

The recent outbreak of dengue in Bangladesh is a public and global threat to the international communities; what should we do to mitigate it?

Malik Olatunde Oduoye, MBBS^{a,b,c}, Aymar Akilimali, MD^{a,*}, Nathan Mugenyi, MD^d, Rodrigue Fikiri Baururhe, MD^a, Ahasanul Hoqu, MD^e, Abubakar Nazir, MBBS^{c,f}, Mayowa Odunayo Kareem, MBBS^g, Jospin Bisimwa, MD^{a,h}, Christian Ahadi Irengé, PharmD, MScⁱ, Martin Sagide, BSc, MLS^j, Fabrice Kibukila, MD^a, Fabien Balagizi, MD^{a,h}, Olivier Nyakio, MD, MSc, PhD^a

Dengue fever, formerly known as tropical influenza or red fever, is a viral infection transmitted to humans by the bite of infected mosquitoes of the species *Aedes aegypti*^[1]. This mosquito-borne illness is widely spread in tropical regions including Bangladesh over the years, making it a public and global health concern that requires urgent attention for all^[2]. The rapid global spread of dengue has been shown to be associated with increased human mobility through travel by air^[3]. More than 70% of the global dengue burden falls in Southeast Asia and the Western Pacific region^[4]. The incidence of overall global dengue virus infection has also increased rapidly in the last 20 years; 505,430 cases were reported in the year 2000, whereas over 2,400,138 and 3,312,040 cases have been reported in the year 2010 and 2015, respectively^[5]. Sadly, another outbreak of dengue fever was reported in Bangladesh in the year 2022, which we believed it is a public and global threat to the international communities that needs an urgent attention. This current study thus aimed to identify these threats and proffer possible solutions to mitigate them.

^aFaculty of Human Medicine, Department of Research, Medical Research Circle (MedReC), Bukavu, DR Congo, ^bDepartment of Human Medicine, College of Medical Sciences, Ahmadu Bello University Teaching Hospital, Shika, Kaduna State, Nigeria, ^cDepartment of Research and Education, Ohi Health Magazine Organization (OHMO), Kigali, Rwanda, ^dFaculty of Medicine, Mbarara University of Sciences and Technology, Mbarara, Uganda, ^eDepartment of Medicine and Surgery, Chattogram Veterinary and Animal Sciences University, Chattogram, Bangladesh, ^fDepartment of Medicine, King Edward Medical University, Lahore, Pakistan, ^gDepartment of Family Medicine, Babcock University Teaching Hospital, Ilshishan-Remo, Ogun State, Nigeria, ^hEvangelic University in Africa, Bukavu, DR Congo, ⁱOfficial University of Bukavu, Bukavu, DR Congo and ^jDepartment of Jewish Pathology Laboratory, Nairobi, Kenya

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*Corresponding author. Department of Research, Medical Research Circle (MedReC), Bukavu, DR Congo Bagira-Kagera rue 16, 570 Bukavu, South Kivu, DR Congo. Tel.: +243825177370. E-mail address: aymarakilimali@gmail.com (A. Akilimali).

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Dengue patients present with symptoms such as fever, headache, joint and muscle pains, and a rash. In severe cases, it can lead to bleeding, shock, and even death. Although there is no specific treatment for dengue fever, the symptoms can be managed with rest, fluid, and pain relievers. This has made dengue fever a threat to health systems in low-resource settings, hence, a need to address it. In addition, dengue fever is a highly contagious disease. The *Aedes aegypti* mosquito that transmits the virus is found in urban and suburban areas, and it breeds in stagnant water, such as in old tyres, flower pots, and even puddles. This implies that the virus can easily spread from person to person, especially in densely populated areas. If an outbreak is not contained, it could potentially affect a large portion of the community.

Dengue fever can have significant economic consequences. Those infected may need to take time off work and any other economic activities, resulting in a loss of productivity and reduced income. The costs of treating the illness can be substantial, especially for low-income earners. This can place a significant burden on families and the community as a whole. Dengue was first recorded in the year 1964 in Bangladesh in East Pakistan where it was known as Dhaka fever^[6,7]. The first official dengue outbreak in Bangladesh was revealed in the year 2000, with 5551 cases and 93 deaths reported^[8]. Since then, outbreaks of dengue fever had occurred in Bangladesh, especially in the year 2018, 2019, 2020, and 2021 with huge prevalent rates. Sadly, in the year 2022, another increasing trend of dengue outbreaks was noted in many parts of the world, including Bangladesh.

The recent outbreak of dengue in Bangladesh started on January 1, 2022. Since the onset of the outbreak on November 20, 2022, a total of 52,807 laboratory-confirmed dengue cases in the country including 230 deaths (resulting in a case fatality rate = 0.44%) were reported by the Ministry of Health and Family Welfare in Bangladesh. On November 23, 2022, a total of 3,643,763 dengue cases and 3380 dengue-related deaths were reported worldwide. On December 10, 2022, a total of 60,078 dengue cases and 266 dengue-related deaths were reported in Bangladesh. In the year 2022, the case fatality rate was high whereas the number of annual cases was the second highest since 2000, the highest having occurred in 2019, where 101,354 cases including 164 deaths were reported^[9].

Despite the strategies devised for the prevention and control of dengue fever, there is always a gap left in the form of challenges and limitations for the perfect implementation of such strategies.

One of the challenges in preventing dengue fever in Bangladesh is poor awareness and education about the disease and the lack of effective public health interventions such as mosquito control and vaccination campaigns. In addition, vaccination campaigns have been hampered by logistical challenges, such as poor funding and resources, and complicated immunopathology of dengue has also perplexed the development of vaccines^[10].

Currently, the climatic conditions of the country are more favorable to the transmission of dengue and other vector-borne diseases, due to excessive rainfall and flooding^[2]. Symptoms of dengue range from subclinical (patients do not feel infected by the disease) to severe flu-like symptoms^[3]. Dengue should be suspected when a high fever (40°C) and dengue symptoms (severe headache, abdominal pain, muscle and joint pain, persistent nausea and vomiting, a rash bleeding from the gums or nose, rapid breathing, hepatomegaly, and blood in vomit or stool) usually last 2–7 days and appear after an incubation period of 4–10 days after the bite of an infected mosquito. Currently, there is no specific treatment for dengue and early detection of signs of progression to severe dengue and access to appropriate medical care can reduce the mortality rate of severe dengue^[4].

Dengue is endemic, but a resurgence of cases has been observed since June 2022. This very high incidence of dengue cases during this year is in the context of a lot of rainfall since June 2022, accompanied by high temperatures and humidity that have led to an increase in mosquitoes throughout Bangladesh^[2]. The impact of dengue on human health and the economy in Bangladesh is of great concern. In the year 2019, the highest occurrence of dengue cases in Bangladesh was observed in Dhaka Division, followed by the Khulna, Chattogram, Barishal, Rajshahi, Mymensingh, Rangpur, and Sylhet divisions^[11]. While in the year 2022, the highest occurrence of dengue cases was again observed in the Dhaka Division, followed by Chattogram, Khulna, Barishal, Rajshahi, Mymensingh, Rangpur, and Sylhet, suggesting that Dhaka Division—in particular, Dhaka City—was the focal point for dengue outbreak in Bangladesh. The number of dengue-related deaths in Bangladesh has thus increased in 2022 compared with those in 2019^[11].

The dengue virus is often carried from one place to another by infected travelers. The combined impact of the coronavirus disease and dengue epidemics is likely to have more devastating consequences for the Bangladesh populations at risk. The government of Bangladesh needs to maintain efforts to prevent, detect, and treat vector-borne diseases, such as dengue, during this pandemic. Hence, to prevent and control this present scourge of dengue fever and future outbreaks in Bangladesh, it is essential to implement effective vector control measures by preventing mosquito breeding, eliminating breeding sites, and controlling larval and adult mosquitoes with various insecticides.

This could be achievable through the One Health approach concept, which is, preventing mosquito breeding, eliminating breeding sites, and controlling larval and adult mosquitoes with various insecticides by veterinary doctors, agriculturists, and social workers, including high index of suspicion and adequate treatment by the physicians, well-prescribed medications by the pharmacists and proper nursing care by the nurses, etc, as well as full community participation and strengthening of mass community awareness campaigns among the Bangladesh community members. The use of the tetravalent dengue vaccine has also been effective^[12]. We, therefore, urge the government of Bangladesh to step up through mutual and bilateral collaborations and

partnerships with the World Health Organization, vaccine organizations, and other international bodies in the provision of this tetravalent dengue vaccine in Bangladesh, which should be compulsory and made free and available for the Bangladesh population as well as the foreigners traveling to Bangladesh.

Lastly, there is a need for the World Health Organization and other international bodies to increase funding and resources for dengue fever prevention and treatment in Bangladesh. This could involve partnerships with international organizations and donors, as well as greater investment from the Bangladeshi government in public and global health infrastructure and research^[13]. In conclusion, dengue fever in the world, particularly in Bangladesh, is a global health concern that requires attention. Action must be taken to alleviate the spread of the virus and protect the international communities from this potentially deadly illness.

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Malik Olatunde Oduoye; College of Medical Sciences, Ahmadu Bello University Teaching Hospital, Shika, Kaduna State, Nigeria; malikolatunde36@gmail.com (<https://orcid.org/0000-0001-9635-9891>).

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