



WEEKLY EPIDEMIOLOGICAL REPORT

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Ministry of Health, Nutrition & Indigenous Medicine

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Dengue Epidemic 2017: Evidence and Lessons Learnt — Part 1

This article, discussed in 5 parts, will try to summarize the events behind the Dengue epidemic in 2017 and the actions that were taken to mitigate the situation.

Background

Dengue is the most important and rapidly expanding mosquito-borne viral infection, according to WHO, and more than half of the world's population are reported to be living in areas where there is high-risk of Dengue. No doubt that Dengue exerts a significant burden on populations, health systems and economies around the world, and Sri Lanka is no exception. Dengue Fever (DF) and its severe form, Dengue Haemorrhagic Fever (DHF) tend to occur in outbreaks and the frequency and magnitude of dengue epidemics have increased in the recent past from many parts of the world.

The occurrence of an illness in a community or a region, in excess of the expectancy, is termed as an outbreak and multiple outbreaks in different locations are known as an epidemic. It should be noted that “the sudden unexpected increase” should be

different from the seasonal peaks which are “expected increases” that usually occur (e.g. following a rainy or wet season). Sri Lanka also experiences such seasonal increases in the incidence of Dengue during monsoonal rainy seasons. During the five-years from 2012 to 2016, nearly 800 Dengue cases were reported per week in average (overall 5-year data ranged from 357 to 1251, with a mean of 792) has been reported and this varied with the seasonal monsoonal rains. A mid-year peak and an end-of-the-year peak corresponding to the rainy seasons (South-western and North-eastern Monsoonal rains) is typically seen and accordingly, more dengue cases are reported per week during these peaks (see Figure 1).

Any outbreak can exert an increasing pressure on the health system, as hospitals and outpatient clinics become overwhelmed by the increased numbers in patients, be it due to Dengue or other illnesses. Such outbreaks can cause a major public health crisis with high mortality figures as a result

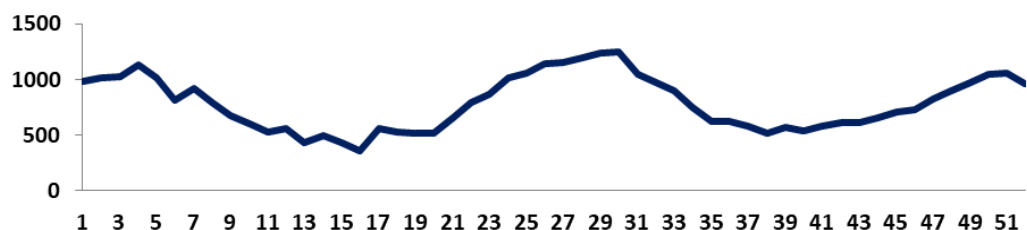


Figure 1: Average Weekly Reporting of Dengue Cases During Last 5 Years (2012-2016) (Source: H399 Data)

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WEB SRI LANKA 2018

RDHS Area	Average Incidence in last 5 years (2012 to 2016)	Incidence in 2016	Incidence in 2017
Colombo	503.2	700.6	1418.9
Gampaha	252.5	302.7	1323.4
Kalutara	190.4	278.2	860.9
Kandy	162.4	284.1	990.3
Matale	125.3	226.2	616.1
Nuwara Eliya	40.1	56.3	117.9
Galle	138.1	280.6	553.3
Hambantota	106.7	164.1	419.5
Matara	89.4	141.3	975.9
Jaffna	251.2	410.7	996.0
Kilinochchi	69.7	70.6	418.1
Mannar	175.1	220.3	500.0
Vavuniya	86.8	147.4	582.9
Mulativu	130.2	192.1	402.0
Batticaloa	157.5	111.9	1000.6
Ampara	66.9	98.7	345.6
Trincomalee	106.9	124.7	1213.9
Kalmunai	131.0	231.4	697.5
Kurunegala	135.3	152.9	665.2
Puttalam	118.7	130.8	964.7
Badulla	88.3	138.9	429.5
Moneragala	64.1	99.3	667.7
Ratnapura	214.2	274.9	978.2
Kegalle	174.2	174.4	1090.2
Anuradhapura	59.8	81.0	317.0
Polonnaruwa	95.8	113.1	325.4
ALL ISLAND	189.4	260.6	865.9

Table 1: Annual Incidence of Dengue (Cases per 100,000 Population) in 2017, 2016 & Last 5 years (2012 to 2016) by RDHS Area (Source: H399)

of overwhelming hospital admissions stretching clinical management facilities beyond tolerable limits.

The year 2016, had already recorded the highest ever number of cases thus far, which was 55,150 cases (an incidence of 261 cases per 100,000 population). As it turned out to be, 2017 recorded an unprecedented number of 185,688 cases, an incidence rate of 866, which was more than 3 times the values in 2016 and more than 4.5 times the average in the last 5 years (see Table -1).

The Methodology of Disease Surveillance

At present, Dengue surveillance in Sri Lanka is spear-headed at national level by the Epidemiology Unit of the Ministry of Health and is mainly carried out using 2 modalities. The paper-based routine surveillance through the disease notification system (H544) has been used since 1996, when Dengue was declared as a notifiable disease. This data is compiled as a weekly report (H399) and published by the Epidemiology Unit. This paper-based system has a lag-time of at least 4-7 days from the time of notification, to initiation of necessary action

by the local public health officials (at field level). This delay has been a major concern in effectively carrying out public health preventive activities like early space spraying to remove adult mosquitoes from the environment and removal of mosquito breeding places.

As a solution, “DenSys”, an on-line notification system was developed in 2012 where the relevant information of Dengue patients from sentinel hospitals (over 90, at present) situated in all parts of the country are uploaded into this web-based system and is made available to the local public health officials real-time. Relevant information of Dengue patients are entered into the system by trained personnel from these sentinel hospitals (including the private sector). Speedy availability and handling of information has made this a robust and very expedient notification system especially during outbreaks.

The following description of the 2017 outbreak is mainly based on the data obtained through the official routine notification system (H399).

Discussion

Using regression analysis methods, research has shown that changes in the meteorological, entomological, and epidemiological variables may correlate with subsequent possible dengue outbreaks. Still, due to the highly complicated transmission dynamics of dengue complex including interactions between the Aedes vector, all 4 serotypes the Dengue virus and the human host (considering the age, habitat, occupation, travel history, behaviour and other activities) has failed to yield spatial and temporal outbreak prediction models. Existing predictive models, nevertheless, tend to focus on smaller spatial units, and these are often inadequate for initiating public health control interventions as district or country-level responses.

The following discussion of the 2017 outbreak is mainly based on comparing the average monthly cases for the last 5 years (from 2012 to 2016) at each district level, taken as the reference (baseline).

The activities to mitigate and control the outbreak situation, by The Ministry of Health through the Epidemiology Unit, National Dengue Control Unit and Disaster Management Unit (at central level) and through the Provincial and District Level Health Departments will be discussed later.

(to be continued...)

**Compiled by Dr. M. B. Azhar Ghouse,
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Table 1: Selected notifiable diseases reported by Medical Officers of Health 06th - 12th Jan 2018(02nd Week)

RDHS Division	Dengue Fever		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Chickenpox		Meningitis		Leishmaniasis		WRCD		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	T*	C**	
Colombo	330	590	1	2	1	1	0	1	0	1	6	10	0	0	0	0	0	0	0	11	16	3	4	0	1	56	95
Gampaha	194	402	2	4	0	0	0	0	2	1	5	5	0	0	1	2	0	0	14	20	0	0	0	0	77	100	
Kalutara	120	244	1	3	0	0	0	0	0	0	7	17	0	0	0	0	0	0	14	20	3	4	0	0	72	100	
Kandy	114	271	1	2	0	0	0	0	0	0	1	4	5	7	0	0	0	0	8	12	1	1	0	1	63	100	
Matale	50	82	0	1	0	0	0	0	0	0	1	1	0	0	1	1	0	0	1	1	0	0	0	1	65	100	
Nuwareliya	2	8	0	0	0	0	0	1	0	0	1	1	0	1	0	0	0	0	6	9	1	1	0	0	15	100	
Galle	21	39	0	0	0	0	0	0	0	0	4	16	2	3	0	0	0	0	2	3	0	0	1	1	45	50	
Hambantota	33	64	1	1	0	0	0	0	0	0	5	6	2	2	0	0	0	0	4	8	1	1	57	72	58	100	
Mataru	44	61	0	2	0	0	1	1	10	9	15	0	0	0	0	0	0	0	7	10	0	0	8	19	65	100	
Jaffna	156	386	4	6	0	0	0	5	5	0	0	24	52	0	0	0	0	0	6	9	0	0	0	0	21	93	
Kilinochchi	8	19	1	3	0	0	0	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	25	100	
Mannar	4	7	3	5	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	6	0	0	0	0	20	100	
Vavuniya	20	46	0	0	0	0	1	3	0	0	1	1	0	1	0	0	0	0	0	0	1	1	0	0	50	100	
Mullaitivu	2	8	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	67	90	
Batticaloa	143	311	4	9	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	1	1	1	0	68	100	
Ampara	6	6	1	2	0	0	0	0	0	0	1	4	0	0	1	1	0	0	3	4	0	0	0	0	50	100	
Trincomalee	26	60	1	4	0	0	0	1	0	0	3	4	2	3	0	0	0	0	7	10	0	0	1	1	36	100	
Kurunegala	133	271	1	5	1	1	0	0	1	1	7	13	3	3	1	1	0	0	12	19	1	2	3	6	71	100	
Puttalam	126	275	1	2	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	5	1	2	0	0	77	100	
Anuradhapura	25	57	3	5	0	0	0	0	0	0	4	9	3	3	0	0	0	0	8	10	0	0	5	6	55	95	
Polonnaruwa	9	21	0	0	1	1	0	0	0	0	5	14	0	0	0	1	0	0	4	6	0	2	2	4	86	100	
Badulla	22	46	7	11	0	0	1	2	0	0	2	8	2	3	2	2	0	0	10	17	2	5	0	0	48	97	
Monaragala	45	98	3	6	0	0	0	1	1	1	12	28	2	3	1	1	0	0	1	8	0	0	2	2	27	100	
Ratnapura	46	96	7	16	4	4	3	3	0	0	13	20	1	1	1	1	0	1	8	12	4	7	33	45	44	100	
Kegalle	28	79	0	3	0	0	0	0	0	0	2	6	1	1	1	3	0	0	4	8	0	0	0	0	68	100	
Kalmune	136	309	0	1	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	3	0	1	0	0	38	100	
SRILANKA	1843	3856	42	93	7	7	7	21	18	22	86	184	49	85	10	14	0	1	133	217	19	32	11	159	55	96	

Source: Weekly Returns of Communicable Diseases (WRCD).
 *T=Timeliness refers to returns received on or before 12th January, 2018 Total number of reporting units 349 Number of reporting units data provided for the current week: 331 C**=Completeness
 A = Cases reported during the current week. B = Cumulative cases for the year.

Table 2: Vaccine-Preventable Diseases & AFP

06th – 12th Jan 2018 (02nd Week)

Disease	No. of Cases by Province									Number of cases during current week in 2018	Number of cases during same week in 2017	Total number of cases to date in 2018	Total number of cases to date in 2017	Difference between the number of cases to date in 2018 & 2017
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	00	00	00	00	00	00	00	00	00	03	01	04	- 75 %
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	03	00	00	00	00	00	01	00	00	04	02	07	10	-30 %
Measles	03	00	00	00	00	00	00	00	00	03	06	03	12	- 75 %
Rubella	00	00	00	00	00	00	00	00	00	00	00	02	00	0 %
CRS**	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Tetanus	00	00	01	00	00	00	01	00	00	02	00	03	00	0 %
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Japanese Encephalitis	00	00	00	00	00	01	00	00	01	02	00	03	04	- 25 %
Whooping Cough	00	01	00	00	01	00	00	00	00	01	01	01	01	0 %
Tuberculosis	62	33	22	05	08	00	00	04	05	139	103	287	289	- 0.6%

Key to Table 1 & 2

Provinces: W: Western, C: Central, S: Southern, N: North, E: East, NC: North Central, NW: North Western, U: Uva, Sab: Sabaragamuwa.
RDHS Divisions: CB: Colombo, GM: Gampaha, KL: Kalutara, KD: Kandy, ML: Matale, NE: Nuwara Eliya, GL: Galle, HB: Hambantota, MT: Matara, JF: Jaffna, KN: Killinochchi, MN: Mannar, VA: Vavuniya, MU: Mullaitivu, BT: Batticaloa, AM: Ampara, TR: Trincomalee, KM: Kalmunai, KR: Kurunegala, PU: Puttalam, AP: Anuradhapura, PO: Polonnaruwa, BD: Badulla, MO: Moneragala, RP: Ratnapura, KG: Kegalle.

Data Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Neonatal Tetanus, Whooping Cough, Chickenpox, Meningitis, Mumps., Rubella, CRS,

Special Surveillance: AFP* (Acute Flaccid Paralysis), Japanese Encephalitis

CRS** =Congenital Rubella Syndrome

NA = Not Available

Dengue Prevention and Control Health Messages

Look for plants such as bamboo, bohemia, rampe and banana in your surroundings and maintain them free of water collection.

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Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail to chepid@slt.net.lk. **Prior approval should be obtained from the Epidemiology Unit before publishing data in this publication**

ON STATE SERVICE

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