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Malaria Prevalence and Risk Factors Among Pregnant Women: A Retrospective Record Review at the Buea Regional Hospital, South West Region of Cameroon

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Abstract

Background

Notwithstanding global efforts to curb the spread of malaria, it has remained one of the most common public health challenges to mothers, foetuses, and neonates with devastating effects in pregnancy. The study, therefore, sought to determine the prevalence and risk factors of malaria in pregnancy among those who attended the antenatal clinic at the Buea Regional Hospital, South West region of Cameroon.

Methods

A five-year hospital-based retrospective study was carried out using ANC registration logbooks. Data was collected from January 2018 to December 2022. A total of 1,200 records meeting the inclusion criteria were assessed. Data on demographics such as age, marital status, gravidity, gestational age, malaria results and preventive factors were obtained and analyzed using SPSS version 25. Chi-square tests and Fisher's Exact Test were used to evaluate associations, with a significance level of $p < 0.05$. Logistic regression was used to determine independent risk factors for malaria infection.

Results

The overall prevalence of malaria among pregnant women was 12.8% (153/1200). Prevalence rose from 14% in 2018 to a peak of 20.6% in 2019, then declined steadily to 8.1% by 2022. Women aged ≥ 35 years had significantly higher odds of infection compared to adolescents (OR = 1.98; $p = 0.039$). Multigravid women had 2.2 times higher odds of malaria compared to primigravid women (OR = 2.21; $p = 0.020$). Use of long-lasting insecticidal nets (LLINs) reduced infection odds by 55% (OR = 0.45; $p = 0.001$), and receipt of three IPTp doses reduced odds by 56% (OR = 0.44; $p = 0.044$). Married women had 29% lower odds of malaria as opposed to unmarried women (OR = 0.71; $p = 0.006$).

Conclusions

This study showed that malaria remains a significant threat to maternal health in Buea, despite recent declines in prevalence. Age ≥ 35 years, multigravidity, and unmarried status were major risk factors, while LLIN use and adequate IPTp dosing were protective. Despite these, there is still a call for scaled-up preventive and control strategies. Strengthening malaria prevention through expanded LLIN coverage, improved IPTp uptake, and strategies to maintain healthcare access during crises could substantially reduce malaria burden among pregnant women in this region.

BACKGROUND

Malaria is an ancient infectious disease caused by *Plasmodium*, a parasitic protozoan [1]. Plasmodium is transmitted through the bite of an infected blood-sucking arthropod insect, the female mosquito of the genus *Anopheles* [2]. Malaria remains a paramount challenge within the realm of public health in sub-Saharan Africa, particularly in Cameroon. It disproportionately affects vulnerable populations such as pregnant women, children, and immunosuppressed individuals, despite global efforts to curb the spread of the infection [3]. Pregnant women infected with malaria suffer enormous health outcomes such as maternal anaemia and mortality, foetal growth restriction, abortion, pre-term delivery, still birth and low birth weight (LBW) [4]. According to the World Health Organization (WHO), there were an estimated 247 million cases worldwide in 2021, with Africa accounting for 95% of cases and 80% of deaths among children under five years old [2]. While malaria incidence in Africa had a downward trajectory from 2000 to 2019, COVID-19 pandemic reversed this progress, leading to a surge in cases and fatalities [2]. Globally, malaria fatalities rose to 625000 in 2020 before dipping slightly to 619000 in 2021, underscoring the fragility of control measures amid overlapping health crisis [2]. Four nations: Nigeria, the Democratic Republic of the Congo, Tanzania, and Niger, shoulder over half of the world's malaria death in 2021. This highlights that the disease has a concentrated impact in Central Africa, exacerbating maternal and fetal health complications in already disadvantaged communities [2]. As one of the countries with highest malaria burdens globally, Cameroon accounted for approximately 2.7% of all cases and 2.3% of deaths in 2021 [2]. Case numbers stagnated until 2017 but surged by 3.6% in 2020 compared to 2011 baselines, while mortality declined by 7% in 2021 from the prior year; yet the disease persists as a daily threat, with around 6 million cases and 11000 deaths annually [5]. 125 million women globally become pregnant per annum in malaria endemic regions of the world [6]. Particularly alarming is the erratic rise in prevalence among pregnant women in Cameroon, escalating from 13% in 2013 to 26% in 2021[6]

Malaria is endemic in Cameroon and exhibits significant regional variation, influenced by diverse ecological factors such as biotic and abiotic factors and socioeconomic factors such as education, age, income and housing conditions [7, 8]. Environmental factors such as vegetation index, altitude and climate drive the variation of malaria in Cameroon [9]. Highland, forested, and high-altitude areas like Buea with high rainfall, humidity, and fluctuating temperatures foster ideal conditions for transmission, while urbanization and climate change further amplify

endemicity [10, 11]. The southern forested zones experience intense, year-round transmission, contrasting with seasonal patterns in the northern savannah [7, 5]. Factors of malaria in pregnancy include, gravidity with primigravid women being the most vulnerable due to lack of immunity [12]. There is limited access to preventive measures like Insecticide treated nets (ITNs) and Intermittent preventive Treatment (IPTp) with sulfadoxine-pyrimethamine [6]. Lacking such adequate preventive interventions, nearly 45% of pregnant women in Africa are at risk of contracting malaria with approximately half developing placental malaria. This precipitates the devastating maternal and neonatal outcomes like infant anaemia, intrauterine growth restriction, preterm delivery, stillbirth and low birth weight [12, 13]. Marital status is also a significant factor associated with the risk of malaria in pregnancy, whereby pregnant women who are married are less likely to get malaria compared to their unmarried counterparts [14]. Environmental conditions during the rainy season greatly increase mosquito breeding grounds. As a results, in settings where malaria transmission exhibit strong seasonality, pregnant women whose gestational period coincided predominantly with the rainy season are observed to have a significant higher likelihood of malaria infection than those whose pregnancies occurred mainly during the dry season [15]. Moreover, vegetation or bushy surroundings near a home constitute an independent risk factor for the likelihood of malaria during pregnancy [14].

Although overall malaria rates have declined in parts of Africa in recent years [16], high transmission zones like Buea; a southern forested high-altitude town in Cameroon [17], encounters distinctive impediments in the prevention and control of malaria. Also, where reliable data remains scarce, continue to endanger large numbers of expectant mothers, perpetuating cycles of malaria disease, morbidity, and mortality. Therefore, this study sought to determine the prevalence and risk factors of malaria in pregnancy among those who attended the antenatal clinic at the Buea Regional Hospital, South West region of Cameroon.

METHODS

Study Area

This study was conducted at the Buea Regional Hospital found in the Buea Health District, Fako Division of the South-West Region of Cameroon. Buea harbours 85 villages with a population of 184,601. Buea Regional Hospital is situated at latitude 4.1482^{o} North and longitude 9.23653^{o} East of the Greenwich Meridian and lies at 900m above sea level [18]. Buea has a surface area of 870 square kilometres with a humid tropical climate characterised by an average annual rainfall of about 3000 to 5000 mm and an average annual temperature of 20^{o}C to 25^{o}C [18].

Study population

This study examined archival records of attendees of antenatal clinics at Buea Regional Hospital for the period January 2018 to December 2022, regardless of gestation age.

Ethical Statement:

Ethical clearance was obtained from the Faculty of Health Sciences Institutional Review Board (FHSIRB) of the University of Buea, ref. No. 2023/2024-03/UB/SG/IRB/FHS with additional approvals from the South West Regional Delegation of Public Health and the Buea Regional Hospital. Informed consent was waived as this was a retrospective study. Steps were taken to ensure confidentiality: anonymous data entry, password-protected storage in computer, and access restricted to both digital and physical records.

Study Design

This hospital-based retrospective study analyzed ANC logbook records from January 2018 to December 2022. The data collected were demographic and clinical information, including season of diagnosis, maternal and gestational age, marital status, gravidity, LLIN possession, and IPTp doses in order to assess malaria trends. All pregnant women whose records met the inclusion criteria were chosen in order to present the prevalence of malaria among pregnant women who attended ANC at Buea Regional Hospital from 2018 to 2022.

Study periods

The study reviewed ANC logbook data from January 2018 to December 2022, assessing a five-year trend in malaria prevalence and risk factors among pregnant women at Buea Regional Hospital.

Sample size determination

This was an exhaustive review of records of all pregnant women registered in the ANC logbooks at Buea Regional Hospital from January 2018 to December 2022, who met the inclusion criteria.

Inclusion and Exclusion Criteria

Inclusion criteria: All pregnant women whose records were recorded in the ANC logbook at Buea Regional Hospital with complete and legible information from January 2018 to December 2022.

Exclusion criteria: Pregnant women whose records were registered in the ANC logbooks with incomplete or illegible information during the same period were excluded from the study.

Data Collection Procedures

Malaria prevalence from January 2018 to December 2022 was obtained by extracting data from ANC logbooks at the Buea Regional Hospital using a Microsoft Excel 2013 data extraction sheet. Data on demography, malaria prevention, date of diagnosis, age, marital status, gravidity, gestational age, malaria results, LLIN possession, and IPTp doses were obtained.

Data management and statistical analysis

The data were entered daily into Microsoft Excel 2013. Consistency and accuracy checks were done periodically. The data was backed-up in external devices and sent through email. Data were analyzed using SPSS version 25. Inconsistencies, missing values, and proper coding of variables were checked. The maternal age, marital status, gravidity, gestational age, malaria results, and IPTp doses were considered in the analysis. The prevalence of malaria was calculated per year and overall. Fisher's Exact Test and Chi-Square (x^2), were used to determine associations at a significant level of $P < 0.05$. Logistic regression was used to calculate infection odds.

RESULTS

Malaria Prevalence and trends in pregnant women who attended antenatal clinic at the Buea Regional Hospital from 2018 - 2022

One thousand two hundred (1,200) pregnant women with complete records from the registration logbooks between January 2018 and December 2022 were included in this study. Of this number, 153 were diagnosed with malaria, giving an overall prevalence of 12.85%. The yearly prevalence calculated from the data showed that the prevalence was 14% (28/200) in 2018; 20.6% (40.7/198) in 2019; 15.7% (34/216) in 2020; 9% (25/266) in 2021 and 8% (25/308) in 2022. Malaria prevalence increased from 14% in 2018 to 21% in 2019 and steadily decreased to 8% in 2022 (figure 1)

Risk factors associated with malaria in pregnant women who attended ANC at the Buea Regional Hospital (2018 -2022).

Maternal age significantly influenced the prevalence of malaria as indicated in figure 2 and Table 1. Prevalence was highest among pregnant women aged 15-19 years (19.3%) and lowest among those 35years (8.8%) and above ($X^2 = 10.13^a$ N =152, P = 0.038).

The prevalence of malaria varied significantly by gestational age, with 15.1% (119/790) in the second trimester, compared to 10.3% (17/165) in the first trimester and 8.2% (17/207) in the third trimesters ($X^2 = 8.113^a$ P = 0.017; Table 1, figure 3).

Table 1: ***The Contingency Table of Bivariate Analysis of Association Between Maternal Characteristics and Percentage Positivity of Malaria Stratified by Year of Occurrence (2018–2022)***

Variable	Total percentage (%) positivity of malaria	Percentage (%) positivity of malaria per year of occurrence					Pearson Chi Square test.
		2018	2019	2020	2021	2022	
Maternal age							X^2=10.13[a] **P = 0.038**
15-19	19.3(16/83)	25.0(3/12)	30.8(4/13)	21.4(3/14)	13.0(3/23)	14.3(3/21)	n =152 df = 4
20-24	15.0(45/301)	17.3(9/52)	23.8(10/42)	21.8(12/55)	12.2(9/74)	6.4(5/78)	
25-29	13.4(57/427)	15.8(12/76)	21.3(16/75)	13.5(10/74)	9.6(9/94)	9.3(10/108)	
30-34	8.6(22/251)	9.3(4/43)	17.4(8/46)	8.5(4/47)	4.2(2/48)	6.0(4/67)	
>=35	8.8(12/136)	0.0(0/18)	12.5(3/24)	18.5(5/27)	3.8(1/26)	7.3(3/41)	
Total	12.7(152/1198)	13.9(28/201)	18.5(37/200)	15.7(34/217)	9.1(24/265)	7.9(25/315)	
Marital status							X^2=3.677[a] P=0.452
Married	12.1(86/711)	10.2(13/128)	19.4(25/129)	16.2(22/136)	6.8(10/146)	9.3(16/172)	n=149 df=1
Unmarried	14.5(63/434)	20.5(15/73)	21.0(13/62)	14.5(11/76)	13.8(15/109)	7.9(9/114)	
Total	13.0(149/1145)	13.9(28/201)	19.9(38/191)	15.6(33/212)	9.8(25/255)	8.7(25/286)	
Gravida							χ^2 = 0.5633 **p = 0.7545**
Primigravid	13.7(54/394)	15.9(11/69)	27.3(15/55)	15.5(11/71)	10.1(9/89)	7.3(8/110)	**n=** 152 df=2
Secundigravid	12.4(42/338)	9.5(6/63)	17.2(10/58)	17.2(11/64)	14.1(10/71)	6.1(5/82)	
Multigravid	12.0(56/465)	16.2(11/68)	18.4(16/87)	14.5(12/83)	4.8(5/104)	9.8(12/123)	
total	12.7(152/1197)	14(28/200)	20.5(41/200)	15.6(34/218)	9.1(24/264)	7.9(25/315)	
Gestational age							χ^2 = 8.113[a] **p= 0.017**
First trimester	10.3(17/165)	13.6(3/22)	16.7(4/24)	17.2(5/29)	5.6(2/36)	5.6(3/54)	n = 153 df = 2
Second trimester	15.1(119/790)	17.0(24/141)	22.7(32/141)	14.6(21/144)	12.7(21/165)	10.6(21/199)	
Third trimester	8.2(17/207)	2.9(1/35)	15.6(5/32)	21.6(8/37)	3.5(2/57)	2.2(1/46)	
total	13.2(153/1162)	14.1(28/198)	23.4(46/197)	16.2(34/210)	9.7(25/258)	8.4(25/299)	
LLIN							χ^2 =2.2137 **p =** 0.697
Yes	13.1(147/1125)	14.0(27/193)	21.1(41/194)	15.5(32/207)	9.8(23/234)	8.8(24/297)	df=4 n = 1190
No	7.7(5/65)	12.5(1/8)	0.0(0/6)	18.2(2/11)	4.5(1/22)	5.6(1/18)	
Total	12.8(152/1190)	13.9(28/201)	20.5(41/200)	15.6(34/218)	9.4(24/256)	7.9(25/315)	
IPT							χ^2 =24.709 **p = 0.0017**
0	10.0 (9/91)	11.8(2/17)	5.9(1/7)	13.6(3/22)	6.7(1/15)	6.7(2/30)	df=8 n = 152
1	12.8(22/172)	14.8(6/42)	26.3(10/38)	6.7(2/30)	9.7(3/31)	3.2(1/31)	
2	15.0(35/234)	20.3(12/59)	16.1(9/56)	9.7(3/31)	7.7(3/39)	16.3(8/49)	
3	12.9(56/435)	9.6(8/83)	23.6(21/89)	19.5(17/87)	5.8(6/104)	5.6(4/72)	
4	12.6(29/230)	0	0	19.1(9/47)	17.8(10/57)	7.9(10/126)	
5	3.7(1/27)	0	0	0.0(0/1)	5.3(1/19)	0.0(0/7)	
Total	12.7(152/1199)	13.9(28/201)	20.5(41/200)	15.6(34/218)	9.1(24/265)	7.9(25/315)	

Regression analysis.

A multivariate logistic regression analysis revealed a significant effect on women aged 35 years and older had 98% higher adjusted odds of malaria infection compared to adolescents aged 15-19 years (OR=1.98, p=0.039). Multigravid women (≥3 pregnancies) had 2.2 times higher odds of malaria than primigravid women (first pregnancy) (OR=2.21, p=0.020). LLIN users had 55% lower odds of malaria infection compared to non-users (OR=0.45, p=0.001). Women receiving 3 IPTp doses had 56% lower odds of malaria than those receiving no doses (OR=0.44, p=0.044). Married women had 29% lower odds of malaria than unmarried women (OR=0.71, p=0.006). As for gestational age, though not statistically significant, the results indicates that pregnant women in the second (OR=0.794, p=0.462) and third trimester (OR=0.889, p=0.704) had approximately 20.6% and 11.1% lower odds of malaria infection compared to those of the first trimester respectively.

Table 2: ***Multivariate Logistic Regression Analysis of Factors Associated with Malaria Positivity Among Pregnant Women (2018–2022)***

Variables	Category	B [95% CI for OR]	S.E. (B)	Wald	Adjusted Odd Ratio
Age (years)	15-19	-	-	-	1.000
	20-24	0.152 [0.621-2.182]	0.321	0.224	1.164
	25-29	0.287 [0.691-2.568]	0.335	0.734	1.332
	30-34	0.403 [0.750-2.985]	0.352	1.313	1.496
	≥35	0.685 [1.037-3.797]	0.331	4.282*	1.984
Marital status	Unmarried	-	-	-	1.000
	Married	-0.338 [0.561-0.906]	0.122	7.672**	0.713
Gravidity	Primigravid	-	-	-	1.000
	Secundigravid	0.412 [0.858-2.657]	0.288	2.046	1.510
	Multigravid	0.793 [1.131-4.321]	0.342	5.374*	2.211
Gestational age	1st trimester	-	-	-	1.000
	2nd trimester (2)	-0.231 [0.429-1.470]	0.314	0.541	0.794
	3rd trimester (3)	-0.118 [0.483-1.635]	0.311	0.144	0.889
LLIN possession	No	-	-	-	1.000
	Yes	-0.805 [0.280-0.714]	0.239	11.354***	0.447
IPTp doses	0	-	-	-	1.000
	1	-0.215 [0.358-1.818]	0.414	0.270	0.807
	2	-0.458 [0.275-1.452]	0.424	1.168	0.632
	3	-0.812 [0.201-0.979]	0.403	4.056*	0.444
	4	-0.213 [0.210-1.052]	0.404	0.630	0.146
	5	-0.713 [0.210-1.241]	0.413	2.018	0.035
Constant		-2.105	0.612	11.823	0.122

Hosmer-Lemeshow Test: χ^2 = 6.93, p = 0.543 R^2 = 0.078 (Cox and Snell), 0.192 (Negelkerke), -2 Log likelihood: 622.8

*P < 0.05, **P < 0.01, ***P < 0.001.

+-95% C.I. for EXP (B

DISCUSSIONS

This study investigated malaria prevalence and its risk factors among pregnant women who attended antenatal care at Buea Regional Hospital, Cameroon. The findings indicated an overall malaria prevalence of 12.85% from 2018 to 2022, slightly exceeding the 12% reported in Nkongho-Mbeng [19]. The peak prevalence (20.6%) occurred in 2019, coinciding with the socio-political crisis, which likely disrupted malaria prevention and control measures. In contrast, during the same period, the prevalence of malaria in the Far North region declined [20]. The

apparent rise in prevalence in Buea could be attributed to reduced access to health care facilities due to the insecurity as a result of the crisis. From 2019 onwards, malaria prevalence was on a declining trend, thus reaching 8.1% by the year 2022. The trend is consistent with the result obtained by Kamau *et al.* [16], who recorded a decline in malaria across sub-Saharan Africa. The decline could be due to increased uptake of IPTp and usage of LLINs by pregnant women. This trend is also in line with the WHO's Global Technical Strategy for Malaria 2016–2030, which has the goal of reducing malaria incidence and mortality by 90% by the year 2030[21]. This trend differs from the findings of the Institut National de la Statistique (INS) du Cameroun [6], which reported an increase in malaria morbidity among pregnant women from about 13% in 2013 to 26% in 2021. This disparity may have stemmed from the circumstance that the research is confined to hospital-based observations rather than encompassing a comprehensive nationwide analysis.

The bivariate analysis (Table 1), which assessed the relationship between maternal characteristics and malaria infection in this study showed a significant association between maternal age and malaria positivity. The youngest group of pregnant women (15-19 years) recorded the highest positivity rate at 19.3% (16/83), and ≥35 years of group recorded the lowest rate at 8.8% (12/136). Nonetheless, this type of analysis evaluated each variable in isolation and did not adjust for confounding factors. Therefore, multivariate logistic regression (Table 2) offered a more robust and realistic assessment as it controlled for multiple variables simultaneously of the independent effects of maternal age on malaria risk. The multivariate logistic regression analysis showed a significant effect on women aged 35 years and older had 98% higher odds of malaria infection compared to adolescents aged 15-19 years (OR=1.98, p=0.039). This may be possibly due to weakened immunity with age. This differs with reports from studies by Gontie *et al*. [22], Abu Bonsra *et al* [23]and Yaro *et al*. [24] who stated that the rate of malaria is lower in older pregnant women than younger ones. Multigravid women (≥3 pregnancies) had 2.2 times higher odds of malaria than primigravid women (first pregnancy) (OR=2.21, p=0.020). Repeated pregnancies appear to increase susceptibility, possibly due to pregnancy-related immune modulation. This contradicts findings by Tadesse *et al.* [25] who reported highest prevalence of malaria in younger pregnant women in Ethiopia.

This study highlights that LLIN users had 55% lower odds **of** malaria infection compared to non-users (AOR=0.45, p=0.001). And the study also revealed that LLINs reduce infection risk by >50%. This study is also in line with that conducted by Abu Bonsra *et al* [23], who reported that women not sleeping under insecticide treated bed nets were 20 times more likely to have high prevalence of malaria than those who used them. Insecticide-treated nets remain highly effective prevention tools. Scaling up LLIN coverage could substantially reduce malaria burden in pregnant women. Women receiving 3 IPTp doses had 56% lower odds of malaria than those receiving no doses (OR=0.44, p=0.044) and complete IPTp (3 doses) provides similar protection magnitude. This study is in line with that carried out by Abu Bonsra *et al* [23], which stated that malaria during pregnancy is significantly higher among women who had not receive any dose of IPTp (OR = 7.0, 95% CI [3.1-9.02], p=0.001; AOR=5.0, 95% CI [2.03-7.3], p=0.000).

The logistic regression also revealed that married women had 29% lower oddsof malaria than unmarried women (AOR=0.71, p=0.006). this study is in line with that conducted elsewhere in Africa by Abu Bonsra *et al* [14, 23], who reported that unmarried women were 3.17 time more likely to have malaria compared to married women. Marital status may serve as a proxy for socioeconomic stability, healthcare access, or household support systems that facilitate prevention behaviours.

The contingency table showed that the prevalence of malaria in relation to the gestational age, was significantly higher in the second trimester at 15.1% (119/790) compared to 10.3% (17/165) in the first trimester and 8.2% (17/207) in the third trimesters ($X^2 = 8.113^a$ P = 0.017; Table 1, figure 3) but adjusted odd ratio showed that gestational age was not statistically significant. The results indicates that pregnant women in the second (OR=0.794, p=0.462) and third trimester (OR=0.889, p=0.704) had approximately 20.6% and 11.1% lower odds of malaria infection compared to those of the first trimester respectively.

Strengths and Limitations of the study.

One of the strengths of this study is that the Buea Regional Hospital ANC clinic is attended by a large majority of pregnant women seeking antenatal care within the Buea Health District. The results obtained can be generalized. Secondly, women of all reproductive age groups (15 – 45) were represented in this study, thus, the results provide a general overview of malaria trends in the Health District and also provide a valuable local data on malaria prevalence and risk factors specific to pregnant women at Buea Regional Hospital. These findings can be useful in informing and modifying NMCP strategies for improved malaria control.

These notwithstanding, this retrospective study is confined to hospital-based observations potentially limiting its generalizability compared to a comprehensive nationwide analysis. Secondly, the sample may not fully represent all pregnant women, as it focuses on those attending antenatal care, potentially missing those with limited access. The data presented here accurately reflect the ANC records at Buea Regional Hospital and provide useful lessons based on routine clinical observations within the limitations imposed.

CONCLUSIONS

The overall prevalence of malaria amongst the pregnant women who attended antenatal care at the Buea Regional Hospital for the five years (January 2018 to December 2022) was 12.85%. Malaria prevalence increased from 14% in 2018 and peaked at 20.6% in 2019, coinciding with sociopolitical crisis but decreased steadily to 8% in 2022. The key (major) risk factors were age (women over 35 had higher odds), and marital status (unmarried women had higher odds). Protective factors included LLIN use (55% lower odds) and IPTp with 3 doses (56% lower odds). This study suggests that scaling up LLIN coverage and IPTp could largely reduce malaria prevalence, though the crisis-related reduction in healthcare access likely contributed to the initial prevalence rise.

Abbreviations

ANC: Antenatal clinic; AOR: Adjusted Odd Ratio; FHSIRB: Faculty of Health Sciences Institutional Review Board; LLINs: Long lasting insecticidal nets; NMCP: National malaria control program; P: *Plasmodium*; PMI: US President Malaria Initiative; SPSS: Statistical Package for the Social Sciences; VAR2CSA: Variant Surface Antigen; WHO: World Health Organisation

Declarations

Conflicts of Interest

The authors declare no conflict of interest.

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Author Contribution

Buh ELvis Wung (B.E.W.) wrote the main manuscript text and prepared figures 1-3 and tables 1-2.ESUM EYONG MATHIAS (E.M.E.) carefully reviewed the manuscript, provided constructive criticism, and made necessary corrections to ensure accuracy.ROLAND NDIP NDIP (R.N.N.) reviewed the manuscript.All authors read and approved the final manuscript.

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Data Availability

The data that support the findings of this study were generated from antenatal clinic registration logbooks at Buea Regional Hospital, South West Region of Cameroon. Restrictions apply to the availability of these data due to patient privacy and ethical considerations, and so they are not publicly available. the data are however available from the corresponding author upon reasonable request and with permission from Buea Regional Hospital.

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Figures

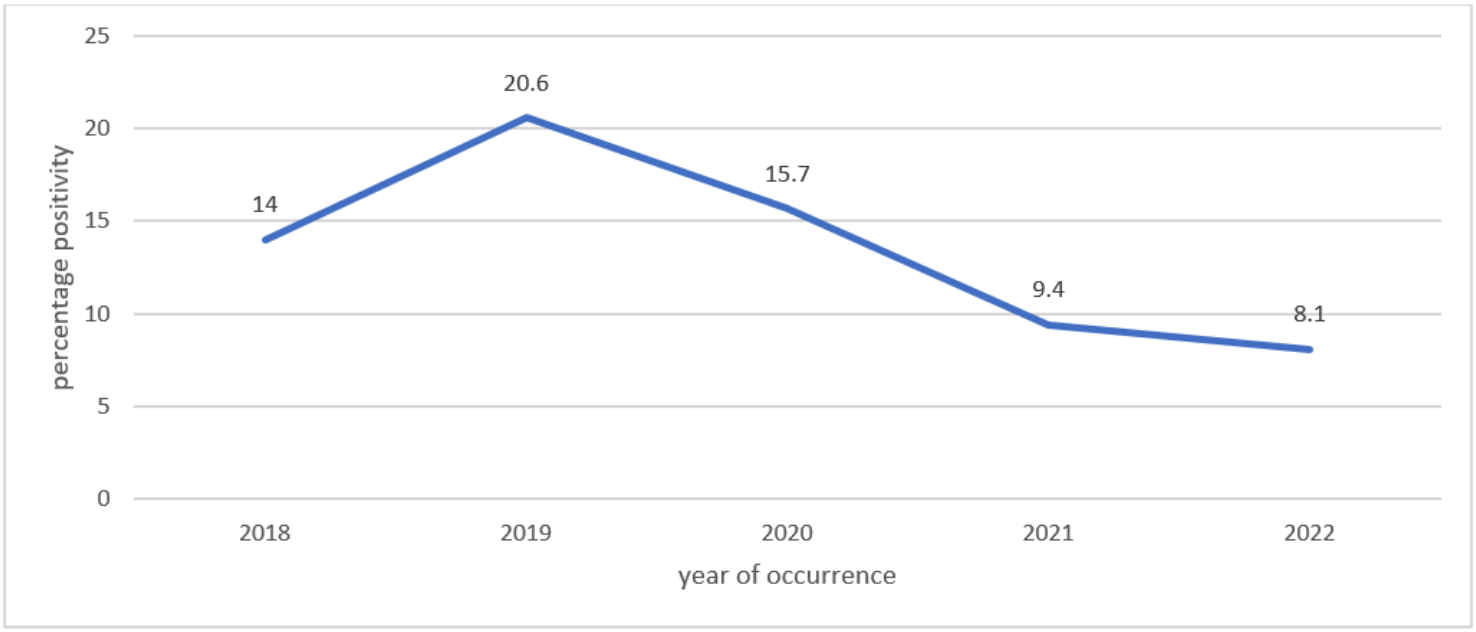


Figure 1

Trends of malaria prevalence in pregnant women who attended ANC at the Buea Regional Hospital from 2018-2022

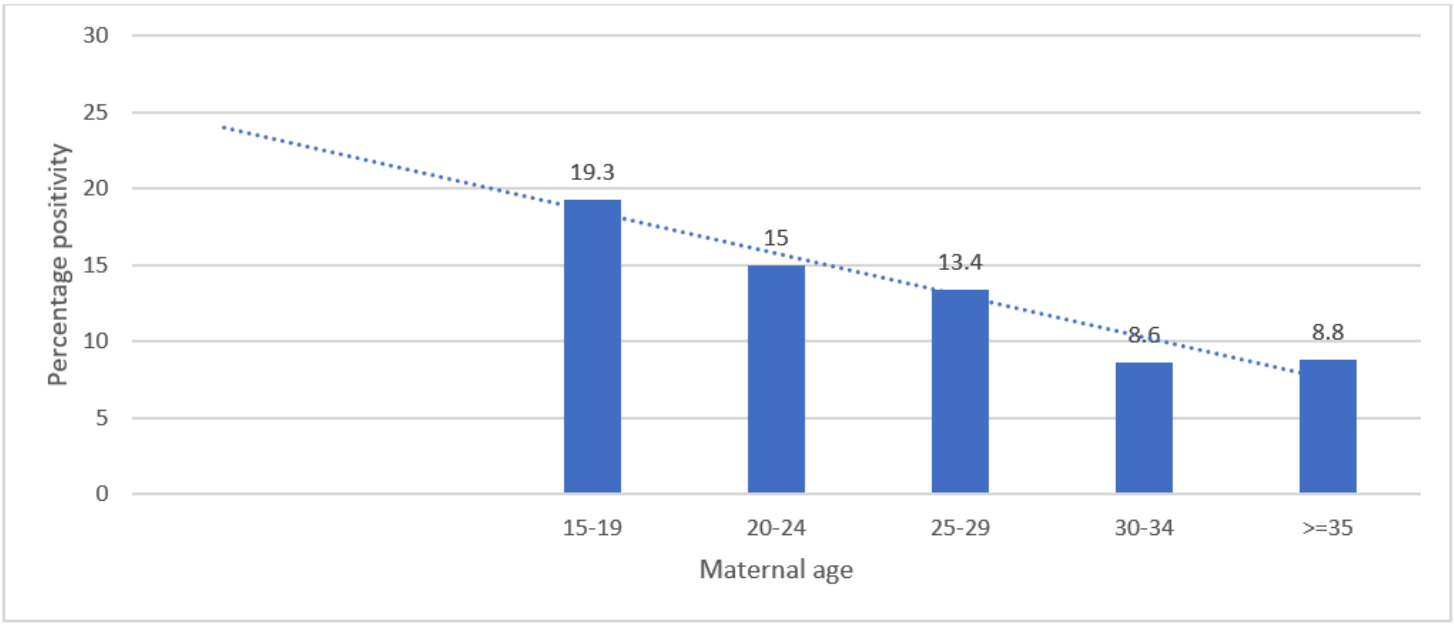


Figure 2

Prevalence of malaria with respect to maternal age.

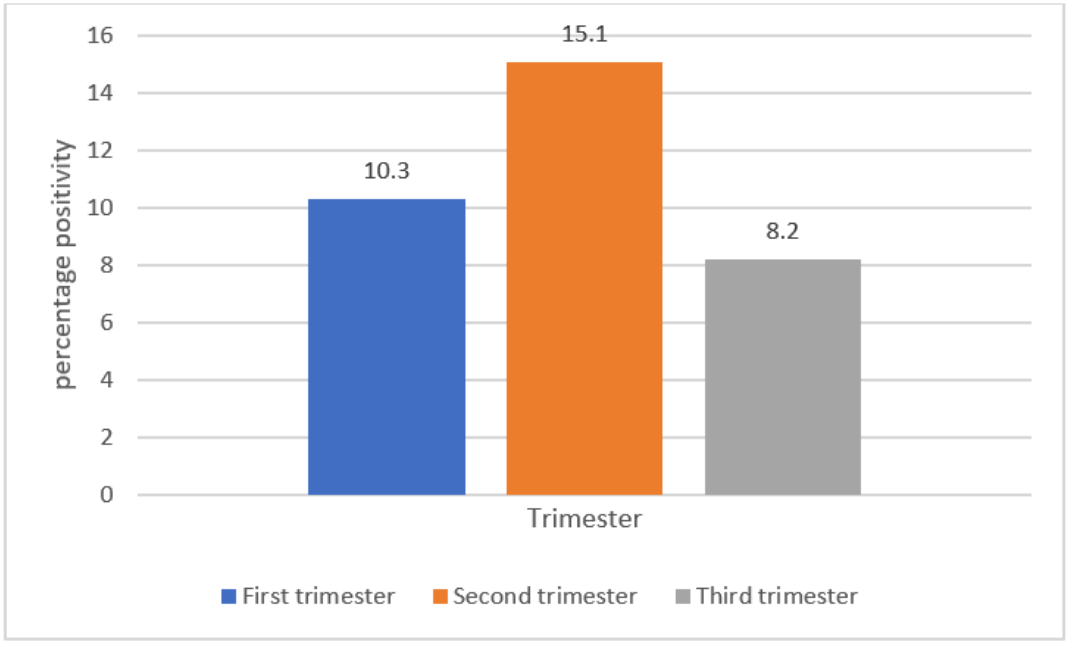


Figure 3

Prevalence of malaria with respect to gestational age.