

Dengue Crisis : A New Challenge for Bangladesh

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Introduction

Dengue, a viral infection spread by the infamous *Aedes aegypti* mosquito, is the fastest growing mosquito-borne disease in the world today. It is now a major international public health concern. Over the past three decades there has been dramatic global increase in the frequency of dengue fever, dengue haemorrhagic fever and dengue shock syndrome and their epidemics. It is found in tropical and subtropical regions around the world. Some 2.5 billion people i.e two fifth of the world's population in tropical and subtropical countries are at risk of the disease. An estimated 50 million dengue infection occurs worldwide annually and about 500,000 people with dengue haemorrhagic fever require hospitalization each year. Approximately 90 per cent of them are children aged less than five years, and about 2.5 per cent of those affected die. During epidemics, infection rate among those who have not been previously exposed to the virus are often 40 to 50 per cent, but can also reach 80 to 90 per cent.¹

The population of *Aedes aegypti* fluctuates with rainfall and water storage. Its life span is influenced by temperature and humidity, survives best between 16°C-30°C and a relative humidity of 60-80 per cent. It breeds in the containers in and around the houses. Being a domestic breeder, it is a endophagic and endophilic. However, even with a 2°C increase in temperature the extrinsic incubation period of dengue virus will be shortened and more infected mosquitos are available for a longer duration. Besides that the mosquitos will bite more frequently because of dehydration and this increase man-moquito contact.^{2,3}

It is characterised by flu-like symptoms, including piercing headaches, muscle and joint pains, fever and fullbody rashes. But this year it shows “atypical” symptoms like low grade fever instead of high fever, no body rashes and minimum joint pain but affecting vital organs like brain, heart, and liver.⁴ The escalating dengue situation in Bangladesh has been emerging as a serious public health problem in terms of morbidity and mortality. Results of analysis of 40,476 cases of Bangladesh occurring during 2000-2017 indicated that 49.73% of the dengue cases occurred during the monsoon season (May-August) and 49.22% during the post-monsoon season (September-December).⁵ There are seasonal fluctuations in dengue incidence, with year-to-year variation in the timing and magnitude of seasonal peaks. Climate and resulting changes in mosquito populations along with the inter-

annual variation in DENV activity drive these changes. During 2015-2017, in the pre-monsoon season, the dengue cases were reported to be more than seven times higher compared to the previous 14 years. The findings closely correlate with those of the pre-monsoon *Aedes* vector survey which revealed the presence of high density of larva and pupa of the dengue vectors in the environment all the year round. The threat of a growing dengue outbreak has been looming over Bangladesh, hitting the country earlier than usual this year with higher levels of rainfall. Thus, stagnant water sources are widespread in the capital – Dhaka, where dengue is most-reported. 61 out the country's 64 districts have reported cases of dengue.^{4,6}

According to DGHS there are total 87,953 reported cases till 30 September since 1st January, 2019. Total no of admitted patient was 1,481. Total no of released patient was 86,241 till to date. About 231 death reports were sent to The Institute of Epidemiology Disease Control & Research (IEDCR). Among them IEDCR investigate 136 cases and confirmed 81 death cases due to dengue.⁷

In addition to the routine monsoon survey at households in July 2019, Disease Control division, DGHS conducted an additional survey in public places (Bus terminals, Railway station, Slum areas, Metro rail projects, Police line, Hospitals etc.). A total of 4 entomology teams surveyed 14 areas during 31 Jul – 04 Aug, 2019. Which reveals 12 out of 14 sites had Breteau Index (BI) > 20, Bus terminal / depot, rail station are most *aedes*-dense areas, Discarded tires are the most potential breeding sources.^{8,9}

Viral Characteristics

All four serotypes of dengue fever have been detected in Bangladesh, with DENV-3 predominance until 2002^{10,11}. After that, no DENV-3 or DENV-4 was reported from Bangladesh. The Institute of Epidemiology Disease Control & Research (IEDCR) under the Ministry of Health and Family Welfare, a mandated organization for outbreak investigation and surveillance in the country, found DENV-1 and DENV-2 in circulation (2013–2016) and predicted that because serotypes DENV-3 and DENV-4 are circulating in neighbouring countries, they may create epidemics of secondary dengue in the near future¹². In 2017, re-emergence of DENV-3 was identified; subsequently there was a sharp rise in dengue cases from the beginning of the monsoon season in 2018. With the expansion of the outbreak, more dengue cases with deaths were also reported compared to the last 15 years. Subsequent infection with different strain of dengue causes dengue haemorrhagic fever and shock syndrome is the main cause of death.¹³

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Prevention and Control

Dengue control is very challenging because aedes mosquito is highly domesticated, strongly anthropophilic, nervous feeder and discordant species. *Aedes aegypti*, which has adapted to living near areas of human habitation. It feeds during the day and prefers human beings to other animals. Mosquito-borne disease transmission is climate sensitive for several reasons; mosquitoes require standing water to breed, and a warm ambient temperature is needed for their development. If the climate is too cold, viral development is slow and mosquitoes are unlikely to survive long enough to become infectious. Moreover when mosquito gets infected there transovarian transmission occurs where virus enters fully developed eggs at the time of oviposition. No effective vaccine or drug treatment for dengue fever is yet available. So management of the disease has relied on vector control measures, such as reduction of breeding sites and use of insecticides. To eradicate dengue fever we will have to fight against the growth of the *Aedes aegypti* mosquito which requires the virus to thrive. These mosquitoes rapidly grows in clear standing water and by serial spraying of anti-mosquito agents their growth can be hindered. We should strongly discourage standing water and ponds near residential areas. The personal prophylactic measures are wearing of full sleeves shirts and pants; use of mosquito repellent creams, liquids, coils, mats etc; use of bednets for sleeping infants and young children during day time to prevent mosquito bite.¹⁴⁻¹⁸

Conclusion

The emergence of dengue and its upcoming challenges need to handle properly. For this to be possible, a collaboration between the common man, community health personnel, NGO's and the Government should be encouraged. Lets fight against dengue together.

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