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Prevalence of Malaria Among Children Under Five Years of Age in Miya Ward Ganjuwa Local Government From 2013-2017

Umar Muhammad Salisu[1], Maimuna Muhammad[2]

[1] Department of Sustainable of Environmental Studies, Abubakar Tafawa Balewa University, Bauchi, Nigeria
[2] College of Nursing Science, Department of Nursing, Abubakar Tafawa Balewa University Teaching Hospital Bauchi, Nigeria

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Corresponding Author:
Umar Muhammad Salisu
umsalisu.pg@atbu.edu.ng

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Abstract: The study was conducted from 2013 to 2017 in Miya ward Ganjuwa local government, Bauchi state, to ascertain the incidence of malaria in children aged 0 to 5. The majority of patients, particularly those under five, who visit the health facility in the Miya Ward clinic have been found to have malaria. This is demonstrated by their epidemiological record, which was acquired at the health facility during the research project. The study project is anticipated to be important for the residents of the Miya ward clinic, especially the children under five, as well as for the government and non-governmental organizations to have a better understanding of the issues that are currently being faced. Male children are more likely than female children to contract malaria, according to the results of this study, which was conducted using a descriptive research design in which data was collected using a methodical approach and the characteristics of specific variables related to the study were explained. Additionally, it was found that malaria is usually quite common during the rainy season. Finally, more study should be done to determine the frequency of malaria in children throughout the whole Miya Ganjuwa local government in Bauchi state.

Keywords: Malaria; Incidence; Children under five; Miya Ward; Ganjuwa Local Government; Bauchi State; Epidemiology; Rainy season

Introduction

This study examines the prevalence of malaria infection in children under five in Ganjuwa local government's Miya ward between 2013 and 2017. Malaria is a serious public health issue; according to the World Health Organization's (WHO) 2012 World Malaria Report, Nigeria and the Democratic Republic of the Congo together are responsible for more than 40% of all malaria cases globally(Hetzel et al., 2022; Oguoma et al., 2021). According to WHO (2012), malaria may be the cause of 30% of deaths in children under five and 11% of maternal deaths, as well as 25% of neonatal deaths. An estimated 655,000 people died from malaria globally in 2013, with over 90% of those fatalities taking place in Africa. With over 300,000 malaria fatalities annually, the majority of which occur in children under five, Nigeria has the highest malaria burden of any country in the world. About 438,000 people died from malaria in 2015, making it one of the major global health issues. Malaria is an acute and chronic illness brought on by obligatory intracellular protozoans of the species Plasmodium malaria. Since they have not yet established immunity to the disease, children under the age of five are among the most vulnerable to contracting malaria, accounting for 70% of those deaths in sub-Saharan Africa(Mbishi et al., 2024; Oyibo et al., 2021)

Anopheles mosquito bites are the means by which malaria is spread from person to person. Seven to thirty days following a mosquito bite, symptoms start to show. The malaria parasite is carried by that. Nearly everyone in the nation is at risk of contracting malaria, according to the Nigeria Malaria Survey ((Mbishi et al., 2024), with the exception of a small minority (3%) who live at elevations between 1200 and 1400 meters, where the risk of transmission is comparatively low. The length of the malaria transmission season also decreases from south to north. According to (Ge et al., 2023), malaria is the

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most widespread parasitic disease that affects an estimated 250 million people annually. It is found in tropical sub-Saharan Africa, south-east Asia, the Pacific Islands, India, and central and south America. Children under the age of five are among the most susceptible groups to malaria, a parasitic disease that is preventable in many parts of the world, particularly Africa. Accordingly, it is estimated that 655,000 people died from malaria globally in 2013 of whom almost 86% were children under the age of five (Akello et al., 2022; Biset et al., 2022)

Plasmodium is a genus of obligatory intracellular protozoan that causes both acute and chronic malaria (Adum et al., 2023). Throughout documented human history, malaria has been one of the deadliest illnesses in the globe. In terms of yearly mortality, it continues to rank among the deadliest illnesses despite efforts to eradicate it. The issue appears to still exist in Miya ward Ganjuwa Local Government despite all the efforts made by the government and non-governmental organizations to prevent malaria, including the distribution of durable bed nets treated with insecticide, the free distribution of anti-malarial medications to all children and pregnant women, community health education on environmental hygiene, and the prompt reporting of any deviation in normal health.

The researcher is motivated to conduct a study on the subject of "Prevalence of Malaria among children under five years old in Miya ward Ganjuwa Local Government from 2013 – 2017" by the aforementioned observation. In tropical and sub-tropical nations, malaria is a serious public health issue that contributes to early mortality (Sarfo et al., 2023; Tsegaye et al., 2021). In many parts of the world and nations, this avoidable illness has spread like an epidemic and is yet unregulated (WHO 2012). In Africa, pregnant women and children under five are at the highest danger of dying from malaria; children who get the disease frequently pass away within 72 hours of exhibiting symptoms.

Malaria deprives infants of essential nutrients, hence hindering their physical and cognitive growth (WHO, 2012). Over a million African children are thought to perish each year as a direct or indirect result of contracting malaria (Tsegaye et al., 2021), malaria is a parasitic illness brought on by a single protozoan parasite of the genus Plasmodium, which is a member of the phylum and epicomplex. The bites of haemotogenous female adults mosquitoes of the insect genus Anopheles transmit malaria parasites (plasmodium species) from one person to another. As a result, these mature female Anopheles mosquitoes are likely to carry malaria parasites. The world's tropical and subtropical regions are home to the majority of these mosquitoes ((Sarfo et al., 2023; Tsegaye et al., 2021). The bulk of human health issues in malaria-endemic areas of the world are caused by the four species of the Plasmodium genus—Falciparum, Plasmodium viva, Plasmodium ovale, and Plasmodium malariae—that are known to cause human malaria (Mbishi et al., 2024; Oguoma et al., 2021). Anopheles Gambiae, Anopheles funestus, Anopheles arabiensis, and Anopheles melas are the main vectors of human malaria.

The savannah regions and urban areas are where an aradiensis is most prevalent. The melas is a saltwater species, the funestus has an irregular distribution, and the Gambiae are found in extremely thick woodland regions (Ge et al., 2023). Over time, Anopheles mosquitoes can adapt to urban breeding grounds. For example, in India, Anopheles stephensi has become an urban species and is found in larger concentrations in several Indian cities than in the nearby rural areas (WHO, 2012). There is proof that Anopheles mosquitoes are also adapting more successfully to Accra's nesting grounds (Biset et al., 2022)

Because the severity of attacks is consistent throughout the year or from year to year, malaria transmission in Nigeria is both severe and steady. Malaria is mesoendemic in urban areas and fully endemic in rural parts of Nigeria. The transmission rate is roughly constant throughout the year in the southern portion of the nation. According to (Sarfo et al., 2023; Tsegaye et al., 2021), there is a noticeable contrast between the low transmission rate during the lengthy dry season and the increased transmission rate during the short rainy season in the far north. Malaria and humans appear to have developed together. Based on the occurrence of homozygous individuals, it is thought that the majority, if not all, of the current human malaria population may have originated in central Africa (P. vivax) and West Africa (P. falciparum). According to (Mbishi et al., 2024), hemoglobin C and RBC Duffy negative alleles provide protection against P. falciparum and P. vivax, respectively. Evidence from recent genomic research suggests that human malaria parasites most likely spread from big apes to humans most likely as a result of vector mosquito bites (Oguoma et al., 2021)

Method

Study Design

The non-experimental descriptive research design will be the method employed for this study. According to (Akello et al., 2022), the descriptive survey method is used to gather, analyze, evaluate, and report facts and information about the situation in order to disclose the existing conditions that exist between certain occurrences.

Research Settings

The Miya community in Bauchi State's Ganjuwa local government is located along Warji Road in Bauchi Central. During the rainy season, which lasts from June to September, it receives a lot of rainfall and is surrounded by mountains. Farming is the Miya people's primary employment. When it comes to their cultural beliefs, the Miya people have a good, rich background. According to estimates, there are 56,000 people living in Miya, the majority of whom follow traditional religions. Samson Emeka Omeruaha, the previous military governor of Anambra state, initiated primary healthcare for Miya. The clinic was established on November 11, 1987, and is currently run by Alhaji Musa Auwalu, with Mrs. Beatrice J. Abba (RnvRN) in charge of the maternity section. There are twelve trained and non-trained staff members, and their primary water source is a well with few bore holes. Due to the area's constant and heavy rainfall, grasses grow everywhere, and mosquitoes breed, which raises the risk of contracting malaria.

Target Population

All youngsters between the ages of 0 and 5 will be the study's target demographic in Ganjuwa local government's Miya ward in 2013.

Sampling Technique

The study's sample consisted of all 2013 Miya ward Ganjuwa local government patients with a diagnosis of malaria who were between the ages of 0 and 5.

Instrument for Data Collection

Passed records served as the researcher's data gathering tool. The records came from the Miya ward Ganjuwa local government's medical records and statistics department. Every patient in Miya ward Ganjuwa local government who has been diagnosed with malaria will have their details included in the register. Regarding the year 2013. The instrument's validity and reliability. By verifying that it is well-documented and up-to-date, the instrument utilized passed records, making it extremely dependable. This is due to the fact that this instrument will supply all the necessary information, which will be verified by three professionals from the School of Nursing and Midwifery. The instrument's final draft will incorporate their suggestions.

Method of Data collection

The director of the statistics unit and the clinic's CNO are provided with a letter of authorization from the School of Nursing Bauchi to conduct the study at the hospital. The researcher hopes to be granted permission to evaluate data from the patient record.

Method of Data Analysis

The data collected from the past records were presented and analyzed using tables, bar chart, pie chart and simple percentage.

Result and Discussion

This chapter discusses the data analysis done between 2013 and 2017 on the prevalence of malaria in children aged 0 to 5 in Miya ward, Ganjuwa local government. All of the information was gathered from historical records, shown in tables, and the outcomes were examined using straightforward percentages(Jiero & Pasaribu, 202; Tchoumi et al., 2022).

Table 1. The number of children affected with malaria between 2013- 2017 in Miya ward Ganjuwa local Government

Years	Number of children with malaria from 2013-2017	Percentage (%)
2013	1324	18.61
2014	1363	19.16
2015	1403	19.72
2016	1421	19.97
2017	1603	22.54
Total	7114	100

According to the data collected between 2013 and 2017, a total of 7,114 children were diagnosed with malaria in Miya ward, Ganjuwa Local Government, Bauchi State. The yearly distribution of cases shows fluctuations, with the lowest figure recorded in 2013 at 1,324 cases, representing 18.61% of the total. This indicates that even at its lowest, malaria remained a major health issue among children under the age of five in the community. The incidence increased in subsequent years, reflecting the continuous vulnerability of the population. Although variations were observed, the trend demonstrates that malaria remained endemic throughout the study period. The steady occurrence of cases highlights the persistence of risk factors such as poor environmental sanitation, inadequate preventive measures, and seasonal transmission patterns(Asmare, 2022; Diawara et al., 2022).

The highest number of cases was observed in 2017, with 1,603 children affected, representing 22.54% of the total. This peak suggests either a rise in transmission intensity or an improvement in case detection and reporting at the health facility. It also emphasizes the continuing burden of malaria and the pressing need for sustainable interventions targeted at children, who remain the most vulnerable group (Mwaiswelo et al., 2021). These findings underscore the importance of reinforcing malaria prevention and control strategies

within the Miya ward and beyond. Strengthening community health education, promoting the use of insecticide-treated nets, improving access to early diagnosis and treatment, and ensuring effective environmental management could help reduce the incidence. Furthermore, the results provide useful insights for government and non-governmental organizations in designing programs that address malaria as a persistent public health challenge (Asmare, 2022; Diawara et al., 2022).

Table 2. Children aged 0 to 5 who were most afflicted by malaria between 2013 and 2017 by gender

Years	Sex of children with malaria	
	Male	Female
2013	720 (18.5%)	604 (18.7%)
2014	760 (19.6%)	603 (18.7%)
2015	800 (20.6%)	603 (18.7%)
2016	700 (18%)	721 (22.3%)
2017	902 (23.2%)	701 (21.7%)
Total	3882 (100%)	3232 (100%)

According to the data recorded between January 2013 and December 2017, a total of 3,882 male children were diagnosed with malaria in Miya ward, Ganjuwa Local Government, Bauchi State. This figure represents a substantial portion of the overall cases and highlights the significant burden of malaria among young boys within the community, the endemic nature of malaria and its ongoing impact on child health. The data further indicate that male children were more likely to contract malaria compared to female children during the study period. This disparity could be influenced by biological, environmental, or behavioral factors that increase exposure risk among boys. Such findings emphasize the importance of considering gender-related differences in malaria research and intervention strategies to ensure that control measures are appropriately targeted and effective (Anjorin et al., 2023).

Table 3. The Prevalence of Malaria among Children in 2013

Months	Number of Patient with Malaria	Percentage (%)
January	79	5.9
February	87	6.57
March	90	6.79
April	89	6.72
May	110	8.31
June	115	8.68
July	120	9.06
August	140	10.57
September	155	11.70
October	123	9.29
November	115	8.68
December	101	7.62
Total	**1324**	**100**

According to the table, malaria incidence in 2013 displayed significant monthly variation. The highest number of cases was recorded in September, accounting for 11.70% of the total cases in that year. This increase is likely related to the rainy season, which provides favorable conditions for mosquito breeding and leads to a surge in malaria transmission within the community. On the other hand, the lowest number of cases occurred in January, with only 79 patients or 5.9% of the total. The relatively low incidence at the beginning of the year may be attributed to the dry season, when mosquito breeding sites are reduced due to limited water collection. Such seasonal fluctuations emphasize the strong link between climatic conditions and malaria prevalence. The overall trend suggests that malaria control efforts should be intensified during the rainy season, particularly from mid-year to early fall, when cases tend to rise sharply. Preventive measures such as the distribution of insecticide-treated nets, environmental sanitation, and health education campaigns would be most effective if aligned with these peak transmission periods. This seasonal approach could help reduce the burden of malaria, especially among vulnerable children under five years old (Alum et al., 2024; Masoyi et al., 2023).

Table 4. Shows the Prevalence of Malaria in 2014

Months	Number of Patient with Malaria	Percentage (%)
January	84	6.16
February	80	6.67
March	90	6.00
April	96	7.04
May	95	6.97
June	121	8.88
July	116	8.51
August	150	11.01
September	165	12.11
October	134	9.83
November	122	8.95
December	110	8.07
Total	**1363**	**100**

The prevalence of malaria from January to December 2014 showed notable fluctuations. The month of September recorded the highest number of cases at 12.11%, indicating a peak in transmission that may be associated with favorable environmental conditions for mosquito breeding during that period. This trend highlights the seasonal nature of malaria incidence. Conversely, January showed the lowest prevalence with only 5.87% of cases, suggesting reduced mosquito activity at the beginning of the year. These variations underscore the importance of implementing malaria prevention and control strategies that are closely aligned with seasonal patterns to effectively reduce transmission rates (Mbishi et al., 2024).

Table 5. Shows the prevalence of malaria in 2015

Months	Number of Patient with Malaria	Percentage (%)
January	76	5.42
February	88	6.27
March	98	6.99
April	92	6.56
May	134	9.55
June	120	8.55
July	134	9.55
August	154	10.98
September	150	10.69
October	127	9.05
November	120	8.55
December	110	7.84
Total	**1403**	**100**

The aforementioned data indicates that, between January and December 2015, the highest prevalence of malaria cases among children occurred in August, with 154 cases, accounting for 10.98% of the total. This peak may be attributed to increased rainfall and stagnant water during the rainy season, which provide favorable breeding conditions for mosquitoes, the primary vectors of malaria (Mwaiswelo et al., 2021; Oyibo et al., 2021). In contrast, January recorded the lowest number of cases, with only 76 children diagnosed, representing 5.42%. The decline in cases at the beginning of the year could be linked to reduced mosquito activity during the dry season (Asmare, 2022; Oyibo et al., 2021; Tchoumi et al., 2022).

Table 6. Shows the prevalence of malaria in 2016

Months	Number of Patient with Malaria	Percentage (%)
January	92	6.47
February	90	6.33
March	98	6.89
April	89	6.26
May	100	7.04
June	142	9.99
July	160	11.26
August	167	11.82
September	138	9.71
October	116	8.16
November	110	7.74
December	120	8.44
Total	**1421**	**100**

According to the above table, the highest prevalence of malaria cases in children from January to December 2016 was recorded in August, accounting for 11.82% of the total. This pattern aligns with the peak of the rainy season, when stagnant water becomes abundant and mosquito breeding intensifies, thereby increasing the risk of malaria transmission. On the other hand, April recorded the lowest prevalence, with 6.26% of cases. This relatively low figure may be associated with transitional weather conditions, which could reduce mosquito activity compared to peak rainy months. The variation across months highlights the seasonal dynamics of malaria and emphasizes the importance of implementing preventive interventions during high-risk periods (Aheto, 2022; Ajayi & Emeto, 2023).

Table 7. Shows the Prevalence of Malaria in 2017

Months	Number of Patient with Malaria	Percentage (%)
January	100	6.24
February	84	5.24
March	99	6.18
April	180	8.78
May	108	6.74
June	161	10.04
July	173	10.79
August	180	11.23
September	174	10.84
October	152	9.48
November	120	7.49
December	112	6.99
Total	**1603**	**100**

The prevalence of malaria in 2017 is displayed in the above table, with August having the greatest number at 180 (11.3%) and February having the lowest at 84 (5.24%) (Ahmed et al., 2021). The aforementioned data indicate that the largest frequency of malaria occurs in the months of June, August, and September. The study examined the prevalence of malaria in children under five (5) in Ganjuwa local government's Miya ward between 2013 and 2017 (Datta et al., 2021; Sulaiman et al., 2022). The study aimed to determine the number of children in Miya ward Ganjuwa local government who contracted malaria between 2013 and 2017, the gender that contracts the disease most frequently, and the seasonal variation of malaria, or the season during which malaria is more prevalent than in the previous five years (Jiero & Pasaribu, 2021; Tchoumi et al., 2022).

The research's conclusions were connected to the following: Response to the research question. The main findings were discussed in accordance with the research questions that served as the study's compass. According to the results of the first research question, which aims to determine the total number of children diagnosed with malaria between 2013 and 2017, 7114 children were diagnosed with the disease (Asmare, 2022; Diawara et al., 2022). From 2013 to 2017, 1324 children were diagnosed with malaria, 1362 in 2014, 1403 in 2015, 1421 in 2016, and 1603 in 2017. This results in a total of 7114 children who had a malaria diagnosis during the course of the five years(Konaté et al., 2022). The maximum number of children was 1603 in 2017, and the lowest number was 1324 in 2014, as seen in table 4.7. This is

consistent with Olver's (2012) research findings. In most endemic locations, children under five years old account for the bulk of malaria cases (Kojom Foko et al., 2021; Oshagbemi et al., 2023).

The second research question is to determine which gender is more frequently affected by malaria. It was also determined how sex affected the prevalence of malaria. Based on the records gathered during the research project, it was found that male children were more likely than female children to contract malaria (Ngere et al., 2022; Oshagbemi et al., 2023). This is consistent with the findings of Cernetich (2006) and illustrates the number of male and female children in Miya ward Ganjuwa local government who have malaria Male bias in malaria was clearly proven by the researchers using the marine model, which also demonstrates the role of testosterone in male susceptibility to the disease (Ibeji et al., 2022; Kayentao et al., 2024; Okell et al., 2023). Finding the season with the maximum occurrence of malaria is the third research question. In addition, it was found that in practically every year from 2013 to 2017, the months of June, July, August, September, and October had the highest rates of malaria in Miya ward Ganjuwa local government during the rainy season. In 2013, September accounted for 11.70% of cases; in 2014, September accounted for 12.11% of cases, the highest number for that year; in 2015, August accounted for 10.9%; and in 2016, August 2017 had 11.23%, followed by August with 11.82%. However, it was found that, out of the five consecutive years for the research, the proportion of children aged 0 to 5 with a malaria diagnosis was greatest in 2017 (22.54%) (Lubinda et al., 2021; Osoro et al., 2024; Yaro et al., 2022).

This is consistent with the research that Gilles (2010) conducted. Bougoula is a 3,200-person rural town located 10 kilometers east of Sikaso. According to him, the rainy season lasts from May to October and has an average of 1,100 mm of rainfall annually, with the majority of that amount (75 percent) occurring between July and September. The most significant contributing factor to the high incidence of malaria in this study was found to be rainfall in Ganjuwa local government's Miya ward. The reason for this is because rains give vectors a location to breed and lay a lot of eggs, which leads to a lot of mosquitoes. This outcome is consistent with Arantax's (2009) findings. In the majority of endemic areas, malaria incidence exhibit seasonal peaks, and seasonality may influence the best timing and method of malaria management (Kabir Sulaiman et al., 2023). According to the results, it is possible to reduce the prevalence of malaria, particularly in children ages 0 to 5. The causes and frequency of malaria should be explained to the community's members. Controlling vector breeding grounds, removing grasses surrounding homes, encouraging the use of intermittent control methods, encouraging the use of long-lasting insecticide nets, and emphasizing early identification and treatment of all children with malaria are all important (Aheto et al., 2021; Liu et al., 2021; Seidahmed et al., 2025).

Conclusion

In conclusion, the prevalence of malaria in Miya is linked to rainfall, namely a lack of knowledge about easy measures to avoid the disease during the rainy season, inadequate medical services, and a lack of use of insecticide-treated nets. The prevalence of malaria may be significantly decreased, nevertheless, with the application of intermittent preventative measures and appropriate health education for disease control in breeding grounds.

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Conflicts of Interest
The authors declare no conflict of interest.

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