

Evolution and Dynamics of Dengue Cases in India 2017-2022: A Retrospective Study of Trends, Seasonality, and the Impact of COVID-19: A Record-Based Study

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Abstract: *This article presents a comprehensive retrospective observational study focusing on the trends and seasonality of dengue fever in India from 2017 to 2022. The study, conducted in a tertiary care hospital in Kolhapur, analyzed 17,672 Dengue IgM Antibody tests. The findings reveal a significant fluctuation in dengue cases, with a notable increase in seropositivity in 2018 and 2019, followed by a decline during the COVID-19 pandemic in 2020 and 2021. The study highlights the impact of the pandemic on dengue testing and reporting, with a resurgence of cases in 2022 post-COVID-19. It underscores the complexity of diagnosing dengue amidst similar COVID-19 symptoms and the necessity for sustained public health measures and vigilant monitoring of dengue trends. The study contributes valuable insights into the epidemiological shifts in dengue virus prevalence and the influence of climatic factors and public health policies in India.*

Keywords: Dengue Fever, Epidemiological Trends, India, COVID-19 Impact

1. Introduction

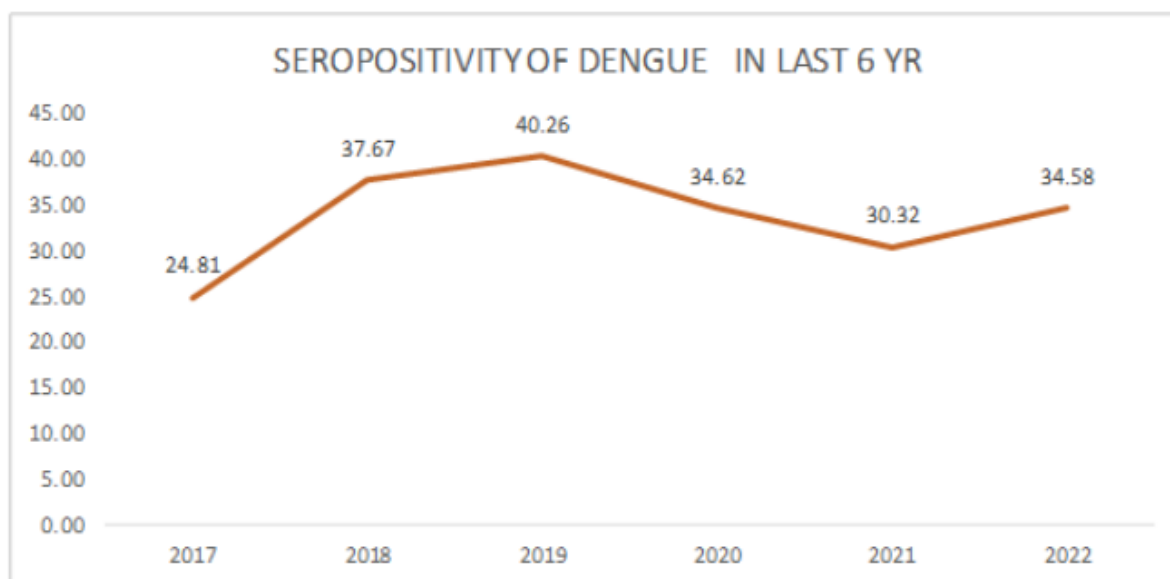
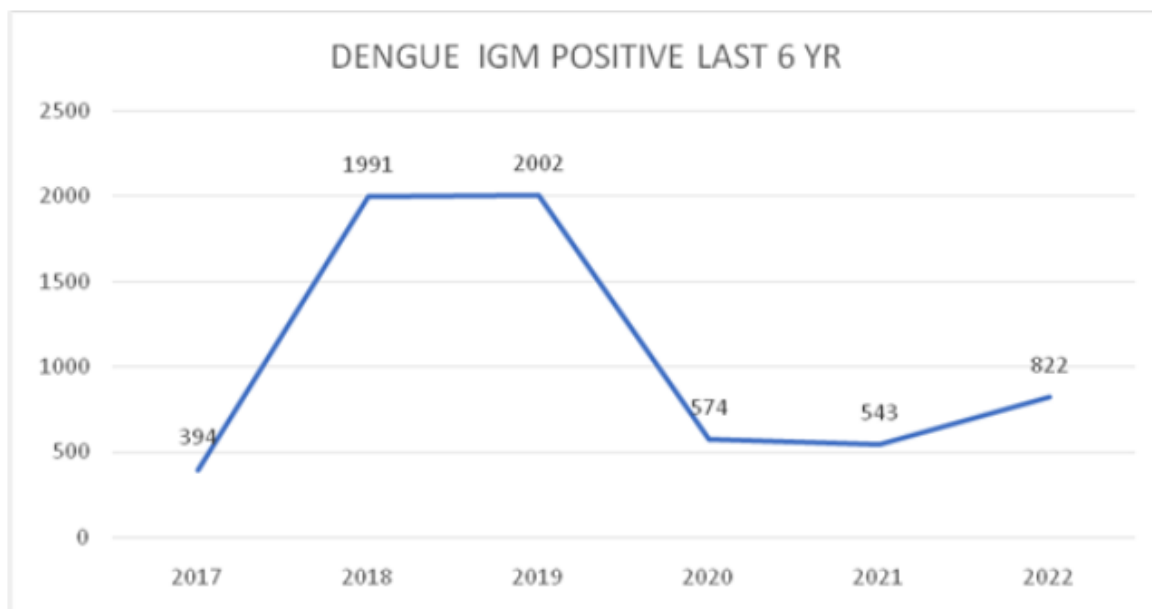
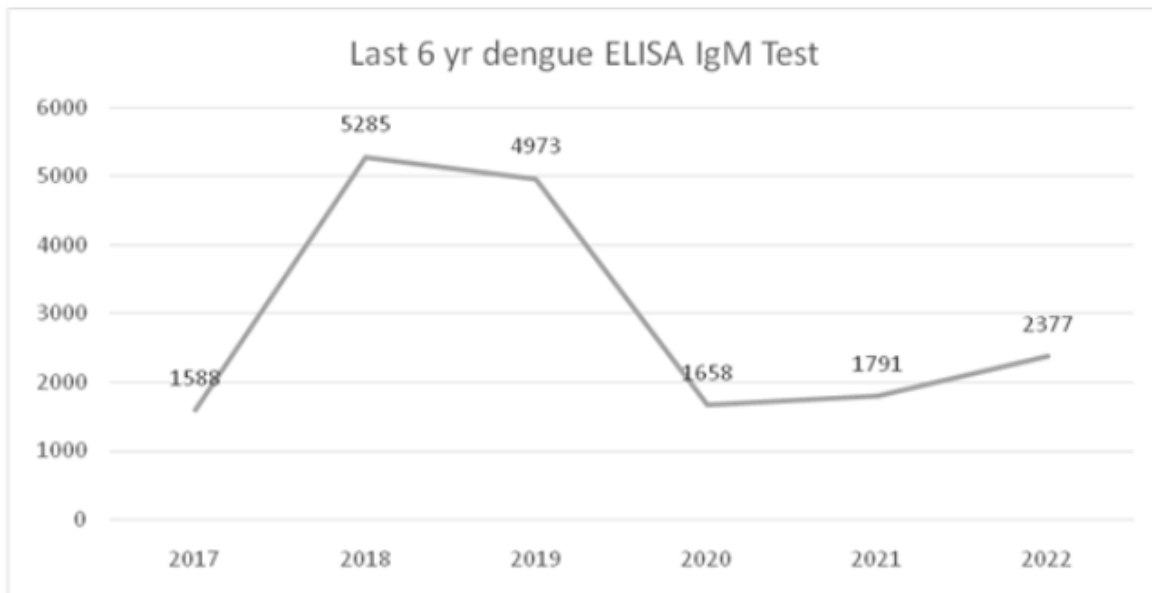
Dengue is a vector-borne disease and is a major public health threat in India.[1] Dengue is a self-limited, flu-like systemic arboviral disease transmitted between humans by Aedes mosquitoes.[2] Between 2006-2008, 18 States and Union Territories (UTs) reported dengue cases. The number increased to 20 and 29 during 2009 and 2010 respectively. Now Dengue is endemic in India. [3] Dengue had been restricted to urban areas, but it has now spread to rural regions.[4] India experiences cyclic epidemics of dengue over the years and the infection imposes for the leading cause of hospitalisation and death among children in the country [5]. Both Aedes aegypti and Aedes albopictus are the main competent vectors for dengue virus in India. [6] Temperature and precipitation are important climatic factors in mosquito population and disease transmission dynamics [7]. In India, case detection, case management, and vector control are the main strategies for the prevention and control of dengue virus transmission.[8] This laboratory record-based study was planned to study the annual and seasonal trend of dengue fever (DF) testing.

2. Material & Methods

A retrospective observational study was carried out on samples received between January 2017 to December 2022 from clinically suspected Dengue patients. Samples were from in & around Kolhapur. Samples received were tested for Dengue IgM Antibody in Microbiology laboratory, in a tertiary care hospital, in Kolhapur. NIV DEN IgM Capture ELISA (MAC ELISA) kit was used. Tests were performed as per manufacturer's instructions. Data were entered and analyzed in Microsoft Excel.

3. Results

In last 6 years total 17672 Dengue IgM Antibody tests were performed. In 2018 and during early phase of covid 19 pandemic, quite high number of samples was received. But there was sudden drop in both samples and dengue testing in 2020 & 2021 due to covid 19 pandemic situation in India. In 2022 samples received for dengue testing reached the levels higher than in 2017. Similar trends were observed in dengue seropositivity in 2020-21.



Seropositivity rate was higher in 2018 (37.67%) followed by 2019 (40.26%) but during Covid-19 pandemic seropositivity declined in 2020 (34.62%) & 2021 (30.32%).

DENGUE CASES MONTH AND YEARWISE						
Month	2017	2018	2019	2020	2021	2022
JAN	8	23	25	82	20	15
FEB	2	9	41	69	7	13
MAR	3	12	35	38	16	16
APR	7	11	25	23	11	17
May	13	47	28	21	9	51
JUN	19	337	57	14	18	52
JUL	14	560	196	112	73	104
AUG	23	406	394	34	54	148
SEPT	32	220	311	28	75	146
OCT	47	168	239	53	105	111
NOV	107	103	426	45	94	100
DEC	119	95	225	55	61	49
TOTAL	394	1991	2002	574	543	822

Dengue cases increased from June to September every year (monsoon season). After end of third wave of Covid 19 in Mar'22, the seropositivity increased gradually & reached its peak in August -September for year 2022 (34.58%).

4. Discussion

Dengue is a major public health problem in India. Some studies have reported that an epidemiological shift in dengue viruses and climate change might be responsible for the observed increase in dengue burden across India [9,10]. In recent years, dengue has shown an increasing trend in the number of cases in the country, therefore requiring urgent public policies to curb the disease.[11] The analysis of time trend of DF clearly shows decrease in the number of cases during COVID-19. This sudden decreases in the number of dengue cases could be due to under reporting of dengue cases and decrease outside mobility due to lockdown during COVID 19. One of the reasons for under-reporting of dengue could be due to its similar clinical picture with COVID-19. Both show non-specific presentations, including fever, headache, abdominal pain, malaise, and nausea. Not only clinical features but they also have similar laboratory findings such as leukopenia and thrombocytopenia, which put together makes the diagnosis more difficult [12]. The number of cases starts ascending in the month of AUGUST and reaches a peak in OCTOBER and then starts descending.

5. Conclusion

The number dengue cases in year 2020 were far less than the previous two years; there was no classical obvious peak in monsoon months. Dengue is still major public health problem requiring sustained testing and strict monitoring of the seropositivity trend so that appropriate public health measures can be taken in real time.

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