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Research Article



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Prevalence of Malaria in Cross River State-Nigeria

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Abstract

This study was carried out in October, 2021, with collection of secondary data across the three senatorial districts. This was followed up with collection of primary data in February, 2022 in the same primary Health Care facilities across the senatorial districts. Secondary data in the month of October, 2021 shows that a total of 856 clients were tested for malaria, with rapid diagnosis of malaria (mRDT) test kits and 638 were tested positive, with positivity rate 638 (74.5%) while primary data in the month of February 2022, shows that a total of 987 clients with fever were tested for malaria and 340 were tested positive, with positivity rate 340 (34.4%). There is significant disparity between the secondary data and the primary data in this study, affecting data quality issues and use of the data for planning and discussion making issues. Several factors may be responsible for this high false positivity rate on the part of service providers across the state resulting to data quality issues.

Keywords: Secondary data; Primary data

Introduction

1

Malaria is a parasitic disease that is transmitted by mosquitos during their blood meal. The risk of contracting malaria is highest for people in tropical countries, due to the ever-present humid weather that allows yearly infections. Consequently, sub-Saharan Africa has a disproportionately higher rate of death among women and children with malaria. One of the major barriers identified in the efficacy of malaria treatment and prevention is the lack of health education and literacy. The lack of health education has decreased the efficacy of antimalarial drugs, such as Artemether Lumefantrine, due to the distribution and administration of the drug by untrained persons. The lack of incidence and prevalence data makes it difficult to ensure adequate supply of the drug in endemic countries. Furthermore, the lack of knowledge of malaria pathogenesis and transmission has prevented many from promptly seeking treatment and practicing preventive care methods. Recently, the implementation of health education programs by international organizations has allowed local and travelling healthcare practitioners to be educated on the disease and methods of antimalarial drug administration.

The state malaria programme has successfully implemented 4 strategic plans over the last one and half decades with Operational Research (OR) issues highlighted, but were not pragmatically implemented due to funding. In the current strategic plan, National Malaria Elimination Programme (NMEP) (2021-2025), adopted by states with the mission to reduce malaria prevalence to less than 10% [1].

Currently Cross River State accounts for 19.5% malaria burden in Nigeria, National Demographic Health Survey [2]. However, malaria still remains the most public health problem in the state with high levels of morbidity and mortality especially among pregnant women and children less than 5 years of age.

However, despite the fact that malaria prevalence rate in Cross River State has declined from 27% in 2015 to the current level of 19.5% in 2020 [3], but service data from health facilities across the state put the prevalence of malaria in the state at 75%. This disparity between survey data and service data is a serious concern to implementers and partners, huge investment on malaria implementation activities in the state.

Data from health facilities are potentially useful for monitoring time, trends in the number of malaria cases and deaths

but have severe limitations. In Cross River State, most cases of malaria in health facilities are diagnosed on the basis of clinical symptoms and treatment is presumptive, rather than laboratory confirmation. This study will help to provide answers to some of the questions arising from the implementation of malaria interventions to guide planning and decision-making.

One of the largest barriers inhibiting malaria treatment is a lack of health education and literacy, which has caused misconceptions about disease development and prevention. Consequently, there has been over use and misuse of malaria drug due to self-diagnosis and self-prescription, a practice that has rendered many on the use non-prescribed standard malaria drugs. To combat malaria, prevention methods must be targeted towards the vulnerable population, hard to reach communities and orphan public health facilities that are not under support by partners must receive direct support from government and the private sector in the form of supply of malaria intervention commodities. Secondly, the formation and introduction of a mobile health team of practitioners to educate rural population/residents on malaria transmission as well as methods of prevention.

Life Cycle and Pathogenesis of Plasmodium Falciparum

An infected female Anopheles mosquito carries male and female gametocytes that contain malaria [4]. The gametocytes develop into oocytes, which mature and release sporozotes into the salivary glands of the mosquito [4]. The Anopheles mosquito bites human because the protein and iron found in blood nourishes their eggs [4]. While the mosquito draws blood, the sporozoites that were in the salivary glands are injected into the human [4]. If another mosquito bites the same human, it will ingest the blood and sporozoites [4]. The injected sporozoites will then travel to the liver and invade the mosquito's liver cells. In the liver, the sporozoites mature into merozoites. The merozoites transform into the male (micro) and female (macro) gametocytes that are reinjected into the human while feeding [4]. As a result, the malaria cycle is perpetuated by the repeated transmission of gametocytes and ingestion of sporozoites while the mosquito feeds on blood [5].

The erythrocytic cycle of the parasite is responsible for the clinical manifestation of malaria symptoms: recurring fevers and chills [6]. The pathogenic process of malaria is characterized by the bursting of erythrocyte-containing merozoites [7]. The merozoites perpetuate reinfection by invading other erythrocytes and releasing adhesive proteins that increase parasitic numbers in the blood [7]. If left untreated, malaria can lead to severe anemia due to the destruction of erythrocytes, as well as respiratory distress due to low oxygen delivery by erythrocytes [6]. Additionally, aggregation of erythrocytes to the endothelium can cause cerebral lesions that can lead to depression, impaired memory, and personality changes [7]. Finally, the peptides on the parasite have low immunogenicity response, which can inhibit their destruction by antibodies [7]. As a result, those that are infected can develop partial immunity with asymptomatic infections.

P. falciparum malaria is very hard to control in sub-Saharan Africa due to year-round infection opportunities [5]. Frequent, epidemics are common because of changes in the environment, a lack of education, and an absence of resources to fund treatment [5]. Discussion studies have shown a positive correlation between health education and the efficacy of treatment [8]. During 1970s and the 1980s, malaria was reasonably well controlled due to high awareness among the population and the use of Intermittent Preventative Treatment (IPT) practices (antenatal administration of sulfadoxine pyrime thamine drug and mosquito net) to treat and prevent malaria among children [9]. However, the spread of drug resistance and a poor understanding of the disease have led to adverse consequences for malaria control [9]. For example, a study conducted on East African mothers reported that many believe that IPT of malaria during pregnancy weakens the mother and causes poor birth outcomes [9]. In fact, 77% of mothers believe that malaria is not preventable [9]. This misconception can negatively affect the compliance to treatment and prevention.

2

Malaria Prevalence in Cross River State 2022

Primary Data in the 3 Senatorial Districts of Cross River State

1. Prevalence of malaria in the Southern Senatorial District (Table 1)

	Name of Health Facility	No Tested	No Positive	Name of Health Facility	No Tested	No Positive
Name of LGA	Urban			Rural		
Calabar Municipality	PHC Big Qua	60	26	PHC Ikot Omin	60	15
Akamkpa	Mma Efa PHC	136	70	PHC AWI	120	30

 Table 1: Representing Calabar Municipality and Akamkpa LGAs respectively.

2. Prevalence of malaria in the Central Senatorial district (Table 2)

	Name of Health Facility	No Tested	No Positive	Name of Health Facility	No Tested	No Positive
Name of LGA	Urban			Rural		
Yakurr	MCH Ugep	120	50	H/P Yenon	140	60
Obubra	PHC Apia Pum	40	10	PHC Iyamoyong	36	11

Table 2: Representing Yakurr and Obubra LGAs respectively.

3. Prevalence of malaria in the Northern Senatorial district (Table 3)

Name of LGA	Name of Health Facility	No Tested	No Positive	Name of Health Facility	No Tested	No Positive
	Urban			Rural		
Ogoja	МСН	70	15	PHC Ekumtak	68	20
Bekwarra	MPHC Abuchiche	75	20	Ukpada H/Post	62	13

 Table 3: Representing Ogoja and Bekwarra LGAs respectively.

Secondary Data in the 3 Senatorial Districts of Cross River State

1. Prevalence of malaria in the Southern Senatorial District (Table 4)

Name of LGA	Name of Health Facility	No Tested	No Positive	Name of Health Facility	No Tested	No Positive
	Urban			Rural		
Calabar Municipality	PHC Big Qua	55	52	PHC Ikot Omin	30	25
Akamkpa	Mma Efa PHC	54	46	PHC AWI	45	14

Table 4: Representing Calabar Municipality and Akamkpa LGAs respectively.

3

Name of LCA	Name of Health Facility	No tested	No Positive	Name of Health Facility	No Tested	No Positive
Name of LGA	Urban			Rural		
Yakurr	MCH Ugep	96	84	H/P Yenon	280	208
Obubra	PHC Apia Pum	32	20	PHC Iyamoyong	31	16

2. Prevalence of malaria in the Central Senatorial district (Table 5)

Table 5: Representing Yakurr and Obubra LGAs respectively.

3. Prevalence of malaria in the Northern Senatorial district (Table 6)

Name of LGA	Name of Health Facility	No Tested	No Positive	Name of Health Facility	No Tested	No Positive
	Urban			Rural		
Ogoja	МСН	69	35	PHC Ekumtak	55	41
Bekwarra	MPHC Abuchiche	69	61	Ukpada H/Post	40	36

Table 6: Representing Ogoja and Bekwarra LGAs respectively.

Materials and Methods

Study Area

The study was carried out in Cross River State-Nigeria. Two local government areas were selected from each senatorial district, and 2 primary health care facilities were selected in each of the local government areas, one facility representing urban and the other one representing rural. Secondary data was obtained from these facilities records. Also, primary data was collected from these facilities representing urban to compare malaria prevalence between secondary data and primary data respectively.

Selection of Study Population

The study involved male and female aged 15 years to 70 years. The ethical approval was obtained before the start of this study from the Cross River State Ethical Committee.

Sample Collection

Secondary data was obtained from selected health facilities in the month of October, 2021 while primary data was obtained from the same health care facilities in the month of February, 2022, with the same personnel involved in diagnosis of malaria with Rapid Diagnostic Test (mRDT).

Discussion

Currently Cross River accounts for 19.5% malaria burden in Nigeria, National Demographic Health Survey [10]. However, malaria still remains the most public health problem in the state with high levels of morbidity and mortality especially in pregnant women and children less than 5 years of age.

Despite the fact that malaria prevalence in Cross River State has declined from 27% in 2015 to the current level of 19.5% in 2020 (NHMIS, 2020), but service data from health facilities across the state put the prevalence of malaria in the state at 75%. This disparity between survey data and service data is a serious concern to implementers and partners, huge investment on malaria activities in the state [11,12].

Conclusion

Data from health facilities are potentially useful for monitoring time, trends in the number of malaria cases and deaths but have severe limitations. In Cross River State, most cases of malaria in health facilities are diagnosed on the basis of clinical symptoms and treatment is presumptive, rather than laboratory confirmation. This study will help to provide answers to some of the questions arising from the implementation of interventions to guide planning and decision-making [13].

Recommendation

To achieve the NMEP 2021-2025 vision and goal towards bringing the prevalence of malaria to less than 10%, there is every need to strengthen data quality and malaria prevention and vector management in Nigeria.

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