

Women's action towards climate resilience for urban poor in South Asia

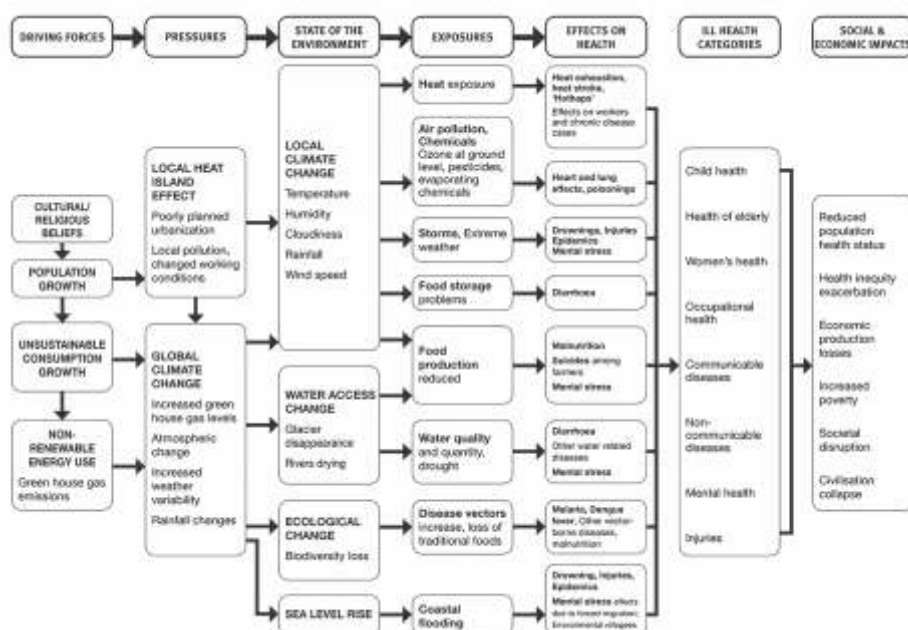


HEAT STRESS AND IMPACT ON COMMUNITIES

*-Dr. Veena Iyer, Ajit Rajiva and Priya Dutta
 Indian Institute of Public Health, Gandhinagar*

Climate and health are closely associated. Millions of people in the tropics are expected to experience extreme heat event in coming year.(1) Different geographical regions have exhibited wide trends in weather patterns such as precipitation, temperature, and humidity. These weather conditions sometimes exceed past trends leading to extreme weather events. Such weather extremes have significant impact on lives of millions and are seen as an important challenge from public health lens. (2, 3)

Figure 1: Description of the ongoing Health and Economic Impacts of Local Climate Change Pressures



Evidence of heat extremes

IPCC has documented an average warming of about 0.2°C per decade, projected for a range of Special Report Emission Scenarios, even if the concentrations of all greenhouse gases and aerosols is kept constant at year 2000 levels. (4) According to the Indian Meteorology Department (IMD), a severe heat wave is declared in India when (i) either there is an excess of 6°C over a normal daily historical maximum temperature (30 year average) when temperature is of less than 40°C; (ii) or an excess of 5°C over a normal historical maximum temperature when temperature is more than 40°C. If the actual maximum temperature is above 45°C, a heat wave is declared irrespective of the normal historical maximum temperature. (5, 6) This causes heat stress in humans, which is a leading, directly-mediated, weather related cause of mortality. (7, 8)

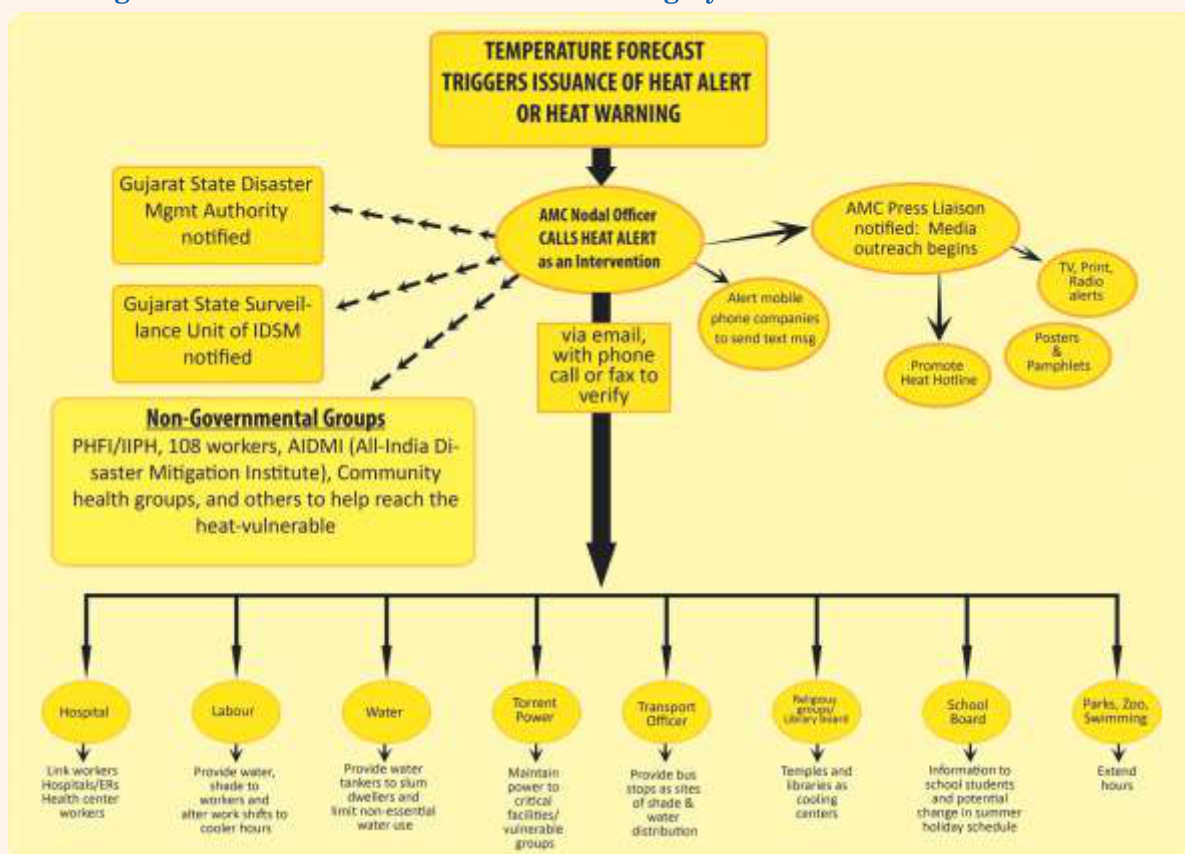
In India, heat wave related deaths were highest (1625) in Rajasthan, followed by Bihar, Uttar Pradesh, and Orissa during the period 1978 to 1999. Notably, the period roughly coincided with last two decades of the twentieth century, which witnessed unprecedented high temperatures globally as a result of the global warming. (9, 10) In the year 1998, India faced an unprecedented heat wave situation, as a result of which 1,300 persons lost their lives, 650

in the State of Orissa. (11) In the year 2003, more than 3000 deaths were noted in Andhra Pradesh attributed to heat waves. (12) However, there are not enough research reports available on health impacts of heat stress, specially its impacts on mortality, particularly in case of developing countries or specific cities in South-East Asia. In 2010 Ahmedabad temperature reached a high of 46.8°C causing 1,344 excess deaths likely caused by the heat wave. (13)

Heat exposure

Heat exposure in urban areas and cities is relatively higher than that in surrounding villages. The temperature in urban areas is on average 3.5-12°C higher due to the urban heat island effect and urban microclimates. (14, 15). Among the fastest growing cities in India, Ahmedabad is known to have highest maximum temperatures and to be highly prone to heat waves. Trends show that annual average maximum temperature in Ahmedabad is increasing at the rate of 0.30°C per decade (16). Projections show that this will only increase. Similarly, for other South Asian cities like Jaipur, Bhopal, Bhubaneswar, Ranchi, Dhaka and Katmandu, annual average maximum temperature is raising at the rate of 0.16°C, 0.27°C, 0.16°C, 0.22°C, 0.11°C, and 0.48°C respectively per decade. (17)

Figure 2: Diagram of the current Heat Wave Warning System in Ahmedabad



Impact on slum and low-income communities

Studies reveal that slum areas and the urban poor are significantly more prone for heat related hazards (18). Along with this, their location in the city, socio-economic conditions, and their dependency on resources and services that are vulnerable to climate change make them more prone to the health hazards. Heat affects people through dehydration, acute heat illnesses (such as heat exhaustion and heat stroke), and the worsening of chronic cardiovascular and respiratory diseases. (19) The urban residents and particularly people from low income groups are at elevated risk due to high population density, compromised access to safe drinking water, exposure to high temperatures, and little access to cooling such as shade, fans, air conditioning, and other protective measures. Due to lack of cooling methods, heat impacts both the health and economic conditions of workers in such situations. (20) Slum residents, other poor communities, the elderly, the young, and outdoor workers are particularly vulnerable. (21) In Southeast Asia, in 2050, more than half the afternoon work hours may be lost due to the need for rest breaks. (22) Above +10°C global warming will leave large populated areas of the globe in many respects uninhabitable. (23)

Coping mechanisms

Coping mechanisms are required globally, at government level (central, state and local), at community level, at household level and at individual level. These include land use planning, community based programs, and early warning systems among other practices. (24). In India, for instance, the Ahmedabad Heat Action Plan (AHAP) has been implemented at city level and other cities/states have started designing similar plans. (25, 26)

Challenges of vulnerability

There are significant and inequitable impacts of climate variability and change on health. With higher rates of warming predicted in the near future, projections indicate further increases in health risks associated with increasing temperatures. (27, 28) Comprehensive strategies to respond to climate change effects are still being tested. The challenge of measuring vulnerability and complex interventions strategies has been recognized. (29) We cannot avoid the burden of climate change completely; however we can reduce it through proactive and efficient adaptation.

Though physiological limits for heat stress exist, they are not linked to specific rates of global warming. Thresholds for heat tolerance are specific to individuals and communities so a universal threshold cannot be used for all cities. (27)

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