Research Paper Healthcare

On Dengue Prevention Activities of the Health Department of Kolkata Municipal Corporation During 2013

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ABSTRACT

In 2012, an outbreak of dengue occurred in the city of Kolkata, India. To prevent its recurrence in 2013, the Health Department of Kolkata Municipal Corporation (KMC) undertook some unprecedented initiatives and brought down the number of dengue cases from 1852 with 2 deaths in 2012 to 238 with no deaths in 2013. The success came in through the route paved by a young, staid and sturdy political leader — Atin Ghosh. Anti-dengue activities carried out by the corporation during 2013 at the behest of Mr Ghosh are reported in this communication. Political leaders around the country may find this story quite inspiring.

KEYWORDS *Aedes aegypti*, Atin Ghosh, Dengue, Kolkata Municipal Corporation

1. Introduction

Here's the news to rejoice!!! The Health Department of Kolkata Municipal Corporation (KMC) has substantially slashed the number of dengue cases in a span of only one single year. It all happened in the city of Kolkata during 2013. And Atin Ghosh — Member of the Mayor-in-Council (Health and Engineering) of KMC — is the key person behind this thumping success.. The present communiqué is all about the KMC's anti-dengue activities carried out during 2013.



Pix1. Atin Ghosh, Member of the Mayor-in-Council (Health & Engineering) of KMC, speaking at the national seminar on malaria and other mosquito-borne diseases organised by the Directorate of National Vector Borne Disease Control Programme, Government of India, in Delhi on 28 June 2012. Photograph by: Dr. TK Mukherjee, Adviser (Health), KMC.

2. Methodologies

Dengue is a viral disease and is primarily spread by the species *Aedes aegypti*. There is no specific treatment for dengue, nor has any effective vaccine been developed yet against the disease. Abatement of *Ae aegypti* population remains the only option for prevention and control of dengue. In view of this, the Health Department of KMC undertook the following unprecedented initiatives during 2013 to prevent transmission of the disease.

2.1 Efforts Made to Strengthen Vector Control

2.1.1 Shifting of Vector Control Responsibilities from Medicos to Non-medicos

The area of KMC (206.2 sq km) is divided into 15 boroughs comprising a total of 144 wards. To step up vector control activities in the KMC area, one able staff at ward-level and one staff at borough-level were empowered to oversee vector control activities as the Ward Vector Control Incharge and Borough Vector Control Incharge respectively. This infrastructural change was made in March 2013. Pertinently, Medical Officers had been looking after vector control activities. in different wards of KMC since 1997. Mr Ghosh didn't want the doctors to waste time looking after vector control activities. Hence he asked them to focus mainly on clinical issues, besides looking after staff attendance. The ball started rolling accordingly.

2.1.2 Joint Drive for Elimination of Mosquito Breeding Sources Undertaken

In Kolkata, *Ae. aegypti* has changed its breeding habits. In the past, the mosquito used to breed more indoors; it was quite photophobic. The insect now breeds more outdoors; it has become photophilic [Biswas, Biswas, Mandal & Banerjee, 2014]. During rainy season, heaps of garbage, unused tyres, plastic containers, coconut shells, industrial scraps and other such discarded items lying stacked outdoors turn into breeding sources of *Ae. aegypti* and other species of mosquitoes. Clogged open surface drains containing rainwater too sometimes become the source of danger. Given the facts, eliminating mosquito breeding sources by the Health Department of KMC alone is just impossible. Other departments of KMC, such as the departments of Solid Waste Management, Building, Water Supply, Drainage and Engineering too need to take the buck. In view of this, a joint mosquito control drive involving the personnel of these departments was undertaken in each KMC ward at a weekly interval throughout the year.

2.1.3 Rapid Action Teams for Vector Control Formed

Fifteen Borough Rapid Action Teams (BRATs), each comprising 6 trained field workers, were formed in March 2013 and placed at 15 boroughs (@ 1 RAT per borough), besides 6 Central Rapid Action Teams (CRATs) formed earlier in two phases — 4 CRATs in December 2010 and 2 CRATs in September 2011 comprising 10-12 trained field workers each. Crosschecking vector control activities in different wards apart, these 21 RATs made thorough inspection of the premises of schools, colleges, universities, medical colleges, hospitals, police stations, office buildings, market places, housing complexes and under-construction buildings around the city for detection and destruction of *Ae. aegypti* and other mosquito larvae on a regular basis, following the guidelines of 3 Consultant Entomologists of KMC. A hired vehicle was provided to each RAT to ensure its mobility. Contingency measures for prevention of dengue too were undertaken by these Rapid Action Teams as and when required. The idea of forming Rapid Action Teams for vector

control was the brainchild of Atin Ghosh.



Pix2. The members of a Central Rapid Action Team is in quest of mosquito larvae. Photograph by: Baishakhi Biswas, Consultant Entomologist of KMC.

2.1.4 Three-tier Monitoring System Introduced

Vector control activities in 144 wards of KMC are carried out through 139 Ward Health Units. There are 6-8 Field Workers in each ward to undertake drive for detection and destruction of mosquito larvae on a daily basis. Activities of the FWs in a ward are cross checked by the concerned Ward VCI. The activities of different Ward VCIs of a borough are monitored by the respective Borough VCI with the assistance of his Borough RAT. And the services of 15 Borough VCIs are monitored by Consultant Entomologists. There are 3 Consultant Entomologists in the department. One Consultant Entomologist oversees vector control activities in 5 boroughs. Every day they visit 2-3 wards each during 10.30 am to 2.30 pm and crosscheck vector control activities in fields and report their observations directly to Mr Ghosh at weekly intervals. The 3 Entomologists work under the administrative control of the Chief Vector Control Officer. This three-tier system for monitoring vector control activities in the city of Kolkata was introduced by Mr Ghosh in March 2013.

2.1.5 Guidelines for Prevention of Mosquito Breeding at Construction Sites Issued

Preventing mosquito breeding at the sites of under-construction buildings is the buck of the concerned developers or promoters or contractors or house-owners. Hence they should take preventive measures on their own. In view of this, the Health Department of KMC issued these guidelines to the promoters/ developers/ contractors/ house-owners all across the city during 2013 at the behest of Mr Ghosh: **A.** Empty water reservoirs at weekly intervals. **B.** If you face any problem in periodic emptying of any water reservoir, do please sprinkle kerosene or diesel or mosquito larvicidal oil (MLO) on its water surface @ of 2 -3 litres per 100 linear or square metres at weekly intervals. **C.** Please procure 1 or 2 Knapsack Sprayers (each having a 16-litre capacity) from the local market and select 1-3 workers from your end for carrying out need-based larvicidal spray at your construction site. If required, technical knowhow for sprinkling/spraying will be provided by the visiting mosquito vector control squad of KMC. **D.** Mosquito control personnel from KMC will inspect your construction site every 7-15 days. If any sort of violation on your part with regard to implementation of the aforesaid anti-mosquito guidelines is found, legal steps will be taken by KMC against you as per the existing norms. **E.** Do please cooperate with KMC.

2.1.6 Larval Indices of *Aedes aegypti* were Reckoned Every Month

Three larval indices of *Ae. aegypti* — House Index (% of houses positive for *Ae. aegypti* breeding containers), Breteau Index (number of *Ae. aegypti* breeding containers per 100 houses) and Container Index (% of water containers positive for *Ae. aegypti* larvae) — were calculated in different dengue-prone wards by the Consultant Entomologists every month to assess the impact of *Ae. aegypti* control activities carried out by the FWs of different Ward Health Units.

2.1.7 Using Pupal Index of *Aedes aegypti* to Nab Deceitful Field Workers

Whether the Field Workers of a particular Ward Health Unit had been doing their job sincerely or not, this was ascertained by Entomologists by means of calculating the pupal index(PI) of *Ae. aegypti* (number of water containers with *Ae. aegypti* pupae per 100 houses). Greater the PI, lesser is the intensity of *Aedes* control drive.

2.1.8 Punitive Steps Undertaken

Apart from serving hundreds of legal notices u/S 496 of the KMC Act, 1980, cases too were filed against the concerned authorities/houseowners in violation of the KMC's directives to remove mosquitogenic conditions inside their premises. Authorities of one renowned medical college and one government-run hospital too were penalized by the Hon'ble Municipal Court for failing to obey the antimosquito guidelines of the corporation. To expedite the process of filing cases, a legal cell has of late been opened by the department following the instructions of Mr Ghosh. The job done is brilliant!

2.1.9 Blood Samples Tested at Private Pathological Laboratories were Crosschecked

Many blood samples tested positive for dengue at private pathological laboratories were crosschecked and found negative. This crosschecking was done at the 5 Dengue Detection Centres (DDCs) of KMC established by Mr Ghosh back in March-April of 2011. Since the Directorate of NVBDCP, the country's only government agency to formulate and monitor vector-borne disease control strategies — has not approved the use of Rapid Diagnostic Test Kits as tools for detection of dengue, Mr Ghosh — by writing personal letters to them — requested each and every private pathological laboratory to stop using RDT kits for detection of dengue. His appeal brought in mixed responses. Some of the laboratories listened to him and some didn't.

But Mr Ghosh is a different breed. He did not stop chasing the errant pathological laboratories. He prepared a list of all such laboratories and caused his department to crosscheck the blood samples that had tested positive at each of them.

2.1.10. Dissemination of Dengue-report Through SMS Alert

Since 12 September 2013, all the 5 DDCs of KMC have been disseminating dengue-reports to patients through SMS alert. Relevant software has been installed at each DDC to provide such facilities. This initiative is unique in the field of dengue control activities around the country.



Pix3: One of the 5 KMC-run Dengue Detection Centres. Free facilities for detection of dengue NS1 antigen and dengue IgM antibody are available at all the DDCs of KMC. Blood-test for dengue is done by ELISA method at each of these DDCs.

2.1.11. Activities Reviewed by Municipal Commissioner Through Video Conferencing

Dengue prevention in different KMC wards — including the weekly intersectoral drive for destruction of mosquito larvae — were critically reviewed by the Municipal Commissioner, Joint Municipal Commissioner and Controlling Officials of all

the concerned departments of KMC on every third Thursday of the month from January to December 2013 through video conference.

2.1.12. Ward-level Review Meeting on Vector Control Held by Mr Ghosh

To review vector control activities in all the 144 wards of KMC, Mr Ghosh held an exhaustive meeting at each borough involving the borough chairman/ chairperson, ward councillors, borough executive health officer, ward medical officers, consultant entomologist, borough VCI, ward VCIs and the personnel of some other concerned departments of KMC. These borough-level meetings were held during June to August 2013.

2.2 Activities Carried Out to Increase People's Awareness

During 2013, these 7 important messages were sent out in splits to increase people's awareness about dengue: **A.** Don't store water in any open container. **B.** Clean masonry tanks, drums, earthen pitchers/vats and other water storage containers properly at weekly intervals. **C.** Don't litter any open space with tyres, small plastic cups, earthen pots, bottles, coconut shells and domestic wastes, since they all help mosquitoes breed following the accumulation of little amount of rainwater in them. **D.** Dengue-spreading mosquitoes bite during the day-time. To avoid their bites, use mosquito-repellents liberally as and when required. **E.** If you suddenly catch fever, please visit a clinic of KMC. Free facilities for diagnosis of dengue and malaria and platelet count are available at that clinic. The clinic is located close to your residence. **F.** In case you become infected with dengue, please inform the health centre of KMC in your ward immediately so that KMC can take prompt measures for mosquito control. If you delay in sending the information, remember, the disease will spread in your area. **G.** Never go for testing of dengue by Rapid Kit. ELISA is the only recommended method.

To ensure better dissemination of these anti-dengue messages, Mr Ghosh caused his department to implement the following campaign tacks.

2.2.1 Workshop for Doctors Organised

To help them brush up their knowledge-base on national guidelines on diagnosis and treatment of dengue and other mosquito-borne diseases, one workshop for the practising primary care physicians of Kolkata was organised on 13 January 2013. Adepts in the subject from both the Directorate of NVBDCP and State Health Department were present in the workshop as resource persons.

2.2.2 Workshop for Ward Councillors and Medical Officers Organised

On 14 January 2013, one workshop was organised exclusively for ward councillors and ward MOs. Various issues concerning vector control — including the need for POLITICAL COMMITMENT — were discussed in the workshop by experts from the Directorate of NVBDCP.

2.2.3 High-level Meeting Organised

To trigger interests among the ward councillors of KMC about vector control, a high-level meeting involving ministers of the concerned departments, ward councillors, KMC's Leader of the Opposition, Secretaries of the Departments of Health and Municipal Affairs and many other dignitaries was organised by KMC on 28 January 2013. The city Mayor, Sovan Chatterjee, convened the meeting and Atin Ghosh spoke about the strategies planned by his health department for prevention of mosquito-borne diseases during 2013.

2.2.4 House-visits by Honorary Health Workers Made

From 1February to 31 December 2013, honorary health project workers — 5 to 6 workers per ward — made house-visits to collect information about fever cases and distribute publicity materials among the people. To supplement them, 100 days workers — deployed by ward councillors (@ 12 workers per ward) under the West Bengal Urban Employment Scheme — too were detailed; they worked from 1 March.

2.2.5 Ward-level Awareness Meetings Held

Five hundred awareness-raising meetings were organised during February to July (@ 3-5 meetings per ward), involving ward councillors and the local people. This sort of meeting had never been organised by KMC before.

2.2.6 Multicoloured Hoardings Put Up

For the first time in the history of KMC, as many as 780 multicoloured hoardings (8 ft x 6 ft each) — prepared in four different languages (Bengali, English, Hindi and Urdu) — were put up around the city during June to August to increase people's awareness about mosquito-borne diseases. Until 2012, the number of hoardings had never crossed 12.

2.2.7 Colourful Banners Displayed

15,000 colourful banners (6 ft x 3 ft each) were put up in 144 wards of KMC during May-July. Another 5,000 banners were put up in and around the campuses of medical colleges, hospitals, educational institutions, market places, office buildings and housing complexes during August-September. Additional 3,500 banners were put up at different pandals of Durga Puja (Hindu festival) during October.

2.2.8 Multicoloured and Multilingual Leaflets Distributed

500,000 multicoloured and multilingual leaflets containing anti-dengue messages — printed in four different languages (Bengali, English, Hindi and Urdu) — were distributed among the citydwellers. Prior to the beginning of Mr Ghosh's reign in 2010, the Health Department used to print most ordinary leaflets every time — either in Bengali or English (all in black-n-white) — and people would hardly read them.

2.2.9 Campaign by Auto-miking Mounted

Campaign by auto-miking was done — once a week in July, twice a week in August and September and once a week in October (till second week).

2.2.10 Educative Booklets Distributed

300,000 copies of a readable and adequately informative booklet (175,000 copies in Bengali, 75,000 in Hindi and 50,000 in Urdu) were distributed among the city people during May-August through ward councillors. Measures needed to prevent mosquito-bites; mosquito breeding and transmission of mosquito-borne diseases, together with the addresses of KMC-run malaria clinics and DDCs were communicated to the people through this booklet.

2.2.11 Anti-dengue Messages Disseminated Through Electricity Consumption Bills

For two consecutive months — July and August 2013, dengue alert was spread among the people of Kolkata through electricity consumption bills issued by the Calcutta Electric Supply Corporation Limited. As many as 500,000 consumers received such alert through their bills.

2.2.12 Screening of a Documentary Film Done

A documentary film of 17-minute duration was shown to people in different places of the city in August and September — from 10 am to 8 pm per day for all the seven days of the week — using two hired publicity vans each fitted with a mobile LED Digital Screen. The vans were hired at Rs. 8,000 per van per day. Let me confess very honestly that the idea of mounting such campaign too was the brainchild of Mr Ghosh.

2.2.13 Awareness Camps Organised

Seventy-six awareness camps — including 16 service-oriented health camps — were organised for 1 month in September.

2.2.14 Educative Leaflets on Mosquito Control Distributed Among Slum-dwellers

150,000 copies of a leaflet titled "Preventing mosquito breeding without wasting water"—printed in Bengali (75,000 copies), Hindi(50,000 copies) and Urdu(25,000 copies) — were distributed among slum-dwellers in June-July to help them learn about some simple techniques of preventing mosquito

breeding in domestic water storage containers without removing water from them.

3. Results

Going by the report provided by the Integrated Disease Surveillance Programme wing of KMC, in all 1852 confirmed cases of dengue with 2 deaths occurred in the city of Kolkata during 2012. In 2013, the number of dengue cases came down to 238 with no death.

4. Discussion

Dengue is of two kinds — DF (dengue fever) and DHF (dengue haemorrhagic fever). The city of Kolkata has been witnessing recurrent outbreaks of DF since 1824 and those of DHF since 1963. Officially, 241 people died of dengue here during 1963 to 2012 — two hundred deaths in 1963, 12 in 1990, 8 in 1996, 12 in 2005, 1 in 2006, 3 in 2008, 3 in 2010 and 2 in 2012 [Biswas, 2007, and the IDSP wing of KMC, 2013].

There is no specific treatment for dengue. No effective vaccine against this disease has been developed yet. *Aedes* control remains the only option for dengue prevention. Since this mosquito breeds primarily in and around human-dwellings, community participation is essentially required to prevent its procreation. Intersectoral cooperation is also needed in this regard. Mr Ghosh took no time to realise these issues. Hence he tried to address these three issues quite religiously to fight against dengue. And, needless to repeat, he has won the battle. Regrettably, political leaders in other parts of India are yet to wake up.



Pix 4: Atin Ghosh says: "If anyone violates the antimosquito guidelines of KMC, take legal step on an urgent basis. Don't compromise. Don't hesitate ..." Photograph by: Dr. AK Saha, MO, KMC.

Mosquito-bashing activities in most of the cities/towns around the country are still running under the administrative control of those health personnel (mostly medical men) who have no inkling of the subject. Without qualified entomologists, changing such dispiriting scenario is tough. But who bothers? In India, controlling officials of different state health departments by and large are still inclined to believe that vector control is a very easy job and doctors can steer it quite easily. How shocking! Had there been just one political leader everywhere like Mr Ghosh, it would have been a different story. My esteemed state health ministers and other political leaders of India, are you listening? Instead of wasting any further time, please cause to invigorate mosquito control activities, recruit qualified entomologists on a war-footing and create an ambience for them to work smoothly and independently for prevention and control of mosquito-borne diseases.

5. Conclusion

In the true sense, Atin Ghosh is an administrator. He knows how to develop public health activities by mobilising funds and human resources. Just 2 months after taking over the charge of the Health Department of KMC as an MMIC, Mr Ghosh established a mosquito research laboratory, which is first of its kind in Eastern India. In Kolkata, he has ushered in a new era of vector control activities to conquer mosquito-borne diseases. India needs one such philanthropic leader everywhere to change the existing sorry state of mosquito-borne disease prevention activities. Why do we lack entomologists everywhere? This dismal scenario, remember, has not developed overnight. Directors of different state health services, have you ever tried to recruit entomologists in your departments?



Pix 5. Mosquito research laboratory of KMC, brainchild of Atin Ghosh. Photograph by: Susanta Srivastava.

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