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## Important Terms

### Adaptation:

The adjustment of our built environment, infrastructure, and social systems in response to actual or expected climatic events or their effects. It includes responses to reduce harm or capture benefits.

### Climate Resilience or Climate Change Resilience:

The capacity of an individual, community, or institution to dynamically and effectively respond to shifting climate impact circumstances while continuing to function at an acceptable level. It is the ability to survive and recover from the effects of climate change.

### Critical Facility:

Facilities for which the effects of even a slight chance of disruption would be too great. Critical facilities include designated public shelters, hospitals, vital data storage centers, power generation and water and other utilities, and installations which produce, use, or store hazardous materials.

### Critical Infrastructures:

Includes assets, systems, and networks, both physical and virtual, that support campuses and buildings, and that are so vital their destruction or incapacitation would disrupt the security, health, safety, or welfare of the public.

### Vulnerability:

The degree to which a system is susceptible to and unable to cope with the negative effects of extreme weather or climate change. Vulnerability of a building or the built environment is the result of age, condition or integrity, proximity to other infrastructure, and level of service.

### Vulnerable populations:

Health care professionals define this group as the segments of the general population most susceptible to some pathogen, disease, or other adverse health outcome, categorized by age, race, gender, income, or other common factors.<sup>1</sup>

### Emergency risk management for health

Emergency risk management for health is multisectoral and refers to: the systematic analysis and management of health risks, posed by emergencies and disasters, through a combination of

- (i) hazard and vulnerability reduction to prevent and mitigate risks,
- (ii) preparedness,
- (iii) response and
- (iv) recovery measures.

### Health Systems

Health care systems provide core capacities for emergency risk management for health. Some countries affected by emergencies have limited basic health services and infrastructure, which hugely compounds the challenges of disaster response. Countries with well-developed systems are often much more resilient and better prepared for disasters. Primary health care (PHC) focuses on basic services to improve health status, which in turn builds community resilience and provides the foundation for responding to emergencies.<sup>2</sup>

<sup>1</sup> <https://kresge.org/sites/default/files/Healthcare-Climate-Resilience-Guidance-HHS.pdf>

<sup>2</sup> [https://www.who.int/hac/techguidance/preparedness/risk\\_management\\_overview\\_17may2013.pdf](https://www.who.int/hac/techguidance/preparedness/risk_management_overview_17may2013.pdf)

## Introduction

There is now a very large body of evidence that human actions, mainly the burning of fossil fuels, have caused significant changes in the global climate system, with effects that will persist for decades or longer. The degree and rate of future climate change will depend on amounts of emissions of greenhouse gases, and other climate pollutants such as black carbon.

There are multiple connections between climate and health. The health chapter of the most recent report of the IPCC – divides these into three main groups:

- (i) The direct impacts on human health, such as those which arise from damages and illness from increased frequency and severity of extreme weather events
- (ii) Impacts mediated through other environmental systems. These include rising air pollution, and changing patterns of vector-, food- and water-borne diseases
- (iii) Socially mediated effects, which occur via climate change's interaction with social and human systems.

These include health effects resulting from undernutrition, occupational heat stress and mental illness, as well as potential increases in population displacement and risks of violent conflict and slowing of economic growth and poverty reduction. Climate change therefore affects health directly, undermines the social determinants of health, and threatens the viability of several environmental services provided by natural systems

The health risks of climate change occur through gradual changes in average conditions, but also in variability, such as more frequent and/or severe heat waves, floods and storms. These are of particular concern, as they are often far less predictable than changes in mean conditions; they have the potential to cripple health facilities, social systems and key infrastructure; and they may result in irreversible shifts, for example through storm surges flooding both natural ecosystems and inhabited areas.<sup>3</sup>

## Impact of climate change on health

Climate change affects the social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter- for instance changing the severity and frequency of health problems already existing in that area, creating unanticipated health problems in places where they have not previously occurred, disturbing food-producing ecosystem and increasing the frequency of extreme weather events.

Between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year, from malnutrition, malaria, diarrhoea and heat stress.

### Water problems and increased risks of water borne diseases:

Water borne diseases are sensitive to climate and show seasonal variation. Diarrheal diseases are more common during rainy season. Globally, water scarcity already affects 4 out of 10 people.

### Changes in vector ecology and vector borne diseases:

India is afflicted with six major vector borne diseases (VBDs) namely malaria, dengue, chikungunya, filariasis, Japanese encephalitis and leishmaniasis. Climate change enhances the transmission season and expands the geographical distribution of vector-borne diseases (like dengue, malaria), as warmer temperature and humidity favours the breeding of insect vectors and alters the geographic distribution of existing vectors.

### Effects of extreme temperatures

Climate change including heat waves, cold spells, and other extreme events will bring new and emerging health issues. Heat stress can make working conditions unfavourable and increase the risk of cardiovascular, respiratory and renal diseases and heat related illnesses.

<sup>3</sup> [https://www.who.int/phe/climate/conference\\_briefing\\_1\\_healthresilience\\_27aug.pdf?ua=1](https://www.who.int/phe/climate/conference_briefing_1_healthresilience_27aug.pdf?ua=1)

## Air pollution and increasing aeroallergen levels

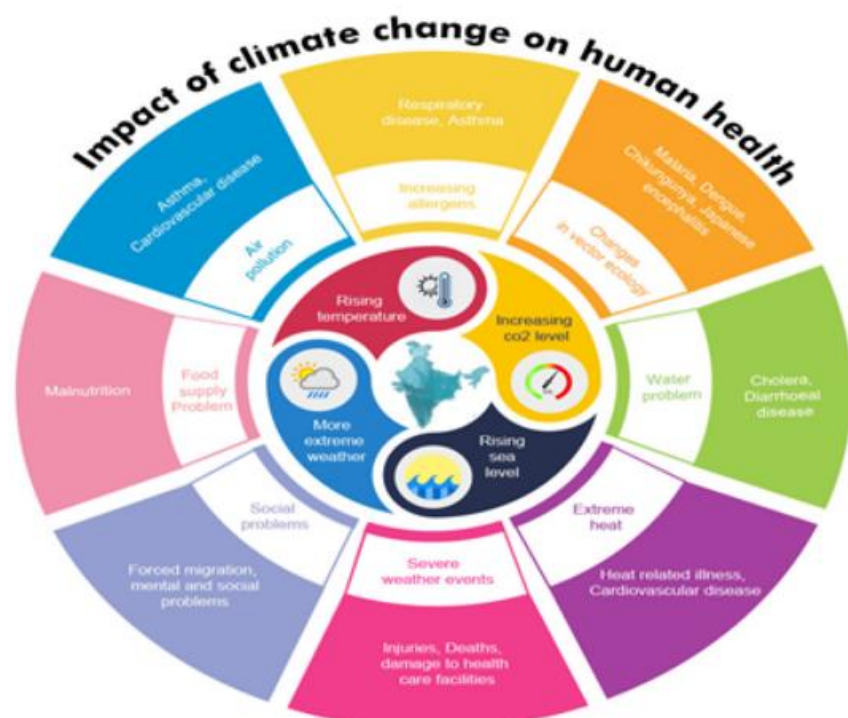
They are also high in extreme heat that can trigger asthma and other respiratory diseases. Climate change may affect human health by increasing ground-level ozone (a key component of smog) and/or particulate matter air pollution.

## Food supply problems:

Rising temperatures and variable precipitation are likely to decrease the production of staple foods in many of the poorest regions. This will increase the prevalence of malnutrition and undernutrition.

## Severe weather events:

An increase in frequency of extreme events such as storms, floods, droughts, and cyclone directly affects the human health in terms of loss of life and injury (physical injuries and post-traumatic stress disorders) and affects indirectly through loss of houses; population displacement; contamination of water supplies; loss of food production; increased risk of epidemics of infectious diseases and damage to infrastructure for provision of health services.



Source: [https://www.nhp.gov.in/health-and-climate-change\\_pg](https://www.nhp.gov.in/health-and-climate-change_pg)

## Forced migration:

It is estimated that 22.5 million people are displaced annually by climate or weather-related disasters, and these figures are expected to increase in the future. Climate-induced human mobility has a socioeconomic cost with mental and social problems to individual and community.

## The human cost:

Climate and weather have direct and indirect impacts on human life. The most disadvantaged, vulnerable and poor populations are expected to be disproportionately affected by climate change, with rising food and water insecurity, higher food prices, loss of income and livelihood opportunities, negative health effects, and population displacement (including forced migration).<sup>4</sup>

## **WHO response**

Many policies and individual choices have the potential to reduce greenhouse gas emissions and produce major health co-benefits. For example, cleaner energy systems, and promoting the safe use of public transportation and active movement – such as cycling or walking as alternatives to using private vehicles – could reduce carbon emissions, and cut the burden of household air pollution, which causes some 4.3 million deaths per year, and ambient air pollution, which causes about 3 million deaths every year.

In 2015, the WHO Executive Board endorsed a new work plan on climate change and health. This includes:

- (i) **Partnerships:** to coordinate with partner agencies within the UN system, and ensure that health is properly represented in the climate change agenda.
- (ii) **Awareness raising:** to provide and disseminate information on the threats that climate change presents to human health, and opportunities to promote health while cutting carbon emissions.

<sup>4</sup> [https://www.nhp.gov.in/health-and-climate-change\\_pg](https://www.nhp.gov.in/health-and-climate-change_pg)

- (iii) **Science and evidence**: to coordinate reviews of the scientific evidence on the links between climate change and health, and develop a global research agenda.
- (iv) **Support for implementation** of the public health response to climate change: to assist countries to build capacity to reduce health vulnerability to climate change, and promote health while reducing carbon emissions.<sup>5</sup>

## Health and the Hyogo Framework for Action: 5 Priorities for Action

The Hyogo Framework for Action identifies 5 priorities for action towards strengthening community and country resilience to disasters. The application of these 5 priorities for health and the health sectors as described below.

### Priority 1: Emergency risk management for health as a national and local priority

- Development and implementation of health and multisectoral policies, strategies and legislation to provide direction and support for emergency risk management, especially at local levels.
- Health sector and multisectoral coordination mechanisms at local and national levels to facilitate joint action on risk reduction, response and recovery by the various health and non-health actors.
- Commitment of sufficient resources to support emergency risk management for health.

### Priority 2: Health risk assessment and early warning

- (i) Assessment of risks to health and health systems.
- (ii) Determining risk management measures based on risk assessments.
- (iii) Surveillance and monitoring of potential threats to health, particularly from biological, natural and technological (such as chemical and radiological hazards) sources to enable early detection and warning to prompt action by the public, health workers and other sectors.

There are three broad elements, which are usually considered in risk assessment:

- (i) **Hazard Analysis**: Identification of the hazards and assessment of the magnitude and probability of their occurrence.
- (ii) **Vulnerability Analysis**: Analysis of vulnerability of individuals, populations, infrastructure and other community elements to the hazards.
- (iii) **Capacity analysis**: Capacity of the system to manage the health risks, by reducing hazards or vulnerability, or responding to, and recovering from a disaster.

### Priority 3: Education and information

To build a culture of health, safety and resilience at all levels Through education, training and technical guidance, strengthen the knowledge, skills and attitudes of professionals in health and other sectors for managing the health risks of disasters. Information, education and risk communication for households and communities at risk to promote healthy behaviours to reduce risks and prepare for disasters.

### Priority 4: Reduction of underlying risk factors to health and health systems

Poverty reduction measures and systems aimed at improving the underlying health status of people at risk of disasters. New hospitals are built with an enough level of protection and existing health care infrastructure is strengthened to remain functional and deliver health services in emergency situations.

<sup>5</sup> <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>

## Priority 5: Emergency preparedness for effective health response and recovery at all levels.

Emergency preparedness, including response planning, training, pre-positioning of health supplies, development of surge capacity, and exercises for health care professionals and other emergency service personnel, is critical for the effective performance of the health sector in the response.<sup>6</sup>

### **GUJARAT PUBLIC HEALTH WORKFORCE STUDY**

Gujarat follows Gujarat Medical Service Rules for remuneration, transfers & posting of Medical and Paramedical staff. Commissionerate Health looks after the establishment issues of Medical & paramedical staff with its Gujarat Public Health workforce study: Issues & Challenges 3 different subdivisions (viz. Health, Medical Services, Medical Education, Family Welfare and Vital Statistics) headed by Additional Directors.

There are 3 patterns being followed by the state for recruitment of Medical Officers:

- (i) **Adhoc basis**: Every Tuesday, walk-in interviews are conducted in Commissionerate Office, wherein they get the appointment letters after getting their credentials verified
- (ii) **Government Medical Officers**: Candidates graduating from the Government Medical colleges are bound to work for at least 3 years in the rural areas. In case of breach of the bond, they are required to pay the bond amount
- (iii) **Gujarat Public Service Commission (GPSC)**: To enter the regular services, doctors serving on adhoc basis have to appear in walk-in interviews conducted by GPSC. During the last round of interviews, 700 seats were announced of which around 500 appointment offers were released.<sup>7</sup>

### **E- Health initiatives in Gujarat**

#### **Gujarat Hospital Management Information System (GHMIS):**

To provide better care to patients by addressing all the major functional areas of the hospital & the entire gamut of hospital activities. The main aim is to maintain electronic Health records of Patients.

#### **Ability Gujarat**

Ability Gujarat', is innovative web based application intended to harness the benefits of ICT to improve effective and efficient delivery of services to PwDs. The project has been designed to cover the entire state of Gujarat. The key component of the project is to identify Persons with Disability (PwDs) and undertake issuance of "disability certificates" to the individuals within a specified time period.

#### **Drug Logistics Information & Management System:**

DLIMS handles procurement, storage and distribution of medicines, drugs, injectable, surgical goods and medical equipments. It enhances the operational efficiency of the healthcare services provided at PHC and Sub-Centre level.

#### **Mukhya Mantri Amrutam(MA)**

The purpose of the scheme is to improve access of BPL families to quality medical and surgical care for the treatment of identified diseases involving hospitalization, surgeries and therapies through an empanelled network of health care providers. The beneficiary is any Below Poverty Line (BPL) family.

<sup>6</sup> [https://www.who.int/hac/techguidance/preparedness/risk\\_management\\_overview\\_17may2013.pdf](https://www.who.int/hac/techguidance/preparedness/risk_management_overview_17may2013.pdf)

<sup>7</sup> <http://nhsrcindia.org/sites/default/files/Gujarat%20Public%20Health%20Workforce%20Report.pdf>

## School Health Program

School Health (SHP) is a single, largest time framed health program operating in the State of Gujarat since 1997. SHP covers all 26 Districts & 18,568 villages (including 7 Corporations) of the State. The main purpose is maintenance of health records of children and adolescents.

**Blood Bank Management System (BBMS):** It provides details of all blood banks in state with availability of stocks, ongoing camps and details of donors. The main purpose is stock availability of blood in blood banks across the state.<sup>8</sup>

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<sup>88</sup> <https://www.nhp.gov.in/e-health-initiatives-in-gujarat- pg>