

To the Editors:

Feasibility of mapping of dengue fever patients admitted to medical wards of Teaching Hospital Karapitiya using Google maps® app in mobile phones or tablets

J S Hewavithana¹, D R Palangasinghe¹, N J Dahanayaka²

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Nearly 185,000 dengue fever patients were reported from Sri Lanka in 2017 [1]. There is a well-established dengue surveillance programme in Sri Lanka but this massive dengue outbreak indicates the necessity of new measures to combat against dengue. One such example is the dengue cluster map maintained by the National Environmental Agency of the government of Singapore [2].

A previous study conducted in Anuradhapura showed the feasibility of mapping dengue fever patients using locus free mapping [3]. However in 2016 Google maps® was upgraded with the street viewing facility in Sri Lanka. In addition, with current Google maps® it is possible to get latitudes and longitudes of places without any additional software. We carried out a descriptive cross sectional study to assess the feasibility of mapping dengue fever cases using a mobile phone or a tablet with Google maps® app and internet connection.

The study was carried out from late October to late December 2016. Confirmed dengue fever patients admitted to all medical wards of Teaching Hospital Karapitiya were recruited by random sampling until the sample size was fulfilled. Considering that there are multiple characteristics of interest with different population proportions; sample size was calculated using 50% as the anticipated population proportion in order to achieve maximum sample size. After adding 10% dropout rate the required sample size was 165. To identify geographical locations, the area was typed in Google maps®. Street view was used to pin point locations. When street view was available only up to the neighbouring byroad, locations beyond that point were

pin pointed using the aerial view. Coordinates were obtained from the aerial satellite view by dropping a pin. Data was uploaded to a Google map. Two or more cases having onset within 14 days and located within 150m of each other was considered as clustering. Ethical clearance was obtained from the Ethics Review Committee of Faculty of Medicine, University of Ruhuna.

Out of 634 suspected dengue fever patients admitted to medical wards of Teaching Hospital Karapitiya data was collected from 165 (26%) confirmed patients. Dengue fever was confirmed by positive NS1 antigen alone (n=126), dengue IgM antibodies alone (n=33) or both (n=6). One hundred and fifty nine (96.3%) households were identified using aerial satellite view. Street view was available right up-to the households in 90 (54.5%) patients. In a further 69 (41.8%) patients, beginning of the neighboring road of the household was located with street view. Street view was not helpful in six patients. Out of 53 patients who were employed or schooling 43 (81.1%) were able to locate their working place or school accurately. Clustering was noted in Makululuwa/Milliduwa, Gintota, Hapugala, Kalegana, Hiribura, Galle town area and Nugaduwa (Figure 1).

Figure 2 was created by amalgamating geographical locations of households (dots) with work places or schools (cross). This reveals possible exposure to dengue fever at work places or schools.

A single data collector collected data from 26% of adult dengue fever patients admitted to the largest Teaching Hospital in the Southern Province and majority

¹University Medical Unit, Teaching Hospital Karapitiya, Sri Lanka, ²Department of Medicine, University of Ruhuna, Sri Lanka.

Correspondence: JSH, e-mail: <hewavithanajanakanajeewa@gmail.com>. Received 27 April 2018 and revised version accepted 01 May 2018.



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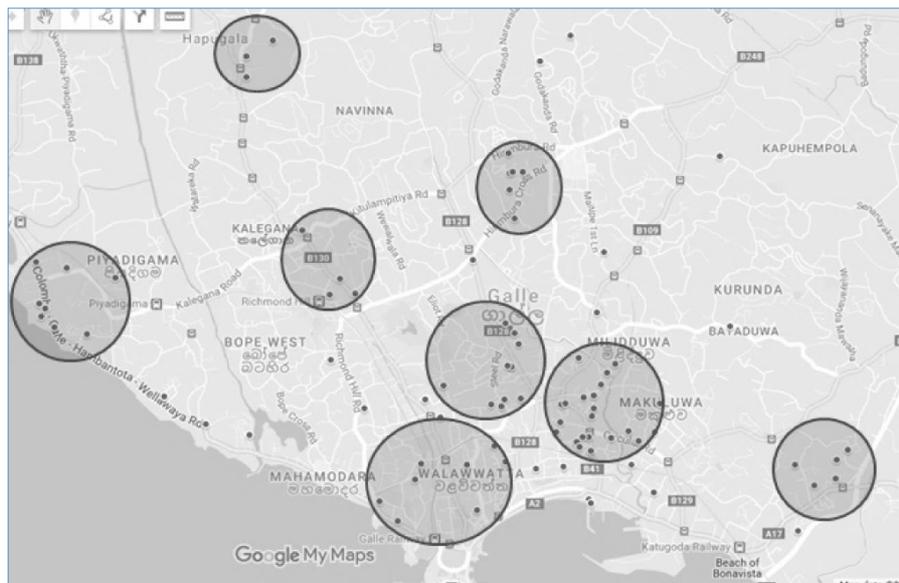


Figure 1. **Geographical distribution of households of adult dengue fever patients.**



Figure 2. **Dengue fever case distribution after amalgamating geographical locations of households (dots) with working place/school (cross).**

were able to identify their households or school or work places using Google maps®. This is a feasible method and can be used to produce case distribution maps at very low cost. If information is gathered from all hospitals and sent to a central unit, a common map can be created and updated frequently. This will enable immediate identification of dengue hot spots and urgent implementation of targeted control measures in and around hot spots and to update general public and authorities.

Conflicts of interest

There are no conflicts of interest.

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