

Epidemiological Analysis of Dengue Fever in Hyderabad 2015-2018

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ABSTRACT

This study presents an epidemiological analysis of dengue fever in Hyderabad, India, from 2015 to 2018, highlighting the dynamics of transmission and outbreak patterns. Data were collected from the Fever Hospital and the Institute of Preventive Medicine, focusing on seasonal trends, demographic distribution, and geographic hotspots. The analysis revealed a significant fluctuation in dengue cases, with a notable rise in positivity rates, increasing from 2.49% in 2015 to 29.23% in 2018, despite a decrease in overall tests conducted. The total number of positive cases surged from 22 in 2015 to 145 in 2018, indicating escalating transmission rates. Admissions peaked in 2016 at 528 cases, followed by a decline to 177 in 2018, suggesting improved community health measures and clinical management, as no fatalities were recorded during the study period. The findings underscore the urgent need for enhanced public health interventions and vector control strategies to address the rising incidence of dengue in Hyderabad, particularly in light of environmental and socio-economic factors influencing transmission. This analysis aims to inform future public health policies and preventive measures to mitigate dengue outbreaks effectively.

Key words: Dengue Fever, Epidemiology, Public Health, Aedes Mosquito, Hyderabad

INTRODUCTION

Dengue fever, a viral infection spread by Aedes mosquitoes, has emerged as a pressing public health concern worldwide, particularly in tropical and subtropical regions. Dengue virus (DENV) infection can lead to a spectrum of illnesses, ranging from mild flu-like symptoms to severe dengue hemorrhagic fever and dengue shock syndrome, which may be fatal if untreated (Guzman & Harris, 2015).

India has been severely affected by dengue, especially in urban areas where conditions are favorable for mosquito breeding, including poor sanitation, stagnant water, and high population density (Murray et al., 2013). Hyderabad, the capital city of Telangana state, has experienced frequent dengue outbreaks, largely due to rapid urbanization, inadequate drainage systems, and seasonal variations that provide optimal breeding grounds for Aedes mosquitoes.

These factors, combined with Hyderabad's climate and geography, make it particularly susceptible to dengue transmission. This report presents an epidemiological analysis of dengue fever in Hyderabad from 2015 to 2018, with the aim of understanding the dynamics of dengue transmission and identifying patterns in outbreak occurrences.

By examining seasonal trends, demographic distribution, and high-risk areas, this study provides valuable insights that could guide public health policies and preventive measures to mitigate future dengue outbreaks in Hyderabad.

MATERIALS AND METHODS

Data Collection

To examine the prevalence and incidence of dengue fever in the Telangana region, de-identified dengue fever data from 2015 to 2018 was obtained from the Fever Hospital and the Institute of Preventive Medicine (IPM) in Hyderabad. The data was archived from medical records, ensuring that no personal identification information was included. This data collection was conducted in compliance with ethical standards for research involving human subjects, maintaining patient confidentiality and adhering to data protection protocols.

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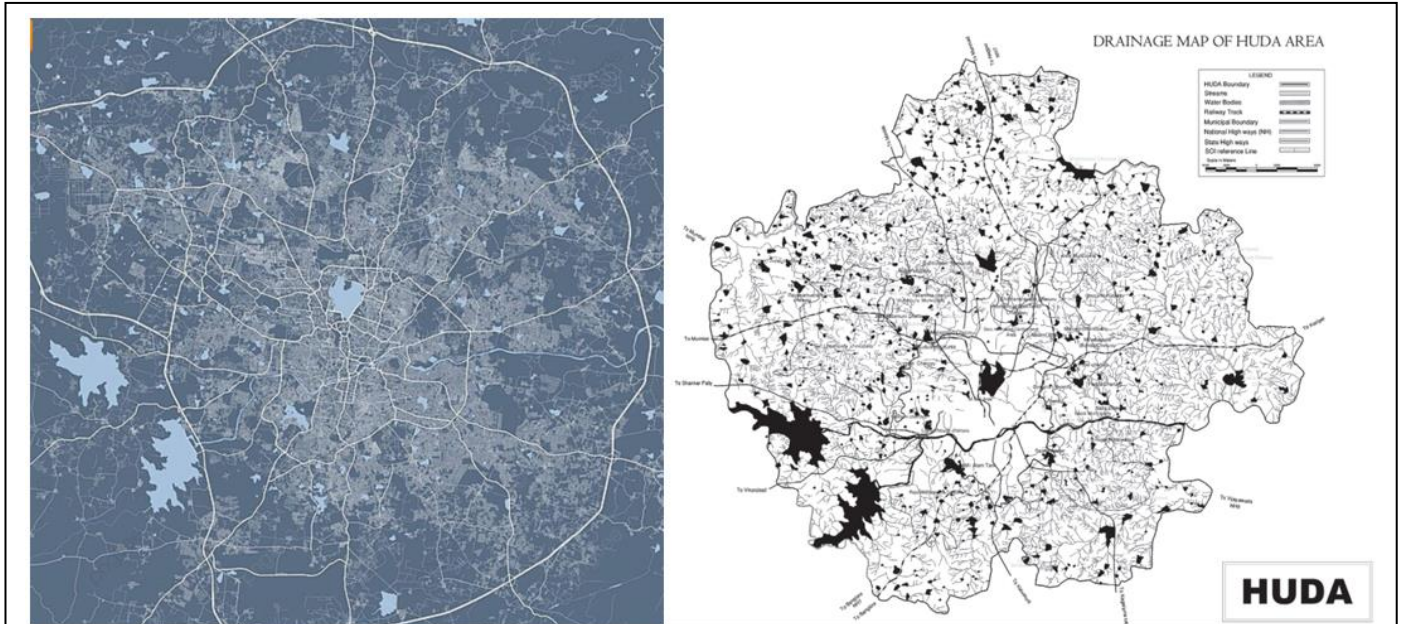


Figure-1. Study Area – Hyderabad Latitude and Longitude **17° 22' 31" N and 78° 28' 27" E.** (Reproduced from *Creative Space (CS) Vol. 1, No. 1 July 2013 pp. 19–37*)

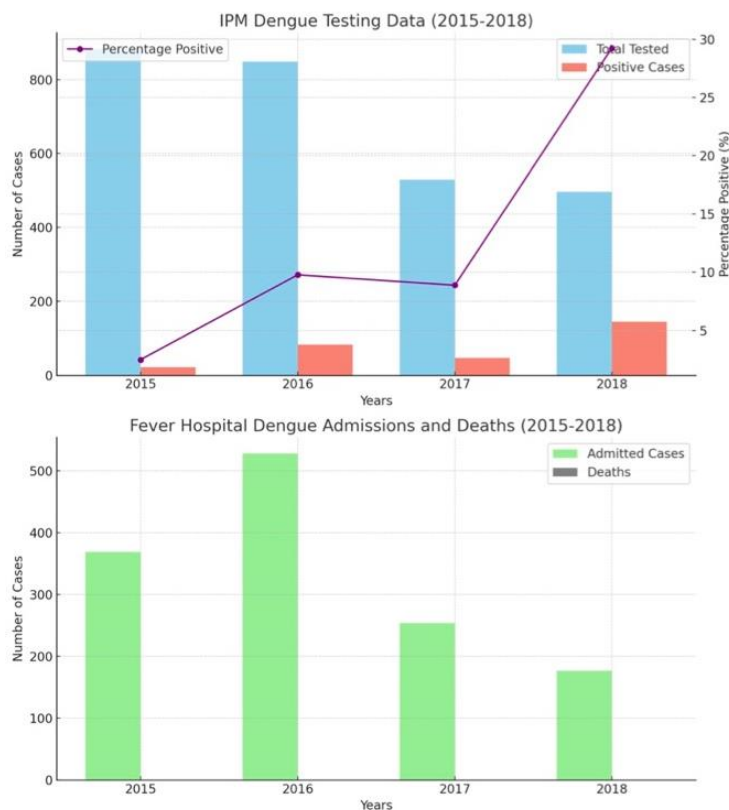


Figure-2. Prevalence of Dengue cases in IPM and Fever Hospital

Study Area (Fig-1)

The study focused on Hyderabad, the capital of Telangana, as well as surrounding areas within the Telangana region. Hyderabad’s climate, which includes hot summers, a monsoon season, and mild winters, along with its high population density and rapid urbanization, creates an environment conducive to

dengue transmission, making it an ideal region for studying dengue epidemiology.

Study Design

This was a retrospective cross-sectional study aimed at analyzing dengue fever trends over a four-year period. Data from both Fever Hospital and IPM were combined to

ensure a comprehensive assessment of dengue cases. The study analyzed annual and seasonal trends, demographic distributions, and the geographic spread of cases across different localities within Telangana.

Data Analysis

The collected data was organized and analyzed to determine the prevalence (proportion of the population with dengue at a given time) and incidence (new cases over time) of dengue fever. Analysis was conducted to identify annual trends, seasonal patterns, demographic and geographic distribution.

RESULTS

There was a decrease in the total number of tests conducted by the Institute of Preventive Medicine (IPM) from 2015 to 2018 (Fig-2) starting from 883 tests in 2015 down to 496 in 2018. In contrast, the number of positive cases showed a fluctuating trend, with a notable increase in 2018. The cases were relatively low in 2015, with only 22 positive cases, but sharply rose to 145 in 2018. The percentage positivity of dengue cases also showed a marked increase over the years. It started at 2.49% in 2015, then spiked to 29.23% in 2018 (Figure-2), indicating an increase in the proportion of confirmed dengue cases among those tested. This rising positivity rate suggests an escalating problem and possibly increased transmission rates or more targeted testing protocols over time.

Data from Fever Hospital shows the number of dengue cases admitted each year. Admissions peaked in 2016 with 528 cases, then declined in the subsequent years, dropping to 177 in 2018. This downward trend might indicate an improvement in community health measures, awareness, or a reduction in severe cases over time. Despite the admissions, no deaths were reported due to dengue from 2015 to 2018 at Fever Hospital (Figure-2). This indicates effective clinical management of dengue cases, which may have prevented fatal outcomes, despite a high number of cases.

The data highlights the increasing prevalence of dengue in Telangana, especially in terms of positivity rates, which suggests a need for enhanced public health interventions and vector control measures. The sharp increase in positivity at IPM in 2018 could point to environmental or socio-economic factors contributing to the higher incidence of dengue cases in the region. Moreover, the absence of recorded deaths indicates successful hospital treatment strategies, though the high number of admissions and positivity rates signal a persistent public health challenge.

DISCUSSION

The analysis of the dengue surveillance data from Telangana between 2015 and 2018 reveals significant trends that highlight both the challenges and successes in managing the disease. One of the key observations is the decrease in the number of dengue tests conducted

by the Institute of Preventive Medicine (IPM), from 883 in 2015 to 496 in 2018. However, this reduction in testing did not correspond to a similar decline in cases. In fact, the number of positive dengue cases increased sharply, particularly in 2018, indicating a rising burden of the disease despite fewer tests. This increase in positivity rates, from 2.49% in 2015 to 29.23% in 2018, suggests a growing incidence of dengue. This trend could be attributed to a combination of factors, including heightened transmission rates and more targeted testing protocols aimed at symptomatic individuals. Similar trends have been observed globally, where a rising positivity rate often correlates with larger outbreaks and intensified surveillance efforts (Gubler, 2011).

Environmental factors such as seasonal variations in temperature and rainfall are likely contributing to the observed increases in dengue cases. Warmer temperatures and increased precipitation create ideal conditions for the breeding of *Aedes* mosquitoes, the primary vectors of dengue. Additionally, socioeconomic and urbanization factors, including inadequate waste management and stagnant water sources, likely contribute to the spread of the virus. These issues have been implicated in the rapid transmission of dengue in densely populated urban areas, as seen in many parts of Southeast Asia and South America (Adriano Mondini 2007).

The data from Fever Hospital presents a slightly different picture. While admissions peaked in 2016 with 528 cases, a significant decline in the number of admissions was observed in the subsequent years, reaching 177 in 2018. This decrease could suggest the effectiveness of community health measures, improved awareness, and possibly better preventive interventions at the local level. While the number of dengue cases remained high, the reduced hospital admissions may also reflect a decrease in the severity of the cases, as less severe infections are often treated at home rather than requiring hospitalization. In this regard, the improvement in clinical management and early intervention could have played a role in preventing severe outcomes.

The fact that no deaths were reported from 2015 to 2018 despite the increasing number of cases is a particularly noteworthy outcome. It suggests that clinical treatment protocols and healthcare infrastructure in Telangana were effective in managing severe cases, which is consistent with findings from other regions where improved treatment methods have significantly reduced mortality rates from dengue (Cameron P. Simmons 2012). Despite the promising outcomes in terms of mortality, the rise in cases and the increasing positivity rates underscore the ongoing public health challenge posed by dengue. These findings emphasize the need for continued and enhanced vector control strategies, including community-based interventions like the elimination of mosquito breeding sites and increased public awareness campaigns. Effective vector control has been identified as one of the most critical components in reducing the transmission of dengue, particularly in urban areas (Cassie C. Jansen et al 2010) Additionally,

improving access to healthcare, especially in high-risk areas, and ensuring timely diagnosis and treatment are vital to reducing the severity of the disease and preventing fatalities.

However, the rise in positivity rates and the increasing number of cases suggest that while clinical management has improved, more focus is needed on preventing the disease at its source through better vector control, surveillance, and public health strategies.

In conclusion, while the decrease in dengue-related deaths and the decline in hospital admissions are encouraging, the rising number of positive cases and the increasing positivity rate highlight the growing burden of dengue in Telangana. These trends call for a multifaceted public health response, focusing on both prevention and treatment. Strengthening vector control measures, improving surveillance, and ensuring that clinical care remains effective will be crucial in managing future outbreaks and reducing the overall impact of dengue in the region. The findings of this study are in line with global observations and underscore the importance of integrated public health interventions in combating dengue.

Conflicts of Interest

Authors declare that there is no conflict of interests regarding the publication of this paper.

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