

Trend Analysis of Three Major Mosquito Borne Diseases in Washim, Maharashtra, India.

¹P. M. Wankhede and ²R. P. Chondekar

¹Assistant Professor, ²Professor

¹Department of Zoology, R. A. Arts, Shri M. K. Commerce and Shri S. R. Rathi Science College, Washim.

²Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University, Chhatrapati. Sambhajinagar

Abstract: A survey has been conducted in the Washim district for observing the total cases of VBDs. Among these malaria, dengue and chikungunya cases were significantly observed and the data is collected from the District Malaria Department, Washim. The data collected from the year 2022 to 2024. More than 300 cases of three major mosquito borne diseases were reported in Washim, Maharashtra, India, between the year 2022 to 2024. There is total six talukas in the Washim district viz., Washim, Malegaon, Mangarulpur, Risod, Karanja and Manora. According to the collected data, in the year 2022, total malarial cases were 05 which were mostly from Washim and Risod in the month July and August. In the year 2023, total malarial cases were 04 which were mostly from Manora in the month September. In the year 2024, total malarial cases were 07 which were mostly from Mangarulpur in the month July. Same study was done in case of chikungunya. In the year 2022, total chikungunya cases were 13 which were mostly from Karanja in the month October and November. In the year 2023, total chikungunya cases were 38 which were mostly from Washim in the month August and October. In the year 2024, total chikungunya cases were 52 which were mostly from Washim in the month April and August. In the year 2022, total dengue cases were 33 which were mostly from Washim, Mangarulpur and Karanja in between the month July to November. In the year 2023, total dengue cases were 85 which were mostly from Washim and Risod in the month September and November. In the year 2024, total dengue cases were 68 which were mostly from Washim in the month April and August. This is the study carried out to determine trend of three years mosquito borne diseases in the Washim district. In this study most of the positive cases among the three vector borne diseases were of dengue.

IndexTerms - Washim, Malaria, Chikungunya, Dengue, Trend analysis

INTRODUCTION

Vector-borne diseases (VBDs) account for about 17% of the global infectious disease burden, with over 70,000 deaths annually and 3.9 billion people at risk, according to WHO. Malaria, dengue, and chikungunya are among the most common VBDs and major public health concerns in India. While malaria cases have declined by over 20% with a 30% drop in mortality in recent years, malaria and dengue remain the deadliest and fastest-spreading VBDs. This study focuses on the epidemiological trends of malaria, dengue, and chikungunya.

Malaria is a potentially life-threatening disease that has affected human populations for thousands of years. In 2018, there were 228 million malaria cases and 405,000 deaths globally. The two most common species of the malaria parasite, *Plasmodium vivax* and *Plasmodium falciparum*, are responsible for the majority of cases. Malaria is transmitted through the bite of infected female *Anopheles* mosquitoes. The World Malaria Report 2019 estimated 228 million malaria cases across 89 countries, with 405,000 deaths in 2018. The majority of cases occurred in the WHO African Region (93%), followed by the WHO South-East Asia Region (3.4%) and the WHO Eastern Mediterranean Region (2.1%). In the South-East Asia Region, India, Indonesia, and Myanmar accounted for 98% of reported cases, with India contributing 58%. In 2019, India represented 3% of the global malaria burden but reported a 49% reduction in malaria cases and a 50.5% decrease in deaths compared to 2017.

MATERIAL AND METHOD:

Our study area is Washim district, Maharashtra, India. Washim is located in the eastern region of Vidarbha. Washim district covers an area of 5,150 square kilometers. Rainfall is generally in Monsoon during the month from June to September. Climate is Hot and Dry summers and cold winters with the seasonal variation in the temperature being pretty large. Six talukas are there viz. Washim, Karanja, Risod, Malegaon, Manora and Mangrulpur. Population is about 12,97,160 and the population sex ratio 926 female for every 1000 males. Quantitatively data was collected from the District Malaria Office, Washim from January 2022 to September 2024.



Photograph: Washim District taluka wise map.

DATA COLLECTION:

Data was collected quantitatively from the District Malaria Office, Washim from January 2022 to September 2024. The District Malaria Office, Washim collects the quantitative data from both the private and government hospitals of the Washim district.

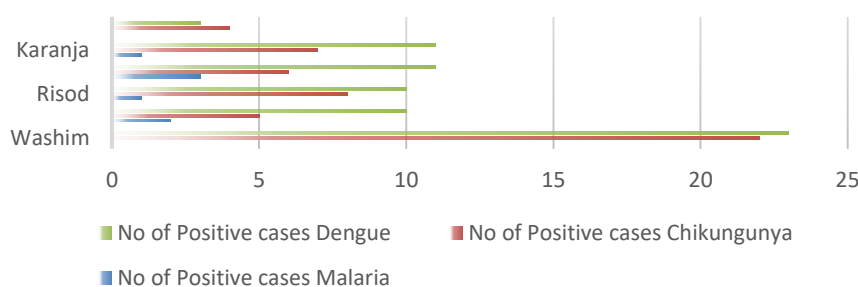
RESULT AND DISCUSSION:

Annual Prevalence of Cases of Mosquito Borne Diseases

1) Total mosquito borne diseases positive cases in 2022 from January to December in Washim district.

| Total mosquito borne diseases positive cases in 2022 (Jan-Dec) | | | | | |
|--|------------------|-------------|------------------|-------------|------------------|
| Malaria | | Chikungunya | | Dengue | |
| Talukas | No. of +ve cases | Talukas | No. of +ve cases | Talukas | No. of +ve cases |
| Washim | 02 | Washim | 01 | Washim | 09 |
| Malegaon | 00 | Malegaon | 00 | Malegaon | 01 |
| Risod | 03 | Risod | 02 | Risod | 02 |
| Mangarulpir | 00 | Mangarulpir | 03 | Mangarulpir | 11 |
| Karanja | 00 | Karanja | 05 | Karanja | 10 |
| Manora | 00 | Manora | 02 | Manora | 00 |
| Total Positive Cases | | | | | 51 |

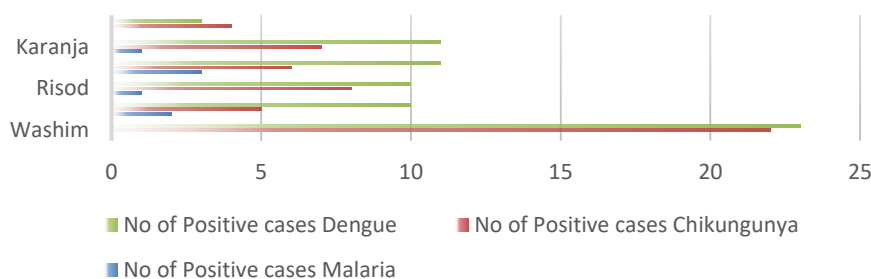
TOTAL MOSQUITO BORNE DISEASES POSITIVE CASES IN 2022



2) Total mosquito borne diseases positive cases in 2023 from January to December in Washim district.

| Total mosquito borne diseases positive cases in 2023 (Jan-Dec) | | | | | |
|--|------------------|-------------|------------------|-------------|------------------|
| Malaria | | Chikungunya | | Dengue | |
| Talukas | No. of +ve cases | Talukas | No. of +ve cases | Talukas | No. of +ve cases |
| Washim | 00 | Washim | 31 | Washim | 22 |
| Malegaon | 01 | Malegaon | 02 | Malegaon | 09 |
| Risod | 00 | Risod | 04 | Risod | 22 |
| Mangarulpir | 01 | Mangarulpir | 01 | Mangarulpir | 18 |
| Karanja | 00 | Karanja | 00 | Karanja | 14 |
| Manora | 02 | Manora | 00 | Manora | 00 |
| Total Positive Cases | | | | | 127 |

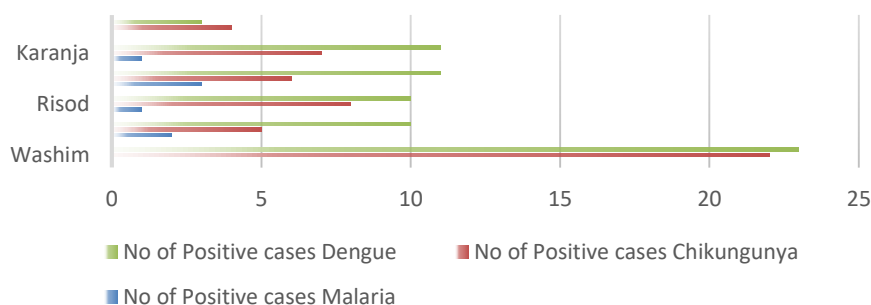
TOTAL MOSQUITO BORNE DISEASES POSITIVE CASES IN 2023



3) Total mosquito borne diseases positive cases in 2024 from January to September in Washim district.

| Total mosquito borne diseases positive cases in 2024 (Jan-Sept) | | | | | |
|---|------------------|-------------|------------------|-------------|------------------|
| Malaria | | Chikungunya | | Dengue | |
| Talukas | No. of +ve cases | Talukas | No. of +ve cases | Talukas | No. of +ve cases |
| Washim | 00 | Washim | 22 | Washim | 23 |
| Malegaon | 02 | Malegaon | 05 | Malegaon | 10 |
| Risod | 01 | Risod | 08 | Risod | 10 |
| Mangarulpir | 03 | Mangarulpir | 06 | Mangarulpir | 11 |
| Karanja | 01 | Karanja | 07 | Karanja | 11 |
| Manora | 00 | Manora | 04 | Manora | 03 |
| Total Positive Cases | | | | | 127 |

TOTAL MOSQUITO BORNE DISEASES POSITIVE CASES IN 2024



Based on the collected data, a total of approximately 305 positive cases of mosquito-borne diseases (malaria, chikungunya, and dengue) were reported in Washim district between January 2022 and September 2024, including both males and females. The study recorded a significant number of positive cases across various talukas, namely Washim, Malegaon, Mangrulpir, Risod, Karanja, and Manora. Among the three vector-borne diseases, malaria showed the fewest positive cases. In contrast, dengue exhibited a high rate of spread during this period, with around 186 positive cases reported in Washim district.

CONCLUSION:

The present study highlights the epidemiological trend of three major mosquito-borne diseases like malaria, dengue, and chikungunya in Washim district, Maharashtra, between 2022 and 2024. A total of approximately 305 positive cases were reported across the district's six talukas, with dengue accounting for the highest number of cases, followed by chikungunya and malaria. The data show that dengue had a particularly high prevalence during the monsoon and post-monsoon months, whereas malaria remained comparatively low in occurrence. Chikungunya cases have also steadily risen, particularly in 2023 and 2024. Overall, the findings indicate that dengue remains the most significant public health concern among the vector-borne diseases (VBDs) in Washim district, necessitating focused attention on prevention, control, and early detection measures.

To effectively control the prevalence of mosquito-borne diseases in Washim district, it is essential to strengthen vector control programs through regular fogging, larval source reduction, and active community participation in eliminating stagnant water. Public awareness campaigns should educate citizens on prevention measures and early symptom recognition. A robust disease surveillance system must be established for early detection and rapid response, alongside strengthening health infrastructure with better diagnostic facilities and trained healthcare workers. Monitoring climate patterns and promoting environmental management practices are crucial for predicting and preventing outbreaks. Intersectoral coordination among departments and encouraging research into locally effective mosquito control strategies will further enhance disease management efforts.

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