

Letter to Editor

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Prevalence, risk factors, and incident rate ratio of Chikungunya virus in Ilorin, Nigeria

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Chikungunya virus (CHIKV) is a mosquito-borne Alphavirus that has emerged and reemerged[1]. Its primary vectors are *Aedes (Ae.) aegypti* and *Ae. albopictus* having characteristics that provide effective invasiveness, vector competence, and vectorial capacity that sets the tone for the global manifestation[2]. CHIKV has now been identified in over 110 countries with notable recent expansions into previously unaffected regions most especially in countries with established presence of the vector[3]. This study aimed to determine the seroprevalence of CHIKV infection and assess associated risk factors to its continuous transmission for public health intervention.

This research was conducted in Ilorin, the capital city of Kwara State, Nigeria which is a strategic location with high population density and mosquito presence. A total of 250 blood samples were collected from patients presenting with Chikungunya-like symptoms such as fever at two selected hospitals in Ilorin, Kwara State, Nigeria. Serological analysis was *via* Melsin ELISA kit (CAT.No: EKHU-1771, Melsin Medical Co., Limited, China) which has a sensitivity of 95.6% and a specificity of 98.2%. Statistical analysis of relevant data was *via* IBM Statistical Package for Social Sciences, version 22 and *R*-studio where Incident Report Ratio was plotted from Poisson to assess the relationship between the predictor and incidence of disease.

Out of 250 blood samples tested, 30 were found to be positive for CHIKV IgM antibodies, representing a seropositivity rate of 12%. The majority of samples 220 (88%) tested negative for CHIKV IgM antibodies. Environmental factors revealed that usage of mosquito nets, proximity to stagnant water and bush were significantly associated with CHIKV seropositivity (Table 1); while indoor spray was at borderline of statistical significance. A plot of the Incidence Rate Ratio (IRR) is presented in Figure 1 where the independent variables, indoor spray, mosquito net, bush proximity and stagnant water, were evaluated for a relative change in the outcome of CHIKV infection. The confidence interval line at 95% is shown to cross the IRR of 1.

The present study investigated the serological evidence of Chikungunya virus infection in Ilorin. Significant associations between certain environmental factors and CHIKV positivity were recorded. The higher prevalence among those not using mosquito nets (P<0.001) and those living near stagnant water (P=0.028) aligns with established knowledge about mosquito-borne disease transmission. Similarly, Onoja *et al.*[4] and Suleiman and Kolawole[5] reported that proximity to standing water bodies increases the risk of infection to arboviruses. However, based on the IRR plot, the large confidence interval suggests a significantly high level of uncertainty which can be attributed to small sample size or collinearity although the predictors had significant P-values (P<0.05) which indicates strong evidence of an association with Chikungunya cases. It can be posited that public health measures should target reducing stagnant water sources, promoting proper use of mosquito nets, and improving indoor spraying practices.

Table 1. Environmental determinants among Chikungunya virus-positive participants (n=30).

Factor	Category	CHIKV positivity	Percentage (%)	χ^2	P value
Use mosquito net	Yes	5	16.7	13.33	<0.001
	No	25	83.3		
Use of indoor spray	Yes	10	33.3	3.33	0.068
	No	20	66.7		
Proximity to stagnant water	Yes	21	70.0	6.53	0.011
	No	9	30.0		
Proximity to bush	Yes	8	26.7	6.53	0.011
	No	22	73.3		

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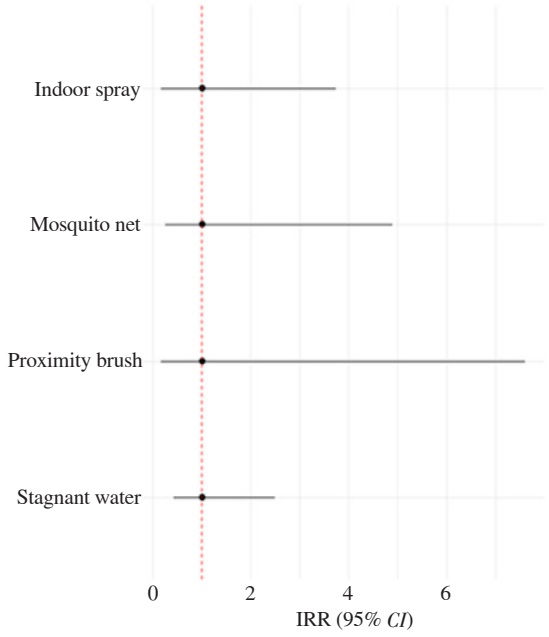

Figure 1. The Incidence Rate Ratio for Chikungunya virus predictors. IRR: Incidence Rate Ratio.

Conflict of interest statement

The authors declare no conflicts of interest.

Ethical consideration

Ethical clearance for the study was obtained from the Ethical Review Committee (ERC) of Kwara State Ministry of Health with approval number ERC/MOH/2024/01/181 on 5th February, 2024. In addition, a written informed consent was obtained from individual patients/parents/guardians after a clear explanation of the objectives and logistics of the study had been given.

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Authors' contributions

MOK and MMS developed the research design and implementation, AOO and MMS performed the calculations and analysis, MOK and MMS contributed to the final version of the manuscript. MOK supervised the project.

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