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Editorial

Emergence of Arboviral Diseases: A Step Forward in Global Preparedness

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The term arbovirus (arthropod-borne virus) refers to several virus families transmitted by arthropod vectors, mainly mosquitoes, ticks, and sand flies. Arthropod-borne viruses (arboviruses) like dengue, chikungunya, yellow fever, and Zika are spread primarily by Aedes (Stegomyia) mosquitoes, representing a significant public health concern worldwide. Although Aedes aegypti and Aedes albopictus mosquitoes are more common in tropical and subtropical regions than in temperate areas, their geographic range is expanding.[1] Their RNA genome allows them to rapidly adapt to changing hosts and environmental conditions. As a result, these virus families greatly contribute to the recent increase in the geographic spread of emerging viruses such as West Nile virus, dengue virus, and chikungunya virus. Dengue alone caused 14.2 million cases in 2024, with over 10,000 deaths. In Bangladesh, as of August 19th, 2025, there have been 27,115 dengue cases and 105 deaths.[2] Chikungunya first appeared in Bangladesh in 2008, leaving behind a trail of significant outbreaks in subsequent years. The 2017 outbreak, with more than two million suspected cases, served as a stark reminder of the country's vulnerability to mosquito-borne diseases. Yet, lessons from that epidemic seem short-lived. In 2024, chikungunya reemerged—this time alongside dengue and Zika virus transmission. PCR testing confirmed infection in 55 patients between September and November in one study, while the Bangladesh Institute of Epidemiology documented 67 additional cases. Although these numbers are modest compared to 2017, they highlight a disturbing trend: chikungunya continues to circulate silently, often overshadowed by dengue, but remains equally threatening to public health.[3]

Although dengue presents a significant public health challenge, an underrecognized yet growing epidemic of chikungunya is unfolding in Bangladesh. It isn't officially tracked, leading to low visibility among the public and policymakers, and many cases go uncounted due to limited diagnostic testing. While not typically fatal, the disease's debilitating effects cause long-term suffering physically and financially for patients. Dengue is characterized by sudden high fever, body aches, retro-orbital headache, and hematological changes (thrombocytopenia, rising hematocrit, leukopenia) and myalgia; chikungunya by intense joint pain; and Zika by itching, with overlapping symptoms like rash, muscle aches, and conjunctivitis. Laboratory confirmation is essential because of symptom overlap.

For non-severe cases, oral hydration protocols are emphasized, while crystalloids are preferred for severe disease to ensure proper volume resuscitation. Severe dengue can be fatal, especially in reinfections and in patients with uncontrolled co-morbidities, including extreme age groups. These patients require hospital care for careful fluid management and to address complications of infection.[4] After the critical phase, patients typically enter recovery with reabsorption of extravascular fluid. Most recover within 1–2 weeks. Although less common, severe chikungunya can also be fatal, particularly among individuals with underlying conditions, the elderly, and neonates infected around delivery time due to maternal viremia or shortly after through infected mosquito bites. Serious complications involving the heart, nervous system, and multiple organs may develop, often requiring intensive medical care.[5] In cases of non-severe arboviral disease, pain relief usually involves paracetamol or metamizole, with strict avoidance of NSAIDs, especially in dengue. This does not apply in confirmed chikungunya and Zika cases, where NSAIDs might be used for joint pain and inflammation. WHO guidelines advise against routine corticosteroid use in non-severe or severe arboviral cases, prophylactic platelet transfusions without active bleeding, and immunoglobulins, focusing instead on supportive care based on evidence. Close monitoring by using capillary refill time, lactate levels, and passive leg raise tests is recommended to guide fluid therapy and prevent complications. For yellow fever, N-acetylcysteine may be used in cases of liver failure. Meanwhile, targeted treatments like the monoclonal antibody TY014 and the antiviral sofosbuvir are still under investigation, highlighting the ongoing need for innovative therapies.[1]

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The recent surge of arboviral diseases makes a wake-up call for taking significant steps forward in harmonizing clinical management across diverse health systems. Beyond the care of individual patients, we should develop a **strategic framework to strengthen outbreak preparedness and reduce health system strain**. By standardizing protocols across all levels of care, they encourage safe, community-based management of non-severe cases, thereby reducing unnecessary hospital admissions during epidemics. This system-wide approach is particularly valuable in **resource-limited settings**, where laboratory confirmation may be unavailable, and clinical judgment remains the cornerstone of decision-making.

Yet, the arboviral management plan also highlights the persistent **gaps in research and policy**. Much of the existing evidence base is derived from dengue studies, while chikungunya, Zika, and yellow fever remain comparatively neglected. Closing these gaps will require investment in **high-quality clinical trials for non-dengue arboviruses**, wider access to affordable diagnostics, and long-term evaluation of novel antivirals and monoclonal antibody therapies. Without such evidence, the promise of standardized care cannot be fully realized.

At the same time, challenges extend beyond clinical management. Too often, **infectious disease treatment remains empirical rather than evidence-based,** a trend incompatible with the principles of modern medicine. The COVID-19 pandemic revealed both strengths and missed opportunities: while critical care capacity expanded, these gains were not sustained or adapted to other infectious threats. Preventive measures, such as **adult vaccination programs** (influenza, pneumococcal, herpes zoster), remain underutilized despite clear indications. Similarly, well-established practices in **infection prevention and control (IPC),** including integrated vector control, planned urbanization, facilities for diagnostic purposes, and appropriate initiatives for climate adaptation**,** must be implemented accordingly to solve this problem. The recent trend is showing more cases of dengue in rural areas, demonstrating a lack of public awareness in these areas. Social and electronic media campaigns should act promptly to solve this shortcoming.

This shortfall is also reflected in medical education. Despite the abundance of specialized programs in medicine**, infectious diseases receive inadequate emphasis** in both undergraduate and postgraduate curricula, a serious concern for countries burdened by diverse and recurrent outbreaks.

So, a successful arboviral control initiative will depend on **local adaptation, workforce training, and sustained research investment**. As climate change, urbanization, and global travel continues to accelerate the spread of arboviral threats, standardized, evidence-based frameworks are indispensable. Strengthening clinical management must go hand-in-hand with **robust prevention strategies, IPC enforcement, and educational reform**, ensuring that health systems are not only reactive but proactively prepared for the evolving landscape of infectious diseases.

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