



MONTHLY DENGUE UPDATE

A publication of the National Dengue Control Unit
Ministry of Health, Sri Lanka



Volume 01 Issue 04

May 2021

CONTENTS

PAGE

| | |
|---|---|
| 1. <i>Featuring article</i> | 1 |
| 2. <i>Summary of entomological and epidemiological surveillance data – April 2021</i> | 5 |
| 3. <i>Dengue forecast</i> | 7 |
| 4. <i>News update</i> | 7 |

Dengue – An overview of distribution

Dengue is a mosquito-borne viral disease caused by 4 closely related viruses: DENV 1, DENV 2, DENV 3 and DENV 4. All four serotypes cause human disease.

Of all infected people, 75% - 80% will remain asymptomatic while the rest will have symptomatic disease. The clinical spectrum of Dengue ranges from self-limited Dengue Fever (DF) to more severe Dengue Haemorrhagic Fever (DHF) and life-threatening Dengue Shock Syndrome (DSS). Among those infected, a majority will have simple dengue fever and only 1% - 2% will develop into DHF or DSS.

Infection with one serotype will provide lifelong immunity to that specific serotype but does not protect against the other serotypes. Subsequent infection with other serotypes puts the individual at greater risk of developing a severe form of Dengue if not diagnosed and treated in time.

History

It is postulated that all four dengue viruses (DENV1-4) originated in monkeys in bygone era. They independently jumped to humans in Africa or Southeast Asia between 100 to 800 years ago. Since then, Dengue remained a relatively minor, geographically restricted disease until the middle of the 20th century.

The first record of a patient of probable dengue fever is in a Chinese medical encyclopedia from the Jin Dynasty (265–420 AD) which referred to as “water poison” associated with flying insects. The earliest recognized Dengue epidemics occurred almost simultaneously in Asia, Africa, and North America in the 1780s, shortly after the identification and naming of the disease in 1779. The first confirmed patient was reported by Benjamin Rush, who coined the term "breakbone fever" due to the intensity of the symptoms of myalgia (muscle pain) and arthralgia (joint pain) ^[1].

Viral aetiology and the transmission by mosquitoes were discovered in the 20th century. The global spread of dengue is attributed to population movements during World War II. The first epidemic of dengue haemorrhagic fever (DHF) was described in South East Asia, Manila in 1953. Epidemics of dengue has become more common since the 1980s.

Global situation of dengue

Before 1970, only nine countries had experienced severe dengue epidemics. At present, the disease is endemic in more than 100 countries in African, the Americas, Eastern Mediterranean, South-East Asia and Western Pacific regions; the Americas, South-East Asia and Western Pacific regions are the most seriously affected.

According to the World Health Organization (WHO) estimates, 390 million dengue infections occur every year (95% CI: 284–528 million) worldwide, out of which 96 million (95% CI: 67–136 million) present with clinical manifestations (with any severity of disease; DF, DHF and DSS) [2]. Another study, on the prevalence of dengue, estimates that 3.9 billion people in 129 countries

are at risk of infection with dengue viruses; 70% of the actual burden is in Asia [3].

The following map published by the WHO indicates the distribution of dengue worldwide in the year 2016.

Distribution of dengue, worldwide, 2016

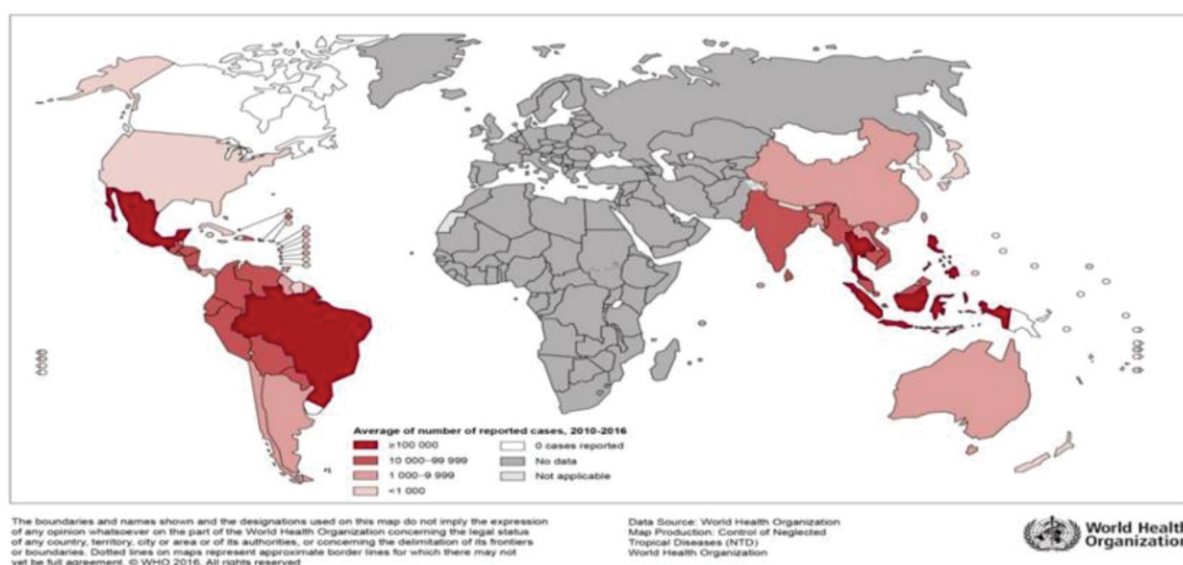


Figure 1: Global distribution of Dengue 2016

Sri Lankan situation

First serologically confirmed dengue patient was detected in 1962 in the Western Province. During 1965-1968, the first epidemic was reported with 51 cases and 15 deaths with a case fatality rate of 30%.

After a period of relative quiescence, resurgence of disease occurred in 1990 with 1350 cases and 54 deaths with a case fatality rate (CFR) of 4%. Since the year 2000, total cases over 5000 per year including both DF and DHF, has been experienced in Sri Lanka with regular outbreaks. Reporting of cases has been gradually increased yearly since it became a notifiable disease in 1996. Reduction of CFR to less than 1% was observed from 1997 (Figure 2).

With the increase of dengue cases since 2000, the level of endemicity also has varied. From 2000 to 2008, a period close to a decade, annual cases varied from 5000 – 10000. The massive outbreak in 2009 with the reported dengue cases of 35095 and 346 dengue deaths (CFR 0.99%), led to an increase in the endemicity level about five-fold higher than the previous value. For the last two decades, this was ranging from 30000 – 50000 dengue cases.

Country faced its worst outbreak in 2017 with 186,101 cases and 440 deaths (CFR 0.24%). This was followed by another massive outbreak in 2019 with over 100 000 cases (105 049) with 157 dengue deaths.

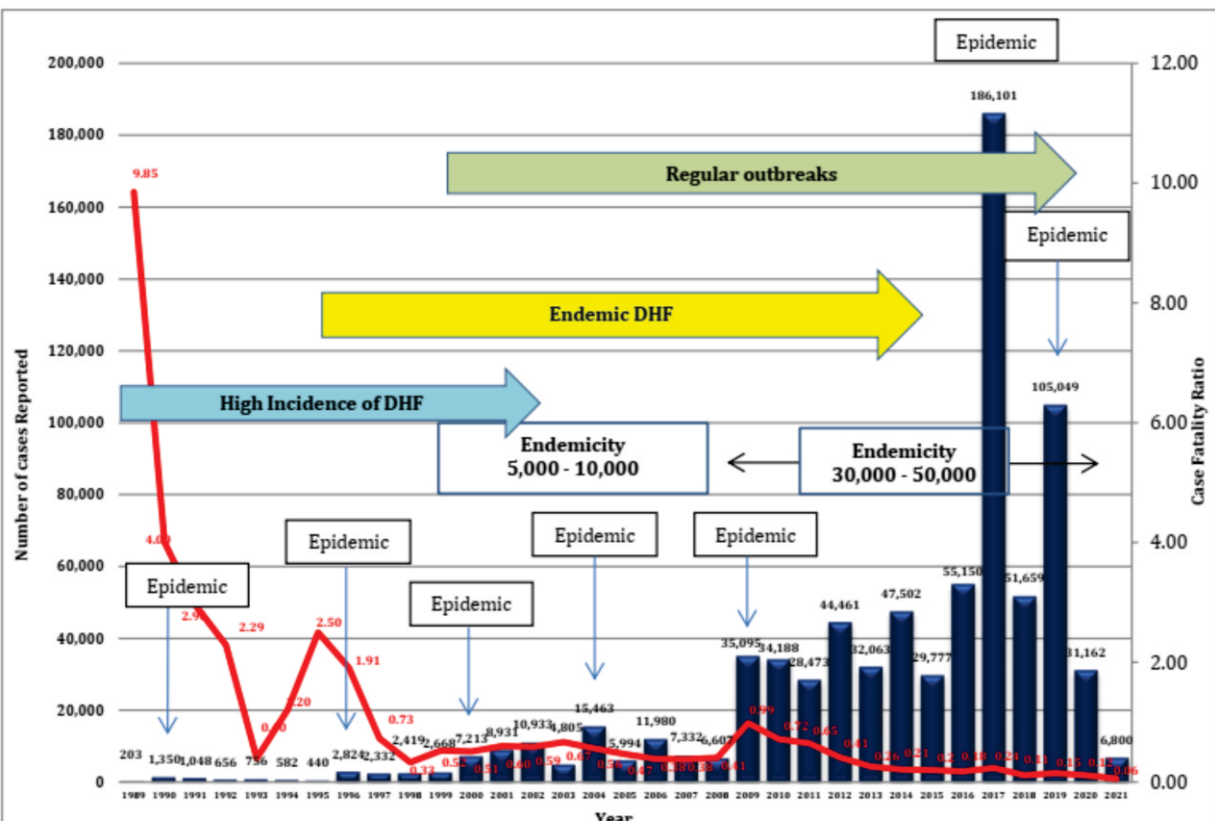


Figure 2: Dengue trend and CFR of dengue from 1989 to April 2021

The incidence of dengue varied during the last 30-year period. From extremely low incidence in late 1980 to mid-1990, a gradual increase has been noted with several high peaks due to outbreaks as shown in figure 3.

The CFR had been high upto late nineties with the reporting of dengue haemorrhagic fever and since 1997, it was maintained below 1%. During the last three years, CFR had been further reduced to below 0.2%.

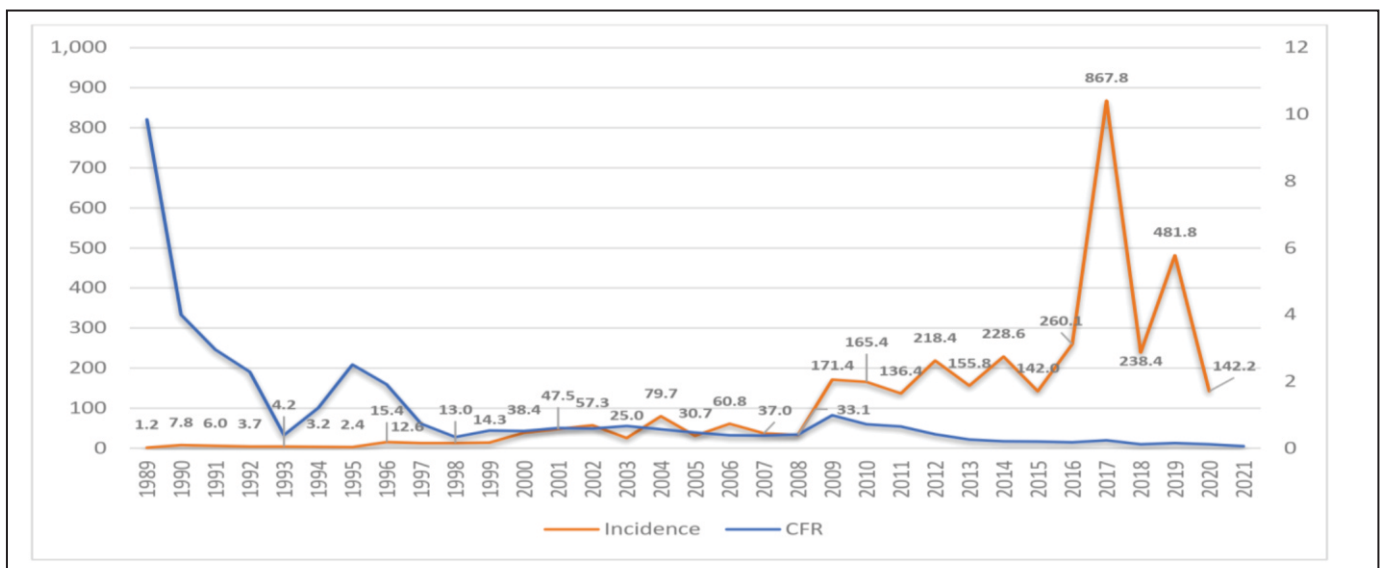


Figure 3: Dengue Incidence and CFR from 1989 to 2021

The district-wise incidence of dengue cases in 2020 is shown in figure 4. The highest incidence, 641.97 per 100 000 population, was reported from Batticaloa district due to an outbreak which started in the latter part of the year (39th week). Trincomalee (532.02) and Jaffna (347.34) districts reported the second and third highest incidence respectively.

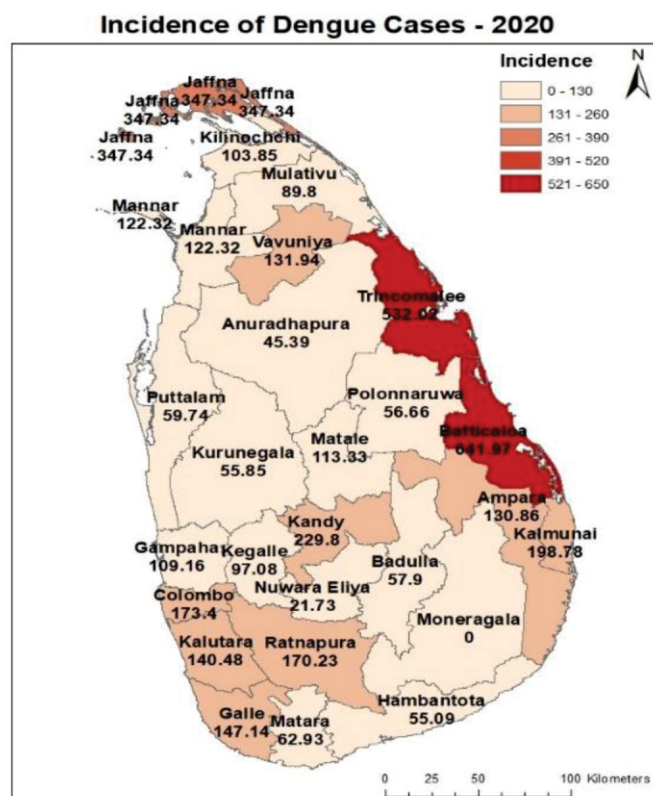


Figure 4: District-wise incidence of dengue 2020

The sex distribution of dengue cases reported in 2020 is shown in figure 5.

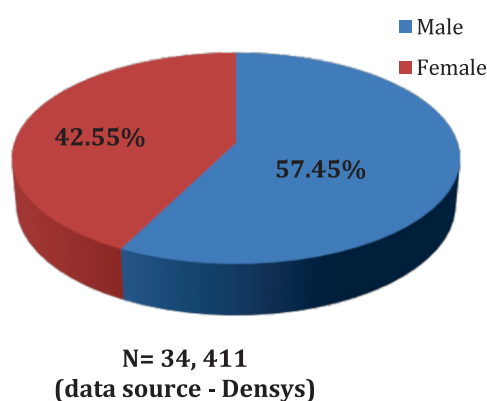


Figure 5: Sex distribution of dengue cases 2020

As shown in the age distribution of dengue cases (figure 6), more than one fourth of cases (27.4%) were reported among school-age children.

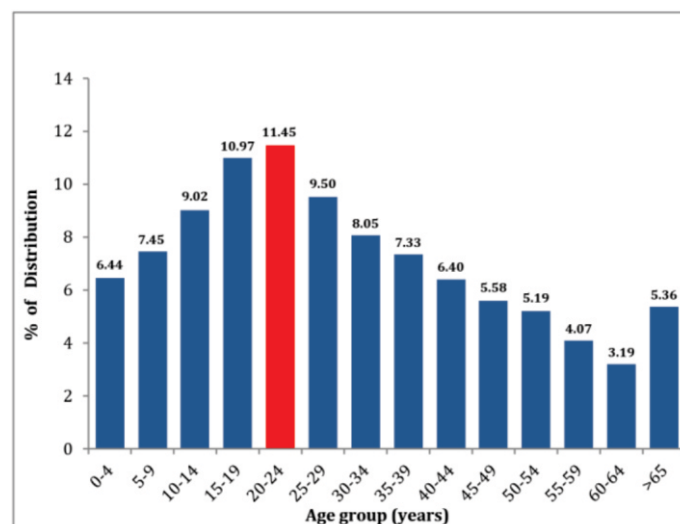


Figure 6: Age distribution of dengue patients reported in 2020

The determinants of dengue will be presented in a subsequent publication.

References

- [1] <http://www.denguevirusnet.com/history-of-dengue.html>
- [2] Bhatt, S., et al., The global distribution and burden of dengue. *Nature*, 2013. 496(7446): p. 504–507.
- [3] Brady, O.J., et al., Refining the global spatial limits of dengue virus transmission by evidence-based consensus. *PLOS Neglected Tropical Diseases*, 2012. 6(8): p. e1760.

Compiled by: Dr. Indika Weerasinghe, Medical officer/ NDCU

2. SUMMARY OF ENTOMOLOGICAL AND EPIDEMIOLOGICAL SURVEILLANCE DATA – April 2021

| Province | District | Entomological surveillance data | | | | Epidemiological surveillance data | |
|----------|--------------|---|----------------|------------|---|-----------------------------------|------------|
| | | (Source - returns of entomology surveys received by NDCU) | | | | (Source – Epidemiology Unit) | |
| | | No. of Premises | | | Main type of containers positive for larvae and Percentage positivity | Month | |
| | | Inspected | Positive Found | Positive % | | April | Cumulative |
| WP | Colombo | 1600 | 170 | 10.63 | Discarded items (28.4%), Temporary removed items (28.4%), Ornamental items (9.5%) | 269 | 734 |
| | Colombo MC | 223 | 18 | 8.1 | Temporary removed items (64%), Concrete slabs (20%), Ornamental items (12%) | 106 | 275 |
| | Gampaha | 825 | 80 | 9.7 | Discarded items (32%), Temporary removed items (24%), Covering items (16%) | 172 | 521 |
| | Kalutara | 1273 | 123 | 9.43 | Discarded items (34.4%), Temporary removed items (15%), Tyres (11%3) | 111 | 351 |
| | NIHS | 502 | 53 | 10.6 | Temporary removed items (40%), Discarded items (23.38%), Covering items (10%) | | |
| CP | Kandy | 2305 | 134 | 5.81 | Discarded items (31.7%), Water storage barrels (16.5%), Ornamental items (12.7%) | 94 | 242 |
| | Matale | 700 | 16 | 2.29 | Discarded items (55.6%), Ornamental items (22.2%), Natural item (11.1%) | 5 | 33 |
| | Nuwara Eliya | 409 | 18 | 4.4 | Water storage barrel (47.4%), Discarded items (31.6%), Tyres (10.5%) | 9 | 21 |
| SP | Galle | 900 | 111 | 12.33 | Discarded items (31.41%), Ornamental items (12.82%), Covered items (12.82%). | 44 | 93 |
| | Hambantota | 933 | 88 | 9.43 | Water storage barrels (23.3%), Discarded items (16.3%), Water storage other (13.2%) | 47 | 120 |
| | Matara | 1600 | 143 | 8.94 | Water storage other item (22.33%), Discarded items (19.42%), Ornamental items (13.11%) | 60 | 140 |
| SGP | Ratnapura | 1075 | 102 | 9.49 | Discarded items (34.1%), Water storage barrel (17.6%), Tyres (10.9%) | 72 | 218 |
| | Kegalle | 2327 | 187 | 8.04 | Discarded items (31.9%), Water storage barrel (14.6%), Ornamental items (14.6%) | 95 | 188 |
| UP | Badulla | 74 | 6 | 8.11 | Discarded items (37.5%), Water storage barrel (25%), Tyres (12.5%) | 15 | 35 |
| | Monaragala | 1770 | 187 | 10.56 | Discarded items (53.1%), Tyres (12.4%) Water storage barrel (8.8%), Covering items (8.8%) | 19 | 44 |
| NP | Jaffna | 1748 | 51 | 2.92 | Water storage other items (30.19%), Water storage cement tanks (15.09%), Discarded items (15.09%) | 11 | 94 |
| | Kilinochchi | 200 | 4 | 2 | Water storage barrel (60%), Temporary removed items (40%) | 4 | 20 |
| | Mannar | 400 | 43 | 10.75 | Discarded items (25%), Water storage other (23.21%), Ornamental items (12.5%) | 5 | 18 |
| | Vavuniya | 1328 | 44 | 3.61 | Discarded items (36.84%), Water storage other (14.04%), Pet feeding (14.04%) | 4 | 24 |
| | Mullativu | 175 | 8 | 4.57 | Water storage other (33.3%), Covering items (22.2%), ornamental items (22.2%) | 0 | 3 |

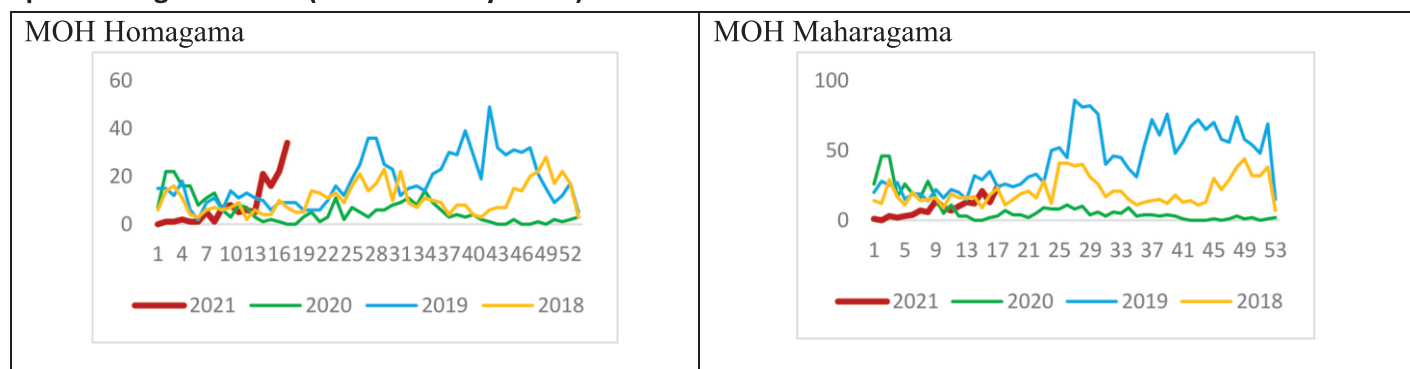
| | | | | | | | |
|------------------|--------------|--------------|-------------|------------|---|-------------|-------------|
| EP | Batticaloa | 1797 | 58 | 3.23 | Other (33.4%), Temporary removed item (12.1%), Discarded items (7.6%), Pet feeding (7.6%) | 304 | 2762 |
| | Ampara | | | | Data not received | 7 | 17 |
| | Trincomalee | 535 | 23 | 4.3 | Water storage other (27.3%), Water storage barrels (23.8%), Temporary removed items (13.7%) | 15 | 82 |
| | Kalmunai | 400 | 18 | 9 | Other items (48%), discarded items (24%), Water storage Other items (12%) | 77 | 199 |
| NWP | Kurunegala | 1355 | 160 | 11.8 | Discarded items (26.3%), Water storage other (10.7%), Ornamental items (9.5%) | 167 | 399 |
| | Puttalam | 701 | 26 | 3.7 | Discarded items (36.25%), Tyres (12.5%), Water storage other (10%) | 56 | 165 |
| NCP | Anuradhapura | 210 | 14 | 6.67 | Water storage barrel (29.4%), Other items (23.53%), Discarded items (17.65%) | 20 | 56 |
| | Polonnaruwa | 200 | 9 | 4.5 | Discarded items (44.4%), Ponds (22.2%), Covering items (11.1). | 9 | 25 |
| Sri Lanka | | 25754 | 1926 | 7.5 | Discarded items (30.7%), Temporary removed items (10%) Water storage barrel (9.6%) | 1797 | 6879 |

* Resistance monitoring was not done due to the current Covid-19 situation.

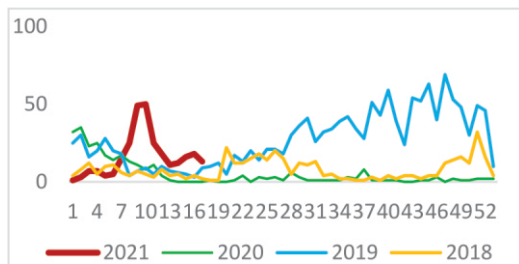
| Summary of Adult Surveys | | | | |
|--------------------------|---------------|-------------------------|---|--|
| District | MOH | GN area | Findings | |
| Matara | Matara MC MOH | Walgama Sunanda Mawatha | Outdoor Findings -8.00am-1.00pm 2021/03/31-4/01 | <i>Aedes albopictus</i> female=01 Abdominal Condition – Blood fed |
| Kalmunai | Akkaraipattu | KT-II | Indoor Findings -8.30am- 11.10am 2021/04/17 | <i>Aedes aegypti</i> female=4 <i>Aedes aegypti</i> male=17 |
| Hambantota | Ambalanthota | Waduruppa | Indoor & outdoor findings 6.00am – 6.00pm on 2021/04/22 | <i>Aedes albopictus</i> female=1 <i>Aedes albopictus</i> female= 6 |
| Colombo | Kolonnawa | CGR-quarters Viharagama | Outdoor findings - 8.30 am -11.30 am 2021/04/01 | <i>Aedes albopictus</i> female=4 <i>Aedes albopictus</i> male=17 Abdominal Condition – Unfed |

Current high risk MOOH

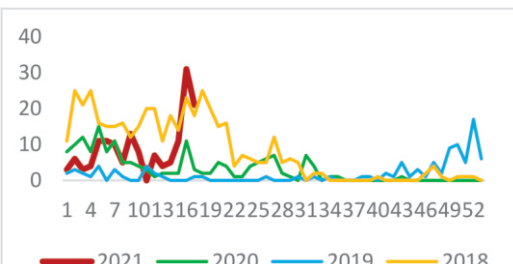
Epidemiological trends (Source: DenSys data)



MOH Battaramulla



MOH Eravur



3. DENGUE FORECAST

| Entomological forecast of high-risk areas | | |
|---|----------------|------------------------------|
| RDHS | MOH | GN Division |
| Kalmunai | Sammanthurai | Viliniyadi-2,1 |
| | Ninthavur | Ninthavur-3, Ninthavur-19,20 |
| | Pottuvil | Pottuvil-4,3 |
| | Aalayadivembu | Akkaraipattu8, 7/1,7/2 |
| | Kalmunai North | Pandiruppu-2,Kalmunai-1 |
| Matara | Akuressa | Locality-Galle road |
| Anuradhapura | Padaviya | New town area |
| Rathnapura | Godakawela | Kottala |
| Jaffna | Kayts | Kayts (Thampaddy) |
| Galle | Ambalangoda | Keraminiya |
| | Balapitiya | Pelagas Palatha |

4. NEWS UPDATES

A special Mosquito Control Campaign was conducted on 05th, 06th & 07th May, 2021 at 13 MOH areas in Colombo, Kalutara, Galle and Batticaloa districts.



Premises summary of the special Mosquito Control Campaign conducted from 5th – 7th May is given below.

| Premises Type | No. of premises visited | No. of potential premises | % | No. of premises with larvae | % | No. of places with larvae | | Number corrected | % |
|----------------------|-------------------------|---------------------------|--------------|-----------------------------|-------------|---------------------------|----------------------|------------------|--------------|
| | | | | | | Inside the building | Outside the building | | |
| Houses | 14,665 | 2,407 | 16.41 | 217 | 1.48 | 50 | 216 | 1,433 | 59.53 |
| Schools | 11 | 8 | 72.73 | 2 | 18.18 | 0 | 2 | 1 | 12.50 |
| Other edu.inst. | 21 | 12 | 57.14 | 2 | 9.52 | 0 | 0 | 8 | 66.67 |
| Gov. institutions | 35 | 19 | 54.29 | 5 | 14.29 | 2 | 3 | 8 | 42.11 |
| Private institutions | 634 | 96 | 15.14 | 14 | 2.21 | 2 | 3 | 78 | 81.25 |
| Factories | 4 | 4 | 100.00 | 2 | 50.00 | 0 | 0 | 3 | 75.00 |
| Construction sites | 78 | 55 | 70.51 | 11 | 14.10 | 2 | 6 | 27 | 49.09 |
| Religious places | 38 | 22 | 57.89 | 6 | 15.79 | 0 | 3 | 8 | 36.36 |
| Public places | 9 | 15 | 166.67 | 0 | 0.00 | 0 | 0 | 4 | 26.67 |
| All the other places | 48 | 23 | 47.92 | 0 | 0.00 | 0 | 0 | 1 | 4.35 |
| Total | 15,543 | 2,661 | 17.12 | 259 | 1.67 | 56 | 233 | 1,571 | 59.04 |

**National Dengue Control Unit,
Public Health Complex,
555/5, Elvitigala Mawatha,
Colombo 05.**

Address:

Comments and contributions for publication in the MDU Sri Lanka are welcome.

Prior approval should be obtained from the NDCU before publishing data in this publication.

National Dengue Control Unit, Ministry of Health, Sri Lanka

555/5, Public health Complex, Elvitigala Mawatha, Narahenpita, Colombo 05.

Tel: +94(0) 112368416/ 7 Fax: +94(0) 11 2369893

Email: ndcu2010@yahoo.com

Web: <http://www.dengue.health.gov.lk>