



Quarterly Newsletter from the National Programme on Climate Change and Human Health (NPCCHH), National Centre for Disease Control (NCDC)



(Left) National Review Meeting of NPCCHH, December 2021. (Read on page 4). (Right) PHC Pozhuthana, Kerala, an excellent example of flood resilient health facility developed with community efforts. (Read on page 5)

Updates from NPCCHH

International Day for Disaster Risk Reduction

With increasing global warming, the risk of extreme weather events increases in frequency and intensity. According to a recent IPCC report, India will experience extreme heat and heavy rainfall events with increasing variability in seasonal monsoon leading to an increase in the incidence of floods, cyclones, droughts, and storm surges. These events increase the risk of mortality, injuries, and illnesses resulting from direct physical impact and indirectly from food insecurity, water stress, communicable diseases, and weakened health system.

National Programme on Climate Change and Human Health (NPCCHH) recognizes health impact of climate change induced extreme weather events including extreme heat, as an essential area of health sector adaptation and resilience planning.

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As such, a capacity building webinar on International Day of Disaster Risk Reduction, October 13, 2021 was organized where experts from meteorology, disaster response and management

shared their knowledge and experience to central, State and District Nodal Officers under the programme. The event focused on practical aspects in health sector strengthening against climate change induced natural disasters.

The webinar began with a brief welcome note from Dr. Sujeet Singh, Director, NCDC. Prof. Anil Gupta, NIDM, emphasized on four aspects 1. health impact of disasters, 2. health disasters in absence of natural calamities, 3. environmental contaminations like in air pollution, and 4. accidents and mishap like increased fire hazard during heatwave. He explained Sendai framework, mainstreaming of disaster risk reduction, and identified areas for health sector resilience.

Mr. Sarabjit Sahota, UNICEF-India talked about reducing the compound vulnerability of the population by focusing on existing health challenges among the younger population, systemic issues (discrimination) and foundational vulnerability (access to clean air, water, soil and unplanned settlements) arising from environmental degradation. He emphasized the need for convergence of formal and social governances with a local focus.

Dr. S. C. Bhan, IMD explained historical changes in meteorological parameters in the country and projected changes with different Representative Concentration Pathway scenarios. He suggested

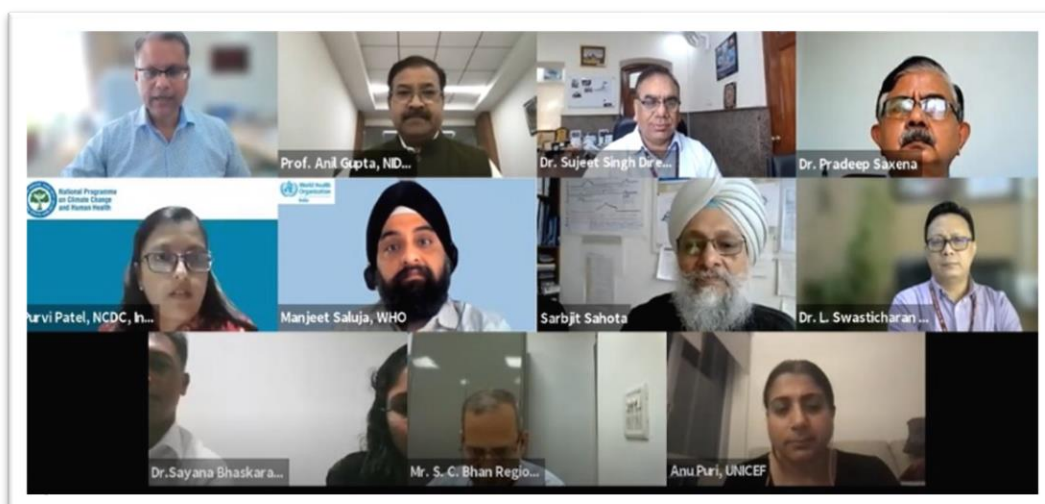
ways of adapting to climate change including establishing threshold and impact-based early warning systems.

Ms. Anu Puri, UNICEF-HQ shared case studies showing the importance of community engagement and behavioral change in climate change adaptation and resilience. Understanding people and their perceptions and engaging them for sustainable practices is needed for ground-level changes.

Mr. Manjeet, WHO-India highlighted the health argument of climate change and mentioned key sectors for cross-sectoral actions. He shared various analytical tools for the assessment of health and economic impact of climate change.

Dr. L. Swasthicharan, EMR emphasized planning for an emergency medical response during a disaster at all levels of health sector with mapping of human resources, micro-planing for health facilities, and finance planning, especially for surge capacity. He explained that rolling out of plan should include triggers, unified commands, mid-term corrections, risk communication, research and development and should be a living document.

Dr. Basantha Pradhan shared experience from Odisha state in implementing a health sector disaster management plan and its impact during recent cyclones.



Panelists in webinar on 'Health Sector Strengthening against Climate Change Induced Natural Disasters' on IDDRR, October 23, 2021

The event ended with vote of thanks from Dr. Aakash Shrivastava, Additional Director & HOD, Centre for Environmental & Occupational Health, Climate Change and Health (CEOH-CCH). Total 396 participants including NPCCHH programme officers from the district, state and central level and guest experts attended the webinar.

Dialogue with Civil Society Organizations

The role of non-state actors in advancing climate action is well recognized. WHO and recent research studies have asserted the importance of such entities, including civil society organizations (CSO), in tackling climate change impacts. CSOs play a vital role in advancing climate action through campaigns in conservation, advocacy, and conflict resolution. They facilitate the population's access to climate information, work as a bridge between research institutions and the population, and encourage direct dialogue. By working close to communities, they give voice to the most vulnerable groups and ensure vulnerable groups are adequately addressed in the policy processes and help integrate disaster risk reduction with a participatory approach. To advance climate awareness and action in the country about the impact of climate change on health the need for collaboration with CSO is perceived by NPCCHH. On December 1, 2021, NPCCHH, NCDC, organized a meeting with CSOs that have a presence in Delhi. The meeting, A Dialogue on Awareness and Action in Climate Change and Health, aimed to identify areas of mutual interest and activities related to climate change and human health for collaboration. The event began with a detailed presentation on NPCCHH's objectives and activities by Dr. Purvi Patel, Sr. Consultant, at 9.30 am, followed by a welcome note from Dr. Sujeet Singh, Director, NCDC. Dr. Aakash Shrivastava, Additional Director & HOD CEOH-CCH further explained the framework of NPCCHH implementation, answered



Director, NCDC chairing the meeting with Civil Society Organizations' representatives with NPCCHH, December 2021

queries from the CSO representatives and set the agenda of the further dialogue. It was followed by an introduction from each CSO representative of their work, geographical presence in the country and potential subject area of mutual interest and collaboration.

About 32 CSO representatives from 25 organizations attended the meeting and presented their interests. The CSO worked on different aspects of climate change ranging from health (air pollution, allergy, cardiopulmonary diseases, mental health, nutrition, vector-borne and heat illnesses), health system (green and sustainable health care, informatics, sustainable infrastructure), disaster risk reduction, energy conservation, environmental education, waste management and reduction of point source pollution. Most CSO worked in air pollution (14), sustainable infrastructure (12), and disaster risk reduction (9). These organizations represented mainly health and development NGO, followed by academic institutions, environmental NGO and other non-health NGO. As a way forward, the CSO were invited to send 1-2 brief concept notes on specific activities they would like to pursue in a specific geographical location in collaboration with NPCCHH.

National Review Meeting

National Review meeting of NPCCHH implementation status at state level was organized on December 17, 2021. The event was conducted in hybrid mode due to spread of Omicron variant of SARS-COV-2. A total of 65 participants attended the meeting in-person. State Nodal Officers from Andhra Pradesh, Arunachal Pradesh, Assam, Chandigarh, Chhattisgarh, Delhi, Gujarat, Haryana, Jammu & Kashmir, Kerala, Ladakh, Madhya Pradesh, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Sikkim, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand, experts from the centers of excellence (CoEs), international organizations, such as CPCB, NIMR, NIDM, PHFI, TERI, UNICEF, UNEP, and members from NCDC met in-person. The remaining states and WHO representatives joined online.

The presentation by each state/UT representative on the activities conducted in areas of health impacts of heat and air pollution specifically on increasing general awareness, capacity building, surveillance and monitoring, and development of green and climate-resilient health infrastructure was done. It was followed by comments from the programme officers. They addressed the technical and administrative issues and challenges that were raised by the State/UT representatives. The representatives from CoEs also gave their insights and answered questions of States/UTs on how their support can be utilized by the nodal officers for technical inputs and to capacity building activities.



State and UT Nodal Officers under NPCCHH, Centre of Excellence representatives and NPCCHH team at National Review Meeting, New Delhi, December 2021

Case Study

Adopting Climate Resilient Measures in Health Centers in Kerala

The case study, from State of Kerala, Department of Health, Kerala, National Programme on Climate Change and Human Health, focuses on the resilient recovery of a Family Health Centre in Wayanad District in Kerala after floods.

Extreme weather events have become more frequent and intense globally over the recent decades. In the last ten years, India experienced over 15 extreme flooding events. In the year 2018 Kerala state witnessed the worst flooding event in the century. Kerala's directorate of health services estimated a loss of almost Rs.110 crores to government hospitals alone. In the worst affected districts of Ernakulam, Pathanamthitta, Thrissur and Alappuzha, several hospitals were forced to evacuate patients and suspend surgeries and critical care.

Aftermaths of 2018 floods

Heavy rainfall resulted in landslides in the Wayanad district resulting in silting of rivers and further aggravation of the floods. All regions in the Pozhuthana panchayat were submerged for at least two days in August 2018. Pozhuthana PHC was one of the worst affected health centers in the entire district. The PHC lost most of its equipment, patient records, and medicines due to flooding in its premises. In addition, there were structural damages to the building itself, the floor of the mini hall had broken, and the boundary wall collapsed. There was no power supply as the grid was affected due to landslides, and the backup generator was underwater as it was located on the ground floor of the PHC. The drinking water source for the PHC was also totally contaminated.



Damage at the PHC Pozhuthana, Kerala during 2018 floods

Leadership of the Medical Officer

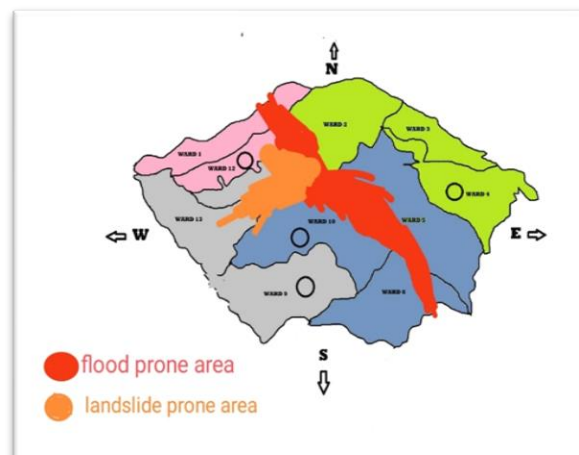
Dr. Sushma P.S. is the medical officer and the senior person at the Pozhuthana PHC. She has been the officer in charge of the center since 2010. The devastating impacts of the floods on the PHC completely shattered the entire

team's morale. Dr Sushma single-handedly documented the damage to the PHC and coordinated with the panchayat members about the situation at the PHC. The coordination and support from the local administration were prompt, and Dr. Sushma was able to restart the health service delivery in the region from the moment the floodwater receded. With the help of the panchayat president, she arranged a panchayat community hall to start the medical camp. She coordinated with a local pharmacy to organize basic medicines like Paracetamol, Ranitidine, Doxycycline, Amlodipine and Metformin, and medical equipment like stethoscopes, thermometers and BP monitoring machine to start outpatient services. The PHC staff scheduled OPD in the morning hours and field visits in the afternoons.

Connecting the Climate Dots

Within a week of the floods, volunteers were organized to help clean up the PHC and shift the services back to the premises after obtaining a fitness certificate from the Assistant Engineer of the panchayat. While the majority of the funds for the restoration of the PHC came from the National Health Mission, the local panchayat also made a small contribution to show community contribution.

During the reconstruction phase, the medical team realized that such an event might occur again, and the new PHC should stand for such disasters. A vulnerability assessment was conducted in the context of flood and landslide. As the PHC is in flood-prone, low-lying region and it was difficult to shift the hospital itself, thus many aspects of the PHC were retrofitted to become flood resilient.



Vulnerability assessment done after 2018 floods, Pozhuthana



(Left) Compound wall of the PHC with metal grills. (Right) Ditch dug around the PHC building for easy drainage in case of floods and fenestrated walls with elevated waste disposal storage.

For example, the compound wall was reconstructed to withstand the pressure of the water in the future. A small metal grill was placed in between layers of the compound wall to ensure it withstood the force of the water.



Tiled floors and elevated ramps to reduce impact of flood waters and ensure continued health care delivery, features of a flood-resilient health facility

Some of the walls of the PHC were tiled, and partitions were made using aluminum fabrication and painted so that walls could withstand the pressure of the water in the event of flooding. Ramps were created in the building for the easy shifting of equipment and medicines in case of water inundation. To ensure adequate preparedness and response, the health facility also formalized a disaster management plan.

Resilient Health Systems Lead to Resilient Communities

This story of Dr. Sushma P.S and her team at Pozhuthana village is a statement of the collective determination and perseverance of the people of Kerala. Dr Sushma's leadership and courage transformed the flood battered health centre to a well-functioning Family Health Center. The transformation is also a shining example of inter-departmental collaboration and coordination. The members of panchayat, local and state-level health departments, Aardram Mission, DDMA and NGOs played a critical role in the process.

NPCCHH team thanks Dr. Manu, Kerala State Nodal Officer, NPCCHH, for his contribution and for bringing this story to us.



Dr. Sushma (*center*) and her team at PHC Pozhuthana, Kerala

PUBLIC HEALTH ADVISORY: COLD WAVE/ FROST

WHAT IS A COLD WAVE?

A cold wave is a weather-related event characterized by sharp drop of air temperature near the surface, leading to

- extremely low values of temperatures
- steep rise of air pressure
- strengthening of windspeed or
- associated with hazardous weather like frost and icing

WHEN AND WHERE DO COLD WAVES OCCUR COMMONLY?

- **Cold wave Season:** during winter (November to March), more frequent in December-January.
- **Cold wave prone regions:** 17 States/UTs from north, northwest, east, and central India are in 'Core Cold Wave Zone' and experience the highest number of cold waves/severe cold waves. They are:

Punjab, Himachal Pradesh, Uttarakhand, Jammu & Kashmir, Ladakh, Delhi, Haryana, Rajasthan, Uttar Pradesh, Gujarat, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, West Bengal, Odisha, and Telangana.

The maximum numbers of cold waves occur in **Jammu and Kashmir** followed by **Himachal Pradesh, Punjab, Bihar, Haryana, and Uttar Pradesh.**

HOW TO BE AWARE OF COLD WAVES/FROST?

Be aware of weather updates

- Weather Warnings (regional/district-wise) updated every 4hrs on: <https://mausam.imd.gov.in/>
- Real-time map of temperature including cold wave: <https://bit.ly/IMDcoldwave>

WHO ARE VULNERABLE?

Homeless, elderly, economically disadvantaged, disabled, pregnant or lactating mothers, women, children, outdoor workers, managers of night shelters, farmers

HOW IS THE COLDWAVE DEFINED?

As per the India Meteorological Department's criteria, **Cold Wave and Cold Day** conditions are defined as:

A. Conditions for Cold Wave: When minimum temperature of a station is 10°C or less for plains and 0°C or less for Hilly regions and fulfils any of the following criteria:

I) Based on Departure of Minimum Temperatures from Normal

Cold Wave: When the Departure is -4.5°C to -6.4°C

Severe Cold Wave: When the Departure is > -6.4°C

II) Based on Actual Minimum Temperature
(For plain stations only)

Cold Wave: When minimum temperature is $\leq 4^{\circ}\text{C}$

Severe Cold Wave: When minimum temperature is $\leq 2^{\circ}\text{C}$

III) For coastal stations:

When the Departure of Minimum Temperature is -4.5°C or less and Minimum Temperature is 15°C or less.

B. Conditions for Cold Day: When minimum temperature is 10°C or less for plains and 0°C or less for Hilly regions and fulfils following criteria:

Cold day: Maximum Temperature Departure is -4.5°C to -6.4°C

Severe Cold day: Maximum Temperature Departure is < -6.4°C

HEALTH IMPACT OF COLD WAVE

Extreme cold may lead to injuries and death if precautionary measures are not taken. Exposure to intense cold may lead to **Hypothermia**, **Frostbite**, and other non-freezing peripheral cold injuries like immersion (trench) foot and chilblain (pernio).

HYPOTHERMIA

- It is caused by prolonged exposures to very cold temperatures where your body begins to lose heat faster than it's produced. It will eventually use up the body's stored energy leading to lower body temperature.
- Very low body temperature affects the brain, making the person unable to think clearly or move well. This makes hypothermia especially dangerous.
- Dangerous hypothermia can occur even at less cold temperatures if a person becomes chilled from rain, sweat, or submersion in cold water.

WHO ARE VULNERABLE TO HYPOTHERMIA?

- Older adults with inadequate food, clothing, or heating
- Babies sleeping in cold bedrooms
- People who remain outdoors for long periods—the homeless, hikers, hunters, etc.
- People who drink alcohol or use illicit drugs.

SIGNS AND SYMPTOMS OF HYPOTHERMIA

Adults		Babies
Shivering	Memory loss	Bright red, cold skin
Exhaustion or feeling very tired	Slurred speech	Very low energy
Confusion	Drowsiness	
Fumbling hands		

Hypothermia is a medical emergency. Take ACTION!

If you see a person with any of the above signs get medical attention immediately!

WHEN MEDICAL ATTENTION IS AWAITED, TRY TO WARM THE PERSON UP.

- Get the person into a warm room or shelter and change clothes, remove any wet clothing
- Warm the person's body with skin-to-skin contact, dry layers of blankets, clothes, towels, or sheets.
- Give warm drinks to help increase body temperature, but do not give alcoholic drinks. Do not try to give beverages to an unconscious person.
- After body temperature has increased, keep the person dry and wrap their body, including their head and neck, in a warm blanket.
- Get the person proper medical attention as soon as possible.

A person with severe hypothermia may be unconscious and may not seem to have a pulse or to be breathing. In that case, handle the person gently, and get emergency assistance immediately.

FROSTBITE

- It is a type of injury caused by freezing. It leads to a loss of feeling and colour in the areas it affects, usually extremities such as the nose, ears, cheeks, chin, fingers, and toes.
- Frostbite can permanently damage the body, and in severe cases can lead to amputation (removing the affected body part).

WHO ARE VULNERABLE TO FROSTBITE?

Individuals with poor circulation

Individual not dressed properly for extreme cold temperature

SIGNS AND SYMPTOMS OF FROSTBITE

Redness of skin or pain in an area that is exposed/unexposed in cold weather may be a beginning of frostbite.

Frostbite presents as:

- A white or grayish-yellow skin area,
- Skin that feels unusually firm or waxy
- Numbness

A person who has frostbite may not know they have it until someone else points it out because the frozen parts of their body are numb.

If you notice signs of frostbite on you or someone else, seek medical care.

IF A PERSON SHOWS SIGNS OF FROSTBITE WITHOUT HYPOTHERMIA AND IMMEDIATE MEDICAL CARE IS NOT AVAILABLE:

- Get the person into a warm room as soon as possible.
- Unless absolutely necessary, do not walk on feet or toes that show signs of frostbite—this increases the damage.
- Do not rub the frostbitten area with snow or massage it at all. This can cause more damage.
- Put the areas affected by frostbite in warm—not hot—water (the temperature should be comfortable to the touch for unaffected parts of the body).
- If warm water is not available, warm the affected area using body heat. For example, you can use the heat of an armpit to warm frostbitten fingers.
- Do not use a heating pad, heat lamp, or the heat of a stove, fireplace, or radiator for warming. Affected areas are numb and can easily burn.
- Frostbite should be checked by a health care provider.

IMMERSION (TRENCH) FOOT

- It occurs when the feet are wet for long periods of time.
- **Sign and symptoms include:** tingling and/or itching sensation, pain, swelling, cold and blotchy skin, numbness, and a prickly or heavy feeling in the foot. The foot may be red, dry, and painful after it becomes warm. Blisters may form, followed by skin and tissue dying and falling off. If untreated it may lead to loss of toes, heel, or the entire foot.
- **Prevention by** air-drying and elevating your feet, and exchanging wet shoes and socks for dry ones
- **Seek medical care if any signs and symptoms appear**
- If you have a foot wound, check your feet at least once a day for infections or worsening of symptoms.

CHILBLAIN (PERNIO)

- It is a painful inflammation of small blood vessels in your skin that occur in response to repeated exposure to cold but not freezing air.
- **Sign and symptoms include:** itching, red patches, swelling, and blistering on your hands and feet.
- **Prevent by** limiting your exposure to cold, dressing warmly, and covering exposed skin
- It usually improves in one to three weeks, especially if the weather gets warmer
- **Seek medical care if signs and symptoms do not improve**

BE PREPARED FOR COLD WEATHER

IT REDUCES THE RISK OF DEVELOPING HEALTH PROBLEMS
RELATED TO COLD WEATHER

Upcoming Events & Activities

February 2022	<ul style="list-style-type: none">• Webinar on Vulnerability of Agriculture to Climate Change Increases the Risk of Child Malnutrition in India
March 2022	<ul style="list-style-type: none">• Capacity building sessions on Heat-Related Illness (HRI) Surveillance• Webinar on Prehospital Data Facilitate the Detection of Acute Heat Illness• Webinar on Science of Climate Change: Impact on India• Capacity building on Health Sector Action Plan for Preparedness and Response to Heatwave (online)
April 2022	<ul style="list-style-type: none">• Observe World Health Day (theme: Our Planet, Our Health)• National workshop on Green and Climate Resilient Infrastructure in Kerala
May 2022	<ul style="list-style-type: none">• Capacity building sessions on Clinical Aspects of Heat-Related Illnesses (online)• Capacity building session on drafting State Action Plan on Climate Change and Human Health (online)
June 2022	<ul style="list-style-type: none">• Observe World Environment Day (theme: Our One Earth)• National workshop on Health Sector Measures to Mitigate and Adapt to Impact of Extreme Heat in Ahmedabad

Editorial Board

Chief editor: Director, NCDC

Managing editor: Additional Director and Head, CEOH-CCHH

Compilation and design: Senior Consultant, CEOH-CCHH

Content: NPCCHH HQ team

For comments and inputs, email npcchh@gmail.com

Address: Centre for Environmental & Occupational Health, Climate Change & Health,
National Centre for Disease Control, 22 Sham Nath Marg, Delhi 110054, India

Twitter: @NPCCHH

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