INDIA
Heatwaves in Maharashtra State

CRISIS IMPACT OVERVIEW

- A heatwave is a period of at least 2–5 days during which abnormally high temperatures are recorded and affect human activities (WMO and WHO 2015). In the Republic of India, heatwaves typically occur in the northwestern regions from March–June. The Indian Government classifies heatwaves based on the temperature threshold of a particular region – specifically temperatures above 40°C in plains, 37°C in coastal areas, and 30°C in hilly regions. A heatwave is defined as temperatures that are 4.5°C–6.4°C higher than normal. Temperatures above this range are considered as severe heatwaves (NDMA 10/2019; NDMA 10/2016).

- Heatwaves can have a detrimental effect on human health. Exposure to high temperatures leads to dehydration, heat cramps, heat exhaustion, and/or heat stroke (WHO 30/06/2015). Between 2011–2018, heatwaves caused at least 6,167 confirmed deaths in India. 2015 was the deadliest year during this period, recording a total of 2,081 deaths (IndiaSpend 16/06/2020; The New York Times 13/06/2019).

- Between March–May 2021, above-normal temperatures are expected in most subdivisions in north, northwest, and northeast India, as well as certain subdivisions in the eastern and western parts of central India and coastal subdivisions in north peninsular India (IMD 01/03/2021). Maharashtra State is one of the regions most affected by heatwaves in India (NRDC 05/2020).

ANTICIPATED SCOPE AND SCALE

- March 2021 was the hottest month of the last decade in certain cities of Maharashtra State. During April, temperatures dropped following some western disturbances that resulted in sudden rains (The Indian Express 24/04/2021; Hidustan Times 24/04/2021; The Weather Channel 30/04/2021).

- Over 20 million people in Maharashtra State – approximately 25% of the regional population – live in densely populated informal constructions (Bhide and Waigankar 10/09/2015). These people are more vulnerable to heatwaves and heat-realted illnesses, as the materials used in building construction increase their exposure to heat.

LESSONS LEARNT

- The adverse effects of heatwaves may be prevented by ensuring accurate weather warnings, a health system that is prepared to treat heat-related illnesses, and relevant building measures (NDMA 10/2019).

- Certain measures to improve the insulation of urban buildings can be effective in reducing the number of heat-related deaths (NIDM 10/2019). Adopting cool roof technology and planting trees in neighbourhoods can reduce the urban heat island effect and lower indoor temperatures by 2°C–3°C (NRDC 05/2020; Macintyre and Heaviside 05/04/2019).

- Focusing on behavioural changes during heatwaves can help reduce the effects on human health (NDMA 2021).

HUMANITARIAN CONSTRAINTS

- Certain provinces in India have established lockdowns to reduce the spread of COVID-19 (The Economic Times 30/04/2021; NDTV 07/05/2021). These lockdowns include strict limitations to free movement, with the exception of essential services. Such limitations will likely impact the delivery of humanitarian aid and may delay programmes related to anticipated heatwaves.

- Heatwaves in India typcially occur between March–May (The Weather Channel 06/04/2021). Many humanitarian organisations will have to implement planned activites during heatwaves and extreme temperatures.

Any questions? Please contact info@acaps.org

KEY FIGURES

20 million
PEOPLE LIVING IN POVERTY AND REMAINING AT INCREASED RISK

25%
OF THE MAHARASHTRA STATE POPULATION LIVING IN DENSE INFORMAL SETTLEMENTS

+6,000
HEATWAVE DEATHS BETWEEN 2011–2018

NATIONAL RESPONSE CAPACITY
- India National Institute of Disaster Management
- Ministry of Home Affairs
- Local governments and NGOs

INTERNATIONAL RESPONSE CAPACITY
- INGOs

SECTORAL NEEDS

Shelter

The increased number of urban buildings and the consequent reduction of green areas can produce an urban heat island effect. This phenomenon occurs when urban spaces are significantly warmer than the areas surrounding them. Maharashtra State is one of the most urbanised states in India (India Ministry of Housing and Urban Affairs 19/05/2021). Roughly 25% of the state's population lives in informally built and densely occupied houses (Bhide and Waigankar 10/09/2015). Identifying areas with the highest risks and implementing actions in urban planning (e.g. adopting cool roof technology for buildings, planting trees, and providing ventilation) can mitigate the effects of heatwaves in the short term. The India National Institute of Disaster Management also recommends installing temporary shelters to distribute water and allowing people to rest at certain times of the day (NDMA 10/2019).

Health

Heatwaves expose people to extreme temperatures and subsequent symptoms, such as dehydration, heat cramps, heat exhaustion, and/or heat stroke (WHO 30/06/2015). People must be able to access clean water, water for bathing, and medicines to help prevent or control heat-related symptoms. The most vulnerable populations – children, the elderly, and people with chronic illnesses – require particular access to water and medicines, as they are more likely to manifest symptoms related to extreme temperatures (NDMA 10/2019). India's public health spending ranks among the lowest in the world, and essential medicines are unaffordable for the average citizen (The Conversation 29/04/2021; Singh et al. 03/03/2020; Oxfam 22/06/2015).

AGGRAVATING FACTORS

COVID-19

India is currently facing a second wave of COVID-19. As at 18 May, the country recorded more than 335,000 cases and has reported 4,000 deaths per day (Indian Ministry of Health and Family Welfare 19/05/2021). Maharashtra State is one of the regions most affected by the pandemic and is among the districts that contribute the most to the COVID-19 mortality rate (CNN-News18 09/04/2021; Business Standard 16/05/2021).

The pandemic has led to high levels of hospital occupancy. In several cities, there are no ICU beds available for COVID-19 or other patients (The Print 13/04/2021; Times Now 27/04/2021). The strain on the health system's capacity will likely influence the care provided to patients affected by heatwaves.

Climate change

Rising global temperatures have increased the frequency and impact of heatwaves. The decade of 2011–2020 was the warmest on record. In 2020, the average temperature in India was 1.2°C higher than in the pre-industrial era (1850–1900) (WMO and WHO 2015). Between 1960–2009, heatwaves with higher temperatures became more frequent in India, and the probability of dying from heat-related causes increased by 146% (Mazdiyasni et al. 07/06/2017). Current consumption and production patterns may cause the country's average temperature to rise by more than 1.5°C over the next two decades (Rajeevan and Srivastava 19/05/2016; Climate Impact Lab accessed 31/10/2019).

Poverty

People living in poverty are more likely to die and/or become sick during heatwaves (Forbes 14/08/2020). Their houses typically lack insulating material and cause increased exposure to heat, and poorer neighbourhoods often have fewer green spaces. People living in poverty also tend to have informal jobs that may involve permanent and unventilated exposure to heat (The Trust for Public Land 08/2020; NDMA 10/2019). Lack of clean water, overcrowded living conditions, and limited access to electricity and quality medicine result in restricted access to cooling spaces and a higher risk of complications during the early stages of heatwave illnesses (Chester and Morris 22/12/2016; The Trust for Public Land 08/2020). In 2020, the number of people living in poverty in India increased by 75 million because of the recession triggered by COVID-19 (Pew Research 18/03/2021).

HEAT VULNERABILITY INDEX MAP OF INDIA BY DISTRICT
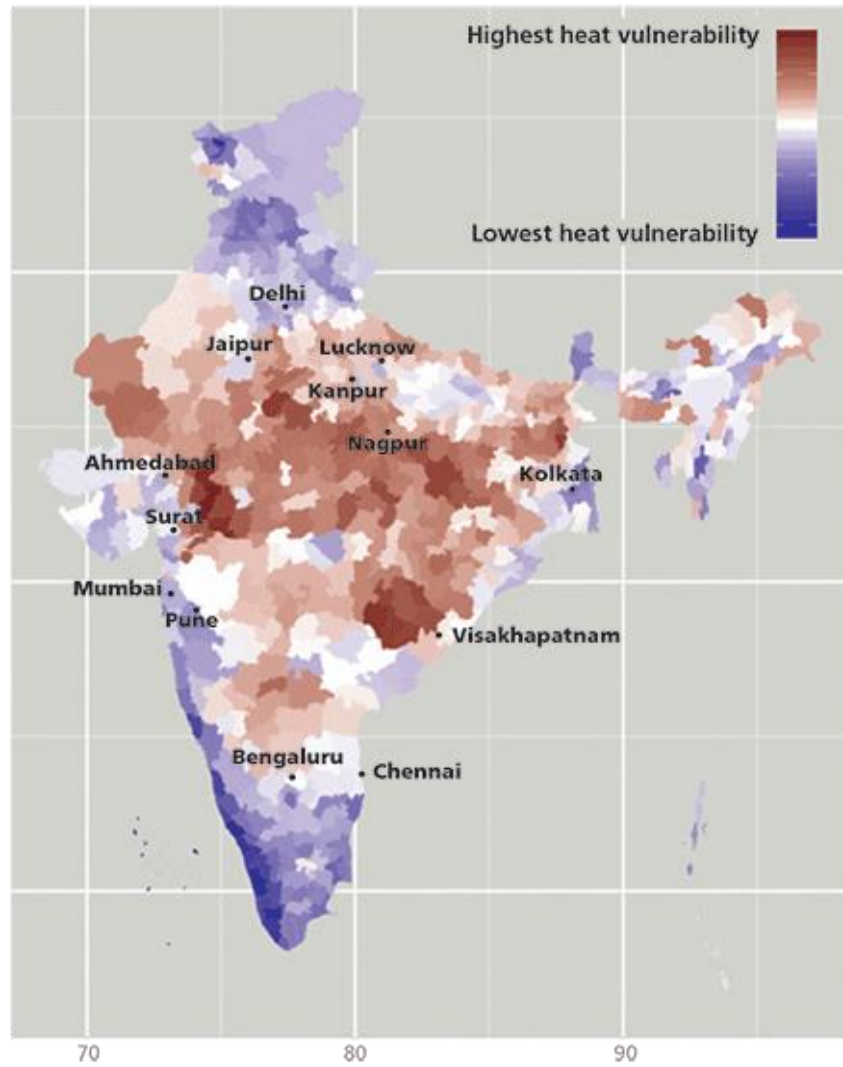
Source: Rand Corporation 30/03/2017