Volume 1, Issue 2 July-September 2021

NPCCHH Newsletter

National Programme on Climate Change and Human Health

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

Training session in Jammu & Kashmir; a poster of live radio phone-in programme in Madhya Pradesh organized on occasion of International Day of Clean Air for blue skies, 2021. Read about different state level activities on page 5.

Updates from NPCCHH, HQ

NPCCHH Documents Released 2021

NCDC's 112th annual day event was celebrated on July 30, 2021. During the e-celebrations, Shri. Mansukh Mandaviya, Union Minister for Health and Family Welfare, released National Action Plan on Heat-Related Illness and Health Adaptation Plan on Acute Respiratory Illnesses due to Air Pollution. Along with these national guidance documents, drafted under NPCCHH, Handbook for Health Professionals on Air Pollution and Its Impact on Health, Health Sector Preparedness for Air Pollution, and NPCCHH Newsletter were also released. Dr. Bharti Pravin Pawar, Minister of State, Ministry of Health and Family Welfare, Shri. Rajesh Bhushan, Union Health Secretary, Dr. Sunil Kumar, Director

In this issue

Release of NPCCHH guidelines and manuals by Union Minister for Health and Family Welfare & other dignitaries on July 30, 2021

General Health Services, Smt. Arti Ahuja, Additional Secretary, Shri. Lav Agarwal, JS, Dr. Sujeet Singh, Director, NCDC, Dr. Roderico H. Ofrin, WHO Representative to India, also graced the occasion.

NPCCHH Officers Visited States

Officers from NPCCHH-HQ, Delhi, conducted tours of states and union territories (UT) in July-August 2021 to facilitate programme activities. Uttarakhand, Jammu division of Jammu and Kashmir, Jharkhand, Karnataka, Uttar Pradesh, Haryana, and Punjab states/UT were visited. Meetings with state nodal officers-climate change (SNO-CC), and MD, NHM

Meeting with CEO Zilla Panchayat with DNO-CC & DHO, Tumkur, Karnataka, July 2021

were held. Selected districts and health facilities were

Meeting with Director Health Services and SNO-CC, Andhra Pradesh, July 2021

also visited to assess the status of programme implementation. In the districts, meetings with district health officers and district collectors were held to apprise NPCCHH deliverables.

After a long pause imposed by the COVID-19 outbreak, these visits helped review the progress of NPCCHH activities in the states/districts and bring the programme implementation on track. It was emphasized that, like COVID-19, climate change is a health threat, and efforts to strengthen the health system must be well-coordinated and expedited.

Capacity Building Programme on Heat Wave Preparedness and Response

A webinar on Health Sector Action Plan for Preparedness and Response to Heat Wave was organized by NPCCHH, HQ for the state and district nodal officers under the programme from 23 heat vulnerable states, on July 15, 2021. The event aimed to sensitize State and District Nodal Officers-Climate Change towards various, direct-indirect impacts of heat on health and build their capacity on health care preparedness and response measures.

The event began with a message from Mr. Lav Agarwal, the Joint Secretary (MoHFW). Dr. Sujeet Kumar Singh, Director, NCDC, welcomed all the attendees. Dr. Aakash Shrivastava, Additional Director and HoD, Centre for Environmental Health and Occupational Health, Climate Change and Health division, NCDC, introduced the guest experts. He

emphasized the importance of accurate and regular reporting of heatstroke cases and deaths in HRI surveillance to understand annual trends. States were asked to complete heat action plans for effective response to extreme heat. Dr. Naresh Kumar, a representative from India Meteorological Department,

Presentation from IIPH-G explaining components of Heat Action Plan

Delhi, talked about Heatwave vulnerable areas and the early warning system of IMD. Dr. Dileep Mavalankar from the Indian Institute of Public Health, Gandhinagar, spoke on the impact of heatwaves on public health and health sector heat action plans. Mr. Anup Shrivastava from National Disaster Management Authority (NDMA) presented on Heat Wave Management: Preparedness and Response through Heat Action Plan. Mr. Polash Mukerjee from Natural Resources Defense Council (NRDC) presented on Preparedness and Response through Passive Infrastructure. He informed about the inclusion of cool roofs in heat action plans. A question-answer session followed each presentation. SNO-CC from Andhra Pradesh, Madhya Pradesh, and Kerala shared preparedness and response measures to heatwave implemented in their respective states.

Almost 280 officers under NPCCHH from different states and districts participated in the webinar. A short post-webinar survey showed that out of 66 participants who took the survey, 28 (42%) answered at least eight questions correctly, and six (9%) answered all ten questions correctly.

Recording of the event and presentations are available at https://bit.ly/HeatWebinar

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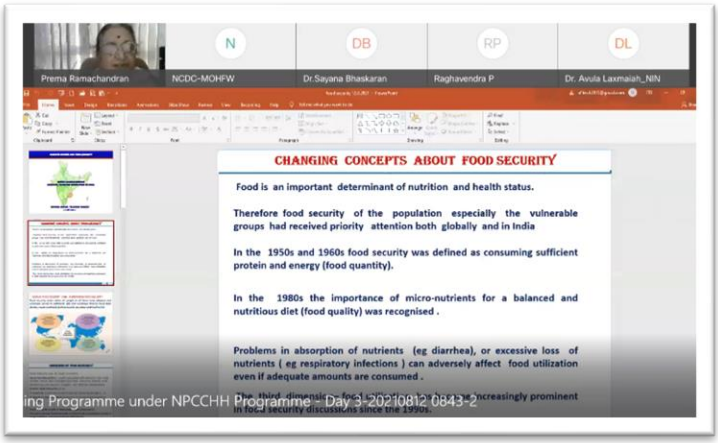
Capacity Building Programme on Climate Change and Health Issues, August 10-13, 2021

A training programme was organized to increase knowledge about various climate change-related health issues, their mechanism of spread, impact on population, and adaptation and mitigation measures that health sector should implement amongst programme officers under NPCCHH in the country.
The training modules were adapted from WHO SEARO modules and updated by Centres of Excellence



Presentation from NFI explaining concept of food security in context of climate change

(CoE) to present India specific context. More than 350 state and district nodal officers were trained on 15 climate-sensitive diseases from August 10-13, 2021, from experts of concerned CoE (IIHMR, AIIMS, VPCI, NIDM, IIPH, PGIMER, NICED, NIN, NFI, NIMHANS, NEIGRIHMS, NIMR, NCDC, PHFI, and JIPMIER). Post-session surveys were conducted for participants' self-assessment.
All the modules are available on NPCCHH's webpage at https://bit.ly/NPCCHHPrg

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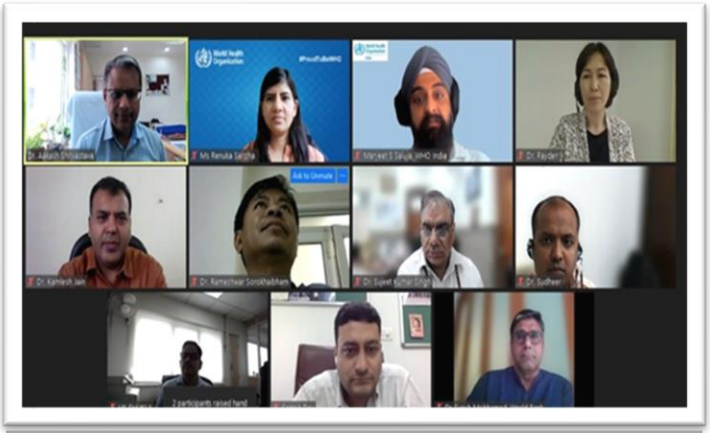
National Events on International Day of Clean Air for Blue Skies (September 7, 2021)

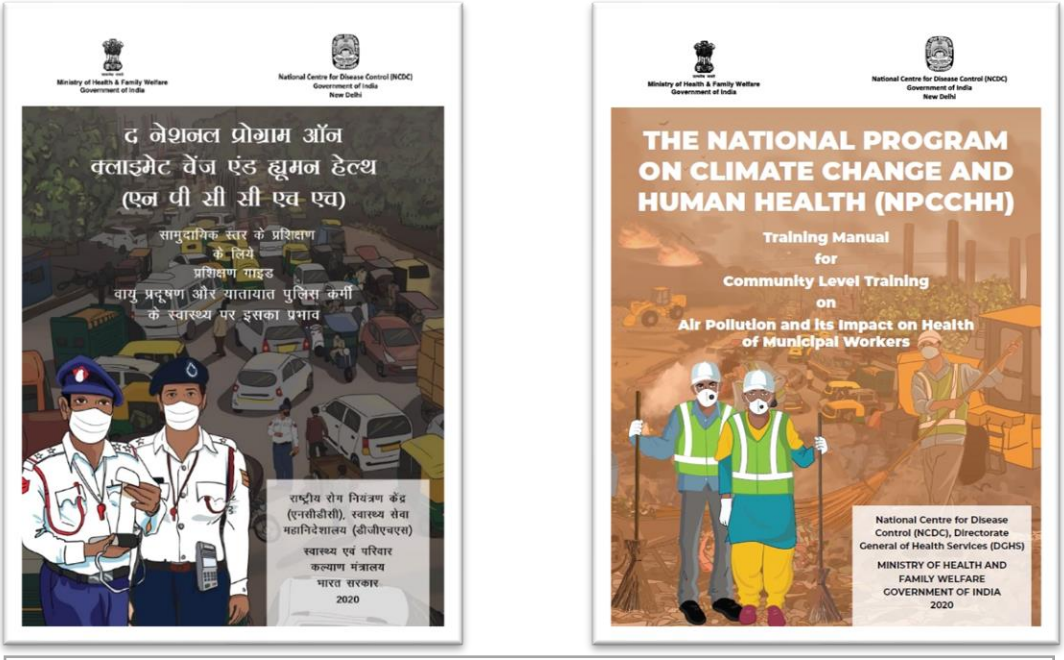
NPCCHH observed International Day of Clean Air for blue skies for the second consecutive year. This year, United Nations General Assembly declared the theme to be 'Healthy Air Healthy Planet.'

Two national-level events were conducted in observance of the day. On September 6, 2021, a capacity building activity on air pollution and its health effects among vulnerable groups. This state-level training of trainers included SNO-CC, DNO-CC, and other stakeholders like traffic police and municipality officials from across the country. The training was conducted based on the modules developed in English and Hindi languages to increase awareness of air pollution's adverse health effects and ways to prevent and control it among at-risk populations like traffic police, municipality workers, women, and children.



Webinar on air pollution related issues and actions was organized with experts from key NPCCHH partners

On September 7, 2021, a webinar on air pollution-related issues and actions was organized with experts from key NPCCHH partners—MoEFCC, CPCB, IIT Delhi, AIIMS-New Delhi, PGIMER-Chandigarh, WHO-India, UNEP-India, and NPCCHH, Chhattisgarh. They shared information on the National Clean Air Programme, air quality and its monitoring centres, and recent evidence of Health impact due to air pollution in India. Participants also learned about the new PRANA portal launched as part of the National Clean Air Action Plan and how the tools available in the portal can be utilized to plan health interventions in non-attainment cities. International, National, and State level experiences on air pollution during the COVID pandemic were also shared. WHO–India and PHFI, Gurugram supported the events, and more than 380 officers participated.



Manuals for community-level training on air pollution and its impacts on health for traffic control officers and municipality workers, released on September 6, 2021. Available at https://bit.ly/NPCCHHIEC

Updates from States and Union Territories

The health awareness campaign that started with events on the International Day of Clean Air for blue skies at the national level was expanded to all the 36 States/UTs during September 7-11, 2021, through the involvement of PHCs, CHCs and communities. Country-wide events included capacity building of the community-level health workers who are the healthcare service providers at the doorstep for the target vulnerable populations of women and children on air pollution, its health effects, and ways to protect, prevent, and control its exposure. The messages were spread through rallies, radio outreach programmes, health messages from senior health officials, television programmes, and other media like posters, newspapers, and social media.

Training on Air Pollution and Health for health care staff in Odisha state and UT of Dadra and Nagar Haveli

Public health messaging on Air Pollution by Jammu & Kashmir and Madhya Pradesh

Public Health Awareness and community engagement: (anti-clockwise from top left) interactive messaging session in Jammu & Kashmir, a rally in Odisha, community members listening to live phone-in radio programe on air pollution and health in Madhya Pradesh, and cycle rally with cleaning and planting drive in Goa on the occasion of International Day of Clean Air for blue skies, 2021

Case Study

Adoption of Risk Mitigation Measures Towards Air Pollution Through Community Mobilization in Chhattisgarh, India

This case study is an excellent example of community mobilization in the fight for clean air through advocacy and communications on health. The ongoing efforts for pollution prevention at source by various stakeholders—Department of Health and Family Welfare (DPHFW), National Programme on Climate Change and Human Health (NPCCHH), State Health Resource Centre (SHRC), health professionals, local governing bodies, and communities, has led to the strengthening of health care preparedness and community empowerment for the adoption of risk mitigation strategies. It is an inspiration to all those who aspire to make a difference where it matters the most.

The threat in the air

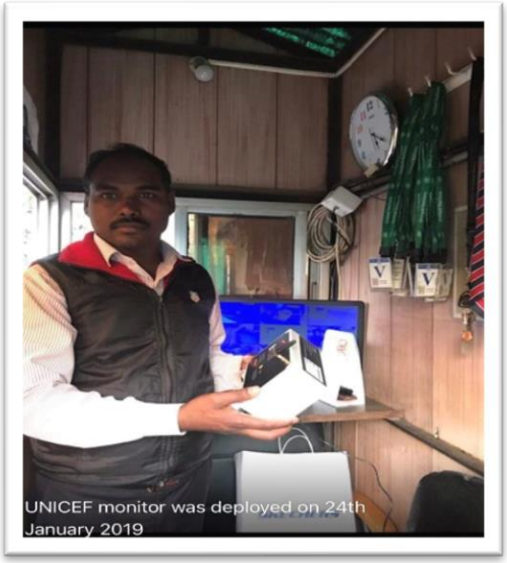
Chhattisgarh, located in the centre-east of India, is the ninth-largest state with a population of 32.2 million as of 2020. The state had a 40% population below the poverty line in 2012 and 31% tribal population as per the 2011 census. The state has the highest number of mines and mineral-based industries. In north Chhattisgarh, Korba district is home to more than ten coal-fired thermal power plants producing 6000MW of electricity and large opencast coal mines. These industries have led to a critical level of air pollution due to the open disposal of fly-ash and have impacted water quality, damaged crops, and impaired sun-dried food preservation processes traditionally used by the residents to survive the lean season.

Over the years, residents of villages located in the periphery of the Korba power plant complained of health problems, specifically increasing skin and respiratory illnesses. As a pattern started to emerge, public health measures were taken to understand the gravity of the situation.

Area Coordinators are being trained for manual air sampling from Raipur and Korba. Chhattisgarh.

Assessing the impact

Chhattisgarh began assessing the health impact of the environment over the last 5-6 years with the help of SHRC and DPHFW. Initially, around 25 focused group discussions (FGD) were conducted to learn communities' concerns and identify sources of environmental contamination. Based on that, a cross-sectional comparative study was done in Korba and Raipur between 2016 and 2019. Area coordinators took environmental samples to assess the extent of the contamination. A Health survey was done to estimate the respiratory disease burden around industries. The findings of higher pollution (high PM2.5 and heavy metals in dust) and high respiratory illness prevalence around power plants of Korba further strengthened the community's resolve to reduce their exposure to polluted air.



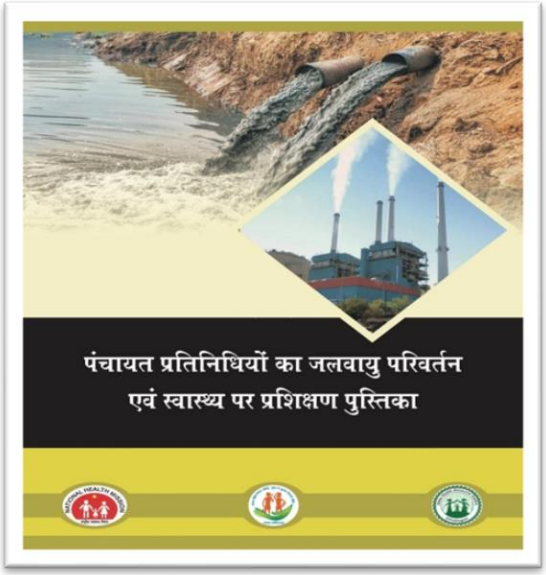
Low-cost air quality monitor has been installed for real time air quality monitoring

Beginning of change

The researchers and communities did not have to wait for the Korba study outcome to act. They identified notable gaps early on and immediately took action to reduce the health impact. The SHRC, with the health department and Health Energy Initiative India co-supported by Shakti Sustainable Energy Foundation, installed 150 low-cost monitors in the communities for real-time air quality monitoring, and a spirometry machine was acquired in a nearby government hospital for early detection of respiratory issues.

The findings from the FGD and Korba study paved the path for more significant reforms. The learnings translated into sensitization workshops and material for information, education, and communication for general awareness and capacity building efforts to highlight the link between air pollution and human health, which are now being continued through NPCCHH. Messages on air pollution and health were developed in regional dialects, using local examples.

The Panchayati Raj Institutions (PRI), administrative entities for villages' self-government, have played a critical role in empowering communities and spreading awareness on important issues. To build their capacity, manuals were created, and extensive training drives were conducted in early 2020. Almost 21,995 PRI leaders were trained in various matters like tree plantation, organic composting, cope selection, solarization, rainwater harvesting, proper waste disposal, energy conservation, smokeless stoves, and reduction of air pollution exposure.



Training Module for Panchayat Leaders on Climate Change and Health

Health workers as advocates of change

Over the last decade, India has implemented many national programmes on communicable and non-communicable diseases, but environmental health was not included. Chhattisgarh has been

actively working on air pollution and climate-related health issues over the years. Still, with the establishment of State Climate Change and Human Health Cell (SCCHH) and NPCCHH, these efforts are now streamlined and formalized. Consequently, the state conducted training of trainers for awareness of the impact of air pollution in women and children (September 2020), observed the International Day of Clean Air for Blue Sky (September 7, 2020), and trained PRI officials (November 2020) under NPCCHH.

IEC material on Air Pollution based on focus group discussions

As health professionals became aware of the challenges at hand, many meaningful actions and policy decisions were taken. Environmental assessments were carried out in eight pollution-vulnerable districts in Chhattisgarh. State-level policy-makers acknowledged air pollution as a crucial health issue and requested a cohort study by a medical institution. DPHFW collaborated with multiple stakeholders like civil societies, academic institutions, and subject matter experts to find solutions.

> *"Not just the land, human beings are turning infertile too. I am a Mitanin. When I meet people, I see so many miscarriages, stillbirths"*
> *-Meena (a Mitanin from Korba)*

Air pollution warriors

The community health workers, called Mitanins (i.e. female friends in local dialect) in Chhattisgarh, have played a vital role in implementing health initiatives at the grass-root level since early 2020. They organically became part of adaptation plans against climate change-related health issues. They were trained in air quality monitoring, air sampling, and related health messaging. Additionally, their observations and experiences while caring for their own community's health need over time imparted authenticity to their campaigns, regarding them as "air pollution worriers." Local health professionals were also inspired to get involved. So far, 6000 Mitanins and 500 doctors are trained and engaged in raising awareness. These efforts made communities more vigilant to sources of air pollution in and around their houses, raising concerns and taking small measures to mitigate the exposure. The behaviour change included steps like willingness to adopt smokeless stoves, if a transition to cleaner energy source was unaffordable, and smaller measures like burning single incense instead of burning the whole packet, proper disposal of waste instead of burning, etc.

Using smokeless chulha (stove) to reduce indoor air pollution

Way forward

There are plans to develop a community-based air quality monitoring system in the entire Chhattisgarh with the help of local pollution control authorities and continue training more health care workers and doctors. Two tertiary care hospitals are identified for sentinel surveillance of acute respiratory illnesses in the context of air pollution in the state under NPCCHH.

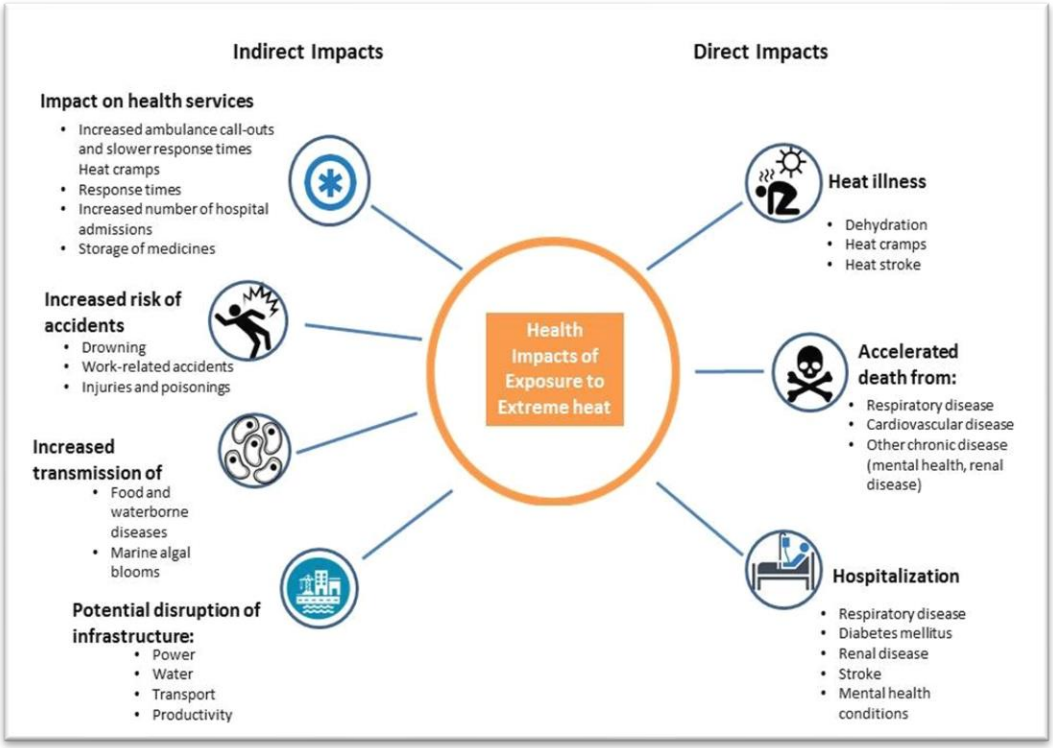
Lessons from Korba experience

Community mobilization can be an important way to make a paradigm shift in all-encompassing issues like environmental health and climate change. It enables communities to help themselves assess their health needs, demand policy change, and ensure demand-driven, accessible, high-quality healthcare services. Enabling community health workers is the key to community awareness. The model of Mitanins is replicable and scalable. It was scaled up country-wide in the form of Accredited Social Health Activist (ASHA) when National Rural Health Mission was implemented in India. Small household measures that communities adapted are replicable by any community needing feasible, low-cost solutions to reduce household air pollution exposure. Localized illness-oriented health care preparedness, i.e., health surveillance, providing basic diagnostics and treatment facilities at the community level around polluting industries, helps communities adapt to the persistent risk.

Surveillance of Heat-Related Illnesses

Surveillance of heat-related illness (HRI) is a vital health sector strengthening activity under NPCCHH. HRI surveillance helps to monitor HRI morbidity and mortality burden to prepare health system response on a short-term basis and identify spatial hotspots, temperature thresholds, and impact of adaptation measures with changing climate on a long-term basis. Although vital for a heat vulnerable country like India, HRI surveillance still remains a less prioritized activity within the health sector.

Assessment of the health impact of heat in terms of morbidity and mortality poses a significant challenge as it deviates from a common understanding of the epidemiological triad of disease occurrence. As an environmental hazard, heat's potential to cause illness is better represented by the risk triangle, where vulnerability and exposure are akin to host and environment. Although meteorological parameters like daily temperatures (maximum and minimum) provide a good understanding of heat hazard, its translation into lethal heat stress for an individual depends on various direct and indirect factors. Complexities in understanding and visualizing the impact of high temperature have misguided us in taking the ever-present natural process with the potential to emerge as a deadly disaster very lightly. Heatwaves, purely meteorological identification that does not clearly reflect health threats, are not named

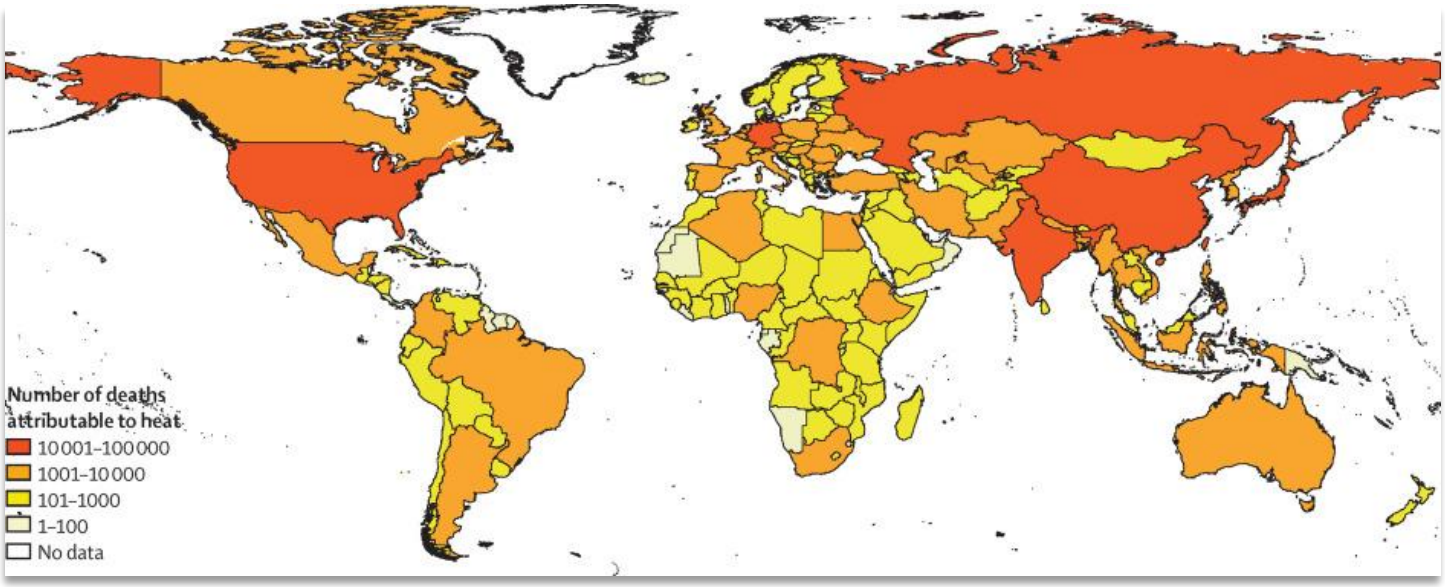


Impact of heat on health *Source:* [Heat and health, WHO]

like cyclones yet but, as a hazard, the extreme temperature is a major underlying weather-related cause of mortality.

Everyone is susceptible to heat—some more than others and the threat is only increasing with increasing greenhouse gas emissions. The wet-bulb temperature of 35°C is almost the absolute limit of human tolerance. Heat stress accumulates with frequent exposures like continuous hot days, with or without their identification as heatwaves, with high nigh-time temperatures, concurrent draught. It is compounded by the inability to cool down due to lack of adequate water, ventilation, electricity, shade, mobility, acclimatization or other medical-social supports that are also often affected by high ambient temperature directly or by increased demand induced by it.

On the other hand, the primary diagnosis of HRI is frequently misclassified. Diagnosis of heatstroke is a peculiar clinical challenge in itself, often further complicated by the inability to elicit good history or a lack of history of direct heat or outdoor sun exposure. Further, deaths resulting from heatstroke rarely have heat exposure as a cause of death, leading to underestimating heat-related mortality. Research studies have shown that exposure to extreme heat increases the risk of death from cardiovascular,



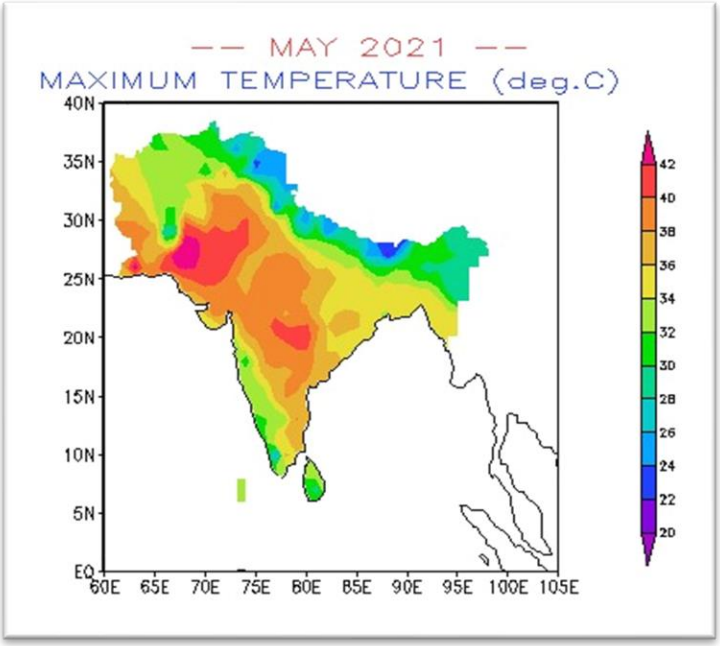
Heat-related deaths of people older than 65 years in each country in 2019
Source: [The 2021 report of the Lancet Countdown on health and climate change]

cerebrovascular, and respiratory conditions and all-cause mortality. These deaths, frequently, are accelerated deaths among the frail population occurring earlier in a heatwave and described as mortality displacement or "harvesting" phenomenon. As such, assessing excess admissions and mortality associated with daily temperature and humidity with various exposure durations over the years is considered an essential method to understand the health impact of extreme heat on the population.

India is the seventh most climate-affected country in 2019, according to the Global Climate Risk Index 2021. According to a latest report, India and Brazil had the biggest absolute increase in heat-related mortality between 2018 and 19. HRI surveillance began in 2015 in India. Since its beginning, a spectrum of HRI cases ranging from heat rash to heatstroke was considered under the surveillance, which is seasonal, passive surveillance in 23 core heat zone states from primary health facility level up to central surveillance unit. In 2021, the surveillance guidelines were revised to focus on heatstroke cases and deaths with the inclusion of a detailed death investigation by a medical officer or an epidemiologist in case of suspected heatstroke death. These guidelines are available in National Action Plan on Heat-Related Illness at https://bit.ly/NAPHRI.

Additionally, health facility-wise daily total admission and deaths, including confirmed CVD deaths, were added to allow assessment of excess mortality. Integration with meteorological parameters and responsibility of analysis of health data is assigned to district nodal officers-climate change (DNO-CC). Training on data collection of the new formats was conducted in early 2021.

In 2021, most northern states experienced high heat for a more extended period due to delayed rain. In May, northwest to south-east states frequently experienced maximum temperatures above 38°C. Between March-July 2021, out of 23 heat vulnerable states, seven states reported regularly and 16 did not submit any report. Of seven reporting states, two reported on old surveillance formats, and three



Maximum Temperatures reported in May 2021, India
Source: India Meteorological Department

reported zero cases and deaths (cardiovascular, heatstroke, total). Kerala reported 16 suspected heatstroke cases, 288 confirmed CVD deaths, and 1686 total deaths. Odisha reported 49 suspected heatstroke cases, four suspected heatstroke deaths, three confirmed CVD deaths, and seven total deaths.

To improve HRI surveillance reporting and data quality following actions are identified:
1. Sensitization of health care staff on the health impact of climate change and extreme heat
2. Frequent training of surveillance data collection, analysis and submission and review
3. Development and timely activation of heat health action plans (a part of State Action Plan on Climate Change and Human Health) for coordination of activities
4. Coordination with India Meteorological Department for integrating weather parameters in analysis at the district level.

Public Health Advisory: Air Pollution and Health

Generate awareness to prevent unhealthy effects of Air Pollution

General Population: Reduce risk from exposure to air pollutants

1. Avoid places with high pollution like roads with slow & heavy traffic, areas near polluting industries, construction-demolition sites, coal-power plants, and brick kilns, etc.
2. On days with poor to severe AQI, avoid outdoor morning and late evening walks, run, jog, and physical exercise. Do not open external doors and windows during morning and late evening hours, may ventilate, if necessary, between 12 p.m. to 4 p.m.
3. Avoid burning biomass such as wood, coal, animal dung, kerosene. *Use* clean, smokeless fuels (gas or electricity) for cooking and heating purposes
4. If using biomass, use clean cookstoves
5. Avoid burning firecrackers
6. Avoid burning in open any form of wood, leaves, crop residues, and waste
7. Do not smoke cigarettes, bidis, or related tobacco products
8. Avoid burning mosquito coils and incense sticks in closed premises
9. Remain indoors on days with poor to severe-plus AQI. Reschedule outdoor activities as per AQI level
10. Practice wet mopping instead of sweeping or vacuum cleaning inside homes. If you choose to use a vacuum cleaner, use those which has a High-Efficiency Particulate Air filter
11. Keep washing your eyes with running water regularly and do regular gargles with warm water.
12. Consult the nearest doctor in case of breathlessness, giddiness, cough, chest discomfort or pain, irritation in eyes (red ‹red or watery)
13. As a “no-regret” strategy, a healthy diet with fruit and vegetables rich in antioxidants and adequate hydration by drinking water is advocated

Vulnerable Population- (additional measures)

Patients with chronic pulmonary or cardiovascular problems; pregnant women, young children, and elderly should-

1. Be more careful to avoid exposure to air pollution. Restrict outdoor movements as far as possible
2. Avoid any strenuous activity
3. Keep a check on exacerbations of symptoms of the underlying conditions
4. Properly follow personal doctor's instructions on healthcare
5. Keep their prescribed medications readily available
6. Seek immediate medical advice if symptoms worsen

Detailed advisory is available for dissemination at *https://bit.ly/NPCCHHadv and IEC material at https://bit.ly/NPCCHHIEC*

Climate Conjunction

Artistic masterpieces as a proxy for air pollution

Obtaining an understanding of the environment in the pre-industrial era has been a challenge due to the lack of measurements. Information on the composition of air in terms of aerosols and their variability over the past 500 years is rare. A team of researchers has shown that the colours of sunsets painted by famous artists from the years 1500-2000 can be used to estimate pollution levels in the earth's past atmosphere. Paintings reveal that ash and gas released during major volcanic eruptions, dust from dust storms or anthropogenic air pollution scatter the different colours of sunlight, making sunsets appear more red. They concluded that the red-to-green colour concentration ratio in the paintings are helpful to detect changes related to air pollution over Europe's middle latitudes.

Painting by Edgar Degas, Horses in a Meadow, 1871 (non-volcanic period)
Open access image, Courtesy National Gallery of Art, Washington

Painting by Edgar Degas, Race Horses in a Meadow, 1885 (post-volcanic period)
Open access image, Courtesy The Metropolitan Museum of Art

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