

A Review On the Impact of Climate Change on Human Health

Harde Aditya Devram, Borude Sanket Ashok, Prof. Mahesh Kumar V. Harale, Dr. Sanjay J. Ingle
Dharmraj Shaikshnaik Pratishthan College of Pharmacy, Ahilyanagar, Maharashtra, India.

Abstract: *The significant effects on human health, climate change is a major worldwide health concern. A thorough summary of how climate change affects infectious diseases, heat stress, mental health, and other health consequences is what this review attempts to deliver. Peer-reviewed papers, official documents, and publications from international organizations were all included in the comprehensive examination of the body of extant material. According to the findings, vulnerable groups including children, the elderly, and people with pre-existing medical disorders would be disproportionately impacted by climate change, which is predicted to accelerate the development of infectious diseases, heat stress, and mental health issues. The evaluation emphasizes how urgent it is to cut greenhouse gas emissions and lessen the negative health effects of climate change.*

Keywords: Human health, infectious diseases, heat stress, climate change, and mental health

I. INTRODUCTION

CALIMATE CHANGE

CLIMATE CHANGE: AN INTERNATIONAL HEALTH ISSUES

One of the most important challenges of our day is climate change, which has profound effects on the environment, the economy, and human health. The phrase “climate change” describes the gradual warming of the world, which is mostly brought on by the rise in greenhouse gas concentrations in the atmosphere. These gases, which include water vapor, carbon dioxide, and methane, trap solar heat and raise global temperatures.

THE SITUATION OF CLIMATE CHANGE RIGHT NOW

The situation of climate change right now is concerning. With an average global temperature of 1.1°C higher than pre-industrial levels, the 2010–2019 decade was the warmest on record. All five of the warmest years on record have happened since 2016, while the 20 warmest years on record have all happened since 1981. The Antarctic ice sheet is also melting, and the Arctic is warming twice as quickly as the world average.

REASON FOR CLIMATE CHANGE

1. As a result of burning fossil fuels like coal, oil, and gas, significant amounts of carbon dioxide are released into the atmosphere, contributing to global warming.
2. Deforestation: Forests lose their capacity to absorb carbon dioxide when they are cleared for urbanization, agriculture, and other uses.
3. The release of stored carbon into the atmosphere can result from changes in land use, such as the conversion of natural habitats to urban or agricultural regions.
4. Agriculture: Methane and nitrous oxide, two strong greenhouse gases, are released whenever meat, particularly beef, and other animal products are produced.

REPERCUSSIONS OF CLIMATE CHANGE

1. Coastal erosion, floods, and saltwater intrusion into freshwater sources are all consequences of rising sea levels brought on by the melting of glaciers and ice sheets and the expansion of seawater as it warms.

2. Extreme weather events: Heatwaves, droughts, and heavy rainfall events are among the extreme weather events that are becoming more often due to climate change. These occurrences can have catastrophic effects on the environment, infrastructure, and human health.
3. In many areas, alterations in precipitation patterns and elevated evaporation brought on by rising temperatures are causing water scarcity, which can have serious effects on business, agriculture, and public health.
4. As environmental circumstances change due to climate change, biodiversity is declining.

EFFECT ON HUMAN HEALTH

1. Heat-related illnesses: As temperatures rise, more people are becoming ill from heat-related conditions such as heat exhaustion and heat stroke.
2. Respiratory issues: As a result of poor air quality and elevated pollen levels brought on by climate change, respiratory issues like asthma and chronic obstructive pulmonary disease (COPD) are becoming more common.
3. Vector-borne diseases: As a result of altered climatic circumstances that enable disease-carrying insects to flourish, climate change is contributing to an increase in vector-borne diseases, including dengue fever, malaria, and the Zika virus.
4. Mental health: Because of the stress and trauma brought on by extreme weather events and shifting environmental circumstances, climate change is also having a major effect on mental health, including anxiety, depression, and post-traumatic stress disorder (PTSD).

HUMAN HEALTH

In the Face of Climate Change, Human Health A broad and multidimensional notion, human health includes social, mental, and physical well-being. According to the World Health Organization (WHO), health is “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.” Numerous factors impact human health, such as socioeconomic status, lifestyle, environment, and heredity.

Climate Change’s Effect on Human Health With profound effects on people, communities, and society, climate change is a serious danger to human health. According to WHO estimates, climate change will result in an additional 250,000 fatalities annually between 2030 and 2050, primarily from heat stress, diarrhea, malaria, and malnutrition.

BOTH DIRECT AND INDIRECT EFFECT ON HUMANS-

DIRECT IMPACT-

- Heat-Related disorders: Heat exhaustion, heat stroke, and other heat-related disorders can be brought on by warmer temperatures.
- Extreme Weather Events: Natural disasters due to climate change, like hurricanes, floods, and droughts, can result in physical injury, displacement, and psychological distress.
- Air Pollution: By boosting the production of particulate matter and ground-level ozone, climate change can make air pollution worse

INDIRECT IMPACT-

- Vector-Borne Diseases: The distribution and prevalence of disease-carrying insects, such as ticks and mosquitoes, may shift as a result of climate change.
- Waterborne Diseases: Waterborne diseases can spread as a result of contaminated water sources brought on by altered precipitation patterns and increased flooding.
- Food Insecurity: Malnutrition and food insecurity may result from climate change’s effects on agricultural productivity.

POPULATION AT RISK-

The negative health effects of climate change:

- Children: Because of their developing physiologies and increased exposure to environmental risks, children are particularly vulnerable to the health effects of climate change.
- Older persons: Due to age-related losses in physical and cognitive ability, older persons may be more susceptible to the health effects of climate change.
- Low-Income Communities: Because they have less access to clean water, sanitary facilities, and medical treatment, low-income communities may be more susceptible to the negative health effects of climate change.

CLIMATE CHANGE EFFECT ON INFECTIOUS DISEASES

The dynamics of infectious disease transmission are changing due to climate change, which facilitates the spread of existing illnesses and the emergence of new ones. Climate change has a complex effect on infectious diseases, influencing their occurrence, transmission, and distribution.

- Diseases Carried by Vectors- The Zika virus, dengue fever, and malaria are among the vector-borne illnesses that are particularly vulnerable to climate change. The range and abundance of disease-carrying insects, such as ticks and mosquitoes, are changing due to rising temperatures and shifting precipitation patterns.
- Malaria- The location and quantity of the Anopheles mosquito, which spreads malaria, are altered by rising temperatures and shifting precipitation patterns, making malaria one of the most climate-sensitive diseases.
- Dengue Fever Another vector-borne illness that is extremely vulnerable to climate change is dengue fever. The disease-carrying Aedes mosquito's range and abundance are changing due to rising temperatures and shifting precipitation patterns.
- Zika Virus- The disease, which is spread by vectors, has been connected to climate change. The disease-carrying Aedes mosquito's range and abundance are changing due to rising temperatures and shifting precipitation patterns. *
- Waterborne Diseases- Climate change has a significant impact on waterborne illnesses like cholera and typhoid fever. Waterborne infections are spreading as a result of contaminated water sources caused by altered precipitation patterns and increasing floods.
- Cholera- A watery illness that is extremely vulnerable to climate change is cholera. Cholera is spreading as a result of contaminated water supplies brought on by altered precipitation patterns and more frequent floods.
- Fever from Typhoid- Another aquatic illness that is extremely vulnerable to climate change is typhoid fever. Typhoid fever is spreading as a result of contaminated water supplies brought on by altered precipitation patterns and increasing floods.
- Respiratory Conditions- Climate change has a significant impact on respiratory conditions including asthma and chronic obstructive pulmonary disease (COPD). The distribution and abundance of airborne pollutants, including ozone and particulate matter, are changing due to rising temperatures and shifting precipitation patterns.
- Asthma- One respiratory condition that is particularly vulnerable to climate change is asthma. The distribution and abundance of airborne pollutants, including ozone and particulate matter, are changing due to rising temperatures and shifting precipitation patterns.
- COPD, or chronic obstructive pulmonary disease- Another respiratory condition that is particularly vulnerable to climate change is COPD. The distribution and abundance of airborne pollutants, including ozone and particulate matter, are changing due to rising temperatures and shifting precipitation patterns.

IMPACT OF CLIMATE CHANGE ON HEAT STRESS

Extreme heat events are becoming more often due to climate change, which can have catastrophic effects on human health. Particularly for vulnerable groups including the elderly, small children, and those with underlying medical disorders, heat stress is a serious concern.

EFFECT OF HEAT STRESS ON THE BODY

The body cannot adequately cool itself, heat stress results, raising body temperature, such as

1. Dehydration: Sweating excessively can cause dehydration, especially in young children and older individuals.
2. Heat Exhaustion: This condition, which is marked by excessive perspiration, pale complexion, and a fast heartbeat, can result from prolonged exposure to heat.
3. Heat Stroke: When the body temperature surpasses 40°C (104°F), heat stroke, a potentially fatal illness, develops.
4. Cardiovascular Disease: Heat stress exposure can raise the risk of cardiovascular disease, especially in those who already have a medical problem.

POPULATION AT RISK

1. Older persons: Age-related decreases in physical function and heat tolerance make older persons more vulnerable to heat stress.
2. Young Children: Because of their developing physiology and inability to control their body temperature, young children are particularly susceptible to heat stress.
3. Individuals with Pre-Existing Medical Conditions: Individuals who already have a medical condition, such as diabetes, kidney illness, or cardiovascular disease, are more vulnerable to the effects of heat stress.

SOCIAL AND ECONOMIC

1. Lost output: In outdoor industries like agriculture and construction, heat stress can result in decreased output.
2. Increased Healthcare Costs: Heat stress, especially for vulnerable groups, can result in higher healthcare expenses.
3. Social Isolation: People who are elderly or have pre-existing medical issues may experience social isolation as a result of heat stress.

STRATEGIES FOR MITIGATION AND ADAPTATION-

1. Heatwave Early Warning Systems*: By creating heatwave early warning systems, vulnerable populations can be made more aware of the dangers of heat stress.
2. Cooling Centers: During heat waves, the establishment of cooling centers can offer a cool and safe environment for people that are more susceptible.
3. Public Education Campaigns*: These initiatives can help spread knowledge about the dangers of heat stress and encourage actions that can lessen those dangers.

HOW CLIMATE CHANGE AFFECT MENTAL HEALTH-

- Mental health is being significantly impacted by climate change, with far-reaching effects on people, communities, and civilizations. Climate change can have direct, indirect, or cumulative psychological effects on people of all ages, genders, and socioeconomic backgrounds.

DIRECT EFFECT

1. Stress and trauma: Natural disasters like hurricanes, wildfires, and floods can directly result in psychological stress and trauma.
2. Pain and loss: Loss of homes, livelihoods, and loved ones due to climate change can cause pain and bereavement.
3. Anxiety and fear: These emotions might be triggered by the uncertainty and unpredictability of climate change.

INDIRECT EFFECT

1. Displacement and migration: Migration and displacement brought on by climate change may cause cultural disruption and psychological suffering.
2. Economic instability: Depression, anxiety, and financial stress can result from climate-related economic instability.

3. Social isolation: Social isolation can result from climate change, especially for vulnerable groups like the elderly and people with disabilities.

TOTAL EFFECT

1. Chronic stress: Prolonged exposure to stressors associated to the climate can result in chronic stress, which can have long-term effects on one's physical and mental health.
2. Mental health comorbidities: Post-traumatic stress disorder (PTSD), anxiety, and depression are among the mental health issues that climate change may make worse.
3. Community mental health: Growing incidence of mental health issues, social discontent, and community disruption are all consequences of climate change.

POPULATION RISK

1. Children and adolescents: The mental health and general well-being of children and adolescents may be significantly impacted by climate change.
2. Indigenous communities: Disparities in mental health that already exist in indigenous communities may be made worse by climate change.
3. Low-income and marginalized populations: The mental health and general well-being of low-income and marginalized communities may be disproportionately impacted by climate change.

IMPACT OF CLIMATE

Change on Other Health Outcomes_ Beyond the immediate consequences of infectious diseases, heat stress, and mental health, climate change is having a significant impact on human health.

Climate impacted are other health outcomes, such as: _Food Insecurity and Malnutrition:

1. Changes in food availability: Malnutrition and food insecurity are being caused by climate change, which is changing the availability of food, especially in areas that are already at risk.
2. Impacts on agricultural productivity: Crop yields and food security are declining as a result of climate change's effects on agricultural production.
3. Increased risk of micronutrient deficiencies: The risk of micronutrient deficiencies is rising due to climate change, especially for vulnerable groups.

RESPIRATORY CONDITIONS

1. Increased air pollution: As a result of climate change, air pollution is rising, especially in cities, which raises the prevalence of respiratory conditions such as asthma and chronic obstructive pulmonary disease (COPD).
2. Changes in pollen and mold: As a result of climate change, pollen and mold are becoming less abundant and less distributed, which is increasing the prevalence of respiratory allergies and illnesses.

CARDIOVASCULAR CONDITIONS

1. Increased heat stress: The effects of climate change are making people more susceptible to heat stress, which raises the risk of cardiovascular conditions such as heat exhaustion and heat stroke.
2. Changes in air pollution: The distribution and amount of air pollutants are changing due to climate change, which is raising the prevalence of cardiovascular illnesses.

NEUROLOGICAL CONDITIONS

1. Increased risk of neurodegenerative diseases: Especially among susceptible groups, climate change is raising the risk of neurodegenerative diseases like Parkinson's and Alzheimer's.
2. Temperature and precipitation changes: As a result of climate change, the distribution and abundance of temperature and precipitation are changing, which is increasing the prevalence of neurological disorders.

RESULT OF BIRTH

1. Increased risk of low birth weight: Low birth weight is becoming more likely due to climate change, especially for vulnerable groups.
2. Changes in temperature and precipitation: Preterm birth rates and other unfavorable birth outcomes are rising as a result of climate change, which is changing the distribution and abundance of temperature and precipitation.

PARTICULAR POPULATION-

1. Children and adolescents: Children and adolescents' health and well-being are being disproportionately affected by climate change, especially in vulnerable communities.
2. Older adults: The health and well-being of older adults, especially those in vulnerable communities, are being disproportionately affected by climate change.
3. Indigenous populations: The health and well-being of indigenous populations, especially those living in vulnerable communities, are being disproportionately impacted by climate change.

II. CONCLUSION

One urgent global health issue that needs to be addressed right away is climate change. The ramifications of climate change are extensive and catastrophic, and its origins are well known. We must act now to cut greenhouse gas emissions and lessen the negative health effects of climate change. With profound effects on people, communities, and society, climate change is a serious danger to human health. To effectively limit and adapt to these changes, it is imperative to comprehend how climate change affects human health.

REFERENCES

- [1]. Climate Change Intergovernmental Panel (IPCC). 2013's Climate Change: The Foundation of Physical Science. Cambridge University Press, 2013.
- [2]. WHO, the World Health Organization. Calculating the health advantages of mitigating climate change. WHO, 2018.
- [3]. Health and climate change: policy approaches to safeguard public health (Watts N, Adger WN, Agnolucci P, et al. 386(10006):1861-1914; Lancet, 2015; doi: 10.1016/S0140-6736(15)60854-6
- [4]. Patz JA, Holloway T, Campbell-Lendrum D, et al. Regional climate change's effects on human health. 310–317 in Nature, 2005, 438(7066). Doi: 10.1038/nature04188
- [5]. McMichael AJ, Woodruff RE, Hales S. Human health and climate change: current and potential hazards. 367(9513):859-869 in The Lancet, 2006. Doi: 10.1016/S0140-6736(06)68079-3
- [6]. Allen A, Abbas M, Costello A, et al. The Lancet and University College London Institute for Global Health Commission, "Managing the Health Effects of Climate Change." 2009;373(9676):1693-1733; Lancet. 10.1016/S0140-6736(09)60935-1 is the doi
- [7]. Campbell-Lendrum D, Kovats RS, Haines A, et al. Human health and climate change: effects, susceptibility, and adaptation. 2006;367(9528):2101-2109; Lancet. 10.1016/S0140-6736(06)68933-2 is the doi
- [8]. Woodward A, Campbell-Lendrum D, Smith KR, et al. Impacts, susceptibility, and mitigation on human health. In: Palutikof JP, Parry ML, Canziani OF, eds. Impacts, Adaptation, and Vulnerability of Climate Change in 2007. 2007:391-431; Cambridge University Press.
- [9]. Akhtar R, Menne B, Confalonieri U, et al. Human health. In: Palutikof JP, Parry ML, Canziani OF, eds. Impacts, Adaptation, and Vulnerability of Climate Change in 2007. 2007:391-431; Cambridge University Press.
- [10]. Rumkin H, Hess J, Luber G, et al. The public health response to climate change. American Journal of Public Health, 2008, 98(3), 435–445. 10.2105/AJPH.2007.119726 is the doi