KNOWLEDGE, ATTITUDE AND MANAGEMENT PRACTICES RELATING TO MALARIA AMONG PRIMARY HEALTHCARE WORKERS IN IDO LOCAL GOVERNMENT AREA, OYO STATE, NIGERIA

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DEDICATION

This work is dedicated to God the Almighty, the Alpha and Omega, the beginning and the end, for his sustenance throughout the period of the MPH programme. I am grateful for your love.

ABSTRACT

Malaria is a serious public health problem in Nigeria and Primary Health Care (PHC) workers have important roles to play in its control. The new anti-malaria policy expects healthcare providers at PHC level to treat uncomplicated malaria with Artemisinin Combination Therapy (ACT). Understanding gaps in knowledge, attitude and management practices relating to uncomplicated malaria among PHC workers is imperative in designing effective intervention strategies for improved management of the disease. This study was designed to investigate knowledge, attitude and management practices of PHC workers relating to malaria in Ido Local Government Area of Oyo State, Nigeria.

A cross-sectional survey was adopted. All available PHC workers (112) who consented to participate in the study were interviewed using a validated semi-structured interviewer administered questionnaire. The questionnaire was used to obtain data on the workers' demographic characteristics, knowledge, attitude and malaria management practices. The questionnaire consisted of a 30-point knowledge scale which was graded as 0-10 (poor), 11-20(fair) and 21-30 (good). Furthermore, the questionnaire assessed workers' attitude and this was graded as negative (0 -11) or positive (>11-24). Data were analysed using descriptive statistics, t-test and ANOVA; $p \leq 0.05$.

Respondents' age was 39.5±8.5 years, 80.4% were females, 92.0% married, 81.3% Christians and majority (63.4%) had Diploma in Health Technology. A larger percentage of respondents were community health extension workers (57.1%) and nurses (12.5%). Over half (54.5%) were unaware of the national treatment guideline for Malaria. Also, 52.7% had never attended a training session on the new malaria treatment guideline in the last five years. The knowledge score of respondents was 17.3±3.2 and most (82.2%) had fair knowledge. The attitudinal score was 16.3±4.1 and most (89.3%) had a positive attitude towards the use of ACTs in the treatment of malaria. Almost all (98.2%) agreed that ACTs was the most effective medicines for treating malaria. Only 5.4% asked about previous use of medications from clients preceeding the visit for treatment. About half (47.5%) diagnosed malaria by asking clients questions about fever, 45.5% by taking temperature and 14.2% by testing malaria parasite. Most (95.5%) prescribed ACT as a

first line of treatment drug in treating malaria with Artemether-Lumefantrine (AL) being the type mostly prescribed (88.7%). However, inappropriate treatment practices included prescription of Sulphadoxine Pyrimethamine (13.4%) and Chloroquine (2.7%) to clients. About half 49.9% and 46.9% respondents correctly prescribed age-appropriate dosages of AL to under-fives with uncomplicated malaria in the two weight categories (5-14kg and 15-25kg respectively). Differences in mean knowledge scores were not significant in all the categories of respondents' demographics.

Majority of the health workers in Ido Local Government Area had a positive attitude towards the use of Artemisinin Combination Therapy in managing uncomplicated malaria. However, respondents' knowledge was fair and management practices was poor. There is a need for this group of health workers to undergo periodic in-service training.

Keywords: Uncomplicated Malaria, Malaria Treatment Guideline, Artemisinin Combination Therapy

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CERTIFICATION

I hereby certify that this study was carried out by Olarinmoye, Adeola O. in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria.

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ABBREVIATIONS

ACT	Artemisinin Based Combination Therapy
AMDs	Anti-malarial Drugs
ANC	Antinatal Clinic
ANOVA	Analysis of Variance
AS	Artesunate
ATM	Artemether
AQ	Amodiaquine
BCC	Behavioural Change Communication
CHEWs	Community Health Extention Workers
CHO	Community Health Officer
CORPs	Community Oriented Resource Persons
CQ	Chloroquine
DHA	Dihydroartemisinin
FMOH	Federal Ministry of Health
IPT	Intermittent Preventive Treatment
ITN	Insecticide Treated Bednet
LF	Lumefantrine
LGA	Local Government Area
LLTN	Long-Lasting insecticidal Teated Net
NPC	National Population Commission
NPHCDA	National Primary Healthcare Development Agency
PHC	Primary Health Care
PMVs	Patent Medicine Vendors
PRECEDE	Predisposing, Reinforcing and Enabling Constraints in Ecosystem Diagnosis and Evaluation
RDT	Rapid Diagnosis Test

SP	Sulfadoxine Pyrimethamine
SPSS	Statistical Package for Social Science
U5	Underfive
UCH	University College Hospital
VHWs	Village Health Workers
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Malaria infection has been a major worldwide cause of death for centuries and it is a devastating vector-borne disease that primarily occurs in tropical countries of the world. Malaria causes over 207 million clinical cases and approximately 627,000 deaths worldwide every year representing an enormous global, social and economic burden (World Health Organisation (WHO), 2013). Over two billion people are said to be at risk of malaria. An estimation of 1.2 million deaths have resulted from the disease and an estimation of 515 million clinical episodes of infection due to *Plasmodium falciparum* have been documented (Lopez, 2001; Snow, 2005). *Plasmodium falciparum* infection annually causes an estimated 500 million infections with 1.5-2.7 million deaths, more than 90% in children under 5 years of age in Africa (Good, 2001; Sach and Malaney, 2002). Its social and economic burden is a major obstacle to human development in many of the world's poorest countries. In heavily affected countries, malaria alone accounts for as much as 40% of public health expenditure, 30 – 50% of hospital admissions and up to 60% of out-patient visits (WHO, 2008). In Africa, under-five children die from malaria at an astonishing rate around 3,000 a day, or one every 30 seconds (WHO, 2008) and about 90% of all malaria deaths is said to occur in sub-Saharan Africa (WHO, 2013).

However, Nigeria is known for a high prevalence of malaria (Federal Ministry of Health (FMOH), 1992; Onwujekwe, Chima and Okonkwo, 2005) and it is a leading cause of morbidity and mortality. Available records show that at least 50 percent of the population of Nigerians suffer from at least one episode of malaria each year and malaria accounts for over 45 percent of all out-patient visits (FMOH, 2001; Ejezie, Ezednachi, usanga,Gemade, Ikpatt, Alaribe, 1991). Also, about 2.4 million was reported as the notified cases of malaria prevalence in 2000 (FMOH, 2001) and the most recent overall childhood mortality rate in under-fives documented for Nigeria in 2009 is 138 per 1000 births (UNICEF, 2009). The Federal Ministry of Health also claimed that 30% of childhood

mortality is due to malaria (FMOH, 2000). Every year the nation loses over 132 billion Naira (Over US$1 billion) from cost of malaria treatment and absenteeism from work, schools and farms (National Antimalarial Treatment Policy (NATP), 2005). The disease accounts for 25 percent of infant mortality and 30 percent of childhood mortality in Nigeria (FMOH, 2005). In Nigeria, malaria impacts on development of the country as it causes death, reduces human work capacity or productivity in all sectors. Malaria reduces Nigeria's GNP by 1.0% annually (about $348 Million), and 25.0% of household income is expended on malaria control and treatment (WHO, 2011). Therefore, it imposes great burden on the country in terms of pains and trauma suffered by its victims as well as loss in outputs and cost of treatments (Onwujekwe, Hanson and Fox-Rushby, 2004). Malaria is responsible for about 66% of all clinic visits in Nigeria (WHO, 2011). Health workers are sometimes forced to work overtime, and they can be on duty for over 12 hours a day. Still, women and children have to wait for hours before receiving medical consultation. There is a lot of activity and momentum to combat malaria in Nigeria, but deadly gaps still exist. More needs to be done to prevent children from being infected and ensure access to quality malaria treatment. The National Primary Healthcare Development Agency (NPHCDA), the agency responsible for the regulation and establishment of primary healthcare centers is also haplessly helpless in the discharge of its saddled responsibilities of ensuring that our primary healthcare centers cater for our primary health needs.

A wide range of childhood illnesses are accompanied by fever, including malaria. Child mortality due to malaria has been attributed to poor health service delivery system and ignorance. An assessment of a mother's ability to recognize malaria in children under-five was carried out among the Bwatiye, a poorly-served minority ethnic group in North-Eastern Nigeria (Akogun and John, 2005). A number of elements are critical to management of the child with fever: The caregiver must recognize the illness as potential malaria and provide the appropriate dose of an antimalarial drug, together with supportive care. This requires attention to care practices, communication, and drug dosing characteristics. An efficacious antimalarial drug must be available either in the home or

near the home when the child becomes ill. This requires attention to national policy formulation, monitoring of drug resistance, and drug procurement and distribution.

The National survey conducted by the FMOH in 2000 showed that home management of malaria in under-five children was very common in communities with or without health care facilities. The survey further reported that home management topped the list of the first actions to be taken during illness in under-fives with caregivers currently using a variety of drugs for the management of childhood malaria. Many of the drugs used were found to be inappropriate and are often used inappropriately and inadequately. Patent Medicine Vendors have also been revealed to be a major source of malaria treatment in certain regions of the country (Oladepo, Kabiru, Adeoye, Oshiname, Ofi, Oladepo, Ogunbemi, Lawal, Brieger, Bloom, and Peters 2007).

Primary Health Care (PHC) centres are manned by health workers who are expected to have been trained to manage malaria, but they can only manage the mild and uncomplicated forms of the disease as they lack the equipment and the skills in managing severe and complicated malaria. In many situations, practices that could best be described as misuse of drugs have become routine, and in some cases, institutionalized and promoted (Bloland and Breman, 2003).

The need to be aware of the drug misuse problem vis-a-vis chloroquine use and to move from monotherapy to more effective combination therapy was recognized when Chloroquine and Sulfadoxine Pyramethamine (SP) were no longer adequate for national firstline use following resistance from *P. falciparum* (Abdullahi, Muhammed, Manga, Tunau, 2003; Oguche, Molta, Pam, Omalu, Afolabi, Odujoko 2004; Pitmag, Thacher, Madaki, Egah, Fischer, 2005). As a result, further efficacy trials were conducted in 2004 by the FMOH on two suitable Artemisinin based Combination Therapy (ACT) and both combination therapy was recognised as good (FMOH, 2005).

1.2 Statement of Problem

Malaria is one of the major causes of morbidity and mortality in Nigeria and it is endemic throughout the country with more than 90% of the total population at risk of stable endemic malaria (FMOH, 2001; NetMark, 2001). The disease is the most common cause of outpatient attendance across all age groups (FMOH, 2001). Every year Nigeria loses over 132 billion Naira (Over US$1 billion) from cost of malaria treatment and absenteeism from work, schools and farms (NATP, 2005). The NATP (2005) in Nigeria revealed that over 100 million people are at risk of malaria every year in Nigeria and indeed it is estimated that about 50% of the adult population in Nigeria experience at least one episode yearly while the under five children have up to 2-4 attacks of malaria annually.

The incidence of malaria in Oyo State is currently reported to range between 50 – 100 cases per 1000 individuals (WHO, 2011). Information from the records unit of the Oyo State Ministry of Health in year 2012 revealed that the general prevalence of malaria in Oyo State is 6.5%. Furthermore, malaria prevalence in underfives and pregnant women are 3.3% and 0.1% respectively. However, studies relating to the morbidity and mortality of malaria in Ido LGA appear sparse.

Health workers at the PHC level are expected to recognise the general danger signs of malaria and it is essential that they themselves are knowledgeable about the basic facts about the disease. However, studies conducted among selected PHC workers in some parts of the country revealed that this is not so; due to the fact that their skills in the diagnosis and case management of patients with malaria fever did not improve even with increasing years of experience (Fawole and Onadeko, 2001). Fawole and Onadeko (2001) in their study reported a fairly adequate knowledge - 75.4% of Malaria fever among PHC workers in Ibadan South-East LGA. Details on knowledge with respect to cadres of the PHC workers and relationship with years of experience was however not reported in the study. The study also only assessed 61 health workers in five primary health care facilities at the given LGA. The knowledge and attitude of PHC workers regarding malaria fever and infestion and prescription of ACTs in the management of uncomplicated malaria in

Nigeria is not fully known. Such information is important to advance best practice in PHC centres across the nation.

According to the FMOH (2005), a health worker at the PHC level is expected to give ACT for uncomplicated cases. The new anti-malaria treatment policy states that the health worker should be able to give ACT for uncomplicated cases. It also states that the health worker is able to give Artesunate suppositories for pre-referral treatment (FMOH, 2005). Unfortunately, there is usually a gap between what is stated in polices and what is actually practised. Umar and Abdulkareem (2008) in a study highlighted this as a major finding in a survey among PHC workers in Sokoto, North of Nigeria. In the study, only 36.4% of the participants were found to have adequate and effective treatment practices of malaria infection. However, this is yet to be fully documented as there is a dearth of information regarding management practices of PHC on malaria in most other parts of Nigeria.

1.3 Justification of the study

The new anti-malaria policy recommends appropriate treatment of uncomplicated malaria using ACTs (National Anti-malarial Treatment Guideline, 2005). The Primary Health Care institutions are the first point of contact of patients with the health care system (Fawole, Onadeko and Oyejide, 2001). However, since the shift to ACT treatment, there has been little focus on the extent to which PHC workers are adhering to the malaria treatment guidelines. This study will ascertain whether PHC staffs are still using the old but non-recommended medicines especially Chloroquine (CQ) or have shifted their practices using the newly recommended Artemisinin Combination Therapy (ACTs). Therefore, this study will add value to knowledge by providing information about the type of Anti-malarial Drugs (AMDs) offered to children Under-five (U5) in line with the current policy.

Second, the quality of malaria treatment practices by health workers in the public sector has not been well documented. The study is expected to generate information in this direction and the facilitators and barriers to practice. This is important given the World

Health Organisation's (WHO) interest in revitalizing PHC since malaria treatment at PHC level has been fraud with difficulties like funding, non availability of drugs at the PHC at the appropriate time, unavailability of quality health care (WHO, 2011).

This study will also reveal any gap in knowledge, attitude and management practices regarding malaria and the findings will serve as a database for proffering strategic interventions such as regular educational programmes and workshops targeted at the PHC workers in Oyo State and Nigeria at large.

1.4 Research Questions

1. What is the level of knowledge of PHC workers on malaria and appropriate treatment of malaria in PHC facilities in Ido LGA of Oyo State, South-West, Nigeria?
2. What is the attitude of Ido LGA PHC workers towards the use of ACT in the management of malaria.
3. What is the current Ido LGA PHC workers' malaria management practices for underfives.
4. Does PHC workers' years of experience and cadre influence their malaria management practices and prescription of ACTs in under-fives in Ido LGA.

1.5 Objectives of the study

Broad Objective

The broad objective of the study was to investigate the level of knowledge, attitude and management practices relating to malaria among PHC workers in Ido Local Government Area (LGA) of Oyo State, South-West, Nigeria.

Specific Objectives

The specific objectives of this study were to:

1. Assess the knowledge of Ido LGA PHC workers on malaria and appropriate treatment.
2. Assess the PHC workers' attitude towards the use of ACT in the management of malaria in Ido LGA.

3. Assess the PHC workers' malaria management practices in Ido LGA.
4. Assess the factors that influence PHC workers in the management of malaria in Ido LGA.

1.6 Hypothesis

The hypotheses formulated for testing were as follow:

Ho1: There would be no significant association between the respondents' years of experience and prescription of ACTs in under-fives in the management of malaria in Ido LGA.

Ho2: There would be no significant association between respondents' cadre and prescription of ACT in under-fives in the management of malaria in Ido LGA.

CHAPTER TWO

LITERATURE REVIEW

2.1 Burden and Profile of Malaria in Nigeria

Malaria is one of the most important and devastating infectious disease in tropical countries. It is a debilitating febrile and life threatening illness caused by a parasite called Plasmodium. Its route of transmission still remains as bites from infected female anopheles mosquitoes. Environmental factors and behavioral patterns of vectors and human populations combine to provide favorable conditions for malaria transmission (*Boutin et al., 2005*). Its social and economic burden is a major obstacle to human development in many of the world's poorest countries. In heavily affected countries, malaria alone accounts for as much as 40% of public health expenditure, 30 – 50% of hospital admissions and up to 60% of out-patient visits (WHO, 2008). Ninety percent of malaria related deaths occur in Sub-Saharan Africa and nearly all serious illnesses and deaths from malaria are caused by *P. falciparum* (Rosenthal, 2008). Malaria remains a major cause of morbidity and mortality in tropical and subtropical regions of the world, despite decades of malaria control efforts. There are approximately 300–500 million clinical cases and about one million deaths due to malaria globally, and Africa south of the Sahara accounts for over 90% of the disease burden (Snow, Guerra, Abdisalan, Myint and Hay, 2005).

Worldwide, more than 300 million cases of malaria occur every year. This disease remains a significant direct and indirect financial burden for both the affected family and for society due to costs of prevention, care, time costs, days of work lost, and premature deaths. Although approximately 90% of the world's malaria cases are reported from tropical Africa, malaria still claims more than 100,000 lives outside of Africa each year (WHO, 2002). A total of 1.06 million new cases of malaria were reported in the Americas in 1997, and 393,000 (37%) of these cases were from Brazil (PAHO, 2003). At present, about 100 countries or territories are considered malarious, almost half of which are in

Africa, south of the Sahara. Although this number is considered less than it was in the mid-1950s, more than 2,400 million of the world's population are still at risk. An increasing number of malaria epidermics have been recently documented throughout the world, particularly in Africa (Carrington, 2001). Approximately one million young children in Africa die from malaria every year (WHO, 2008). Partly as a result of the burden of malaria, mortality rates for children aged less than 5 years have generally remained stagnant over the past decade in Africa. Ninety percent of the estimated 300–500 million cases of malaria worldwide occur each year in sub-Saharan Africa.

In Nigeria, incidence of malaria varies by weather, which affects the ability of the main carrier of malaria parasites, anopheline mosquitoes, to survive or otherwise. Tropical areas including Nigeria have the best combination of adequate rainfall, temperature and humidity allowing for breeding and survival of anopheline mosquitoes. The burden of malaria varies across different regions of the world and even within a country. This is driven by the variation in parasite vector–human transmission dynamics that favour or limit the transmission of malaria infection and the associated risk of disease and death. Of the four species of *Plasmodium* that infect humans - *P. falciparum*, *P. vivax*, *P. malariae* and *P. oval*. *Plasmodium falciparum* is the most virulent and causes nearly all illnesses and deaths attributable to the disease; it is most prevalent in Africa, south of the Sahara, where Nigeria has the largest population (Rosenthal, 2008).

Malaria is endemic in tropical Africa, with an estimated 90% of the total malaria incidence and deaths occuring there. Malaria constitutes a major burden on endemic communities in Africa. Malaria attack results in morbidity, disability and mortality (Hussain, Echoja, and Iwarere, 2009). Therefore, the two major costs of malaria disease are: morbidity and mortality costs. Malaria morbidity affects household welfare as a result of an increase in the cost of treatment and prevention of the disease and decline in productivity through lost time. In the case of mortality, losses to households include lost of future incomes and cumulative investment on the dead due to malaria (Alaba and Alaba, 2006). Beside mortality "malaria causes morbidity through fever, weakness,

malnutrition, anaemia, spleen disorders and vulnerability to other diseases. Malicious patients also experience asymptomatic parasitemia, acute febrile, chronic debilitation, and pregnancy complications" (Bremen, 2001).

There are over 140 million people at risk of malaria every year in Nigeria and it is estimated that about 50% of the adult population in Nigeria experience at least one episode yearly while the under five children have up to 2 - 4 attacks of malaria annually. The yearly economic loss due to malaria in Nigeria has been put at 132 Billion Naira due to costs of treatment ad transport to source of treatment, loss of man-hours, absenteeism from schools and other indirect costs. Thus malaria imposes a heavy cost not only on a country's income, but also on its rate of economic growth and invariably on its level of economic development. (Federal Ministry of Health, 2011).

At the African Summit on Roll Back Malaria in year 2000, the Heads of Government and International Agencies signed the Abuja Declaration committing themselves to the "Abuja target", one of which stipulates that concerted efforts would be made to ensure that by the end of 2005 at least 60% of the vulnerable populations in Nigeria would have access to good quality, affordable and efficacious antimalaria medicines. At the end of 2005, this target was raised to 80% by 2010 in order to achieve the goal of reducing the malaria burden by 50% (Federal Ministry of Health, 2011).

The World Malaria report, which indicated that Nigeria accounts for a quarter of all malaria cases in the 45 malaria-endemic countries in Africa, clearly showed the challenge of malaria in Nigeria World Health Organization (WHO 2008). About 90% of all malaria deaths in the world today occur in Africa south of the Sahara. This is because the majority of infections in Africa are caused by *Plasmodium falciparum*, the most dangerous of the four human malaria parasites. It is also because the most effective malaria vector – the mosquito *Anopheles gambiae* is the most widespread in Africa and the most difficult to control. An estimated one million people in Africa die from malaria each year and most of these are children under 5 years old (World Health Report 2000). Malaria is the most common cause of hospital attendance in Nigeria accounting for about 30% of all hospital

admissions and about 60% of all out-patient attendance (Federal ministry of health, 2009). About 50% of the Nigerian population has at least one episode of malaria each year (Federal ministry of health, 2005; Federal ministry of health, 2009).

Malaria is one of the leading causes of under-five morbidity and mortality contributing 30% of under-five mortality and 25% of infant mortality (NPC, 2012). In 2009, it accounted for 60% of under-five admissions as well as 54% of deaths in under-five (WHO, 2010). It is also responsible for an annual loss of 132 billion naira in treatment costs and loss of man hours (NPC, 2012). The most recent overall childhood mortality rate in underfives documented for Nigeria in 2009 is 138 per 1000 births (UNICEF, 2009). Malaria impacts on the development of the Nigeria as it causes death, reduces human work capacity or productivity in all sectors including the agricultural sector (Oladepo, Tona, Oshiname, Titiloye, 2010). Malaria accounts for 25% of infant mortality and 30% of childhood mortality in Nigeria (FMOH, 2005). The most recent overall childhood mortality rate in underfives documented for Nigeria in 2009 is 138 per 1000 births (UNICEF, 2009). It is important to look at health problems like malaria that grossly affect the morbidity and mortality rates, as well as the economy of a developing country, such as Nigeria which has a population of about 160 million people; a large percentage of its population live in extreme poverty in rural areas, without access to portable water and adequate healthcare (Carrington, 2001).

The latest World Malaria Report from the WHO (2011) revealed that a prevalence of 100% of *P. Falciparum* exist among the Nigerian population of about 158,000; no single person in Nigeria is malaria free. Malaria fever is reported to be responsible for 16% of illnesses of under-fives in Nigeria NDHS (2008). About half of these children were taken to a health facility or sought treatment from a provider NDHS (2008). In the same survey, 17% and 8% of households have a mosquito net and insecticide-treated net (ITN) respectively. This is noted to have increased since 2003 when only 2% of households had an insecticide treated net (ITN). Overall, 6% of children under five slept under an ITN the night before the survey. Among zones, use of ITNs by children ranges from a low of 4%

to a high of 11%. Use is not consistent even in households that own mosquito nets; only half of children living in households that owned an ITN actually slept under an ITN the night before the survey. Although children's use of ITNs continues to be low, it has increased in recent years, from only 1% in 2003 to 6% in 2008 NDHS (2008). Four percent of women age 15 – 49 and 5% of pregnant women age 15 – 49 slept under an ITN the night before the survey. Use of ITNs by pregnant women is low across all zones, ranging from 3% in North Central and South West zones to 7% in South zone. ITN use among pregnant women has also increased since 2003 NDHS (2008).

Malaria during pregnancy contributes to low birth weight and to infant mortality. It is recommended that pregnant women receive at least two doses of the antimalarial drug SP/Fansidar, Amalar, or Maloxine as intermittent preventive treatment (IPT). Overall, 8% of pregnant women received one of these drugs during an ANC visit, and 5% received two doses of the antimalarial drug NDHS (2008). Among children under-five years that had fever in the two weeks before the survey, one-third (33%) were given antimalarial drugs, and 15% were given antimalarial drugs the same day or the day following the onset of fever. According to the National Demographic Health Survey (NDHS) (2008) malaria fever was reported to be responsible for 16% of illnesses of under-fives. About half of these children were taken to a health facility or sought treatment from a provider NDHS (2008). In the same survey, 17% and 8% of households have a mosquito net and insecticide-treated net (ITN) respectively. This is noted to have increased since 2003 when only 2% of households had an insecticide treated net (ITN). Overall, 6% of children under five slept under an ITN the night before the survey. Among zones, use of ITNs by children ranges from a low of 4% to a high of 11%. Use is not consistent even in households that own mosquito nets; only half of children living in households that owned an ITN actually slept under an ITN the night before the survey. Although children's use of ITNs continues to be low, it has increased in recent years, from only 1% in 2003 to 6% in 2008 NDHS (2008).

2.2 Malaria in Africa

Malaria continues to be a major cause of high morbidity and mortality rates in many regions of the developing world, the situation most severe in sub-Saharan Africa. In Nigeria, malaria remains the commonest disease and commonest cause of hospital attendance in all age groups in all parts of the country. It consistently ranks among the five most common cause of death in Nigeria for all ages and represents 8-12% of childhood death under the age of five (Odusanya 2001).

The vast majority of malaria deaths occur in Africa, south of the Sahara, where malaria also presents major obstacles to social and economic development (WHO, 2001). There are several reasons why Africa bears an overwhelming proportion of the malaria burden. Most malaria infections in Africa south of the Sahara are caused by *P. falciparum*, the most severe and life threatening from the disease, this region is also home to the most efficient, and therefore deadly, species of the mosquitoes, which transmits the disease. Moreover, many countries in Africa lacked the infrastructures and resources necessary to mount sustainable campaigns against malaria and as a result few benefited from historical efforts to eradicate malaria (WHO, 2001).

In Africa today, malaria is understood to be both a disease of poverty and a cause of poverty. Malaria has a direct impact on Africa's human resources. Not only does malaria result in loss of life and loss of productivity due to illness and premature death, but malaria also hampers children's schooling and social development through both absenteeism and permanent neurological and other damage associated with severe episodes of the disease (WHO, 2001).

Malaria in sub-Saharan Africa is a problem of dimensions unlike those seen anywhere else in the world today. Malaria, which can be fatal, is transmitted to humans by mosquito vectors of the Anopheles species. The magnitude of malaria in Africa is affected by a variety of factors, none of which addressed alone is likely to effect a resolution. It is further compounded by the general poor social and economic conditions in Sub-Saharan

Africa. The disease afflicts pregnant women, young Children and migratory populations particularly severely because of their low or non-existent immunity to the disease.

2.3 Profile of Malaria in Oyo State and Ido LGA

The incidence of malaria in Oyo State is currently reported to range between 50 – 100 cases per 1000 individuals (WHO, 2011). Based on unpublished records at the Ministry of Health in Oyo State, Malaria fever cases reported in children and adolescents is 413,050 with a prevalence of 6.47%. Furthermore, a Malaria fever prevalence of 3.34% and 0.1% was documented for underfive children and pregnant women respectively. Information on the prevalence of ACT use in Oyo State revealed that ACTs are still very under prescribed by authorized healthcare professionals in Oyo State; only 3.0% and 1.2% of children above 5 years and underfive years respectively were treated with ACTs in the general population of children with Malaria fever. (Appendix 1).

2.4 Current Trends in the Management of Uncomplicated Malaria –Artemisinin Combination Therapy (ACT)

Malaria is an entirely preventable and treatable disease. The primary objective of treatment is to ensure a rapid and complete elimination of the Plasmodium parasite from the patient's blood in order to prevent progression of uncomplicated malaria to severe disease or death, and to chronic infection that leads to malaria-related anaemia. From a public health perspective, treatment is meant to reduce transmission of the infection to others, by reducing the infectious reservoir and to prevent the emergence and spread of resistance to antimalarial medicines (WHO, 2014). For decades, in Nigeria chloroquine (CQ) was the mainstay of uncomplicated malaria therapy. The eventual appearance and spread of CQ resistance led to the introduction of SP which soon met with rapid development of resistance, rendering it increasingly ineffective in many endemic areas (Wongsrichanalai, Pickard, Wernsdorfer and Meshnick, 2002). To date, *P.falciparum* clinical treatment failure has been reported for all the common classes of antimalarial drugs apart from artemisinin compounds, although there are recent reports of reduced

artemisinin sensitivity in Cambodia (Noedl, 2008; Dondorp, Pongponratn and White 2004).

To reduce the pace of selection of resistance, WHO recommends that all antimalarial therapies be deployed as combinations that include an artemisinin derivative as one of the partner drugs, a strategy referred to as Artemisinin Combination Therapy (ACT). The WHO Global Malaria Programme maintains a list of antimalarial medicines that have been adopted as first-line treatment in malaria-endemic countries. Updates are made on the basis of information received from national malaria control programmes (WHO, 2014).

The introduction of ACT in malaria endemic countries together with other malaria control interventions is reported to have contributed to the recent declines in malaria mortality and morbidity observed in some settings (WHO, 2009).

2.4.1 National policy on malaria diagnosis and treatment In Nigeria

This National Policy on Malaria Diagnosis and Treatment describes the goal of the Federal Ministry of Health, with respect to the diagnosis and treatment of malaria and the strategy by which the goal is to be achieved. The primary goal of treatment of malaria is to cure the patient of the infection and thereby reduce morbidity and mortality. A second purpose is to encourage the rational and safe use of medicines to prevent or delay the development of antimalarial medicine resistance. The ultimate public health objective of treating malaria infections is to reduce the reservoir of infection and, therefore, malaria transmission which, in turn, will result in reducing morbidity and mortality. Malaria is an eminently preventable, treatable and curable infection. Medicines and other interventions for its prevention and treatment are widely available. Many of these are easy to apply and are affordable and accessible. There is therefore, no justification for Nigeria to continue to suffer the burden brought upon it by malaria.

In order to steadily reduce and, ultimately, eliminate the burden of uncomplicated malaria the policy therefore aims to: Institutionalize evidence-based diagnosis, using microscopy and rapid diagnostic tests and treatment with effective Artemisinin-based Combination

Therapies (ACT) in the management of malaria in Nigeria; and Provide a quality assurance programme for malaria diagnosis – an important platform for quality malaria diagnosis, treatment and control, Ultimately, the objectives include

- Reducing morbidity,
- Halting the progression of an uncomplicated malaria into severe and potentially fatal disease, and thereby reduce malaria mortality;
- Reducing the impact of placental malaria infection and maternal malaria-associated anaemia through intermittent preventive treatment,
- Minimizing the development of antimalarial medicine resistance.

2.4.2 Malaria Control Historical Perspectives

In 1996, Nigeria developed its first National Malaria Control Policy. A yearly Plan of action was developed for 1997 and 1998 and a three-year Plan of Action was also developed for 1999 – 2001. The Malaria Control units in the States were revitalized or re-established and public awareness of the need to fund malaria activities was created. The highest advocacy point between 1996 and 1998 was the celebration of the 'National Social Mobilization Day' when the Malaria Control logo was launched by the then Minister of Health, Rear Admiral Jubril Ayinla. The National Technical Committee (on Malaria) was resuscitated in 1998. The National Malaria Control Committee comprises National, State and some LGA malaria programme managers and officials, as well as representatives from the private sector and international agencies. The committee meets at the end of each calendar year and is responsible for reviewing the activities of the previous year and planning those of the following year.

In 1997 and 1998, Training of Trainers activities were carried out on management of severe and uncomplicated malaria. The training programmes were held nationally and in specified zones in the country. It was hoped that such training would produce a core of trainers capable of handling the monitoring and evaluation requirement of malaria activities. The year 2000 witnessed the launching of the 'African Malaria Day' and the adoption of 25th of April every year for the celebration of the day. In 2008, the

celebration was accorded global recognition and was re-christened 'World Malaria Day'. In the last five years, level of advocacy, political awareness and commitment to malaria control in Nigeria have all continued to improve (Federal Ministry of Health, 2011).

2.4.3 Roll Back Malaria in Nigeria

RBM is an initiative to improve malaria control in the context of Health Sector Reform. It was initiated in 1998 through a joint partnership of WHO, UNICEF, UNDP and the World Bank. RBM consists of two phases - the inception phase and the implementation phase. After the Consensus Building Meeting for countries in West Africa in March 1999, Nigeria started the RBM inception phase.

Sensitization and advocacy on RBM at the highest level included letters to all Commissioners of Health in the States and the FCT, Abuja, ministerial press briefings to enlighten the public about the importance of RBM and the need for all stake- holders and partners to embrace the new approach to malaria control. Workshops were held for executives of media houses to inform them adequately on the technicalities of RBM and its envisaged benefits to Nigerian society (Federal Ministry of Health, 2011)

Nigeria hosted and co-financed the African Heads of State Summit on RBM in April 2000, at which forty-four of the fifty malaria-affected countries in Africa where in attendance. Nineteen country delegations were led by the Heads of State while the attended by the senior officials from each of the four founding agencies (WHO, UNICEF, The World Bank & UNDP) and other development partners. (Federal Ministry of Health, 2011)

The Summit concluded with the signing of the Abuja Declaration and Plan of Action. By this, African leaders had rededicated themselves to the principles and targets of the Harare Declaration of 1997 and committed to intensifying efforts to reduce by 50% the malaria mortality in Africa by the year 2010, through implementing the strategies and action of Roll Back Malaria (RBM) programme. The implementation of RBM has started with the Federal Ministry of Health (FMOH), States and LGAs carrying out specific activities as indentified in the Plan of Action (Federal Ministry of Health, 2011).

2.4.4 Antimalarial Medicines Resistance

The development of resistance, defined as the 'ability of a parasite strain to multiply or to survive in the presence of concentrations of a medicine that would normally destroy parasites of the same species or prevent their multiplication' has continued to threaten the effective of antimalarial medicines. Resistance to Chloroquine has spread through South America, Southeast Asia to East Africa and eventually to all endemic countries of the continent. A similar but more rapid process has been recorded for Sulfadoxine–Pyrimethamine (SP). The important consequences of medicine resistance are: an increase in morbidity and mortality, a delay in initial therapeutic response and, an increased cost of treatment to the community. These consequences need to be urgently addressed in Nigeria. In the same vein, there is an urgent need to preserve and prolong the useful life of the currently available antimalarial medicines (Federal Ministry of Health, 2011).

The results of the therapeutic efficacy studies, in 2002 and 2004 of antimalarial medicines carried out in the six epidemiological regions of the country are shown in Table 2.1. WHO guidelines advise policy review when antimalarial therapeutic failure reaches 10%. The result of the 2002 Efficacy Studies indicated that Chloroquine and SP were no longer adequate for national first line use. As a result, further efficacy trials were conducted in 2004 by the Federal Ministry of Health on two suitable Artemisinin based combination therapies. Both combination therapies were found to be highly efficacious and thus suitable for use in the treatment of uncomplicated malaria.

Table: 2.1 Therapeutic Efficacy of Anti-malarial Medicines in Nigeria.

(Adequate Clinical and Parasitological Response ACPR)

S/N	Zones	Chloroquine*	Sulphadoxine/Pyrimethamine*	Artemether/Lumefantrine**	Artesunte/Amodiaquine**
1	SE	3.7%	14.5%	100%	100%
2	SS	9.1%	8.5%	87%	82.5%
3	NC	53.2%	82.7%	100%	96%
4	NW	77.3%	94.2%	100%	100%
5	SW	40.9%	75.6%	100%	100%
6	NE	50.8%	64.8%	100%	100%

* 2002 Drug Efficacy Study

** 2004 Drug Efficacy Study

(Federal Ministry of Health, 2011)

2.4.5 Recommended medicines for the treatment of uncomplicated malaria

Current medicines for treatment of uncomplicated malaria are Artemisinin based Combination Therapies. This combination takes advantage of the rapid blood schizontocidal action of the artemisinins and the long duration of action of the partner compound to effect rapid cure with low level of recrudescence. The medicines include the following:

2.2a Medicine of Choice in the Treatment of Malaria

Medicine	Dosage	Presentation	Strength
Artemether Lumefantrine	Tablet	Co-formulated	20mg artemether + 120mg Lumefantrine per tablet
Artemether Lumefantrine	Dispersible (children)	Co-formulated	20mg artemether + 120mg Lumefantrine per tablet

Table 2.2b Dosage Regimen for Artemether-Lumefantrine

Weight	Dosage Regime
5 - <15kg	1 tablet twice daily for 3 days
15 <25kg	2 tablets twice daily for 3 days
25 - <35kg	3 tablets twice daily for 3 days
> 35kg	4 tablets twice daily for 3 days

The first day dosage should be taken 8 to 12 hours apart.

2.2.1a Alternate Treatment

Medecine	Dosage form	Presentation	Strength
Artesunate - Amodiaquine	Tablet	Co-formulated	Artesunate-Amodiaquine Each tablet exists at 1:2.7
Artesunate + Amodiaquine	Tablet	Bd co-packedlistere	Artesunate- 50mg and Amodiaquine 153.1mg

The co-formulated medicines are preferred.

Table 2.2.2b Dosage Regimen for Co-formulated Artesunate-Amodiaquine

Weight /Age	Tablet Strength	Dosage Regimen
4.5kg - < 9 kg 2 months – 11 months		1 tablet once daily for three days
≥ 9kg - < 18 kg 1year-11 months	50mg/135mg	1 tablet once daily for three days
≥18kg - < 36 kg 6 years - 13 years	100mg/270mg	1 tablet once daily for three days
≥ 36 kg or 14 years and above	100mg/270mg	2 tablets once daily for three days

The co-formulated Artesunate-Amodiaquine combination tablets exist in various strengths at the ratio of 1:2.7 (Federal Ministry of Health, 2011).

2.4.6 The Use of Monotherapy for the Treatment of Uncomplicated Malaria

Monotherapy occurs when one component of antimalarial combination therapies is used for the treatment of uncomplicated malaria e.g. Artesunate, Artemether, Amodiaquine etc. The use of antimalarial monotherapy medicines for the treatment of uncomplicated malaria is not recommended. Their use significantly increases the risk of development of resistance by the parasites.

Resolution 12.5 of the World Health Assembly, published in May 23, 2007, urges Member States to progressively discontinue the provision, in both the public and private sectors, of oral Artemisinin monotherapies, and to promote the use of Artemisinin-combination therapies, and to implement policies that prohibit the production, marketing, distribution and the use of counterfeit antimalarial medicines. Nigeria has complied with these requirements and the country's regulatory authorities have also stopped further registration of Artemisinin monotherapies and have prohibited the importation, and local production.

In 2005, the National Administration for Foods and Drug Control (NAFDAC), working in collaboration with the National Malaria Control Programme discontinued the registration of Artemisinin monotherapies in the country. In the same vein, NAFDAC has declassified the medicine of choice, Artemether-Lumefantrine and the alternate medicine, Artesunate-Amodiaquine / Artesunate+Amodiaquine from Prescription Only (PO) to Over the Counter (OTC) medicines (Federal Ministry of Health, 2011).

2.5 Medicines that are no longer Recommended for the Treatment of Uncomplicated Malaria

These are medicines that were previously used on a wide programmatic basis for the treatment of uncomplicated malaria. Their efficacy levels have been undermined by the parasite resistance trend observed.

Table 2.3 The medicines include the ones listed in the table below:

S/N	Medicines	Comments
1	Sulphadoxine Pyrimethamine	Not recommended for treatment of malaria. Reserved for intermittent preventive treatment in pregnancy (IPTp)
2	Chloroquine	Inadequate efficacy and therefore no longer recommended

2.6 Treatment Failure

This occurs when fever and parasitaemia fail to resolve, or recur within 2 weeks of treatment. It must be confirmed parasitologically preferably by microscopy. The alternate treatment should be given after confirmation has been made. Recurrence of fever and parasitaemia more than 2 weeks after treatment could result either from recrudescence or new infection. In such a case, parasitological confirmation is desirable. However, treatment could be effected with the same medicine administered earlier or the use of alternate medicine (Federal Ministry of Health, 2011).

2.7 Knowledge, Attitude and Malaria Management Practices among Primary Health Care Workers

Primary health-care (PHC) workers constitute the frontline health workers charged with the responsibility of managing disease conditions at the community level. They see more cases of malaria than any other childhood disease condition, malaria being the most common out-patient consultation. A malaria case management, which is effective, has been described as that which institutes complete anti-malaria treatment and provision of required support to a person with malaria-like symptoms within 24 hours of the symptoms (WHO, 2004). It involves a timely decision to treat either based on clinical or on parasitological diagnosis, accessibility of appropriate drugs, correct use of drugs and follow-up to detect treatment failure or referral to appropriate care centers. Nigeria has a national policy on diagnosis and treatment of malaria, which is a necessary accompaniment to effective case management (federal ministry of health, 2005). It adopted the RBM strategic framework on case management in 2006 and was updated in 2010 (WHO, 2010; Federal ministry of health, 2010). The policy spells out the recommended guidelines for case management ranging from clinical and laboratory diagnosis, treatment and prevention. Provision of care conforming to standard guidelines is one of the major elements of quality of care (O'Connor 2005). The corner-stone of the case-management of malaria is the early identification and treatment of those with mild disease with an effective antimalarial. In principle, almost all deaths due to malaria in children are avoidable, since patients can be treated with anti-malarial drugs which are now available in every country (Campbell, 1988).

Studies have been conducted among different populations documenting the knowledge, attitude and management practices with respect to malaria among Primary Healthcare Workers in Nigeria (Fawole and Onadeko, 2001; Joda and Fanimokun, 2008; Oreagba *et al*, 2008; Ajayi *et al*, 2008; Umar and Abdulkareem, 2008; Oladepo *et al*, 2010, Oladepo *et al*, 2011). PHC workers performed reasonably well in most of the parameters assessing knowledge. Health workers at the primary level of care have generally been described as having good knowledge as shown by the survey of knowledge and management of malaria

in under-fives among PHC workers in Ibadan, where it was observed that general knowledge of malaria was good with workers demonstrating good knowledge of several of the key components assessed by the researchers (Fawole and Onadeko, 2001). Similarly, a cross-sectional study of malaria treatment practices and perceptions in South East Nigeria also observed good knowledge among PHC workers (Onwujekwe, Uzochukwu, Dike, Uguru, Nwobi and Shu, 2009). Mubyazi, Bloch, Kamugisha, Kitua and Ijumba (2005) revealed that Health personnel at both dispensary and district level were generally aware that SP is the recommended drug for preventive treatment of malaria in pregnant women.

The poor knowledge of IPTp documented by Arulogun and Okereke 2012 in their study among health workers in Ibadan North LGA of Oyo state had earlier been documented by Onyeaso and Fawole (2007) who reported knowledge gaps of malaria prevention strategies in pregnancy among healthcare providers studied. Arulogun and Okereke (2012) showed that most of the respondents' definition of IPTp revolved around known preventive measures of malaria during pregnancy, without specifically stating any of the IPTp guidelines, such as SP anti-malaria drugs to be given as directly observed treatment (DOT), first dose of SP should be given after quickening, awareness creation among pregnant women through health talks to mention a few. Furthermore from the exit interview conducted, it was evident that health workers were still using chloroquine despite the evidence against the use of the drug due to resistance and reduced efficacy (Onyeaso and Fawole, 2007; Kayentao, Kodio, Newman, Maiga, Doumtabe, Ongoiba, Coulibaly, Keita, Maiga, Mungai, Parise and Doumbo 2005). Knowledge of WHO strategies on malaria prevention in pregnancy was poor with (11.5%) having correct knowledge of all WHO strategies, 77.7% were aware of IPT treatment and awareness was highest among CHEWS (95.8%). SP was the most widely prescribed among respondents with 67.4% prescribing it. Healthcare providers at the primary level of care were significantly more likely to use SP for IPT than other level of care.

Compliance with IPTp guideline was poor as verified by the exit interview carried out by Arulogun and Okereke 2012 with pregnant women where health workers administered different types of anti-malaria drug, not necessarily SP, at varying stages of their pregnancy instead of during the prescribed period (second trimester and a month after) as well as it not been given under supervision. This corroborates the findings of Akinleye, Falade and Ajayi (2009) which revealed that respondents' knowledge, attitude and practice of IPTp were poor in their study carried out in PHC centres in Southwest, Nigeria. Majority did not know sulfadoxine-pyrimethamine (SP) as the drug recommended for IPTp and were not aware that IPTp could be given to pregnant women. This poor compliance is not peculiar to the region of the country where the study was carried out as poor knowledge of malaria in pregnancy and management practice has been documented in Eastern and Northern parts of Nigeria (Enato Okhamofe, Okpere, 2007; Galadanci, Ejembi, Illiyasu, Alagh and Umar, 2007). In a study conducted by Fawole and Onadeko (2001) on 61 PHC workers in Ibadan South-East LGA to investigate their knowledge of malaria and management practices in underfives, results revealed that fair number (75.4%) of the PHC workers knew the cause of malaria. However, treatment practices were poor as only 55.7% and 63.9% of them respectively prescribed chloroquine and paracetamol correctly. Similarly, Fawole *et al.* (2004) in a study among health workers in primary health centers in Ibadan reported that the treatment practices by healthcare workers were poor, as they prescribed chloroquine and paracetamol wrongly and most of them gave underdosage. The use of ACTs in Nigeria was not popular then; hence the authors did not assess this. In another study conducted by Umar and Abdulkareem (2008) among PHC workers in Sokoto State, inadequate knowledge of the use of ACTs and ineffective malaria treatment practices were revealed. In the study, only 36.4% of the participants were found to have adequate and effective treatment practices of malaria infection. Different types of treatment error among health workers was reported, each with different assumed clinical consequences.

Majority of the aforementioned studies have indicated that the attitude of Nigerian health workers (Physicians, PHC workers e.t.c) towards the new line of recommendation for

malaria management is fair and there is a high level of acceptance among them and in health facilities, although the recommended drugs are expensive and not abundantly available (Joda and Fanimokun, 2008; Ajayi *et al*, 2008; Umar and Abdulkareem, 2008). Concerned health workers need to be empowered both at the Local and Federal levels to ensure full implementation of the 2005 antimalarial policy by the Federal Ministry of Health of Nigeria. Zurovac (2004) argued that replacing failing drugs with more effective drugs will only be successful if they are prescribed by health workers according to evidence-based guidelines and then administered correctly to patients at home and in health facilities. However, findings from health facility surveys have shown that health workers frequently do not comply with treatment guidelines and management practices among health workers in PHCs in Nigeria are poor. Umar and Abdulkareem (2008) have recommended that early recognition and adequate treatment of cases through capacity building of health workers as one of the current strategies for malaria control in Nigeria.

The result of a study carried out among PHC workers in Plateau state by Bello, Tagurum, Afolaranmi, Chirdan and Zoakah, (2013) showed that malaria diagnosis was based on a presenting symptom of fever in 69.1% of cases and based on laboratory test in 29.1% of cases. The diagnosis of malaria based on fever algorithms is the recommended mode of diagnosis in malaria case management of under-fives among PHC workers in Nigeria as advocated for in highly endemic countries with poor laboratory support (Federal Ministry of Health, 2009; Chandramohan, Jaffar and Greenwood, 2002). Bello et. al. 2013 reported that while knowledge was observed to be good, there were shortcomings observed in the case management of malaria among PHC workers. This finding is consistent with other findings on health-care workers treatment patterns (Umar and Abdulkareem, 2008; Onwujekwe, 2009). In the review of case management among PHC workers in Sokoto, 86.2% of respondents commonly prescribe CQ as the first line drug and 4.6% prescribe ACT's with wrong drug dosages in 63.6% of the time (Umar and Abdulkareem, 2008). In the study carried out by Bello et al., 2013, 30% of workers still use only CQ as first line drug, while 32% will use any available antimalarial. Drug dosages were wrong in 61% of cases in the study. Furthermore, in keeping with other findings (Umar and Abdulkareem, 2008), years of work experience had no association with treatment patterns of PHC

workers. However, health worker cadre had a statistically significant relationship with correct drug dosages. This might be related to the longer training times associated with the higher cadres (Bello et al., 2013).

Studies on the knowledge, attitude and practices of PHC workers in Nigeria are invaluable to effectively estimate the status of implementation of the recommended national anti-malaria policy. Although a few of such studies exist on different populations, there is still a dearth of information on the subject matter. More of such studies are needed to proffer appropriate interventions in modulating malaria in Nigeria. At the moment, no local study exists on the knowledge, attitude and practises of PHC workers in Ido LGA of Oyo State, Nigeria.

2.8 Primary healthcare workers and Malaria

Malaria is the most common cause of Hospital attendance. About 50% of the Hospital attendance in Nigeria accounting for about 30% of all Hospital admissions and about 60% of all out-patient attendance (WHO 2010). About 50% of the Nigerian population has at least one episode of malaria each year (FMOH 2009).

In 2010, WHO recommended that all suspected cases of malaria be confirmed with a diagnostic test prior to treatment.

In Uganda and some other parts of Africa, presumptive treatment of malaria is a common practice. In some facilities, supplies and staff for good quality laboratory diagnosis are not available. Even where diagnostic capabilities exist, studies have found that health workers often do not request a diagnostic test for patients suspected to have malaria. (Hamer, Ndhlovu, Zurovac, Fox, Yaboah-Antwi, Chanda, Siplinyambe, Simon, Snow 2007) and (Zurovac , Midia, Ochola, English, Snow 2006).

Most countries in Sub-saharan Africa have recently changed their antimalarial drug treatment policies, adopting ACTs as the recommended treatment of uncomplicated malaria. The widespread implementation of these new highly effective drugs provides an

important opportunity to substantially improve the treatment of malaria. However, it is imperative that these drugs are used rationally to maximize their impact. Training of health workers and improving diagnostic capabilities have been identified as potential avenues for improving malaria case management (Osterholt, Rowe, Hamel, Flanders, Mkandala, Marum, Kaimila 2006).

2.9 Health Workers' Practice of Malaria Case Management

A study conducted in Jos Plateau state on Knowledge and pattern of malaria case management among primary health-care workers in Jos shows about 70% of respondents had not had any training on malaria case management while only about 4% of those who had been trained received such training within 6 months prior to the commencement of the study. Majority of the workers (70%) had not had any recent training on malaria case management. In spite of this, knowledge of malaria was good among the respondents (95%) were able to define malaria and 98.1% were able to list the symptoms of malaria respectively. Also Health worker pattern of anti-malarial use was determined with 38% of respondents prescribing artemisinin combination treatment (ACT), while about 30% prescribed chloroquine (CQ). About 32% of respondents prescribed any available anti-malarial. Accuracy of the drug dosages were also evaluated using a 5-year-old child as standard. Respondents' drug dosages were wrong in 61% of cases (Bello, Tagurum, Afolaranmi, Chirdan and Zoakah, 2013).

2.10 Theoretical Framework

The theoretical framework for this study is the 'PRECEDE' model. The acronym PRECEDE represents – Predisposing, Reinforcement and Enabling Causes in Educational Diagnosis and Evaluation. The model was developed several years ago by Green et al (1980) and has since been applied in several epidemiological studies. It is a planning model that offers a framework for identifying intervention strategies to address the factors that influence people's behaviour and developing interventions that will promote healthy behaviours. The model was developed as a framework for determining key antecedents of behaviour as a guide to the selection of appropriate health intervention stategies. It states that the performance or non-performance of behaviour is influenced by three sets of factors:

Predisposing factors

Enabling factors

Reinforcing factors

The 'precede' model was used in the present study to evaluate the knowledge, attitude and management practices relating to malaria among PHC workers in Ido LGA of Oyo State (See Fig 2.1). The predisposing factors here relates to knowledge and awareness of the PHC worker on the key factors that influences their attitude and behaviours towards appropriate management practices for the treatment of uncomplicated malaria. Knowledge on the following were assessed - aetiology and transmission of malaria, complications and severity, prevention of malaria, diagnosis of malaria and the new recommended treatment guidelines for uncomplicated malaria.

The enabling factors in this model are the ones that empower the PHC workers in functioning optimally at work. These factors were assessed vis-a-vis professional and technical skills/cadre, availability of drugs at PHC facilities, financial support from government and access to diagnostic facilities for malaria.

The reinforcing factors are those that influence the respondents' decisions on treatment plan. These factors are expected to either enhance or delimit the PHC workers. The type and frequency of training of PHC workers relating to current trends in the treatment of uncomplicated malaria was assessed among other factors.

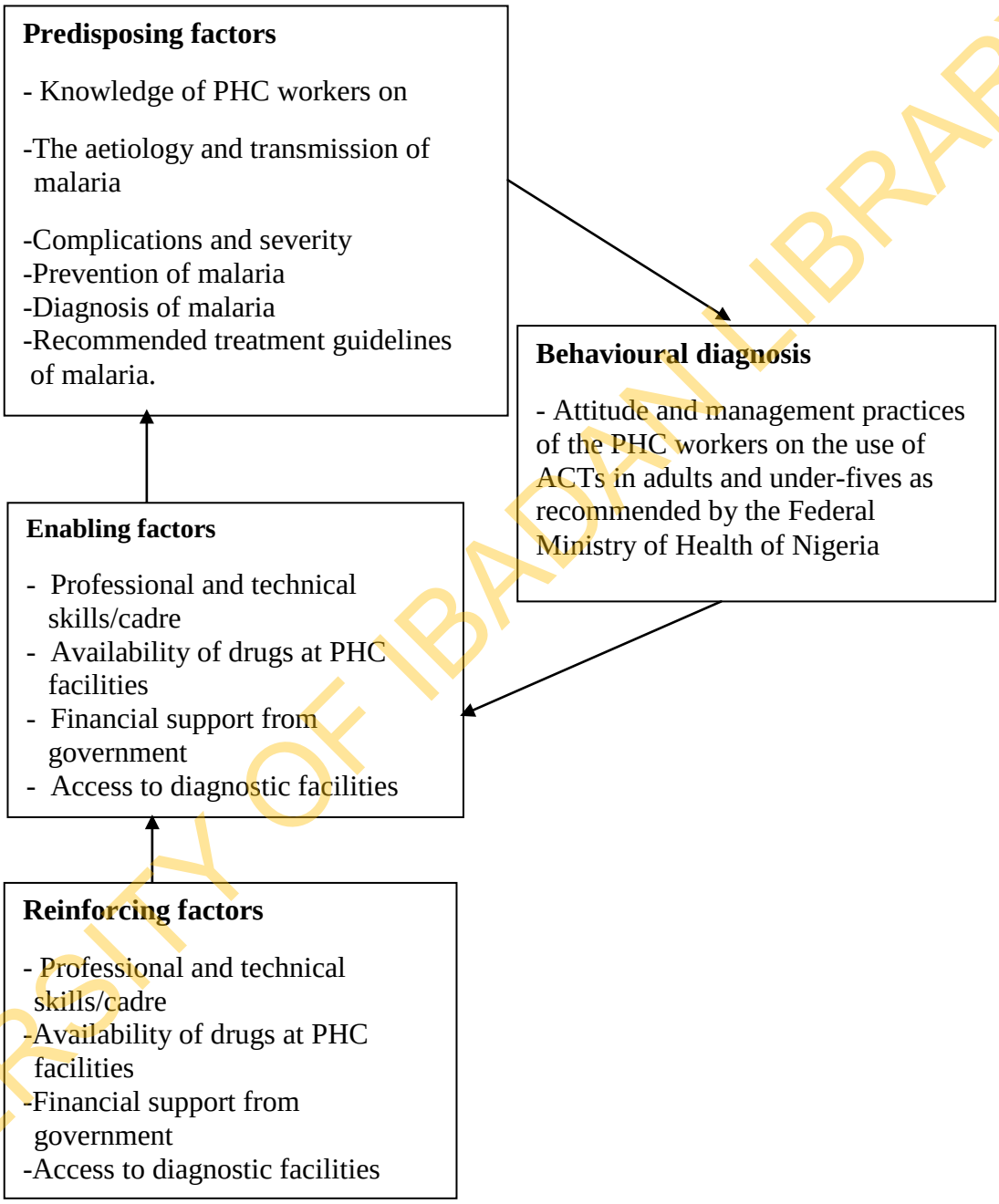

Fig: 2.1 The PRECEDE framework adopted for assessing the knowledge, attitude and management practices relating to malaria among Primary Healthcare Workers

CHAPTER THREE

METHODOLOGY

3.1 Study Design

It was a descriptive cross-sectional cohort study design for all the Primary Health Care (PHC) workers in Ido Local Government Area. The study assessed Knowledge, attitude and management practices relating to malaria among primary health care workers in Ido Local Government Area (ILGA) Oyo State, Nigeria.

3.2 Study Area

The study area is Ido Local Government Area, Oyo State, Nigeria. The LGA has its head quarter on Eruwa road at Ido along Iba Area shares boundaries with Oluyole, Ibarapa East, Akinyele, Afijo, Ibadan North, Ibadan North West and Ibadan South West Local Governments in Oyo State and Odeda Local Government in Ogun State. Ido LGA came into being in May 1989 and it was carved out of the former Akinyele Local Government Area which has its headquarters in Ido along the Ibadan-Eruwa road. The area was referred to as Akinyele west LGA during the second republic before it merged again with akinyele LGA by Buhari and Idiagbion regime in 1987. Ido LGA covers the area spanning Apata, Ijokodo, Omi-Adio, and Akufo. It shares boundaries with Oluyole Ibarapa, Akinyele and Ibadan Municipal Government, in Oyo State and Odeda LGA in Ogun State. Ido LGA formerly had six wards which has been increased to ten for election purposes. Among the major towns within Ido LGA are Ijokodo, Apete, Bakatari and Important villages such as Ogunwande, Dada, Oderemi, Odetola, Odufemi and Alagbaa. It has an area of 186 km^2.

There are altogether seventeen PHCs in the LGA with sixteen functional ones namely: Ido PHC, Araromi PHC, Akufo PHC, Apete PHC, Idi-oro elewa PHC, Akinware PHC, Ladunni PHC, Omi Adio PHC, Gbekuba PHC, Leo PHC, Ilaju PHC, Koguo PHC, Agbopa PHC, Ogundele PHC, Oloya PHC and Ologuneru PHC. A total of 120 PHC workers are officially employed at the various PHC centres in the LGA. Most of the PHC

centres were noted to have little to no working facilities that are expected of standard PHC centres.

On account of the extensive fertile soil which is suitable for agriculture, the people of Ido are mainly small scale farmers with significant proportion of the farmers engaging in secondary occupation such as hunting, trading, artisan, civil service jobs e.t.c. Farmers in the area grow mainly food crops such as maize, cassava, yam, fruits and vegetables.

3.3 Study Population

The population for this study includes male and female health service providers drawn from all categories of all Ido PHC frontline workers who attend to patients in the PHCs in the LGA.

The study population consisted of the following categories of health workers Doctors, Nurses, Midwives, Community Health Officers (CHOs), Community Health Extension Workers (CHEWs) and Health Assistants

All the 120 PHC workers officially employed in Ido local Government were invited to participate in the study. However 112 PHC workers gave their consent for participation. This cohort of PHC workers formed the sample frame of this study and served as respondents for the study.

3.4 Variables

In order to determine the study variable to assess the knowledge, attitude and management practices of malaria relating to malaria among primary healthcare workers in Ido Local Government Area in Oyo State, a number of variables were identified. These variables were segregated to dependent and independent variables, for easy analysis.

3.4.1 Dependent Variable: The dependent variables identified include knowledge on appropriate treatment on malaria, attitudes displayed towards the use of ACTs in the treatment of malaria and the management practices of underfives with respect to malaria treatment.

3.4.2 Independent Variable: The independent variables were social and demographic variables (sex, age, marital status, religion, ethnic group, Years of working experience, current cadre and highest level of education).

3.5 Sample size Determination

In determining the sample size for the study, a 2009 registered list of health care providers in Ido Local Government area was used. The total consenting respondents were employed for the study. A total of 120 health care workers were located in the LGA and 112 of the healthcare workers used for the study as there was no use for sample size calculation.

Based on this criteria, 112 questionnaires were administered on respondents from the 16 functioning health facilities in the study location. Table 3.1 clearly explains the distribution of these health facilities.

Table 3.1: List of the PHCs in Ido LGA

S/N	Names of PHC	Total numbers of health workers	Sex		Total numbers of PHC workers selected		Total numbers of questionnaiters Administered
			Females	Males	Females	Males	
1	Ido	8	5	3	4	2	6
2	Araromi	7	6	1	6	2	8
3	Akufo	8	6	2	6	1	7
4	Apete	8	5	3	4	2	6
5	Idi-oro elewa	9	6	3	5	2	7
6	Akinware	6	5	1	5	1	6
7	Ladunmi	8	8	-	5	1	6
8	Omi-Adio	6	6	-	3	1	4
9	Gbekuba	7	6	1	5	1	6
10	Leo	8	6	2	6	2	8
11	Ilaju	8	6	2	6	1	7
12	Koguo	7	5	2	5	1	6
13	Agbopa	7	6	1	7	-	7
14	Ogundele	8	6	2	4	2	6
15	Oloya	7	7	-	6	1	7
16	Ologuneru	8	6	2	5	2	7
Total	**16**	**120**	**95**	**25**	**90**	**22**	**112**

In each of the facility sampled, the following stages were followed in selecting the respondents for the study. These are:

-List of the categories of health workers on duty as at the time of the visit.

-Seeking of consent of all qualified health workers as further exclusion criterion and balloting to select the respondents per category of health workers who had indicated interest to participate. Overall, 112 PHC workers gave their consent, four were on leave while the remaining four said were not interested.

3.6 Inclusion Criteria

The respondents must be a PHC worker.

Being at duty at their office during the period of the study.

3.7 Exclusion criteria

A respondent who does not give his consent was excluded.

A respondent who is not a PHC worker was also excluded in the research.

3.8 Methods of data collection

A quantitative method used was used in data collecting the data. The instruments were designed after reviewing literature and extracting pertinent variables relating to knowledge, attitude and management practices relating to malaria among primary health care workers in Ido Local Government Area (ILGA) Oyo State. The questionnaire employed both open and closed ended questions and was interview administered. There instrument consist of to 56 questions variables derived from the study objectives and framework and these were divided into five sections. The questionnaire consists of 5 sections. Section A sought information on the socio-demographic characteristics of the respondents which centered on sex, age, marital status, religion, ethnicity, and other demographic information on the respondents. Second B section assessed respondents'

training and general Knowledge on malaria. Section C assessed respondents' knowledge of appropriate treatment for malaria, Section D assessed attitude towards the use of ACTs in the treatment of malaria while section E assesed management practices of Underfives with respect to malaria treatment.

3.9 Training of Research Assistants

Some of the criteria for recruiting research assistants included the familiarity with the LGA, Sex three females and one male, age, fluency in English languge, educational level and experience in the field. Four research assistants were recruited for the study. Educational qualifications of the assistants were at least Ordinary National Diploma (OND), BSc, MSc and MPH. The candidates were fluent in English Language. The research assistants were trained for two days. A time table was drawn for this period of 3 hours 9 a.m-12 noon daily. The training commenced with introduction of the trainer or the principal investigator and trainees, followed by the background of the study and objectives. Contents of the training focused on interview techniques, interpersonal and communication skills. Demonstrations was used to transfer skills after which the trainees were equipped with a copy of the instrument each to be taken home and read over for better understanding with the aim of answering any burning question that may result the following day.

3.10 Validity of Instruments

This is the ability of the instrument to measure what it set out to measure. In order to ensure the validity, the instruments were designed through a comprehensive review of related literatures. The salient variables of interest were teased out from the literature relating to knowledge, perceptions and practices for measurement. The instrument was subjected to independent, peer and expert reviews particularly experts in Public Health, in the field of Community Medicine, Environmental Health and colleagues from the department of Health Promotion and Education who are vast in the field of malaria management practices in the Faculty of Public Health, University of Ibadan to ensure its content validity.

The following steps were taken to ensure the validity of the instrument before the commencement of the study. The instrument was pre-tested among PHC workers in Egbeda Local Government Area because the community has similar characteristics with Ido LGA in terms of level of development, the occupation and ethnicity of the inhabitants, health facilities and PHC workers. Pre-test exercise was done among 12 PHC workers (i.e 10 % of the sample size) in Egbeda LGA. Necessary corrections were made after the pre-test exercise based on the review and analysis of the result of the pre-test. This helped to improve the face and content validity of the instruments. Comments from my supervisor was also used to further enhance the quality of the instruments.

3.11 Reliability of Instruments

Reliability refers to the consistency of a measure. A measure is said to have a high reliability if it produces consistent results under consistent conditions. The questionnaire used in pre-testing was coded and analyzed using statistical package (Cronbach's alpha co-efficient) and a result showing correlation coefficient equal or greater than 0.5 is said to be reliable. In this study the result was 0.87 which is greater than 0.5. The result of the analysis of the data collected during the pre-test show that the instrument was reliable. At the end of the exercise, items that were not easily understood were reframed; those that were found to be irrelevant were removed. The pretest questions were analyzed using the SPSS package.

3.12 Procedure for data collection

The quantitative data was collected with the use of a semi-structured questionnaire that was administered by the principal investigator with the help of four trained field assistants and the questionnaires were completed on the spot and collected back after completion. The questionnaires were administered between 17th of December, 2009 and 28th of January, 2010 (a period of 6 weeks). All the PHC centers in Ido LGA were visited one after the other at their various centers and their consent were sought before the

questionnaires were administered to them. The data collection process included the following steps; visit to each of the PHCs, coupled with identification visit to each of the PHC to the heads of each of the selected PHCs to seek permission to conduct interviews and administer questionnaire on the respondents. Identification and establishment of rapport with eligible participants in each PHC center including a disclosure of the nature of the study, its objectives, the inconveniencies involved, and even what the PHC workers stand to gain and assurance of confidentiality of responses. The semi-structured questionnaire was interview administered though the potential participants were able to read and write but the investigator did not want the respondents to discuss with their colleagues before they fill the questionnaire as the response of a colleague might affect the response of the other. The sections in the questionnaire included the socio- demographic characteristics of the respondents while other section contains information on variables of the study.

Four well trained research assistants administered the questionnaire to 112 respondents after introducing themselves, explaining the objectives of the study, and obtaining respondents' informed consent to participate in the study using the interview method and data was collected over a 35 - day period. Each interview lasted about 35 minutes for each respondent. Short briefing sessions was held at the end of each day where the day's work was reviewed and the next plan of action disseminated to the research assistants. The data collected was checked for completeness and accuracy in the field. Serial number was assigned to each questionnaire for easy identification, daily cleaning and editing of data collated from the field was done, and entered into the computer . The investigator monitored the progress of the interviews and daily held review meetings at the beginning and at the end of each day's interview.

3.13 Data Analysis and management

All the administered questionnaires was checked one by one and they were edited for the purpose of completeness and accuracy. Serial number were written on the questionnaires for easy identification and recall of any instrument without problems. Serial number was assigned to each questionnaire for identification and for correct data entry and analysis. The processing of the data were sifting, sorting, collection and scoring of questionnaires. A coding guide was developed after carefully reviewing the responses and appropriate scoring done. The data was manually coded and entered into the computer for analysis.

The questionnaires were stored in a place that was safe from destruction of water or fire or where unauthorized people have no access to them. The coded quantitative data was entered into the computer and subjected to descriptive and inferential statistics. The data were analysed using descriptive statistics (i.e. mean, median) and inferential statistics (i.e. bi-variate and multivariate analysis, Chi- square, t-test, and ANOVA) with the level of significance set at 0.05. The information obtained were summarised and presented in tables. The Knowledge variable was scored: The questionnaire comprises of 30 knowledge questions and 12 attitude questions. Each question was scored with a mark. Participant who scored >19 was good knowledge, 10-19 as fair and <10 as poor knowledge respectively.. The scores were then sum up to give a composite knowledge score for each respondent. Knowledge was categorized into, good, fair and poor. Knowledge of malaria treatment scores ≤5, >5-10 and >10 were categorised as poor, fair and good respectively. Attitude was measured on 24–point scale in which negative (0 -11) or positive (>11-24) respectively.

3.14 Ethical Considerations

The recruitment of respondents was based on their permission. Informed consent was obtained after explaining to each PHC worker that the data will be used for research purpose, kept confidential and the participation was voluntary. Respondents were also educated on the potential benefits of the research to the local Ido community. Respondents

were given the choice to withdraw their consent freely whenever they feel to get out of the study. To maintain respondents' confidentiality during and after the collection of data, data were kept in a secured place where public access to it was restricted. The names of the respondents were not recorded in the questionnaire in order to ensure anonymity.

3.15 Limitation of the study.

Some of the participants were not willing to provide information required by the researcher at the initial stage because of the fear of their job as the study may be used for evaluation. Efforts were however made to reduce this problem by assuring them of the confidentiality of information provided and that ministry of health would not be involved in the study. It was also revealed that the outcome of the study would not be used to institute punitive measures against anyone.

CHAPTER FOUR

RESULTS

The findings from this study are presented in this section. They are organized into the following five sections: Respondents' socio-demographic characteristics; respondents' training and general knowledge of malaria; respondents' malaria management practices of underfives in respect to malaria treatment, Appropriate treatment for malaria and attitude towards the use of ACT in the treatment of malaria.

4.1 Socio-demographic Characteristics

Most of the respondents were females (80.4%) while 19.6% of the respondents were males. The ages of the respondents ranged from 22 to 59 years with a mean of 39.5±8.5years. 92.0% were married while 8.0% were singles. Respondents were predominantly Christians (81.3%) and 18.7% were Moslems. All the respondents were of Yoruba origin. As regards the years of working experience in the field of health, most of the respondents have worked between 11-19 years (50.0%). The cadre of respondents shows that most of the respondents are community health workers (57.1%). The respondents highest level of Education completed was Diploma in Health Technology (63.4%) (Table 4.1).

Table 4.1: Respondents' sociodemographic characteristics (N = 112)

Sociodemographic characteristics	n	%
Sex		
Male	22	19.6
Female	90	80.4
Marital status		
Married	103	92.0
Never married	9	8.0
Years of working experience in PHC		
0-10	42	37.5
11-20	56	50.0
21and above	14	12.5
Current cadre		
Medical Doctor	1	0.9
Nurses	16	14.2
Community Health Officers	28	25.0
Community Health Extension Workers	36	32.2
Medical Record Officer	1	0.9
Health Assistants	30	26.8

Table 4.2: Comparative Analysis of Respondents attendance at any Training Programme Relating to New Guidelines for Malaria Treatment.

Comparative analysis of respondents' attendance at any training programme relating to new guidelines for malaria treatment revealed that the more senior PHC workers (doctor, nurses etc) had a significantly higher attendance for training programmes ($p = 0.000$) than the lower cadre PHC workers (0.0%). The comparative analysis of res;pondents shows that those in the higher cadre attend training Programmes more than those in the lower cadre. (Table 4.2).

Table 4.2: Comparative Analysis of Respondents' Attendance at any Training Programme Relating to New Guidelines for Malaria Treatment

Cadre	Yes n (%)	No n (%)	Total n (%)	X^2	P-Value
Medical Doctor	1 (100)	0 (0.0)	1 (100)	43.04	0.000
Nurses	13 (75.0)	3 (25.0)	16 (100)		
Community Health Officers	19 (67.9)	9 (32.1)	28 (100)		
Community Health Extension Workers	35 (55.6)	28 (44.4)	63 (100)		
Medical Record Officers	0 (0.0)	1 (100.0)	1 (100)		
Health Assistants	0 (0.0)	30 (100.0)	30 (100)		

4.3 Respondents' Knowledge about Malaria

(a) Overall Knowledge

Based on the 30-point knowledge scale for the assessment of malaria-related knowledge issues (cause, enabling factors, signs and symptoms, consequences/complications and treatment) respondents' overall mean knowledge score was 17.3 ± 3.22. Furthermore, The Knowledge variable was scored: The questionnaire comprises of 30 knowledge questions and 12 attitude questions. Each question was scored with a mark. Participants who scored >30 was good knowledge >11-20 was scored as fair knowledge while those who scored ≤ 10 was scored as poor knowledge score. The score were then summed up to give a composite knowledge score for each respondent. based on the knowledge score range 0-10, 11-20, 21 and above points described as low, average and high respectively, the overall, majority (82.2%) had average knowledge scores while few (15.6%) had high and only 2 (2.2%) had low knowledge scores.

(b) Knowledge by Professional Cadre

Individual knowledge scores of the different professional cadre are presented in Table 4.3, No significant difference exist in the knowledge scores of the various PHC workers (p = 0.592).

(c) Knowledge by Demographics

Table 4.4 compares the differences in Knowledge scores between the dermographic variables. Knowledge scores were found to be slightly higher in female than male respondents (17.5 ± 3.29 vs 16.5 ± 2.85). Also, respondents with >21 years of experience scored higher than the other respondents with lesser years of experience. However, no significant difference exist in the mean values of all the variables (p = 0.473).

(d) Knowledge on Causation

All the respondents (100%) said malaria is transmitted through the bite of mosquitoes. Almost all the respondents (94.6%) knew that malaria is a parasitic infection.

(e) Knowledge of Signs and Symptoms

Three major signs and symptoms were the most mentioned by the respondents comprising headache (90.2%), loss of appetite (77.7%) and body pains (71.4%). Surprisingly, only 14.3% listed high temperature as a symptom of Malaria (Table 4.5).

(f) Knowledge of Complications

Table 4.6 reveals that most respondents did not know the likely complications of malaria. Convulsion (72.3%), anaemia (63.4) and death (58.0%) were mostly listed as complications of malaria. Less than a third of the respondents considered jaundice (27.7%), cerebral malaria (25.0%) and convulsion (27.7%) as complications of malaria (Table 4.6).

(g) Knowledge on Vulnerable Groups to Malaria

A large percentage of the respondents (68.8%) believed that the most vulnerable groups to mlaria were pregnant women followed by underfives (57.1%). A large percentage of the respondents (47.3%) rightly reported that the transmission of malaria is high during raining season while 23.2% and 29.5% wrongly reported that transmission is higher during the dry season and anytime of the year respectively. Majority of the respondents (68.8%) were of the view that poor drainages facilitate the transmission of malaria while 56.2% felt that improper disposal of waste facilitates the transmission of malaria.

(h) Knowledge about Antimalarial Treatment Policy

Slightly more than half of the total number of respondents (54.5%) was not aware of the national treatment guideline for malaria. More than half (53.3%) of this 54% got to know about the National Treatment Guideline for malaria through training programmes/seminars attended while 33.3% got to know about the National Treatment guideline for malaria through professional colleagues .

Table 4.3: Respondents' Knowledge by Professional Cadre

Cadre	Knowledge Score X ± SD	F-value	p-value
Medical Doctor	19.0 ± 1.23	0.746	0.592
Nurses	19.5 ± 3.54		
Community Health Officer	18.7 ± 2.16		
Community Health Extension Workers	18.5 ± 1.92		
Medical Record Officer	16.9 ± 3.07		
Health Assistants	16.3 ± 3.15		

Table 4.4: Comparison of knowledge scores in the socio-demographic variables of respondents

Variable	Knowledge Score X ± SD	t-value	p-value
Sex			
Male	16.5 ± 2.85	-1.01	0.315
Female	17.5 ± 3.29		
Training			
Yes	17.3 ± 3.25	0.03	0.974
No	17.3 ± 3.23		
Years of Experience			
1-10	17.3 ± 3.67	0.755	0.473
11 – 20	17.0 ± 2.88		
21 and above	18.4 ± 3.04		

Table 4.5: Respondents' knowledge on signs and symptoms of malaria (N= 112)

Signs and Symptoms of Malaria	Response	
	Yes (%)	No (%)
Headache*	101 (90.2)	11 (9.8)
Loss of appetite*	87 (77.7)	25 (22.3)
Joint pains (body pains)*	80 (71.4)	32 (29.6)
Shivering*	51 (45.5)	61 (55.5)
Stomache ache	17 (15.2)	95 (84.8)
Vomiting*	17 (15.2)	95 (84.8)
High temperature*	16 (14.3)	96 (85.7)
Diarrhoea	10 (8.9)	102 (91.1)
Cold*	5 (4.5)	107 (95.5)
Convulsion*	3 (2.7)	109 (97.3)
Insomnia	1 (0.9)	111 (99.1)

Appropriate answers*

Table 4.6: Respondents' knowledge on the complications of malaria (N = 112)

Complications of Malaria	Responses	
	Yes (%)	No (%)
Convulsion*	81 (72.3)	31 (27.7)
Anaemia*	71 (63.4)	41 (36.6)
Death*	65 (58.0)	47 (42.0)
Jaundice*	31 (27.7)	81 (72.3)
Cerebral Malaria*	28 (25.0)	84 (75.0)
Dehydration*	26 (23.2)	86 (76.8)
Vomiting*	1 (0.9)	111 (99.1)

Appropriate answers*

Table 4.7: Responses on how respondents knew about the national treatment guideline for malaria treatment (N = 60)

Ways respondents got to know about the National Treatment Guideline for malaria treatment.	Yes (%)	No (%)
Through training Programme/Seminars	32 (53.3)	28 (46.7)
Through Professional Colleagues	20 (33.3)	40 (66.7)
Through the Television	3 (5)	57 (95)
Through Policy Documentation	2 (3.3)	58 (96.7)
Through Posters	2 (3.3)	58 (96.7)
Through the News Papers	1 (1.7)	59 (98.3)

4.4 Attitude towards the Use of ACTs in the treatment of Malaria

The mean attitudinal score of respondents was 16.3±4.1 and most (89.3%) had a positive attitude towards the use of ACTs in the treatment of malaria. Although medical doctors were found to have the highest attitudinal score (17.5 ± 3.2), there was no significant difference in the attitudinal scores among the PHC professionals ($p>0.05$) (Table 4.8). All the respondents except one (111; 98.2%) agreed that ACTs are most effective in the treatment of malaria and 92.9% agreed that ACTs should always be used in the treatment of malaria. Majority of the respondents (92.9%) agreed that all PHC workers should adhere to the new ACT treatment guideline. However, over a third (38.8%) agreed that Chloroquine is still useful as a choice drug for the treatment of malaria in Nigeria (Table 4.9).

Table 4.8: Atitudinal scores of respondents

Cadre	Mean Score	F-value	p-value
Medical Doctors	17.5 ± 3.2	0.875	0.576
Nurses	16.7 ± 4.5		
Community Health Officers	16.1 ± 3.7		
Community Health Extention Workers	16.2 ± 4.2		
Medical Record Officer	15.6 ± 3.2		
Health Assistants	14.8 ± 5.3		

Table 4.9: Attitude towards the use of ACTs in the treatment of malaria (N=112)

Statement	Agree (%)	Disagree (%)	Undecided (%)
ACT drugs are too costly for patients to afford, therefore PHC workers should not prescribe them all the time.	25 (23)	87 (77)	0 (0.0)
ACTs are most effective in the treatment of malaria.	111 (98.2)	1 (0.9)	0 (0.0)
The shift to the use of ACT in treating malaria is a good thing.	106 (92.9%)	6 (5.3)	0 (0.0)
All PHC workers should adhere to the new ACT treatment guideline	106 (92.9)	6 (7.1)	0 (0.0)
PHC workers should not give ACTs to patients because patients complain of side effects as a result of ACTs usage	8 (7.6)	91 (87.5)	5 (4.9)
PHC workers should prescribe non ACT drugs because compliance with the ACT dosage regimen is difficult.	8 (7.27)	99 (90)	3 (2.73)
ACTs are more cost effective in the management of uncomplicated malaria.	77 (68.75)	29 (25.89)	6 (5.36)
There is no need prescribing ACT drugs since ACTs are usually not available at PHC centers, it is better not to prescribe them for the management of malaria.	19 (16.96)	91 (81.25)	2 (1.79)
It is difficult for health workers in PHC centers to prescibe ACT drugs as they are still not familiar with them.	14 (12.5)	92 (82.14)	6 (5.36)
ACTs should always be used in the treatment of malaria as they have minimal side effects.	106 (92.9)	6 (7.1)	0 (0.0)
The shift from the use of chloroquine to ACTs in the management of uncomplicated malaria is a most effective way of eliminating malaria parasites in patients.	98 (87.5)	10 (8.9)	4 (3.6)
Chloroquine still useful as a choice drug for the treatment of malaria in Nigeria.	43 (38.3)	69 (61.7)	0 (0.0)

4.5 Malaria Management Practices for Underfives

(a) Diagnosis of Malaria

Tables 4.10 – 4.12 presents comparative analysis of the modes by which PHC workers in the different cadres make diagnosis for malaria**.** There were no significant differences in the modes of diagnosing malaria among the respondents ($p > 0.05$). Generally, about half of the respondents (47.5%) reported that malaria was diagnosed in the PHC clinics through self examination of patients while 30.6% followed by complaints from the mother/caregiver and only 14.2% reported diagnosis of malaria through laboratory testing.

Concerning under-fives, less than half of respondents collected information on child's illness regarding vomiting (46.4%) and fever/high temperature (45.5%) among other important information.

A significant association was found between PHC workers' knowledge and prescription prevalence of ACTs ($p = 0.031$) in which prescription prevalence increased with knowledge categories. Table 4.13.

The relationship between PHC's attitude and prescription practice of ACTs. Health workers with positive attitude significantly prescribed more ACTs than those with negative attitude (81.0% vs 33.3%; $p = 0.001$). Table 4.14.

Worse still, only 5 respondents (4.5%) carried out physical examination of underfive children; 14 (12.5%) collected information on when illness started and 6 (5.4%) on previous drug history among other important information (Table 4.15).

(b) Pattern of Malaria Treatment and Prescription

A few of the respondents (36.6%) reported that the last time they treated malaria was three days preceding the research interview while 31.1% said they treated malaria everyday (Table 4.16). The prevalence of prescription of ACTs and specifically for Artemether/Lumefantrine among the PHC workers regarding ACTs are as shown in Tables 4.17 and 4.18 respectively. Respondents' cadres did not significantly influence the prescription of ACTs ($p = 0.369$).

A large percentage of the respondents (95.5%) reportedly used ACTs as the first line of drug for the treatment of uncomplicated malaria (Table 4.19). However, more than half of

respondents wrongly practised the prescription of Coartem in the treatment of uncomplicated malaria for under-fives (53.1% for 15-24kg weight category; 55.1% for 5-14kg weight category), and for adults (73.6%) (Table 4.18). Respondents' years of experience did not influence their prescription practices regarding ACTs (Table 4.19).

(d) Respondents' Approach to reducing Fever in febrile Underfive Children

Respondents methods of reducing fever in febrile children are as shown in Table 4.20; only about half of respondents (50.1%) reported tepid-sponging as a method of reducing fever in febrile children.

(e) Respondent reasons for changing from the Old Line of malaria treatment to ACTs

Table 21 shows the reasons why the respondents shifted from the old line of malaria treatment to the new. Majority stated that it is because the old drugs were no longer effective as they use to be (35.2%) and because the old drugs were posing problems of drug resistance. A large proportion of the respondents (54.8%) opined that Chloroquine injection is no longer effective in the management of malaria (Table 4.22).

(f) Reported Follow-up treatment by Respondents

Few respondents (16.1%) asked mothers/caretakers of the children treated to bring them back for review after the treatment given while only 3.6% told mothers to give their children lots of fluids. Furthermore, 33.0% and 19.6% of respondents advised caregivers to take good care of the environment and make sure that children sleep under ITNs respectively. Only a few respondents (16.1%) asked patients to come back review (Table 4.23).

Table 4.10: Comparison of Diagnosis of Malaria among Respondents Using Laboratory Test

Cadre	Diagnosis of Malaria by Laboratory Test			X^2	P-Value
	Yes (%)	No (%)	Total (%)		
Medical Doctor	1 (100)	0 (0)	1 (100)	12.970	0.225
Nurses	4 (17.8)	12 (82.2)	16 (100)		
Community Health Officer	8 (28.6)	20 (71.4)	28 (100)		
Community Health Extention Worker	6 (16.7)	30 (83.3)	36 (100)		
Medical Record Officer	1 (100.0)	0 (.0)	1 (100)		
Health Assistants	6 (20.0)	24 (80.0)	30 (100)		

Table 4.11: Comparison of diagnosis of malaria among Respondents using self examination

Cadre	Diagnosis of Malaria by Examination				
	Yes (%)	No (%)	Total (%)	X^2	P-Value
Medical Doctor	1 (100)	0 (0)	1 (100)	13.282	0.208
Nurses	15 (93.3)	1 (6.7)	16 (100)		
Community Health Officer	19 (67.9)	9 (32.1)	28 (100)		
Community Health Extention Worker	26 (72.2)	10 (27.8)	36 (100)		
Medical Record Officer	1 (100.0)	0 (.0)	1 (100)		
Health Assistants	25 (73.3)	5 (26.7)	30 (100)		

Table 4.12: Comparison of Diagnosis of Malaria among Respondents through History taking

Cadre	Diagnosis through History Taking			X^2	P-Value
	Yes (%)	No (%)	Total (%)		
Medical Doctor	0 (0)	1 (100)	1 (100)	6.525	0.769
Nurses	0 (0)	16 (100)	16 (100)		
Community Health Officer	0 (0)	28 (100)	28 (100)		
Community Health Extention Worker	0 (0)	36 (100)	36 (100)		
Medical Record Officer	0 (.0)	1 (100.0)	1 (100)		
Health Assistants	1 (6.7)	29 (93.3)	30 (100)		

Table 4.13: The relationship between PHCs' knowledge and prescription practices for ACTs.

Table 4.13: Association between PHC's knowledge and prescription practice of ACT

Knowledge Category	**Prescription of ACTs**			
	YES № (%)	**NO № (%)**	**X^2**	**p-value**
Low	0 (0.00)	2 (100.0)	11.07	0.031*
Average	80 (86.7)	12 (13.3)		
High	16 (88.9)	2 (11.1)		
Total	96	16		

Table 4.14: Association between PHC's Attitude and prescription practice of ACT

Attitude	Prescription of ACTs			
	YES **№ (%)**	**NO** **№ (%)**	**X^2**	**p-value**
Positive Attitude	81 (81.0)	19 (19.0)	34.06	0.001*
Negative Attitude	4(33.3)	8 (66.7)		
Total	85	27		

Table 4.15: Information reportedly collected concerning the childs illness (N = 112)

Information collected concerning the childs illness	Response	
	Yes (%)	No (%)
The child was vomiting	52 (46.4)	60 (53.6)
The child had fever/high temperature	51 (45.5)	61 (54.5)
The child had loss of appetite	47 (42.0)	65 (58.0)
Asked if the child has headache	19 (17.0)	93 (83.0)
Asked of the childs age	15 (13.4)	97 (86.6)
Asked if the child was weak	14 (12.5)	98 (87.5)
Asked the mother/caretaker when the illness started.	14 (12.5)	98 (87.5)
Asked if the child has cold	8 (7.1)	104 (92.9)
Asked of the drugs that had been given to the child.	6 (5.4)	106 (94.6)
Asked of the childs name.	5 (4.5)	107 (95.5)
Took the physucal Examination of the child.	5 (4.5)	107 (95.5)
Asked if the child convulsed	5 (4.5)	107 (95.5)
Asked if the child is shivering	4 (3.6)	108 (96.4)
Asked the mother if the child is less playful	4 (3.6)	108 (96.4)
Asked of the childs sex	3 (2.7)	109 (97.3)
Asked if the child had anaemia	2 (1.8)	110 (98.2)
Asked if the child has running nose	2 (1.8)	110 (98.2)
Asked the mother if they have a good drainage in their area	2 (1.8)	110 (98.2)
Asked if the mother uses ITN for the child	1 (0.9)	111(99.1)

Table 4.16: Last time respondents treated malaria in their PHC clinics

Variable	n	%
Everyday	5	31.1
One day preceding interview	15	13.4
Two days preceding interview	3	2.7
Three days preceding interview	41	36.6
Seven days preceding interview	8	7.1
30 days preceding interview	10	8.9

Table 4.17: Prescription of ACTs by Respondents as a Firstline Drug Given to Children Under 5 Years in the PHC Clinics

Cadre	Prescription of ACTs Yes (%)	No (%)	Total (%)	X^2	P-Value
Medical Doctor	1 (100)	0 (0)	1 (100)	10.955	0.361
Nurses	10 (60.0)	6 (40.0)	16 (100)		
Community Health Officer	17 (60.7)	11(39.3)	28 (100)		
Community Health Extention Worker	22 (61.1)	14 (38.9)	36 (100)		
Medical Record Officer	0 (.0)	1 (100.0)	1 (100)		
Health Attendants	20 (85.0)	10 (15.0)	30 (100)		

4.18: Prescription of Artemether/Lumefantrine by Respondents as a First line Drug Given to Children Under 5 Years in the PHC Clinics.

Cadre	Prescription of Artemether Lumefantrine			X^2	P-Value
	Yes (%)	No (%)	Total (%)		
Medical Doctor	1 (100.0)	0 (0)	1 (100)	9.40	0.495
Nurses	6 (40.0)	10 (60.0)	16 (100)		
Community Health Officer	10 (35.7)	18 (64.3)	28 (100)		
Community Health Extention Worker	23 (63.9)	13 (36.1)	36 (100)		
Medical Record Officer	0 (0.0)	1 (100.0)	1 (100)		
Health Attendants	8 (20.0)	22 (80.0)	30 (100)		

Table 4.19: Reported first line drug for malaria treatment (N = 112)

Types of antimalarial drugs used by respondents in treating the underfive children	N	%
ACTs*	107	95.5
Sulphadoxine Pyrimethamine	15	13.4
Chloroquine	3	2.7
Paracetamol	1	0.9

Appropriate answer*

Table 4.20: Responses on specific treatments rendered for uncomplicated malaria in Undefives (N = 49)

Prescription given to a child less than 5 years old (Weight Specific)	Yes (%)	No (%)
Coartem- 15-24kg: give 2 tabs 2x daily for 3 days.*	23 (46.9)	26 (53.1)
Coartem- 5-14kg: 1 tab twice daily for three days. *	22 (44.9)	27 (55.1)
Give drugs and injection according to their ages	3 (6.1)	46 (93.9)
Give Paracetamol 3 times daily for three days	1 (2.0)	48 (98.0)

Appropriate answers*

Table 4.21: Association between years of experience and prescription of ACT in underfives

Years of working experience	Prescription of ACTs		X^2	P-value
	Yes (%)	No (%)		
1-10	28 (66.7)	14 (33.3)	3.27	0.352
11 – 20	31 (55.4)	25 (44.6)		
21 and above	10 (71.4)	4 (36.4)		

Table 4.22: Respondents' approach to reducing fever in febrile children (N = 133)

Methods of reducing fever in febrile children	Response Yes (%)	No (%)
By tepid- sponging	67 (50.1)	66 (49.9)
By exposing the child to fresh air	22 (16.5)	111 (83.5)
By giving Paracetamol	16 (12.0)	117 (88.0)
By using insecticide treated bednets	13 (9.7)	120 (90.3)
By giving cold bath	7 (5.3)	126 (94.7)
By cleaning the environment	3 (2.3)	130 (97.7)
By taking the child's temperature	2 (1.5)	131 (98.5)
By giving the mother on Health education	2 (1.5)	131 (98.5)
By cutting the bushes around the house	1 (0.8)	132 (99.2)

Table 4.23: Respondents' reasons for the shift from the old line of malaria treatmesnt to the new line of treatment (N = 54)

Reasons	n	%
The old line of treatment was no longer effective	19	35.2
There was drug resistance	17	31.4
Through research.	9	16.6
The old one had lots of side effects	2	3.6
Many parents disallowed it	1	1.9
It leads to tiredness in some people.	1	1.9
It itches.	3	5.6
Causes blurred vision.	1	1.9
Causes body weakness.	1	1.9

Table 4.24: Respondents opinions about antimalarial drugs that are not effective (N=73)

Antimalarial drugs that are no longer effective	n	%
Chloroquine injection	4	54.8
Daraprim	11	15.1
Chloroquine Tablet	5	6.8
Paladrine	5	6.8
Fansidar	8	11.0
Camoquine	2	2.7
Maloxine	1	1.4
Paracetamol	1	1.4

*Multiple responses given

Table 4.25: Follow-up advice given by respondents to mothers/caregivers after treating the child (N = 112)

*Follow-up advise	n	%
Take good care of the environment	37	33.0
Let child sleep under insecticide treated bed net	22	19.6
Come back for review	18	16.1
Tepid-sponge the child if he/she has fever	15	13.4
Ensure that the child take all the medicines as recommended	14	12.5
Give blood tonic to the child	11	9.8
Reassured the mother that the baby will be alright	7	6.2
Give the child lots of fluid	4	3.6
Ensure that their drainage is kept clean	3	2.7
Bring back the child if there is adverse reaction to the drugs given	2	1.8
Notify the clinic if there is is no improvement	1	0.9

*Multiple responses included

TEST OF HYPOTHESES

Hypothesis 1: There would be no significant association between respondents' years of experience and prescription of ACT in underfives in the management of malaria in Ido LGA.

There is no significant association between PHC workers' years of experience and the prescription of ACT in underfives in the management of malaria. All (100%) workers with more than 31 years of experience prescribed ACT in underfives. No significant association exist between PHC workers' years experience and prescription of ACTs (p=0.352). Therefore the null hypothesis was accepted.

Table 4.26: Association between years of experience and prescription of ACT in underfives

Years of working experience	**Prescription of ACTs in under-fives**	
	YES **№** (%)	NO **№** (%)
1 – 10	28 (66.7)	14 (33.3)
11 – 20	31 (55.4)	25 (44.6)
21 – 30	7 (63.6)	4 (36.4)
> 31	3 (100.0)	0 (0.0)
Total	69 (61.6)	43 (38.4)

$X^2 = 3.27$
P-value = 0.352

Hypothesis 2: There would be no significant association between the respondents' cadre and prescription of ACT in under-fives in the management of uncomplicated malaria in Ido LGA.

There is no significant association between respondents' cadre and prescription of ACT in underfives (p= 0.669). Therefore the null hypothesis was accepted. The clinical workers (53.3%), community health workers (60.9%) and other cadre of PHC workers 66.7%) did not significantly differ in prescribing ACTs in the management of under-fives with uncomplicated malaria.

Table 4.27: Association between cadre and prescription of ACT in underfives

Respondents cadre	**Prescription of ACT in underfives** YES № (%)	NO № (%)
Nurses	9 (53.3)	7 (46.7)
Community Health workers	39 (60.9)	25 (39.1)
Others	22 (66.7)	11 (33.3)
Total	69 (61.6)	43 (38.4)

$X^2 = 0.80$
P-value = 0.669

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

This chapter focuses on the discussion of the findings of this study. It starts with the discussion of the socio-demographic characteristics of the respondents, followed by Training Experience of Respondents on Malaria, Respondents' Knowledge on Malaria, Attitude Towards the use of ACT in the Treatment of Malaria, Malaria diagnosis and management Practices for Underfives and influences of Years of Experience and factors affecting the prescription of ACTs. The implications of the findings for health education are also discussed in this chapter. The chapter ends with conclusion and evidence based recommendations.

5.1 Respondents' Socio-Demographic Characteristics.

In this study, majority of the respondents was between 22 to 59 years with a mean of 39.5±8.5years. This was in agreement with a study conducted in Jos by Bello et.al in 2013 where they found out that the mean age of the respondents in their study was 40.0±8.1. This indicated that most of the respondents in this study were adults. Majority (80.4%) of the respondents in this study were females which agrees with findings of Bello et.al (2010) which reported 89% females PHC workers. This is not surprising as females constitute a large proportion of the health workers in Nigeria (Bozdech et al, 2003). Specifically, the practice of nursing in Nigeria is dominated by females (Adetunji et al, 2008). Female nurses therefore have unique roles to play in the mobilization of fellow women for impacting knowledge on malaria and improving the management of malaria management practices at the community level.

From this current study, the cadre of respondents shows that most of the respondents are community health workers (57.1%). This is in disparity with the study of Bello et.al (2010) where CHO were just 8.7%. All the respondents were of Yoruba origin and this is expected since the study area is an indigenous part of Ibadan and the respondents are also expected to be indigens of Ibadan. Also from this study, over half of the respondents

(52.7%) had never attended a training session on malaria in the past five years. This is supported in another study by Bello et.al (2010). They reported in their study that, about 70% of respondents had not had any training on malaria case management while only about 4% of those who had been trained received such training within 6 months prior to the commencement of the study.

5.2 Respondents' Knowledge about Malaria

From this study, all the respondents (100%) said malaria is transmitted through the bite of mosquitoes. This is in line with another study where 99.1% of their own respondents were able to identify mosquito as the vector Bello et.al (2010). The three major signs and symptoms mentioned by the respondents in this study comprising headache (90.2%), loss of appetite (77.7%) and body pains (71.4%). These percentages were high and the findings were corroborated by Bello et.al (2010). They reported that about 98% of respondents were able to list main symptoms of malaria.

Convulsion (72.3%), anaemia (63.4) and death (58.0%) were mostly listed as complications of malaria were the three major complication listed by the respondents in this study. It was reported in another similar study that some respondents (6.7%) considered severe malaria to be that form of malaria, which occurs in neonates. Nearly, 80% of the respondents in that study were however, able to identify symptoms of severe malaria. Differential diagnosis for malaria was considered to be typhoid fever (47.6%) and measles (16.2%), while about 24.8% of health workers from the said study listed various ailments ranging from diarrheal disease to seizure disorders Bello et.al (2010). From this study, majority (68.8%) of the respondents reported that the most vulnerable groups to malaria were under fives. This took the second highest on the respondents scale and this corroborates the findings of the WHO (2003). This further buttresses that the health care workers had not been attending periodic trainings on issues related to malaria and for the few that attended; their attention was perhaps divided thereby leading to misinterpretations of trainings given.

From this study, majority (82.2%) of the respondents had average knowledge on appropriate treatment for malaria. This is in contract with the reports from different studies. Health workers at the primary level of care have generally been described as having good knowledge on appropriate treatment for malaria as shown by the survey of knowledge and management of malaria in under-fives among PHC workers in Ibadan, where it was observed that general knowledge of malaria was good with workers demonstrating good knowledge of several of the key components assessed by the researchers (Fawole and Onadeko, 2001). Similarly, a cross-sectional study of malaria treatment practices and perceptions in South East Nigeria also observed good knowledge among PHC workers (Onwujekwe et.al, 2009). Respondents had a good knowledge on the aetiology and mode of transmission of malaria. However, knowledge on the signs, symptoms and complications of malaria was only fairly adequate. Respondents' responses on the signs and symptoms of uncomplicated malaria were similar to those documented by Fawole and Onadeko (2001) Fawole, Madubuike (1997) and Oladepo et.al, (2010).

5.3 Attitude towards the Use of ACTs in the treatment of Malaria

Majority (98.2%) of the respondents in this study agreed that ACTs were most effective in the treatment of malaria. This is in disagreement with Bello et.al (2010) because they reported a lower percentage. Health worker pattern of anti-malarial use was determined in their study, and they found that, 38% of respondents prescribed artemisinin combination treatment (ACT), while about 30% prescribed chloroquine (CQ); about 32% of respondents prescribed any available anti-malaria. Majority (92.9%) of the respondents agreed that all PHC workers should adhere to the new ACT treatment guideline. This is in line with previous studies. Nigeria has a national policy on diagnosis and treatment of malaria, which is a necessary accompaniment to effective case management (Federal Ministry of Health, 2005). It adopted the RBM strategic framework on case management in 2006 and was updated in 2010 (World Health Organisation, 2010 and Federal Ministry of Health, 2010). The policy spells out the recommended guidelines for case management

ranging from clinical and laboratory diagnosis, treatment and prevention. However, the workers generally have a good attitude towards this new trend of malaria management.

5.4 Malaria Management Practices for Underfives

From this study, about half of the respondents (47.5%) reported that malaria was diagnosed in the PHC clinics through self examination of patients while 30.6% followed by complaints from the mother/caregiver and only 14.2% reported diagnosis of malaria through laboratory testing. This was slightly different from the previous studies accessed. Self examination of patients is also a way of determning whether a patient has malaria or not and this is done by mere asking of questions from the patient but this is not enough to confirm diagnosis as typhoid fever also has the same symptoms as that of malaria and malaria can be mistaken for typhoid. Chandramohan in 2002 reported that malaria diagnosis was based on a presenting symptom of fever in 69.1% of cases and based on laboratory test in 29.1% of cases in his study. The diagnosis of malaria based on fever algorithms is the recommended mode of diagnosis in malaria case management of under-fives among PHC workers in Nigeria as advocated for in highly endemic countries with poor laboratory support. (Federal Ministry of Health, 2009). Laboratory diagnosis has been documented as the best confirmatory test to use for the detection of malaria parasites in both children and adults. In WHO's news release (2010), it was clearly stated that the guidelines for treatment and procurement of medicines should be based on the Laboratory Test confirmation done as laboratory diagnosis can improve rational provision of malaria treatment services, but the result shows that only few PHC workers (14.2%), actually use laboratory diagnosis in diagnosing patients that complain of having malaria in their PHC centres. This could be as a result of non-availability of laboratory centres in most of these PHCs which made accessibility a problem for most patients.

Findings from this study revealed that majority (95.5%) of the respondents reportedly used ACTs as the first line of drug for the treatment of uncomplicated malaria. This is contrary with the similar study carried out in Sokoto. The researchers claimed that, in the

review of case management among PHC workers in Sokoto, 86.2% of respondents commonly prescribe CQ as the first line drug and 4.6% prescribe ACT's with wrong drug dosages in 63.6% of the time (Umar and Abdulkareem, 2008). In this current study, 30% of workers still use only CQ as first line drug, while 32% will use any available antimalarial. Similarly, Fawole and Onadeko (2001) in a study among health workers in primary health centers in Ibadan reported that the treatment practices by healthcare workers were poor, as they prescribed chloroquine and paracetamol wrongly and most of them gave underdosage. It is important to note however that the use of ACT as at that time was not popular.

About half of the PHC worker reported that they would use tepid sponging to reduce fever in children while a surprising few would expose children to air. This shows that a number of the PHC workers were not knowledgeable on the simple methods used in alleviating malaria related fever. Respondents in this study claimed to have shifted from the old drugs because the old drugs were no longer effective as they use to be (35.2%) and because the old drugs were posing problems of drug resistance. A large proportion of the respondents (54.8%) opined that Chloroquine injection is no longer effective in the management of malaria. A malaria case management, which is effective, has been described as that which institutes complete anti-malaria treatment and provision of required support to a person with malaria-like symptoms within 24 h of the symptoms (World Health Organization; 2004). It involves a timely decision to treat either based on clinical or on parasitological diagnosis, accessibility of appropriate drugs, correct use of drugs and follow-up to detect treatment failure or referral to appropriate care centers. It is striking to know that only a very few PHC worker instruct mothers/caregivers to bring their children back for review after treatment. Hence, when drugs are prescribed to most children in the PHCs, mothers and caretakers hardly took them back to the PHCs for follow up. This is not good enough because often times the children may need close supervision and this might not be known to the mother/caretaker on time but when the children are taken back to the PHCs for review the neccessary corrections needed to be taken on the child will be done in due time.

In conclusion, the PHC workers at Ido LGA have an average knowledge of malaria, good attitude towards the prescription of the newly recommended ACTs and a poor prescription practice of ACTs in underfives. Higher cadre PHC workers such as doctors and nurses were found to have higher knowledge, attitude and better practices, however not to a level of statistical significance. The findings from this study on the assessment of malaria management practices among PHC Workers in Ido LGA indicates that there is a fairly adequate knowledge of the new malaria management practices and this cuts across all respondents regardless of their years of working experience and cadre. More than half of the workers had never attended any training programme on malaria and the new malaria treatment guideline in Nigeria. Malaria was mostly diagnosed through self examination of patients. Most of the PHC workers practised the use of ACTs in the management of malaria in under-fives. However, the ACTs were wrongly prescribed by majority of the PHC workers.

5.5 Implication of findings

The following are the findings from the survey that have several health education implications:

a) There is apparently need for educational intervention at Ido LGA of Oyo State and the same may be initiated across the other LGAs in Oyo State and perhaps nationwide.

b) Of major concern is the poor and inappropriate prescription practice of the PHC workers; most of the PHC workers prior to the study period wrongly prescribed ACTs to under-fives at the various PHC centres. This calls for an urgent measure in order to forestall further inappropriate practices and possible adverse effects of the drugs.

c) This study unveils the urgent need for adoption of health education strategies to train PHC workers. The Oyo State Ministry of Health in collaboration with the LGA executives and other stakeholders should establish an Health Education Board that will regularly organise and oversee training programmes and workshops on malaria for PHC workers. The training/workshop content needs to focus on updates and recent knowledge about malaria causation, diagnosis, signs and symptoms, new malaria treatment guideline in

Nigeria and the appropriate prescription of ACTs. The proposed Health Education Board should then ensure that this becomes a routine activity for all PHC workers so as to ensure best practices and protect the health of the people.

Health education interventions such as in-service training/workshop for health workers on Behavioural Change Communication (BCC) will be effective in bridging the gap in knowledge. The regulatory bodies for public health facilities in the State and Primary Health Care Centers should be mobilised to organise in-service training workshops for health workers in public and private health facilities. Three types of training will be found useful in this regard and there are: a one-day workshop for the policy makers and executives of the regulatory bodies for public and private health facilities in the state. The second will be 1-day training for health workers in the primary health facilities, while the third will be a 3-day workshop for all the health workers that attend to patients in the health facilities in the Primary healthcare centers in Oyo State.

Participants at the one-day workshop should include representatives of the State Ministry of Health, State Hospital Management Board, the Local Government Primary Health Care departments and executives of the regulatory bodies of private and public medical practices in the State. The training objective is to increase their awareness of the research main findings and decide on ways to ensure adherence to Malaria health policies in the state among health workers and health facilities, and review/development of implementation guidelines for the policy. The second objective is to produce monitoring plan of the implementation of the policies in the health facilities.

Topics to be discussed at the workshop should include update on the malaria health policy in Nigeria, the provisions of the policies, the review of implementation of the policy. Other proposed topics include increasing awareness of Malaria policies in Nigeria, enhancing the strategies for wide dissemination and implementation of the policy as well monitoring for its compliance at the health facility levels. The workshop should be delivered through discussions, brainstorming and group work. The topics listed above

should be discussed through presentations, while participants should be required to make contributions at group exercises that will follow the presentations. At the end of the workshop, a communiqué should be developed and signed off to, by all participants and should be widely disseminated among relevant stakeholders in the State and Primary Health care facilities.

Since the health workers like Doctor and Nurses displayed good knowledge of malaria and positive attitude to the use of Artemisinin Combination Therapy, 1-day training will be organised to addresss the updates on the recent malaria policy and this will be discussed in details. Durinmg the 1-day meeting, awareness will also be created on national policies supporting the use of ACTs.

The 3-day workshop on the other hand should have the objectives of updating health workers on recent ACT drugs for children and adults in general and the possible effects of giving over dose and under-dose of such drugs. The workshop will also discuss ensuring adequate Rapid Diagnostic Test (RDT) for each patient when they come for treatment and how the RDT can be done will be taught and also demonstrated to all the participants of the training session. The workshop will utilise a combination of methodologies such as presentations, lecturette, group work, brainstorming, visual aid, etc to discuss sessions on Malaria treatment updates and highlight practical situations of drug mis-use to the participants in the training session.

Good communication skills are vital requirement for health workers in providing quality services. Therefore, sessions on counselling and communication skills would be discussed extensively and health workers will be given the chance to demonstrate learning through practices with their patients. Malaria policy booklet will be produced and distributed in health facilities.

5.6 Conclusion

High cadre PHC workers such as doctors and nurses were found to have higher knowledge, attitude and better practices, however not to a level of statistical significance. Generally, this study revealed that majority of the health workers in Ido Local Government Area had a positive attitude towards the use of ACTs in managing uncomplicated malaria. However, respondents' knowledge was just fair and malaria management practices were poor. Respondents' knowledge about malaria, professional cadre and years of experience significantly influenced their prescription practices for ACTs in under five children.

5.7 Recommendations

The following recommendations are made to address the various findings from this research study:

1. As at the time of this study only one doctor and 16 nurses who participated in this study were employed as PHC workers in Ido LGA. There is a need for more senior cadre PHC workers' employment at the LGA.

2. Training programmes for PHC workers should be done regularly as this will improve their general knowledge on malaria and enable them to be familiar with the current mode of prescription of ACTs.

3. Supportive supervision during occasional visit to PHCs and inspection of the type of drugs used in these centres are important to know in order not to pose problem for those patronizing these health care facilities as the inspection team would inspect round the PHCs to know whether the drugs given to patients are those recommended to be used in the treatment of malaria or not.

4. Facilities to conduct laboratory tests on patients with malaria should be made available at the various PHCs and PHC workers should be educated and encouraged to conduct such alongside the self examination before treatment is given to patients.

5. Further studies may be carried out to identify determinants to availability and appropriate prescription of ACTs in both rural and urban Nigeria.

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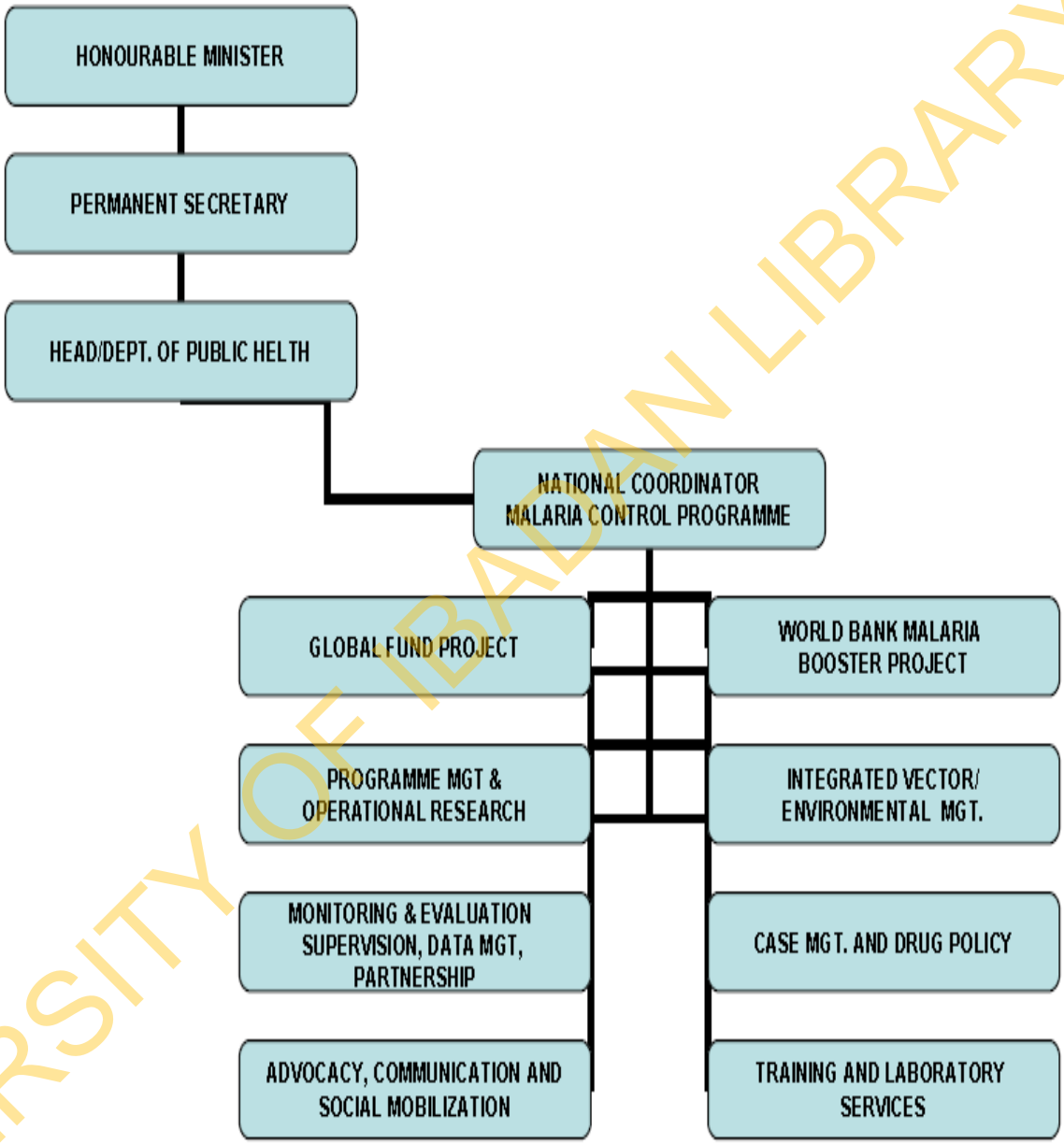
APPENDIX

Appendix : I

Malaria Fever Cases Reported in Oyo State in 2011

Malaria Fever Cases Reported	**Frequency**	**Prevalence in Overall Population Based on Age Category (%)**
In both underfives and 5+	413,050	6.47
In underfives only	213,182	3.34
In 5+ only	199,868	3.13
Pregnant women with malaria	5158	0.0812
Malaria Cases Treated with ACT	**Frequency**	**Prevalence in Overall Population Based on Age Category (%)**
In both underfives and 5+	190,205	2.98
Underfives	78,720	1.23
5+	111,485	1.747
Malaria Cases Diagnosed with Microscope	**Frequency**	**Prevalence in Overall Population Based on Age Category (%)**
In both underfives and 5+	4,674	0.00007
Underfives	1322	0.02072
5+	3352	0.052
Reported Cases of Severe Malaria	**Frequency**	**Prevalence in Overall Population Based on Age Category (%)**
Underfives and 5+	2071	0.032
Underfives	544	0.0085
5+	1527	0.02

APPENDIX II



Organogram for National Malaria Control Programme

APPENDIX III

ASSESSMENT OF KNOWLEDGE, ATTITUDE AND MANAGEMENT PRACTICES RELATING TO MALARIA AMONG PRIMARY HEALTHCARE WORKERS IN IDO LOCAL GOVERNMENT AREA, OYO STATE

INTRODUCTION: *I am a postgraduate student from the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan. I am carrying out a research on the topic above. Your honest answers to these questions will be useful in planning for appropriate ways in improving the Health of the people of this community. I assure you that the interview is voluntary and information derived from it will be solely used for research. Also your response to this interview will be taken as your consent for participation. Remember also that your name is not required in the interview. You are also free to ask questions about the study at any time.*

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

Please answer the following questions by completing the blank spaces or by ticking the options that concerns you in the boxes provided.

1. Sex 1.Male [ ] 2.Female [ ]

2. Age (as at last birthday) …….years

3. Marital status: 1. Married [ ] 2. Never married [ ] 3.Cohabiting [ ] 4. Separated [ ]

5. Divorced [ ] 6. Widowed [ ] 7. Others (Specify) ……..

4. Religion 1. Christianity [ ] 2. Islam [ ] 3. Traditional [ ] 4. Others (Specify) ……

5. Ethnicity 1.Yoruba [ ] 2.Igbo [ ] 3. Hausa 4. Others (Specify) …….

6. Years of working experience in the field of health …….

7. What is your current cadre

1. Medical Doctor [ ] 2. Nurse [ ] 3. Community Health Officer [ ]

4.Community Health Extention [ ] Others (Specify)

50……

8. Highest Level of Education completed 1.MBBS [ ] 2. RM [ ] 3.RN [ ]

4. Diploma in Health Technology [ ] 5.SSCE [ ]

Others……

SECTION B: TRAINING AND GENERAL KNOWLEDGE ON MALARIA

9a.Have you attended any training programme on the new guideline for malaria treatment?

9b.If yes, please answer this question?

Year of the programme	Organizers of the programme	Theme of the training

10. How many training sessions on management of malaria have you had in the last five years?

…….

. 11. How is malaria transmitted from one person to another? (Tick one correct answer)

1.Through the bite of mosquitoes [ ] 2.Through blood transfusion [ ] 3. From mother to baby in Pregnancy [ ] 4.Using the clothing of a malaria infected person [ ]

12.Malaria is a parasitic infection? 1.Yes [ ] 2.No [ ] 3.Don't know [ ](If no or don't know Q 12. Go to Q.14).

13.What is the name of the parasite that causes malaria infection?

……

14.Which vector is responsible for most of the malaria causes?

……

15.What are the signs and symptoms of malaria? (Tick all that apply)

1. Joint pains [ ]
2. Diarrhoea [ ]
3. Shivering [ ]
4. Headache [ ]
5. Stomache ache [ ]
6. Blurred vision [ ]
7. Loss of appetite [ ]

Others ……

16a. Is malaria a serious disease?1. Yes [ ] 2. No [ ]

16b. If yes, give reasons for your answer?

1……

2 ……

16c. If no. why?

1 ……

2 ……

17. Which of the following are complication(s) of malaria? (Tick all that apply) 1.Cerebral malaria [ ] 2.Convulsion [ ]3.Death[ ]4.Anaemia [ ]5.Dehydration [ ]6.Jaundice[ ]

Others (Specify) ……

18.Who are the most vulnerable groups to malaria? 1.Pregnant women [ ] 2.Under five[ ] 3.Children of different ages [ ] 4.Older women [ ] Others (specify)

……..

19. At what season of the year is malaria transmission mostly high?1.Rainy season [ ] 2. Dry season [ ] 3.Any time of the year [ ]

20. What factors facilitate the transmission of malaria? (You can tick more than one)

1.Poor drainages [ ] 2.Improper disposal of waste [ ] 3.Overgrown bushes [ ]

4.Improper use of antimalarial drugs [ ] Others (Specify) ……..

SECTION C: KNOWLLEDGE ON APPROPRIATE TREATMENT FOR MALARIA

21. Are you aware of the new National Guideline for malaria treatment?1.Yes [ ] No [ ]

(If yes, please continue and if no, go to Q27).

22. How did you get to know about the National Guideline for malaria treatment? Through:

1.Newspapers [ ] 2.Television [ ] 3.Professional colleagues[ ] 4.Training programme/Seminar [ ] 5.Policy documentation [ ]

23a. Based on the National Guideline for malaria treatment. What is the recommended first line medicine for the treatment of uncomplicated malaria?

……

23b. Please give the treatment prescription for the following:

(a) A child who is less than 5 years?

……

(b) A child less than 11 years?

……

(c) An adult?

……

24. What necessitated the shift from old first line of treatment to the new line of treatment?

……

……

25a. Are you aware that some antimalarial drugs are no longer effective in the treatment of malaria in Nigeria?

Yes [ ] No [ ] (if no, go to question 38)

25b. If Yes, please name all of such drugs

1……

2 ……

The questions below relate to malaria treatment, please indicate your response appropriately beside each question.

S/N	Statement	True	False
26.	Chloroquine is effective as choice of drug for the treatment of uncomplicated malaria in Nigeria.		
27.	Artemisinin based Combination Therapy (ACT) is the new drug of choice in the treatment of malaria in Nigeria.		
28.	The most effective anti-malaria drug recommended for sickle cell anaemia patient is proguanil		
29.	ACT (e.g coartem, larimal, artequine, dart) is the most effective drug for the treatment of malaria as at today.		
30.	The new antimalarial treatment policy specifically states that a health worker is to give Artemisinin Combination Therapy for the management of uncomplicated malaria cases		
31.	It is safe for women pregnant 3-6 months to take ACT.		
32.	Sulphadoxine Pyrimethamine (Fansidar,maloxine,amarlar e.t.c) is effective in the control of prevention of malaria.		
33.	The new antimalarial treatment policy states that the health workers is to give artesunate suppositories for pre-referral treatment.		

SECTION D: ATTITUDE TOWARDS THE USE OF ACTS IN THE TREATMENT OF MALARIA

S/N	STATEMENT	SA	A	SD	DA	U
34.	I consider ACT drugs too expensive for patients to afford, therefore PHC workers should not prescribe them all the time.					
35.	I consider ACTs more effective in the treatment of malaria.					
36a.	The shift to the use of ACT in treating malaria is a good thing.					
36b.	All PHC workers should adhere to the new ACT treatment guideline.					
37.	PHC workers should not give ACTs to patients because patients complain of side effects as a result of ACT usage.					
38.	PHC workers should not give ACTs to patients because compliance with the ACT dosage regimen is difficult.					
39.	ACTs are cost effective in the management of uncomplicated malaria.					
40.	There is no need prescribing ACT drugs since ACTs are usually not available at PHC centers, it is better not to prescribe them for the management of malaria.					
41.	It is difficult for health workers in PHC centers to prescribe ACT drugs as they are still not familiar with them.					
42.	ACTs should always be used in the treatment of malaria as they have minimal side effects.					
43.	I consider the shift from the use of Chloroquine to ACTs in the management of uncomplicated malaria as the most effective way of eliminating malaria parasites in patients.					
44.	I consider Chloroquine still useful as a choice drug for the treatment of malaria in Nigeria.					

SECTION E: MANAGEMENT PRACTICES OF UNDER FIVES WITH RESPECT TO MALARIA TREATMENT

45. Please indicate all the ways in which you make all the diagnosis of malaria in your PHC clinic? 1. Self examination of the patient [ ] 2.Laboratory test result [ ]
3. Complain from mother/caregiver [ ] 4. Others (specify)

……

46a.What is your first line drug in the treatment of malaria in children under five years? (Tick as appropriate). 1. Chloroquine [ ] 2.ACT [ ] 3.Sulphadoxine-Pyrimethamin [ ] (Fansidar, amalar, malaoxine) 4.Artemether Lumefantrine [ ] Others(Specify)

……

46b. What is the reason for your choice of drug in (Q46a)?
1.It is very cheap[ ] 2.It is easily available [ ] 3.Sulphadoxine-Pyrimethamine [ ] (Fansidar,amalar,maloxine) [ ] 4. It is subsidized by the Government [ ] Others(specify)

……

47. Has there been a change in the drug(s) used for the treatment of malaria in your PHC in the last two years?
1.Yes [ ] 2.No[ ] [If no go to 47c]
a) If yes, what is/are the reason(s) for the change?

……

b) What are the new drug(s) for malaria treatment in your PHC clinic?

……

c) If no to Q47. Why not?

……

The next set of questions refers to a child less than 5 years that you last treated for uncomplicated malaria.

48a.How long did you treat a child with malaria?

……..

48b.How old was the last child you treated for malaria?

……

48c.Was the child a male or a female? 1.Male [ ] 2.Female [ ]
48d. What information did you collect concerning the child's illness?
(1)……(2)……
(3)……(4)……
49. What drug(s) did you give the Child?

……
……
50. What dosage of the prescribed drug(s) did you recommend for the child?
……
……
51. After prescribing the drug(s) what other things did you do for the child or say to the person who brought the child for treatment?
1……
2……
52. Was the child brought back after the treatment given to him or her?
1. Yes [ ] 2. No [ ]
53. If yes, why?
……
……
54a. Do you always advice mothers/caretakers to bring back their children after they have been treated of malaria? 1. Always [ ] 2. Sometimes [ ]3.Never [ ]
54b. Give reasons for your answer?
……
55. What are the methods for reducing fever in febrile children?
……
……
56. How many times should ACT be given to underfive children in a day and for how long should it be given?
……
THANK YOU FOR YOUR TIME.