

# Why we need a nationwide dengue surveillance system

**I**N 1854, Dr John Snow (not the Game of Thrones character) used a pre-computer method of spatial analysis by mapping patterns and occurrences of cholera outbreaks in Soho, London. He mapped the patients in the neighbourhood and determined that a vast majority of cholera cases occurred around one particular water well.

Last month, when severe dengue outbreak started in Dhaka, I was surprised to note that mapping the dengue patients was something no one had considered. Although it was one of the few first things that should have been done on priority basis. So I voluntarily started to make a map of the patients' location since I had some knowledge about how to make such a map. People voluntarily filled out a google form from where I found the location of the dengue patients which I used to generate the map.

After preparing the map, the first thing I noticed was that dengue patients were mostly concentrated around the hospitals. What this means is that all dengue patients in the hospitals must be kept under mosquito nets and 400 meters radius from the hospital area must go under mosquito and larva cleaning operation.

In January 2019, the World Health Organization (WHO) announced their new 5-year strategic plan, among the 10 highest priority health issues presented, dengue was identified as one of the main infections threatening global health. Intensive action against dengue was proposed by the WHO in 2012 with the aim of reducing dengue mortality by 50 percent and dengue morbidity by 25 percent by the year 2020 (World Health Organization, 2012). The five key elements needed to achieve the dengue public health targets identified by the WHO Global Strategy are diagnosis and case management, integrated surveillance and outbreak preparedness, sustainable vector control, future vaccine implementation, and basic operational and implementation research (World Health Organization, 2012).

Although it was a priority health issue worldwide, we seemed to have downplayed the issue at the beginning. And we have paid the price. In August 2019, the highest number of people were infected with dengue in the last 19 years. According to the IEDCR, a total of 51,734 patients were admitted to the hospitals in August 2019 alone, which exceeded the cumulative number of dengue patients admitted to the hospitals ever recorded. The IEDCR report also shows that nationwide a total of 70,195 patients were admitted to the hospitals from January 2019 till August 31, 2019.

However, all these figures represent the number of patients who were admitted to the hospitals. Patients who had received treatment from outdoors or home were not included in these figures.

Again, the data does not include all the government and private hospitals. For example, the number of dengue patients in Dhaka, shown by IEDCR, were collected from 12 government or autonomous hospitals and 29 private hospitals in Dhaka. But according to Bangladesh private clinic and diagnosis owners Association (BPCDOA), there exist

*In order to control an outbreak like that of dengue, the most important thing to do is to identify the patients' location and keep them inside mosquito nets.*

609 registered private clinics in Dhaka. So, there is a big vacuum of information about the actual number of dengue patients.

Most of us already know by now that all Aedes mosquitoes (both Aegypti and Albopictus) do not carry dengue virus. When any female Aedes mosquito bites a Dengue infected person, the mosquito gets infected by the dengue virus. Whenever that infected mosquito bites any person, that person also gets infected. As this cycle continues, the



In August 2019, the highest number of people were infected with dengue in the last 19 years.

PHOTO: ASIA NEWS NETWORK

number of infected people rise very quickly.

We have seen that already many actions have been taken to destroy Aedes mosquitoes. For example, using mobile phone apps, drones, etc., to locate mosquito's breeding ground are appreciable. These are useful to control mosquitoes and can help to run the year-round operations to destroy the breeding grounds.

But we must understand that mosquito control and outbreak control are not the same thing. In order to control an outbreak like that of dengue, the most important thing to do is to identify the patients' location and keep them inside mosquito nets, so that no Aedes mosquitoes can further bite the patients and get infected. The second priority is to destroy all the larva and mosquitoes within 400 meters radius from the patients' location. 400 meters radius is important because flight range studies suggest that most female Aedes Aegypti may spend their lifetime in or around the houses where they emerge as adults and they usually fly an average of 400 meters (WHO).

One single dengue patient can potentially

spread the disease among a hundred more people in very short period of time, if not counted and not kept under safety net. So, counting every single dengue patient and keeping them under surveillance system is very important. And this surveillance system should be active and be operated in real time data feed. Development and operation of this "Active Surveillance System" is not very easy, but this is the only option we now have.

In Malaysia, Singapore, Queensland-Australia, dengue is a nationally notifiable disease. All dengue cases are required under the Public Health Act to be notified to health departments, where there is a laboratory confirmation of infection by any one of several different methods including virus isolation, nucleic acid testing, detection of dengue non-structural protein 1 (NS1) antigen and dengue virus-specific IgG seroconversion.

We need similar laws. Patients can notify the health department by a toll-free number, website, mobile app with very little information, including location. We can also collect those data from the government and

private hospitals and diagnostic centres across the internet. Then by call centre, we can verify every single patient and include them into the main database. Patients' location can be shown on interactive and dynamic maps. Government stakeholders from DGHS, IEDCR, DNCC, DSCC to upazila chairman can see the maps. Anyone can zoom in to any particular location and check the number of dengue patients there—in last 24 hours to last 30 days or even last 6 months. They can take immediate actions to secure the patients and take initiatives to kill the mosquitoes and destroy larva in that particular location. Even an automatic notification can be sent to any UNO or chairman of a particular upazila about the number of dengue patients affected in the last 24 hours in their area. But all the relevant stakeholders need to work in coordination for proper implementation of the system.

Our surface temperature is getting warmer due to climate change. And this year we have observed increased rainfall. Both these factors have made the environment suitable for Aedes mosquitoes' breeding. In addition, rapid urbanisation is also creating more suitable breeding condition for these mosquitoes.

What is alarming is that this year's dengue outbreak is just the beginning. Next year, it might be even more severe, since dengue patients have already spread across the various districts of the country. Some of these viruses may stay in dormant condition within the egg until next year. Another worrying part is, these Aedes mosquitoes are also carriers of Zica, Yellow fever and Chikungunya. If we do not develop an "Active Surveillance system" and if someone infected with Zica or Yellow fever, comes to Bangladesh, there will also be the risk of Zica or Yellow fever outbreak.

With Bangladesh being one of the most densely populated countries in the world, citizens here are at highest risk of these outbreaks. We may not fully eradicate dengue, but it is possible to keep any of these outbreaks under control by preparing an integrated surveillance and outbreak preparedness system. If we want that surveillance system operational before April 2020, we need to act as fast as we can.

Atik Ahsan is a medical anthropologist and a former Senior Research Investigator of icddr,b.

## Saving Dhanmondi Lake



The dilapidated condition of the Dhanmondi Lake.

PHOTO: NAWSHAD AHMED

**T**HE Dhanmondi lake deserves some serious attention by the relevant authorities to save it from pollution. Dhanmondi's development began as early as the mid-1950s: the entire area was built on 240.74 ha of land of which the lake covers 37 ha or about 16 percent of the residential area. The lake, which is an essential part of the Dhanmondi residential area, is 3 km in length and between 35 and 100 metres in width.

The lake side is dotted with large trees providing shade to the passers-by for the last six decades. A park and a walkway along the lake added extra beauty to the area. Several small restaurants have been allowed to operate inside the park. There are also four public toilets in the area.

The lake is not managed by a single authority, but by five different government entities looking after its various facilities. The Ministry of Works has formal ownership of the lake; the Fisheries Department looks after fishery development; the Ministry of Local Government, Rural Development and Cooperatives and Dhaka South City Corporation undertake development works and look after its maintenance. The Department of Environment (DOE) takes care of the environmental aspects and protection of aquatic resources of the lake.

The Dhanmondi lake, park and the walkway have been revamped through two government development projects in the recent past. The last project was implemented

slope as there is no protection wall, and iron fencing has fallen apart in several parts of the lake area.

One of the main attractions of Dhanmondi area is the Bangabandhu Memorial Museum on Road 32. A large number of people from different parts of the country visit the museum on a regular basis. The heads of states and foreign dignitaries also visit the museum to show respect to the Father of the Nation when they visit Bangladesh. Thousands of people also inhabit the surrounding areas every day for a walk, and many of them also use it as a socialising spot: they meet up with friends, gossip over a cup of tea and snacks.

Taking advantage of the large number of visitors, many tea and snack stalls have mushroomed in the area and hawkers are selling ground nuts, fruits, vegetables and ice-cream. The cleaners struggle to keep the area clean as there are very few dustbins in the area. Empty food packets, ground nut shells, used soft drink and water bottles and plastic bags litter the whole area. Since the number of garbage bins is limited, the visitors throw away a significant volume of garbage into the lake.

The bed of the lake is rising due to this and water pollution is worsening, which needs to be looked at on a priority basis. The only public toilet on Road 32 is inadequate for the large number of people visiting the area. Therefore, people are seen urinating and defecating on the lake side every now and then. While there is iron fencing in other parts of Dhanmondi area to protect the lake, there is no fencing on Road 32; thus people take the liberty to answer nature's call on the lake side.

The few remaining plants along this road

are being damaged by the people who enter the lake side easily since there is no iron fencing along this road. The plants are also dying because of the heat produced by the gas stoves used for cooking snacks and tea. The locals are worried about the deterioration of the environment of the area, specially because the Bangabandhu Memorial Museum is situated there and thus the area should be more strictly protected. Colourful plants and flowers should be planted and well maintained.

The Public Works Department and the City Corporation are expected to divide the responsibility to maintain the area as a model neighbourhood. All the sources of the lake's pollution should be identified, including any sewerage pipe entering the lake and polluting water. These should be immediately removed, garbage bins should be installed and the public should stop throwing garbage into the lake. The lake bed should be cleaned up and lake water treated. Earth filling is also needed to raise the land level in some places.

The responsibility of keeping Dhanmondi lake clean falls on the shoulders of the relevant authorities as well as the people who visit the area every day: the pedestrians, the vendors, the hawkers, and the guards and cleaners of the lake who should do a better job of keeping the area clean. The government should seek expert advice on how the lake water can be treated and it can be made fish friendly. Some locals plant trees and clean the garbage in the area on a voluntary basis; but individual efforts are not enough. The concerned authorities must now come forward to preserve the lake.

Dr Nawshef Ahmed is an economist and urban planner. He worked previously as a UN official in Bangladesh and abroad.

### CROSSWORD BY THOMAS JOSEPH

**ACROSS**

- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
- 43 Cut off
- 44 Spring period
- 45 Obeys
- 1 Bank fixtures
- 6 Assistant
- 10 Barnraising sect
- 11 Fixes, as holey socks
- 13 Oklahoma city
- 14 Mirror sight
- 15 Take advantage of
- 16 Bakery buy
- 18 Pallid
- 19 Tyrannical people
- 22 Sort
- 23 Ill-mannered
- 24 Out of practice
- 27 Computer units
- 28 Poker payment
- 29 Tax org.
- 30 District attorneys
- 35 Golf goal
- 36 Old soldier
- 37 Pet perch
- 38 Steer clear of
- 40 Spanish resort
- 42 One of Lear's daughters
<li