Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2016; 4(2): 500-502

Received: 02-02-2016
Accepted: 05-03-2016

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A note on the dengue surveillance system introduced in Kolkata

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Abstract
Since January 2014, the health department of Kolkata Municipal Corporation [KMC] has been collecting dengue-reports from different non-KMC health set-ups [commercial pathological laboratories, hospitals, polyclinics and nursing homes] located in the KMC area by sending its 144 personnel called morning data collectors. The effort has yielded commendable results. During January 2014 to December 2015, as many as 1157 dengue cases diagnosed at different non-KMC health set-ups, which would otherwise have gone unrecorded, came to surface. Besides, the initiative has helped the department undertake prompt measures for prevention of dengue. Other cities around India, which still depend on digital receipt of reports from different non-government diagnostic clinics, can replicate this unique dengue surveillance system to stop underreporting of dengue cases.

Keywords: Non-KMC health establishments, collection of dengue-reports by 144 personnel, dengue detection centres of KMC, dengue-report dissemination through SMS alert

1. Introduction

The city of Kolkata has long experience of recurrent outbreaks of dengue [1, 2, 3]. Circulation of all the four serotypes of the dengue virus [DEN-V-1-4] has been demonstrated here [4]. During 2005-2014, officially 8,711 dengue cases with 23 deaths have occurred in the city [5]. The onus of preventing transmission of mosquito-borne diseases primarily rests with the health department of Kolkata Municipal Corporation [KMC].

Inhabited by over 4.5 million people, the KMC area [206.2 sq km] is divided into 16 boroughs consisting of a total of 144 wards. Each ward is equipped with a ward health unit headed by a ward medical officer [MO]. As many as 600 non-KMC health establishments are located in the KMC area and these include commercial pathological laboratories, hospitals [government/ non-government], polyclinics and nursing homes. Barring the government-run hospitals and some commercial laboratories, all other health establishments use rapid diagnostic test kits [RDTKs] indiscriminately for detection of dengue [NS1 antigen/Ig M antibody], instead of employing the method of ELISA/Mac ELISA recommended by the Directorate of the National Vector Borne Disease Control Programme, Government of India. Upon repeated persuasions by the KMC authorities during 2012-2013, some of them have stopped using RDTKs.

Until 2013, the health department of KMC did not have any system of collecting dengue-reports from non-KMC sources. The IDSP [integrated disease surveillance programme] wing of the department, which is the nodal office for preparation of database for different diseases, would depend on digital inflow of reports. But such reliance created huge problem. Save 5-6 hospitals and some 30-35 reputed commercial laboratories, the other diagnostic centres remained unresponsive. As a result, making assessment of the city's actual dengue-burden was very difficult. In January 2014, the department designated 144 personnel [called morning data collectors] — one person in each ward — to collect dengue-reports from different non-KMC sources on a daily basis. Results obtained during January 2014 to December 2015 are reported in this short communication.

2. Materials and Methods

In each ward of KMC, the morning data collector accomplished his task by 1 pm every day. He collected reports as per this format: name, age, sex and residential address of the patient; type of the test done [NS1 antigen or IgM antibody], method employed [RDTK or ELISA/Mac

ELISA] and results obtained [positive or negative]. Upon returning to the ward office, the morning data collector gave the reports [positive or negative] to the ward MO. Cases of dengue detected by ELISA/Mac ELISA method were considered 'confirmed' and the others 'not confirmed'. The ward MO noted down the reports in a register and asked the ward vector control incharge to undertake indoor space spray with pyrethrum 2% extract in dengue-affected area [@ 50 houses surrounding each dengue positive household] to disrupt transmission of the disease. Antilarval drive against *Ae. aegypti* too was carried out on the same day or the day after. While undertaking anti-*Aedes* measures, the ward vector control personnel verified the address of each dengue patient and collected information regarding the patient's travel history [if any]. Having made confirmation of each dengue case in 24-48 hours, the ward MO sent the report to the respective borough health office through a messenger for onward transmission to the IDSP wing.

Each borough comprises 7 to 12 wards. Dengue-reports from different wards of a borough reach the borough health office through ward staff and from there, the reports reach the IDSP wing online [Figure 1].

Besides non-KMC health set-ups, there are 5 KMC-run charitable dengue detection centres. These dengue detection centres were commissioned during 2011 at a total cost of 1.25 crore INR. Blood samples of suspected dengue patients drawn at different ward health units under the supervision of ward MOs were brought to these dengue detection centres in hired vehicles. Each blood sample was sent together with all relevant information regarding the patient — including the patient's contact number and the kind of test needed to be done [NS1 antigen or IgM antibody] — and name and contact number of the ward MO who had drawn the blood sample. Blood tests at KMC-run dengue detection centres were done only by ELISA/Mac ELISA method and the test-reports were disseminated to patients and the concerned officials — including the ward MOs — through SMS alert which carried information as per the following format: name of the dengue detection centre; patient's name, age, sex, kind of test done, result obtained [positive or negative] and name of the ward MO. Wherever and whenever a report of dengue came in, no matter whether the test was done by ELISA or RDTK, the preventive measure was undertaken in 24 hours. Reports of 'confirmed' dengue cases from both KMC-run dengue detection centres and non-KMC health set-ups reached the IDSP wing from different borough health offices online. The IDSP wing updated the line-list of dengue cases on a daily basis and sent the list to all concerned, including the chief vector control officer.

3. Results and Discussion

Consequent upon the commencement of manual collection of dengue-reports, confirmed cases of this group B arboviral disease detected by non-KMC health set-ups came to surface in greater numbers. During 2012-2013, in all 2090 dengue cases entered into the records of the IDSP wing of KMC [1181 cases were reported by the 5 dengue detection centres of KMC and 909 cases by 45 non-KMC health set-ups]. Reports from a large number of non-KMC health set-ups did not reach KMC during 2012 and 2013. The sorry scenario improved remarkably during 2014 and 2015. Besides getting reports of 666 dengue cases from its own dengue detection centres, the health department of KMC got reports of 1857 cases from non-KMC health set-ups during this period of time [reports of 700 cases came in from 45 non-KMC health set-ups online and reports of 1157 cases from other non-KMC set-ups through the 144 morning data collectors]. Pertinently, the reports of 700 dengue cases detected at 45 non-KMC health set-ups had reached KMC through its morning collectors much before they were sent by the concerned diagnostic centres online, thereby implying that all the 1157 dengue cases detected at different non-KMC set-ups would have gone unreported had the KMC not begun collecting reports manually.

There is no denying the fact that digital inflow of reports is much better than going about the manual way. But in a country like India, where most of the non-government diagnostic clinics either refrain themselves from disseminating reports or deliberately procrastinate the process of report-dissemination, manual collection of reports has no alternative.

Other cities could try this trick for dengue surveillance for 2 reasons: One is, it will help them get reports of dengue from each and every diagnostic clinic within 24 hours, thereby enabling them to undertake prompt measures for disease prevention and the other is, it will help prepare an accurate database which is essentially required for planning long-term strategies for dengue prevention and control.

All concerned need to remember that most cities in India undertake measures only after the outbreak of dengue. Surprisingly, there's no proper dengue surveillance system, nor there is any entomologist-based infrastructure for vector control. Nobody knows how many people in India actually suffer from this disease every year. The reported numbers substantially underrepresent the full impact of the disease, according to a study reported in the *American Journal of Tropical Medicine and Hygiene*. [6] The study has yielded dreadful results; it has estimated an annual average of 57 lakh 78 thousand 406 clinically diagnosed dengue cases between 2006 and 2012, or 282 times the number reported by India, i.e. 20,474 per year. The total direct annual medical cost was 548 million US dollars. Ambulatory settings treated 67% of cases representing 18% of costs, whereas 33% of cases were hospitalised, comprising 82% of costs. 80% of the expenditures went to private facilities.

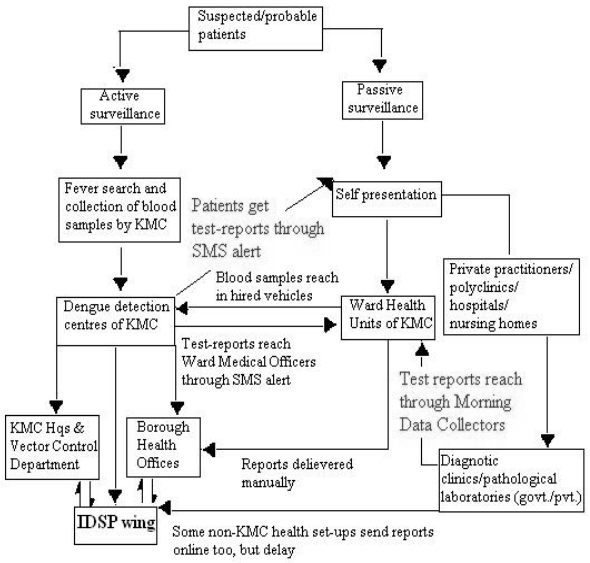

Figure 1. Dengue surveillance system introduced by the health department of Kolkata Municipal Corporation.

Given the situation, achieving reduction of dengue mortality by 50% and reduction of dengue morbidity by 25% by the year 2020, as targeted by the World Health Organization [7], is indeed very tough. Policy-makers of the country need to realise and act to improve the sorry scenario. If ignored, dengue will wreak havoc in the times to come.

4. Acknowledgements
Shri Atin Ghosh, Honourable Member of the Mayor-in-Council [Health], KMC, 5 SN Banerjee Road, Kolkata-700013, first conceived the idea of collecting dengue-reports from different non-KMC sources by sending KMC's own personnel on a daily basis.

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