



### THREE UNIQUE INITIATIVES OF KMC FOR DENGUE PREVENTION IN KOLKATA CITY, INDIA, DURING 2014

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#### Abstract:

Information regarding travel-associated dengue in Kolkata City is abysmally lacking. By strengthening its intra-departmental disease surveillance system, the health department of Kolkata Municipal Corporation (KMC) has for the first time succeeded in studying the issue. During January to August 2014, identifying 183 laboratory-diagnosed indigenous cases of dengue apart, the KMC people came across 15 residents of the city who contracted the disease after they had returned from travel to different dengue-endemic areas outside the city. One of them had visited Sri Lanka and one Thailand. The rest 13 citizens brought in the dengue infection from places around India. Preventing import of travel-associated dengue is just not feasible in the present era of globalisation, when one can easily move from one place to another in a jiffy. In view of this, the health department of Kolkata Municipal Corporation has given a top priority on controlling the population of the dengue-bearing mosquito *Aedes aegypti*.

**Keywords:** *Aedes aegypti*, Kolkata, travel-associated dengue, 3-tier monitoring, data-bank

Transmission of indigenous dengue in the city of Kolkata, India, has been going for aeons [1, 2]. Circulation of all the four serotypes of dengue virus (DEN-1, DEN-2, DEN-3 and DEN-4) has been established here [3]. Between 1963 and 2014, officially 242 people

succumbed to dengue haemorrhagic fever in this metropolis [4, KMC, unpublished data]. The onus of preventing mosquito-borne diseases rests primarily with the health department of Kolkata Municipal Corporation (KMC). As in many other places around the world, in Kolkata too, import of dengue virus from outside by the city people is going unnoticed. Some specific cases of travel-associated dengue were detected by the corporation between January and August 2014, details of which are reported in this short communication together with two

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unprecedented initiatives undertaken by the KMC to conquer dengue as a whole.

Over 4.5 million people live in KMC area and its daily floating population is 6 million. There are over 500 commercial laboratories and 7 government-run hospitals here, besides KMC-run 143 charitable malaria clinics and 5 dengue detection centres. The average monthly temperature here varies from 19.6<sup>0</sup>C (in January) to 31.0<sup>0</sup>C (in May). Variation in the monthly average humidity is 61.4% (in March) to 83.9% (in August). The annual rainfall is 1400 mm-2300 mm.

The KMC area (206.2 sq km) is divided into 15 boroughs comprising a total of 144 wards. Each borough consists of 7-12 wards equipped with 6-14 field workers (FWs) each for vector control work. Human resources of the KMC's health department available for vector-borne disease control activities include: 4 deputy chief municipal health officers, 1 chief vector control officer, 15 borough executive health officers, 2 special officers, 143 medical officers, 3 consultant entomologists, 20 health supervisors, 312 bailiffs, 55 multipurpose health assistants, 163 laboratory technicians, 72 senior FWs, 1286 FWs, 21 rapid action teams comprising 160 trained FWs, 518 honorary health workers and 1728 hundred days workers deployed under the state urban employment scheme. These apart, there is one member of the mayor-in-council, Atin Ghosh, who, unlike his predecessors, plays pivotal role in planning and implementing almost all unique strategies in KMC needed to fight against mosquitoes and mosquito-borne ailments (dengue and malaria).

In 2012, an outbreak of dengue involving 1852 cases with 2 deaths occurred in Kolkata. To prevent its recurrence in 2013, the corporation's health department stepped up its antidengue activities by undertaking these unprecedented measures: **1.** Shifting of vector control responsibilities from medicos to non-medicos after selecting one sincere non-medical staff to work as the Vector Control Incharge (VCI) at ward-level and one such staff to work as the VCI at borough-level. **2.** Mounting city-wide drive for detection and destruction of *Aedes aegypti* larvae right from the beginning of the

year. **3.** Regular monitoring of the larval densities of *Aedes aegypti* in different vulnerable KMC wards by reckoning three indices such as house index, container index and Breteau index. **4.** Periodic disposal of garbage from different vulnerable areas by the department of solid waste management. **5.** Cleaning of open clogged surface drains by the drainage department. **6.** Fever surveillance by detailing honorary health workers and 100 days workers. **7.** Dissemination of dengue-reports to patients by all the 5 KMC-run dengue detection centres through SMS alert. **8.** Campaign through TV and FM channels. **9.** Screening of a documentary film of 17-minute duration (first-of-its kind film in India) in different public places around the city (10 hours a day for 60 consecutive days). **10.** Publicity through 780 hoardings, 20 thousand banners, 3.25 lakh booklets, leaflets and 5 lakh electricity consumption bills. **11.** Organising awareness-raising meetings (4-5 meetings/ward) by involving ward councillors. **12.** Stock-taking by the Municipal Commissioner through video conferencing once a month. Consequent upon these concerted efforts, dengue cases dropped to 238 in 2013 with no death.

People's expectations scaled up. Hence the health authorities of KMC undertook three unique Strategies during 2014 to achieve more in terms of dengue prevention. The first initiative was strengthening of its disease surveillance system to assess the city's actual burden of dengue. It was done in January 2014 by designating one staff in each KMC ward to collect daily dengue-reports from commercial laboratories and hospitals located in the ward. These report-collecting personnel are called morning collectors. This sort of disease surveillance system is indeed exemplary.

The second initiative was the preparation of a 9048-page data bank containing information regarding the addresses of all potential mosquito breeding sources in each and every KMC ward to streamline ward-level activities for destruction of *Aedes* and other mosquito larvae. The data bank will be updated every year. No other city in India has prepared such data bank yet.

The third initiative was the introduction of a unique 3-tier system of monitoring vector control activities in fields. How the system works is here. Activities of FWs in a ward are crosschecked by a Ward VCI. Activities of 144 Ward VCIs are monitored by 15 Borough VCIs. Each Borough VCI does his job with the assistance of a Borough Rapid Action Team comprising 6 trained field workers. The last tier of the supervision/monitoring is done by 3 Consultant Entomologists; they crosscheck the activities of 15 Borough VCIs with help of 6 Central Rapid Action Teams comprising 10-12 trained field workers each.

Between January and August 2014 — while crosschecking the addresses of all the laboratory-diagnosed cases of dengue garnered by morning collectors, the supervisory personnel of KMC came across some 15 residents of Kolkata, who had contracted dengue immediately after returning from travel to areas outside the city. One of them had travelled to Thailand and one to Sri Lanka (**Table 1**) — both the countries are highly dengue-endemic. Import of dengue virus from Bengaluru was detected in 6 residents. One person got the infection in Delhi, one in Mumbai, one in Pune. One person contracted the disease after returning from Kanheipur in Odisha. The rest three brought in dengue virus from three other districts of West Bengal, the same state in which Kolkata is situated.

The incubation period for dengue ranges from 3 to 14 days [5]. During this period of time, viraemic human may continue his usual activities and may encounter *Aedes aegypti* at work, home or elsewhere. Persons traveling to dengue-endemic areas always should avoid

exposure to mosquito-bites by using repellents, wearing protective clothing, and remaining in well-screened or air-conditioned areas. Preventing travel-associated dengue not only benefits the traveller but also helps prevent introduction of dengue virus into non-endemic areas where vector mosquitoes might transmit the virus indigenously.

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Table 1: Laboratory-diagnosed cases of travel-associated dengue in Kolkata City during January-August 2014

Name and residential address of the person who brought in dengue infection from outside	Date of return with/without fever and the place of travel	Date of blood- test for dengue (NS1 antigen and IgM antibody)
<b>Nibu George Babu, M, 27 years, BlocK-C, Mukundapur, Kolkata-700099.</b>	4 January, from Kanchrapara, North 24 Parganas, West Bengal, caught fever on 8 January.	Tested at Rabindranath Tagore International Institute of Cardiac Sciences on 16 January and proved IgM reactive.
<b>Soumyadip Chakraborty, M, 33 years, 49/24 Purbachal Main Road, Kolkata-700078.</b>	7 January, from Bengaluru, Karnataka.	Tested at Medica Superspeciality Hospital on 9 January and proved IgM reactive.
<b>Arindam Chatterjee, M, 38 years, 4 Ramlal Bazar, Kolkata-700078.</b>	25 February, from Colombo, Sri Lanka.	Tested at Ashok Laboratory on 27 February 2014. Proved IgM reactive.
<b>Suman Nathwani, F, 36 years, 5 Sardar Sankar Road, Kolkata-700026.</b>	11 June, from Thailand.	Tested at Apollo Gleneagles on 17 June and proved IgM reactive.
<b>Shreya Brahma, F, 25years, A-Purba Diganta, Santoshpur, Kolkata-700075.</b>	14 June, from Bengaluru, Karnataka.	Tested at Quadra Medical Services Private Limited on 18 June and proved NS1 reactive.
<b>Shubhrajit Biswas, M, 26 years, 364/11 Kamdahari, Purbapara, Kolkata- 700084.</b>	26 June, from Bengaluru, Karnataka.	Tested at Rabindranath Tagore International Institute of Cardiac Sciences on 1 July and proved NS1 reactive.
<b>Harendra Pratap, M, 27 years, 403 NTS Quarters, KPC Medical College &amp; Hospital, PS: Jadavpur, Kolkata-700032.</b>	14 July, from Bengaluru, Karnataka.	Tested at KPC Medical College & Hospital on 19 July and proved positive for both NS1 and IgM.
<b>Shrabani Ganguly, F, 21 years, 6 Purbachal Main Road, Kolkata-700078.</b>	14 July, from Bengaluru, Karnataka.	Tested at Vision Care Hospital on 14 July and proved NS1 reactive.
<b>Joshi Joseph, M, 30 years, MIG-DG, Niva Park, Phase-III, Brahmapur, Kolkata-700096.</b>	17 July, from Delhi.	Tested at Sparsh Diagnostics on 18 July and proved NS1 reactive.
<b>Amit Chatterjee, M, 37 years, 1/21 Nelinagar, Haltu, Kolkata-700078.</b>	18 July, from Bengaluru, Karnataka.	Tested at Medica Superspeciality Hospital on 18 July and proved NS1 reactive.
<b>Chunchun Sharma, M, 36 years, Brahmapur, Badamtala, Garia, Kolkata- 700096.</b>	9 August, from Panchpota area of Rajpur-Sonarpur, South 24 Parganas, West Bengal.	Tested at Ashok Laboratory on 10 August and proved NS1 reactive.
<b>Mahendra Paswan, M, 22 years, 72/1 Grey Street, Kolkata-700005.</b>	11 August, from Mumbai, Maharashtra.	Tested at a KMC-run dengue detection centre on 11 August and proved NS1 reactive.
<b>Koustabh Das, M, 25 yrs, 67 Avenue South, Kolkata-700075.</b>	25 August, from Kanheipur, Odisha.	Tested at Ashok Laboratory on 26 August and proved NS1 reactive.
<b>Banani Raha, F, 46 yrs, 108/1 Garfa Main Road, Kolkata-700075.</b>	26 August, from Puruliya, West Bengal.	Tested at Peerless Hospital on 30 August and proved IgM reactive.
<b>Riddhiman Roy, M, 28 yrs, 78 Raja SC Mallick Road, Kolkata-700084.</b>	5 September, from Pune, Maharashtra.	Tested at Medica Superspeciality Hospital on 5 September and proved NS1 reactive.