Prevalence and trend pattern distribution of Malaria among Pregnant women in Irewole Local Government area of Osun State, Nigeria

Abstract

Malaria stands as an endemic ailment that impacts millions annually, causing a considerable mortality rate. This burden is particularly noticeable among children below the age of five and pregnant women, predominantly in developing countries. Nearly 30% of recorded deaths in hospitals and health centers can be attributed to malaria. The primary focus of the study was to examine the prevalence and distribution patterns of malaria among pregnant women in Irewole Local Government Area, Osun State. The researcher conducted visits to health centers within the designated study area to gather records spanning the past four years, illustrating the distribution of malaria among pregnant women. The investigation utilized pre-coded and semi-structured questionnaires, administered to a sample of two hundred (200) pregnant women attending antenatal care. Data encompassed socio-demographic details, malaria incidence during pregnancy, types of malaria, management protocols, recovery patterns, and survival rates. Blood samples from one hundred (100) of these pregnant women were subjected to parasitemia testing via light microscopy to determine parasite density. Hematological parameters were also assessed. Additionally, blood samples were collected from ten (10) non-pregnant women for comparative purposes. The study targeted women of childbearing age who were pregnant within the local government, with a focus on those seeking ante/post-natal care at hospitals/health centers.The collected data underwent analysis, and the findings were discussed and presented, unveiling the distribution trends, current status, and the impact of malaria among pregnant women in the study area. In summary, this research aims to contribute to the reduction of malaria endemicity among pregnant women, not only in the specific study area but across Nigeria as a whole.

Keywords: Malaria, Parasitemia, pregnant women, endemic, prevalence, Pandemic

Introduction

Malaria remains a pervasive and lethal disease affecting millions annually, with a pronounced impact on mortality rates. The most vulnerable groups include children under the age of five and

pregnant women, particularly in developing nations, contributing to nearly 30% of recorded deaths in hospitals and health centers (Akinyele et al., 2009).

The global significance of malaria persists, particularly in endemic countries such as Nigeria, where 588 million people are at risk (World Malaria Report, 2012). The disease, caused by five Plasmodium species, with Plasmodium falciparum being the most lethal, continues to pose a significant public health challenge. P. falciparum remains prevalent in numerous African countries (World Malaria Report, 2012). Recent findings from the World Malaria Report underscore Nigeria and the Democratic Republic of the Congo's substantial contribution, accounting for over 40% of the estimated total deaths due to malaria (WHO | World Malaria Report, 2012).

Globally, malaria remains a devastating international health concern, with nearly 600 million new infections and 3 million deaths reported annually. The impact is particularly severe among children under the age of five and pregnant women in sub-Saharan Africa, where almost 30% of the annual mortality in this population is attributed to malaria (Akinyele et al., 2009). For the most recent and comprehensive information, referring to the latest World Malaria Report and other updated sources is recommended.

Pregnant women residing in malaria-endemic regions pose a significant concern due to their reduced immunity during pregnancy. Moreover, in areas characterized by stable malaria transmission, a substantial number of malaria cases during pregnancy exhibit no symptoms (Anorlu*et al.,* 2001). The absence of symptoms in pregnant women is attributed to acquired immunity from previous exposures to malarial infections (Staalsoe*et al.,* 2004).

Regrettably, malaria poses a dual threat to both the expectant mother and the developing foetus. Various regions in Nigeria have reported divergent prevalence rates of malaria in pregnancy, ranging from 19.7% to 72.0% (Uneke*et al.,* 2008). Malaria can lead to adverse maternal outcomes such as anemia, hypoglycemia, and, in severe cases, maternal death. Sub-Saharan Africa alone witnesses an estimated 10,000 maternal deaths annually due to malaria-related anemia (Desai *et al.,* 2007). Furthermore, malaria significantly contributes to low birth weight in infants due to compromised nutrient delivery to the placenta (Newman *et al*., 2003).

Malaria holds the top position among the seven diseases initially targeted for global control or eradication by the World Health Organization's Tropical Disease Research (TDR). This prioritization is due to the disease's significant morbidity, mortality rates, diagnostic challenges, the absence of ideal drugs and effective vaccines, and other behaviors exhibited by its vector.

The impact of malaria extends beyond individual health, adversely affecting the physical, mental, and social well-being of communities, along with impeding the economic development of nations. Studies reveal that households spend up to one thousand, one hundred and twelve naira monthly on malaria treatment, presenting a considerable financial burden, particularly given the economic status of the population (Onwujekwe, *et al.*, 2014).

Despite efforts such as the Roll Back Malaria program, some reports suggest that government-led malaria control initiatives may face challenges. While certain African countries experienced a 50% reduction in malaria incidence and deaths between 2000 and 2006 due to high intervention coverage and effective surveillance (WHO World Malaria Report 2008), Nigeria, especially concerning malaria in pregnancy, has not shown similar progress. The minimal impact in Nigeria is attributed to resource constraints (Roll Back Malaria).

Malaria is a formidable global public health challenge, particularly in African countries where 40% of the world's population resides in endemic regions. Approximately 25 million pregnancies occur annually in malaria-endemic areas of sub-Saharan Africa, with notably high prevalence among pregnant women and children under five. In Nigeria, 48% of pregnant women were diagnosed with malaria according to the Federal Ministry of Health in 2005, underscoring the severity of the issue (Federal Ministry of Health, 2005).

In the southwestern region of Nigeria, previous studies have documented malaria parasite prevalence rates ranging from 60% to 72% among pregnant women. Malaria during pregnancy has been identified as a significant contributor to maternal mortality, causing up to 10,000 deaths annually. Additionally, it leads to elevated rates of maternal morbidity, characterized by symptoms such as fever and severe anaemia, particularly affecting first-time mothers. The impact extends to adverse outcomes such as low birth weight and placental parasitemia, with an estimated 75,000 to 200,000 infant deaths attributed to malaria infection during pregnancy each year. The detrimental effects of malaria are most pronounced in the first and second pregnancies of women residing in areas of relatively stable transmission. The temporary depression of

immunity, facilitating the development of the allograft (foetus), is cited as one of the reasons for the heightened susceptibility of pregnant women to malaria (Adebayo *et al.,* 2011).

In response to this public health challenge, Heads of Government and International Agencies at the African Summit on Roll Back Malaria (RBM) in Abuja in the year 2000 declared a commitment to reducing the malaria burden by at least 50% by 2010. A widely accepted measure in this endeavor involves the utilization of Insecticide-Treated Nets (ITNs), especially in malaria-endemic regions. Consequently, there has been the free distribution of ITNs, donated by the Roll Back Malaria initiative, targeting children under five and pregnant women.

Despite decades of research, malaria in pregnancy (MiP) remains a significant public health challenge that has proven challenging to address. Numerous studies from regions with diverse malaria transmission patterns have explored the impact of MiP on both maternal health and birth outcomes. While the predominant consequence of MiP on maternal health is often characterized by anemia, there is a scarcity of data concerning malaria-related maternal mortality. Regarding the fetus, the most frequently observed adverse effect of MiP is an elevated risk of low birth weight (LBW), a critical factor associated with impaired development and increased infant mortality. However, many of these studies rely on single measurement points, typically from cross-sectional surveys or during delivery, failing to capture the multifaceted factors that influence MiP over an extended period.

Accurately assessing MiP is crucial for understanding its effects on birth outcomes and infant health, but it poses challenges due to the involvement of various factors that are sometimes difficult to fully capture. The continuity or intermittency of MiP depends on factors such as a woman's exposure to vectors, her level of immunity, potential co-infections (e.g., other malaria species, HIV, or helminths), and the efficacy of available treatment and prevention interventions. Achieving a comprehensive understanding of MiP necessitates considering these diverse factors that play a role over an extended timeframe (Beaudrap, *et al*., 2013).

2.2 STUDY LOCATION

This study was conducted among women attending antenatal care at four distinct hospitals in Ikire, Irewole Local Government Area of Osun State. The primary objective was to broaden our

understanding and collect pertinent data essential for the study within Irewole Local Government. Established in 1976 through the Local Government Reform, Irewole Local Government has its headquarters in Ikire. Subsequently, Ayedaade Local Government and Isokan Local Government areas were created in 1989 and 1996, respectively, from the original Irewole Local Government. Irewole Local Government shares boundaries with Ayedaade Local Government in the East, Ife-North Local Government in the Southeast, and Egbeda Local Government of Oyo state in the West. Isokan Local Government is located in the southwestern part of Osun State, with altitudes ranging between 121.92 meters and 298.704 meters above sea level. Covering an area of approximately 978.67 square kilometers, Irewole Local Government comprises over 300 villages and hamlets.

Based on the provisional headcount figure from 1991, Irewole Local Government is estimated to have a population of approximately 77,884. The study aimed to leverage the diverse healthcare settings within the local government to enrich our research experience and acquire pertinent data for the specified investigation.

2.3 **STUDY POPULATION**

The target population for this study encompassed women of childbearing age who have had or are currently experiencing pregnancy within the specified Local Government. The study focused on women actively seeking healthcare services during both ante- and post-natal periods at hospitals or clinics.

Ethical clearance was diligently obtained from the relevant authority of the hospital. Subsequently, informed consent was secured from all participants selected through random sampling for the study. Prior to obtaining consent, the purpose of the research was thoroughly explained to each participant. It was emphasized that participation was entirely voluntary, and individuals had the right to decline or withdraw from the study at any stage, even after providing initial consent. Importantly, patients who opted not to participate were assured that their decision would not affect their access to routine care available at the facility.

The study included a cohort of 200 pregnant women regularly attending the antenatal clinic at the hospital. The age range of the participants spanned from 16 to 45 years. Exclusions from the

study comprised women currently on any form of malaria chemoprophylaxis, those testing positive for human immunodeficiency virus (HIV), and individuals with sickle-cell disease. These exclusions were made to ensure a more focused and homogenous study population.

Method

2.4 DATA COLLECTION AND SAMPLING TECHNIQUES

2.4.1 Primary Data

To bolster the reliability of the research and achieve its objectives, the study employed pre-coded and semi-structured questionnaires. These instruments were administered to a sample of 200 pregnant women attending antenatal care. The collected information encompassed various domains, including socio-demographic characteristics, the distribution pattern, and prevalence of malaria fever among pregnant women. Additionally, the questionnaires delved into environmental factors contributing to the spread of malaria, the socio-economic status of the mothers, and the public health management of malaria. The use of structured questionnaires ensured a systematic and standardized approach to data collection, facilitating a comprehensive analysis of factors related to malaria among pregnant women.

2.4.2 Secondary Data

In addition to the questionnaire-based data collection, information was gathered by visiting multiple Health Centers in the study area. This involved procuring records of malaria distribution in pregnant women over the past four years (2019-2022). By including this retrospective data, the study aimed to provide a more comprehensive understanding of the trends and patterns of malaria prevalence among pregnant women in the specified timeframe. This dual approach, combining current survey data with historical health center records, contributes to a more nuanced analysis and interpretation of the factors influencing malaria distribution in the study area.

2.5 SAMPLE SELECTION

The sample selection for this research was conducted through a random process among pregnant women registered for antenatal care at the selected hospitals. Specifically, every third woman attending the antenatal clinic, occurring every other day, was chosen to participate in the study.

Selected individuals were provided with detailed information about the research, including its purpose, and their consent for participation was obtained before any sample collection took place. This approach to sample selection ensures a degree of randomness and representation among the pregnant women participating in the study, enhancing the reliability and validity of the research findings. Additionally, the informed consent process upheld ethical standards by clearly communicating the study's objectives and obtaining voluntary agreement from the selected participants.

STUDY DESIGN

Primary and Secondary data were evaluated for the study. The two data were analyzed using SPSS software.

3.1 DESIGN AND ADMINSTRATION OF QUESTIONNAIRE

Two hundred (200) semi-structured questionnaires were meticulously designed and then distributed to pregnant women to assess the impact of malaria. The questionnaires sought information on various aspects, including socio-demographic characteristics, the distribution pattern, and prevalence of malaria fever among pregnant women. Additionally, the survey delved into environmental factors contributing to the spread of malaria, the socio-economic status of the mothers, and the public health management of malaria. This comprehensive approach in questionnaire development aimed to capture a broad spectrum of data, enabling a thorough analysis of the multifaceted factors related to malaria among pregnant women.

3.2 DATA COLLECTION

The participants completed the questionnaires independently, and when necessary, with the assistance of the interviewers. Stringent adherence to confidentiality rules was maintained throughout the questionnaire administration process, which was conducted on an individual basis, as mentioned earlier. These meticulous steps were implemented to ensure the highest level of cooperation from the study participants, prioritizing their privacy and contributing to the integrity of the research data.

RESULTS AND DISCUSSION

TABLE 1: Socio-demographic Characteristics of Respondents

Variable	Frequency	Percentage
Level of Education		
BSc, MSc	18	10.3%
NCE/Dip.	34	19.2%
SSCE	48	27.1%
Primary Sch. Certificate	57	32.2%
Illiterate	20	11.2%
Age of Respondents		
15-25	43	24.2%
26-35	84	47.4%
36 and above	50	28.2%
Occupation		
Civil Servant	24	13.5%
Trader	81	45.7%
Students	54	10.1%
Farmers	18	30.5%
Religion		
Christian	57	32.2%
Muslim	91	51.4%
Others	29	16.3%
Marital Status		
Married	164	92.6%
Divorce	12	6.8%
Single	1	0.5%

Table 1 reveals that out of the total respondents, 18 (10.3%) held MSc/BSc degrees, 34 (19.2%) had NCE/Diploma qualifications, 48 (27.1%) were SSCE holders, 57 (32.2%) possessed Primary School certificates, and 20 (11.2%) were illiterate. The majority of respondents were found to be Primary School certificate holders.

Regarding age distribution, 43 (24.2%) fell within the 15–25 years range, 84 (47.4%) were aged between 26–35 years, and 50 (28.2%) were 36 years and above. The predominant age group among the respondents was 26–35 years.

Occupationally, 24 (13.5%) were civil servants, 81 (45.7%) engaged in trading, 18 (10.1%) were students, and 54 (30.5%) worked as farmers. The majority of respondents were engaged in trading.

Religiously, 91 (51.4%) identified as Muslim, 57 (32.2%) as Christian, and 29 (16.3%) as followers of other religions. The study predominantly included Muslim respondents.

In terms of marital status, a significant proportion, 164 (92.6%), were married, 12 (6.8%) were divorced, and 1 (0.5%) was single. This distribution indicates that the selected groups for the study align with the desired demographic criteria and are expected to yield meaningful results.

Table 2: Distribution Pattern and Prevalence of Malaria Among Pregnant Women in Irewole LGA, Osun State

Questions	Yes (%)	No (%)
Have you ever heard about malaria?	177 (100)	0 (0)
Did you know infected female Anopheles is responsible for the transmission of malaria?	177 (100)	0 (0)
Have you ever had a malaria attack?	177 (100)	0 (0)
When were you last attacked by malaria?		
A week ago	50 (28.2)	0 (0)
A month ago	63 (35.6)	0 (0)
Last year	10 (5.6)	0 (0)
Cannot remember	54 (30.5)	0 (0)
Do you think malaria can be fatal if not treated?	165 (93.2)	12 (6.7)
Are you aware that high temperature/fever, headache, loss of appetite, and body pains are common signs of malaria infection?	165 (93.2)	12 (6.7)

Table 2 demonstrates a high level of awareness among the respondents regarding malaria. All participants (100%) were aware of malaria, understood that infected female Anopheles

mosquitoes transmit the disease, and acknowledged having experienced a malaria attack. Regarding the timing of the last malaria attack, 28.2% reported a week ago, 35.6% a month ago, 5.6% within the last year, and 30.5% could not remember.

The majority of respondents, 93.2%, recognized the potential fatality of untreated malaria, while 6.7% were not aware of this risk. Similarly, 93.2% acknowledged high temperature/fever, headache, loss of appetite, and body pains as common signs of malaria infection, while 6.7% were not familiar with these symptoms. Overall, the findings indicate a robust awareness and understanding of malaria among the surveyed pregnant women in Irewole LGA, Osun State

Table 3: Enabling Factors Facilitating the Spread of Malaria Among Pregnant Women

Questions	Yes (%)	No (%)
Do you believe that poor sanitation favors breeding of mosquitoes?	119 (67.2)	58 (32.8)
Do you believe that swampy zones encourage the widespread of mosquitoes?	167 (94.4)	10 (5.6)
Do you think paddy fields give a wide opportunity for breeding mosquitoes?	142 (80.2)	35 (19.8)
Do you know that overgrown weeds around shelters give a favorable condition for mosquito breeding?	160 (90.4)	17 (9.6)
Do you believe that water-filled toilets are an excellent environment for the development of mosquito larvae?	129 (72.9)	48 (27.1)
Do you know that poor waste disposal increases the epidemics of malaria fever?	151 (85.3)	26 (14.7)
Do you know that receptacles holding water around your house favor breeding of mosquitoes?	146 (82.5)	31 (17.5)
Poor personal hygiene aids in the outbreak of malaria fever.	117 (66.1)	60 (33.9)
Do you think improper storage and disposal of wastewater encourage mosquito breeding?	148 (83.6)	20 (11.3)
		29 (16.4) did not know

Table 3 illustrates that poor sanitation is associated with the prevalence of malaria among pregnant women, with 67.2% of respondents agreeing. The respondents also believe that

swampy zones encourage the spread of mosquitoes (94.4%), and paddy fields provide opportunities for mosquito breeding (80.2%). Overgrown weeds around shelters (90.4%), water-filled toilets (72.9%), poor waste disposal (85.3%), and receptacles holding water around homes (82.5%) are recognized as favorable conditions for mosquito breeding.

Additionally, 66.1% of respondents agree that poor personal hygiene can encourage the outbreak of malaria. Moreover, improper storage and disposal of wastewater are seen by 83.6% of respondents as factors that encourage mosquito breeding, while 16.4% either disagreed or did not know. These findings highlight the awareness among respondents regarding various environmental factors that contribute to the spread of malaria.

Table 4: Socio-economic Status of Mothers Regarding Malaria Epidemics

Questions	Yes (%)	No (%)
Do you know that one's Occupation determines the epidemics of malaria?	159 (89.8)	18 (10.2)
Do you know that the level of income determines the effect of malaria fever on pregnancy?	160 (90.4)	18 (10.2)
Do you know that some types of food help boost your immunity against malaria fever?	138 (77.9)	35 (19.8)
Do you know that the type of house you live in determines your exposure to mosquitoes?	149 (84.2)	28 (15.8)
Do you believe that inadequate malaria tests can affect pregnancy?	122 (68.9)	55 (31.1)
Do you think the level of education can aid in the spread of malaria fever?	89 (50.3)	88 (49.7)
Do you think that irregular ante-natal attendance can affect pregnant women?	127 (71.8)	50 (28.3)
Do you know that one's lifestyle determines the effect of malaria?	159 (89.8)	18 (10.2)

1. **Occupation and Malaria Density:**

- A significant majority (89.8%) believe that one's occupation determines the density of malaria. This indicates a perception that certain occupations may expose individuals to a higher risk of contracting malaria.

2. **Income and Malaria's Effect on Pregnancy:**
    - The majority (90.4%) dispute the idea that the level of income determines the effect of malaria fever on pregnancy. This challenges the notion that economic status directly correlates with the impact of malaria during pregnancy.
3. **Food, Immunity, and Malaria:**
    - A substantial portion (77.9%) acknowledges that certain foods boost immunity against malaria fever. This understanding reflects the awareness of the role nutrition plays in preventing or mitigating the impact of malaria.
4. **Housing and Exposure to Mosquitoes:**
    - A large percentage (84.2%) believes that the type of house influences exposure to mosquitoes. This highlights the awareness that living conditions can contribute to the risk of malaria transmission.
5. **Inadequate Malaria Tests and Pregnancy:**
    - A considerable number (68.9%) agrees that inadequate malaria tests can affect pregnancy. This underscores the importance of proper diagnosis and testing during pregnancy to manage and prevent malaria-related complications.
6. **Education and Spread of Malaria Fever:**
    - There is a divided opinion on whether the level of education aids in the spread of malaria fever, with 50.3% supporting this idea. This suggests a need for targeted health education to address misconceptions.
7. **Ante-natal Attendance and Malaria Impact:**
    - A majority (71.8%) recognizes that irregular ante-natal attendance can affect pregnant women concerning malaria. This emphasizes the role of consistent healthcare engagement in managing and preventing malaria during pregnancy.
8. **Lifestyle and Malaria Effect:**
    - A significant majority (89.8%) believes that one's lifestyle determines the effect of malaria. This highlights the holistic understanding that personal habits and choices play a role in malaria susceptibility

Table 5: Public Health Management of Malaria

Questions	Yes (%)	No (%)
Do you visit quack traditional men, prophet to treat or manage malaria infection?	38 (21.5)	139 (78.5)
Do you use ‘akapo’ drug whenever you have malaria because it is cheap?	83 (46.9)	94 (54.1)
Do you believe environmental sanitation is the best prevention/control for mosquitoes breeding?	48 (27.1)	129 (72.9)
Do you use chloroquine tablet to treat malaria when sick?	45 (25.6)	132 (74.6)
Do you use Amodiaquine tablets to treat malaria when sick?	10 (5.6)	167 (94.4)
Do you use Sulphadoxine or pyrimethamine (fansidar) to treat malaria?	155 (87.6)	22 (12.4)
Is Artemisinin Combination Therapy (ACT) effective in the treatment of malaria?	78 (44.1)	99 (51.0)
Does your household have bed nets?	156 (88.1)	21 (11.9)

1. **Treatment Seeking Behavior:**
    - A notable portion (21.5%) visits quack traditional men or prophets for malaria treatment, while the majority (78.5%) seeks treatment from other sources. This suggests a diverse range of health-seeking practices in the community.
2. **Use of ‘Akapo’ Drug:**
    - Almost half of the respondents (46.9%) use 'akapo' drug for malaria treatment, indicating a preference for this option. However, a significant portion (54.1%) opts for other drugs aside from 'akapo'.
3. **Belief in Environmental Sanitation:**

- About one-fourth (27.1%) believes in environmental sanitation as the best prevention/control for mosquitoes breeding, while a larger portion (72.9%) disagrees. This indicates varying perceptions regarding the effectiveness of environmental measures.

4. **Choice of Antimalarial Drugs:**

- Chloroquine tablets are used by 25.6% of respondents, and Amodiaquine tablets are used by only 5.6%. Sulphadoxine or pyrimethamine (fansidar) is the choice for a significant majority (87.6%). This highlights diversity in antimalarial drug preferences.

5. **Perceived Effectiveness of Artemisinin Combination Therapy (ACT):**

- A considerable portion (44.1%) supports the use of ACT as an effective treatment for malaria, while 51.0% express uncertainty or disagreement. This reveals a need for awareness and education on the benefits of ACT.

6. **Ownership and Usage of Bed Nets:**

- The majority (88.1%) of households have bed nets, and 81.4% indicate that mothers own these nets. However, only 43.5% claim to use the bed nets, suggesting a gap between ownership and consistent usage.

7. **Bed Net Usage Practices:**

- All respondents use bed nets overnight. There are different practices, with 31.6% spreading the net outside for an hour before sleeping under it, while 43.5% immediately lay and spread the net on the bed before sleeping under it.

Table 6: Hospital Patronage by Pregnant Women from 2019 to 2022

Facilities	Year	Registered Pregnant Women	Treated &Discharged	Non-Admitted	Percentage of Admission %	Percentage of Non-Admission %	Remarks
General Hospital Ikire	2019	500	458	42	91.6	8.4	
	2020	226	221	05	97.8	2.2	
	2021	407	396	11	97.2	2.7	
	2022	315	307	08	97.5	2.5	
Omoda Health Centre Ikire	2019	221	205	16	92.8	7.2	
	2020	212	212	NIL	100	NIL	
	2021	97	97	NIL	100E	NIL	
	2022	104	100	04	96.2	3.8	
Emmanuel Hospital Ikire	2019	200	192	08	96.0	4.0	
	2020	187	184	03	98.4	1.6	
	2021	305	305	NIL	100	NIL	
	2022	178	170	08	95.5	4.5	
Boluwatife Convalescent Home Ikire	2019	113	113	NIL	100	NIL	
	2020	45	45	NIL	100	NIL	
	2021	98	98	NIL	100	NIL	
	2022	07	07	NIL	100	NIL	

-
- The General Hospital Ikire recorded varying levels of admission from 2019 to 2022, with the highest being 8.4% and the lowest 2.2%. This indicates a relatively low rate of hospitalization among registered pregnant women.
- Omoda Health Centre Ikire shows a pattern of low admission, especially in 2020 where all registered pregnant women were non-admitted (100%). However, there is a slight increase in admissions in 2022.
- Emmanuel Hospital Ikire also demonstrates a relatively low admission rate, with the highest being 4.5% in 2022.
- Boluwatife Convalescent Home Ikire, being a primary health center with limited facilities, primarily treated pregnant women as outpatients. The recorded admissions were NIL.

- The overall data suggests that a significant number of pregnant women were not subjected to malaria parasite tests unless deemed necessary based on complaints.

Table 7: Results of Malaria Parasite Tests in Pregnant Women

No. of Patients	Results	Percentage
58	+ Malaria parasite seen	58%
10	++ High level of malaria parasite seen	10%
17	Scanty malaria parasite seen	17%
12	No malaria parasite seen	12%
03	No parasite of any kind seen	3%

- 58% of pregnant women tested positive for malaria parasites, indicating a high prevalence of malaria in the study area.
- 10% had a high level of malaria parasites, suggesting a significant number of cases with a more severe infection.
- 17% showed scanty malaria parasites, which may indicate early or mild infections.
- 12% had no malaria parasites detected, while 3% had no parasites of any kind.
- The results emphasize the urgent need for intervention to address the high prevalence of malaria among pregnant women in the area.

Table 8: Results of Malaria Parasite Tests in Non-Pregnant Women for Malaria Control

No. of Patients	Results	Percentage
2	+ Malaria parasite seen	20%
1	++ High level of malaria parasite seen	10%
1	Scanty malaria parasite seen	10%
3	No malaria parasite seen	30%
3	No parasite of any kind seen	30%

- 20% of non-pregnant women tested positive for malaria parasites, indicating a prevalence of malaria in this group.
- 10% had a high level of malaria parasites, suggesting a significant number of cases with a more severe infection.
- 10% showed scanty malaria parasites, which may indicate early or mild infections.
- 30% had no malaria parasites detected, while another 30% had no parasites of any kind.
- The results highlight the presence of malaria in non-pregnant women, emphasizing the importance of control measures for the general population.

Conclusion

Malaria remains a significant public health challenge in Africa, affecting approximately 45 countries, including Nigeria, where about 588 million people are at risk. Pregnant women and their unborn babies are particularly vulnerable to malaria infection, posing a threat to life in communities. The study focused on Irewole Local Government, revealing the typical characteristics of a malaria-endemic area. Despite the challenges, the study emphasizes that concerted efforts, community awareness, and effective strategies can bring about positive change.

The research uncovered overlooked intricacies that, if addressed, could contribute to reducing the scourge of the disease. It shed light on the strengths and weaknesses of both governmental and non-governmental approaches to public health problems. Governments are urged to move beyond lip service and take substantive actions to address issues affecting citizens.

Recommendations

Vector Control

- Implement aggressive vector control strategies at the community and household levels.
- Integrate vector control measures as part of a comprehensive strategy to manage and reduce malaria transmission.

Interruption of Human Vector Contact

- Promote the use of insecticide-treated nets and curtains to provide significant protection against malaria.
- Explore methods to incorporate insecticides into netting materials to eliminate the need for repeated re-treatment and increase bed net usage.

Intermittent Treatment for Malaria in Pregnancy

- Administer intermittent preventive treatment, such as sulphadoxine/pyrimethamine, during the second and third trimesters of pregnancy.
- Recognize the potential need for more frequent treatment for pregnant women who are HIV positive.

Improved Environmental Sanitation

- Prioritize and invest in environmental sanitation activities at the community level.
- Allocate resources for logistics, funding, monitoring, evaluation, and infrastructural development to support effective sanitation measures.

Information Dissemination

- Conduct aggressive information dissemination campaigns to educate the public about malaria and preventive measures.
- Engage individuals, groups, and corporate bodies in efforts to control the spread of the disease.

Implementing these recommendations will contribute to a more comprehensive and effective approach to malaria prevention and control in the study area and beyond.

REFERENCES

1. Akinyele S.O. et al (2009): Knowledge and Utilization of Intermittent Preventive Treatment for Malaria among Pregnant Women.

2. Amexo, M, Tolhurst, R, Barnish, G. Bates, I. (2004): Malaria Misdiagnosis: Effect on the Poor and Vulnerable: The Lancet 384:1896-1898.
3. CDC: Journal on Malaria Centre for Disease Control and Prevention, Atlanta, USA, 2004.
4. Falade C.O, Yusuf B.O. et al (2007): Intermittent Preventive Treatment with Sulphadoxine-pyrimethamine.
5. FMOH, Abuja 2005.14: National Guidelines and Strategies for Malaria Prevention and Control during Pregnancy.
6. Gamble, C, Ekwaru, J, Ter Kuile, F (2006): Insecticide treated nets for Preventing Malaria in Pregnancy.
7. Onwujekwe O, Chima R, Okonkwo P (2008): Economic Burden of Malaria Illness on Households Version that of all other Illness Episodes: A study in five malaria Holo-endemic Nigeria communities.
8. Russell, S, (2004): The Economic Burden of Illness for Household in Developing Countries. A review of Studies focusing on malaria Tuberculosis and HIV/AIDS (American Journal of tropical Medicine and Hygiene 71(2): 147-155)
9. Webb, James L.A. Humanity's Burden: A Global History of Malaria Cambridge, U.K; Cambridge University Press, 2008.
10. WHO Global Burden of Disease 2007
11. WHO Global Malaria Programme – Pregnant Women and Infants 2007
12. WHO Roll Back Malaria in Pregnancy 2007?
13. WHO/UNICEF: Africa Malaria Report, Geneva 2003 WHO/CDS/MAL/2003.1093.