A Study of Some of the Factors Hampering the Effective Treatment of Malaria in Niger State, North-Central Nigeria

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Abstract: This study was done in 2017, and was funded by **tetfund** and was undertaken to find out some of the prevailing factors hampering the effective treatment of Malaria treatment in Niger state-North central Nigeria, with the view to improving health delivery, as it relates to Malaria. The population for this study comprised of health practitioners i.e., doctors and nurses from nine (9), hospitals spread across the three senatorial zones of Niger state. It also comprised of pharmacists from one major town in each of the three senatorial zones. The total sample of practioners is 595, representing 70% of the population. However 544(64%) of valid questionnaire was returned. while 36(100 %?) of the population of registered pharmacists was taken as sample. The main instrument used to acquire the data was questionnaire. The data were analyzed using chi-square, and simple percentages. The result amongst others shows that; lack of recommendation of proper diagnostic test, lack of qualified laboratory technicians to carry out diagnostic test and lack of proper prophylaxis to treated Malaria patients were limiting factors to the effective treatment of malaria in Niger state, as there was a significant difference in statistical analysis at ($P<0.0.05$) ($p<0.001$), ($p<0.001$) thereby, rejecting the hypothesis that says so. Lack of requisite training of pharmacists operating Pharmaceutical shops was also found to be a limiting factor to the treatment of Malaria in Niger state as there was a significant difference in statistical analysis at ($P<0.05$) ($P<0.001$) thereby, rejecting the hypothesis that stated so. The followings are recommended; that Niger state government should upgrade its diagnostic laboratories to modern standards and always encourage the use of long lasting insecticide treated nets (LLIN) as preventive measure. The state can also join in the global research efforts in the search for vaccine for the control of Malaria.

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Introduction

Malaria has remains a major public health issue in, Nigeria, despite polices and control efforts put in place by government targeted towards it control and eradication, it still remains in the front burner in most public health discourse in Nigeria. Niger state is not an exception of the malaria menace. Morbidity and mortality associated with the disease cannot be quantified. Malaria is one of the most important parasitic diseases in the world. It is caused by the protozoan parasites of genus *Plasmodium.* Four species of *Plasmodium* (*P. falciparum, P. ovale, P. malariae, and P. vivax)* can produce the disease in its various forms. Wate, (2006) stated that of the four, *P. falciparum* is the most wide spread and dangerous and if untreated can lead to fatal cerebral malaria (Wate, 2006). In Arica malaria remains a major public health issue, responsible for the annual death of over one million children below the age of five years (Omolade,2013). Malaria is endemic in some 90 countries in Africa, Asia, central and south America and in the Island of Hispaniola in the Caribbean. It has recently been estimated that 300-500 million cases occur each year. In its socio-economic impact, Malaria is the most important of the transmissible parasitic diseases (WHO, 1995) Despite control efforts geared towards its control and eradication in Nigeria, it still remains the main subject in most public health discourse in Nigeria (Narain, 2008). Malaria accounts for about 60% of outpatient visits and 30% hospital admission in Nigeria (FMOH, 2007). The story is not different in Niger state. Morbidity and mortality associated with the disease cannot be quantified especially the effects it has on children and pregnant mothers. This research intends to find out why the disease is so much prevalent in Niger state. Could it be that the practitioners do not have the requisite training to handle the disease, or lack of knowledge of the current diagnostic methods to diagnose the disease or lack of advice on prophylaxis to treated patient. The researchers intend to find answers to these various assertions.

Hypothesis

1. Lack of proper diagnostic test does not hamper the effective treatment of malaria in Niger state. 2. Lack of qualified laboratory

technicians/scientists/technologists to carry out the proper test does not hamper the effective treatment of malaria in Niger state. 3. Lack of proper advice by practitioners on prophylaxis after treatment, does not hamper the does not hamper the effective treatment of malaria in Niger state.

4. Lack of the requisite training on malaria by pharmacists is not a limiting factor to the effective treatment of Malaria in Niger state.

Justification

Why are so many people in Africa and in particular Nigeria and Niger state impoverished and dying as a result of Malaria? The reason is not farfetched. Africans with Malaria epidemic are not benefitting from proven strategies and treatment, for instance affordable and effective drugs are not available to them, so people continue to use older, medicines that health experts describe as being less effective or the parasites are already resistant to such drugs (WHO,2007). of recent many drugs have been made available for the treatment of Malaria, and also the uncontrolled and widespread spread misuse of such drugs over the years have contributed to the rapid emergence and spread of the parasite resistance, particularly in Africa and this therefore forms a strong basis for the justification of this research.

The Malaria Situation

Malaria has remained a major public health issue in Nigeria, Africa and the entire World (Malaria Control Programme 2007, and Narain, 2008). According to FMOH (2007), Malaria accounts for 60% outpatient's visits and 30% hospital admissions in Nigeria. According to the Roll back Malaria report (2007), t the disease has impacted negatively on the Nigerian economy with about 132 billion naira loss to the disease, and lost in man hours resulting in sickness absence and loss of treatment and that it is a major cause of absenteeism from work and school. Malaria is also confirmed to increase the morbidity and mortality rates as well as health problems of developing countries, Nigeria in particular (Carrington, 2001). Children and pregnant women are the most vulnerable to malaria attacks. Since the introduction of the Roll Back Malaria (RBM) initiative in 1999, malaria control in Nigeria has been transformed but in line with the roadmap to achieve the RBM 2010 targets, much is still desired. Despite efforts geared towards its eradication and control in Nigeria and Niger state in particular, much effort is yet needed because it still remains a serious health issue as it is found in almost all discourse on health issues in Nigeria.

Malaria: An-Overview United States Embassy in Nigeria (2011), gave the following as Malaria fact sheet in Nigeria.

Malaria in Nigeria

- Malaria is a major public health problem in Nigeria where it accounts for more cases and deaths than any other country in the world.
- Malaria is a risk for 97% of Nigerian population. The remaining 3% of the population live in the malaria free highlands.
- There is an estimated 100 million malaria cases with over 300,000 deaths per year in Nigeria. This compares with 215,000 deaths per year in Nigeria from HIV/AIDS.
- Malaria contributes to an estimated 11% of maternal mortality.

Niger State Profile/Malaria Situation

Niger State is located in the North Central geopolitical zone of Nigeria with a land mass of 76,481.1km^2 equivalent to about 9.3% of the total land area in Nigeria. It is considered as the State with the largest land area in Nigeria. The State is bordered to the north by Zamfara State; to the northwest by Kebbi State; to the south by Kogi State; to the southwest by Kwara State; while Kaduna State and the Federal Capital Territory border the state to the northeast and southe as respectively. Furthermore, the State shares a common international boundary with the Republic of Benin at Babanna in Borgu Local Government Area in the North West of the State. It has a population of 3,950,249 consisting of 2,032,725 males and 1,917,52 females based on the 2006 population census. The projected crude population for 2017 is 5,706,245 based on annual growth rate of 2.8%. The state is made up of 25 Local Government Areas, 274 political wards spread across the 3 senatorial districts and 6 health zone. In line with the constitution of the Federal Republic of Nigeria, two levels of government exist in the State; the State Government and the Local Government Councils.

Malaria in Niger State: Vital statistics

Item	Value
Total population	5,706,245 (2017) projected from 2006 Census
Under-5 years (20%)	1,141,249
Under 1 year (4%)	228,250
6-59 months (18%)	1,027,124
6-11 months (2%)	114,125
12-59 months (16%)	912,999
Women of Child Bearing Age (22%)	1,255,374
Pregnant women (5%)	285,312
Growth Rate	3.4%

An estimated 3.2 billion people worldwide are at risk of malaria, a preventable and treatable mosquito-borne illness. In 2015 alone, there were an estimated 214 million new cases of malaria and 438,000 deaths. (WHO, 2015). Nigeria accounted for up to 25% of

global cases and deaths. Malaria is endemic in Niger state, transmission is all year round with its peak in July to November. Pregnant women and children under the age of 5years are more vulnerable, therefore programs endeavoring to reduce the burden of malaria and preventing it among these population group is a key step in reducing malaria-related morbidity and mortality. It account for 65% of all outpatient attendance and 30% of hospital admission. Among young children, malaria has a high rate of childhood mortality (37% - MIS 2015) and, even when not fatal, it can affect nutrition and growth.

It also accounts for 11% of maternal deaths (MIS 2015). Among pregnant women, the disease adversely affects birth outcomes and can lead to spontaneous abortion, pre-term labor, low birth weight and still birth. Although ownership of at least one mosquito net is high across Nigeria (71%), Long Lasting Insecticidal Net (LLIN) ownership in Niger state is 60.8% while only 37.6% sleep under the net (MIS 2015).

Methodology

Table 1: Showing area of Study.

The area of study area comprise the following three (3) government hospitals/health care centers and three (3) pharmaceutical centers in the three senatorial zones in Niger state.

ZONES	A	B	C
GENERAL HOSPITALS	BIDA LAPAI KUTIGI	MINNA SULEJA KUTA	KONTAGORA RIJAU TUNGA MAGAJIYA

The populations of study comprise of doctors and nurses in the aforementioned hospitals/health center see (Table 2), and also pharmacists in the designated pharmaceutical centers in the zones (see Table 3).

Table 2: Showing the distribution of Doctors and Nurses in designated General hospitals across the three Senatorial zones, of Niger State.

S/N	SENATORIAL ZONE	GENERAL HOSPITAL	DOCTORS	NURSES
		a. BIDA	12	95
01	A	b. LAPAI	06	30
		c. KUTIGI	06	30
SUBTOTAL			24(16.32%)	155(20.05%)
		d. MINNA	87	338
02	B	e. SULEJA	17	84
		f. KUTA	03	26
SUBTOTAL			107(72.79%)	448(63.73%)
		g. KONTAGORA	11	64
03	C	h. NASKO	03	17
		I. TUNGA MAGAJIYA	02	19
SUBTOTAL			16(10.88%)	100((14.22%)
GRAND TOTAL	850		147	703

Source:*Department of Planning, Research & Statistics, Niger state,
State, Ministry of Health, Feb.2017

Table 3. Showing the distribution of Registered Pharmacy in the Major towns in each of the Senatorial District.

S/N	ZONE	TOWN	NO. of PHARMACY
1	A	BIDA	09(25.00)
2	B	MINNA	26(72.22.)
3	C	KONTAGORA	01(02.78)

Source* Department of Planning, Research and Statistics, Niger state ministry of Health, Feb 2017

Sample of Study

For the health centers, 70% of the population of study is taken as the sample see (Table 4), while for the Pharmaceutical centers 100% of the population is taken as sample, see (Table 3).

Table 4: Showing Sampling Size based on 70% of total Population of practitioners.

S/N	SENATORIAL ZONE	GENERAL HOSPITAL	DOCTORS	NURSES
		a. BIDA	08	67
01	A	b. LAPAI	04	21
		c. KUTIGI	04	21
SUBTOTAL			16(15.69%)	109(22.11%)
		d. MINNA	61	237
02	B	e. SULEJA	12	59
		f. KUTA	02	18
SUBTOTAL			75(73.53%)	314(63.69%)
		g. KONTAGORA	08	45
03	C	h. NASKO	02	12
		I. TUNGA MAGAJIYA	01	13
SUBTOTAL			11(10.78%)	70(14.20%)
GRAND TOTAL			102	493
GRAND TOTAL			595	

Table 5: Showing Sampled Practitioners allocation by Zone

S/N	ZONE	DOCTORS	NURSES	PERCENTAGE
1	A	16	109	21.01
2	B	75	314	65.38
3	C	11	70	13.60
GRAND TOTAL		102	493	100

Instrument

The main instrument employed in this research, to reach out to the respondents was a questionnaire. The questions were structured to meet the objectives of the research. Two sets of questionnaire were produced. The first to reach out to the health workers, i.e. doctors and nurses in the nine (9), medical facilities, and the second to reach out to pharmacists, in the pharmaceutical centers. The questionnaires were thoroughly scrutinized and validated for the first time, by the directorate of research and planning Niger state ministry of health.

Pilot Testing

The research instrument were pilot tested in nine hospitals spread across the three senatorial zones in Niger State, after some minor corrections it was certified to meet the objectives of the research and were finally validated by the Directorate of research and planning, Niger state ministry of health.

Administration of Instrument

The instruments were effectively administered by research assistants to the various medical facilities upon obtaining ethical approval and clearance from the directorate of medical services and Training, Niger state Ministry of Health, Minna. In the same manner also was the instrument for the Pharmacists was effectively administered to Pharmacy located in one of the major towns in each of the senatorial districts. After attending to the instrument, they were duly retrieved, for sorting and analysis.

Result and Analysis

Table 6: Response of practitioners to critical factors hampering the effective Treatment of Malaria in Zone A (Bida)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	NA	NA
Does your health centre have a standard laboratory for carrying out malaria test?	NA	NA
Does your health centre have qualified laboratory technologists/scientist/technician?	NA	59.23***
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	NA	63.06***
Do you have a copy of the national guideline for treatment of malaria?	0.50ns	1.21ns
Do you have posters of malaria at your hospital for sighting?	2.00ns	6.58*

NA = not available as Chi-Square could not be performed because the variable was constant, ns = not significant ($p>0.05$), * = significant ($p<0.05$), *** = significant ($p<0.001$).

Table 7: Response of Practitioners to critical factors hampering the effective Treatment of Malaria in Zone A (Lapai)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	0.67ns	17.19***
Does your health centre have a standard laboratory for carrying out malaria test?	0.67ns	NA
Does your health centre have qualified laboratory technologists/scientist/technician?	0.67ns	NA
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	0.67ns	13.76***
Do you have a copy of the national guideline for treatment of malaria?	0.67ns	2.33ns
Do you have posters of malaria at your hospital for sighting?	0.67ns	2.33ns

NA = not available as Chi-Square could not be performed because the variable was constant, ns = not significant ($p>0.05$), *** = significant ($p<0.001$).

Table 8: Response of Practitioners to critical Factors hampering the effective Treatment of Malaria in Zone A (Kutigi)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	NA	NA
Does your health centre have a standard laboratory for carrying out malaria test?	NA	17.19***
Does your health centre have qualified laboratory technologists/scientist/technician?	NA	NA
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	NA	NA
Do you have a copy of the national guideline for treatment of malaria?	1.00ns	0.43ns
Do you have posters of malaria at your hospital for sighting?	NA	NA

NA = not available as Chi-Square could not be performed because the variable was constant, ns = not significant ($p>0.05$), *** = significant ($p<0.001$).

Table 9: Response of Practitioners to critical Factors hampering the effective Treatment of Malaria in Zone A (Combined)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	5.56*	105.04***
Does your health centre have a standard laboratory for carrying out malaria test?	10.89***	105.04***
Does your health centre have qualified laboratory technologists/scientist/technician?	10.89***	101.14***
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	10.89***	97.33***
Do you have a copy of the national guideline for treatment of malaria?	2.00ns	0.23ns
Do you have posters of malaria at your hospital for sighting?	2.57ns	8.91**

ns = not significant ($p>0.05$), * = significant ($p<0.05$), ** = significant ($p<0.01$), *** = significant ($p<0.001$)

Table 10: Response of Practitioners to Critical Factors hampering the effective Treatment of Malaria in Zone B (Minna)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	2.47ns	75.94***
Does your health centre have a standard laboratory for carrying out malaria test?	30.04***	137.22***
Does your health centre have qualified laboratory technologists/scientist/technician?	41.33***	137.22***
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	25.00***	130.61***
Do you have a copy of the national guideline for treatment of malaria?	2.47ns	7.37**
Do you have posters of malaria at your hospital for sighting?	4.90*	19.36***

ns = not significant ($p>0.05$), * = significant ($p<0.05$), ** = significant ($p<0.01$), *** = significant ($p<0.001$).

Table 11: Response of Practitioners to critical Factors hampering the effective Treatment of Malaria in Zone B (Suleja)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	8.33**	44.09***
Does your health centre have a standard laboratory for carrying out malaria test?	NA	56.07***
Does your health centre have qualified laboratory technologists/scientist/technician?	NA	47.61***
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	3.00ns	51.27***
Do you have a copy of the national guideline for treatment of malaria?	0.33ns	2.86ns
Do you have posters of malaria at your hospital for sighting?	1.33ns	4.90*

NA = not available as Chi-Square could not be performed because the variable was constant, ns = not significant ($p>0.05$), * = significant ($p<0.05$), ** = significant ($p<0.01$), *** = significant ($p<0.001$).

Table 12: Response of Practitioners to critical Factors hampering the effective Treatment of Malaria in Zone B (Kuta)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	NA	NA
Does your health centre have a standard laboratory for carrying out malaria test?	NA	14.22***
Does your health centre have qualified laboratory technologists/scientist/technician?	NA	NA
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	NA	NA
Do you have a copy of the national guideline for treatment of malaria?	NA	13.24***
Do you have posters of malaria at your hospital for sighting?	NA	13.24***

NA = not available as Chi-Square could not be performed because the variable was constant, *** = significant (p<0.001).

Table 13: Response of Practitioners to critical Factors hampering the effective Treatment of Malaria in Zone B (Combined)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	8.40**	71.66***
Does your health centre have a standard laboratory for carrying out malaria test?	44.59***	183.18***
Does your health centre have qualified laboratory technologists/scientist/technician?	55.25***	202.29***
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	29.35***	198.86***
Do you have a copy of the national guideline for treatment of malaria?	1.92ns	9.53**
Do you have posters of malaria at your hospital for sighting?	0.02ns	31.49***

ns = not significant (p>0.05), ** = significant (p<0.01), *** = significant (p<0.001).

Table 14: Response of Practitioners to critical Factors hampering the effective Treatment of Malaria in Zone C (Kontagora)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	2.00ns	33.80***
Does your health centre have a standard laboratory for carrying out malaria test?	2.00ns	37.36***
Does your health centre have qualified laboratory technologists/scientist/technician?	2.00ns	33.80***
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	4.50*	33.80***
Do you have a copy of the national guideline for treatment of malaria?	2.00ns	8.02**
Do you have posters of malaria at your hospital for sighting?	2.00ns	0.02ns

ns = not significant (p>0.05), * = significant (p<0.05), ** = significant (p<0.01), *** = significant (p<0.001).

Table 15: Response of Practitioners to critical Factors hampering the effective Treatment of Malaria in Zone C (Nasko)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	NA	8.33**
Does your health centre have a standard laboratory for carrying out malaria test?	NA	NA
Does your health centre have qualified laboratory technologists/scientist/technician?	NA	NA
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	NA	NA
Do you have a copy of the national guideline for treatment of malaria?	NA	5.33*
Do you have posters of malaria at your hospital for sighting?	NA	0.00ns

NA = not available as Chi-Square could not be performed because the variable was constant, ns = not significant, * = significant (p<0.05), ** = significant (p<0.01).

Table 16: Response of Practitioners to critical Ffactors hampering the effective Treatment of Malaria in Zone C (Tunga Magajiya)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	NA	NA
Does your health centre have a standard laboratory for carrying out malaria test?	NA	9.31**
Does your health centre have qualified laboratory technologists/scientist/technician?	NA	6.23*
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	NA	6.23*
Do you have a copy of the national guideline for treatment of malaria?	NA	3.77ns
Do you have posters of malaria at your hospital for sighting?	NA	0.69ns

NA = not available as Chi-Square could not be performed because the variable was constant, ns = not significant, * = significant (p<0.05), ** = significant (p<0.01).

Table 17: Response of Practitioners to critical factors hampering the effective Treatment of Malaria in Zone C (Combined)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	0.09ns	54.91***
Does your health centre have a standard laboratory for carrying out malaria test?	4.46*	58.51***
Does your health centre have qualified laboratory technologists/scientist/technician?	4.46*	51.43***
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	7.36**	51.43***
Do you have a copy of the national guideline for treatment of malaria?	4.46*	16.51***
Do you have posters of malaria at your hospital for sighting?	1.80ns	0.32ns

ns = not significant (p>0.05), * = significant (p<0.05), ** = significant (p<0.01), *** = significant (p<0.001).

Table 18: Response of Practitioners to critical Factors hampering the effective Treatment of Malaria in Niger State (Zone A, B and C Combined)

Question	Doctors	Nurses
Does your health centre recommend laboratory test for malaria before treatment?	11.13**	286.73***
Does your health centre have a standard laboratory for carrying out malaria test?	59.52***	368.28***
Does your health centre have qualified laboratory technologists/scientist/technician?	69.57***	356.54***
Does your health centre advice treated malaria patients on how to prevent future reoccurrence?	47.35***	345.95***
Do you have a copy of the national guideline for treatment of malaria?	0.10ns	17.56***
Do you have posters of malaria at your hospital for sighting?	0.26ns	41.85***

ns = not significant (p>0.05), ** = significant (p<0.01), *** = significant (p<0.001).

Table 19: Response of Pharmacists to Factors hampering the effective Treatment of Malaria in the Senatorial Zones in Niger State

Question	Bida	Minna	Kontagora	Total
Have you any training on malaria?	5.44*	12.46*	NA	18.78***
Do you advice customers to run test before drug prescription?	1.00ns	12.46*	NA	13.44***
Do your customers oblige to carry such test?	1.00ns	0.15ns	NA	0.11ns
Do you often give drugs even when such test is negative?	1.00ns	0.62ns	NA	1.78ns
Do you give prophylaxis even after treatment?	0.11ns	0.00ns	NA	0.15ns

NA = not available as Chi-Square could not be performed because the variable was constant, ns = not significant, * = significant (p<0.05), * = significant (p<0.001).**

Table 20: Responses of Practitioners to Recommended current Drugs for the Treatment of Malaria in Hospitals of the three Senatorial Zones in Niger State.

S/N	Z/H	RECOMMENDED DRUGS				
		ACT	ARTESUNATE	ARTHEMETER	COARTEM	ORTHERS
1	A	54(42.52)	43(33.86)	02(1.57)	19(14.96)	09(7.09)
2	B	218(64.88)	33(9.82)	36(10.71)	05(1.49)	44(13.10)
3	C	64(79.01)	05(6.17)	10(12.35)	-	02(2.47)
G.Tot		336(61.76)	81(14.89)	48(8.82)	24(4.42)	55(10.11)

Key: **Z/H=Zone/Hospital ACT=Artemisinin Based Combination Therapy**

Table 20: shows that in Niger state, (61.76 %)0f practitioners sampled recommend ACT, (14.89%), Arthemeter, ((4.42%), Coartem, and (10.11%), other drugs for the treatment of malaria cases. In set are also the data for drugs recommended by zone.

Table 21: Responses of Pharmacists to the Drugs/Dosage they recommend for Malaria Treatment according to the National guideline for the Treatment of Malaria, in Niger state

S/N	ZONE	DRUGS		DOSAGE	
		ACT	OTHERS	BODY WEIGHT/AGE	OTHERS
01	A	08	01	02	07
02	B	23	03	15	11
03	C	01	-	01	-
TOTAL		32(88.89)	04(11.11)	18(50.00)	18(50.00)

Table 21, shows that 88.89% of Pharmacists recommend ACT drug for the treatment of malaria, while 11.11% do not. It also shows that 50% of respondents recommend dosage based on body weight and age, while 50% do not use other considerations

Discussion

This survey was basically undertaken with the aim to improving the malaria disease treatment and control in particular, and the general health care delivery system in Niger state North-Central Nigeria and the country as a whole. To say that Malaria is not a public health issue is an understatement (United State Embassy, 2011), as malaria is mentioned in almost every public health discourse in Nigeria. Despite considerable research and control efforts devoted to Malaria since the turn of the last century, Malaria remains the most prevalent, and from the public stand point, the most devastating parasitic disease in the tropics and subtropics (Ajayi, 1992, and Goshie, 2008). In Nigeria, Malaria is responsible for approximately 60% outpatient visits, and 30% of admissions in hospitals and other health centers. It is also believed to contribute up to 11% maternal mortality, 25% of infant mortality, and 30% of under 5 of age mortality (MIS, 2015). This is an alarming statistic that could undermine health of the citizenry. The research work focus mainly on factors that are perceived to hinder the effective treatment of Malaria in Niger State North-Central Nigeria, with the view to improving health delivery in Niger State. The causes of Malaria is no more an issue, buts its control and treatment.

The population for this survey comprises of health practioners i.e. doctors and nurses in government hospitals/health centers, and registered pharmacists spread across towns in the three senatorial zones of Niger state. In this regard the total population of practioners i.e. doctors and nurses in the three hospitals in each of the three senatorial districts of Niger state is 850 (table 2). The total population of registered Pharmacist, in one major town, in each senatorial zone A, B, C is 3(Table, 3). About 70% of practitioners i.e. doctors and nurses was taken as sample, and this translates to595 (Table 4). However, only 544 of valid forms were returned, representing 64%, of practitioners, while 100%? of registered pharmacist in one major town in each of the three senatorial districts is taken as the sample for the study translating to 36 (Table 3). Table 5 shows the allocation of practioners by zones and shows the following; zone A has (21.01%), B, (65.38%), and C (13.60%). Hypothesis was formulated to guide this research, and chi-square, and simple percentages were used to analyze the data obtained. Tables 6, 7,,8 are the results of analysis of the data on responses of respondents on factors militating against the effective treatment of malaria in zone A. It shows the analysis of responses of the practioners to factors that could hamper effective treatment of malaria in hospitals in zone A. Table 9, is the summary of the analysis of the hospitals in zone A, and shows that lack of proper diagnostic test, lack of qualified laboratory technicians to carry out Malaria test, and proper advice on prophylaxis were a limiting factor to the effective treatment of Malaria in hospitals in zone A, as there was a significant difference in statistical analysis for both doctors and nurses at ($p<0.05$), ($p>0.0.01$) (Table 9), thereby, rejecting the hypothesis that was stated. Therefore, there is the need for hospitals in this zone to pay special attention to these areas to better the health delivery. Table 10, shows the responses of practitioners to critical questions that could hamper the effective treatment of malaria in hospitals in zone B (Minna, Suleja and Kuta). The analysis for the responses of practioners from Minna general hospital, shows that for doctors and nurses, lack of recommending the laboratory test before drug prescription, lack of technicians to carry out the test, and prophylaxis advice given after treatment were a limiting factor to effective treatment as there was a significant difference in statistical analysis at ($p<0.05$), ($p<0.01$), and ($P<0.001$, and therefore rejecting the hypothesis that was stated (Table 10)), which means that the relevant authorities will have to take note and improve on these areas. However, copies of national guide line for treatment of Malaria have to be made available, as well as posters of malaria, at hf. sight (Health Facility). For general hospital kuta, standard laboratory for carrying out Malaria diagnostic test was an issue, as there was significant difference ($p<0.001$), particularly for nurses, thereby, rejecting the hypothesis that was stated at that level of significance (Table 12). Table 13, is the summary of the analysis for hospitals in zone B, and it shows that, lack of recommending laboratory test for malaria before treatment, lack of qualified laboratory technologist/technicians for carrying out Malaria diagnostic test, and lack of proper advice to treated Malaria patients on how to prevent reoccurrence, were limiting factors to the effective treatment of Malaria in hospitals in zone B, as there was a significant difference in statistical analysis at ($p<0.01$), ($P<0.001$) level of significance thereby, rejecting the hypothesis that was stated and a such these are areas the government will have to pay attention to in order to improve upon the health delivery as it relates to malaria. For practitioners from zone C, data obtained (Table 14) were analyzed and the results of the analysis are shown in (Tables 14,15,16). The summary

of analysis for zone C, is shown in (Tables 17), and it shows that, lack of recommending laboratory test for malaria patients before treatment, lack of qualified laboratory technologists/technicians, and lack of proper advice of treated Malaria patients on how to prevent future reoccurrence were limiting factors to the effective treatment, particularly for the nurses as there was a significant difference in statistical analysis at ($p<0.05$), ($p<0.01$), ($p<0.001$) level of significance, thereby, rejecting the stated hypothesis.

Having established the fact that Malaria is an issue particularly in poor Africa Countries, including Nigeria, greater emphasis should be place on its prevention. Government of affected countries must team up with current efforts of international Agency such as W.H.O. in development of vaccine for that purpose. For instance, the W.H.O (2007) progress report gave a review of Malaria vaccine development and has identified more than 80 Vaccines at clinical and developmental stages. This is a welcome development. The result of analysis of the responses of practitioners to limiting factors to effective treatment of malaria in the state as a whole is shown in Table 18, and it reveals that lack of standard laboratory, qualified laboratory technologists/scientist and proper advice of treated patients on prophylaxis after treatment were a limiting factors to the effective treatment of Malaria in Niger states, as there was a statistically significant differenceat ($p<0.01$), ($P<0.001$), and ($p<0.001$) level of significance, thereby, rejecting the stated hypothesis, (Table 18). Prophylaxis is effective for Malaria treatment, and should be encouraged after treatment, and as a prophylaxis the use of insecticide Treated nets should be encouraged (USAID, 2012), stated that 46.9 million insecticide treated nets (ITNS), have been purchased and distributed in Nigeria, therefore Niger state should intensify and encourage its use as a cost effective and preventive option. Table 19, shows the analysis of the responses of Pharmacists to limiting factors to the effective treatment of Malaria in Niger state and it shows that training on malaria was an impediment as there was a significant difference in statistical analysis for Bida and Minna ($p<0.05$), ($p<0.001$) thereby, rejecting the stated hypothesis. Infact, the authorities have to be encouraged to register more qualified Pharmaceutical shops in kontagora, a major cosmopolitan town in zone C that from available record has only one registered pharmacy. This is so because they play a major role in health delivery. Table 20, shows that (61.76%) of the respondents recommend ACT, as the drug of choice for the treatment of Malaria in Niger state, while 14.89%, 8.82%, 4.42%, and 10.11%, recommend artesunate, arthemeter, coartem, and other drugs respectively. This is a welcome development, as ACT is the best drugs for now for the treatment of malaria i.e. the therapies that combine artemisinin with some other antimalarial drugs are the preferred treatment for malaria and are both effective and well tolerated by patients (Omolade, 2013). Health care providers in Niger state should promote the use of ACT. Packaged socially marketed (ACT), treatments for children under five were developed and distributed in 18 states in Nigeria (USAID, 2012). Similarly, Table 20 shows that, 88.89% of Pharmacists recommend ACT, while 11.11% recommend other drugs, and that 50% recommend the drugs based on age/body, while 50%, recommend the drugs based on other considerations.

Table 21, shows what informs the choice of drugs for the treatment of malaria in Niger state, and it shows that (47.06%), base their choice on clinical diagnosis, (37.68%) on Parasitological, and (15.26%), on both clinical and parasitological diagnosis, finally (Table 29), shows the choice of diagnostic test by practitioners in hospitals in Niger state, it shows that (51.84%), recommend mp test, (38.42%) RDT, while (9.74%), on other kinds of test, this is a far outcry from what test that is obtainable now, and much needs to be done in this regard (MIS, 2015), recommends that the most effective diagnostic of malaria is (RDT), which is the rapid diagnostic test. It is qualitative test to detect histidine-rich protein 11 antigen of Plasmodium falciparum, the primary cause of malaria in Nigeria.

Recommendations:

- Niger state should as a matter of urgency and as a deliberate policy be engaged in the training and retraining of her health personnel to abreast them with current trends in global Malaria treatment and control strategies.
- It should as matter of urgency upgrade its laboratory health facilities to modern standards, to be able to carry out qualitative Malaria diagnosis.
- RDT (Rapid Diagnostic Test) is the currently recommended qualitative test for malaria. The kit should amply be supplied to the various health centers across the state, and also training on how to use the kits.
- The use of long lasting insecticide nets (LLIN), should be encouraged as prophylaxis.

Niger state government should be commended in this regard because according to (MIS,2015) in 2015 61.2% households owned insecticide treated mosquito nets (ITN),60.8% owned long lasting insecticide nets (LLIN). This is commendable and also a cost effective control option.

- The government should also use the media, radio and Television to disseminate, and educate the populace on malaria and preventive control measures.
- The government should also design a program/training Owners of Pharmacies on the current global trends of Malaria control.

- More pharmacies should be registered in Kontagora, as from the available records, there is only one in a major town of zone C.
- Niger state should think seriously to join in the global quest in the elimination of malaria, by joining the global control efforts in the development of vaccine for control/elimination of Malaria.
- Doctors and all other health practitioners must insist on laboratory investigation before prescription to avoid wrong diagnosis that could further compound the patient pains.

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