

# A STUDY ON THE PREVALENCE OF DENGUE IN HOSUR MUNICIPAL CORPORATION AND STRATIFICATION OF THE AREA

*Kanniyammal S<sup>(1)</sup>, Anandapadmanaban S D<sup>(1)</sup>, Vijayalakshmi V<sup>(1)</sup>, Nirmalson J<sup>(2)</sup>,  
Krishnaraj K<sup>(2)</sup>, Vadivelan P<sup>(2)</sup>, Selvavinayagam T S<sup>(2)</sup>*

(1) - Institute of Vector Control and Zoonoses, Hosur

(2) - Directorate of Public Health and Preventive Medicine, Chennai.

## Abstract

**ABSTRACT :** In recent years it has been observed that Dengue emerges as a Public Health problem in Tamil Nadu, after a massive outbreak of Dengue cases during 2012. Subsequently the rise in dengue cases was noticed during 2017 and the incidence continues year after year in the State, with varying degree of intensity. So the Department of Public Health & Preventive Medicine has taken up the matter seriously and initiated scientific analysis of the data and field studies were under taken by involving the Institute of Vector Control and Zoonoses, Hosur. So under the guidance of the Director of Public Health & Preventive Medicine and Joint Director of Institute of Vector Control and Zoonoses, a study on the prevalence of dengue in Hosur Municipal Corporation area was taken up, since Hosur area in Krishnagiri district is reporting dengue cases year after year with considerable proportion to the district. Utilizing the data available, field visits were made during 2020 and 2021, the epidemiological and entomological parameter, were collected, analysed and it was felt that there is an urgent need to carry out control activities on stratification of areas to minimize the displacement of health state. The outcome of this exercise has helped to draw a stratification map of dengue for Hosur Municipal Corporation area. The existing surveillances for Dengue case detection, treatment and follow up measures are discussed in this paper. Further the required containment measures based on the stratification of the area is also proposed.

**KEYWORDS :** dengue; prevalence; entomological parameters- Stratification.

## INTRODUCTION

Dengue is a mosquito borne disease which registers nearly 50 million cases annually. This disease is spread by Aedes species. Dengue affects entire globe, nearly 4 billion people are at risk by DEN V infections and most affected regions are from the developing countries. It causes threat to the tropical regions where the temperature is abnormal.<sup>1</sup> Rapid urbanization, global warming, environmental factors, human activities are the factors for its spread.

The contribution of India to total dengue cases in SEAR has increased from 6% in 2009 to 39% in 2017. Based on the transmission potential for Dengue, WHO has categorized the countries in SEAR into three categories ie A,B and C. Till 2009, India was under category B in which cyclical epidemics are more frequent, circulation of multiple virus serotypes and geographical expansion is occurring. Repeated out breaks of dengue have also been reported from many parts of the country.<sup>2</sup>

Many investigations over the dengue out breaks/ epidemics has been carried out, analysed and reported now and then in scientific journals. Tamil Nadu has reported outbreaks of dengue almost in all years from 2012. The number of

dengue cases reported from Tamil Nadu, Krishnagiri district and the study area ie Hosur Municipal Corporation area (HMC) is shown in Table.1&Fig.1

Table 1: Number of dengue cases reported from 2015-2019

Year	Tamil Nadu	Krishnagiri District	Hosur Corporation	Proportion of Hosur (%) to District.
2015	4535	148	81	54.73
2016	2531	60	31	50.82
2017	23294	337	107	31.75
2018	4486	91	48	52.75
2019	8527	185	45	24.32

Please Scan this QR Code to  
View this Article Online



Article ID: 2022:02:04:06

Corresponding Author : Kanniyammal S

e-mail : skanniyammal@yahoo.in

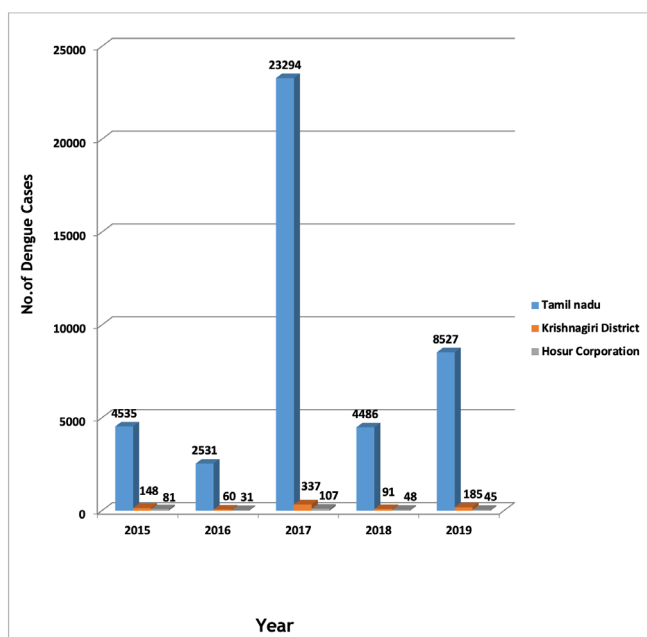


Figure 1: Dengue cases reported from State, District and Hosur Municipal Corporation

## REASONS FOR SELECTION OF THE STUDY AREA

Out of the 4 known urban / semi urban area that are in Krishnagiri District, Hosur Municipal Corporation has been taken for Dengue prevalence study and for stratification for the following reasons.

- Hosur is a developing industrial urban area.
- The growth of urbanization is very marked with rise in number of residential areas and industries.
- Located on the NH connectivity Chennai and Bangalore, the two capital cities of states Tamil Nadu and Karnataka and thereby the population movement is all through the year.
- The proximity of Hosur to Bangalore urban area which reports seasonal dengue outbreaks.
- The area is vulnerable due to migratory population to this area from other

Urban cities.

- All most all wards have breeding sources for Aedes mosquitoes both during pre monsoon and post monsoon period, The climate in Hosur area is very conducive for the proliferation of the mosquitoes and longevity.
- The Hosur area has contributed 24.32 to 54.73% of the total cases of the district, Krishnagiri during the past 5 years.

## STUDY AREA

Nickname(S): Little England, Rose city, flower City, Industrial City, Gateway of Tamilnadu, Chill City. Hosur is an industrial city located in the Indian country, State

of Tamil Nadu. It is located on the bank of the river River Ponnaiyar, 40 kilometres (25 mi) southeast of Bengaluru and 306 kilometres (190 mi) west of Chennai, the state capital of Tamil Nadu. Hosur is home to major manufacturing industries including Ashok Leyland, Titan, TVS Motors, Caterpillar, Sundaram Fasteners, Schaffler, and many others.

The Chandrachoodeshwara Swamy Temple, an 11th century temple, has inscriptions that tell about the contributions made by Rajendra Chola. Hoysalas ruled Hosur around 1200 A.D after the decline of Chola Empire and contributed to the temple. Then it came under Vijayanagara Samrajyam. Later, Hosur was part of Mysore Province until 1799, When Tipu Sultan lost the third Anglo-Mysore war, he handed over the southern part of the Mysore kingdom as a partial settlement to the English Government.

Hosur was constituted as a Selection Grade Town Panchayat in 1962 and then it was upgraded as Second Grade Municipality in the year 1992. In the year 1998, it was again upgraded to the Selection Grade Municipality. In 2011, the town panchayats Mathigiri, Village Panchayats Zuzuvadi, Mookandapalli, Avalapalli and Chennathur were included in Hosur Municipality. On 2019, Hosur was upgraded as the 13th Corporation city of Tamil Nadu comprising the adjoining areas.

Hosur experiences a tropical savanna climate (Koppen climate classification) with distinct wet and dry seasons. Due to its high elevation, Hosur usually enjoys salubrious and moderate climate throughout the year, with occasional heat. The coolest months are November to February with an average low temperature of 17°C winter temperatures rarely drop below 12°C with the lowest ever recorded temperature of 7.1°C recorded on 1st February 2018 and summer temperatures rarely exceed 35°C. Hosur receives rainfall from both the northeast and southwest monsoons, the wettest months are August, September and October. The summer heat is moderated by fairly frequent summer rains. The annual average humidity is 31% and average rainfall is 34 cm (Govt. web site)

## MATERIALS AND METHODS

A frame work of this project work was prepared. The Dengue data available with the District Authorities, ie Deputy Director of Health Services, Krishnagiri of the state government were collected. Also the data pertaining to Hosur Municipal Corporation (HMC) were collected from Municipal Authorities. The area map of the Municipal Corporation showing the wards was also collected. The dengue data pertaining to Hosur Municipal Corporation was

analysed, ward wise for the last 5 years ie from 2015 to 2019.

By adopting random sampling method, 10 wards were selected for survey to obtain the entomological parameters through home visit and checking of breeding sources. This was done in two seasons ie pre monsoon and post monsoon period. The data related to rainfall, temperature, relative humidity were collected from the websites concerned for the period from 2015 to 2019. The Hosur Municipal Corporation area has 45 wards. The number of dengue cases reported, ward wise for the years 2015-2019 is shown in Table.3. Out of these 45 wards 10 wards were selected randomly. So to have a proportion of the area. All these 10 wards were visited, one in 10 houses (Systematic random basis) to find out the prevalence of breeding sources of Aedes mosquitoes and to understand socio economic conditions of the residents. Two rounds of visits were made covering pre monsoon period, ie February to May and post monsoon period, ie from September to November during 2020 and 2021 respectively. The receptivity and vulnerability of the area, ward wise was analysed using the available epidemiological and entomological data. The following variables were considered for grouping. The weightage obtained was taken for stratifying the area as low, medium and high. A map of the Hosur Municipal Corporation area was prepared based on this.(Fig.3)

## RESULTS

The month wise dengue cases reported in Hosur Municipal Corporation area for the period from 2015 to 2019 is shown in the Table.2

Table 2: Year wise and month wise dengue cases reported from Hosur Municipal Corporation.

Sl.No	Month	2015	2016	2017	2018	2019	Total
1	January	4	5	2	3	1	15
2	February	6	3	2	0	2	13
3	March	5	0	0	4	0	9
4	April	1	1	3	2	1	8
5	May	5	0	1	0	2	8
6	June	11	0	6	2	2	21
7	July	17	2	30	1	3	53
8	August	15	5	25	3	6	54
9	September	10	5	17	4	6	42
10	October	3	8	8	14	8	41
11	November	2	1	10	12	12	37
12	December	2	1	3	3	2	11
	<b>Total</b>	<b>81</b>	<b>31</b>	<b>107</b>	<b>48</b>	<b>45</b>	<b>312</b>

Table 3: Hosur Municipal Corporation. The number of dengue cases reported- ward wise for the period 2015 to 2019

Ward No.	2015	2016	2017	2018	2019	Total
1	7	0	8	6	5	26
2	1	1	3	1	4	10
3	6	1	14	4	2	27
4	6	2	8	4	3	23
5	5	3	6	3	2	19
6	3	1	2	1	2	9
7	1	1	1	0	0	3
8	0	1	1	0	0	2
9	1	1	4	0	0	6
10	4	4	2	0	0	10
11	2	0	5	2	0	9
12	1	1	3	0	2	7
13	2	0	4	2	0	8
14	2	1	5	0	5	13
15	10	3	6	3	3	25
16	6	1	5	3	1	16
17	1	0	0	0	0	1
18	1	0	1	0	0	2
19	1	1	3	0	0	5
20	0	0	0	2	3	5
21	0	1	2	0	0	3
22	0	0	0	1	0	1
23	0	0	1	0	0	1
24	1	2	3	0	1	7
25	0	1	3	0	1	5
26	0	0	2	2	2	6
27	0	0	0	1	0	1
28	3	0	0	0	0	3
29	0	0	0	0	0	0
30	1	1	1	0	0	3
31	2	1	0	3	1	7
32	1	0	1	3	3	8
33	1	0	2	0	1	4
34	1	0	1	1	0	3
35	2	0	4	2	1	9
36	0	0	1	0	0	1
37	2	1	0	0	0	3
38	3	2	0	1	0	6
39	0	0	2	1	2	5
40	0	0	1	0	0	1
41	4	0	0	2	0	6
42	0	0	1	0	0	1
43	0	0	0	0	0	0
44	0	0	0	0	0	0
45	0	0	1	0	1	2
<b>Total</b>	<b>81</b>	<b>31</b>	<b>107</b>	<b>48</b>	<b>45</b>	<b>312</b>

Based an earlier selection ward no.5,12,14, 24, 25, 28, 34, 38, 39 & 44 surveyed. The number of dengue cases reported from Krishnagiri during the year 2015-2019 is not very significant when compared to the state's cases. It ranges from 1.45% to 3.26% whereas; when comparing the number of cases reported from Hosur against the Krishnagiri district it is very significant. It ranges from 24.32% to 54.73% except Table1. The analysis of the dengue cases reported during

the year 2015,2016,2017,2018 &2019 shows a clear seasonal pattern Fig2. The influence of the south west monsoon which usually sets in 1st week of June in Tamil Nadu, in this part provides a good number of breeding sources for Aedes mosquito species, which in turn increases the density of the vector Ae.aegypti. The lean period in dengue cases ie from December through January, February, March and April is visible. The dengue case starts picking up from the last week of May and continues till October with a peak in July and in few years in October which is helps the transmission of Dengue in this part. The onset of Northeast monsoon in October helps to prolong the transmission season up to November.

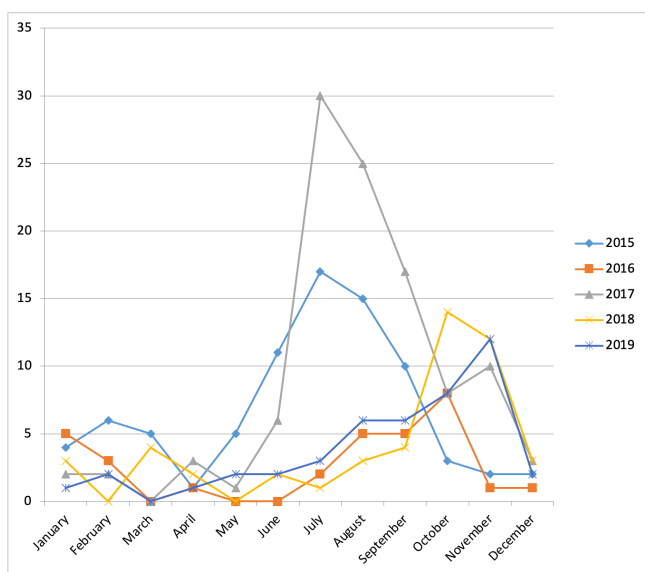


Figure 2: Trend of dengue cases in Hosur Municipal Corporation area during 2015-2019

To know abundance of the vector of dengue ie Ae.aegypti, the main vector in Tamil Nadu a survey of breeding sources and along with the check for breeding of Aedes spp. was carried out in two seasons of the year ie February to May and September to December in 2020-21, pre and post monsoon period respectively.

The entomological parameter observed during the survey was as follow.

Season	Entomological parameters			
	HI	CI	BI	PI
Pre monsoon -	7.56 -	0.83 -	8.83	- 14.78
Post monsoon -	6.10 -	0.89 -	8.57	- 36.19

## DISCUSSION

The Hosur Municipal Corporation (HMC) area has been divided into 45 wards and 10 Divisions to carry out PH/ Sanitation activities etc. The number of dengue cases (Ward

Wise) reported during 2015 to 2019 is shown in Table 3. The analysis of this data clearly shows that all wards are not dengue prone. The wards 1,3,4&15 and adjoining wards 2,5,10,14&16 (Totally 9) have reported cases year after year. In such condition it seems that only 20% of the corporation area 'dengue prone' at the outset. But considering the various epidemiological, entomological and environment aspects, it is safely understood that 23 wards or 51% ie a little over half of the Corporation area is 'vulnerable' as the risk of transmission of dengue in high and medium degree. Hence all control measures to prevent dengue out break needs to be carried out in these identified areas.

Table 4: The activities recommended for the wards of Hosur Municipal Corporation for Dengue control based on the stratification of the area

Sl.No.	Activities	Low risk (22 wards)	Moderate risk (16 wards)	High risk (7 wards)
1	Strengthening of surveillance	+	++	+++
2	Case management	-	-	++ (For reported cases)
3	Vector management	++	+++	++++
4	Capacity building	++	+++	++++
5	IEC	++	+++	++++
6	Inter sectoral co ordination	+	++	+++
7	Monitoring and supervisions	++	+++	++++

+ = Routine

++ = Selective

+++ = Intensified

++++ = As required for Out Break Response (OBR)

OBR: All the recommended activities need to be carried into with concurrent monitoring, supervision and evaluation.

Low Risk Area- Ward No. 7, 8, 17, 18, 21, 22, 23, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, 40, 42, 43, 44, 45, (22)

Moderate Risk Area- Ward No. 2, 6, 9, 10, 11, 12, 13, 19, 20, 24, 25, 26, 30, 38, 39, 41 (16)

High Risk Area- Ward No. 1, 3, 4, 5, 14, 15, 16 (7)

Areas shown in the map (Fig.3)

In our country the peak incidence of dengue rather upsurge has been reported during July-November (NVBDCP, GOI,2020) As such this disease has a seasonal pattern, ie, the peak after the south west monsoon. Similar pattern is observed in Hosur area also, since more of rains a regular feature during south west monsoon.It has been observed that there is little variation in infection among male and female. Table.4 shows that both the male and female affected with dengue during the period varied from 33% to 54% in the case of male and 40% to 67% in the case of female. However the overall ratio is almost equal, when grouped for the period

from 2015 – 2019. The age group wise analysis shows that the earning age group ie >16 to 45 years is mostly affected by dengue. This shows that these groups of people are more exposed to mosquito (vector) bite than the other age group. The people >60 years and <5 years are not much affected and practically well protected / and may be not exposed to the bite of the vector mosquitoes.

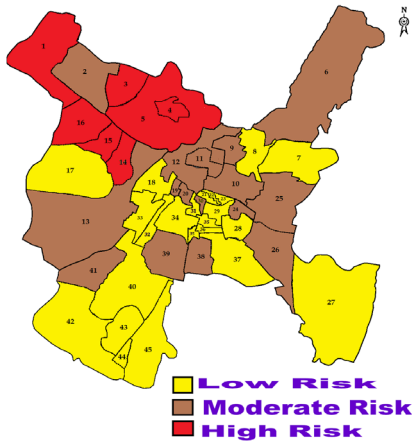


Fig.3. Hosur Municipal Corporation map showing the Stratum of Dengue.

Table 5: Sex -wise Dengue Incidence from 2015-2019

Year	Male	%	Female	%	Total
2015	44	54	37	46	81
2016	13	42	18	58	31
2017	56	52	51	48	107
2018	22	46	26	54	48
2019	22	49	23	51	45

The ward wise analysis of the data shows (Table. 3 ) that almost all wards have been affected (except 3 wards ie 29, 43 & 44). The receptivity and vulnerability which are the key elements in the transmission of the disease is very prominent in 23 wards which are identified as epidemic prone area and these wards are classified as high and medium risk areas. From the available entomological parameters- obtained through the field survey these entomological parameters are valuable to identify the area. It is under stood that the area maintains the mosquito genic condition with little variation except in the case of pupal index in both seasons. The habitat wise details are shown in Table.5. This parameter

also indicates the more possibility of transmission of dengue during post monsoon period. The same is inferred with the number of dengue cases reported from July to November in the years.

Table 6: Observed Entomological parameters during the survey.

Survey details		Pre- monsoon period	Post- monsoon period	Total	
Total No.of Houses		28060	28060	56120	
10% .of Houses		2806	2806	5612	
Total No.of Houses Surveyed		2753	2755	5508	
Breeding Habitats	Tyers	Nos.	51	111	162
		Pos.	2	9	11
	Tanks / Cisterns/Syntax	Nos.	203	237	440
		Pos.	17	17	34
	Drum / barrels	Nos.	3191	2228	5419
		Pos.	75	111	186
	Plastic Containers	Nos.	10451	9078	19529
		Pos.	86	62	148
	Grinding stone	Nos.	785	596	1381
		Pos.	11	16	27
	Flower pots	Nos.	7735	7318	15053
		Pos.	30	12	42
	Fridge	Nos.	2477	2277	4754
		Pos.	21	7	28
	OHT	Nos.	2525	2609	5134
		Pos.	0	1	1
Sump	Nos.	1876	2153	4029	
	Pos.	1	1	2	
No. of Containers Checked		29294	26611	55905	
No. of Containers Positives		243	236	479	
No. of Houses Checked		2753	2755	5508	
No. of Houses Positives		208	168	376	
No. of Pupa		407	997	1404	
Container Index		0.83	0.89		
House Index		7.56	6.10		
Breteau Index		8.83	8.57		
Pupal Index		14.78	36.19		

Every year during the period of July – November an upsurge in cases of dengue has been observed. A peak of the cases after monsoon depends with the season. It is not uniformly distributed throughout the year. The prevalence of serotype of dengue has not fully been studied in this area. However as per the information available serotype 2 and 3 are recorded so far. (unpublished information) the study of the serotype becomes important. the Aedes species of mosquitoes, Aedes aegypti has been incriminated as the vector of dengue in this area.(unpublished data of IVCZ, Hosur). The climatic conditions predominantly temperature and humidity play a vital role in the life cycle, breeding and longevity of the mosquito and transmission of the disease. The maximum temperature of this area ranges from 25°C to 27.5°C and the minimum ranges from 20°C to 20.8°C. The RH ranges from 11.33% to 59.33%. During summer months (pre

monsoon period) it ranges from 11.33% to 29.33%. During the monsoon and post monsoon period the RH range from 36.0% to 59.33%. As of now there is a significant association between temperature and humidity. The higher temperature and humidity has been noticed during the incidences of dengue. The location of Hosur is such that this place receives rains during both rainy seasons ie by the influence of South West monsoon and North East monsoon. The quantum of rain that is received by this area is more during South West monsoon than North East monsoon, for all purposes this area is under the influence of South West monsoon. The total number of rainy days in a year ranges from 203 to 211, but the quantity of rainfall is not heavy. It ranges from 35.04cm to 75.4cm. The undulating terrain of this area provides more number of breeding grounds for the mosquitoes in this area. However the containers and water storage tanks helps to maintain the breeding of the *Aedes* spp of mosquitoes in all seasons of the year.

### CRITERIA FOR STRATIFICATION

Considering the prevalence of dengue in Hosur Municipal Corporation area at various degree in all through these years, the factors that influence the transmission and prevalence of dengue has been analysed with the following variables.

- a) Ward wise number of dengue cases.
- b) The potential breeding sources and the entomological parameters.
- c) The abiotic factors like rainfall, temperature, RH etc.
- d) Case detection (surveillance) and
- e) Intervention measures that are being carried out.

After analyzing the available data on each aspects noted above, the variables were given the weightage. Ward wise analysis was made and each ward is identified as low risk, medium risk and high risk area. A mapping has been done on this basis. Based on this 7 wards are considered as high risk, 16 wards as medium risk and 22 wards as low risk. The same has been shown in the map. (Fig.3). As observed from data, the prevalence of dengue in Hosur area is seasonal. To understand the exact trend of the disease whether endemic or epidemic the data for more years ie more than 10 to 12 years are required. It has been noted that the trend of dengue is not clear for Chennai city after analyzing the epidemiological data for 20 years.<sup>3</sup> So it is not easy to define this area as endemic, but safely be considered this area as epidemic (dengue) prone. The interventional issues and challenges like population growth, rapid urbanization, which are also leading causes of the cyclic epidemiological pattern of dengue<sup>2</sup> in this area is notable here also. Further the temperature and humidity

suitable for vector mosquito supporting the transmission of dengue is also to be borne in mind and a routine control measures which include all key elements for the control of dengue, as recommended by the DPH&PM, Chennai<sup>4</sup> must be adopted to free this area from epidemic prone status. There are variations in the characteristics of dengue epidemic from region to region. Hence information on all factors that favour the transmission of dengue is essential to identify the outbreak (epidemic). These information will be useful to plan suitable anti-dengue measures<sup>5</sup>. Taking the above observations into consideration this stratification of the area for dengue control has been attempted and recommended for adoption also. The outbreak of dengue fever in the coastal areas of Nagapattinam, Thiruvarur and Thanjavur Districts in Tamil Nadu during 2012 has been investigated and found that the dengue outbreak was seasonal, the entomological indices were high along with eco-bio-socio economic factors such as rainfall, good number of breeding sources.<sup>6</sup> Similar conditions have been noticed in Hosur area also. The WHO recommends that every dengue endemic country should have a surveillance system and it should be mandated by law.<sup>1</sup> The same is lacking in our country, which makes our population vulnerable to dengue infections. Hosur area is not exceptional to this condition. Having observed the various factors related to dengue prevalence. Hosur area is stratified as High, Medium, Low risk area. The actions required is a holistic approach adopting the key elements that have been discussed here in the earlier paragraphs, A trial may be made in implementing strata wise activities to keep Hosur Municipal Corporation area free from dengue "out breaks".

### CONCLUSIONS

The present study which was planned and executed has brought out that,

- The Hosur Municipal Corporation area is both vulnerable and receptive for Dengue out break and a seasonal incidence of dengue cases have been noticed during the last 5 years.
- The dengue incidence that has been reported from wards are not uniform.
- Epidemiologically, out of 45 wards in Hosur Municipal Corporation area, 23 wards needs greater attention to avoid seasonal incidence of the disease.
- All the wards are having potential breeding places for *Aedes* spp. Mosquitoes, all through the months of the year.
- The entomological parameters varies from one area to another, indicating the need of area specific control measures.
- The environmental conditions that includes the rainfall,

RH, Temperature etc., are conducive for the prevalence of the vector mosquito ie *Aedes* spp. Hence the vector control measures needs to be carried out on regular basis and not restricted to outbreak season only.

- The stratification done for Hosur Municipal Corporation area shows that by utilizing the available resources (ie man power and materials) it is feasible to avoid outbreak of Dengue when adopted / implemented. The Hosur Municipal Corporation Authorities may approach both the District Health Authorities and Institute of Vector Control and Zoonoses for technical guidance in dengue control, whenever required.

## RECOMMENDATIONS

- The case detection mechanism is practically absent and it has to be taken up.
- The case detection mechanism is practically absent and it has to be taken up.
- This key elements of the control measures such as surveillance, vector control, case management, IEC, Intersectoral co ordination, Community involvement, capacity building, monitoring and supervision are to taken up by the Local Body ie the Hosur Municipal Corporation's administration, as per the need of the time.
- In the absence of the surveillance for dengue, the services of the available staff (both the UPHC and Frontline workers in Health wing) may be utilized as a routine for dengue control. ie house visit, case detections (by referring the fever cases to Health / Medical Institution) source reduction and notification of the fever incidence. All private medical facilities should notify the dengue incidence to local health authority without fail.
- Both IEC and capacity building at Hosur Municipal Corporation level must be taken up to meet the outbreak situations.

The case detection mechanism is practically absent and it has to be taken up.

- This key elements of the control measures such as surveillance, vector control, case management, IEC, Intersectoral co ordination, Community involvement, capacity building, monitoring and supervision are to taken up by the Local Body ie the Hosur Municipal Corporation's administration, as per the need of the time.
- In the absence of the surveillance for dengue, the services of the available staff (both the UPHC and Frontline workers in Health wing) may be utilized as a routine for dengue control. ie house visit, case detections (by referring the fever cases to Health / Medical Institution) source reduction

and notification of the fever incidence. All private medical facilities should notify the dengue incidence to local health authority without fail.

- Both IEC and capacity building at Hosur Municipal Corporation level must be taken up to meet the outbreak situations.

This key elements of the control measures such as surveillance, vector control, case management, IEC, Intersectoral co ordination, Community involvement, capacity building, monitoring and supervision are to taken up by the Local Body ie the Hosur Municipal Corporation's administration, as per the need of the time.

- In the absence of the surveillance for dengue, the services of the available staff (both the UPHC and Frontline workers in Health wing) may be utilized as a routine for dengue control. ie house visit, case detections (by referring the fever cases to Health / Medical Institution) source reduction and notification of the fever incidence. All private medical facilities should notify the dengue incidence to local health authority without fail.
- Both IEC and capacity building at Hosur Municipal Corporation level must be taken up to meet the outbreak situations.

## LIMITATION OF STUDY

Considering the available man power and materials this study was designed to cover both pre monsoon and post monsoon period of the years, 2020 and 2021. Since Hosur Municipal Corporation area is vast 10 wards out of 45 wards were selected randomly. The data of last five years ie 2015 - 2019 was considered for the proposed study and taken up for analysis. Considering the operational constraints the study has been limited for a short period.

## CONFLICT OF INTEREST

Nil

## ACKNOWLEDGEMENTS

The authors thank the staff of Institute of Vector Control and Zoonoses, Hosur, Deputy Director of Health Services, Krishnagiri, Hosur Municipal Corporation's authorities and especially to the staffs in Health wing for the support and help lent during the study period. The guidance of Mr.K.Kamarasu, Senior Entomologist and Mr.M.Neelamegam, Reader in Public Health Entomology is thankfully acknowledged. The services of Dr.G.Narayanasamy, formerly Reader, Institute of Vector Control and Zoonoses, Hosur are thankfully remembered for preparation of this script. The support

provided by the Directorate of Public Health and Preventive Medicine, Chennai is gratefully acknowledged.

## REFERENCES

1. Comprehensive Guidelines for Prevention and Control of Dengue and Dengue Haemorrhagic Fever -WHO (SEARO) 2015.
2. Kalpana Baruah, Amit Katewa, Gavendra Singh, Neeraj Dhingra (2020) Dengue Bulletin – Volume 41, 2020 149. Epidemiological stratification of dengue in India and strategic challenges.
3. Radhakrishnan J,a Selvakumar S,b Dhanraj B,b# Sanjeevi Prasad S, Samuel Tennysond (2020). Dengue Bulletin –

Volume 41, 2020..Dengue In Chennai : a retrospective study. 4.Training Module for dengue, DPH & PM,Chennai-Publication-2019.

5. L. Kabilan, S. Balasubramanian1, S.M. Keshava1 and K. Satyanarayana (2005). Indian Journal of Pediatrics, Volume 72—November,2005 .The 2001 dengue epidemic in Chennai

6.Praveen, BK Tyagi, Nirmal joe and M B Thakur. An out break investigation of dengue fever in the coastal areas of Nagapattinam, Thiruvarur,and Thanjavur Districts in Tamil Nadu,India during 2012. International journal of mosquito Research.