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Editorial

The Dengue Outbreak of 2023: A Wake-Up Call for Healthcare Professionals and Policymakers for Effective Prevention and Control Strategies

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Dengue fever, caused by the dengue virus transmitted by Aedes mosquitoes, continues to pose a significant health threat in many regions worldwide. In recent years, the global burden of this arboviral disease has escalated dramatically, culminating in a devastating outbreak in 2023. This editorial aims to highlight the key implications of the 2023 dengue outbreak, discuss the challenges faced in its prevention and control, and propose potential strategies for mitigating future outbreaks.

In Bangladesh and other Southeast Asian countries, all four DENV serotypes (DENV 1-4) circulate, contributing to the global rise in DENV infections[1]. The WHO Southeast Asia and Western Pacific regions bear nearly 75% of the global disease burden. The emergence of DENV-4 poses a substantial public health threat to Bangladesh, especially regarding secondary infections. The magnitude of dengue infections, estimated at 50 million annually, is alarming, with over 2.5 billion people living in endemic countries[2]. In 2023, DENV-2 became a predominant serotype (51%) along with DENV-3 (44%)[3].

The factors contributing to the upsurge in dengue cases are multifaceted, including climate change, urbanization, and global travel. Rising temperatures and increased rainfall have created favorable conditions for the Aedes aegypti mosquito, the primary vector for dengue virus transmission, to thrive and spread the disease. Urbanization has led to overcrowding, inadequate sanitation, and water storage practices that promote mosquito breeding, while global travel has facilitated the international spread of the virus.

The 2023 dengue outbreak marks a significant escalation of the disease's incidence and severity in comparison to previous years. This alarming upsurge presents a clear challenge to public health authorities and researchers worldwide. Dengue has gained prominence as a global public health concern due to its ability to rapidly spread in urban settings, surpassing malaria and becoming the most prevalent arboviral disease.

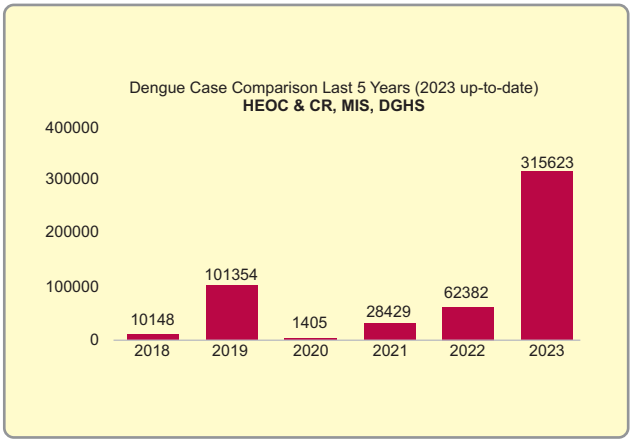

Figure-1: *Dengue case comparison of last 5-years in Bangladesh[4].*

Globally, 400 million are infected yearly, causing 100 million illnesses and 40,000 severe dengue deaths[5]. As of December 6th, Bangladesh reports 315,623 cases with a 0.5% fatality rate[4].

Analyses of data from inpatient records and geographic coordinates of residence locations between 1 January and 17 August 2023 highlight an important finding - approximately half of the cases (n=52,656) were recorded

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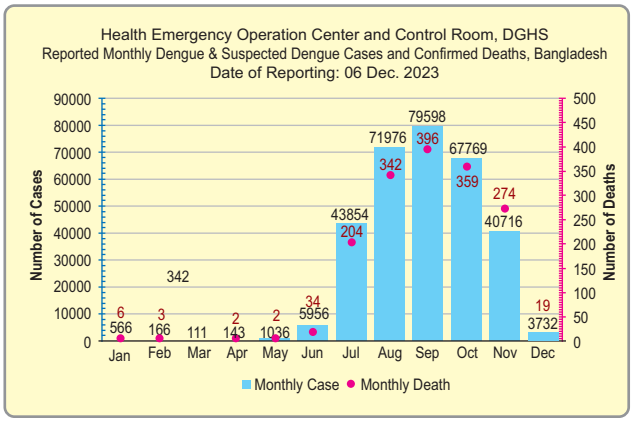

Figure-2: *Reported monthly dengue data-2023, Bangladesh*[4].

in the capital city Dhaka, and 86% of them were located within a 2-km radius of 77 hospitals included in the dengue surveillance system, raising a concern about the high density of DENV patients in the proximity of the hospitals[6].

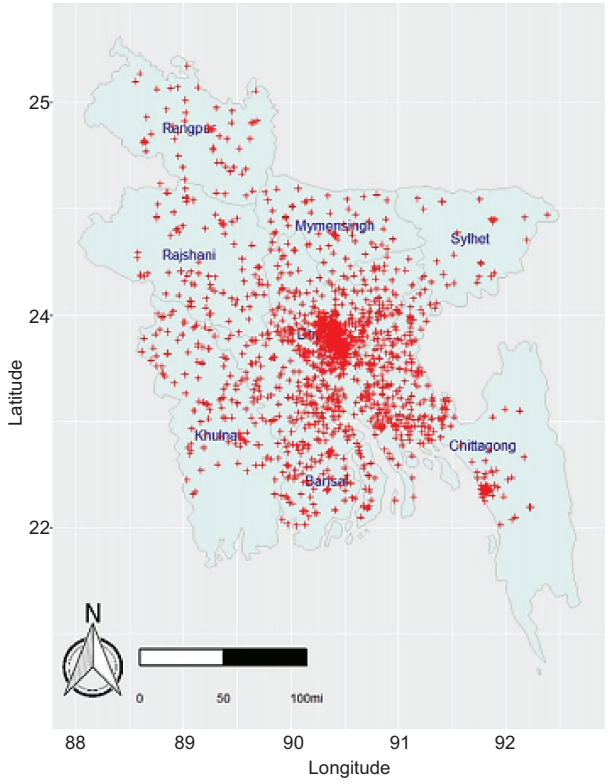

Figure-3: *Geographical distribution of dengue cases in Bangladesh: 1 January – 17 August 2023*[6].

The dire consequences of the dengue outbreak include overwhelmed healthcare systems, high mortality, and economic burdens. In Bangladesh, specialized health care management is centralized in the country's capital city Dhaka. Current data shows that more than 44% of the patients admitted to hospitals in Dhaka had traveled from outside Dhaka city[7,8]. All the hospitals were overwhelmed with patients of Dengue. There was an acute shortage of electrolytes/ saline in the hospitals and pharmacies in Dhaka[7]. All these factors could have contributed to sub-optimal management and increased mortality of severe dengue patients.

In the light of current situation, policymakers must prioritize dengue control. This involves comprehensive mosquito control, increased public awareness, and investment in vaccine research. Collaborative efforts among government agencies, healthcare organizations, and communities are crucial to address the complex challenges of the 2023 outbreak and prevent fatalities. Here are some steps that could be taken:

1. Public Awareness Campaigns: Launch an extensive public awareness campaign to educate the population about dengue, its symptoms, and preventive measures. This can be done through TV, radio, and social media platforms.
2. Vector Management: WHO advocates enhancing Integrated Vector Management (IVM) to eliminate breeding sites, diminish vector populations, and reduce individual exposure[9]. Strategies encompass source reduction, weekly maintenance of water storage, larvicide use, and distributing insecticide-treated nets to fever/dengue inpatients. Indoor space spraying is suggested for rapid containment, while the Wolbachia-mediated mosquito control program, successful in Brazil, Indonesia, Viet Nam, and Australia, demonstrated a significant reduction in dengue cases by over 69% in intervention sites[10]. Earlier studies showed that mosquito control intervention in Bangladesh should start in April[11].
3. Insecticide Application: Apply insecticides to control mosquito populations in high-risk areas. This can be done by local health authorities and relevant agencies.
4. Use of Protective Measures: Encourage individuals to protect themselves from mosquito bites by wearing long sleeves, using mosquito repellents, and using bed nets during sleep, especially in high-risk areas.
5. Community Engagement: Promote community involvement by encouraging residents to actively participate in identifying and reporting potential breeding sites, as well as supporting local authorities in implementing preventive measures.
6. Decentralizing Healthcare System: As like any other health-care systems in Southeast Asian countries, Bangladesh has a high dependency on the capital or larger cities. Decentralizing healthcare facilities with proactive community education and full engagement is the key to optimizing outbreak management and this

should be a mandatory long-term objective for the Bangladesh government. Also should strengthen the healthcare system by expanding medical facilities, training healthcare professionals, and ensuring adequate supplies of quality dengue test kits and equipment.

7. Timely Diagnosis and Treatment: Develop a system for early diagnosis of dengue cases and prompt treatment to prevent severe complications. This includes training healthcare professionals on recognizing dengue symptoms and providing appropriate care.

8. Research and Innovation: The Dengue vaccine, Dengavaxia, is available now but requires further evaluation in field research and trials to determine its effectiveness in preventing DENV transmission and reducing dengue-related morbidity and mortality. Experimental use of the TV-005 (Tetravelent) vaccine in Bangladesh has shown efficacy against all four types of dengue virus (Den-1, Den-2, Den-3, and Den-4), suggesting that a single dose can provide protection against dengue[12].

9. Surveillance: Establish an effective surveillance system to monitor the spread and intensity of the outbreak, allowing for timely intervention strategies and resource allocation. Enhanced surveillance is crucial for accurate tracking of the cases.

10. Collaboration and International Support: Foster collaboration among local and international health organizations, as well as governments, to leverage expertise, resources, and funding to tackle the outbreak effectively.

It is important to tailor strategies to outbreak specifics. Local authorities must adapt measures based on location and severity. As we observe the complexities of the dengue outbreak in 2023, we must unite in our efforts from all stakeholders, as well as a commitment to ongoing research and innovation for proactive and sustainable solutions that address the root causes of the problem.

In conclusion, the 2023 dengue outbreak serves as a momentous reminder of the persistent threat posed by this arboviral disease. While significant progress has been made in dengue prevention and control, the outbreak highlights the need for continued research and innovation. To mitigate future outbreaks, concerted efforts are required, involving interdisciplinary collaborations and comprehensive approaches that include vaccination, vector control, community engagement, and cross-sectoral partnerships. By adopting a holistic approach, we can ultimately work towards reducing the global burden of dengue and safeguarding public health.

Conflicts of Interest

The author has no conflict of interest to declare.

Acknowledgments

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References:

1. Marchiori E, Hochhegger B, Zanetti G. Pulmonary manifestations of dengue. Jornal Brasileiro de Pneumologia. 2020 Mar 2;46:e20190246. https://doi.org/10.1590/1806-3713/e20190246

2. Islam QT. Changing epidemiological and clinical pattern of dengue in Bangladesh 2018. JOM. 2019;20(1). DOI: http://dx.doi.org/10.3329/jom.v20i1.38812

3. World Health Organization Dengue – Bangladesh 11 August 2023. Geneva: WHO; 2023 https://www.who.int/emergencies/disease-outbreak-news/item/2023-DON481#

4. Ministry of Health and Family Welfare (Management Information System). Daily Press release on dengue outbreak. Dhaka: DGHS; 2023 https://old.dghs.gov.bd/index.php/bd/home/5200-daily-dengue-status-report

5. http://www.cdc.gov/ncezid/dvbd/index.html-19-January-2023

6. Bangladesh's 2023 Dengue outbreak – age/gender-related disparity in morbidity and mortality and geographic variability of epidemic burdens. https://www.researchgate.net/journal/International-Journal-of-Infectious-Diseases DOI: 10.1016/j.ijid.2023.08.026

7. Sujan Moudud Ahmmed. Dengue Outbreak: Saline disappearing from store shelves in Dhaka. The Daily Star 2023 Aug 8:1.

8. Islam, Q. T., Tasnim, R., Sagar, H. B., Noor, N., Ahmed, A., & Hasan, T. (2023). The Alarming Resurgence of Dengue Fever with Unusual Clinical Manifestations and Deadly Consequences of 2023 Outbreak in Bangladesh. *Journal of Bangladesh College of Physicians and Surgeons*, *41*(40), 12–20. https://doi.org/10.3329/jbcps.v41i40.69677

9. Centers for Disease Control and Prevention Surveillance and Control of Aedes aegypti and Aedes albopictus in the United States. Atlanta: CDC; 2022 www.cdc.gov/chikungunya/resources/vector-control.html

10. World Mosquito Program Our Wolbachia method. Melbourne: Monash Australia; 2023 https://www.worldmosquitoprogram.org/en/work/wolbachia-method

11. Haider N, Chang YM, Rahman M, Zumla A, Kock RA. Dengue outbreaks in Bangladesh: Historic epidemic patterns suggest earlier mosquito control intervention in the transmission season could reduce the monthly growth factor and extent of epidemics.

12. https://www.who.int/news-room/questions-and-answers/item/dengue-vaccines