोधन , - सदस्य
- आयुक्तराष्ट्रीय आरोग्य अभियान , - सदस्य

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- विभागीय संचालकआरोग्य व कुटुंब कल्याण , मंत्रालय,आकुर्डी पुणे ,भारत सरकार , - सदस्य

त्याचप्रमाणे राज्यस्तरीय टास्क फोर्स स्थापित करण्यासाठी वातावरणातील बदल आणि आरोग्य राज्य कृती आराखडयाच्या समितीमध्ये खालीलप्रमाणे सदस्य असतील.

अ.क्र.	पदनाम	टास्क फोर्स मधील भूमिका
१	प्रधान सचिव ,सार्वजनिक आरोग्य विभाग , मुंबई ,मंत्रालय	अध्यक्ष
२	संचालक, राष्ट्रीय विषाणू विज्ञान संस्थापुणे ,	सदस्य
३	शास्त्रज्ञ आणि प्रमुख हवामान संशोधन विभाग , पुणे	सदस्य
४	अध्यक्षमहाराष्ट्र प्रदुषण नियंत्रण मंडळ ,	सदस्य
५	सचिव राज्य आपत्ती व्यवस्थापन विभाग	सदस्य
६	पर्यावरण अभियंता शास्त्रज्ञ पर्यावरण व वन / विभाग	सदस्य
७	सचिव राज्य कृषी विभाग	सदस्य
८	सचिवराज्य भूजल सर्वेक्षण विभाग ,	सदस्य
९	राज्य सर्वेक्षण अधिकारी तथा राज्य नोडल अधिकारी क्लायमेट चेंज	सदस्य

२. राज्य स्तीय टास्क फोर्सचे उदिष्ट व कार्य :

उदिष्ट: १) वातावरणातील बदल आणि मानवी आरोग्य या विषयी राज्याचा कृती आराखडा तयार करणे.
२) सदर कृती आराखडयाची अंमलबजावणी करणे.

कार्य : १) वातावरणातील बदलाचा परिणाम होणारे आजार ओळखणे.
२) अशा आजारांचे सर्वेक्षण करुन जोखीम निश्चित करणे.
३) जोखीमग्रस्त भाग व लोकसंख्या निश्चित करुन त्यानूसार कार्य योजना आखणे.
४) उपलब्ध संसाधनाची यादी कणे.

पृष्ठ ५ पैकी २

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५) संबंधित जबाबदार व्यक्ती / संस्था यांची यादी करुन त्यांची भूमिका व जबाबदारी निश्चित करणे.

६) विविध विभाग, नागरिक संस्था यामध्ये समन्वय स्थापन करणे.

समितीच्या बैठकीचा कालावधी :-

राज्य स्तरीय गव्हर्निंग बॉडीची बैठक वर्षातून एक वेळा आणि टास्क फोर्सची बैठक वर्षातून तीन वेळा घेण्यात यावी.

जिल्हा स्तरावर मा जिल्हाधिकारी यांच्या अध्यक्षतेखाली.जिल्हास्तरीय टास्क फोर्स स्थापित करण्यासाठी वातावरणातील बदल आणि आरोग्य जिल्हा आराखडयाच्या समितीमध्ये खालीलप्रमाणे सदस्य असतील.

अ.क्र.	पदनाम	अभिप्राय
१	जिल्हाधिकारी	अध्यक्ष
२	जिल्हा आरोग्य अधिकारी	सदस्य सचिव
३	जिल्ह सर्वेक्षण अधिकारी	सदस्य
४	जिल्हा हिवताप अधिकारी	सदस्य
५	सदस्य जिल्हा आपत्ती व्यवस्थापन केंद्र	सदस्य
६	जिल्हा कृषी अधिकारी	सदस्य
७	प्रतिनिधीअन्न व सुरक्षा विभाग ,	सदस्य
८	प्रतिनिधीपाणी पुरवठा स्वच्छता , विभाग	सदस्य
९	प्रतिनिधी जिल्हा प्रदुषण नियंत्रण मंडळ	सदस्य

जिल्हा स्तरावील कृती :

१) प्रत्येक जिल्हा स्तरावर क्लायमेट चेंजसाठी नोडल अधिकारी निवडण्यात याव.

२) जिल्हा पर्यावरणी आरोग्य कक्षाची स्थापना.

३) जिल्हा टास्क फोर्सची स्थापना

पृष्ठ ५ पैकी ३

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११.सचिवराज्य भूजल सर्वेक्षण विभाग ,
१२.राज्य सर्वेक्षण अधिकारी तथा राज्य नोडल अधिकारी क्लायमेट चेंज
१३.सर्व सहसंचालक/उप संचालक, आरोग्य सेवा,
१४.सर्व समिती सदस्य
१५. जिल्हा शल्य चिकित्सक (सर्व)
१६.जिल्हा आरोग्य अधिकारी (सर्व)
१७.निवडनस्ती (आरोग्य-५).

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