



# MONTHLY DENGUE UPDATE

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



Volume 02 Issue 06

June 2022

## Contents

1. Feature article	1
2. Distribution of Dengue patients	4
3. Virus surveillance data	4
4. Summary of entomological and epidemiological surveillance data – May 2022	4
5. Entomological forecast	7
6. News update	8

## *Strengthening entomological surveys as a way forward in Dengue prevention*

Since there are no definitive vaccine or cure as a long-lasting treatment for dengue fever/ dengue hemorrhagic fever, the importance of the preventive measures is critical. Dengue as one of the prominent vector-borne diseases in the world, reducing the vector abundance and breaking the vector-host contact are the key preventive aspects in suppressing its incidence to an acceptable level. Efficient vector control programs are not only dependent on reporting caseload but also it requires tremendous amount of data on vector availability, their abundance, breeding places, fecundity rates, adult resting places and susceptibility of vectors against available control methods. These key entomological aspects should be incorporated in planning and execution of productive vector control measures which will cause the immediate and gradual reduction of the vector abundance and ultimately the caseload.

To strengthen and optimize the vector control strategies, the vector surveillance techniques should be planned and deployed well to produce accurate and precise vector abundance data. Furthermore, frequent bioassays and susceptibility testing should also be conducted to ensure the quality of the vector control strategies especially the chemical larviciding and adulticiding.

Under the guidelines of the National Dengue Control Unit following techniques are currently being performed in all the vector surveillance sentinel sites and selected techniques in routine sites and spot checks all over Sri Lanka.

- A. Larval surveys
- B. Adult surveys
- C. Oviposition traps (*Aedes* egg collection)
- D. Insecticide susceptibility testing
- E. Cage bio-assay



### A. *Aedes* immature surveys (Larval and pupae)

In *Aedes* immature surveys, all potential dengue vector breeding sites in and around selected houses/premises (100 m around the identified site/reported case or designated number of houses) are examined for *Aedes* larvae and pupae, keeping the index house or premise or cluster as the primary sampling unit. Other than in spot surveys, in routine and sentinel site immature surveys, an identified site is selected based on suspected cases reporting pattern, other epidemiological data, past entomological data and outbreak potentiality. Larval samples are collected for laboratory identification for species of *Aedes*, and larval indices (Breteau index, premise index and container index) are calculated. These larval indices are essential for decision-making on eliminating the most common habitats, to identify potential epidemic prone areas, to determine the effectiveness of vector control interventions, developing educational messages and orientation of community-based initiatives. In addition, *Aedes* immature surveys provide information on the presence of *Aedes* species and their densities in an area. At the same time, the pupal surveys provide the proxy of adult density in an area.



### B. Adult Surveys

Adult vector surveys provide:

- Information on the seasonal trends of mosquito density
- The peak biting activity/time
- Resting places

- Potential dengue transmission areas.
- Transmission risk.
- The effectiveness of vector control interventions.

Adult vector survey methods include human bait collections using double nets or indoor and outdoor resting collections. Adult collections are a sensitive means of detecting the number of infestations of *Ae. aegypti* and *Ae. albopictus* in an area. The presence of males in the collection indicates the presence of larval habitats in close vicinity.

#### I. Human bait collections using double net traps.

Human bait collections using the double net traps method are more suitable during epidemic periods. In this method, a human bait is allowed to rest on a folding bed/chair inside the inner mosquito-proof net, and another net is arranged around the inner net. The outer net is set in such a way to keep a space of about 6 inches between the lower edge of the net and the ground and with sufficient space between the two nets for moving a mosquito collector between the two nets. The mosquito collector collects the mosquitoes attracted to the bait (the adult mosquitoes trapped between the two nets) using a manual mouth aspirator.



#### II. Indoor and outdoor resting collections of adult dengue vectors

In resting collections, indoor sites and objects such as hanging clothes, on or under furniture, closets and outdoor sheltered places such as inside empty store rooms, garages, domiciliary objects and nearby vegetation are checked for adult mosquitoes with the aid of a flashlight. Mosquitoes are collected using mouth or battery-powered aspirators.



### C. Oviposition traps

The standard oviposition trap (commonly known as ovitrap) is a wide-mouthed plastic cup of approximately 250ml painted in black on the outside to attract the *Ae. aegypti*/*Ae. albopictus* females to oviposit. A piece of red cloth or filter paper is placed inside the cup as an oviposition substrate, and the cup is partially filled with clean water to provide the right ovipositing medium for the female mosquito (hay infusion may attract non-*Aedes* mosquitoes especially *Culex* and *Armigeres*, thus tap water is preferred for the ovitraps). The ovitraps are placed appropriately in a suspected mosquito frequenting place, both indoors and outdoors. Collection of ovitraps is made once in 5 -7 days, and the paddles/paper strips are examined under a dissecting microscope for the presence of *Aedes* Eggs.

Oviposition traps are used,

- To assess dengue vector density when and where larval surveys produce low vector indices
- To determine the effectiveness/ efficacy of vector control interventions.
- To collect eggs of dengue mosquitoes for susceptibility and bio-efficacy tests.
- To assess vector population fluctuations over the long term.

### D. Insecticide susceptibility test

Insecticide resistance monitoring of both adult and immature vector populations is an essential part of entomological surveillance. They are used to detect and characterize the insecticide resistance in vector populations. Together with information on adult mosquito density, larval and pupal indices, ecology and habitats, and efficacy of vector control interventions, appropriate responses to prevent and control dengue can be developed.

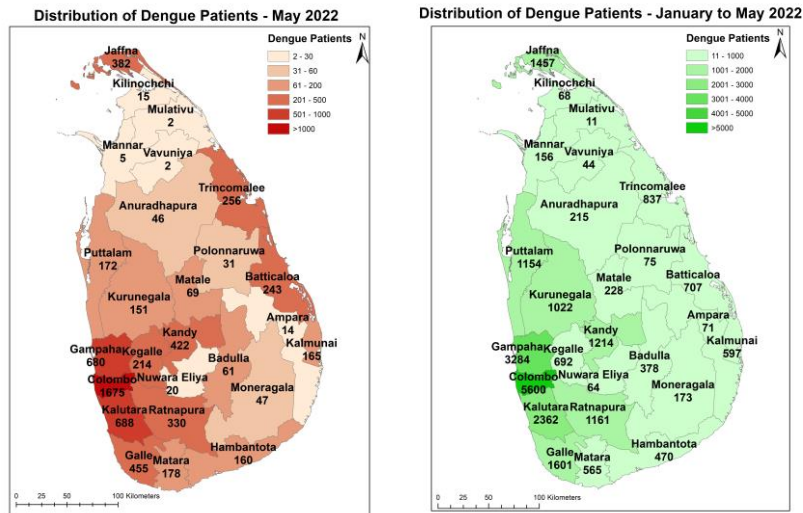


The standard guidelines and test kits available from World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) are used for test procedures. It is recommended to carry out these tests once in 06 months for each dengue vector species for each insecticide of interest in each sentinel and routine site.

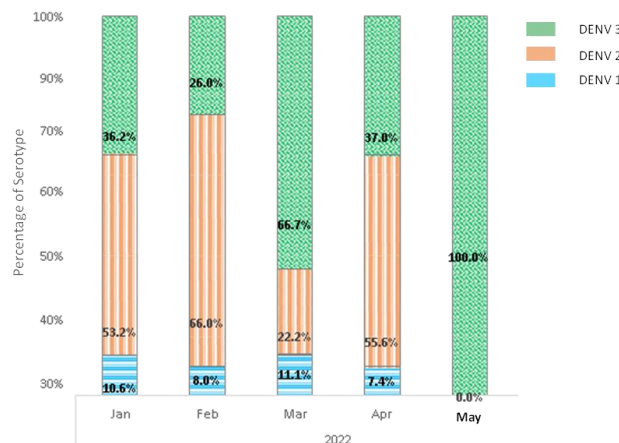
### E. Cage Bioassays

Cage bioassays are used to evaluate the effectiveness of space spraying operations and to regularize the ongoing space spraying activities. Here, spraying efficiency of the fogging machine and effect of the chemical type on adult mosquitoes are evaluated. Additionally, the efficiency of different mesh sizes on mosquito cages is also investigated. The test could be repeated at least once in 6 months for each mosquito species (or according to MOH request, for clarification of usage of space spraying).

## 2. DISTRIBUTION OF DENGUE PATIENTS – May 2022



## 3. VIRUS SURVEILLANCE DATA – May 2022



Source: Department of Virology, MRI and Centre for Dengue Research, University of Sri Jayewardenepura

## 4. SUMMARY OF ENTOMOLOGICAL AND EPIDEMIOLOGICAL SURVEILLANCE DATA – May 2022

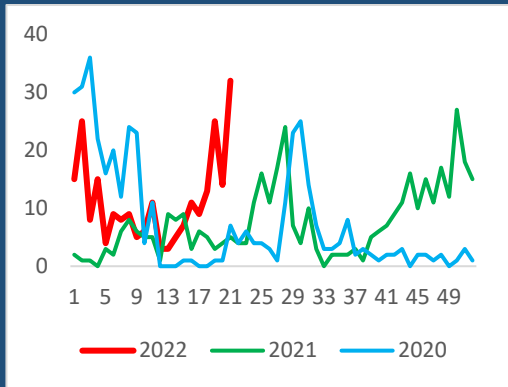
SUMMARY OF ADULT SURVEYS				
District	MOH	GN area	Findings	
Colombo	Gothatuwa	Bopetta	Indoor findings (7.40 am -2.45 pm)	<i>Aedes aegypti</i> Female 02 (unfed 01, blood fed 01); Male 02
	Gothatuwa	Welewatta	Indoor findings (8.05 am - 12. 30 pm)	<i>Aedes aegypti</i> Female 13 (unfed 03, blood fed 07, semi gravid 03); Male 07
	Maharagama	Waththegedara	Indoor findings (8.05 am -2.30pm)	<i>Aedes aegypti</i> Female 05 (unfed 03, Blood fed 02)
Kalutara	Horana	615, Wewala West	Outdoor findings (8.10 am -2.50 pm)	<i>Aedes albopictus</i> Female 03 (Unfed 01, Blood fed 02)
	Ingiriya	627, Kurana South	Outdoor findings (8.50 am -1.20 pm)	<i>Aedes albopictus</i> Female 03 (Blood fed 03)

## 2. SUMMARY OF ENTOMOLOGICAL AND EPIDEMIOLOGICAL SURVEILLANCE DATA

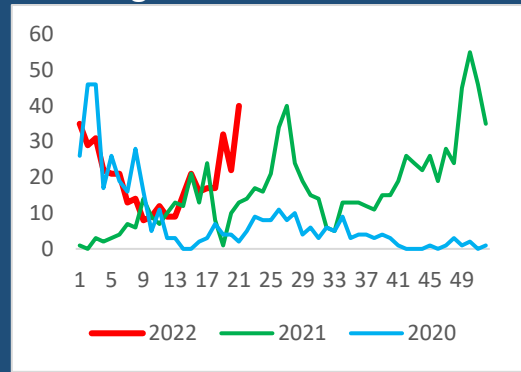
Province	District	Entomological surveillance data					Epidemiological surveillance data	
		(Source - returns of entomology surveys received by NDCU)					(Source-DenSys)	
		No. of Premises			Main type of containers positive for larvae and percentage positivity	Month		
		Inspected	Positive Found	Positive %		May	Cumulative	
W P	Colombo	1625	265	16.3	Discarded items (25.6%), Temporary removed items (23.1%), Ornamental items (7%)	1675	5600	
	Colombo MC	277	16	5.8	Discarded items (36.7%), Water storage cement tank (20%), Ornamental items (16.7%)			
	Gampaha	2244	372	16.8	Discarded items (23.1%), Temporary removed items (13.2%), Covering items (10.9%)	680	3284	
	Kalutara	1814	249	13.7	Discarded items (32.1%), Temporary removed items (16.2%), Covering items (10.4%)	688	2362	
	NIHS	300	66	22	Temporary removed items (38.8%), Discarded items (15.3%), Ornamental items (12.9%)			
C P	Kandy	2213	189	8.5	Discarded items (19.6%), Temporary removed items (15%), Tyres (14.3%)	422	1214	
	Matale	700	41	5.9	Discarded items (27.9%), Water storage cement tanks (18.6%), Ornamental items (16.3%)	69	228	
	Nuwara Eliya	623	18	2.9	Discarded items (33.3%), Water storage barrel (19%), Water other items (14.2%)	20	64	
S P	Galle	1900	284	14.9	Discarded items (20.7%), Ornamental items (16.1%), Temporary removed items (12.5%)	455	1601	
	Hambantota	925	119	12.9	Discarded items (19.6%), Temporary removed items (18%), Water storage barrel (12.2%)	160	470	
	Matara	1302	121	9.3	Discarded items (26.1%), Water storage other item (13.3%), Ornamental items (12.1%),	178	565	
N P	Jaffna	720	20	2.8	Water storage other item (33.3%), Water storage cement tanks (22.2%), Pet feeding items (11.1%)	382	1457	
	Kilinochchi	230	7	3	Temporary removed items (33.3%), Discarded items (33.3%), Water storage barrel (22.2%)	15	68	
	Mannar	1074	26	2.4	Water storage cement tank (36%), Water storage other items (20%), Discarded items (12%), Water storage barrel (12%)	5	156	
	Vavuniya	1174	43	3.7	Discarded items (34.5%), Water storage other items (16.4%), Tyres (14.5%)	2	44	
	Mullaitivu	335	11	3.3	Water storage barrels (41.1%), Water storage cement tanks (41.1%), Tyres (8.3%)	2	11	
E P	Ampara	175	8	4.6	Discarded items (30%), Tyres (20%), Temporary removed items (20%)	14	71	
	Batticaloa	1141	91	8.2	Other items (22.3%), Tyres (20.1%), Temporary Removed items (10.2%)	243	707	
	Trincomalee	505	19	3.8	Water storage barrel (31.6%), Other items (22.3%), Water storage cement tank (15.8%), Water storage other items (15.8%)	256	837	
	Kalmunai	1596	126	7.9	Other items (22.1%), Temporary removed items (19.9%), AC and refrigerators (13.2%)	165	597	
N W	Kurunegala	2113	147	7	Discarded items (18.2%), Ornamental items (12.5%), Pet feeding (9.4%)	151	1022	
	Puttalam	512	40	9.6	Discarded items (25%), Water storage other items (17.3%), Temporary removed items (13.5%)	172	1154	
N C	Anuradhapura				Data not Received by NDCU	46	215	
	Polonnaruwa	350	28	8	Discarded items (18.8%), Water storage other items (18.8%), Temporary removed items (18.8%)	31	75	
U P	Badulla	100	16	16	Discarded items (45%), Water storage other items (15%), Water storage cement tank (15%)	61	378	
	Monaragala	1911	214	11.2	Discarded items (53.1%), Water Storage barrels (18.2%), covering items (5.4%)	47	173	
S G	Rathnapura	1200	190	15.8	Discarded items (38.6%), Water storage other items (9.8%), Tyres (9.1%),	330	1161	
	Kegalle	2204	142	6.5	Ornamental items (24.4%), discarded items (22.6%), water storage barrel (13.6%)	214	692	
<b>Sri Lanka</b>		<b>27789</b>	<b>2827</b>	<b>10.2</b>	<b>Discarded item (25.8%), Temporary removed items (11.7%), Ornamental items (8.6%)</b>	<b>6483</b>	<b>24206</b>	

Current High Risk MOH Areas - Epidemiological Trends (Source: DenSys)

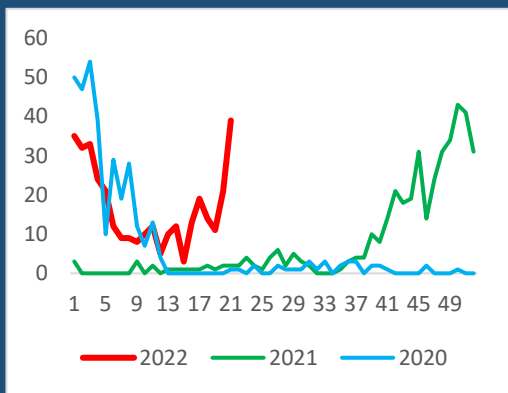
Kaduwela



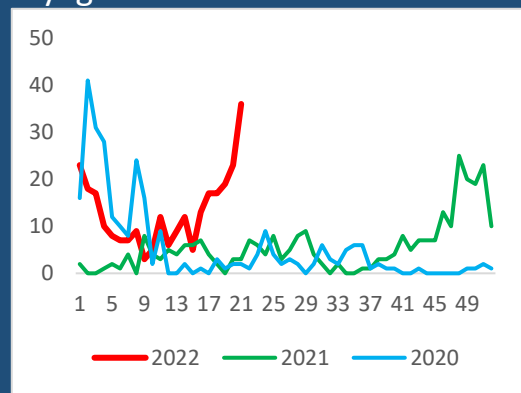
Maharagama



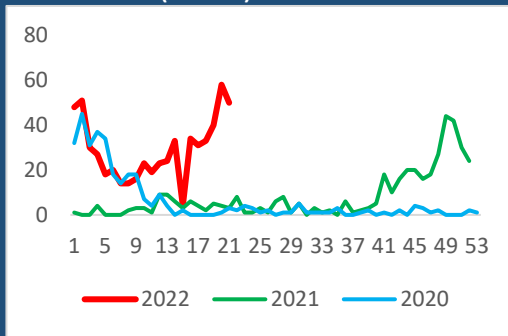
Gothatuwa



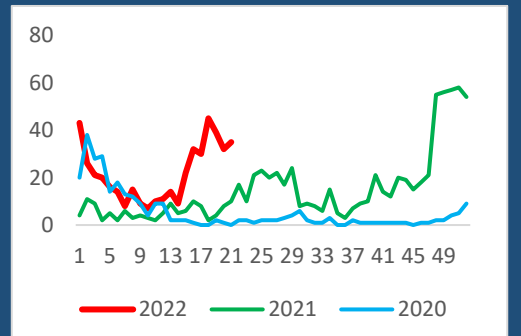
Biyagama



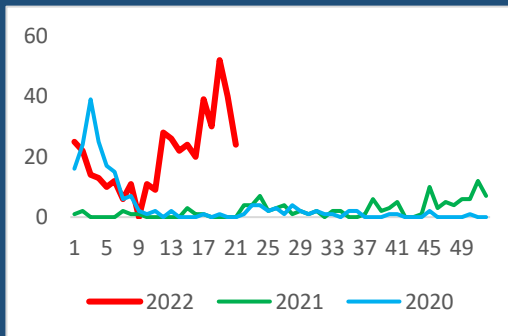
Beruwala (NIHS)



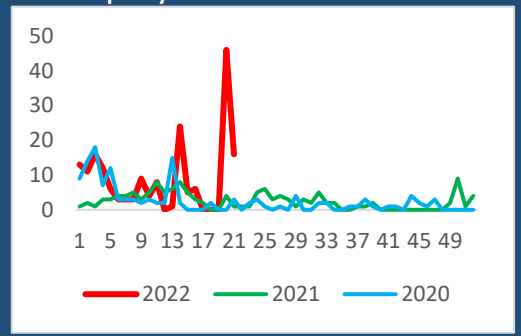
Panadura



MC Galle



Embilipitiya



## 5. High-risk areas based on Entomological forecast

District	MOH Area	GN Division
Colombo	Gothatuwa	Welewatta
	Nugegoda	Obesekarapura
	Rathmalana	Watarappala
	Dehiwala	Karagampitiya
	Dehiwala	Kohuwala
	Dehiwala	Neadimala
	Moratuwa	Katubedda
	Kolonnawa	Salamulla
Gampaha	Attanagalla	Thihariya
	Biyagama	Delgoda
	Biyagama	Ulahitiwala
	Negombo	Dalupotha
	Negombo	Mangala Road
	Kelaniya	Kiribathgoda
	Kelaniya	Wanawasala
	Ja-Ela	Uswatta
Kalutara	Beruwala	749
	Kalutara	727
	Horana	615A-Horana East
	Mathugama	7795-Badugama
	Panadura	672- Miriyawatta
Kandy	Kundasale	Jayasena Uyana
	Kundasale	Rajawella
	Harispattuwa	Etamurungagoda
	Harispattuwa	Rathmale
	Akurana	Kurundugaha Ela

District	MOH Area	GN Division
Galle	Ambalangoda	Vilegoda
	Galle	Thalapitiya
	Hikkaduwa	Weragoda
	Imaduwa	Dorape
Matara	Matara MC	Welegoda
	Devinuwara	Devinuwara East
Hambantota	Tangalle	Kudawella
Mannar	Mannar town	Pallimunai East
Batticaloa	Kaluwanchikudy	Periyakallar
	Batticaloa	Karuvappankerny (176B)
	Eravur-1	1/1A
	Oddamavadi	208B/2
	Oddamavadi	208B/1
Kalmunai	Kalmunai North	Pandiruppu 2
	Akkaraipattu	TD 1-4
	Ninthavur	Ninthavur12
Trincomalee	Trincomalee	244P
	Uppuveli	243
Kurunegala	Mc Kurunegala	Vidya Mawatha
	Pannala	Maholawa
Puttalam	Puttalam	Puttalam East
	Puttalam	Thiladiya
Monaragala	Siyambalanduwa	Muthukandiya
Rathnapura	Embilipitiya	Pallegama

Dengue vector surveys were conducted in 365 GN areas inspecting 25585 premises in May. Here, the Entomological forecasting has been done by considering the districts currently recording a high number of Dengue cases that are also recorded high values for Entomological indices against their conventional threshold values.

**6. SPECIAL ACTIVITIES AND EVENTS CONDUCTED BY THE NATIONAL DENGUE CONTROL UNIT**

*Special Mosquito Control Week was conducted from 18<sup>th</sup> to 24<sup>th</sup> May 2022 in 148 MOH areas in 20 districts.*



<p><b>National Dengue Control Unit Public Health Complex, 555/5, Elvitigala Mawatha, Colombo 05.</b></p>	<p><b>Address</b></p>
--	-----------------------

Any comments, suggestions, and contributions for the MDU Sri Lanka are welcome.

**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](mailto:ndcu2010@yahoo.com)    Web: <http://www.dengue.health.gov.lk>