



## Climate Change and its Emerging Impact on Infectious Diseases and Public Health

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With the progressive intensification of the global climate crisis, the associated public health implications are becoming more pronounced and measurable. Among the most concerning effects is the profound influence of climate change on the epidemiology of infectious diseases. Once-considered tropical illnesses are now emerging in temperate zones, and long-standing public health efforts risk being undermined by shifting ecological dynamics [1].

Rising temperatures, altered rainfall patterns, and increased frequency of natural disasters have created favorable environments for vectors like mosquitoes, ticks, and rodents to expand their geographical reach. Diseases such as malaria, dengue, chikungunya, and Zika virus are now appearing in areas where they were previously unknown, placing new populations at risk and challenging local health systems ill-prepared for their management [2]. For example, Europe has witnessed cases of autochthonous dengue, while the United States has seen the re-emergence of West Nile virus and tick-borne illnesses in novel regions [3].

Flooding and poor sanitation, often consequences of extreme weather events, facilitate the spread of waterborne diseases such as cholera, typhoid, and hepatitis A. Coastal and low-lying regions—especially in South Asia and Sub-Saharan Africa—are at heightened risk due to fragile infrastructures and densely populated environments [4].

Another emerging concern is the resurgence of fungal infections, particularly in immunocompromised individuals. Pathogens like *Candida auris*, a multi-drug resistant fungus, are thriving

under warmer global conditions [5]. Moreover, air pollution and heatwaves are compounding respiratory illnesses and contributing to excess mortality, particularly among the elderly, children, and those with pre-existing lung conditions [6].

The intersection of climate change and infectious diseases demands a multidisciplinary approach. Public health strategies must now incorporate climate modeling, environmental monitoring, and improved disease surveillance systems. Clinicians should be trained to recognize changing disease patterns, while governments must prioritize climate resilience in health infrastructure planning. The health sector also bears a responsibility to reduce its own environmental impact, being a significant contributor to greenhouse gas emissions globally. Sustainable healthcare practices, climate-informed health education, and proactive policies are essential to mitigate this looming threat.

Climate change is no longer a distant concern—it is a present-day health emergency. Immediate, collective action is essential to safeguard global health and prevent the undoing of decades of progress in infectious disease control.

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