

## Original Research Article

## Malaria prevalence and health-seeking behaviour in two Niger Delta communities

Chijioke-Nwauche IN, Sam-Ozini P

Department of Clinical Pharmacy and Management, Faculty of Pharmaceutical Sciences, University of Port Harcourt, Port Harcourt, PMB 5323, Port Harcourt, Rivers State, Nigeria.

**\*Corresponding author**

Chijioke-Nwauche IN

Email: [eleloheisraelify@yahoo.com](mailto:eleloheisraelify@yahoo.com)

**Abstract:** The persistence of malaria in Nigeria is a source of public health challenge and this has resulted in various treatment-seeking behaviour among the citizenry. Many factors have been shown to influence the choice of health-seeking behaviour and of particular importance are the socio-economic and cultural factors which differ a lot from different communities in Nigeria. In order to win the war against malaria, it is important to identify these factors in the various communities. The study was designed to determine the prevalence of malaria and treatment-seeking behaviour of the people living in Azikoro Town and Aluu community of Bayelsa and Rivers States respectively. A prospective community based study was conducted on a sample size of 203 and 282 persons in Azikoro Town and Aluu Community respectively using rapid diagnostic test (RDT) kit and well-structured questionnaires to retrieve socio-demographic information from respondents. Data collected was analysed using SPSS package. The results showed 12.3% and 10.8% prevalence rate in Aluu community and Azikoro town respectively with highest prevalence occurring among age groups 20-29 (6.4 %) and 10-19 (5.4 %) respectively. Various methods ranging from insecticides use to herbal medicines were employed by the people for prevention and treatment of malaria. The study revealed the prevalence of malaria and measures employed by the people in the two communities for the prevention and treatment of malaria. There is need for continuous sensitization and public awareness programmes for the prevention and treatment of malaria in the country.

**Keywords:** Malaria, prevalence, treatment- seeking behavior, community-based.

### INTRODUCTION

Malaria is a protozoan infection in humans caused by the parasite *Plasmodium* which is mainly classified into four main species *P. falciparum*, *P. ovale*, *P. malariae* and *P. vivax*. Of all these, *Plasmodium falciparum* is the agent of the most malignant form of malaria, usually presenting with severity mostly in children in sub-Saharan Africa. It is the most dangerous form of malaria with the highest rates of complications. It is also the commonest species in virtually all parts of Africa accounting for up to 98% of the confirmed cases in Nigeria and is associated with significant morbidity and mortality. *Plasmodium falciparum* is responsible for virtually all the features of severe malaria. *P. malariae* usually occurs as a mixed infection with *P. falciparum*. [1]. The sub-Saharan Africa carries disproportionately high share of the global malaria burden of 89% malaria cases and 91% of malaria deaths with Nigeria having the highest record of malaria occurrence [2].

Malaria is holoendemic in Nigeria with transmission all year round but very high and intense

during the rainy season. Annual rainfall ranges from about 2,000 millimeters in the coastal zone (averaging more than 3,550 millimeters in the Niger Delta) to 500–750 millimeters in the north. Significant high rainfalls, consistent high temperatures, high humidity along with stagnant waters provide very good conditions for continuous breeding ground for mosquitoes [3]. These are the prevailing conditions in Niger Delta where the study was carried out. Studies on malaria in various parts of the country have reported percentage prevalence ranging from 22.5% among school children in Kaduna State in the northern part, 29.7% in Oyo State south-Western to as high as 76.8% among University students in Mid-Western and 80.4% in Abia State, Eastern Nigeria [4-7]. In the Niger Delta area, a prevalence of 12.56% was reported in Bayelsa while 11.2% was reported in Rivers State [8, 9].

The continuous prevalence of malaria and the varied treatment-seeking behavior in developing countries continues to be an enormous challenge to public health. Health-seeking behavior constitute of series of actions taken by individuals to prevent or

rectify perceived ill health. It is characterized by problem-focused and intentional action as well as interpersonal interaction [10]. Certain factors influence people's attitudes and choice of treatment during sickness. Among such factors are socio-cultural factors such as beliefs, household decision making to seek care, social networks and gender and economic status [11, 12]. In areas where government establishments have introduced user fees, there has been an increased use of private health facilities, herbal medicines and traditional healers thereby contributing to the influence on the attitudes and health-seeking behavior of the people [13, 14].

The Federal Government of Nigeria adopted artemisinin combination therapy (ACT) in 2005 as first-line treatment for uncomplicated malaria following the failure of chloroquine and sulphadoxine-pyrimethamine due to resistance [15]. Since the new policy, many government health facilities have been complying, however, reports have shown that this is not the case in every establishment and especially the private sector since there are many cases of use of the chloroquine for treatment of malaria [16, 17].

Studies have shown a high rate of treatment-seeking in the private sectors such as pharmacies, drug vendors and patent medicine stores as well as use of herbs or consulting herbalists among Nigerians in addition to self-medication of orthodox medicines which could be ACTs, chloroquine, sulphadoxine-pyrimethamine or any other modern medicine believed to be used for malaria treatment [18, 19]. Poor or improper health seeking behavior towards effective treatment is still a great concern for health practitioners especially in rural areas [20]. Therefore understanding the local perceptions of malaria, knowledge and belief systems and their influence on health-seeking behaviour of the community is critical and relevant to the development of health education programmes that will improve malaria control [21]. The aim of this study was to determine the prevalence of malaria and assess the treatment-seeking behavior among the people living in Azikoro Town and Aluu community of Bayelsa and Rivers States respectively.

## MATERIALS AND METHOD

This study was conducted in Azikoro Town in Yenagoa Local Government Area of Bayelsa State and Aluu Community in Ikwerre Local Government Area of Rivers State both in Niger Delta. Azikoro town is located in the central part of Bayelsa State and as a Community settling in the upland; it is under the Epie kingdom. The Community is made up of indigenes

(who are predominantly involved in farming) and non-indigenes from other parts of the State and Country who are basically Civil Servants, Traders, Business Men/Women, Students etc.

Aluu is a sub-regional Community in the eastern part of Rivers State, bounded by Rukpoku and Umagua in the north, Emohua in the west and Choba in the south and is made up of sub-communities that are all under the Ikwerre Local Government of Rivers State. Aluu is one of the host communities of the University of Port Harcourt. As a Community in the upland, Aluu people are predominantly farmers; little trading and fishing activities are also carried out. Both areas are geographically in the tropical rain forest belt consisting of flat plains with a network of rivers and tributaries which favors the breeding of mosquitoes, and therefore making it very endemic for malaria.

A prospective community based study was carried out to determine the prevalence of malaria and health-seeking behavior among people living in the respective areas. Using Leslie-Kish formula, sample sizes of 203 and 282 were calculated for Azikoro town and Aluu respectively. House to house sampling was done and finger prick blood samples were collected from participants after previously signing an informed consent form. The collected blood samples were analysed for the presence of *Plasmodium falciparum* using rapid diagnostic kit (RDT Care Start HRP-2 (P.f and SD malaria Ag P.f/Pan) according to manufacturer's instructions. Structured questionnaires were administered to the participants to obtain information on socio-demography, treatment/prevention measures against malaria, antimalarial drugs used and their awareness of ACT. Statistical analysis was done using Statistical Package for Social Science (SPSS) software version 20.

## Ethical approval

Ethical approval was obtained from the Ministry of Health in Bayelsa and Rivers States respectively. Study participants signed a consent form to confirm their willingness to participate in the exercise.

## RESULTS

Demographic data obtained from the two communities showed that a greater percentage of the respondents were students followed by civil servants, the least being housewives (Table. 1). Additionally, the educational attainment were different but in both communities, primary education was the least and the dominant religion in both communities is Christianity.

**Table 1: Demographics of study participants**

Sex	Aluu N (%)	Azikoro N(%)
Males	126(44.7)	102(50.2)
Females	156(55.3)	101(49.8)
<b>Education</b>		
Primary	11(4)	35(17.9)
Secondary	95(33.6)	95(47.2)
Tertiary	176(62.4)	71(34.9)
<b>Occupation</b>		
Students	105(37.2)	77(37.9)
Unemployed	64(22.7)	30(14.8)
Civil servants	53(18.8)	45(22.2)
Traders	47(16.7)	15(7.4)
Farmers	8(2.8)	12(6.4)
Fishers	3(1.1)	13(5.9)
Housewives	1(0.4)	11(5.4)
Others	1(0.3)	0
<b>Religion</b>		
Christianity	257(91.1)	177(87.1)
Islam	20(7.1)	3(1.5)
Traditional	5(1.8)	20(9.9)
Others	0	3(1.5)
<b>Marital Status</b>		
Married	52(18.4)	64(31.5)
Single	219(77.7)	112(55.2)
Others	11(3.9)	27(13.3)

**Prevalence of malaria in the two communities**

The result shows an overall prevalence of 10.8% of parasitaemia among Azikoro town inhabitants with the highest prevalence seen in the 10-19 years age range (5.4%) and the least in the age range 40-49 (0.5%). No parasitaemia was detected in the 30-39 and the >50 age range (Table 2). Analysis based on sex revealed that the females had higher parasitaemia than males but this was however not significant ( $p=0.67$ ). Also the difference in parasitaemia distribution among the age groups was not significant.

On the other hand, the result in Aluu community shows an overall prevalence of 12.4% with 20-29 age range having the highest prevalence of 6.5% and the least in >50 age group (0.4%). Just as in the Azikoro community, there was no parasitaemia detected in the 30-39 age range. The distribution based on sex was similar to the Azikoro community with females having a higher prevalence than men but this was however significant ( $p=0.041$ , Table 3).

**Table 2: Frequency and distribution of parasitaemia according to age**

Age range	Azikoro			Aluu		
	No. tested	No. positive	No. Negative	No. tested	No. positive	No. negative
0-9	19	3 (1.5%)	16	28	3 (1%)	25
10-19	55	11 (5.4%)	44	76	10 (3.5%)	66
20-29	42	7 (3.4%)	35	115	18 (6.5%)	97
30-39	29	0	29	30	0	30
40-49	27	1 (0.5%)	26	21	3 (1%)	18
≥50	31	0	31	12	1 (0.4%)	11
Total	203	<b>22 (10.8%)</b>	181	282	<b>35 (12.4%)</b>	247 (87.6%)

**Table 3: Frequency and distribution of parasitaemia according to sex**

	Azikoro			Aluu		
	No. tested	No. positive	No. Negative	No. tested	No. positive	No. negative
Male	102 (50.2%)	8 (3.9%)	94	126 (44.7%)	11 (3.9%)	115 (40.8%)
Female	101 (49.8%)	14 (6.9%)	87	156 (55.3%)	24 (8.5%)	132 (46.8%)
Total	203	<b>22 (10.8%)</b>	181	282	<b>35 (12.4%)</b>	247 (87.6%)

Analyzing the approach towards malaria, results show that a high percentage (62.4%) of the inhabitants of Aluu community claim they treat malaria, 23.1% prevent while 14.5% both prevent and treat malaria. However in the Azikoro community, more people prevent malaria (41.9%), while 32.5% treat malaria and 25.6% both prevent and treat malaria.

The methods of prevention of malaria differ from both communities, while a greater percentage (55.7%) of Aluu community dwellers prevent malaria with insecticides, those from Azikoro community mostly (41.6%) use medicine (Table 4). However the pattern for treatment of malaria is similar with a higher percentage of both communities resorting to orthodox medicines when infected with malaria (Table 5).

**Table 4: Method of malaria prevention employed**

Attitudes	Aluu (%age)	Azikoro (%age)
Window nets	17 (16%)	12 (8.8%)
Insecticides	59 (55.7%)	41 (29.9%)
Insecticide treated nets	13 (12.3%)	27 (19.7%)
Orthodox Medicine	17 (16%)	57 (41.6%)

\*n=106 (Aluu) and 137 (Azikoro)

**Table 5: Method of malaria treatment employed**

Attitudes	Aluu (% age)	Azikoro (%age)
Prayers	23 (8.2%)	11 (5.4%)
Herbs	42 (14.8%)	44 (21.7%)
Orthodox Medicine	217 (77%)	148 (72.9%)

\*n=282 (Aluu); 203 (Azikoro)

Responding to the question on how they treat malaria, majority (77%) of inhabitants of Aluu community treat malaria using medicine, 14.8% take herbs while 8.2% pray. The picture is similar in Azikoro community with 72.9% using orthodox medicine, 21.7% take herbs and 5.4% pray (Table 5). Analysis of the results on ACT knowledge, observation shows a poor knowledge of ACTs in both communities with participants from Aluu having higher awareness (30.5%) compared to 20.4% of those from Azikoro town.

## DISCUSSION

This study was carried out to check the prevalence of malaria as well as assess the health seeking behavior in the two communities in Niger Delta. The 10.8% and 12.4% prevalence obtained in the Azikoro and Aluu respectively is in consonance with previous studies in the areas [8, 9] but at variance with another study in Bayelsa with a prevalence of 63.3% [22]. This vast disparity could be because the Bayelsa study was probably carried out during the rainy season, a period of high transmission while the present study was carried out at the dry season. With regards to sex,

the study revealed that more females were infected when compared to their male counterparts. This is agreeable with earlier studies but at variance with some other studies [22-24]. The higher number of females sampled could also account for the higher prevalence especially in Aluu community. The result also showed that the distribution of malaria parasite was highest among age groups 10-19 years in Azikoro Town and 20-29 in Aluu Community. This distribution can be attributed to the fact that less attention and care is given to children above 10 years when compared to those below 10. This could also be related to the recent finding in Western Nigeria which indicated a higher prevalence among children 5-12 years where some of this group fall into compared to those below 5 years thus indicating a new pattern of parasite distribution [25]. The low turn-out of children below 5 years may also have contributed to the low prevalence in that age group. Moreover, many of the study participants are students who possibly stay out late to read thereby being more exposed to mosquito bites, so this could account for the higher prevalence in this age group. Observation from the results revealed that the higher tertiary education level observed among the residents in

Aluu community had no influence on their attitude towards the prevention or treatment of malaria. Both communities have similar attitudes towards treating malaria with majority using orthodox medicine, followed by herbs and a smaller minority resorting to divine healing through prayers. While greater percentages (55.7%) of the Aluu people use insecticides, the people Azikoro community prefer to take medicines to prevent malaria.

A close observation shows that the use of window netting and insecticide treated nets is very low in both communities. Part of the control measures of malaria involves the use of ITN and window nettings. There is need to promote the use of these control measures in order to reduce the burden of malaria in the community. Herbal medicine use was found to be higher in Azikoro community being a more rural community than Aluu which has closer proximity to the University Teaching Hospital and the Health Centre. This proximity reflects the greater awareness of ACT among the study participants in Aluu. Traditional medicine use is a well-known practice in Nigeria for treatment not just for malaria but also for other ailments. Most of the herbs in use have not been scientifically proven to be effective and even for those that have long been in use such as 'Dogonyaro' (*Azadiracta indica*), there is no established dosage and most of the treatment is not standardized [26]. Since herbal medicine use is prevalent in Nigeria, it is important for the Federal Ministry of Health to establish policies on the use and provide templates for standardization of the medicines.

## CONCLUSION

Prevalence of malaria was found to be 12.4% and 10.8% in Aluu community of Rivers State and Azikoro Town of Bayelsa State respectively which is inconsonance with earlier studies in the area. A larger and more detailed study incorporating PCR which is more sensitive is imperative in order to get the true picture of malaria prevalence in the area.

The study has shown community efforts in the prevention and treatment of malaria. There is need for increased public awareness and campaigns for malaria prevention and treatment. The need for improved accessibility to health facilities and government support is imperative in order to achieve the goal of malaria elimination.

## REFERENCES

1. National Population Commission & National Malaria Control Programme (NPC& NMC). Nigeria Malaria Indicator Survey, 2010 Final Report, Federal Republic of Nigeria, 2012

- World Health Organization. "Malaria Fact sheet N°94" Reviewed October 2015.
- Abdullahi UB, Zainad JO, Rai JK, Gwani M and Gado AG. Effect of Some Atmospheric Variables on Malaria Prevalence in Kebbi State, Nigeria International Journal of Environment and Bioenergy 2013; 8(1):12-21.
- Orogade AA, Ogala WN, Aikhionbare HA. Asymptomatic Malaria Parasitaemia-A suitable index for evaluation of Malaria Vector Control Measures. Nigerian Journal of Paediatrics. 2002; 29(2):23-6.
- Adedotun AA, Salawu OT, Odaibo AB. Plasmodial infection and haematological parameters in febrile patients in a hospital in Oyo town, South-western Nigeria. Journal of Public Health and Epidemiology. 2013 Mar 31; 5(3):144-8.
- Otajewwo FD. Prevalence of malaria parasitaemia and its association with ABO blood grouping among students of Igbinedion University Okada, Nigeria. British Journal of Medicine and Medical Research. 2013 Oct 1; 3(4):1164.
- Kalu MK, Nwogo A, Obasi F, Nduka O. & Otuchristian G. A comparative study of the prevalence of malaria in Aba and Umuahia urban areas of Abia State, Nigeria. Research Journal of Parasitology, 2012; 7 (10) 17-24.
- Pondei K, Lawani L, Ndiok E. The Malaria Parasite in Screened Blood in a Tertiary Health Centre in the Malaria-Endemic Niger Delta Region of Nigeria. I 2012; 1(11):188-93.
- Ebong OO, Nwauche CA, Ogbuehi IH, Chijioke-Nwauche IN, Ezirim CT, Umoh RE, Afia AG, Zara-kokpa P. Is this Evidence of Success in Malaria Prevention and Control Measures?
- Cornally N, McCarthy G. Help-seeking behaviour: A concept analysis. International journal of nursing practice. 2011 Jun 1; 17(3):280-8.
- Puentas-Markides C. Women and access to health care. Soc Sci Med. 1992. 35:619-626
- Okojie CE. Gender inequalities of health in the Third World. Social science & medicine. 1994 Nov 1; 39(9):1237-47.
- Haddad S, Fournier P. Quality, cost and utilization of health services in developing countries. A longitudinal study in Zaire. Social Science & Medicine. 1995 Mar 31; 40(6):743-53.
- Uzochukwu BSC, Onwujekwe. Socio-economics differences and health-behaviour for the diagnosis and treatment of malaria: a case study of four local government areas operating the Bamako Initiative programme in south-east Nigeria. International Journal of Equity in health, 2004; 3:6 1-10
- Federal Ministry of Health Nigeria (FMOH). National Malaria and Vector Control Division. 2005

16. Efunshile M, Runsewe-Abiodun T, Ghebremedhin B, König W, König B. Prevalence of the molecular marker of chloroquine resistance (pfcrt 76) in Nigeria 5 years after withdrawal of the drug as first-line antimalarial: A cross-sectional study. *South African Journal of Child Health*. 2011; 5(2):39-42.
17. Nneji CM, Adedapo AD, Okorie PN, Ademowo OG. Chloroquine Resistance and Host Genetic Factors among Nigerian Children with Uncomplicated *P. falciparum* Infection. *Archives of Medicine*. 2015.
18. Erhun WO, Agbani EO, Adesanya SO. Malaria prevention: Knowledge, attitude and practice in a southwestern Nigerian community. *African Journal of Biomedical Research*. 2005; 8(1):25-9.
19. Tafeng YM. The Attitude of Patients towards the Treatment of Malaria in Edo State, Nigeria. *East and Central African Journal of Pharmaceutical Sciences*. 2011; 14(3).
20. Lawal AM, Balogun SK, Bada BV. Knowledge of transmission, malaria belief and health-seeking behaviour in Oye-Ekiti local government area of Ekiti State, Nigeria. *American Journal of Rural Development*. 2014 Jan 23; 2(1):8-12.
21. Laar AS, Laar AK, Dalinjong PA. Community perception of malaria and its influence on health-seeking behaviour in rural Ghana: a descriptive study. *Malaria World Journal*. 2013; 4(1):1-4.
22. Abah AE, Temple B. Prevalence of Malaria Parasite among Asymptomatic Primary School Children in Angiama Community, Bayelsa State, Nigeria. *Tropical Medicine & Surgery*. 2015 Dec 17.
23. Adedotun AA, Salawu OT, Odaibo AB. Plasmodial infection and haematological parameters in febrile patients in a hospital in Oyo town, South-western Nigeria. *Journal of Public Health and Epidemiology*. 2013 Mar 31; 5(3):144-8.
24. Mogaji HO, Adeniran AA, Awoyale AK, Oluwole AS, Ekpo UF. Baseline Study of Malaria Infection in Four Rural Communities of Ogun State. *Asian Journal of Biological Sciences*. 2013; 6(6):300-5.
25. Oladosu OO, Solebo C and Oyibo WA. Early evidence of higher malaria prevalence in febrile children five years and above attending health facilities in Lagos, Nigeria. *Journal of Malaria and Phytomedicine* 2015 Vol. 1(1&2), pp 10-17.
26. Idowu OA, Mafiana CF, Luwaye IJ, Adehanloye O. Perceptions and Home Management Practices of Malaria in Some Rural Communities in Abeokuta, Nigeria. *Travel Med. Infect. Dis.*, 2008; 6 (4): 210-214.