



Impact of Climate Change on Physical and Mental Health

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Abstract: *One of the most important issues of our time regarding human health and mental health is the impact of climate change. This situation is, of course, not about a new impending ice age but is clearly about global warming. Unfortunately, there has been little in the general medical or psychiatric literature discussing this critically important topic. The reality of climate change is undeniable, catastrophic, and immediate. Its impact is already being felt throughout the world.*

Climate change is propelled along an inexorable course, creating ever-worsening environmental conditions destined to be with us long into the future. The degree of peril we and most other forms of life on this planet face are particularly linked to two unsustainable and unsupportable human-derived factors: air pollution from the extraction and consumption of fossil fuels and large-scale animal agriculture. Scientists and policy experts have known about the risks of excessive carbon in the atmosphere for decades, yet our leaders have failed to do anything significant to adequately address this unmitigated global slow-moving disaster.

Health is the level of functional or metabolic efficiency of a living being. In humans, it is the general condition of a person's mind, body and spirit, usually meaning to be free from illness, injury or pain. The World Health Organization (WHO) has defined health in its broader sense in 1946 as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." A disease is an abnormal condition affecting the body of an organism. It may be caused by external factors, such as infectious disease, or it may be caused by internal dysfunctions, such as autoimmune diseases. In

humans, "disease" is often used more broadly to refer to any condition that causes pain, dysfunction, distress, social problems, death to the person afflicted, or similar problems for those in contact with the person. Human health is influenced by many factors like nutritional, biological, chemical or psychological. It is quite true that the environment has a direct impact on those living in it and many diseases are the outcome of man's maladjustment to his environment. The factors, which affect human health and cause disease, can be divided into two categories:

1. Intrinsic, and
2. Extrinsic factors

The factors such as malfunctioning of the body parts, hormonal imbalances, malfunctioning of the immune system and genetic disorders, which exist within the human body, are called Intrinsic Factors. The disease caused by intrinsic factors is called organic diseases or metabolic diseases.

Some examples of diseases caused by extrinsic factors are Heart attack Kidney failure, Cataract, Diabetes etc. The disease caused by intrinsic factors can be cured by proper medical treatment. The factors, such as malnutrition, disease causing microorganisms, environmental pollutants use of tobacco, alcohol and narcotics, which exist outside the human body, are called Extrinsic Factors. Some examples of diseases caused by extrinsic factors are Kwashiorkor, Goitre, Malaria, Cholera, Tetanus etc. The diseases caused by extrinsic

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factors can be cured by providing wholesome food, providing a clean environment, by social remedies which encourage good habits. Many chemicals applied to the skin, inhaled or taken by mouth are also known to cause cancer. These chemicals, which can cause cancer, are known as carcinogenic. Carcinogenic agents in foods may be natural substances or they can be chemicals (food additives) that are deliberately added to food as flavouring agents, colouring agents, and sweeteners as a preservative. Cancerous growths or tumours can be treated only at early stages. Cancerous growths in advanced stages often result in death.

There are three types of health hazards:

1. Physical Hazards: Radioactive and UV radiations, Global warming, Chlorofluorocarbons, Noise etc.
2. Chemical Hazards: Combustion of Fossil fuels, industrial effluence, pesticides, heavy Metals.
3. Biological Hazards: Bacteria, Viruses, Parasites.

CLIMATE CHANGES ON HUMAN HEALTH IN GENERAL-

The impact of climate change has been considered enough to threaten human health both directly and indirectly through increasing temperatures, rising sea levels, water and food supply impacts, extreme weather events like floods, droughts, earthquakes, etc., susceptible shelter and population migration. The direct effect of environmental circumstances may ease the diffusion of vector-borne diseases, water-borne diseases, cardiovascular diseases, respiratory

allergies and malnutrition, etc. Indirect effects of climate change such as mental health problems and involuntary migration are also important. Children, the elderly and communities are living in poverty among the most susceptible of the damaging effects due to climate change. Environmental consequences of climate change, such as extreme heatwave, rising sea levels, changes in precipitation resulting in cyclones, earthquakes, flooding and droughts, intense hurricanes and degraded air quality, affect directly and indirectly the physical, social and psychological health of humans. For instance, changes in precipitations are creating changes in the availability and quality of water, as well as resulting in extreme weather events such as intense hurricanes and flooding.

Seeing the cumulative trend of impact of climate change on human health, implementation of alleviation measures like consolidation health systems and service delivery mechanisms through early monitoring, disease investigation, vector and disease control, and health insurance to counter the same becomes authoritative. Investment in research and development, health risk calculation studies, susceptibility mapping studies, formation of baseline circumstances, scenario modelling and acceptance of clean expansion mechanisms, etc. are the need of the hour. Economics would play a major role in combating the potential threat. Countries with good GDP would be able to introduce the

best available tools of intervention and can fill up the lacunae in health system. India is a large developing country, with the Great Himalayas, the world's third largest ice mass in the north, 7500 km long, and densely populated coast line in the south. Nearly 700 million of her over one billion population- living rural areas directly depends on climate sensitive sectors (agriculture, forests, and fisheries) and natural resources (such as water, biodiversity, mangroves, coastal zones, grasslands) for their subsistence and livelihoods. Heat wave, floods (land and coastal), and draughts occur commonly. Malaria, malnutrition, and diarrhoea are major public health problems. Any further increase, as projected in weather-related disasters and related health effects, may cripple the already inadequate public health infrastructure in the country.

Trends in heavy rainfall events in India show that it has increased in the western coast and few pockets in North, Central, Eastern and the North East! A significant increasing trend has been observed in discomfort indices during the last ten days of April and a significant increasing trend has been observed in discomfort indices, relative humidity and maximum temperature during May. Similarly, a significant increasing trend has been observed during the second fortnight of May and first fortnight of June². Climate change is a significant and emerging threat to public health. The effects of climate change on human health are influenced by a variety of pathways



and there may be long delays between causes and effects. Various methods have been developed for quantitative estimation of health impacts of future climate change. WHO has defined a general methodology to quantify the disease burden caused by 26 risk factors at selected time points up to 2030⁴. The major brunt of global climate change in terms of adverse health impact will be mostly borne by the poor and developing countries, even though the rich and industrialized countries account for maximum greenhouse gas emission⁵. Though India has contributed only 2 per cent of the total carbon emissions from fossil fuel burning over the last 100 years, still it is likely to experience greater effects from the 'extreme weather' events⁶. In this paper, the impact of climate change in health through analysis of the various diseases association with changes in the atmospheric environment and climate conditions are reviewed.

REPERCUSSIONS ON HUMAN HEALTH-Climate change can result in increased temperatures in both ocean water and ambient air. Rise in sea level due to increased temperatures can lead to coastal flooding, which can force the communities to use contaminated-water, inadequate sanitation systems, or trigger migration into areas with insecure water and sanitation availability which can lead to the spread of Cholera. Rising temperatures and changing patterns of rainfall are projected to decrease crop yields in many developing countries,

stressors upon food supplies. There are 13 coastal states and Union territories susceptible to sea-level rise in the country, with about 84 coastal districts affected by tropical cyclones. States like Tamil Nadu, Andhra Pradesh, Odisha and West Bengal, Gujarat and Union Territory of Puducherry are most affected by cyclonic activities. Under-nutrition and related disease is currently the greatest contributor to the global burden of disease, killing over 3.5 million people a year, mostly children in developing countries. With much dependence on natural resources and climate sensitive sectors such as agriculture, water and forestry, India may face a major threat from scarcity of vital resources.

Major health effects due to changing climate can be broadly classified as follows:

1. Extreme weather-related health effects
2. Air pollution-related health effects
3. Water and food-borne diseases
4. Vector-borne diseases
5. Effects of food and water shortages
6. Psycho-social impacts on displaced populations
7. Health impacts from conflicts over access to vital resources

P O L I C Y IMPLICATIONS-Recently, under the aegis of Indian Network of Climate Change Assessment (INCCA) the report projected climate change scenario for India by the year 2030 would be in the four most vulnerable sectors¹¹. Precisely at a time when India is confronted with development imperatives, we will

also be severely impacted by climate change. With close economic ties to natural resources and climate-sensitive sectors, India may face a major threat, and require serious adaptive capacity to combat climate change¹². With 27.5 per cent of the population still below the poverty line, reducing vulnerability to the impacts of climate change is essential¹³. Over India, the annual mean temperature has increased in the past hundred years. Projection of the future climate change scenario shows catastrophic events will exhibit an increase in frequency and intensity resulting in enormous impact on human life in terms of death toll and disease epidemic.

CONCLUDING REMARKS-The paper shows that linkages between climate change and human health are complex and multi-layered and predictions of the future health impacts of climate change are still uncertain. Considering the increasing trend of impact of climate change on human health, adoption of mitigation measures like strengthening health systems and service delivery mechanisms through early monitoring, disease surveillance, vector and disease control, and health insurance to counter the same becomes imperative. Investment in research and development, health risk assessment studies, vulnerability mapping studies, establishment of baseline climate conditions, scenario modelling and adoption of clean development mechanisms, etc. are the need of the hour. Economics would play a major role in combating the potential threat.



Countries with good GDP would be able to introduce the best available tools of intervention and can fill up the lacunae in health system. Climate change poses one of the greatest threats to public health in modern times. Assuming that we don't get annihilated by a meteor or extinguished by a nuclear winter from nuclear war, we will contend with the multiple and complex effects of climate disruption long beyond the time we successfully achieve the targeted reductions in global temperature. The effects of increasing global temperatures, rising sea level, excessive CO2 levels, droughts, and other extreme weather events, reflected most recently by the spate of historic hurricanes, cyclones, and wildfires, combine to threaten the health, well-being, and economic stability of individuals, communities, and nations worldwide. If we are concerned about well-being and burnout in the

health sector, we should be even more concerned about the risks to earth's well-being and planetary burnout.

The health effects of climate change are vast and distressingly serious. They encompass

the creation, exacerbation, and complication of conditions involving almost all organ systems of humans and most other biological fauna and flora. The mental health consequences are also vast, pervasive, and likely to last longer than most other impacts on health. They require attention, understanding, education, and commitment from all of the

psychiatrists (and other health and mental health professionals) to effectively identify, treat, and prevent.

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