

Editorial



Alarming Trends of Dengue in 2023

Doi: <https://doi.org/10.3329/kyamcj.v14i02.68523>

Americanism first derived the term dengue in 1820–1830 from the Latin American Spanish homonym for the Swahili *ki denga pepo*, literally meaning “prudery, affectation,” by folk etymology from Swahili *-dinga, kadinga* meaning a sudden, cramp-like seizure, that was supposed to be caused by an evil spirit”, or from another Bantu language. It is also called ‘dengue fever’ or ‘dandy fever’ because of simile with the posture and gait of a dandy, or simply ‘dengue’ (right pronunciation being ‘dengee’). Another popular name for dengue is “breakbone fever”, because of muscle and joint pains associated with it. The phrase ‘dengue fever’ was coined for general use only after 1828. Other historical terms for dengue include “bilious remitting fever”, “infectious thrombocytopenic purpura” and “Philippine hemorrhagic fever”, “Thai hemorrhagic fever”, or “Singapore hemorrhagic fever”. Though the exact history of when and how dengue virus evolved and started to affect human beings is unknown, the first probable case of dengue fever is found in a Chinese medical encyclopedia from the Chin Dynasty (265–420 AD), which then was referred to as a “water poison” linked with flying insects.¹ The written features of unconfirmed dengue were noted as early as 1635. The first confirmed reported outbreak of dengue was from 1779 to 1780, simultaneously in Southeast Asia, Africa, and North America. Thereafter till 1940, dengue epidemics were stated to be infrequent. Transmission of dengue by the vector *Aedes mosquitos* was confirmed in 1906, and its viral etiology was ascertained in 1907. Because of ecological disruption, there was its marked spread during the twentieth century, when its most different serotypes and deadly complications were discovered. The causative dengue virus was isolated for the first time in 1943 in Japan by two Japanese physicians Ren Kimura and Susumu Hotta during a dengue epidemic in the city of Nagasaki in Japan. One year later, a noted virologist and microbiologist of the United States Dr Walter Schlesinger and a Polish-American medical researcher Albert B. Sabin independently isolated the dengue virus. In 1953, Dengue hemorrhagic fever was first reported in the Philippines. It was incriminated as a major cause of child mortality by the 1970s.^{1,2} Dengue is now regarded as a cosmopolitan *Aedes* mosquito-borne endemic viral infectious disease. Now, dengue fever and its deadly complications are reported to be most common in over 140 tropical and subtropical countries of the world. The vectors *Aedes aegypti* and *Aedes albopictus* mosquitoes transmit the causative virus. Commonly it is spread through bites by female *Aedes aegypti* and *Aedes albopictus* mosquitoes. These mosquitoes were usually known to bite mostly in the morning and daytime for sucking human blood as meal. Now, it is found that these vectors can bite anytime, irrespective of particular hours of the day and night. The usual habitat of these mosquitoes was known to be stagnant clean water, commonly in urban localities, where they lay their eggs for getting hugely dense in that area. But surprisingly, these mosquitoes are now seen to lay eggs on any water, dirty or clean. The vectors get the virus through biting infected persons while sucking infected blood. By 2-10 days, the infected mosquitoes can spread the virus to uninfected humans through their saliva during sucking blood. Thus, an uninfected person gets infected. These mosquitoes, once infected, commonly remain infected for lifetime. Dengue can also get spread through blood or organ donation from an infected person. Otherwise,

dengue can’t spread directly from one person to another. Belonging to the genus *Flavivirus*, the dengue virus has four serotypes: DENV-1, DENV-2, DENV-3, DENV-4. If one is infected by one serotype, a prolonged immunity is seen to that particular serotype and a short-lived immunity is observed to the other serotypes.^{2,3}

Now, Asia represents around 70% of dengue’s total global disease burden. Dengue is now increasingly spreading to new areas, including Europe, suburbs and rural zones all over the tropical and subtropical countries of the world, and explosive outbreaks are rampant now.

Dengue infection has an incubation period of about 3 to 14 days, febrile phase of 3 to 7 days (with or without myalgia, arthralgia, bone pain simulating breaking bones, nausea, diarrhea, rash, petechia, leukopenia, mild bleeding, etc.), critical phase of 1 to 2 days (without fever, usually with capillary leakage, with or without shock, or severe hemorrhage, or epistaxis, or hematemesis, or subconjunctival hemorrhage, or severe organ involvement, etc.). The warning signs of dengue include 1. Abdominal pain or tenderness, 2. Persistent vomiting, 3. Clinical fluid accumulation, 4. Mucosal hemorrhage, 5. Lethargy or restlessness, 6. hepatomegaly by more than two fingers, 7. Increasing hematocrit, 8. Concurrent thrombocytopenia, or rapid decrease in thrombocyte count. Dengue antibody antigen complexes activate the complement cascade destroy the vessels, platelets and other tissues, leading to coagulopathy, thrombocytopenia and bleeding. In addition, dengue antigens activate T cells, causing genesis and release of various chemical mediators that result in vasculopathies and increased capillary permeability and leakage. Various organs may be involved in these pathological insults, resulting in variable grades of hemorrhage, ascites, pleural effusion, shock (hypotension), respiratory distress, kidney failure, etc., that may lead to death. Clinically, Dengue infection can exhibit a wide spectrum of such illnesses as asymptomatic illness, symptomatic fever with or without hemorrhage, symptomatic dengue hemorrhagic fever with plasma leakage with or without shock or dengue shock syndrome, expanded dengue syndrome, etc. No organ and no system in the body are immune to direct or indirect insults to dengue. If the patient is well managed or if the patient survives the critical phase, recovery occurs usually soon within 3 to 5 days (marked by fluid reabsorption and diuresis). Clinically, a dengue patient usually can present in any of the following forms: Undifferentiated (simple) fever, Dengue fever, Dengue hemorrhagic fever, Dengue shock syndrome, and Expanded dengue syndrome. The patient may have leukopenia, hypoalbuminemia, thrombocytopenia, rising Hct. 5-20%, positive tourniquet test (indicative of capillary fragility with thrombocytopenia), systemic hypotension, cold extremities, delayed capillary refill time, lethargy, restlessness, tachycardia, tachypnea, kussmaul’s breathing. Prolonged shock or co-infections, and co-morbidities may lead to EDS (Expanded Dengue Syndrome). Acute renal failure, hemolytic uremic syndrome, febrile seizures in young children, encephalopathy, intracranial hemorrhages, cerebrovascular thromboembolism, subdural effusions, mononeuropathies/polyneuropathies, transverse myelitis, acute respiratory distress syndrome, pulmonary hemorrhage, myocarditis, pericarditis, conduction abnormalities, hepatitis, acalcul-

lous cholecystitis, acute pancreatitis, hyperplasia of Peyer's patches, Myositis with raised Creatine Phosphokinase (CPK), Rhabdomyolysis, Infection associated hemophagocytic syndrome, Idiopathic thrombocytopenic purpura (ITP), Spontaneous splenic rupture, Lymph node infarction, Macular hemorrhage, Impaired visual acuity, Optic neuritis, etc., have also been reported. Important differential diagnosis includes 1. Malaria, 2. Sepsis, 3. Typhoid, 4. Chikungunya, 5. Rickettsial infection, 6. Leptospirosis, etc. Complications in untreated persons include dengue hemorrhagic fever, bleeding in various parts and tissues, thrombocytopenia, plasma leakage, dengue shock syndrome, altered consciousness, delirium, the risks of miscarriage in pregnant women, etc.¹⁻³

Before January 2023, the most significant number of dengue cases ever reported globally was in 2019. In Bangladesh, most dengue cases are documented during the monsoon of rainy season (June to October) and post-monsoon seasons (October to November) with sometimes a peak occurrence in September in a single month. However, the peak of dengue epidemic period is usually around June to August during the monsoon, as this climate is congenial for dengue transmission. Dengue is now endemic in Bangladesh, with a definite risk of nationwide transmission, the highest risk being during June to September every year. From the years of 2021 till date, it has been determined that out of all eight divisions, highest dengue cases and deaths are usually in Dhaka, Chattagram and Barishal. Dengue cases and deaths in Bangladesh from 2019 to July 27, 2023 were as follows: total reported cases 100,354, and total reported deaths 164 in 2019; total reported cases 1405, and total reported deaths 3 in 2020; total reported cases 28429, and, total reported deaths 105 in 2021; total reported cases 62832, and total reported deaths 281 in 2022.³

As reported on July 28, 2023, the condition of dengue disease was found gradually deteriorating. In the last 24 hours, by the health emergency monitoring center and control room of the Director General of Health Services of Bangladesh, ten dengue patients were reported to die in Bangladesh, of which five died in Dhaka city & rest five in other places outside Dhaka City. With these, total death in this year was reported to be 225 till 27 July, of which 177 in Dhaka city and the rest 48 in places outside Dhaka city, excluding the unreported figures of death. In the last 24 years, new 2361 patients of dengue were reported to get hospitalized, of which 1,122 were admitted into different hospitals of Dhaka city, the rest 1,239 into other hospitals of the country. Up till July 27, 2023, the total reported dengue patients in this year in the country were 42,702, of which 24,798 in Dhaka city and rest 17,904 in areas outside Dhaka city. Total 8,467 dengue patients on July 27, 2023, were reported to be in a hospitalized state under treatment, of which 4,809 in Dhaka city and 3,658 were outside Dhaka city. In this year of 2023, up to July 27, the reported total death was 225, excluding unreported deaths, which is very much alarming. On average, ten or so dengue patients are reported to die daily. These alarming trends herald more worsening situation by next August, September and thereafter.³

Daily reported dengue cases and deaths are now alarming. The recent outbreak is seen to occur before the usual onset of mosquito breeding season, because mosquito breeding is now seen to occur in areas with no stagnant surface water. Lot many

reported and unreported dengue cases and mortality from it are there in Bangladesh, as most of the people are not aware of it, and all people of Bangladesh have no equal access to health care amenities for its diagnosis and management. Its current trend in Bangladesh is very alarming. It is rapidly spreading from urban areas to suburb and rural areas. There is crisis in hospital beds for dengue patients, with inadequate specialists all over the country to manage the complicated patients properly. It is now seen that many of the asymptomatic dengue patients, or patients with nonspecific symptoms of dengue, or test negative dengue patients rapidly get deteriorated with thrombocytopenia, hemorrhage and shock. Critical situations may arise within a day instead of the classical three days. All available doctors need to be made aware of it, how to diagnose and manage it properly through repeated seminars symposia either physically or online, to avoid mismanagement and overtreatment, and to remove panic from common people throughout the country.^{1,2} Unlike polio, dengue can't be eradicated. But it is a preventable disease. For preventive measures, we should make new, effective vaccines available to all susceptible people. Avoidance of exposure to mosquitoes can be achieved by drainage of all water, Such water in containers as earthen jars, cement tanks, plastic drums etc. should not be kept for more than three days open, cleansing and covering all water storage devices, keeping surroundings neat and clean, entrusting basic sanitary precautions, inhibiting breeding by application of oil to stagnant and/or open water, spraying insecticides to their breeding places, using mosquito nets while sleeping (preferably insecticide-treated, even during the day time also, not excluding the night time), using protective clothes to cover the whole body (such as full sleeved shirts and full pants), using of insect repellents (such as, mosquito coils, aerosols, mats, repellents body creams and lotions, etc.), encouraging use of insecticide-treated nets and curtains, Placing screens, wire meshes, nets on windows and doors. As an integrated vector management (IVM) larval source reduction is the principal tool. Efficient control needs a unified action involving government agencies, nongovernmental organizations (NGOs), communities and other stakeholders, raising awareness in the community. Community orientation and participation is the principal key to implementing all prophylactic and control strategies. The control strategies should be at all personal, community, institutional, regional, national and international levels.^{1,2}

References

1. Etymology and History of Dengue: https://en.wikipedia.org/wiki/Dengue_fever#History
2. Zerfu, B., Kassa, T. & Legesse, M. Epidemiology, biology, pathogenesis, clinical manifestations, and diagnosis of dengue virus infection, and its trend in Ethiopia: a comprehensive literature review, 2023. *Trop Med Health* 51, 11. <https://doi.org/10.1186/s41182-023-00504-0>
3. Health Bulletin on current Dengue situation published by CDC, DGHS: <https://old.dghs.gov.bd/index.php/en/home/5175-health-bulletin-on-current-dengue-situation-published-by-cdc-dghs>

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