

Dengue and Chikungunya spread beyond the historical areas of transmission: A rising Public Health Challenge

Sruthi M

Public Health Specialist, Airport Health Organization, International Airport Trivandrum, Kerala

CORRESPONDING AUTHOR

Dr Sruthi M, Public Health Specialist, Airport Health Organization, International Airport Trivandrum, Kerala

Email: drsruithi.madhu@gmail.com

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Dengue fever and chikungunya are viral diseases transmitted by *Aedes* mosquitoes, which have been historically limited to specific regions in the Americas. However, in recent years, these diseases have been spreading beyond their traditional boundaries, affecting new populations and presenting a major public health challenge.

According to the Pan American Health Organization (PAHO), there were over 3.5 million cases of dengue reported in the Americas in 2022, with Brazil, Mexico, Colombia, and Nicaragua being the countries with the highest incidence rates. Furthermore, chikungunya cases have been increasing in the region, with over 190,000 cases reported in 2022, a significant rise compared to the just over 9,000 cases reported in 2019.(1)

The reasons for the expansion of these diseases are multifaceted, and include factors such as climate change, urbanization, globalization and COVID 19 pandemic. The increase in global temperatures and changes in rainfall patterns create new breeding grounds for mosquitoes, while urbanization leads to higher densities of human populations and a greater number of potential hosts for the viruses. Globalization, in turn, has facilitated

the spread of these diseases through increased travel and trade. The COVID-19 pandemic led to interruption of vector control activities leading to a high mosquito density with a large population becoming susceptible to arbovirus infections, particularly in areas where these viruses are newly circulating. Also, the competing disease priorities, overwhelmed healthcare facilities and decreased availability of resources due to the pandemic have adversely affected disease control and proper clinical management of these diseases (2)

The emergence of dengue and chikungunya in new areas presents significant challenges for public health officials especially in a current world of increased international travels. These diseases can cause severe illness, including haemorrhagic fever in the case of dengue, and joint pain and arthritis in the case of chikungunya, with children and the elderly being particularly vulnerable (3). Moreover, there is currently no specific treatment for either disease, and vaccines are still in developmental phase.

To address this challenge, countries need to strengthen their surveillance and response systems for dengue and chikungunya. This includes improving diagnostic capabilities,

enhancing mosquito control measures, and increasing public awareness of the diseases and preventive measures (4). Furthermore, it is crucial to continue research into the transmission dynamics of dengue and chikungunya, particularly in non-traditional areas, to develop more effective strategies for control and prevention.

One area of research that holds promise is the use of genetically modified mosquitoes to control the transmission of dengue and chikungunya. Trials of these mosquitoes have shown positive results, with significant reductions in mosquito populations and dengue transmission in some areas. However, there are still concerns regarding the environmental impact and public acceptance of this strategy.

In conclusion, the expansion of dengue and chikungunya beyond their historical transmission areas in the Americas presents a significant public health challenge. To effectively address this challenge, countries must improve their surveillance and response systems: especially at the point of entries like the airport, seaport and land border crossings. Also increase public awareness of the diseases, and continue research into transmission dynamics and control strategies.

DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this work, I Dr Sruthi M, the author, used Grammarly (AI Tool) in order to check the mistakes in grammar, spelling, punctuation and also to style better sentence formation. After using this tool/service, I have reviewed and edited the content as needed and take full responsibility for the content of the publication.

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