UTTARAKHAND

STATE ACTION PLAN FOR CLIMATE CHANGE AND HUMAN HEALTH

National Health Mission
Directorate of Medical Health and Family Welfare Uttarakhand
Danda Lakhond, P.O. Gujrada, Sahastradhara Road, Dehradun
CONTENTS

Executive Summary
Acknowledgement

1. Introduction
2. Climate Resilient Health System
3. SAPCCHH: Vision, Goal & Objectives
4. SAPCCHH: Organisational Framework
5. SAPCCHH : Activity Matrix
6. Climate Sensitive Diseases prevalent in Uttarakhand
7. Health Adaptation Plan for Acute Respiratory Illnesses attributed to Air Pollution
8. Health adaptation plan for Heat related illnesses
9. Health adaptation plan for Vector Borne Diseases
10. Health adaptation plan for Water Borne Diseases
11. Health adaptation plan for Food Borne Diseases
12. Health adaptation plan for Nutrition related illnesses
13. Health adaptation plan for Allergic Diseases
14. Health adaptation plan for Cardio-pulmonary Diseases
15. Health adaptation plan for Mental Health Illnesses
16. Health adaptation plan for Zoonotic Diseases
17. Health adaptation plan for Sea and coastal areas
18. Health adaptation plan for Hilly and Mountainous areas

19. Health adaptation plan for Disaster Management

20. Capacity Building and System Awareness

21. Reporting, Monitoring & Evaluation

22. Budget

23. References

24. Annexures:

   Annexure A: Impact of Climate Change on Human Health

   Annexure B: Steps to Reduce Impact of Climate Change

   Annexure C: India’s Strategic Framework for Adaptation of Human Health against Climate Change

   Annexure D: Integration of Health Mission with other Ministries and Missions on Climate Change

   Annexure E: Salient recommendation of the Regional Consultations on Climate Change

   Annexure F: Male declaration

   Annexure G: Regional Meteorological Offices

   Annexure H: State Pollution Control Board

   Annexure I: List of Hospital Infrastructure data in the State

   Annexure: Anything if the State Task Force thinks relevant
EXECUTIVE SUMMARY

To be prepared by the state
ACKNOWLEDGEMENT

To be prepared by the state
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.


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 & climate-resilient, particularly in promoting to encourage that these 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 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 (NEGCCCH) 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, Delhi, conducted four regional consultations in 2017-18 involving all the states and Union Territories of the country. Regional consultations aimed at sensitising states and Union Territories on reassessment of diseases' morbidity and mortality with respect to climate variability and extremes have been conducted. These regional consultations had participations from ministries and department of states and UTs including Senior Regional Directors, Regional Directors from Regional Office of Health & Family Welfare, State Nodal Officers, State Surveillance Officers, National Vector Borne Diseases Control Programme, Officers from Integrated Diseases Surveillance Programme, representatives from identified Centre of Excellence, representatives from Regional Centre of Meteorological Departments, Ministry of Environment Forest and Climate Change and Central Ground Water Board.

In Uttarakhand, *State Climate change & Human health (CCHH)* cell has been established. *State Nodal Officer for CCHH* has been nominated. *State Task Force under chairmanship of Mission Director NHM is formed for multidisciplinary approach. State environment health Cell (EHC) has been established. Presently State CCHH is operating with the resources of Integrated disease surveillance programme Uttarakhand. The establishment of placing dedicated human resource and infrastructure for SCCHH is under process.

Climate sensitive illnesses in the state are as follows:

1. Water Borne Diseases i.e. ADD, Typhoid fever, Hepatitis A and E
2. Vector borne Diseases i.e. Malaria, Dengue, JE
3. Acute Respiratory Infections
4. Non Communicable diseases i.e. Hypertension, Heart Diseases, Bronchitis, Asthma, Emphysema, Mental disorders
5. Zoonotic diseases i.e. scrub typhus
6. Allergic Disorders

Projected Changes in Annual Maximum Temperature for Mid Century and End Century with respect to the baseline (1981 - 2010) for Uttarakhand

Below is the map of uttarakhand. The red line demarcates between plain and hilly region. Priority climate sensitive health events may be different on both sides of red line

Uttarakhand state is divided in two regions i.e. Garhwal and Kumaon. There are 13 districts
in Uttarakhand state (7 districts in Garhwal region and 6 districts in Kumaon region). Geographically most of districts are situated in hilly region. 5 districts are more sensitive for Climate change related illnesses i.e. Dehradun, Haridwar, Udham Singh Nagar, Nainital and Pauri which are considered as plain/mid plain areas.
Chapter 2

Climate Resilient Health System

Climate Change vs Health Resilience: ‘Resilience’ may be defined as the “capacity of a social-ecological system to cope with a hazardous event or disturbance, responding or reorganizing in ways that maintain its essential function, identity, and structure, while also maintaining the capacity for adaptation, learning and transformation." Accordingly, a climate resilient health system may be defined as the one that is capable to anticipate, respond to, cope with, recover from and adapt to climate-related shocks and stress, so as to bring sustained improvements in population health, despite an unstable climate.

There are ten components that together provide a comprehensive approach to integrating climate resilience into existing health systems:

1. Leadership & governance,
2. Capacity building on climate change and health,
3. Vulnerability and adaptation (V&A) assessments;
4. Integrated risk monitoring and early warning;
5. Research to reduce uncertainty on local conditions, gain insight into local solutions and capacities, and build evidence to strengthen decision-making;
6. Climate resilient and sustainable technologies and infrastructure;
7. Management of environmental determinants of health;
8. Departments and programs that can become climate-informed;
9. Managing changing risks of climate extremes and disasters and lastly,
10. Climate and health financing.

It is a cumulative process to build health system resilience to climate change. It starts with making resilience a goal and then, being responsive and efficient and providing social and financial protection to the people. For the whole health system to become more climate-resilient, its independent building blocks (i.e. leadership and governance, health workforce, health information systems, essential medical products and technologies, service delivery and financing) have to become climate resilient.

As per the available evidences, it is known that change or variation in climate at any geographic location may affect the pattern of morbidity and mortality among the dwelling population.
Activities undertaken and further proposed related to greening of health sector i.e. health facilities use energy-efficient services and technologies in the state.

Proposal

Green and climate resilient health care facilities development i.e. 1 in urban and another in rural setting as a pilot project.

Training of health professionals including Medical Officers, Nursing staff, Allied health professionals are under consideration.

Vulnerability assessment including health impacts due to climate changes are undergoing.

Research to reduce uncertainty on local conditions, gain insight into local solutions and capacities, and build evidence to strengthen decision-making

Procurement of funds from NABARD in health sector for activities related to climate change and human health.
CHAPTER 3

SAPCCHH: Vision, Goal & 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 4
SAPCCHH: Organisational Framework

NATIONAL LEVEL

Key Nodal Agency
Head, NPCCHH (NCDC, MoHFW)

STATE LEVEL

Key Nodal Point
SNO-CC

DISTRICT LEVEL

Key Nodal Point
DNO-CC

BLOCK LEVEL
(DNO-CC)

VILLAGE LEVEL
(DNO-CC)

Prime Minister’s Council on Climate Change (PMCCC)

Ministry of Health and Family Welfare (MoHFW), Govt of India

State Governing Body - Environmental Health

State level Task Force - Environmental Health

State Environmental Health Cell (EHC)

District Task Force – Environmental Health

District Environmental Health Cell (EHC)

CHC Level

Health Facility Level (PHC)
A) **State Level - Governing Body - Environmental Health**

The state level governing body for policy level decision shall be working under Chairmanship of Honourable State Health Minister. The other members may be as follows:

<table>
<thead>
<tr>
<th>Position</th>
<th>Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honourable State Health Minister</td>
<td>Chairman</td>
</tr>
<tr>
<td>Secretary (Health)</td>
<td>Vice Chairman</td>
</tr>
<tr>
<td>Director General, Medical Health and Family Welfare</td>
<td>Member</td>
</tr>
<tr>
<td>Mission Director-National Health Mission</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Revenue (Disaster)</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Agriculture</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Water and Sanitation</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Transport</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Animal Husbandry</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Environment and Forests</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Women and Child Development / Social Justice</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Education</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Human Resource Development</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Public Works Department</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Power</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Urban Development (Municipalities)</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Finance</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Law</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Food and Civil Supplies</td>
<td>Member</td>
</tr>
<tr>
<td>Secretary, Department of Panchayati Raj</td>
<td>Member</td>
</tr>
<tr>
<td>Regional Director -Health &amp; Family Welfare (GoI)</td>
<td>Member</td>
</tr>
<tr>
<td>Director Medical Education</td>
<td>Member</td>
</tr>
<tr>
<td>State Nodal Officer- Climate Change</td>
<td>Member</td>
</tr>
<tr>
<td>Head – NAPCCHH, CEOH&amp;CCH Division, NCDC</td>
<td>Member</td>
</tr>
</tbody>
</table>

**A) State Level Task Force - Environmental Health**

This task force shall be working under the guidance of Mission Director, NHM 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. It shall be working through Directorate of Health Services (DHS) of the state, which will be the implementing agency for SAPCCHH.

The State level Task Force shall have inter-departmental members which are suggested as:

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission Director</td>
<td>National Health Mission</td>
</tr>
<tr>
<td>Director General</td>
<td>Medical Health and Family Welfare</td>
</tr>
<tr>
<td>Director/Chairman - Department of Agriculture</td>
<td></td>
</tr>
<tr>
<td>Director/Chairman - Department of Water and Sanitation</td>
<td></td>
</tr>
<tr>
<td>Director/Chairman - Department of Animal Husbandry</td>
<td></td>
</tr>
<tr>
<td>Director/Chairman - Department of Environment and Forests</td>
<td></td>
</tr>
<tr>
<td>Director, Meteorological department of State/UT</td>
<td></td>
</tr>
<tr>
<td>Director/Chairman - Department of Food and Civil Supplies</td>
<td></td>
</tr>
<tr>
<td>Director/Chairman - Water Board (jal Sansthan)</td>
<td></td>
</tr>
<tr>
<td>Head - State disaster Management Authority</td>
<td></td>
</tr>
<tr>
<td>Chairman, State Pollution Control Board</td>
<td></td>
</tr>
<tr>
<td>Regional Director - Health &amp; Family Welfare (GoI)</td>
<td></td>
</tr>
<tr>
<td>Director Medical Education and Research</td>
<td></td>
</tr>
<tr>
<td>State Nodal Officer - Climate Change</td>
<td></td>
</tr>
<tr>
<td>State Surveillance Officer</td>
<td></td>
</tr>
<tr>
<td>Head – NAPCCHH, CEOH&amp;CCH Division, NCDC, MoHFW</td>
<td></td>
</tr>
</tbody>
</table>

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:

**Structure at State/ UT Environment Health Cell:**
<table>
<thead>
<tr>
<th>Role Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nodal Officer (Public Health Expert - State Health Department)</td>
<td>1</td>
</tr>
<tr>
<td>Consultant-Capacity building/ Training/ HR Management</td>
<td>1</td>
</tr>
<tr>
<td>Consultant-Environmental Health</td>
<td>1</td>
</tr>
<tr>
<td>Data Manager &amp; Analyst</td>
<td>1</td>
</tr>
<tr>
<td>Secretarial Assistants cum Data entry Operator</td>
<td>1</td>
</tr>
</tbody>
</table>

**Executive Members of EHC**

<table>
<thead>
<tr>
<th>Role Description</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Nodal Officer- Climate Change</td>
<td>Chairman</td>
</tr>
<tr>
<td>State Program Manager – NHM</td>
<td>Member</td>
</tr>
<tr>
<td>Officer Incharge/Nodal Officer- NCD</td>
<td>Member</td>
</tr>
<tr>
<td>Officer Incharge/Nodal Officer- NVBDCP</td>
<td>Member</td>
</tr>
<tr>
<td>Officer Incharge/Nodal Officer- IDSP</td>
<td>Member</td>
</tr>
<tr>
<td>Officer Incharge/Nodal Officer- IEC</td>
<td>Member</td>
</tr>
<tr>
<td>Officer Incharge/Nodal Officer- Human Resource</td>
<td>Member</td>
</tr>
<tr>
<td>State Epidemiologist, IDSP</td>
<td>Member</td>
</tr>
<tr>
<td>Microbiologist , IDSP</td>
<td>Member</td>
</tr>
</tbody>
</table>

**Roles and Responsibilities of the State/ UT 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.

**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-CC.

**Structure of District Level Task Force- Environmental Health**

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>District Magistrate</td>
<td>Chairman</td>
</tr>
<tr>
<td>Chief Medical Officer</td>
<td>Vice Chairman</td>
</tr>
<tr>
<td>District Nodal Officer – Climate Change.</td>
<td>Member Secretary</td>
</tr>
<tr>
<td>Dean – Govt Medical College in the district/ Head-Department of Community Medicine of the Medical College</td>
<td>Member</td>
</tr>
<tr>
<td>District Surveillance Officer</td>
<td>Member</td>
</tr>
<tr>
<td>District Programme Manager – NHM</td>
<td>Member</td>
</tr>
<tr>
<td>District Head, Department of Revenue (Disaster)</td>
<td>Member</td>
</tr>
<tr>
<td>District Head, Department of Agriculture</td>
<td>Member</td>
</tr>
<tr>
<td>District Head, Department of Water and Sanitation</td>
<td>Member</td>
</tr>
<tr>
<td>District Head, Department of Transport</td>
<td>Member</td>
</tr>
<tr>
<td>District Head, Department of Animal Husbandry</td>
<td>Member</td>
</tr>
<tr>
<td>District Head, Department of Environment and Forests</td>
<td>Member</td>
</tr>
<tr>
<td>District Head, Department of Women and Child Development / Social Justice</td>
<td>Member</td>
</tr>
</tbody>
</table>
The District Environmental Health Cell will be constituted by the District Nodal Officer- Climate Change in consultation with the SNO-CC. At District level, a District Environmental Health Cell shall be constituted; which shall comprise of the following:

**Structure at District Environment Health Cell:**

<table>
<thead>
<tr>
<th>Role</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>District Nodal Officer- Climate Change</td>
<td>Chairman</td>
</tr>
<tr>
<td>District Veterinary officer</td>
<td>Member</td>
</tr>
<tr>
<td>District Surveillance Officer-IDSP</td>
<td>Member</td>
</tr>
<tr>
<td>District RCH officer/FW Officer</td>
<td>Member</td>
</tr>
<tr>
<td>District Epidemiologist</td>
<td>Member</td>
</tr>
<tr>
<td>District Microbiologist</td>
<td>Member</td>
</tr>
<tr>
<td>District Immunisation Officer</td>
<td>Member</td>
</tr>
<tr>
<td>District Training Officer</td>
<td>Member</td>
</tr>
<tr>
<td>Data entry operator</td>
<td>Supporting staff</td>
</tr>
</tbody>
</table>

**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:

- Block Medical Officer (CHC/Block PHC) : Chairman
- Block Health Officer : Member Secretary
- IEC/BCC Officer/Similar Post : 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.
## Chapter 5: SAPCCHH : Activity Matrix

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Key Actions</th>
<th>Activity</th>
<th>Indicators (First 2 years - Short Term Activity)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Short term (First two years)</td>
<td>Medium Term (up to five years)</td>
</tr>
<tr>
<td>1.</td>
<td>To create awareness among general population (vulnerable community), health-care providers and Policy makers regarding impacts of climate change on human health</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Development of IEC material on health impacts of Climate variability &amp; change in coordination with NCDC</td>
<td>- Identify nodal agency to undertake communication needs assessment for the target groups</td>
<td>- Develop integrated IEC strategy</td>
</tr>
<tr>
<td></td>
<td>- Develop Communication Plan &amp; Tools</td>
<td>- Explore inter-sectoral / inter-ministerial / civil society / NGOs for collaboration</td>
<td>- Commissioning of impact studies</td>
</tr>
<tr>
<td></td>
<td>- Develop IEC materials in Hindi, English and other vernacular languages.</td>
<td>- Integrate health impacts of climate change into school and College curricula</td>
<td>- Follow up 'Evaluation' of awareness activities</td>
</tr>
<tr>
<td></td>
<td>- Dissemination of IEC: mass media and inter-personal communication</td>
<td>- Periodic impact assessment of communication activities and monitor dissemination and utilization of IEC material</td>
<td>- Actively pursue partnerships with other agencies</td>
</tr>
<tr>
<td></td>
<td>- Training &amp; Sensitization of Health Care Providers</td>
<td>- Explore additional sources of funding</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Advocacy on health impacts of Climate variability &amp; change in coordination with NCDC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Advocacy forum to conduct and support workshops and meetings.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- Evidence based Information to legislators and decision makers on issues of climate change and impact on health</td>
<td></td>
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<tr>
<td></td>
<td>Provide evidence/ information for decision-makers to assess existing policies, practices and systems</td>
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<tr>
<td></td>
<td>Involve community-based organizations (CBOs) for dissemination of information.</td>
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</tr>
<tr>
<td>S. No.</td>
<td>Key Actions</td>
<td>Activity</td>
<td>Indicators</td>
</tr>
<tr>
<td>-------</td>
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</tr>
<tr>
<td>2.</td>
<td>To strengthen capacity of healthcare system to reduce illnesses/diseases due to variability in climate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strengthening of health care system in context of climate change with NCDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Establish ‘Environment Health Cell’ (EHC) at Health dept.</td>
<td>Implement/ adapt/ modify Monitoring, Supervision and Evaluation tool for climate sensitive diseases</td>
<td>- Share appropriate technology like reduction in carbon footprint at healthcare facilities</td>
</tr>
<tr>
<td></td>
<td>- Depute State Nodal Officer – Climate change (SNO-CC) as focal point</td>
<td>- Coordinate with other agencies (municipalities, PRIs) for efficient and effective implementation of proposed activities at state and below level.</td>
<td>- Continue Phased Implementation of recommendations of Task Force.</td>
</tr>
<tr>
<td></td>
<td>- Notify Task Force with multiple stakeholders and review existing Indian Public Health Standards and appropriate suggestions</td>
<td>- Phased Implementation of the recommendations of Task Force.</td>
<td>- Notification of - SNO, State level EHC, State level Task Force, State level Governing Body</td>
</tr>
<tr>
<td></td>
<td>- State to form climate sensitive health Programme Implementation Plan (PIP)</td>
<td>- Share appropriate technology like reduction in carbon footprint at healthcare facilities</td>
<td>- Notification of District Nodal Officers identified, District Environmental Health Cell, District Task Force formed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- State Action Plan for Climate Change and Human Health (SAPCCHH) developed, approved by the State Governing Body and launched by the state.</td>
<td>- State Action Plan for Climate Change and Human Health (SAPCCHH) developed, approved by the State Governing Body and launched by the state.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- District specific Heat Action plan developed by the respective District Task Force. (State specific heat action plan will be a chapter of SAPCCHH and the respective district specific plan will be consolidated within the SAPCCHH)</td>
<td>- District specific Heat Action plan developed by the respective District Task Force. (State specific heat action plan will be a chapter of SAPCCHH and the respective district specific plan will be consolidated within the SAPCCHH)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- PIP submitted to state NHM</td>
<td>- PIP submitted to state NHM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Consultant Recruited in the state EHC</td>
<td>- Consultant Recruited in the state EHC</td>
</tr>
<tr>
<td></td>
<td>Capacity building for vulnerability assessment at various levels and liaison with centre in coordination with NCDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Identify agency/institute/Organizations/Centers of Excellence for developing guidelines, capacity building, supporting implementation, monitoring, supervision.</td>
<td>- As per priority list, State to prepare guideline/action plan and upload the same on its website for ready reference.</td>
<td>- Names of related institutes and NGO’s identified per state specific climate sensitive illnesses in the state and district.</td>
</tr>
<tr>
<td></td>
<td>- Enlist (customized as per states’ vulnerabilities) i) Technical committees/working groups to support the focal point, ii) skilled staff, (iii) logistics, (iv) funds</td>
<td>- Develop training modules, organize training</td>
<td>- No of SNO’s/DNO’s trained at National/State level Trainings, Workshop and ToT.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Conduct meeting/Workshops/Training on CC&amp;HH for health care personnel</td>
<td>- Details of funds mobilised and utilised from other sources (Govt/NGOs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Sensitize and orient private health care providers</td>
<td></td>
</tr>
<tr>
<td>S. No.</td>
<td>Key Actions</td>
<td>Activity</td>
<td>Indicators</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3.</td>
<td><strong>To strengthen health preparedness and response by performing situational analysis at national/ state/ district/ below district levels.</strong></td>
<td>- Develop / strengthen surveillance for each CSD</td>
<td>- No of polluted cities identified for ARI surveillance in the state and no of Sentinel Surveillance Hospitals identified from polluted cities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Train all concerned personnel on surveillance system (data collection, collation and analysis)</td>
<td>- No of hospitals identified with ‘Special Cold Room’ (SCR) for management of heat related illnesses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Integrate relevant non-health data in the health surveillance system</td>
<td>- Coordination with SDMA regarding death due to heat related illnesses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Initiate Sentinel &amp; real-time surveillance for illnesses due to Air Pollution, Heat etc</td>
<td>- Coordination with respective IMD offices for climate data for analysis of climate sensitive illnesses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Build an interdisciplinary platform i.e. link health databases with real-time monitoring of weather, climate, geospatial, and exposure data so as to accurately forecast health illness/ event</td>
<td>- Coordination with the respective State Pollution Control Board for getting AQI data.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Develop/ modify mechanism and indicators to monitor trend of CSDs.</td>
<td>- No. of Biennial Training Workshops of concerned personnel on surveillance system (data collection, collation and analysis)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Conduct Joint Review Missions / Central Internal Evaluations and feedback mechanisms.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Update monitoring and surveillance system as per new evidences</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Evaluate interdisciplinary platform and upgrade as per evolving technologies.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Identify gaps for research</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop mechanisms for EWS/ alerts and responses at state, district and below district level in coordination with NCDC</td>
<td>- Review monitoring and surveillance system of CSDs</td>
<td>- Establishment of Working group by EHC for development of a mechanism for EWS/ alerts for climate sensitive illnesses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Develop thresholds/ prediction models for health events or CSDs.</td>
<td>- Steps taken by EHC to develop mechanisms to integrate public health response plan with related stakeholders (SPCB, NDMA, IMD etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- States to develop communication plan and dissemination systems to warn people and communities</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Evaluation and modifications for the appropriateness of the plans’ for</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Thresholds of action</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Interventions to maximize response effectiveness for the relevant community or region.</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- CSD: Climate Sensitive Diseases
- EHC: Emergency Health Centre
- NCDC: National Centre for Disease Control
- NC: National Centre
- SOP: Standard Operating Procedure
- SDMA: State Disaster Management Authority
- IMD: Indian Meteorological Department
- SPCB: State Pollution Control Board
- EWS: Early Warning System
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Key Actions</th>
<th>Activity</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Short term</strong> (First two years)</td>
<td><strong>Medium Term</strong> (up to five years)</td>
<td><strong>Long Term</strong> (up to fifteen years)</td>
</tr>
<tr>
<td>4.</td>
<td><strong>To develop partnerships and create synchrony/synergy with other missions and ensure that health is adequately represented in the climate change agenda in the country</strong></td>
<td><strong>To develop partnerships and create synchrony/synergy with other missions and ensure that health is adequately represented in the climate change agenda in the country</strong></td>
<td><strong>To develop partnerships and create synchrony/synergy with other missions and ensure that health is adequately represented in the climate change agenda in the country</strong></td>
</tr>
<tr>
<td></td>
<td>Develop joint action plan with other deptt./organizations in view of their capabilities and complementarities in coordination with NCDC</td>
<td>- Identify or assess aspects/areas underserved in management of CSDs</td>
<td>- Broaden Stakeholders’ network and partnership and reassess service areas to be served for climate related health risk reduction and Environmental Health Impact Assessment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Develop affordable and acceptable tools for risk reduction and Environmental Health Impact Assessment.</td>
<td>- Evaluate Corporate Social Responsibility (CSR) under laws for Health strategies, Policies and measures for promotion of health.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Establish Corporate Social Responsibility / Accountability in terms of finances for implementing measures for prevention/reduction/treatment of CSDs</td>
<td>- Meeting/Consultation with local governing body for reassessment of roles and services and appropriate resource allocation and for limiting duplication of actions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Expand measures to make healthcare sector ‘Green’.</td>
<td>- Reassess tools for risk reduction and Environmental Health Impact Assessment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Increase plantation in and around building to make it ‘Green’.</td>
<td>- Share best management practices which are affordable and acceptable in social/traditional context locally.</td>
</tr>
<tr>
<td></td>
<td>Integrate, adopt and implement environment friendly measures suggested in other missions on climate change in coordination with NCDC</td>
<td>- Incorporate measures in building design for making it climate resilient.</td>
<td>- Evidence based support to decision makers for addressing gaps in climate resilient healthcare services.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Use technologies which reduce harmful chemicals emission &amp; carbon foot print.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Use of energy-efficient equipments and services.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Replicate the successful ‘model of building design’ for new healthcare facilities.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Explore and support technologies, equipments and services which are energy efficient and reduce harmful chemicals emission &amp; carbon foot print</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assess and document reduction of climate risk in climate resilient building design for replication in other states and UTs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- No of plants planted in the various health care facilities- PHC, CHC, SDH, DH annually</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- No of Green Hospital models Initiated, Constructed and Renovated at Primary, Secondary and Tertiary levels.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- No of prototype hospital buildings prepared which are resilient to Disasters (Floods, Cyclones, earthquake, Tsunami)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>- No of health facilities where solar panels installed, LEDs installed, rain water harvesting done</td>
<td></td>
</tr>
<tr>
<td>S. No.</td>
<td>Key Actions</td>
<td>Activity</td>
<td>Indicators</td>
</tr>
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<td>-------</td>
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</tr>
<tr>
<td></td>
<td><strong>Short term</strong> (First two years)</td>
<td><strong>Medium Term</strong> (up to five years)</td>
<td><strong>Long Term</strong> (up to fifteen years)</td>
</tr>
<tr>
<td></td>
<td><strong>To strengthen research capacity to fill the evidence gap on climate change impact on human health.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strengthening of healthcare services based on researches on climate variables and impact on human health in coordination with NCDC</td>
<td>- Create database of professionals, researchers and institutions engaged in studies of impact of weather and climate on health.</td>
<td>- List of professionals, researchers and institutions engaged in studies of impact of weather and climate on health at the state and district level.</td>
</tr>
<tr>
<td></td>
<td>- Create a platform for ‘data-repository’ of various researches on climate and health effects.</td>
<td>- Develop models mathematical or other types for early warning alerts for CSDs.</td>
<td>- Creation of ‘data-repository’ of various researches on climate and health effects at state and district level.</td>
</tr>
<tr>
<td></td>
<td>- Scenario-building (initiation of study, data sources, mechanism used, apportionment of risk factor, methodology, assumptions, model used, confidence interval) for establishing relation of climate variables and health impacts.</td>
<td>- Develop / adapt techniques for modelling or use other research advances by transitioning them into operational products and decision support tools.</td>
<td>- List of ‘best practices’ in implementation of measures to combat the effect of climate change.</td>
</tr>
<tr>
<td></td>
<td>- Identify best practices in implementation of measures to combat the effect of climate change.</td>
<td>- Reassess health data esp CSDs using modelling techniques.</td>
<td>- Number of seminars in a year on CSDs and related aspects including ‘best practices’ at state and district level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Inform Policy-makers about ‘scenario’ of health-related statistics with focus on CSDs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Conduct seminars, workshops, conferences on best practices of measures to combat effect of climate change on human health.</td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

(Note: The indicators related to input process, output and outcome shall be added in the State Action Plan during subsequent meetings at time of firming up the State Action Plan for Climate Change and Human Health).
Chapter 6

Climate Sensitive Diseases prevalent in the State

Geographic Profile

- Population : 1.1 Crore (74% rural population)
- Total geographic area is 53,483 km², of which 86% is mountainous and 65% is covered by Forest
- Vulnerable Population:

<table>
<thead>
<tr>
<th>Population Group</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 5 Children</td>
<td>15 Lakh</td>
</tr>
<tr>
<td>Adolescent (10 – 19 yrs)</td>
<td>23 Lakh</td>
</tr>
<tr>
<td>Elderly ( &gt; 60 yrs )</td>
<td>09 Lakh</td>
</tr>
</tbody>
</table>

- Districts - 13, Blocks - 95, Villages - 16414
- Population density : 189 persons per sq. km.
- Sex ratio : 963
- Literacy rate : 79%

Below is the map of Uttarakhand. The red line demarcates between plain and hilly region. Priority climate sensitive health events may be different on both sides of red line.

Health care Infrastructure at the State level:

Enlist the number of Health care Infrastructure/ facilities like PHC, CHC, District hospital, Tertiary care hospitals- Government as well as Private in State/UTs (preferably District wise).
<table>
<thead>
<tr>
<th>S. No</th>
<th>Name of District</th>
<th>Number of Medical college (Govt/ Pvt)</th>
<th>Number of district/civil hospital</th>
<th>Number of CHC hospital</th>
<th>Number of PHCs</th>
<th>Number of Subcenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Almora</td>
<td>2 (1 Govt/1 Pvt)</td>
<td>2</td>
<td>4</td>
<td>29</td>
<td>197</td>
</tr>
<tr>
<td>2</td>
<td>Bageshwar</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>12</td>
<td>87</td>
</tr>
<tr>
<td>3</td>
<td>Chamoli</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>12</td>
<td>111</td>
</tr>
<tr>
<td>4</td>
<td>Champawat</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>71</td>
</tr>
<tr>
<td>5</td>
<td>Dehradun</td>
<td>2 (1 Govt/1 Pvt)</td>
<td>2</td>
<td>7</td>
<td>34</td>
<td>179</td>
</tr>
<tr>
<td>6</td>
<td>Haridwar</td>
<td>2</td>
<td>2</td>
<td>9</td>
<td>44</td>
<td>169</td>
</tr>
<tr>
<td>7</td>
<td>Nainital</td>
<td>1 (Govt)</td>
<td>1</td>
<td>8</td>
<td>24</td>
<td>151</td>
</tr>
<tr>
<td>8</td>
<td>Pauri Garhwal</td>
<td>1 (Govt)</td>
<td>2</td>
<td>5</td>
<td>36</td>
<td>258</td>
</tr>
<tr>
<td>9</td>
<td>Pithoragarh</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>18</td>
<td>164</td>
</tr>
<tr>
<td>10</td>
<td>Rudraprayag</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>13</td>
<td>78</td>
</tr>
<tr>
<td>11</td>
<td>Tehri Garhwal</td>
<td>1</td>
<td>1</td>
<td>11</td>
<td>35</td>
<td>216</td>
</tr>
<tr>
<td>12</td>
<td>Udham Singh Nagar</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>32</td>
<td>154</td>
</tr>
<tr>
<td>13</td>
<td>Uttrakashi</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>10</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>4 (3 Govt/1 Pvt)</strong></td>
<td><strong>20</strong></td>
<td><strong>73</strong></td>
<td><strong>305</strong></td>
<td><strong>1919</strong></td>
</tr>
</tbody>
</table>

2. Climate Sensitive Illnesses in the State:

- Acute Respiratory Illnesses attributed to Air Pollution
- Vector Borne Diseases
- Water Borne Diseases
- Food Borne Diseases
- Cardio-pulmonary Diseases,
- Mental Health support,
- Zoonotic Diseases
- Disaster management - Extreme weather events affecting health
Chapter 7

Health Adaptation Plan for Acute Respiratory Illnesses attributed to Air Pollution

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.\textsuperscript{29,30}

Two major types of Air Pollution:

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

Ambient (Outdoor) air pollution is a broader term used to describe air pollution in outdoor environments. Poor ambient air quality occurs when pollutants reach high enough concentrations to affect human health and/or the environment.

Household (Indoor) air pollution refers to chemical, biological and physical contamination of indoor air. It may result in adverse health effects.

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.\textsuperscript{41-43}

Any study conducted by the state govt on air pollution may be described here in short with data.
Prominent causes of Ambient Air Pollution in the (name) state:

1. Pollution by Automobiles
2. Industrial Emission
3. ....................................
4. ....................................

Prominent causes of Household Air Pollution in the (name) state:

1. Use of biomass, kerosene as fuel for cooking
2. Burning of waste, cow dung, coal
3. .............................................
4. .............................................

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

1.
2.
3.

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.

<table>
<thead>
<tr>
<th>Air Quality Index (AQI) Category</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>0-50</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>51-100</td>
</tr>
<tr>
<td>Moderately Poor</td>
<td>101-200</td>
</tr>
<tr>
<td>Poor</td>
<td>200-300</td>
</tr>
<tr>
<td>Very Poor</td>
<td>300-400</td>
</tr>
<tr>
<td>Severe</td>
<td>401-500</td>
</tr>
</tbody>
</table>

Number of AQI monitoring stations within state:

1. By Central Pollution Control Board (CPCB) - Number
2. BY State Pollution Control Board (SPCB)- Number

3. By System of Air Quality and Weather Forecasting and Research (SAFAR) - Number

➢ Enlist the probable causes of air pollution in the cities having AQI level (Highest AQI value available in the previous year) above 200 :-

1. 
2. 
3. 

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

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of the city</th>
<th>District</th>
<th>Highest AQI value in previous year</th>
<th>Reasons for High AQI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

➢ Names of Cities identified under National Clean Air Program (NCAP) in the (name) state

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………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<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Type of Health effect due to Air Pollution</th>
<th>Data for 2017 (if available)</th>
<th>Data for 2018 (if available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ARI patients attending at OPDs of PHC/CHC/DH/MC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>ARI patients attending at emergency department of the casualty of CHC/SDH/DH/MC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>No of deaths due to Heart Attacks at DH/MC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>No of patients admitted with stroke at DH/MC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>No of newly detected Lung cancer patient in a year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>No of lung cancer deaths in a year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Skin illness like dermatitis, Eczema patients attended at skin OPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Eye irritation patients attended at Ophthalmology OPDs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**State wise Morbidity, Mortality and related statistics of air pollution**

Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for air pollution Map Colour coding
List the stakeholders with defined roles and responsibilities (Govt. & non-Govt)

Role of different Ministries in control of Air Pollution (relevant Ministry)

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 check-ups 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 MahilaMandals 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

**Roles and Responsibility of Task Force members**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Task force Member</th>
<th>Role and Responsibility for Air Pollution control in state</th>
</tr>
</thead>
</table>
| 1      | SNO-CC            | 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. |
<p>| 2      | Director, from any research Institute | - To create evidence of Air Pollution impact on health by undertaking various studies, research for the same. |</p>
<table>
<thead>
<tr>
<th></th>
<th>Role</th>
<th>Responsibilities</th>
</tr>
</thead>
</table>
| 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 | Chairman, 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 | Chairman, 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.                                                                                                                                                                              |

**Health Sector Adaptation plan for Air Pollution Control**
Table: Action points in accordance with Air Quality Index

<table>
<thead>
<tr>
<th>AQI</th>
<th>Associated Health Impacts</th>
<th>Action Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good (0-50)</td>
<td>Minimal Impact</td>
<td></td>
</tr>
<tr>
<td>Satisfactory</td>
<td>May cause minor breathing discomfort to sensitive people.</td>
<td>-</td>
</tr>
</tbody>
</table>

Diagram:
- Ongoing interventions
- Monitoring and Evaluation
- Screening
- Health sector Adaptation Plan for controlling Air Pollution
- Strengthen the facilities
- Awareness
- Training and capacity building
<table>
<thead>
<tr>
<th>Pollution Level</th>
<th>Description</th>
<th>Health Impacts</th>
<th>Prevention Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderately polluted (101-200)</td>
<td>May cause breathing discomfort to people with lung disease such as asthma, and discomfort to people with heart disease, children and older adults.</td>
<td>Stop garbage burning Close/stringently enforce all pollution control regulations in brick kilns and industries Stringently enforce pollution control in thermal power plants through PCB monitoring periodic mechanized sweeping Strict norms vigilance and enforcement of PUC Stringently enforce rules for dust control in construction activities and close non-compliant sites Information dissemination—Social media, mobile Apps should be used to inform people about the pollution levels.</td>
<td></td>
</tr>
<tr>
<td>Poor (201-300)</td>
<td>May cause breathing discomfort to people on prolonged exposure, and discomfort to people with heart disease</td>
<td>Alert in newspapers/TV/radio to advise people with respiratory and cardiac patients to avoid polluted areas and restrict outdoor movement</td>
<td></td>
</tr>
<tr>
<td>Very Poor (301-400)</td>
<td>May cause respiratory illness to the people on prolonged exposure. The effect may be more pronounced in people with lung and heart diseases.</td>
<td>Stop use of diesel generator sets Stop use of biomass fuels for cooking, heating purposes</td>
<td></td>
</tr>
<tr>
<td>Severe (401-500)</td>
<td>May cause respiratory impact even on healthy people, and serious health impacts on people with lung/heart disease. The health impacts may be experienced even during light physical activity.</td>
<td>Stop entry of heavy diesel vehicles Stop construction activities Shutting of schools Task force to shut down brick kilns, Hot Mix plants, Stone Crushers, power plants Increase frequency of mechanized cleaning of road and sprinkling of water on roads.</td>
<td></td>
</tr>
</tbody>
</table>

**Alert system**

Automated Air Quality Warning devices in all the schools, offices, and other public buildings in the vulnerable areas for triggering warning manually by the local government.

a) Radio communication system for district administration.

b) Air quality alerts, based on the air quality index thresholds determined by the local government

b) Leaflets and pamphlets describing prevention guidelines.

c) 24/7 Tele-assistance communication services and devices.
Actions undertaken and further proposed to reduce the burden of Air pollution in the polluted cities of the State/UT

(Activities Done in state)

1. Advertisement and promotion through IEC:
   a. Street plays in low-income communities
   b. Hoards, billboards, as and other advertisement modes

2. Medical professional training:
   a. Expanded training of doctors and associate staff
   b. Increased training of NGOs and Asha workers

3. Access to an air-conditioned space
   a. Air conditioners and air purifiers can be a useful addition to daily precautions to remove particulate matter from the indoor environment.
   b. To effectively remove airborne particulate matter a High-Efficiency Particulate Arrestance (HEPA) filter with a rating of at least H13 or above is needed.
   c. Avoid the use of ionization filter technology as it will generate ozone and may pose additional health hazards.

4. Masks or particulate respirators
   a. Masks may help in special circumstances if you have to be outside for long periods.
   b. Masks should be disposable, regularly changes and have a rating of at least N-95 meaning that the mask is adequate for filtering out 95% or most of the PM$_{2.5}$ particles.

Activities conducted and planned for awareness generation on the health impacts of Air pollution

1. Carry out mass media campaigns
2. Promote a culture of risk prevention, mitigation, and better risk management
3. Promote attitude and behavior change in the awareness campaigns linking air pollution and climate change.
4. Engage local and regional media (community radio, TV)

Activities conducted and proposed to integrate air pollution in respective health programmes or policy.

1.
2.
3.
4.

Activities undertaken if any and further proposed to train health workforce on Air pollution adaptation measures

1. Formulate and implement national training and capacity building programmes.
2. Ensure the availability of qualified and experienced trainers
3.

Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to air pollution.

1. ARI Surveillance Activity at State Level
2.
3.
4.

ARI Surveillance at State - Data Flowchart
ARI Surveillance Activity at State Level

- State Nodal Hospital for ARI Surveillance
- (Name & contact detail - mobile no & email Id):
- Number of cities selected for ARI Surveillance:
- Names of the cities selected for ARI surveillance:
**City wise List of Sentinel hospitals selected for ARI surveillance activity:**

<table>
<thead>
<tr>
<th>Name of City</th>
<th>Name of Hospital</th>
<th>Public or Private</th>
<th>Type Of Hospital( Medical College, District Hosp, Rural Hosp, Pediatric Hosp, Respiratory Disease Hospital)</th>
<th>Name of Nodal (reporting)Officer of hospital</th>
<th>Contact Details of Nodal Officer of hospital (Mobile No. &amp; Email ID)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dehradun</td>
<td>Govt. Doon Medical College</td>
<td>Public</td>
<td>Medical College</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haridwar</td>
<td>District Hospital</td>
<td>Public</td>
<td>District Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Udham Singh Nagar</td>
<td>District Hospital</td>
<td>Public</td>
<td>District Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SDH Kashipur</td>
<td>Public</td>
<td>Sub District Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nainital</td>
<td>Govt. Medical College</td>
<td>Public</td>
<td>Medical College</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Status of ARI Surveillance data collection at states**

<table>
<thead>
<tr>
<th>Name of City</th>
<th>Name of Hospital</th>
<th>Capturing ARI data as per format of annexure 3 from different departments</th>
<th>Data compilation in format of annexure 4</th>
<th>Data is sent to state office on daily basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>City 1</td>
<td></td>
<td>Yes/No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>City 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**How effective are current health and other sector policies and programmes to manage the Air pollution levels in the polluted cities of your state/UT.**
Success Stories if any, of the State/ UT health sector for adaptation or mitigation of Air pollution levels in the polluted cities.

1.
2.
3.
4.

Research studies, reports, innovative actions etc related to air pollution done in the states by govt/NGO/ academic institution

1.
2.
3.
4.

(Reporting formats for ARI surveillance are attached at Annexure F)
Chapter 8

Health Adaptation Plan for Heat

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 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 pathophysiology, 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. State may enter their State specific inputs related to the same.

Different type of heat related illness includes:

1. Minor heat related Illnesses: Heat rash, heat cramps, heat syncope
### Types of heat related illnesses

<table>
<thead>
<tr>
<th>Clinical Entity</th>
<th>Age Range</th>
<th>Setting</th>
<th>Cardinal Symptoms</th>
<th>Cardinal / Important Signs</th>
<th>Pertinent Negative findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat rash/prickly heat/Miliaria</td>
<td>All, but frequently children</td>
<td>Hot environment; +/- insulating clothing or swaddling (wrap in tight clothes)</td>
<td>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</td>
<td>DIFFUSED RED COLOUR SKIN OR VESICULAR RASH, itching of the skin without visible eruption</td>
<td>NOT FOCALLY DISTRIBUTED like a contact dermatitis</td>
</tr>
<tr>
<td>Heat cramps</td>
<td>All</td>
<td>Hot environment, TYPICALLY WITH EXERTION, +/- insulating clothing</td>
<td>PAINFUL SPASMS of large and frequently used muscle groups</td>
<td>Uncomfortable appearance, may have DIFFICULTY FULLY EXTENDING AFFECTED LIMBS/JOINTS</td>
<td>No contaminated wounds/tetanus exposure; no seizure activity</td>
</tr>
<tr>
<td>Heat exhaustion</td>
<td>All</td>
<td>Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)</td>
<td>Feeling overheated, light headedness, EXHAUSTED AND WEAK, unsteady, feeling of VOMITING, SWEATY AND THIRSTY, inability to continue activities</td>
<td>SWEATY/diaphoretic; flushed skin; hot skin; NORMAL CORE TEMPERATURE; +/- dazed, +/- generalized weakness, slight disorientation</td>
<td>No coincidental signs and symptoms of infection; no focal weakness; no difficulty in swallowing food or speech; no overdose history</td>
</tr>
<tr>
<td>Heat syncope</td>
<td>Typically adults</td>
<td>Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)</td>
<td>Feeling hot and weak; light headedness followed by a BRIEF LOSS OF CONSCIOUSNESS</td>
<td>Brief, generalized loss of consciousness in hot setting, short period of disorientation, if any</td>
<td>NO SEIZURE ACTIVITY, no loss of bowel or bladder continence, no focal weakness, no difficulties in food swallowing or speech</td>
</tr>
<tr>
<td>Heat Stroke</td>
<td>All</td>
<td>Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)</td>
<td>Severe overheating; profound weakness; DISORIENTATION, NOT FULLY ALERT, CONVULSION, OR OTHER ALTERED MENTAL STATUS</td>
<td>Flushed, DRY SKIN (not always), CORE TEMP ≥40°C OR 104°F; altered mental status with disorientation, incoherent behaviour, COMA, CONVULSION; tachycardia; +/- hypotension</td>
<td>No coincidental signs and symptoms of infection; no focal weakness; no difficulties in swallowing food or speech, no overdose history</td>
</tr>
</tbody>
</table>
Enlist the Priority Districts for Heat related illnesses (according to Prevalence in the past years)

Vulnerability Assessment for Heat related illnesses:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elderly people age more than 60 years</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Children’s below 5 years of age</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Pregnant women</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data of vulnerable population State:

Statistics i.e., Population (Total, Population density), Vulnerable Population (Under five Children, Adolescents, Elderly, migrants and Occupation (Primarily for major population and others) – State

Other vulnerability factors are: Health status, Socioeconomic status, Occupation, working place and working conditions, unplanned urban housing, overcrowding, Drought/ flood prone area, water scarcity zone, proportion of population-malnourished, accessibility to health care.
Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for water borne diseases

Risk mapping can be done by analysing heat related illness data of IDSP as per vulnerability assessment tools annexed at Annexure B.1, B.2, B.3, B.4, B.5, B.6, B.7 and B.8.

Geo-physical & Climate variables i.e., Area with highest maximum temperature(Tmax), average day temperature, (month wise) as per IMD in previous 5 years.

Table: 1.1 Roles and responsibilities of health department, medical colleges & hospitals, health centres and link workers

<table>
<thead>
<tr>
<th>S.No</th>
<th>Department</th>
<th>Season</th>
<th>Roles and responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health department</td>
<td>During <strong>Pre-Heat Season</strong> (Annually from January through March)</td>
<td>• Create list of high risk areas (heat-wise) of districts/block/cities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Update surveillance protocols and programs, including tracking daily heat-related data</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Develop/revise and translate IEC in local language</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Make a communication plan for dissemination of heat related alerts or education materials</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Check inventories of medical supplies in health centers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Identify cooling centers and barriers to access cooling centers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Capacity building of health care personnel to detect and treat heat related illnesses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Community involvement for workers and trainers’ education</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Issue health advisory to healthcare personnel based on IMD seasonal prediction or warning</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Reassess ‘Occupational Health Standards’ for various types of Occupation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>During <strong>Heat Season</strong> (Annually from March through July)</td>
<td>• Ensure real-time surveillance and monitoring system in case of extreme event.</td>
</tr>
</tbody>
</table>
| 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 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 |
| 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 |
<p>| During Heat | Recheck management stock |</p>
<table>
<thead>
<tr>
<th>S.No</th>
<th>Department</th>
<th>Season (Annually from March through July)</th>
<th>Roles and responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Modify worker hours to avoid heat of day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Visit at-risk populations for monitoring and prevention</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Communicate information on tertiary care and 108 service</td>
</tr>
<tr>
<td></td>
<td></td>
<td>During Post-Heat Season (Annually from July through September)</td>
<td>• Participate in annual evaluation of heat action plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Review revised heat action plan</td>
</tr>
</tbody>
</table>

**Table 1.2. Other department’s roles and responsibilities**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Department</th>
<th>Season</th>
<th>Roles and responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Meteorological Department</td>
<td>Pre-Heat</td>
<td>Issue weather forecasts on Short/Medium/Long range duration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heat</td>
<td>• Issue Heat wave alerts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Coordination with health department for analysing cases and death data with meteorological variables like maximum temperature and relative humidity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post-Heat</td>
<td>• Participate in annual evaluation of heat action plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Review revised heat action plan</td>
</tr>
<tr>
<td>2</td>
<td>Dept of Drinking water &amp; Sanitation</td>
<td>Pre-Heat</td>
<td>Identify vulnerable places</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heat</td>
<td>Provide drinking water points at identified places and worksites</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post-Heat</td>
<td>• Participate in annual evaluation of heat action plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Review revised heat action plan</td>
</tr>
<tr>
<td>3</td>
<td>Public Health &amp; Engineering Dept</td>
<td>Pre-Heat</td>
<td>To construct cool shelters/sheds at public places, bus stands etc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heat</td>
<td>To maintain shelters/sheds, bus stands</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post-Heat</td>
<td>• Participate in annual evaluation of heat action plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Review revised heat action plan</td>
</tr>
<tr>
<td>4</td>
<td>Municipalities</td>
<td>Pre-Heat</td>
<td>Review the heat preparation measures.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heat</td>
<td>Ensure implementation of guidelines of heat action plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post-Heat</td>
<td>Review the heat preparation measures and make a note of the lessons learnt for the next season</td>
</tr>
<tr>
<td>5</td>
<td>Dept of Education</td>
<td>Pre-Heat</td>
<td>Train and Sensitise teachers and students towards health impact of extreme events and disseminate health ministry approved</td>
</tr>
<tr>
<td><strong>Pre-Heat</strong></td>
<td><strong>Heat</strong></td>
<td><strong>Post-Heat</strong></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
<td>---------------</td>
<td></td>
</tr>
</tbody>
</table>
| Dept of Labour & employment | • 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 | • Participate in annual evaluation of heat action plan  
• Review revised heat action plan |
| 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 | |
| Dept of Power supply | Maintenance of electrical lines | • Participate in annual evaluation of heat action plan  
• Review revised heat action plan |
| Pre-Heat | Ensure uninterrupted supply of electricity | |
| Dept of Forest & Climate change | Develop/encourage projects to decrease the ‘Urban Heat Island effect’ | • Participate in annual evaluation of heat action plan  
• Review revised heat action plan |
<p>| <strong>Heat</strong> | Ensure implementation of guidelines of heat action plan | |
| <strong>Post-Heat</strong> | Review the heat preparation measures and make a note of the lessons learnt for the next | |</p>
<table>
<thead>
<tr>
<th>Dept of Transport</th>
<th>Pre-Heat</th>
<th>Review the road map for preparation for the heat season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Heat</td>
<td>Ensure implementation of guidelines of heat action plan</td>
</tr>
<tr>
<td></td>
<td>Post-Heat</td>
<td>• Participate in annual evaluation of heat action plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Review revised heat action plan</td>
</tr>
<tr>
<td>Media or Press officer</td>
<td>Pre-Heat</td>
<td>• Secure commercial airtime slots for publicservice announcements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Identify areas to post warnings and information during heat season</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Activate telephone heat hotline</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Begin placing temperature forecasts in newspapers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increase installed LED screens with scrolling temperature</td>
</tr>
<tr>
<td></td>
<td>Heat</td>
<td>• Issue heat warnings in heat and electronic media</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Contact local FM radio and TV stations for announcements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use SMS, text and WhatsApp mobile messaging and centralized mobile databases to send warnings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Contact transport department to place warnings on buses</td>
</tr>
<tr>
<td></td>
<td>Post-Heat</td>
<td>Evaluate reach of advertising to target groups and other means of communication such as social media</td>
</tr>
</tbody>
</table>

Table: 2 Activities undertaken and further proposed to generate awareness, accessing weather data and capacity building related to heat related illness.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Activities to generate awareness, accessing weather data and capacity building</th>
<th>Activities done (yes/no)</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Increasing public awareness of heat vulnerability</td>
<td>Assess and prioritize heat-vulnerable communities&lt;br&gt;Disseminated more information on the health effects of heat</td>
<td>Distribute informational pamphlets&lt;br&gt;Launch a “heat line” call centre&lt;br&gt;Develop heat health early action response strategies&lt;br&gt;Involve link workers in heat health campaigns&lt;br&gt;Disseminate public service announcements and health warnings&lt;br&gt;Form partnerships and heat health preparedness networks</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>2. Improving access to weather data and heat warnings</td>
<td>Increase communication channels between the Met Center, Municipal corporation and the health department.&lt;br&gt;Work with MC and state government to install displays for temperature and weather forecasts.&lt;br&gt;Revise the current heat wave advisory thresholds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Building capacity in the health care infrastructure</td>
<td>Conduct heat vulnerability reduction trainings to increase awareness and diagnosis of heat illnesses</td>
<td>Provide a train-the-trainers session for primary medical officers&lt;br&gt;Create a training program or multiday workshop for health care providers, ward leaders and paramedics&lt;br&gt;Conduct training programs for link workers&lt;br&gt;Increase heat stress outreach and education for women in maternity wards&lt;br&gt;Create and implement heat health guidelines&lt;br&gt;Adopt heat-focused examination procedures at local hospitals and Urban Health Centers.</td>
<td></td>
</tr>
</tbody>
</table>
Annexure B.1

Vulnerability assessment

Figure 1. Distribution of cases and deaths in district wise map of State
e.g. Andhra Pradesh (distribution of deaths, year 2019)

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Number of Death</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>No deaths</td>
</tr>
<tr>
<td>Yellow</td>
<td>1-2</td>
</tr>
<tr>
<td>Orange</td>
<td>3-5</td>
</tr>
<tr>
<td>Red</td>
<td>6-10</td>
</tr>
<tr>
<td>Black</td>
<td>More than 10</td>
</tr>
</tbody>
</table>

Annexure B.2

District wise Heat related illnesses data of the State for year 20__-20__

<table>
<thead>
<tr>
<th>S.no</th>
<th>Name of the District</th>
<th>Year wise total no. of cases reported due to Heat Related Illness</th>
<th>Year wise total no. of deaths reported due to heat related illness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Annexure B.3

Area wise distribution of Heat related illnesses data of the State for year 20__-20__

<table>
<thead>
<tr>
<th>S.no</th>
<th>Name of the District</th>
<th>Year wise total no. of cases reported due to Heat Related Illness</th>
<th>Year wise total no. of deaths reported due to heat related illness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>District 1 Urban</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>District 2 Urban</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Urban</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Urban</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Annexure B. 4

Average maximum temperature (Tmax) from March to June of year 20__-20__0

<table>
<thead>
<tr>
<th>S.no</th>
<th>Name of district</th>
<th>Tmax in year 20__</th>
<th>Tmax in year 20__</th>
<th>Tmax in year 20__</th>
<th>Tmax in year 20__</th>
<th>Tmax in year 20__</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mar</td>
<td>Apr</td>
<td>May</td>
<td>June</td>
<td>Mar</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Source of Tmax: IMD)

Enlist the probable causes of rise in Temperature in the districts having high Tmax from year 20__-20__:

1. Probable cause in District 1:
   a.
   b.

2. Probable cause in District 2:
   a.
   b.

Priority City/District for heat illness Surveillance as per above Tmax:

1.
2.

Annexure B. 5

Age wise distribution of cases and deaths due to heat related illnesses till date

<table>
<thead>
<tr>
<th>Age-group</th>
<th>Number of heat stroke cases</th>
<th>Number of heat stroke deaths</th>
<th>Age wise population of district</th>
<th>Attack rate (per lakh population)</th>
<th>Case fatality rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-15 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>61 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Annexure B.6

Gender wise distribution of cases and deaths due to heat related illnesses till date
<table>
<thead>
<tr>
<th>Gender</th>
<th>Gender wise population of district</th>
<th>Attack rate (per lakh population)</th>
<th>Case fatality rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Annexure B. 7**

Occupational status of cases and deaths due to heat related illnesses till date

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Number of heat stroke cases</th>
<th>Number of heat stroke deaths</th>
<th>Case fatality rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Annexure B. 8**

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

<table>
<thead>
<tr>
<th>BPL/APL</th>
<th>Number of heat stroke cases</th>
<th>Number of heat stroke deaths</th>
<th>Case fatality rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chapter 9

Health Adaptation plan for Vector Borne diseases

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.

The National Vector Borne Disease Control Programme (NVBDCP) is for prevention & control of vector borne diseases like- Malaria, Dengue and Chikungunya Japanese Encephalitis (JE), Kala-azar and Lymphatic filariasis.

Enlist various types of Vector Borne diseases in the state. Indicate in a tabular column the district wise data of the past years.

Malaria Cases (2015-2018)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of District</th>
<th>No. of Malaria Cases</th>
<th>API</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pithoragarh</td>
<td>0 0 0 0 0</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>Uttarkashi</td>
<td>0 0 0 0 0</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>Almora</td>
<td>0 0 1 0 0</td>
<td>0.00</td>
</tr>
<tr>
<td>4</td>
<td>Rudraprayag</td>
<td>9 4 0 0 0</td>
<td>0.00</td>
</tr>
<tr>
<td>5</td>
<td>Bageshwar</td>
<td>1 3 2 0 0</td>
<td>0.00</td>
</tr>
<tr>
<td>6</td>
<td>Chamoli</td>
<td>6 11 2 4 0</td>
<td>0.01</td>
</tr>
<tr>
<td>7</td>
<td>Champawat</td>
<td>0 4 18 27 0</td>
<td>0.10</td>
</tr>
<tr>
<td>8</td>
<td>Tehri</td>
<td>7 21 6 1 0</td>
<td>0.00</td>
</tr>
<tr>
<td>9</td>
<td>Dehradun</td>
<td>359 192 58 49 1</td>
<td>0.03</td>
</tr>
<tr>
<td>10</td>
<td>Haridwar</td>
<td>663 483 176 110 4</td>
<td>0.06</td>
</tr>
<tr>
<td>11</td>
<td>Nainital</td>
<td>202 43 53 111 0</td>
<td>0.12</td>
</tr>
<tr>
<td>12</td>
<td>Pauri</td>
<td>118 181 161 57 0</td>
<td>0.02</td>
</tr>
<tr>
<td>13</td>
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<td><strong>1466 961 508 409</strong></td>
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</table>
## District wise Dengue Cases Uttarakhand (Last 3 years)

<table>
<thead>
<tr>
<th>Name of District</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Deaths</td>
<td>Cases</td>
</tr>
<tr>
<td>Dehradun</td>
<td>1421</td>
<td>3</td>
<td>198</td>
</tr>
<tr>
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<td>430</td>
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<tr>
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<tr>
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<tr>
<td>Almora</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>U. S. Nagar</td>
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<td>46</td>
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<td>Tehri Garhwal</td>
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<tr>
<td>Champawat</td>
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<td>0</td>
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<tr>
<td><strong>Total</strong></td>
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## District wise JE Cases Uttarakhand (Last 3 years)

<table>
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<th>2017</th>
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<td>Cases</td>
<td>Deaths</td>
<td>Cases</td>
</tr>
<tr>
<td>Nainital</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Champawat</td>
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<td>U. S. Nagar</td>
<td>0</td>
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<td>0</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
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</tbody>
</table>

---

**Enlist the causes of different Vector Borne diseases in the state:**

1. Vast transmission period
2. Rapid urbanisation
3. Demographic and societal changes
4. *Increased population movement (work, travel, tourism or pilgrimage)*
Various factors contributing to increase/ decrease of respective Vector Borne in the state.

**Dengue**

1. Demographic and societal changes leading to unplanned and uncontrolled urbanization
2. Increased population movement (work, travel, tourism or pilgrimage)
3. Lack of awareness

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

<table>
<thead>
<tr>
<th>S.N</th>
<th>Name of District</th>
<th>Name of diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dehradun</td>
<td>Dengue, Malaria</td>
</tr>
<tr>
<td>2</td>
<td>Haridwar</td>
<td>Dengue, Malaria</td>
</tr>
<tr>
<td>3</td>
<td>Nainital</td>
<td>Dengue, Malaria, JE</td>
</tr>
<tr>
<td>4</td>
<td>Udham Singh Nagar</td>
<td>Dengue, Malaria, JE</td>
</tr>
</tbody>
</table>

2. **Vulnerability Assessment for Vector Borne diseases:**

2.1 **Data of vulnerable population district wise:**

**Name Of district:**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elderly people age more than 60 years</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Children's below 5 years of age</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Pregnant women</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.2 **Indicators for Vector Borne diseases:**
API for Malaria

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.

2.3 District wise Morbidity, Mortality and related statistics of Vector Borne diseases

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

03. Adaptation strategy and action plan for Vector Borne diseases

3.1 List the stakeholders with defined roles and responsibilities (Govt. & non-Govt)

Role of Health Sector (State Nodal Officer and Task Force)

1. Programme Officer for National Programs for control of vector borne diseases (NVBDPCP) must consider climate variability as an important factor for assessment of morbidity and mortality statistics and develop/ adapt health micro-plan based on recent VBD diseases trend
2. Map vulnerabilities: population at risk, geo-climatic conditions, seasonal variation, change in population demography, migration (in & out), available resources, healthcare infrastructure, laboratories, etc.

3. Strengthen/ Develop active and passive surveillance and establish sentinel sites for vector borne diseases.

4. Capacity building and increasing awareness for individuals, communities, health care workers through involvement of various media as well as campaigns and training workshops.

5. Develop or translate IEC on effects of climate change on VBDs in local language, and make a communication plan for dissemination of health related alerts/ education materials.

6. 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 or an outbreak

7. Vaccination of animals and animal handlers for vaccine preventable diseases.

8. ‘Environmental Health Impact Assessment’ of new development projects


10. Enforce legislation and regulations of vector borne diseases

**Coordination with other sectors for reducing Zoonotic diseases**

(As per the suggested sectors in the NVBDCP)

- Inter-sectoral collaboration for vector control
- Providing equipments and other related logistics for control of vectors
- Elimination and reduction of vector breeding sites.
- Encourage research on new safe and effective control measures

**Intervention by veterinary task force**

- Prevention and control of animal diseases and zoonoses
- Vaccination of animals & control on population of stray animals
- Safe destruction of carcasses and other material of animal origin
- The care of ‘food animals’, including collection, feeding, sheltering, slaughtering etc

**Intervention by Community & Individual**

- Eliminate/ control small & manmade vector breeding sites
- Make barriers for human dwellings to keep stray animals away from human dwellings by fencing the residential areas especially if in approximation to forests etc.
- House protection by using screening windows, doors and fencing the garden etc.
- Use self protection measures like protective clothing etc,
2.2 Enlist all the resources required/available to mitigate/reduce burden of Vector Borne diseases.

**Human Resource:**

<table>
<thead>
<tr>
<th>Staff</th>
<th>Regular/Contractual</th>
<th>Sanctioned</th>
<th>In Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVBDDO</td>
<td>Regular</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>ADVBDO</td>
<td>Regular</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Malaria Inspector</td>
<td>Regular</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>LT</td>
<td>Regular</td>
<td>202</td>
<td>198</td>
</tr>
<tr>
<td>VBD Consultant (NHM)</td>
<td>Contractual</td>
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<td>1</td>
</tr>
<tr>
<td>DEO (NHM)</td>
<td>Contractual</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

2.3 Identify actions for risk reduction that are agreed upon by stakeholders and the public

2.4 Operational Coordination (Stakeholders’ role and involvement): Building partnerships by involving citizens, organizations, and businesses.
2.5 Mechanism of Generation of Alert system for the outbreak of Vector Borne diseases.

- Data Surveillance and Data Reporting
- Integration and coordination with IDSP
- Monitoring and supervision
- Media alert and verification

Make a detailed action plan with checklist for the Vector Borne diseases:

- Logistics required at health care facilities
- Preparedness of health system and personnel
- List activities for prevention of illnesses (IEC, pamphlets, advisories, training, workshop etc).
- Operational communication channel
- Mechanism to ensure data maintenance, surveillance, timely sharing with concerned departments and stakeholders.
3 Actions undertaken and further proposed to reduce the burden of Vector Borne in the State/UT

3.1 Activities conducted and planned for awareness generation on the health impacts of Vector Borne diseases:

   a. Advertisement and promotion through IEC:
      i. Street plays
      ii. 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)

3.2 Activities conducted and proposed to integrate Vector Borne diseases in respective health programmes or policy.

   1. Integration and coordination with IDSP

   2. Awareness material published in ASHA diaries

   3.

   4.

3.3 Activities undertaken if any and further proposed to train health workforce on Vector Borne adaptation measures
1. Formulate and implement national training and capacity building programmes.
2. Ensure the availability of qualified and experienced trainers
3.  
4.4 Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to Vector Borne illnesses.

1. Routine data collection
2. Cross notification of cases
3. Enhance surveillance in Cross bordering districts
4. Daily reporting during outbreaks

4.5 Activities undertaken and further proposed related to integration with State Disaster Management Authority for emergency risk reduction and early response.

1.  
2.  
3.  
4.  

4.6 How effective are current health and other sector policies and programmes to manage the Vector Borne diseases of the State/UT.

1.  
2.  
3.  
4.  

4.7 Success Stories if any, of the State/ UT health sector for adaptation or mitigation of Vector Borne diseases

1.  
2.  
4.8 Research studies, reports, innovative actions etc related to Vector Borne illnesses done in the states by Govt /NGO/ academic institution

1.
2.
3.
4.
Chapter 10

Health Adaptation plan for Water borne Diseases

4. Introduction

Illnesses due to contaminated water and food are usually seen following flood, drought, religious or other mass gatherings.

Waterborne diseases such as typhoid, hepatitis, dysentery, and others caused from micro-organisms such as Vibrio vulnificus and Vibrio cholera, E.Coli, Campylobacter, Salmonella, Cryptosporidium, Giardia, Yersinia, Legionella are some climate-dependant infectious diseases. The increase in temperature is seen to be associated with increased survival and abundance of micro-organisms\(^{44,46}\). The decreased precipitation and drought result in decrease availability of safe-water, reuse of wastewater, contamination of water sources, transmission from vertebrate to human or human to human etc. Flooding cause contamination of water source as well as disruption of sewage disposal system, further contributors are population displacement, overcrowding, poor sanitation and hygiene, subsequent faeco-oral contamination and spread of pathogens etc.

Enlist various types of water borne disease in the state. Indicate in a tabular column the district wise data of the past years.

1. ADD
2. Enteric Fever
3. Viral Hepatitis
4. Bacillary Dysentery

<table>
<thead>
<tr>
<th>Districts</th>
<th>2017</th>
<th>2018</th>
<th>2019 (sep)</th>
</tr>
</thead>
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<tr>
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<td>2251</td>
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<td>15528</td>
<td>11095</td>
</tr>
<tr>
<td></td>
<td>2017</td>
<td>2018</td>
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</tr>
<tr>
<td>----------</td>
<td>------</td>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td>PITHORAGARH</td>
<td>1721</td>
<td>4133</td>
<td>3965</td>
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<tr>
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### Enteric Fever

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</table>

### Viral Hepatitis

<table>
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<th>Districts</th>
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</tr>
</thead>
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</tr>
<tr>
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<td>140</td>
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<td>1632</td>
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<tr>
<td>HARIDWAR</td>
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<td>159</td>
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<td>860</td>
<td>654</td>
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<tr>
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<td>20</td>
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<tr>
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<td>2</td>
<td>12</td>
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<td>U S NAGAR</td>
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<td>Total</td>
<td>8149</td>
<td>8397</td>
<td>5981</td>
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</table>
### Bacillary Dysentery

<table>
<thead>
<tr>
<th>Districts</th>
<th>2017</th>
<th>2018</th>
<th>2019 (Sep)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1000</td>
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<td>1307</td>
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<tr>
<td>BAGESHWAR</td>
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<td>TEHRI GARHWAL</td>
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<td><strong>20556</strong></td>
<td><strong>23012</strong></td>
<td><strong>16480</strong></td>
</tr>
</tbody>
</table>

Enlist the causes of different water borne diseases in the state:

1. Contamination of water sources
2. Water storage practices
3. Use of water from open sources in hilly areas
4. Lack of awareness

Various factors (if any) contributing to increase/ decrease of respective water borne diseases in the (name) state:

1.
2.
3.

Enlist the Priority Districts for Water borne diseases (according to Prevalence in the past years)

<table>
<thead>
<tr>
<th>S.N</th>
<th>Name of District</th>
<th>Name of diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dehradun</td>
<td>ADD, Dysentery, Enteric Fever, Viral Hepatitis</td>
</tr>
<tr>
<td>2</td>
<td>Haridwar</td>
<td>ADD, Dysentery, Enteric Fever</td>
</tr>
</tbody>
</table>
2. Vulnerability Assessment for Waterborne diseases:

2.1 Data of vulnerable population district wise:

Name Of district:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elderly people age more than 60 years</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Children’s below 5 years of age</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Pregnant women</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
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</tr>
</tbody>
</table>

2.2 Indicators for Waterborne diseases -related diseases:

Vulnerability Assessment: Availability of safe water supply to all, sanitation facilities in general and in urban slums and remote rural areas, personal hygiene, political willingness, Socio-economic status, cultural beliefs, natural disasters, demographic changes, accessibility to health care.
2.3 District wise Morbidity, Mortality and related statistics of Waterborne diseases:

<table>
<thead>
<tr>
<th>District</th>
<th>Morbidity</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

2.4 Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for water borne diseases

3. **Adaptation strategy and action plan for water borne diseases sensitive to Climate variability**

3.1 List the stakeholders with defined roles and responsibilities (Govt. & non-Govt)

*Role of Health Sector* (State Nodal Officer and Task Force)

1. Develop/ adapt health micro-plan for water borne illnesses (case management, resources required like logistics, drugs, vaccines, laboratories' role)
2. Map vulnerabilities: population at risk, geo-climatic conditions, recent trend of climate variability (flood, drought), change in population demography (migration), available resources, healthcare infrastructure, laboratories, burden of chronic illnesses in the community etc
3. Build capacity of health care personnel to detect and treat water borne illnesses
4. Strengthen/ Develop real-time surveillance, evaluation and monitoring system for water borne illnesses, enhance this surveillance during high risk period
5. Issue advisory to healthcare personnel, laboratories and related stakeholders
6. Develop or translate IEC in local language, and make a communication plan for dissemination of health related alerts/ education materials.
7. Ensure adequate supplies (vaccines and medications) for cases management with other required logistic as identified to the affected region
8. Improve access to health care facilities by vulnerable population, especially those in remote areas.
9. Coordinate with related stakeholders like Municipalities to keep a check and strengthen surveillance of food handling units, local vendors, water supply etc.

10. Explore collaborative mechanisms (e.g. memoranda of understanding) with other departments, stakeholders for sharing of data and for coordinating efforts to manage health risks.

**Coordination with other sectors in reducing water borne illnesses**

*Department of Water & Sanitation*
- Ensure minimum household safe water supply
- Reuse treated waste-water for non-household use
- Encourage water saving technologies like low-flow toilets & Showers, rain water harvesting etc

*Municipalities and other Local regulating bodies*
- Ensure safe water supply and good sanitation to check transmission of infective agents
- Regulate street vendors, food handling units for quality food

*Ministry of Agriculture*
- Develop/ encourage programs for efficient use of irrigation water.
- Promotion of climate resilient crops among farmers

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**3.2 Enlist all the resources required/available to mitigate/reduce burden of water borne illness.**

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**3.3 Identify actions for risk reduction that are agreed upon by stakeholders and the public**

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**3.4 Operational Coordination (Stakeholders’ role and involvement):**

Building partnerships by involving citizens, organizations, and businesses.

...........................................................................................................................................
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3.5 Mechanism of Generation of Alert system for the outbreak of water borne illness

1. Enhance data surveillance under IDSP
2. Media alerts and verification

**Make a detailed action plan with checklist for the water borne illnesses:**

- Logistics required at health care facilities
- Preparedness of health system and personnel
- List activities for prevention of illnesses (IEC, pamphlets, advisories, training, workshop etc).
- Operational communication channel
- Mechanism to ensure data maintenance, surveillance, timely sharing with concerned departments and stakeholders.

4. Actions undertaken and further proposed to reduce the burden of water borne illnesses in the State/UT
4.1 Activities conducted and planned for awareness generation on the health impacts of water borne illnesses

a. Advertisement and promotion through IEC:
   i. Street plays
   ii. 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)

4.2 Activities conducted and proposed to integrate water borne illnesses in respective health programmes or policy.

1.
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4.3 Activities undertaken if any and further proposed to train health workforce on water borne illnesses adaptation measures

1. Formulate and implement national training and capacity building programmes.

2. Ensure the availability of qualified and experienced trainers

   ........................................................................................................................................
   ........................................................................................................................................
4.4 Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to water borne illnesses.

1.
2.
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4.5 Actions undertaken if any and further proposed to ensure unaffected water supply, sanitation, waste management and electricity.

1.
2.
3.
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4.6 Activities undertaken and further proposed related to greening of health sector i.e. health facilities use energy-efficient services and technologies.

1.
2.
3.
4.

4.7 Activities undertaken and further proposed related to integration with State Disaster Management Authority for emergency risk reduction and early response.

1.
2.
3.
4.
4.8 How effective are current health and other sector policies and programmes to manage the water borne illnesses of the State/UT.

1. 
2. 
3. 
4. 

4.9 Success Stories if any, of the State/UT health sector for adaptation or mitigation of water borne illnesses

1. 
2. 
3. 
4. 

4.10 Research studies, reports, innovative actions etc related to water borne illnesses done in the states by Govt/NGO/academic institution

1. 
2. 
3. 
4. 

Chapter 11

Health Adaptation plan for Food Borne illnesses

1. Introduction

Illnesses due to contaminated food are usually seen following flood, drought, religious or other mass gatherings. Foodborne diseases such as typhoid, hepatitis, dysentery, and others
caused from micro-organisms such as Vibrio vulnificus and Vibrio cholera, E.Coli, Campylobacter, Salmonella, Cryptosporidium, Giardia, Yersinia, Legionella are some climate-dependant infectious diseases. The increase in temperature is seen to be associated with increased survival and abundance of micro-organisms. The decreased precipitation and drought result in decrease availability of safe-water, reuse of wastewater, contamination of water sources, transmission from vertebrate to human or human to human etc. Flooding cause contamination of water source as well as disruption of sewage disposal system, further contributors are population displacement, overcrowding, poor sanitation and hygiene, subsequent faeco-oral contamination and spread of pathogens etc.

Types of Food borne diseases prevalent in the state

Prominent causes of Food borne diseases in the (name) state:

Other factors (if any) contributing to increase/ decrease of Food borne diseases in the (name) state.
1.
2.
3.

Enlist the Priority City/District for Food borne diseases mitigation and Surveillance according to Prevalence in the past years
2. Vulnerability Assessment for Foodborne diseases:

2.1 Data of vulnerable population district wise:

Name Of district:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Elderly people age more than 60 years</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Children’s below 5 years of age</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Pregnant women</td>
<td></td>
</tr>
</tbody>
</table>

2.2 Indicators for Foodborne diseases-related diseases

Vulnerabilityassessment: Availability of safe water supply to all, sanitation facilities in general and in urban slums and remote rural areas, personal hygiene, political willingness, Socio-economic status, cultural beliefs, natural disasters, demographic changes, accessibility to health care.

2.3 District wise Morbidity, Mortality and related statistics of Foodborne diseases

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</tbody>
</table>
2.4 Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for Foodborne diseases

3. Adaptation strategy and action plan for Food Borne Diseases

3.1 List the stakeholders with defined roles and responsibilities (Govt. & non-Govt)

Role of Health Sector (State Nodal Officer and Task Force)

1. Develop/ adapt health micro-plan for food borne illnesses (case management, resources required like logistics, drugs, vaccines, laboratories’ role)
2. Map vulnerabilities: population at risk, geo-climatic conditions, recent trend of climate variability (flood, drought), change in population demography (migration), available resources, healthcare infrastructure, laboratories, burden of chronic illnesses in the community etc
3. Build capacity of health care personnel to detect and treat food borne illnesses
4. Strengthen/ Develop real-time surveillance, evaluation and monitoring system for food borne illnesses, enhance this surveillance during high risk period
5. Issue advisory to healthcare personnel, laboratories and related stakeholders
6. Develop or translate IEC in local language, and make a communication plan for dissemination of health related alerts/ education materials.
7. Ensure adequate supplies (vaccines and medications) for cases management with other required logistic as identified to the affected region
8. Improve access to health care facilities by vulnerable population, especially those in remote areas.
9. Coordinate with related stakeholders like Municipalities to keep a check and strengthen surveillance of food handling units, local vendors, water supply etc.
10. Explore collaborative mechanisms (e.g. memoranda of understanding) with other departments, stakeholders for sharing of data and for coordinating efforts to manage health risks.
**Coordination with other sectors in reducing water and Food borne illnesses**

**Department of Water & Sanitation**
- Ensure minimum household safe water supply
- Reuse treated waste-water for non-household use
- Encourage water saving technologies like low-flow toilets & Showers, rain water harvesting etc

**Municipalities and other Local regulating bodies**
- Ensure safe water supply and good sanitation to check transmission of infective agents
- Regulate street vendors, food handling units for quality food

**FSSAI and other food regulatory body**
- Check food items for various types of contamination or adulteration
- Disseminate appropriate information for reducing food borne illnesses

3.2 Enlist all the resources required/available to mitigate/reduce burden of the food borne diseases.

3.3 Identify actions for risk reduction that are agreed upon by stakeholders and the public

3.4 Operational Coordination (Stakeholders’ role and involvement): Building partnerships by involving citizens, organizations, and businesses.
3.5 Mechanism of Generation of Alert system for the outbreak of Foodborne diseases

Make a detailed action plan with checklist for Foodborne diseases

- Logistics required at health care facilities
- Preparedness of health system and personnel
- List activities for prevention of illnesses (IEC, pamphlets, advisories, training, workshop etc).
- Operational communication channel
- Mechanism to ensure data maintenance, surveillance, timely sharing with concerned departments and stakeholders.

4. Actions undertaken and further proposed to reduce the burden of Foodborne diseases in the State/UT
4.1 **Activities conducted and planned for awareness generation on the health impacts of Foodborne diseases**

1. Advertisement and promotion through IEC:
   i. Street plays
   ii. Hoards, billboards, as and other advertisement modes

2. Medical professional training:
   i. Expanded training of doctors and associate staff
   ii. Increased training of NGOs and Asha workers

3. Carry out mass media campaigns

4. Promote a culture of risk prevention, mitigation, and better risk management

5. Promote attitude and behavior change in the awareness campaigns linking air pollution and climate change.

6. Engage local and regional media (community radio, TV)

4.2 **Activities conducted and proposed to integrate Foodborne diseases in respective health programmes or policy.**

1.

2.

3.

4.

4.3 **Activities undertaken if any and further proposed to train health workforce on Foodborne diseases adaptation measures**

1. Formulate and implement national training and capacity building programmes.

2. Ensure the availability of qualified and experienced trainers

3.
4.4 Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to Foodborne diseases.

1.
2.
3.
4.

4.5 Activities undertaken and further proposed related to integration with State Disaster Management Authority for emergency risk reduction and early response.

1.
2.
3.
4.

4.6 How effective are current health and other sector policies and programmes to manage the Foodborne disease of your state/UT.

1.
2.
3.
4.

4.7 Success Stories if any, of the State/ UT health sector for adaptation or mitigation of Foodborne diseases

1.
2.
3.
4.
4.8 Research studies, reports, innovative actions etc related to Foodborne diseases done in the states by Govt /NGO/ academic institution

1.
2.
3.
4.

Chapter 12

Health Adaptation plan for Nutrition related illnesses
Introduction

Climate variability and extremes of weather events affect food quantity and quality through reducing production, poor storage, pathogen infestation, disrupted supply chain, hike in market price.

Malnutrition and consequent disorders, like retarded child growth and development have been identified as one of the health threat by the Working Group-II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Climate change result in food insecurity, namely, food availability, food accessibility, food utilization, and food system stability. Drought occurrence diminishes crop yield, dietary diversity, supply chain disrupted, increase in market prices, also reduction in animal and aquatic products are being experienced. These factors reduce overall food consumption, and may therefore lead to macro as well as micronutrient deficiencies.

For India, a proactive approach is critical as nearly half of children (48%) aged less than five are chronically malnourished, more than half of women (55%) and almost one-quarter of men (24%) are anaemic (NFHS-3). The health of the vulnerable population is further threatened by the changing climate. For instance, in Gujarat, during a drought in the year 2000, diets were found to be deficient in energy and several vitamins. In this population, serious effects of drought on anthropometric indices may have been prevented by public-health measures\textsuperscript{48,49}.

There are certain positive effects of climate change too, like modest reductions in cold-related morbidity and mortality, geographical shifts in food production, and reduced capacity of disease-carrying vectors due to exceeding of thermal thresholds. These positive effects will however be increasingly outweighed, worldwide, by the magnitude and severity of the negative effects of climate change.

Relevant inputs may be put by the state

----------------------------------------------------------------------------------------------------------------------
Enlist various types of nutrition related illnesses in the state. Indicate in a tabular column the district wise data of the past years.
Enlist the causes of different nutrition related illnesses in the state:

1. 
2. 
3. 

Various factors (if any) contributing to increase/ decrease of respective nutrition related diseases in the (name) state.

1. 
2. 
3. 

Enlist the Priority Districts for nutrition related diseases (according to Prevalence in the past years)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elderly people age more than 60 years</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Children’s below 5 years of age</td>
<td></td>
</tr>
</tbody>
</table>
2.2 Indicators for nutrition related illnesses:

Vulnerability Assessment: Changes in food like availability, accessibility, utilization, system stability, crop failure/ yield decline. Indirect effects are due to reduction in animal/ aquatic population, agricultural yield

2.3 District wise Morbidity, Mortality and related statistics of Nutrition related illnesses

2.3 Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for Nutrition related illness

3. Adaptation strategy and action plan for Nutrition related illnesses

3.1 List the stakeholders with defined roles and responsibilities (Govt. & non- Govt)
**Role of Health Sector (State Nodal Officer and Task Force)**

1. Develop/ adapt health micro-plan for reducing nutritional deficiency disorders
2. Map vulnerabilities based on seasonal nutritional screening (Vit A, Anaemia) in children, pregnant & lactating females high risk communities
3. Capacity building and increasing awareness for individuals, communities, health care workers through involvement of various media as well as campaigns and training workshops.
4. Strengthen/ Develop active and passive surveillance for nutritional deficiency diseases
5. Strengthening surveillance & control programs for diseases like malaria, schistosomiasis, parasitic infections
6. Scale up integrated food security, nutrition and health programmes in vulnerable zones for at risk populations
7. Strengthen maternal & child health services and promote implementation of IMNCI programme.
8. Expand & promote fortified food consumption in the vulnerable population
9. Develop or translate IEC, communication plan and mass media strategy for behaviour change of vulnerable population.
10. Capacity building and increasing awareness of the population through regular training workshops on health and nutrition education
11. Support and strengthen preventive programme on health nutrition (fortification and supplementation) and projects within public health divisions, with emphasis on community involvement projects.

**Coordination with other sectors for reducing Nutrition related diseases**

*Ministry of Human Resource Development & Ministry of Women & Child Development*

- Regular screening of school children for early detection of nutritional diseases.
- Inclusion of dietary guide in the school curriculum, with reference to Indian food habits.
- Sensitize students and teachers on nutritional deficiency, worm infestation and other Gastro-intestinal infections leading to malnutrition.

*Ministry of Agriculture*

- Promote agriculture practice addressing specific nutrition demand of general population and availability of same
3.2 Enlist all the resources required/available to mitigate/reduce burden of nutrition related illnesses.

...........................................................................................................................
...........................................................................................................................

3.3 Identify actions for risk reduction that are agreed upon by stakeholders and the public

...........................................................................................................................
...........................................................................................................................

3.4 Operational Coordination (Stakeholders’ role and involvement): Building partnerships by involving citizens, organizations, and businesses.
3.5 Mechanism of Generation of Alert system for the outbreak of nutrition related illnesses

Make a detailed action plan with checklist for the nutrition related illnesses:

- Logistics required at health care facilities
- Preparedness of health system and personnel
- List activities for prevention of illnesses (IEC, pamphlets, advisories, training, workshop etc).
- Operational communication channel
- Mechanism to ensure data maintenance, surveillance, timely sharing with concerned departments and stakeholders.

4. Actions undertaken and further proposed to reduce the burden of Nutrition related illnesses in the State/UT

4.1 Activities conducted and planned for awareness generation on the health impacts of Nutrition related illnesses

   a. Advertisement and promotion through IEC:
      i. Street plays
      ii. 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.
4.2 Activities conducted and proposed to integrate Nutrition related illnesses in respective health programmes or policy.

1.
2.
3.
4.

4.3 Activities undertaken if any and further proposed to train health workforce on Nutrition related illnesses adaptation measures

4.  Formulate and implement national training and capacity building programmes.
5.  Ensure the availability of qualified and experienced trainers

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4.4 Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to Nutrition related illnesses

1.
2.
3.
4.

4.5 Actions undertaken if any and further proposed to ensure unaffected water supply, sanitation, waste management and electricity.

1.
2.
3.
4.
4.6 Activities undertaken and further proposed related to integration with State Disaster Management Authority for emergency risk reduction and early response- if any.

1. 
2. 
3. 
4. 

4.8 How effective are current health and other sector policies and programmes to manage the Nutrition related illnesses of the State/UT.

1. 
2. 
3. 
4. 

4.9 Success Stories if any, of the State/ UT health sector for adaptation or mitigation of Nutrition related illnesses

1. 
2. 
3. 
4. 

4.10 Research studies, reports, innovative actions etc related to Nutrition related illnesses done in the states by Govt /NGO/ academic institution

1. 
2. 
3. 
4.
Chapter 13

Health Adaptation plan for Allergic illnesses

Introduction

Climate variability and frequent change in weather and extreme events affects have been linked to increase in illnesses of lungs and cardio-vascular system.

The IPCC AR5 mention few studies which states that ultraviolet radiation (UVR) are linked to higher incidence of few skin carcinoma for every 1°C increment in average temperatures\textsuperscript{36}. However, exposure to the sun also has beneficial effects on synthesis of vitamin D, with important consequences for health. Accordingly the balance of gains and losses due to increased UV exposures vary with location, intensity of exposure, and other factors (such as diet) that influence vitamin D levels.

The excess of exposure to solar ultraviolet radiation(UVR) even within the ambient environmental range may results in sunburn, photo-ageing, cataracts,
immunesuppression and skin melanomas\textsuperscript{37}. UVR induced immune-suppression may influence occurrence of various infectious diseases as well as affect vaccine efficacy. There is evidence to support a relationship between sunburn during childhood and adolescence and skin cancer in adulthood. The World Health Organization (WHO) has argued that school sun protection programmes should be emphasised, because a sizeable portion of lifetime sun exposure occurs during childhood and adolescence. Similarly, personal exposure studies among outdoor workers found that individuals engaged in road construction, horticulture, roofing and other outdoor occupations received ~20 - 26% of the total daily ambient solar UV radiation levels.

**Enlist various types of allergic diseases in the state. Indicate in a tabular column the district wise data of the past years.**

<table>
<thead>
<tr>
<th>District</th>
<th>Prevalence 1</th>
<th>Prevalence 2</th>
<th>Prevalence 3</th>
</tr>
</thead>
</table>

**Enlist the causes of different allergic diseases in the state:**

1. 
2. 
3. 

**Various factors (if any) contributing to increase/ decrease of respective allergic diseases in the (name) state:**

1. 
2. 
3. 

**Enlist the Priority Districts for allergic diseases (according to Prevalence in the past years):**

2. **Vulnerability Assessment for allergic diseases:**

2.1 **Data of vulnerable population district wise:**
Name Of district:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elderly people age more than 60 years</td>
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<td>3</td>
<td>Pregnant women</td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.2 Indicators for allergic diseases:

Vulnerability assessment: Change in timing, survival, transmission & duration of certain microbes (like Influenza virus), Interaction of air pollution, pollen and weather, Proportion of population-malnourished, extremes of age, underlying illnesses, pregnant females, Commonest type of occupation, urban slums and remote rural areas, Socio-economic status, accessibility to health care

2.3 District wise Morbidity, Mortality and related statistics of Allergic illnesses

2.4 Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for Allergic illnesses:
3. Adaptation strategy and action plan for allergic diseases

3.1 List the stakeholders with defined roles and responsibilities (Govt. & non-Govt)

Role of Health Sector (State Nodal Officer and Task Force)

1. Develop/adapt health micro-plan for ‘Air borne, Cardio-pulmonary and Respiratory diseases (case management, resources required like logistics, drugs, vaccines, and laboratories’ role).

2. 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

3. Strengthen/Initiate Sentinel surveillance, real-time surveillance, evaluation and monitoring system for respiratory and cardio-vascular illnesses, hospital admission as well as Outpatient attendance in relation to weather and air quality parameters.

4. Enhance vaccination programs and ‘Vaccination Campaign’ for vaccine-preventable air borne and respiratory diseases

5. Develop or translate IEC in local language, and make a communication plan for dissemination of health related alerts/education materials.

6. Capacity building and increasing awareness for individuals, communities, health care workers through involvement of various media as well as campaigns and training workshops.

7. Develop Standard treatment guidelines for allergen management based on exposure forecasts – air quality, allergens, dust, etc.

8. 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.
9. 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.

**Coordination with other sectors**

(Adapted from MoHFW’s Steering Committee Report on Air Pollution & Health Related issues 2015)

**Ministry of Environment, Forests and Climate Change**
- Ensure that Central and 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, including current policies and mitigation practices that are designed to reduce air pollution
- Improve indoor air quality of educational institutions nationwide
- 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.
- 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 (Include Health Promoting city guidelines in the “100 Smart Cities”)

- Develop and 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

- Develop 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

- Develop National Policy on clean Biofuels (biogas, ethanol, etc) and set up National Biofuels Development Board for strengthening the existing institutional mechanism and overall coordination.

- Create a national 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

- Better target LPG subsidies to poorer households

Ministry of Power

- Promote the development of 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

**Ministry of Labour and Employment**

- Regular health check-ups for early screening of pollution related diseases.
- Frame guidelines and conduct workshops for health promoting workplaces, (guidelines on indoor air quality),
- Strengthen the capacity of ESI Hospitals to cater to the growing burden of respiratory diseases and NCDs
- 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 MahilaMandals 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

**Ministry of Law and Justice**

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

### 3.2 Enlist all the resources required/available to mitigate/reduce burden of Allergic illnesses.

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.................................................................................................................................................................
3.3 Identify actions for risk reduction that are agreed upon by stakeholders and the public

3.4 Operational Coordination (Stakeholders’ role and involvement): Building partnerships by involving citizens, organizations, and businesses.

3.5 Mechanism of Generation of Alert system for the outbreak of Allergic illnesses
Make a detailed action plan with checklist for the Allergic Diseases:

- Logistics required at health care facilities
- Preparedness of health system and personnel
- List activities for prevention of illnesses (IEC, pamphlets, advisories, training, workshop etc).
- Operational communication channel
- Mechanism to ensure data maintenance, surveillance, timely sharing with concerned departments and stakeholders.

4. Actions undertaken and further proposed to reduce the burden of allergic diseases in the State/UT

4.1 Activities conducted and planned for awareness generation on the health impacts of allergic diseases

a. Advertisement and promotion through IEC:
   i. Street plays
   ii. 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)
4.2 Activities conducted and proposed to integrate allergic diseases in respective health programmes or policy.

1.
2.
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4.

4.3 Activities undertaken if any and further proposed to train health workforce on allergic diseases adaptation measures

1. Formulate and implement national training and capacity building programmes.
2. Ensure the availability of qualified and experienced trainers

4.4 Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to allergic diseases.

1.
2.
3.
4.

4.5 Activities undertaken and further proposed related to greening of health sector i.e. health facilities use energy-efficient services and technologies.

1.
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4.
4.6 How effective are current health and other sector policies and programmes to manage the allergic diseases of the State/UT.

1.
2.
3.
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4.7 Success Stories if any, of the State/UT health sector for adaptation or mitigation of allergic diseases

1.
2.
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4.

4.10 Research studies, reports, innovative actions etc related to allergic diseases done in the states by Govt/NGO/academic institution

1.
2.
3.
Chapter 14

Health Adaptation plan for Cardio-pulmonary diseases

Introduction

Cardio-Respiratory Illnesses: Climate variability and frequent change in weather and extreme events affects have been linked to increase in illnesses of lungs and cardio-vascular system. Climate change influences various illnesses including respiratory tract infections like asthma, rhino-sinusitis, chronic obstructive pulmonary diseases (COPD), respiratory viral diseases (Avian Influenza) & circulatory collapse posing danger to cardiac patients. The cited reasons are poor air quality, high ozone, dust storms, extreme heat, desertification, alteration of allergens, change in timing and duration of survival and transmission cycle of respiratory virus, alteration in bird migration. Further the other contributory factors are demographic factors (age, sex, immunity status, pregnant women, prevailing endemic illnesses etc) low socio-economic status, overcrowding, poor hygienic conditions, accessibilities to health care facilities, population with tuberculosis, immune-compromised level, or mentally or physically challenged people.37-39.

Enlist various types of cardio-respiratory illnesses in the state. Indicate in a tabular column the district wise data of the past years.

----------------------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------------------
Enlist the causes of different cardio-respiratory illnesses in the state:

1.
2.
3.

Various factors (if any) contributing to increase/ decrease of respective cardio-respiratory illnesses in the (name) state.

1.
2.
3.

Enlist the Priority Districts for cardio-respiratory illnesses (according to Prevalence in the past years)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name Of district</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Elderly people age more than 60 years</td>
<td></td>
</tr>
</tbody>
</table>
2. Children’s below 5 years of age

3. Pregnant women

4

5

6

3.2 Indicators for cardio-respiratory diseases:

Vulnerability assessment: Change in timing, survival, transmission & duration of certain microbes (like Influenza virus), Interaction of air pollution, pollen and weather, Proportion of population-malnourished, extremes of age, underlying illnesses, pregnant females, Commonest type of occupation, urban slums and remote rural areas, Socio-economic status, accessibility to health care

2.3 District wise Morbidity, Mortality and related statistics of Cardio-pulmonary diseases

2.4 Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for Cardio-pulmonary diseases

3. Adaptation strategy and action plan for cardio-respiratory illnesses
3.1 List the stakeholders with defined roles and responsibilities (Govt. & non-Govt)

**Role of Health Sector (State Nodal Officer and Task Force)**

1. Develop/ adapt health micro-plan for Cardio-pulmonary diseases (case management, resources required like logistics, drugs, vaccines, and laboratories’ role).

2. 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.

3. Strengthen/ Initiate Sentinel surveillance, real-time surveillance, evaluation and monitoring system for respiratory and cardio-vascular illnesses, hospital admission as well as Outpatient attendance in relation to weather and air quality parameters.

4. Enhance vaccination programs and ‘Vaccination Campaign’ for vaccine-preventable air borne and respiratory diseases.

5. Develop or translate IEC in local language and make a communication plan for dissemination of health related alerts/ education materials.

6. Capacity building and increasing awareness for individuals, communities, health care workers through involvement of various media as well as campaigns and training workshops.

7. Develop Standard treatment guidelines for allergen management based on exposure forecasts – air quality, allergens, dust, etc.

8. Ensure adequate logistic support, including equipments and other treatment modalities and supplies for case management at all levels of health care and under ‘Emergency response Plan’ in case of any disaster where air borne illnesses may occur as an outbreak.

9. 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.

**Coordination with other sectors for reducing cardio-vascular illnesses**

(Adapted from MoHFW’s Steering Committee Report on Air Pollution & Health Related issues 2015)

**Ministry of Environment, Forests and Climate Change**

- Ensure that Central and 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, including current policies and mitigation practices that are designed to reduce air pollution

- Improve indoor air quality of educational institutions nationwide

- 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.

- 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 (Include Health Promoting city guidelines in the “100 Smart Cities”)

- Develop and 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**

- Develop 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

- Develop National Policy on clean Biofuels (biogas, ethanol, etc) and set up National Biofuels Development Board for strengthening the existing institutional mechanism and overall coordination.

- Create a national 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

- Better target LPG subsidies to poorer households

**Ministry of Power**

- Promote the development of 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

**Ministry of Labour and Employment**

- Regular health check-ups for early screening of pollution related diseases.
Frame guidelines and conduct workshops for health promoting workplaces, (guidelines on indoor air quality).

- Strengthen the capacity of ESI Hospitals to cater to the growing burden of respiratory diseases and NCDs

- 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 MahilaMandals 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

Ministry of Law and Justice

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

3.3 Enlist all the resources required/available to mitigate/reduce burden of cardio-respiratory illnesses.

3.4 Identify actions for risk reduction that are agreed upon by stakeholders and the public

3.5 Operational Coordination (Stakeholders’ role and involvement): Building partnerships by involving citizens, organizations, and businesses.
3.6 Mechanism of Generation of Alert system for the outbreak of cardio-respiratory diseases?

Make a detailed action plan with checklist for the Cardio-respiratory Diseases:

- Logistics required at health care facilities
- Preparedness of health system and personnel
- List activities for prevention of illnesses (IEC, pamphlets, advisories, training, workshop etc).
- Operational communication channel
- Mechanism to ensure data maintenance, surveillance, timely sharing with concerned departments and stakeholders.
4. Actions undertaken and further proposed to reduce the burden of cardio-respiratory diseases

4.1 Activities conducted and planned for awareness generation on the health impacts of cardiorespiratory diseases

a. Advertisement and promotion through IEC:
   i. Street plays
   ii. 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)

4.2 Activities conducted and proposed to integrate cardiorespiratory illnesses in respective health programmes or policy.

1.
2.
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4.3 Activities undertaken if any and further proposed to train health workforce on cardiorespiratory illnesses adaptation measures

1. Formulate and implement national training and capacity building programmes.
2. Ensure the availability of qualified and experienced trainers

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4.4 Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to cardiorespiratory illnesses.

1. 
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4.5 How effective are current health and other sector policies and programmes to manage the cardiorespiratory illnesses of the State/UT.

1. 
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4.6 Success Stories if any, of the State/UT health sector for adaptation or mitigation of cardiorespiratory illnesses

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4.7 Research studies, reports, innovative actions etc related to cardiorespiratory illnesses done in the states by Govt /NGO/ academic institution

1. 
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3.
Chapter 15

Health Adaptation plan for Mental Health Diseases:

Introduction

NCD and Mental illnesses

Non-communicable diseases and mental disorders have been found to be closely associated with variation in climate, exposure to various types of pollutants and type of occupation.

May be elaborated ............................................

Enlist various types of Mental health diseases in the state. Indicate in a tabular column the district wise data of the past years.


Enlist the causes of mental health diseases in the state:

1. 
2. 
3.

Various factors (if any) contributing to increase/ decrease of mental health diseases in the (name) state.

1. 
2. 
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Enlist the Priority Districts for mental health diseases ( according to Prevalence in the past years )

<table>
<thead>
<tr>
<th>District 1</th>
<th>District 2</th>
<th>District 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
2. Vulnerability Assessment for Mental health diseases:

2.1 Data of vulnerable population district wise:

Name Of district:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elderly people age more than 60 years</td>
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<td>Pregnant women</td>
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</tbody>
</table>

1.2 Indicators for Mental health diseases:

Vulnerability assessment: Demography, Health status, Socio-economic status, type of occupation, accessibility to health care and diagnostic facilities, weather variables, exposure to pollution and Nutritional status

2.3 District wise Morbidity, Mortality and related statistics of Mental health diseases
2.4 Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for Mental health diseases

3. Adaptation strategy and action plan for Mental health diseases:

3.1 List the stakeholders with defined roles and responsibilities (Govt. & non-Govt)

*Role of Health Sector and related non-health sectors (State Nodal Officer and Task Force)*

1. Establish & Integrate multisectoral mechanisms to plan, guide, monitor and evaluate and enactment of NCD through implementation of plans, policies and legislation
2. Adapt and implement WHO surveillance framework that monitors exposure (risk factors), outcome (morbidity and mortality), and health system response
3. Implement effectively the national health programmes aimed at reducing/controlling NCD and mental illnesses.
4. Strengthen surveillance and monitoring for the high risk population and identify/assess need in routine as well as in emergency situation (Emergency preparedness plans).
5. Ensure access to appropriate diagnostic facilities, related logistics and case management to the high risk population.
6. Define price regulatory mechanism for NCD drugs and basic diagnostic equipments and laboratory tests to increase affordability by the poor section of the society.
7. Risk communication, counselling and case management skills, should be available at all the levels including primary health-care level
8. Capacity building through training of human resource for addressing NCD related risk factors due to climate change.
9. Raise public and political awareness and understanding about NCDs including mental health, oral health, injuries and indoor air pollution through social marketing, mass-media and responsible media-reporting during extreme weather.
10. Assess the health impact of policies in non-health sectors e.g., agriculture, education, trade, environment, energy, labor, sports, transport, urban planning.

11. Strengthen supportive policies and legislations to promote healthy diet, reducing food with high transfat content, artificial colours and junk food.

12. Strengthen capacity of the enforcement agencies (Police, Food Trade Inspectors and Road Safety Inspectors).

13. Provide adequate and sustained resources for NCDs by increasing domestic budgetary allocations, innovative financing mechanisms, and through other external donors.

3.2 Enlist all the resources required/available to mitigate/reduce burden of mental health illness.

3.3 Identify actions for risk reduction that are agreed upon by stakeholders and the public.

3.4 Operational Coordination (Stakeholders’ role and involvement): Building partnerships by involving citizens, organizations, and businesses.
3.5 Mechanism of Generation of Alert system for the outbreak of Mental health diseases

Make a detailed action plan with checklist for the Mental health diseases:

- Logistics required at health care facilities
- Preparedness of health system and personnel
- List activities for prevention of illnesses (IEC, pamphlets, advisories, training, workshop etc).
- Operational communication channel
- Mechanism to ensure data maintenance, surveillance, timely sharing with concerned departments and stakeholders.

4 Actions undertaken and further proposed to reduce the burden of Mental Health illnesses in the State/UT:
4.1 Activities conducted and planned for awareness generation on the health impacts of Mental health diseases

a. Advertisement and promotion through IEC:
   i. Street plays
   ii. 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)

4.2 Activities conducted and proposed to integrate Mental health diseases in respective health programmes or policy.

1.
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4.3 Activities undertaken if any and further proposed to train health workforce on Mental health disease adaptation measures

1. Formulate and implement national training and capacity building programmes.

2. Ensure the availability of qualified and experienced trainers

   ..................................................................................................................................................
4.4 Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to Mental health diseases.

1. 
2. 
3. 
4. 

4.5 How effective are current health and other sector policies and programmes to manage the mental health illnesses of the State/UT.

1. 
2. 
3. 
4. 

4.6 Success Stories if any, of the State/UT health sector for adaptation or mitigation of mental health illnesses

1. 
2. 
3. 
4. 

4.7 Research studies, reports, innovative actions etc related to mental health illnesses done in the states by Govt/NGO/academic institution

1. 
2. 
3.
Chapter 16

Health Adaptation plan for Zoonotic diseases

Introduction

Zoonotic 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.
The introduction may be elaborated ..............

Enlist various types of zoonotic diseases in the state. Indicate in a tabular column the district wise data of the past years.

<table>
<thead>
<tr>
<th>District</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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Enlist the causes of different zoonotic diseases in the state:

1.
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3.

Various factors (if any) contributing to increase/ decrease of respective zoonotic diseases in the (name) state.

1.
2.
3.

Enlist the Priority Districts for zoonotic diseases ( according to Prevalence in the past years )

<table>
<thead>
<tr>
<th>District</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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<tbody>
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</tr>
</tbody>
</table>
2. Vulnerability Assessment for Zoonotic diseases:

2.1 Data of vulnerable population district wise:

Name Of district:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
</tr>
</thead>
<tbody>
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<td>5</td>
<td></td>
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<td>6</td>
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<td></td>
</tr>
</tbody>
</table>

2.2 Indicators for zoonotic diseases:

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.

2.3 District wise Morbidity, Mortality and related statistics of zoonotic diseases
2.4 Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for zoonotic diseases

03. Adaptation strategy and action plan for zoonotic diseases

3.1 List the stakeholders with defined roles and responsibilities (Govt. & non-Govt)

Role of Health Sector (State Nodal Officer and Task Force)

11. Programme Officer for National Programs for control of vector borne diseases (NVBDCP) & various zoonotic diseases must consider climate variability as an important factor for assessment of morbidity and morality statistics and develop/ adapt health micro-plan based on recent VBD & Zoonotic diseases trend

12. Map vulnerabilities: population at risk, geo-climatic conditions, seasonal variation, change in population demography, migration (in & out), available resources, healthcare infrastructure, laboratories, etc.


14. Capacity building and increasing awareness for individuals, communities, health care workers through involvement of various media as well as campaigns and training workshops.

15. Develop or translate IEC on effects of climate change on VBDs & zoonotic diseases in local language, and make a communication plan for dissemination of health related alerts/ education materials.

16. 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 or an outbreak

17. Vaccination of animals and animal handlers for vaccine preventable diseases.

18. ‘Environmental Health Impact Assessment’ of new development projects

19. Early warning system for vector borne and zoonotic diseases.

20. Enforce legislation and regulations of vector borne and zoonotic diseases
Coordination with other sectors for reducing Zoonotic diseases

(As per the suggested sectors in the NVBDCP)
- Inter-sectoral collaboration for vector control
- Providing equipments and other related logistics for control of vectors
- Elimination and reduction of vector breeding sites.
- Encourage research on new safe and effective control measures

Intervention by veterinary task force
- Prevention and control of animal diseases and zoonoses
- Vaccination of animals & control on population of stray animals
- Safe destruction of carcasses and other material of animal origin
- The care of ‘food animals’, including collection, feeding, sheltering, slaughtering etc

Intervention by Community & Individual
- Eliminate/ control small & manmade vector breeding sites
- Make barriers for human dwellings to keep stray animals away from human dwellings by fencing the residential areas especially if in approximation to forests etc.
- House protection by using screening windows, doors and fencing the garden etc.
- Use self protection measures like protective clothing etc,

4.2 Enlist all the resources required/available to mitigate/reduce burden of zoonotic diseases.

4.3 Identify actions for risk reduction that are agreed upon by stakeholders and the public

4.4 Operational Coordination (Stakeholders’ role and involvement): Building partnerships by involving citizens, organizations, and businesses.
4.5 Mechanism of Generation of Alert system for the outbreak of zoonotic diseases.

Make a detailed action plan with checklist for the zoonotic diseases:

- Logistics required at health care facilities
- Preparedness of health system and personnel
- List activities for prevention of illnesses (IEC, pamphlets, advisories, training, workshop etc).
- Operational communication channel
- Mechanism to ensure data maintenance, surveillance, timely sharing with concerned departments and stakeholders.
5 Actions undertaken and further proposed to reduce the burden of zoonotic diseases in the State/UT

4.1 Activities conducted and planned for awareness generation on the health impacts of zoonotic diseases:

   g. Advertisement and promotion through IEC:
      i. Street plays
      ii. Hoards, billboards, as and other advertisement modes

   h. Medical professional training:
      i. Expanded training of doctors and associate staff
      ii. Increased training of NGOs and Asha workers
   i. Carry out mass media campaigns
   j. Promote a culture of risk prevention, mitigation, and better risk management
   k. Promote attitude and behaviour change in the awareness campaigns linking air pollution and climate change.
   l. Engage local and regional media (community radio, TV)

4.2 Activities conducted and proposed to integrate zoonotic diseases in respective health programmes or policy.

   1.
   2.
   3.
   4.

4.3 Activities undertaken if any and further proposed to train health workforce on zoonotic illnesses adaptation measures

   3. Formulate and implement national training and capacity building programmes.
   4. Ensure the availability of qualified and experienced trainers
4.4 Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to zoonotic illnesses.

1. 
2. 
3. 
4. 

4.5 Activities undertaken and further proposed related to integration with State Disaster Management Authority for emergency risk reduction and early response.

1. 
2. 
3. 
4. 

4.6 How effective are current health and other sector policies and programmes to manage the zoonotic illnesses of the State/UT.

1. 
2. 
3. 
4. 

4.7 Success Stories if any, of the State/ UT health sector for adaptation or mitigation of zoonotic illnesses

1. 
2. 
3. 
4.
4.10 Research studies, reports, innovative actions etc related to water borne illnesses done in the states by Govt/NGO/academic institution

1.
2.
3.
Chapter 17

Health adaptation plan for Sea and Coastal areas

Introduction

To be prepared by the state

Enlist various types of diseases prevalent in the sea and coastal areas of the state. Indicate in a tabular column the district wise data of the past years.

Enlist the causes of diseases specific to sea and coastal areas in the state:

1. 
2. 
3. 

Various factors (if any) contributing to increase/decrease of relevant/respective diseases in the coastal areas of the (name) state.

1. 
2. 
3. 

Enlist the Priority Districts for diseases prevalent in sea and coastal areas (according to Prevalence in the past years)
2. Vulnerability Assessment for diseases prevalent in the sea and coastal areas of the state:

2.1 Data of vulnerable population district wise:

Name Of district:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elderly people age more than 60 years</td>
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<td>2</td>
<td>Children’s below 5 years of age</td>
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<td>Pregnant women</td>
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<tr>
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2.2 Indicators for diseases prevalent in the sea and coastal areas of the state:

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2.3 District wise Morbidity, Mortality and related statistics of diseases prevalent in the sea and coastal areas of the state
4.4 Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for Sea and coastal area health adaptation

03. Adaptation strategy and action plan for diseases prevalent in the sea and coastal areas of the state

3.1 List the stakeholders with defined roles and responsibilities (Govt. & non-Govt)

3.2 Enlist all the resources required/available to mitigate/reduce burden of diseases prevalent in the sea and coastal areas of the state.

3.3 Identify actions for risk reduction that are agreed upon by stakeholders and the public

3.4 Operational Coordination (Stakeholders’ role and involvement): Building partnerships by involving citizens, organizations, and businesses.
3.5 Mechanism of Generation of Alert system for the outbreak of diseases prevalent in the sea and coastal areas of the state

Make a detailed action plan with checklist for diseases prevalent in the sea and coastal areas of the state:

- Logistics required at health care facilities
- Preparedness of health system and personnel
- List activities for prevention of illnesses (IEC, pamphlets, advisories, training, workshop etc).
- Operational communication channel
- Mechanism to ensure data maintenance, surveillance, timely sharing with concerned departments and stakeholders.
4. Actions undertaken and further proposed to reduce the burden of water borne illnesses in the State/UT

4.1 Activities conducted and planned for awareness generation on the health impacts of water borne illnesses

a. Advertisement and promotion through IEC:
   i. Street plays
   ii. 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)

4.2 Activities conducted and proposed to integrate diseases prevalent in the sea and coastal areas of the state in respective health programmes or policy.

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4.3 Activities undertaken if any and further proposed to train health workforce on adaptation measures for diseases prevalent in the sea and coastal areas of the state

1. Formulate and implement national training and capacity building programmes.
2. Ensure the availability of qualified and experienced trainers

4.4 Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to diseases prevalent in the sea and coastal areas of the state.

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4.5 Actions undertaken if any and further proposed to ensure unaffected water supply, sanitation, waste management and electricity in event of disaster.

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4.6 Activities undertaken and further proposed related to greening of health sector i.e. health facilities use energy-efficient services and technologies.

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4.7 Activities undertaken and further proposed related to integration with State Disaster Management Authority for emergency risk reduction and early response.

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4.8 How effective are current health and other sector policies and programmes to manage the diseases due to climate change in the sea and coastal areas of the State/UT.

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4.9 Success Stories if any, of the State/UT health sector for adaptation or mitigation of diseases prevalent in the sea and coastal areas of the state

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4.10 Research studies, reports, innovative actions etc related to diseases prevalent in the sea and coastal areas of the state done in the state by Govt /NGO/ academic institution

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Chapter 18

Health adaptation plan for Hilly and mountainous areas

Introduction

To be prepared by the state

Enlist various types of diseases prevalent in the hilly and mountainous areas of the state. Indicate in a tabular column the district wise data of the past years.

Enlist the causes of different diseases prevalent in the hilly and mountainous areas of the state:

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Various factors (if any) contributing to increase/ decrease of diseases prevalent in the hilly and mountainous areas of the state:

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Enlist the Priority Districts for diseases prevalent in the hilly and mountainous areas of the state (according to Prevalence in the past years):

<table>
<thead>
<tr>
<th>District 1</th>
<th>District 2</th>
<th>District 3</th>
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<tbody>
<tr>
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</table>
2. Vulnerability Assessment for diseases prevalent in the hilly and mountainous areas of the state:

2.1 Data of vulnerable population district wise:

Name Of district:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elderly people age more than 60 years</td>
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<tr>
<td>2</td>
<td>Children’s below 5 years of age</td>
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<td>Pregnant women</td>
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2.2 Indicators for diseases prevalent in the hilly and mountainous areas of the state:

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2.3 District wise Morbidity, Mortality and related statistics of diseases prevalent in the hilly and mountainous areas of the state:
2.4 Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for diseases prevalent in the hilly and mountainous areas of the state:

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03. Adaptation strategy and action plan for diseases prevalent in the hilly and mountainous areas of the state:

3.1 List the stakeholders with defined roles and responsibilities (Govt. & non-Govt)

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3.2 Enlist all the resources required/available to mitigate/reduce burden of diseases prevalent in the hilly and mountainous areas of the state.

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3.3 Identify actions for risk reduction that are agreed upon by stakeholders and the public

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3.4 Operational Coordination (Stakeholders’ role and involvement): Building partnerships by involving citizens, organizations, and businesses.

…………………………………………………………………………………………………………………………………………………………
3.5 Mechanism of Generation of Alert system for the outbreak of diseases prevalent in the hilly and mountainous areas of the state

Make a detailed action plan with checklist for the diseases prevalent in the hilly and mountainous areas of the state:

- Logistics required at health care facilities
- Preparedness of health system and personnel
- List activities for prevention of illnesses (IEC, pamphlets, advisories, training, workshop etc).
- Operational communication channel
- Mechanism to ensure data maintenance, surveillance, timely sharing with concerned departments and stakeholders.
4. Actions undertaken and further proposed to reduce the burden of diseases prevalent in the hilly and mountainous areas of the state in the State/UT

4.1 Activities conducted and planned for awareness generation on the health impacts of diseases in hilly/mountainous areas

   a. Advertisement and promotion through IEC:
      i. Street plays
      ii. 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)

4.2 Activities conducted and proposed to integrate diseases prevalent in the hilly and mountainous areas of the state in respective health programmes or policy.

1. 
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4. 

4.3 Activities undertaken if any and further proposed to train health workforce on diseases prevalent in the hilly and mountainous areas of the state
1. Formulate and implement national training and capacity building programmes.
2. Ensure the availability of qualified and experienced trainers

4.4 Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to diseases prevalent in the hilly and mountainous areas of the state.

   1.
   2.
   3.
   4.

4.5 Actions undertaken if any and further proposed to ensure unaffected water supply, sanitation, waste management and electricity.

   1.
   2.
   3.
   4.

4.6 Activities undertaken and further proposed related to greening of health sector i.e. health facilities use energy-efficient services and technologies.

   1.
   2.
   3.
   4.

4.7 Activities undertaken and further proposed related to integration with State Disaster Management Authority for emergency risk reduction and early response.
4.8 How effective are current health and other sector policies and programmes to manage the diseases prevalent in the hilly and mountainous areas of the state of the State/UT.

1. 
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4.9 Success Stories if any, of the State/UT health sector for adaptation or mitigation of diseases prevalent in the hilly and mountainous areas of the state

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4.10 Research studies, reports, innovative actions etc related to diseases prevalent in the hilly and mountainous areas of the state done in the states by Govt/NGO/academic institution

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Health adaptation plan for Disaster management

Introduction

Human Health vs Extreme weather events

States and UTs may have recorded raised morbidity and mortality due to effect of extreme weather conditions viz frequent and severe episodes of heat waves, floods, droughts and fires as a direct impact of climate variability and affecting population at large.

Climate change can result in more hot days, resulting in more periods of ‘drought’, ‘dust storms’, or ‘heavy rains (precipitation)’, and even ‘flooding’. The health gets directly affected due to injuries, hypothermia, hyperthermia, drowning and indirectly through population dislocation, crowding, poor living conditions, faeco-oral transmission of gastro-intestinal pathogens causing water and food borne illnesses, respiratory illness and other infectious diseases (e.g., leptospirosis, vector-borne disease, cholera and also mental illnesses)\textsuperscript{58-50}. The reason primarily is due to contamination of water and sewage disposal.

Enlist various types of diseases prevalent during disasters in the state. Indicate in a tabular column the district wise data of the past years.

Enlist the causes of different diseases prevalent during disasters in the state

1.
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3.
Various factors (if any) contributing to increase/ decrease of respective diseases prevalent during disasters in the state (over the years)

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Enlist the Priority Districts for diseases prevalent during disasters in the state (according to Prevalence in the past years)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Category of vulnerable population</th>
<th>Total count for the district (Year)</th>
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<tbody>
<tr>
<td>1</td>
<td>Elderly people age more than 60 years</td>
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2. Vulnerability Assessment for diseases prevalent during disasters in the state:

2.1 Data of vulnerable population district wise:

Name Of district:

<table>
<thead>
<tr>
<th>Sr. No</th>
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2.2 Indicators for diseases prevalent during disasters in the state:

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**Vulnerability Factors:** Demography especially people at extremes of age (>65yrs, children), Health status, Socioeconomic status, Occupation, working place and working conditions, unplanned urban housing, overcrowding, remote area, Drought/ flood prone area, water scarcity zone

2.3 District wise Morbidity, Mortality and related statistics of diseases prevalent during disasters in the state

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2.4 Risk Mapping to identify the ‘Hot spots’ for vulnerable population with respect to health infrastructure and other resources for diseases prevalent during disasters in the state

3 Adaptation strategy and action plan for diseases prevalent during disasters in the state

3.1 List the stakeholders with defined roles and responsibilities (Govt. & non-Govt)

**Role of Health Sector** (State Nodal Officer and Task Force)

1. Develop/ adapt health micro-plans for extreme weather events based on meteorology warnings and change in trend of illnesses in recent years.
2. Map vulnerable population based on demography, land cover, water bodies, potential exposure, available resources health insurance coverage, and burden of chronic illnesses in the community.
3. Develop or translate IEC in local language, and make a communication plan for dissemination of health related alerts/ education materials for target or general population.
4. Build capacity of health care personnel to detect and treat illnesses associated with extreme weather events.
5. Issue health advisory to healthcare personnel based on IMD seasonal prediction or warning.
6. Ensure health related Real-time Surveillance and Monitoring System in case of extreme event

7. Explore collaborative mechanisms (e.g. memoranda of understanding) with other departments, stakeholders, such as meteorological, pollution control board etc for sharing data and for coordinating efforts to manage health risks.

8. Ensure Inter-sectoral convergence and coordination for improving architecture, design, energy efficient cooling and heating system at health facility, increase in plantation i.e. Climate Resilient Green Building Design.


10. Ensure strict implementation of legislative/ regulatory actions as per Occupational Health Standards.

**Coordination with other sectors in reducing illnesses due to Extreme Weather Events**

SNO-CC and the Task Force should explore collaborative mechanism (e.g. memoranda of understanding) for regular sharing data and for coordinating efforts to manage health risks. The suggested sectors are listed below, however the list may be expanded or modified as per the need of the state/ UT.

**Meteorological Department**
- Accurate and timely forecast for extreme weather
- Communication of ‘alert’ to state health departments, vulnerable groups/ agencies

**Water Board**
- Management and supply of safe and adequate water to all in the state.
- Support & promote water conservation methods like rain water harvesting.

**Municipalities**
- Develop and promote building design and other infrastructure codes supporting ‘Green building’ and use of energy efficient and natural ways of lighting and cooling
- Undertake actions like: planting trees, ensure non-burning of garbage, supply of safe water and maintaining sanitation.
- Build cool shades at public places, cool corridors for pedestrians

**Ministry of Environment, Forest Climate Change**
- Develop/ encourage projects to decrease the ‘Urban Heat Island effect’.
- Ensure green coverage in the cities through checking deforestation, urban planning and increasing plantation.

**Ministry of Education**
- Sensitise students towards health impact of extreme events and disseminate health ministry approved prevention and first-aid measures.
- Train teachers on first aid measures for all possible extreme events (as per state’s vulnerability)
- During extreme events: keep a check on outdoor activities and close teaching institutes in case of issue of alert from Government.

**Ministry of Transport**

- Provision of safe and improved Public transport like air conditioned buses, local trains and other transport at affordable rates.

**Media & NGOs**

- Disseminate success stories, methods and measures to promote community awareness on preventive measures and first aid to reduce health impacts of extreme weather.

3.2 Enlist all the resources required/available to mitigate/reduce burden of diseases prevalent during disasters in the state.

3.3 Identify actions for risk reduction that are agreed upon by stakeholders and the public.

3.4 Operational Coordination (Stakeholders’ role and involvement): Building partnerships by involving citizens, organizations, and businesses.
3.5 Mechanism of Generation of Alert system for the outbreak of diseases prevalent during disasters in the state

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Make a detailed action plan with checklist for the diseases prevalent during disasters in the state:

- Logistics required at health care facilities
- Preparedness of health system and personnel
- List activities for prevention of illnesses (IEC, pamphlets, advisories, training, workshop etc).
- Operational communication channel
- Mechanism to ensure data maintenance, surveillance, timely sharing with concerned departments and stakeholders.
4. Actions undertaken and further proposed to reduce the burden of diseases prevalent during disasters in the state

4.1 Activities conducted and planned for awareness generation on the health impacts of diseases prevalent during disasters in the state

a. Advertisement and promotion through IEC:
   i. Street plays
   ii. 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)

4.2 Activities conducted and proposed to integrate diseases prevalent during disasters in the state in respective health programmes or policy.

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4.3 Activities undertaken if any and further proposed to train health workforce on adaptation measures on diseases prevalent during disasters in the state

1. Formulate and implement national training and capacity building programmes.
2. Ensure the availability of qualified and experienced trainers

4.4 Activities undertaken and further proposed related to data collection and analysis, strengthening of surveillance related to diseases prevalent during disasters in the state.

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4.5 Actions undertaken if any and further proposed to ensure unaffected water supply, sanitation, waste management and electricity.

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4.6 Activities undertaken and further proposed related to greening of health sector i.e. health facilities use energy-efficient services and technologies.

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4.7 Activities undertaken and further proposed related to integration with State Disaster Management Authority for emergency risk reduction and early response.

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4.8 How effective are current health and other sector policies and programmes to manage the diseases prevalent during disasters in the state.

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4.9 Success Stories if any, of the State/ UT health sector for adaptation or mitigation of diseases prevalent during disasters in the state:

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4.10 Research studies, reports, innovative actions etc related to diseases prevalent during disasters in the state, done in the states by Govt /NGO/ academic institution

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Chapter 20

SAPCCHH: Capacity building and system awareness

Capacity building will be based on the baseline and follow-up situation which should be assessed periodically. Communication and training are crucial in adaptation to variability or changes in the climate. Communication programmes based on a thorough needs assessment must aim to enable and empower people, in particular, the illiterate, poor and other vulnerable people such as women, children, the elderly, people suffering from debilitating medical problems and those living in coastal areas, highlands and urban slums. Such programmes should have adequate and appropriately designed communication tools that are locally suitable, popular and comprehensible.

✓ Effective communication and public awareness activities/advocacy: sensitize, orient and take support of leaders/ opinion makers / stakeholders/ celebrities/ civil societies.

✓ Communication intervention for target audience: Appropriate, efficient and cost-effective measures include clear and timely information covering who is involved; what happened; when it happened; where it happened; and why or how it happened or what may happen – how, why, where, among whom and how to face it.

✓ State and district level capacity building institutions needs to be identified for capacity building of health staff: include training and imparting technical skills for case management, risk assessment skills, entomology, epidemiology, climate models, disaster management, meteorology, monitoring and evaluation, and research.

✓ Conducive institutional and management arrangements to ensure involvement of private sector by forming public private partnerships.

✓ Hospital and all other health-care systems must be strengthened. Involve community in the process of strengthening and in managing and maintaining the system.

✓ Inventory management: standardized list of adequate and appropriate logistics medicines, kits, equipment and machines along with efficient storage systems.

✓ Specific strategies and standard operating procedures for managing climate sensitive diseases need to be developed in light of the future impacts of climate change with prevention in mind.

✓ Communication interventions in schools are effective approaches for which teachers would need materials and training to educate the children.
Chapter 21

SAPCCHH: Reporting, Monitoring & Evaluation

The Monitoring & Evaluation of the implementation of SAPCCH has been stipulated with a mix of internal and external approaches. The State DoHFW, District Health Officers and the individual health facilities along with MoHFW will be involved in regular internal monitoring. External Monitoring will be done by an independent agency.

The Monitoring & Evaluation of the implementation of NAPCCHH has been stipulated with a mix of internal and external approaches. MoHFW, State DoHFW, District Health Officers and the individual health facilities will be involved in regular internal monitoring. External Monitoring will be done by an independent agency.

a) Internal: Monthly / quarterly progress monitoring for climate sensitive illnesses has to be done at all levels, i.e. District to State to MoHFW. These Monthly / Quarterly Progress Reports should include a collation / aggregation of the data / information compiled in each health care facility. The District Cell will have the responsibility of collation / aggregations of the data / information compiled in each health care facility and submit to the State Cell which will validate and forward the data to the National Cell.

b) External: Each state should commission an independent evaluation every 2 years. At the minimum, the audit should cover one well performing district and one slack performing district. The agency to conduct the SAPCCHH Implementation Audit should be chosen based on the background, experience in the State’s health sector, environmental auditing and reputation of reliability. The recommendations of the audit should be developed into an action plan to strengthen the existing system.
Chapter 22

SAPCCHH: Budget
References


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Annexure A

Impact of Climate Change on Health

Climate change refers to a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties (usually by models or statistical tests), and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external force such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use. The Framework Convention on Climate Change (UNFCCC), in its Article 1, defines climate change 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”. The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes.

Climate change is perceived to be among the greatest health risks of the 21st Century. It affects social and environmental determinants of health like clean air, safe drinking water, sufficient food, and secure shelter. Climate change, together with other natural and human-made health stressors, influences human health and disease in numerous ways (Fig: 1).

Climate change may have various impacts, but most commonly observed negative effects on human health are seen as rise in illnesses and deaths. The climatic variables costing lives directly are identified as increase in frequency and intensity of heat waves, increased precipitation, floods and droughts. High temperature is known to increase the level of ‘ground level ozone’ and other ‘climate altering polluants’ 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 occurrence of disasters and increased probability of malnutrition. The marginalised populations among all are found to be more adversely affected due to variability and change in climatic conditions.

The World Health Organization (WHO) estimates that between 2030 and 2050, climate change is expected to cause approximately 2,50,000 additional deaths per year, resulting from malnutrition, malaria, diarrhea and heat stress. These deaths will further have financial implications which are estimated to be between US$ 2-4 billion/year by 2030\textsuperscript{13,14,16}. Diseases such as malaria, yellow fever, dengue and cholera are all sensitive to climate change due to effect on the viability and the geographical distribution of the mosquitoes and micro-organisms, which prefer a wetter, warmer world.

India is a highly populous country, undergoing industrialisation, with large scale rural to urban migration, chaotic, unplanned urbanization, depletion of forest cover and requirement of high energy demand makes it more vulnerable to adverse impacts of climate change. As evident from various literature worldwide, the health effects may occur either due to direct or indirect causes of climate change or extremes of weather.

A) Direct Impacts of Change in Climate and Weather on Health:

Changes in temperature and precipitation and occurrence of heat waves, floods, droughts and fires directly impact health of people.

1. Air pollution

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, countries can reduce the burden of disease from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma\textsuperscript{29,30}.

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 affect 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\textsuperscript{41-43}.

2. Heat-Stress and Related Impacts

The IPCC Special Report on Extreme Events (SREX)\textsuperscript{6} has a mention that there has been an overall decrease in the number of cold days and nights, and an overall increase in the number of warm days and nights, at the global scale. If there has been an increase in daily maximum temperatures, resulting in increase in number of heat-related illnesses. As per the basic processes of human thermoregulation, the health effects are seen when body temperature rises above 38°C i.e. physical functions are impaired with experience of weakness (heat exhaustion), when body temperature rises further to 40.6°C, the risk of physical and cognitive functions get impaired (heat syncope), risks of organ damage, loss of consciousness, and death increase sharply at further rise in body temperature usually above 40.6°C (heat stroke). Various factors interplay in occurrence of these morbidity and mortality majorly affecting mainly the vulnerable population especially in the vulnerable regions\textsuperscript{21-23}.

The vulnerable population implies the demography (extremes of age, sex, population density, pregnant women and certain occupations), Health Status (like proportion of malnourishment, suffering with infectious and/or chronic diseases, mental or physical disability), socio-economic status (poor/marginalised- more vulnerable), type of occupation or socio-cultural practices. The vulnerable regions implies unplanned urban housing, proportion of slums, drought risk zones, water-stressed zones, food-insecure zones and remote rural areas.

Numerous studies have reported increase in temperature-related morbidity (hospital admissions or emergency presentations), events due to cardiovascular, respiratory, and kidney diseases. These impacts have been related to the duration and intensity of heat. Health risks during heat extremes are greater in people who are physically active.

Eighteen heat-waves were reported in India between 1980 and 1998, with a heat-wave in 1988 affecting ten states and causing 1,300 deaths. Heat-waves in Odisha, India during 1998 to 2000 caused an estimated more than two thousand deaths and heat-waves in 2003 in Andhra Pradesh, India, caused more than 3000 deaths. The significant correlation between mortality and high temperature and high heat index has also been documented.
3. Drought, Storms and Floods

Climate change can result in more hot days, resulting in more periods of ‘drought’, ‘dust storms’, or ‘heavy rains (precipitation)’, and even ‘flooding’. The health gets directly affected due to injuries, hypothermia, hyperthermia, drowning and indirectly through population dislocation, crowding, poor living conditions, faeco-oral transmission of gastro-intestinal pathogens causing water and food borne illnesses, respiratory illness and other infectious diseases (e.g., leptospirosis, vector-borne disease, cholera and also mental illnesses). The reason primarily is due to contamination of water and sewage disposal.

4. Ozone

Ozone is a secondary pollutant, formed via sunlight-driven photochemical reactions involving precursor hydrocarbons and oxides of nitrogen. Ozone pollution is projected to increase because warmer temperatures enhance these reactions. Ozone is a powerful oxidant that has been persistently associated with damage to structure of airway or lung tissue. It contributes to more severe symptom of asthma, increase in other respiratory illnesses and deaths. High concentration of ground-level ozone accompanied with Heat waves result in higher frequency and severity of cardio-pulmonary attacks. Similarly, combination of high level of Ozone and dust storms or alteration of allergens or all, will result in outbreaks of asthma and allergic rhinitis.

5. Ultraviolet Radiation

The IPCC AR5 mention few studies which states that ultraviolet radiation (UVR) are linked to higher incidence of few skin carcinoma for every 1°C increment in average temperatures. However, exposure to the sun also has beneficial effects on synthesis of vitamin D, with important consequences for health. Accordingly the balance of gains and losses due to increased UV exposures vary with location, intensity of exposure, and other factors (such as diet) that influence vitamin D levels.

The excess of exposure to solar ultraviolet radiation (UVR) even within the ambient environmental range may results in sunburn, photo-ageing, cataracts, immunesuppression and skin melanomas. UVR induced immune-suppression may influence occurrence of various infectious diseases as well as affect vaccine efficacy. There is evidence to support a relationship between sunburn during childhood and adolescence and skin cancer in adulthood. The World Health Organization (WHO) has argued that school sun protection programmes should be emphasised, because a
sizeable portion of lifetime sun exposure occurs during childhood and adolescence. Similarly, personal exposure studies among outdoor workers found that individuals engaged in road construction, horticulture, roofing and other outdoor occupations received ~20 - 26% of the total daily ambient solar UV radiation levels.

B) **Indirect Impacts of Climate and Weather on Health:**

Indirect impacts are due to ecological disruptions, rising sea level, changing temperatures and precipitation patterns which leads to crop failures, shifting patterns of disease vectors, water-borne disease, vector-borne disease. Climate dependant diseases particularly affecting the vulnerable populations include the following:

1. **Air-Borne and Cardio-Respiratory Illnesses:** Climate change influences various illnesses including respiratory tract infections like asthma, rhino-sinusitis, chronic obstructive pulmonary diseases (COPD), respiratory viral diseases (Avian Influenza) & circulatory collapse posing danger to cardiac patients. The cited reasons are poor air quality, high ozone, dust storms, extreme heat, desertification, alteration of allergens, change in timing and duration of survival and transmission cycle of respiratory virus, alteration in bird migration. Further the other contributory factors are demographic factors (age, sex, immunity status, pregnant women, prevailing endemic illnesses etc) low socio-economic status, overcrowding, poor hygienic conditions, accessibilities to health care facilities, population with tuberculosis, immune-compromised level, or mentally or physically challenged people37-39.

2. **Vector-borne diseases (VBD):** Climate change and other weather parameters have significant impact on vector borne diseases such as Malaria, Dengue, Chikungunya, Japanese Encephalitis, kala-azar, and filariasis. The known parameters are temperature, humidity, wind, rainfall, flood and drought, affecting ‘distribution of vector’ and ‘effectiveness of transmission of pathogen’ through vectors. The temperature affects: vectors’ survival, population growth, feeding behaviour, susceptibility to pathogen, incubation period, seasonality of vector activity as well as pathogen transmission. The roles of rainfall on vectors are: increase in breeding sites due to increase in surface water, increase vegetation and expansion of vertebrate hosts, flooding bring vertebrate host close to human population41-43.

Other factors affecting VBDs are population growth, population displacement, socio-economic status, changes in residential pattern, changes in land use, water projects, agricultural practices, housing projects, international travel, resistance of diseases vectors and pathogens, accessibility to health care and diagnostic facilities.
3. **Waterborne & Foodborne diseases** such as typhoid, hepatitis, dysentery, and others caused from micro-organisms such as Vibrio vulnificus and Vibrio cholera, E.Coli, Campylobacter, Salmonella, Cryptosporidium, Giardia, Yersinia, Legionella are some climate-dependant infectious diseases. The increase in temperature is seen to be associated with increased survival and abundance of micro-organisms. The decreased precipitation and drought result in decrease availability of safe-water, reuse of wastewater, contamination of water sources, transmission from vertebrate to human or human to human etc. Flooding cause contamination of water source as well as disruption of sewage disposal system, further contributors are population displacement, overcrowding, poor sanitation and hygiene, subsequent faeco-oral contamination and spread of pathogens etc.

4. **Malnutrition** and consequent disorders, like retarded child growth and development have been identified as one of the health threat by the Working Group-II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Climate change result in food insecurity, namely, food availability, food accessibility, food utilization, and food system stability. Drought occurrence diminishes crop yield, dietary diversity, supply chain disrupted, increase in market prices, also reduction in animal and aquatic products are being experienced. These factors reduce overall food consumption, and may therefore lead to macro as well as micronutrient deficiencies.

For India, a proactive approach is critical as nearly half of children (48%) aged less than five are chronically malnourished, more than half of women (55%) and almost one-quarter of men (24%) are anaemic (NFHS-3). The health of the vulnerable population is further threatened by the changing climate. For instance, in Gujarat, during a drought in the year 2000, diets were found to be deficient in energy and several vitamins. In this population, serious effects of drought on anthropometric indices may have been prevented by public-health measures.

There are certain **positive effects of climate change**, too, like modest reductions in cold-related morbidity and mortality, geographical shifts in food production, and reduced capacity of disease-carrying vectors due to exceeding of thermal thresholds. These positive effects will however be increasingly outweighed, worldwide, by the magnitude and severity of the negative effects of climate change.
Annexure B

Steps to Reduce Impact of Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) came into force on 21st March 1994. The "Rio Convention", was adopted out of three conventions identified at “Rio Earth Summit” in 1992. Today, this convention known as “Convention of Parties” has 197 countries. Industrialized nations agree under the Convention to support climate change activities in developing countries by providing financial support for action on climate change. This was followed by first Conference of Parties (COP1) that took place in Berlin in 1995.

Another milestone was Kyoto protocol, which was adopted in Kyoto, Japan, on 11th December 1997. The Parties agreed for were made bound for targets for reducing emission. The Kyoto Protocol places a heavier burden on developed nations under the principle of “common but differentiated responsibilities”, owing to high level of GHG emissions by developed nations by their industrial activity for approximately 150 years. The detailed rules for the implementation of the Protocol were adopted at COP-7 in Marrakesh, Morocco, in 2001, and are referred to as the "Marrakesh Accords." Its first commitment period started in 2008 and ended in 2012.

The Cancun Agreement came up in 2010 at COP-16 in Cancun, where Governments decided to establish a “Green Climate Fund”. The fund will support projects, programmes, policies and other activities in developing country using thematic funding windows. The objective was to enhance action on adaptation, international cooperation and coherent consideration of matters relating to adaptation under the Convention.

At COP17, Durban Platform, Enhanced Action drafted, where governments clearly recognized the need to draw up the blueprint for a fresh universal, legal agreement to deal with climate change beyond 2020, where all will play their part to the best of their ability and all will be able to reap the benefits of success together. The Durban outcome recognized, in its spirit and intention that smart government policy, smart business investment, and the demands of an informed citizenry, all motivated by an understanding of mutual self-interest, must go hand in hand in pursuit of the common goal.

At COP 21 in Paris, Parties to the UNFCCC reached a historic agreement to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future. The Paris Agreement requires all Parties to put forward their
best efforts through “Nationally Determined Contributions” (NDCs) and to strengthen these efforts in the years ahead.

India has undertaken many initiatives in pursuance to the obligation implied by UNFCCC like:

a) Identification of Ministry of Environment, Forest & Climate Change (MOEF&CC) as nodal ministry for matters related to Climate Change;

b) Formulation of National Environmental Policy2006;

c) Formulation of Prime Minister’s Council on Climate Change to advice proactive measures, facilitate inter-ministerial coordination and guide policy in relevant areas.

The Hon’ble Prime Minister of India office had released a National Action Plan on Climate Change in June 2008. NAPCC addresses the urgent and critical concerns of the country through enhancement of the current and planned programmes presented in the Technology Document. It identifies measures that promote our development objectives along with yielding co-benefits for addressing climate change effectively. It outlines a number of steps to simultaneously advance India’s development and climate change related objectives of adaptation and mitigation.

The NAPCC identified eight national missions initially:

1. National Mission on Sustainable habitat
2. National Mission for Sustaining the Himalayan Ecosystem
3. National Mission for Sustainable Agriculture
4. National Solar Mission
7. National Mission on Strategic Knowledge for Climate Change
8. National Mission for “Green India”
The reconstituted Prime Minister Council on Climate Change (PMCCC) reviewed the progress of eight national missions on 19th January 2015 and suggested formulation of four new missions on Climate Change viz.

1. National Health Mission
3. National Mission on India’s Coastal areas
4. National Wind Mission

In this background, the proposed ‘Health Mission’ was undertaken by Ministry of Health & Family Welfare, Government of India under the umbrella of ‘National Action Plan on Climate Change’ by MoEFCC. As a follow-up action, MoHFW constituted a National Expert Group on Climate Change & Health (NEGCCH) under the chairmanship of Dr Vishwa Mohan Katoch, Former Secretary (Health Research), Government of India and DG (ICMR) to prepare action plan, recommend strategies for adaptation and response plan for diseases occurring due to climate variability and change.

The National Centre for Diseases Control (NCDC) was identified as the nodal agency for ‘Health Mission’ by Ministry of Health & Family Welfare, Government of India. An expert group was constituted with members’ representation from DteGHS, MoHFW, MoEFCC, ICMR, DST, NDMA, CGWB, Min of Agriculture, CPCB, Ministry of Earth Sciences, TERI, NEERI etc.
Annexure C

India’s Strategic Framework for Adaptation of Human Health against Climate Change

India’s Health and Family Welfare System derives strength from several institutes and infrastructures of the GOI, multi-lateral institutes, and NGOs including the National Institute of Malaria Research; Indian Institute of Tropical Meteorology, India Meteorological Department, Director General of Health Services, Indian Council of Medical Research, National Centre for Disease Control and many others.

Measures that would help address the imminent challenges would include development of an integrated early health warning system, state specific emergency response plan, along with increased capacity to provide health care to the most vulnerable and the marginalized populations.

Therefore, a fundamental area of intervention would include strengthening of local monitoring of appropriate climate and disease variables. This would be directed at building temporally and spatially disease specific database. A strong surveillance would help develop effective prevention strategies, aid epidemiological understanding and predictive computations. Improvements in information infrastructure that are innovative and that promote interdisciplinary collaborations have been identified as areas that require strengthening in India (Bush et al. 2011).

The linkage of health with environmental and climate change determinants is well recognized. Consequently, coordination and synergies with other Ministries becomes crucial to yield health benefits. To facilitate joint action and Inter-Ministerial cooperation, it is imperative to develop feedback mechanisms of health trends to related Ministries and agencies to enable health statistics to leapfrog.

Health sector in preparedness for climate change needs urgent, serious, and multifaceted action, which should include:
1. Strengthen/ develop coordination for health related early warning and surveillance systems in specific areas (e.g. heat waves, floods, air pollution, ultraviolet radiation, vector borne, water-borne and infectious diseases) through an integrated disease surveillance system.

2. Feedback mechanisms to other ministries responsible for several ecological determinants of health particularly - air, water, food, fuel and human resource.

3. Development of risk maps for climate sensitive diseases for each geographical area.

4. Strengthening/ developing response action based on innovative or new strategies or technological approaches to increase access, early health care advice/ referral and health tracking system incorporating Aadhaar card number to assist surveillance and generate trends.

5. Undertake case studies and research and pilot test new approaches aimed at building health resilience in climatically sensitive locations.

The proposed ‘Health Mission’ will take a multi-pronged approach to address the health-related aspects of climate change through the strategies listed in the National Action Plan for Climate Change and Human Health (NAPCCHH). The Health Missions seeks coordination with other missions identified under the umbrella of National Action Plan for Climate change (NAPCC) listed earlier in this document. The targets achieved by other national missions launched under the NAPCC will also scale down the morbidity and mortality of various types of illnesses.
Annexure D

Integration of Health Mission with other Ministries and missions on climate change

The frequency and magnitude of occurrence of “morbidity and mortality”, “acute and chronic” “communicable” or “Non-Communicable” illnesses depends on socioeconomic status, residence, occupation, level of nourishment, underlying illness, availability of safe drinking water, sanitation facilities, overcrowding, pollution, extreme weather, chemical exposures, agricultural practices, governance (local, state and national level), access to health facilities, trained/skilled health manpower, laboratory support, and religious practices etc.

The strengthening of the National Programmes under various ministries will raise the level of health of people through direct or indirect impacts by reducing risk factors. To name the beneficial national programmes/schemes are: NamamiGange Programme, Mid Day Meal Programme, Integrated Child Development Schemes, Indira Gandhi MatritvaSahyogYojna, DeenDayal Upadhyaya Gram Jyoti Yojna, Atal Mission for Rejuvenation and Urban Transformation, GraminBhandaranYojna, Jawaharlal Nehru National Urban Renewal Mission, Livestock Insurance Scheme, National Urban Livelihood Mission, Smart Cities Mission, National Vector Borne Disease Control Programme, National Programme for Prevention and Control of Diabetes, Cardiovascular diseases, Cancer and Stroke, National Mental Health Programme, National Iodine Deficiency Disorder Control Programme, Revised National TB Control Programme (RNTCP), National Programme for Control and Treatment of Occupational Disease, National Programme for the Health Care for the Elderly, National Programme for Prevention and Control of Deafness and Universal Immunization Programme.

The MoHFW seeks to coordinate & collaborate with other Ministries, departments & NGOs/CBOs. These Ministries & Departments are: Ministry of Environment, forest & Climate Change, Ministry of Information & Broadcasting, Ministry of Human Resource Development, Indian Council of Medical Research, Ministry of Agriculture, Medical Council of India, Ministry of Drinking Water and Sanitation, Min. of New & Renewable Energy, National Disaster Management Authority, Ministry of Women and Child Development, Indian Institute of Tropical Meteorology, Indian Institute of Tropical Meteorology, Department of Space,
The possible health impacts of other missions under NAPCC are foreseen as follows:
Annexure E

Salient recommendations of the Regional Consultations:

Four Regional consultations (South: 2nd & 3rd March 2017 at Chennai, Tamil Nadu; North: 19th-20th Sep 2017 at New Delhi; East and Northeast: 11th-12th Oct 2017 at Kolkata, West Bengal and West, Central and remaining states: 22nd-23rd Nov 2017 at Bhopal Madhya Pradesh) were conducted.

The salient points of recommendations of regional consultations are as follows:

- Representative from Regional Centre, Indian Meteorological Department suggested to use the term ‘Climate Variability’ to study the health consequence as Climate Change is more vast and generic term.
- The geographical distribution, mapping and epidemiology of the diseases like vector borne, water borne etc should be done at the earliest in each state/ UT.
- “Personal Cooling Garment” or equivalent devices developed by other agencies may be advocated for use if it is (these are) found appropriate.
- Existing surveillance system like IDSP should be used for disease related data capture, through expanding of reporting units and regularly conducting review meetings may be weekly.
- As population is indirectly related and resulting to climate change, population policy may be revised.
- Vector survival and breeding are known to be affected by the climate variability hence programme on vector borne diseases control should be revised to check diseases occurrence in new areas.
- For dealing with the extreme heat events, reconsider the following for issue of health related advisories:
  - OPD timings in healthcare settings
  - Drugs and vaccine storage
  - Norms for Working hours at workplace
  - School timings etc
- Detailed plan for each climate sensitive illnesses should be laid down by each state/ UT considering planning for present illnesses and also with scope to include new/ emerging or re-emerging climate sensitive illnesses.
The state while drafting their state health action plan for climate change should also refer the Joint Monitoring Meeting report of IDSP.

Rapid Response Teams may be trained at state level using infrastructure of CSU, IDSP and medical colleges.

Participants proposed rules and regulations formulation should be in place for the factors which are directly or indirectly affecting weather and climate and hence the human health.

Actionable points/ good initiatives/ practices should be shared so as the same can be adopted by other states/ UTs.

Chairman proposed a ‘Climate Change Health Forum’ to include all experts as informal members. This forum will help in sharing of experience, meeting outputs and further it will bring all together to contribute in terms of feedback, suggestions.

The available data of states and UT need to be linked to climate/ weather data for which the assurance was given by the representative from Regional Centre Meteorological Departments.
Annexure F

Male declaration
Malé Declaration

Building health systems resilience to climate change

We, the Health Ministers of Member States of the WHO South-East Asia Region, participating in the Seventieth session of the WHO Regional Committee for South-East Asia in Male, Maldives,

Recognizing the increasing body of evidence on the direct and indirect adverse impacts of climate change on human health and health systems, which pose a serious burden to sustainable socioeconomic development,

Concerned that extreme weather events, which are increasing in frequency and intensity in the Region, can overwhelm the already overstretched health sector’s capacity to respond and pose health threats to the vulnerable populations in the Region,

Reaffirming the commitment made to World Health Assembly resolution WHA61.19, and Regional Committee resolution SEA/RC62/R2 on climate change and health; the Parliamentarians’ call for action on protecting human health from climate change in the South-East Asia Region¹, and the Dhaka Declaration on South-East Asia Regional Health Concerns for Climate Change Negotiations²,

Recalling the reference to the right to health in the 2015 Paris Agreement on Climate Change³, the Sustainable Development Goal 13 that calls for urgent action to combat climate change and its impacts, and the Sendai Framework for Disaster Risk Reduction 2015–2030⁴,

Acknowledging the efforts being made by Member States in the WHO South-East Asia Region and development partners to address the challenges posed by climate change,

Recognizing the need to strengthen the capacity and efficiency of health systems to be responsive, reduce vulnerabilities and increase resilience to climate change and extreme weather events,

Noting the WHO Operational Framework on building health systems resilience to climate change⁵,

1. Endorse the Framework for Action on Building Health Systems Resilience to Climate Change in WHO South-East Asia Region 2017–2022, as annexed to this Declaration, as the operational reference in implementing this Malé Declaration;

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¹ http://www.searo.who.int/entity/climate_change/documents/sea_en_511/en/
² http://www.searo.who.int/entity/climate_change/documents/sea_en_572/en/
⁵ http://www.who.int/globalchange/publications/buildingclimateresilienthealthsystems/en/
2. Call upon UN agencies and other international organizations, development partners, philanthropic agencies, academic and civil society organizations to support the implementation of this Declaration, and to mobilize human, financial and technical resources for this purpose;

3. Agree at national level to:

3.1 continue to raise public and policy awareness on the health impacts of climate change across the entire societies, and encourage the leading role of the health sector in addressing such impacts of climate change;

3.2 advocate and intensify work with health-determining sectors⁶ to encourage climate-sensitive health concerns and risks are taken into account and integrated in their respective policies and programmes;

3.3 develop and/or strengthen health national adaptation plans (HNAPs) as an integral part of national adaptation plans in order to encourage that climate risks are integrated into health policy, climate-sensitive disease (CSD) programmes and health systems, as appropriate;

3.4 strengthen national capacity in building health systems resilience to climate change, including establishing and/or strengthening national institutions for training the health workforce;

3.5 enhance health sector preparedness to climate change, particularly in promoting climate-resilient health-care facilities to encourage that these are able to withstand any climatic event, and that essential services such as water, sanitation, waste management and electricity are functional during such events;

3.6 initiate the greening of the health sector by adopting environment-friendly technologies, and using energy-efficient services;

3.7 establish and strengthen climate change and health information systems and research, and promote the dissemination of evidence, including in the operational areas of health vulnerability assessment to climate change, health risk mapping, and CSD surveillance systems;

3.8 encourage that climate change risks are integrated in national disaster risk management, including emergency risk reduction and response;

3.9 mobilize domestic and external resources, including through advocacy for a better share to the health sector of climate change funding mechanisms; and

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⁶ Water and sanitation, environment, agriculture, energy, transport and disaster management sectors
3.10 designate a national focal point in the Ministry of Health to coordinate and monitor implementation of this Declaration,

4. Request the WHO Regional Director for South-East Asia to:

4.1 raise awareness and advocate for international attention to, and support Member States of the South-East Asia Region in mobilizing resources to address the health impacts of climate change;

4.2 promote knowledge and experience-sharing mechanisms, including through establishing regional research networks and centers of excellence in climate change and health for collaborative research;

4.3 provide technical support to, and strengthen the technical capacity of, Member States in implementing the Malé Declaration, including through monitoring and tracking progress in addressing climate change and health, and relevant SDG targets;

4.4 report on the progress of implementing this Malé Declaration at the Seventy-fifth session of the WHO Regional Committee for South-East Asia in 2022.

Malé, Maldives
7 September 2017
# Annexure G

## Regional Meteorological Offices

<table>
<thead>
<tr>
<th>Regional Meteorological Office</th>
<th>Address</th>
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<tbody>
<tr>
<td>India Meteorological Department, Regional Meteorological Centre, Chennai</td>
<td>New 6, Old 50, College Road, Chennai, Tamil Nadu- 600006</td>
</tr>
<tr>
<td>India Meteorological Department, Regional Meteorological Centre, Guwahati</td>
<td>LGBI Airport, Guwahati, Assam- 781015</td>
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<tr>
<td>India Meteorological Department, Regional Meteorological Centre, Kolkata</td>
<td>4, Duel Avenue, Alipore, Kolkata, West Bengal – 700027</td>
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<tr>
<td>India Meteorological Department, Regional Meteorological Centre, Mumbai</td>
<td>Regional Meteorological Centre, Mumbai, Colaba, Mumbai, Maharashtra- 400089</td>
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<tr>
<td>India Meteorological Department, Regional Meteorological Centre, Nagpur</td>
<td>Regional Meteorological Centre, IMD DBAI Airport, Sonegaon, Nagpur, Maharashtra-440005</td>
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<tr>
<td>India Meteorological Department, Regional Meteorological Centre, New Delhi</td>
<td>RMC Building, Lodi Road, New Delhi- 110003</td>
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## Annexure H

### State Pollution Control Board

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<th>State Pollution Control Board</th>
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<tr>
<td>Andhra Pradesh Pollution Control Board</td>
<td>Paryarana Bhawan, A-3, Industrial Area ,Sanathnagar, Hyderbad-500 018, Andhra Pradesh</td>
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<tr>
<td>Arunachal State Pollution Control Board</td>
<td>Government of Arunachal Pradesh Office of the Principal Chief and Secretary (E&amp;F) Conservator of Forests, Itanagar 791111, Arunachal Pradesh</td>
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<tr>
<td>Assam Pollution Control Board</td>
<td>Control Board Bamunimaidam, Guwahati - 781021 Assam</td>
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<td>A &amp; N Islands Pollution Control Committee</td>
<td>Van Sadan, Port Blair-744 102</td>
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<tr>
<td>Bihar State Pollution Control Board</td>
<td>IInd Floor, BeltronBhavan, Jawaharlal Nehru Marg, Shastri Nagar, Patna 800023, Bihar.</td>
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<tr>
<td>Chattisgarh State Environment Conservation Board</td>
<td>Nanak Nivas, Civil Lines Raipur - 492001 Chattisgarh</td>
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<td>Chandigarh Pollution Control Committee</td>
<td>Chandigarh Administration, Additional Town Hall Building, IIndFloor, Sector 17-C, Chandigarh 160 017.</td>
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<td>Delhi Pollution Control Committee</td>
<td>4th Floor, I.S.B.T. Building, Kashmere Gate, Delhi-110006</td>
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<tr>
<td>Daman Diu &amp; Nagar Haveli Pollution Control Committee</td>
<td>Office of the Dy. Conservator of Forests, Moti Daman-396220, Daman</td>
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<tr>
<td>Goa State Pollution Control Board</td>
<td>Dempo Tower, 1st Floor Patto Plaza Goa 403110</td>
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<td>Gujarat State Pollution Control Board</td>
<td>Sector 10-A, Gandhi Nagar 382043 Gujarat</td>
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<td>Haryana State Pollution Control Board</td>
<td>S.C.O.No.11 A-12, Sector 7-C Madhya Marg, Chandigarh – 160019</td>
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<td>H.P. State Environment Protection &amp; Pollution Control Board</td>
<td>Paryavaran Bhawan, Phase III New Shimla -171 009 Himachal Pradesh</td>
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<tr>
<td>Jammu &amp; Kashmir State Pollution Control Board</td>
<td>SheikhulAlam Campus, Behind Govt. Silk Factory, Rajbagh , Srinagar (April - Oct.) Parivesh Bhawan Forest Complex, Gandhi Transport Nagar (Nawal), Jammu (Nov. - March)</td>
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<td>Jharkhand State Pollution Control Board</td>
<td>T.A. Building, HEC P.O. Dhurwa Ranchi - 834004 Jharkhand</td>
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<td>“ARDEN”, Lumpyngngad, Shillong – 793 014, Meghalaya.</td>
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<td>Langol Housing Complex, Imphal-795 004, Manipur.</td>
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<td>Nagaland Pollution Control Board</td>
<td>Office of the Chairman, Forests Colony, Dimapur, Nagaland</td>
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<td>Orissa State Pollution Control Board</td>
<td>A-118, Nilakantha Nagar, Unit-VIII, Bhubaneswar 751012. Orissa</td>
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<td>Punjab Pollution Control Board</td>
<td>Vatavaran Bhawan, Nabha Road, Patiala-147 001 Punjab.</td>
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<td>Pondichery Pollution Control Committee</td>
<td>Department of Science, Technology &amp; Env. Housing Board Complex, Illrd Floor Pondicherry-600 005</td>
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<tr>
<td>Rajasthan Pollution Control Board</td>
<td>A-4, Institutional Area, JalanaDungri, Jaipur-302 004, Rajasthan.</td>
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<td>Sikkim Pollution Control Board</td>
<td>State Land Use and Environment Cell Govt. of Sikkim, Deorali,-737101</td>
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<td>Tamil Nadu Pollution Control Board</td>
<td>No. 76, Mount Salai, Guindy, Chennai- 600 032, Tamil Nadu.</td>
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<td>Tripura State Pollution Control Board</td>
<td>Vigyan Bhawan, Pandit Nehru Complex, Gorkhabasti,PO-Kunjab, Agartala (W)-799 006 (Tripura) .</td>
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<tr>
<td>Uttar Pradesh Pollution Control Board</td>
<td>Illrd floor PICUP Bhavan, Vibhuti Khand, Gomti Nagar, Lucknow - 226020, UP.</td>
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<tr>
<td>West Bengal Pollution Control Board</td>
<td>Paribesh Bhavan, 10-A, Block LA, Sector III, Salt Lake City, Kolkata-700 091.</td>
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Annexure I

List of Hospital Infrastructure data in the State