



# Prevalence and Risk Factors for Dengue Virus Infection and Malaria among Febrile Patients in Anambra State, Nigeria, 2024

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## BACKGROUND

- Dengue virus and malaria parasites are mosquito-borne pathogens causing febrile illness among people in tropical and subtropical regions.
- Dengue, often misdiagnosed as malaria, is an epidemic-prone disease in over 90 countries across all WHO regions.
- Due to climate change, about half of the world's population is at risk of dengue, with an estimated 100–400 million infections occurring annually.
- Among previously infected persons, infection with a different serotype of dengue virus has been associated with an increased risk of severe complications.

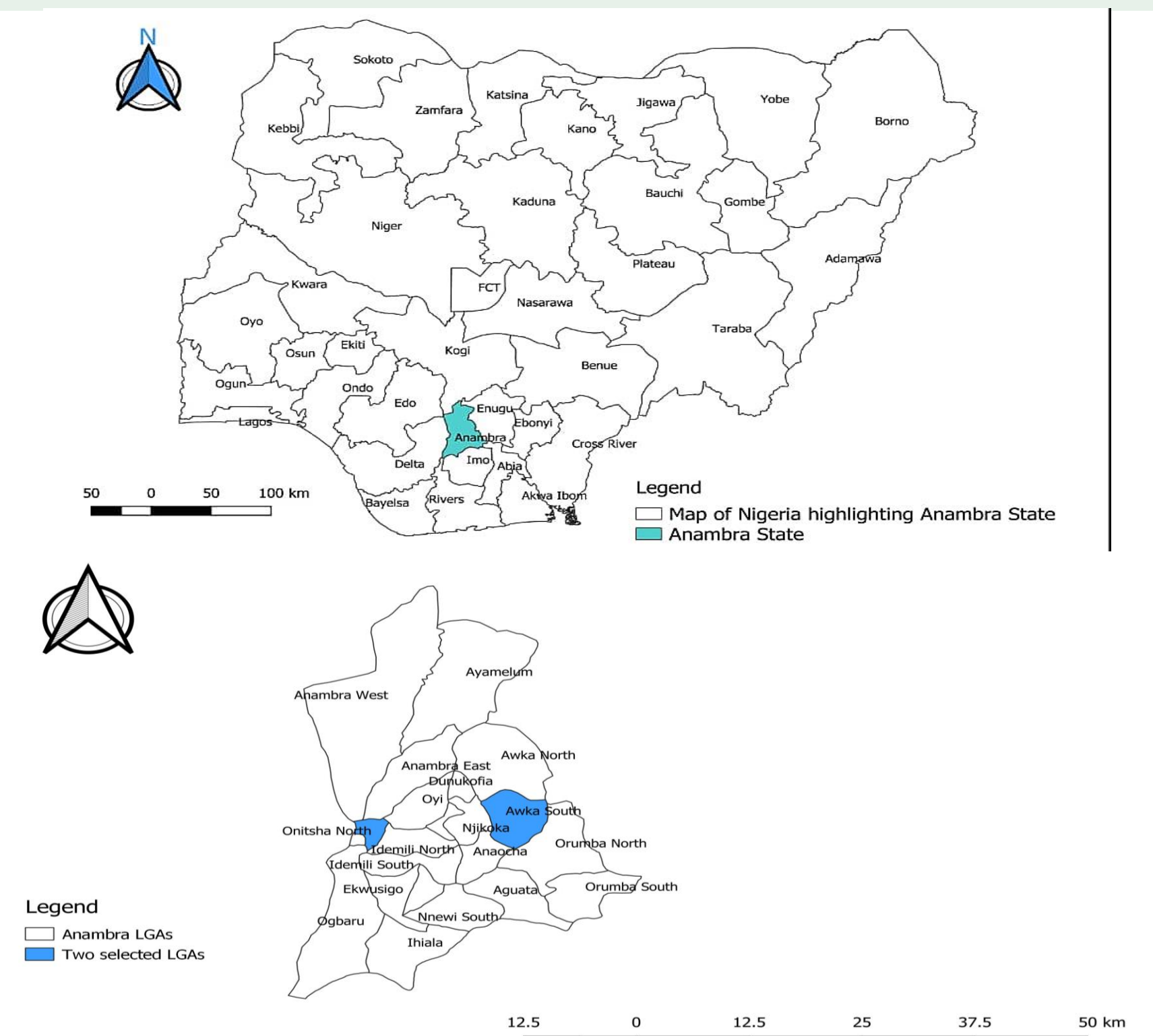
## Objectives

- To determine the dengue serotypes, prevalence and risk factors of dengue and burden of malaria among febrile patients in public hospitals in Anambra State, Nigeria

## METHODS

- Study design:** cross-sectional study of consenting febrile patients ( $\geq 1$  year of age) from May 2024 - July 2024 in two public tertiary healthcare facilities in Anambra State, Nigeria
- Data collection:** Semi-structured questionnaires to collect data on socio-demographic characteristics, risk factors and exposures, and clinical features.

- Laboratory methods:** Blood samples for serology (IgG, IgM and NS1) and multiplex real-time reverse transcription polymerase chain reaction (RT-PCR) for dengue and examined thick blood smears for malaria parasites under microscopy.
- Data analysis:** Computed frequencies and proportions and conducted logistic regression analysis to estimate adjusted odds ratios.



## RESULTS

- 221 (62.6%) out of 352 were female.
- The mean age:  $29.9 \pm 18.8$  years, and 86.4% resided in urban areas.
- Positive for dengue: in 29 participants (8.2%, 95% CI: 5.6-11.6)
- Positive for malaria: 172 participants (48.7%, 95% CI: 43.4-54.1).
- Co-infection detected in 16 participants (55.2%).
- Urban residents less likely to test positive for malaria (AOR: 0.4, 95% CI: 0.22-0.82).
- Only dengue serotype 3 was detected by RT-PCR.

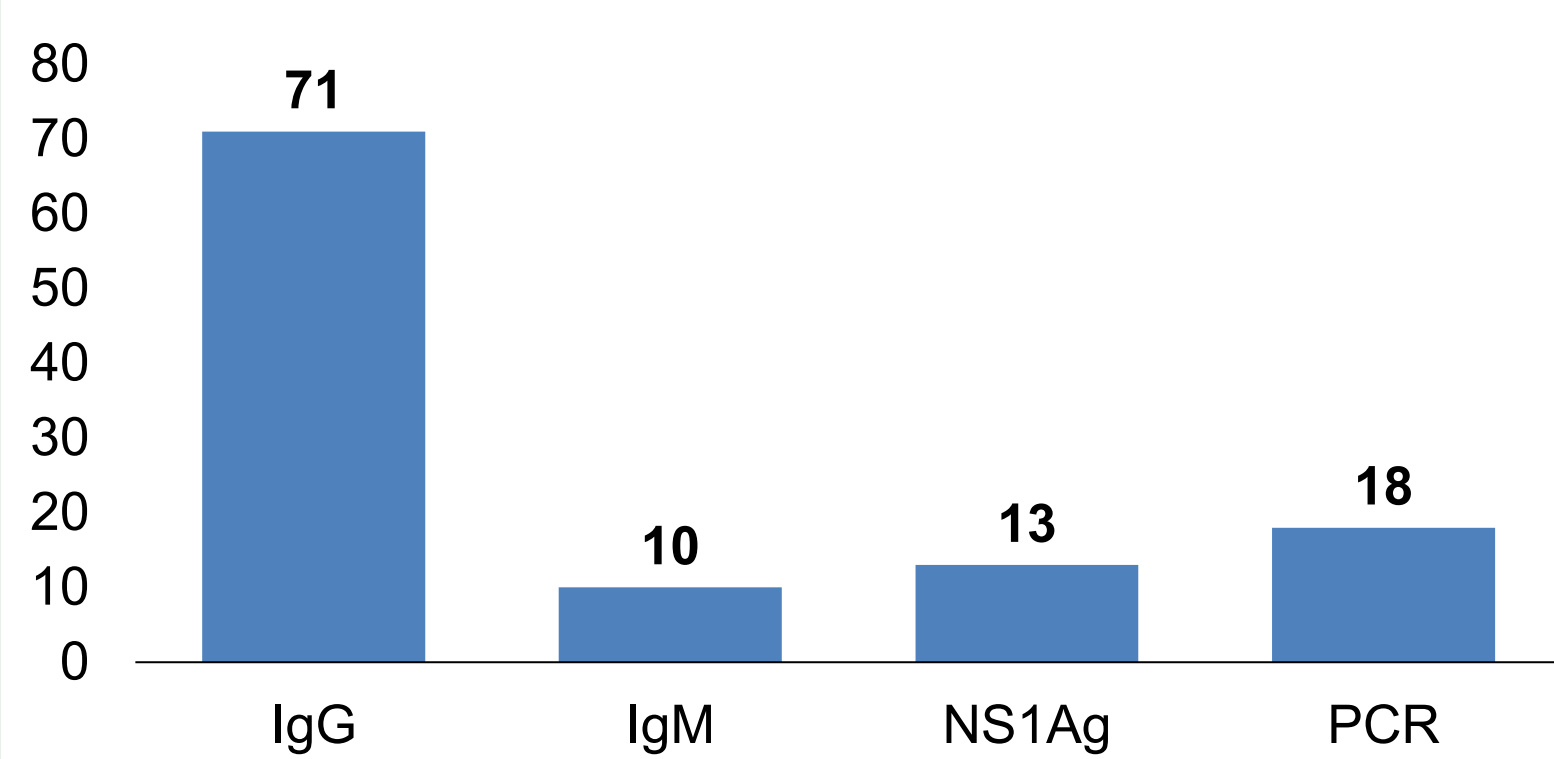


Figure 1: Prevalence of Dengue virus antigen and antibodies among study participants

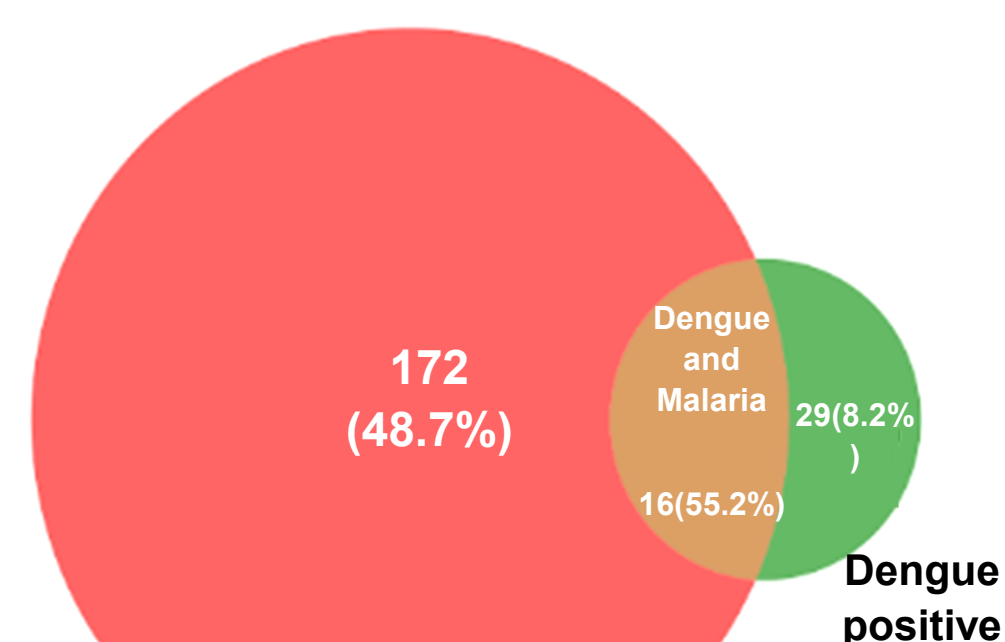


Figure 2: Prevalence of Dengue and Malaria

Variables	Respondents N=353	Dengue positive N=29 (%)	OR (95% CI)	p-value	Malaria positive N=172 (%)	OR (95% CI)	p-value
Sex							
Male	132	15 (11.4)	1.9 (0.88-4.07)	0.100	71 (53.8)	1.4 (0.89-2.13)	0.141
Female	221	14 (6.3)			101 (45.7)		
Place of residence							
Urban/suburban	305	26 (8.5)	1.4 (0.41-4.81)	0.595	139 (45.6)	0.4 (0.19-0.73)	0.003
Rural/village	48	3 (6.3)			33 (68.8)		
Sleep under a mosquito net?							
Yes	197	19 (9.6)	1.6 (0.70-3.46)	0.275	96 (48.7)	1.0 (0.66-1.52)	0.998
No	156	10 (6.4)			76 (48.7)		
Have house window/door nets?							
Yes	318	26 (8.2)	1.0 (0.27-3.31)	0.936	157 (49.4)	1.3 (0.64-2.63)	0.464
No	35	3 (8.6)			15 (42.9)		
Use insecticides or spray the environment daily?							
Yes	120	8 (6.7)	0.7 (0.31-1.68)	0.449	58 (48.3)	0.98 (0.623-1.52)	0.916
No	233	21 (9.0)			114 (48.9)		
Use long sleeve clothing and trousers frequently?							
Yes	88	6 (6.8)	0.7 (0.30-1.96)	0.583	40 (45.5)	0.84 (0.52-1.36)	0.479
No	265	23 (8.7)			132 (49.8)		
Have open water containers in house?							
Yes	150	16 (10.7)	1.7 (0.81-3.75)	0.153	78 (52.0)	1.3 (0.82-1.92)	0.290
No	203	13 (6.4)			94 (46.3)		
Stagnant water and abandoned tyres around the house?							
Yes	144	11 (7.6)	0.9 (0.40-1.92)	0.744	67 (46.5)	0.9 (0.56-1.32)	0.493
No	209	18 (8.6)			105 (50.2)		
Have bushes near the house?							
Yes	166	15 (9.0)	1.2 (0.57-2.63)	0.597	91 (54.8)	1.6 (1.04-2.42)	0.031
No	187	14 (7.5)			81 (43.3)		
Keep domestic waste around the house?							
Yes	137	13 (9.5)	1.3 (0.61-2.82)	0.489	68 (49.6)	1.1 (0.69-1.623)	0.785
No	216	16 (7.4)			104 (48.1)		
Live near a waste dump site?							
Yes	30	0 (0.0)	0.0 (0.00)	0.998	13 (43.3)	0.8 (0.37-1.68)	0.537
No	323	29 (9.0)			159 (49.2)		

## CONCLUSIONS AND RECOMMENDATIONS

- Dengue virus serotype 3, was prevalent among febrile patients (8.2%) in Anambra State, with frequent coinfection with malaria (55.2%).
- Malaria is the most common cause of febrile illness, nearly 50% of patients.
- Serotype 3 dengue was consistent with previous investigations of serotypes in Nigeria.
- A substantial proportion of patients tested negative for both dengue and malaria.
- Testing for the dengue virus should be considered routinely for patients presenting for care with fever.
- Strengthened vector control is important for the prevention of dengue transmission

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