



## Editorial

# Climate Change Crisis: Extreme Weather and Its Impact on the Health of Our Society

Climate represents the long-term average of weather conditions including weather determinants like temperature variation, precipitation rates, humidity indices, wind velocity and pressure, and atmospheric pressure variations in a specific area. The World Meteorological Organization (WMO) utilises a 30-year timeframe to assess average climatic conditions<sup>1</sup>. Climate change, characterised by enduring changes in temperatures and atmospheric conditions over an extended period, can occur naturally due to variations in solar activity or significant volcanic eruptions. However, starting in the 19<sup>th</sup> century, human activities became the predominant catalyst for climate change, primarily due to the combustion of fossil fuels such as coal, petroleum, and natural gas<sup>2</sup>, which resulted in anthropogenic emissions of greenhouse gases. This climate change has emerged as the most significant threat to modern human society<sup>3</sup> and natural ecosystems. The natural environment is undergoing numerous unforeseen changes, leading to various hazardous natural disasters such as hurricanes, cyclones, tornadoes, tsunamis, floods, intense precipitation<sup>4</sup>, along with saline intrusion, water scarcity, polar ice melt, cold spells, severe fires, and loss of biodiversity.

Climate change is evidenced yearly by severe extreme weather events, including heat waves, droughts, and heavy rainfall. Climate variability and change affect nearly all societal dimensions, encompassing health, food production, housing, energy, water resources, safety, tourism, finance, and transportation<sup>1</sup>. The ramifications of extreme meteorological events adversely affect human health through fatalities, illnesses, and injuries associated with heat waves, floods, and storms. The health risks associated with climate change include injuries, illnesses, and deaths from extreme events, infectious diseases, and food and water insecurity, with these risks being unevenly distributed and exacerbating existing inequities<sup>5</sup>, the escalation of infectious and water-borne diseases, intensification of noncommunicable diseases, mental health challenges, emergence of new displaced and vulnerable groups, and deterioration of essential health infrastructure<sup>6</sup>.

This editorial explores the multifaceted severe weather events driven by the impacts of climate change, and its adverse effects on human health of our society, emphasizing the urgent need for comprehensive measures to mitigate and adapt to this increasing dilemma.

The mean temperature of the Earth's surface currently stands approximately 1.2°C higher than it was during the late 1800s, prior to the industrial revolution. The average global temperature in 2023 was approximately 1.45°C higher than the average, recorded between 1850 and 1900, attributed to 2023 being the warmest year on record<sup>7</sup>. Bangladesh has also encountered escalating heat waves during the past few years. The year 2024 stands out as the warmest year on record, with mean temperatures ranging from 40 to 42°C across all regions. Reports indicate that a minimum of four individuals have succumbed to heatstroke, while millions have experienced various health complications such as emesis, diarrhoea, heat exhaustion, cephalalgia, pneumonia, dyspnoea, and dehydration, among others. Several educational establishments had to temporarily cease operations owing to the extreme heat<sup>8</sup>. High temperatures adversely impact various populations, notably the elderly, infants, outdoor workers, and individuals with chronic illnesses. Heat-related disorders arise when elevated ambient temperatures surpass the body's heat dissipation capacity<sup>9</sup>. Excessive heat can induce exhaustion and heat stroke while exacerbating pre-existing medical conditions including cardiovascular, respiratory, renal diseases, and mental health disorders<sup>10</sup>. A comprehensive investigation spanning 567 cities in 27 countries over four decades revealed a correlation between extreme temperature exposure- both hot and cold, and heightened mortality risk from various cardiovascular ailments, including ischaemic heart disease, stroke, and heart failure. The findings indicated that days categorized as extremely hot and extremely cold were associated with 2.2 and 9.1 additional deaths per 1000 cardiovascular fatalities, respectively, with heart failure exhibiting the most significant excess death rates of 2.6 for hot days and 12.8 for cold days per 1000 heart failure fatalities<sup>11</sup>.

The ramifications of climate change have also presently encompassed widespread intensification of daily precipitation extremes. In the year 2023, a cumulative of 79 calamities linked to hydro-meteorological hazard

incidents were documented in Asia as per the Emergency Events Database. Among these, over 80% were connected to flooding and storm occurrences, resulting in over 2,000 deaths and impacting nine million individuals directly<sup>12</sup>. Ever since the beginning of the monsoon season of 2024, Bangladesh has encountered the impact of tropical cyclone REMAL-24 and substantial flooding<sup>13</sup>.

Approximately 3.8 million individuals have been affected and a total of 16 fatalities have been documented in the aftermath of the cyclonic event<sup>14</sup>. Since the landfall of cyclone Remal on 26 May, the Haor Region, Jamuna Basin, and Chattogram have experienced severe flooding events. Approximately 18 million individuals have been impacted. The climate crisis is globally induced, yet its human ramifications are distinctly local<sup>15</sup>. In August 2024, Bangladesh experienced nine separate hazardous incidents<sup>16</sup>. Since late August, severe flooding and monsoons have affected nearly 6 million individuals in Bangladesh. The floods have inflicted significant devastation, particularly in Feni, Cumilla, Lakshmipur, Chattogram, and Noakhali districts. The United Nations Children's Fund (UNICEF) reported 71 fatalities. Bangladesh's Directorate of General Health Services indicated that within 24 hours of the flooding onset, 5000 individuals were hospitalized with diarrhoea, skin infections, and snake bites<sup>17</sup>.

Climate change adversely influences environmental health determinants. Consequently, the geographic spread of infectious diseases is anticipated to rise. Specifically, communicable diarrheal diseases and vector-borne diseases like malaria and dengue are foreseen to spread owing to climate change<sup>18</sup>. In the month of August, dengue cases surged in Bangladesh. A total of 47 districts were impacted, with Dhaka recording the most confirmed cases at 3,339 along with 20 fatalities<sup>16</sup>.

Climate change possesses the capacity to influence numerous facets of our lives, including health, agricultural productivity, living standards, safety, and employment. It is anticipated that in the coming years, the frequency of meteorological occurrences will increase. To protect our society from the most severe consequences of extreme climatic phenomena, a comprehensive approach is essential to confront the challenges presented by climate change. Given that the mitigation of climate change represents a protracted and complex endeavour, recent focus has shifted towards the requisite initiatives for adaptation. Although the fundamental tenets governing these initiatives are broadly applicable, preparedness strategies and policies must be tailored to conform to local conditions. Enhanced capacity to manage extreme weather incidents can mitigate the extent of economic, social, and human losses. The susceptibility to extreme weather phenomena, disaster management, and adaptation should be integral components of long-term sustainable development planning<sup>19</sup>. Public health adaptation policy alternatives are essential. These policies ought to incorporate improved early warning and monitoring systems, health system preparedness, educational programs, and enhancements to the living environment.

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