

Dengue: A Growing Health Problem in Bangladesh

Syed Abu Hasnath

PhD, is a faculty member (retired) at Boston University, Massachusetts, USA

Corresponding author

Syed Abu Hasnath, PhD, is a faculty member (retired) at Boston University, Massachusetts, USA.

Received: May 17, 2026; Accepted: May 22, 2026; Published: June 04, 2026

ABSTRACT

Dengue fever, a mosquito-borne viral disease transmitted by Aedes mosquitoes, has emerged as a major public health concern in Bangladesh over the past decade (2015–2025). This article examines dengue epidemiology, focusing on infection trends and the principal drivers of its spread, including rapid urbanisation, high population density, poor environmental management, and climate change. The disease is particularly severe in the metropolitan cities of Dhaka and Chattogram, where residents have repeatedly urged authorities to adopt stronger preventive measures. The discussion also addresses the clinical management of dengue and the financial burden of treatment. The article concludes by emphasising the need for sustainable urban planning, environmental management, and effective mosquito-control programmes to reduce dengue transmission and improve public health outcomes.

Keywords: Bangladesh, Chattogram, Dengue, Dhaka, Environment, Urbanisation.

Introduction

By the end of 2024, dengue had been present in Bangladesh for approximately six decades, since its first identification in 1964. Despite advances in public health, the disease continues to affect thousands of people each year. Dengue is an infectious viral disease transmitted to humans by the bite of infected Aedes mosquitoes. In the epidemiological literature, it is classified as a vector-borne disease, alongside malaria, yellow fever, and Zika virus infection.

Dengue has become a major endemic and public health challenge across Africa, Latin America, and developing regions of Asia, including Bangladesh. In Bangladesh, outbreaks occur primarily during the monsoon and post-monsoon seasons, although occasional cases are also reported in winter. In recent years, both the incidence and severity of dengue have risen significantly, particularly in Dhaka and Chattogram, the country's two largest metropolitan areas. Hospital admission rates in these cities reached 37,715 and 10,872, respectively, underscoring the growing pressure on the healthcare system and the need for effective disease management, patient care, and research-based interventions.

This article first examines temporal trends and the geographical

distribution of dengue in Bangladesh. It then analyses the environmental and demographic drivers of transmission, including urbanisation, population density, and climate change. The article also reviews the clinical characteristics of dengue and the economic burden of treatment. Finally, it discusses public engagement and policy responses and offers recommendations for sustainable dengue control and improved public healthcare delivery.

Temporal Trends in Dengue Incidence

Statistics on dengue infections, hospital admissions, and deaths from 2018 to 2025 show significant fluctuations in disease incidence and mortality.

Table 1: Dengue Statistics in Bangladesh [1]

Year	Cases	Deaths	Cases-Fatality Ratio
2018	10,148	28	0.27
2019	101,354	164	0.16
2021	28,429	105	0.37
2022	62,382	281	0.45
2023	321,179	1,705	0.53
2024	101,224	577	0.57
2025	102,552	412	0.40

Sources: <https://www.who.int/emergencies/disease-outbreak-news/item/2023-DON481>

The data indicate that Bangladesh has experienced repeated large-scale dengue outbreaks, with more than 100,000 reported cases annually in several recent years. The sharp decline in cases in 2020 and 2021 is widely attributed to COVID-19-related restrictions and underreporting during the pandemic.

Although annual mortality figures fluctuated, the overall case fatality ratio rose over time, indicating increasing disease severity and pressure on healthcare services. The unprecedented 2023 outbreak marked the deadliest dengue epidemic in Bangladesh's history, with more than 321,000 reported infections and 1,705 deaths.

These trends demonstrate that dengue is no longer a seasonal nuisance but a major and potentially fatal public health threat requiring sustained institutional attention.

Geography of the Disease

This section is based on data collected by the U.S. Agency for International Development (USAID) in 2024. We have also cross-checked the data against records maintained by the Ministry of Health and Family Welfare. We have also closely reviewed six selected articles and two newspaper clippings closely relevant to our investigation (see References). A summary of the results is given below.

Table 2: Number of Patients Admitted, Number of Deaths, and Case Fatality Ratio [2]

Division	Patients Admitted	Deaths	Case Fatality Ratio
Barisal	5,734	40	0.7
Chittagong	10,872	68	0.62
Dhaka	37,715	205	0.54
Khulna	5,344	19	0.36
Mymensingh	1,729	5	0.3
Rajshahi	1,838	2	0.1
Rangpur	952	2	0.21
Sylhet	1,792	1	0.05

<https://docs.google.com/spreadsheets/d/1hmR1IkFPOJyZqp6pomuUeaLNlR3bHmM/edit?pli=1&gid=303129655#gid=303129655>

The above table shows that the number of dengue patients admitted to hospitals is disproportionately high in Dhaka, followed by Chittagong.

Dhaka is the capital and largest city of Bangladesh. It is the economic heartbeat, the prime center of education and cultural fusion, and a transportation hub, with an area of 140 sq. miles and a population of 105,000 per sq. mile, making it one of the most densely populated cities in the world.

One-third of its population lives in slums and dilapidated accommodation in unsanitary conditions, which are favourite breeding grounds for mosquitoes. Moreover, there are hundreds of large, medium, and small areas of stagnant water, which are essential for mosquito breeding as females lay eggs in stagnant water that hatch into larvae within days. The percentage of

people in Dhaka living below the poverty line is 20-25%, and many cannot afford mosquito nets. There is hardly enough space to put a mosquito net. However, even high-class residential areas where houses are covered by fine metal mesh cannot keep mosquitoes out. Mosquitoes are a menace in Dhaka.

Chittagong is the country's second-largest city and its main commercial capital, with a seaport handling 90% of the nation's import-export trade. It is a maritime gateway on the Bay of Bengal and an important regional hub, offering transit for India, Nepal, and Bhutan. The city-region hosts major industries, including manufacturing, chemical production, and engineering. Its built-up area is growing rapidly, and chaotic land use and high population density leave open space in short supply. In 2024, seven major, primarily mixed-use areas of the city—traditional commercial hubs—were declared “red zones” due to a surge in dengue cases. These areas are also characterised as mosquito-density zones. Another important town in the division is Cox's Bazar, located within a few miles of the world's largest refugee camp (population 1.2 million). This huge, sprawling slum settlement has a high incidence of dengue, further increasing the Chittagong division's overall incidence.

Khulna is the country's third-largest city and industrial center and is home to the Sundarbans mangrove forest. It is also home to Mongla Port, the country's second-largest seaport, and a vital economic hub in the country's southwest. Yet the incidence of dengue was lower than in Dhaka and Chittagong. Two key reasons for the lower incidence are low population density and, more importantly, rising salinity in Khulna, driven by its proximity to the Bay of Bengal. The increase in salt concentration in soil and water, directly caused by climate change, is harmful to mosquito larvae, acting as a deterrent to breeding.

The incidence of dengue in Mymensingh, Rajshahi, and Sylhet is lower, attributable to shared environmental factors such as low levels of urbanisation and modest population density. Two outlier divisions are Barisal, with a high incidence (5,734), and Sylhet, with a low incidence (952). The high incidence in Barisal is attributed to heavy rainfall, high humidity, and poor sanitation, which create ideal breeding grounds for *Aedes* mosquitoes. The low incidence of dengue in the Rangpur division is primarily due to low population density, lower urbanisation, and lower temperatures, which limit mosquito breeding sites and reduce conditions conducive to rapid *Aedes* reproduction.

Epidemiology and Treatment

Dengue infection typically progresses through three phases:

Febrile Phase (2–5 days)

Common symptoms include:

- High fever
- Headache
- Eye redness
- Muscle and joint pain
- Nausea and vomiting
- Loss of appetite

Critical Phase (3–7 days after onset)

Symptoms may include:

- Gum bleeding

- Fatigue
- Blood in urine or stool
- Gastrointestinal bleeding
- Blood pressure fluctuations

Recovery Phase (1–3 days)

Symptoms gradually improve, including:

- Reduction of fever
- Stabilisation of blood pressure
- Healing of skin rashes

In Bangladesh, common symptoms include high fever, severe headache, joint pain, skin rashes, gastrointestinal problems, and, in severe cases, persistent vomiting and bleeding.

There is currently no antiviral medication specifically designed to eliminate the dengue virus. Mild cases are usually managed at home through rest, hydration, paracetamol, and mosquito protection. Severe cases require hospitalisation, close monitoring, intravenous fluid therapy, and, in some instances, blood transfusions.

Socioeconomic inequality strongly influences dengue vulnerability. Residents of slums and low-income settlements often lack access to proper sanitation, mosquito nets, and safe living conditions. At the same time, stagnant water in construction sites, poorly maintained lakes, and open waste disposal areas contribute to mosquito breeding even in higher-income neighbourhoods.

The financial burden of dengue treatment is substantial. The average treatment cost in Bangladesh is estimated at approximately US\$285, which can exceed the monthly income of many low-income households. Costs are significantly higher in private hospitals than in public healthcare facilities. Diagnostic tests—including blood counts, electrolyte analysis, liver function tests, and albumin testing—constitute a large share of treatment expenses. Compared with neighbouring countries such as India and Pakistan, dengue treatment in Bangladesh remains relatively expensive.

Public Awareness and Civic Engagement

Graffiti and wall writing have emerged as informal tools of public communication in Bangladesh. Often referred to locally as *chika mara*, such messages are commonly used to highlight social concerns, including overcrowding, pollution, and public health crises.

In Dhaka and Chattogram, graffiti related to dengue has served as a form of civic protest and public awareness, drawing attention to mosquito infestation, poor sanitation, and failures in municipal management. Citizens have used public spaces to demand more effective mosquito-control measures and improved urban cleanliness.

Government authorities have acknowledged the seriousness of the crisis. Public health experts continue to emphasise that

eliminating stagnant water in drains, ditches, sewers, and construction sites remains one of the most effective strategies for reducing mosquito breeding.

However, maintaining clean urban environments in densely populated cities such as Dhaka remains a major challenge. Effective dengue control requires trained personnel, modern equipment, regular pesticide spraying, efficient waste management, and sustained public awareness campaigns. Equally important are transparent and accountable municipal administrations capable of implementing long-term public health strategies.

Conclusion and Areas for Further Research

Dengue fever has become a major public health crisis in Bangladesh, particularly in Dhaka and Chattogram. Rapid urbanisation, overcrowding, inadequate sanitation, poor waste management, and environmental degradation have created ideal conditions for *Aedes* mosquitoes to proliferate.

Climate change has further intensified the problem by raising temperatures, extending monsoon seasons, and creating environmental conditions favourable to mosquito breeding and viral transmission. Unregulated construction, stagnant water, and poor drainage continue to worsen the situation.

The evidence suggests that unplanned urbanisation and inadequate low-income housing are among the principal drivers of dengue transmission in Bangladesh. However, regional variations in infection rates indicate that additional environmental and social factors warrant further investigation. For example, the relationship between salinity and mosquito survival remains complex, as shown by differences between Khulna and Barisal.

Future research should therefore focus on the interplay among climate change, urban development, mosquito ecology, and socioeconomic inequality. Sustainable dengue control will require integrated urban planning, improved sanitation infrastructure, stronger public healthcare systems, and coordinated mosquito management programmes. Reducing out-of-pocket healthcare costs through expanded public health services will also be essential to protect vulnerable populations and improve overall health outcomes.

Endnotes

[1] In 2020, Bangladesh experienced a COVID-19 endemic; dengue infection data were not available.

[2] The case-fatality ratio is the number of case-specific deaths that occurred during a specified time divided by the number of individuals diagnosed.

References

1. Kamal Mohammad et al. Epidemiological Characteristics of Dengue Infection in Bangladesh: A Systematic Review. *International Journal of Public Health*. 2026. 23: 235-245.