INFLUENCE OF SOCIAL FACTORS ON THE ADOPTION OF THE ROLL BACK MALARIA PROGRAMME AND MATERNAL HEALTH IN IBADAN, NIGERIA

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CERTIFICATION

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DEDICATION

I dedicate this work to:

God Almighty for the wisdom and knowledge granted me throughout this work and for making the completion of my doctoral programme a reality. I pray for more of YOUR guidance, blessings and success forever and ever. Amen.

And to my guardian angel, my one and only husband, 'Seun Addie, for his unrelenting correction in love, for his support in form of time, money and for editing my work. And also for his protective arm around me when I am discouraged. Thank you very much for being there.

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- Oluwakemi & Oluwafemi: My Wonderful Twins
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Kehinde Funmilayo Seun-Addie

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

FIGURES Page

TABLES

LIST OF ACRONYMS

1. NMCP - National Malaria Control Programme
2. RBM - Roll Back Malaria
3. NIMR - Nigeria Institute for Medical Research
4. MOH - Ministry of Health
5. FMOH - Federal Ministry of Health
6. GFATM - Global Fund for AIDS, Tuberculosis and Malaria
7. WHO - World Health Organization
8. ITNs - Insecticide Treated Net
9. LLIN - Long Lasting Insecticide Treated Net
10. EPI - Expanded Programme on Immunization
11. IPT - Intermittent Prevention Treatment
12. ACT - Artemisinin Based Combination Therapy
13. PHC - Primary Health Care Centre's
14. CCM - Country Coordinating Mechanism
15. ATM - AIDS Tuberculosis and Malaria
16. NMCC - National Malaria Control Committee
17. IRS - Indoor Residual Spray
18. CBO - Community Based Organization
19. USAID - United State Agency for International Development
20. DFID - British Department
21. CIDA - Canada international development Agency
22. NDHS - National Demographic and Health Survey
23. ANC - Antenatal Care
24. BCC- Behavior Change Communication
25. LBW - Law Birth Weight
26. MIP - Malaria In Pregnancy
27. PMVs - Patent Medical Vendors
28. RH - Reproductive Health
29. SP - Sulfadoxine – Pyrimethamine
30. TBAs - Traditional Birth Attendant
31. CHW - Community Health Workers
32. HBM - Health Belief Model
33. IDI - In-Depth Interview
34. LGA - Local Government Area
35. MDG - Millennium Development Goal
36. RDT - Rapid Diagnostic Tools
37. UN - United Nations
38. NMIS – National Malaria Indicator Survey
39. MN – Maternal health
40. TFR – Total Fertility Rate
41. MMb – Maternal Morbidity
42. MMt – Maternal Mortality
43. MMR – Maternal Mortality Rate
44. MMRo – Maternal Mortality Ratio
45. UTI – Urinary Tract Infection
46. PIH – Pregnancy Induced Hypertension

ABSTRACT

Malaria contributes substantially to maternal mortality in Nigeria, especially in Ibadan, which is a holo-endemic area. Despite the introduction of the Roll Back Malaria (RBM) programme, evidence shows that the incidences of maternal mortality due to malaria persist. Most studies on malaria have focused on preventive behaviour related to environmental and hygiene practices; however little attention has paid to how social factors influence adequate treatment procedure, case management and use of insecticide treated nets (ITNs), which are components of the RBM initiative, particularly during pregnancy. This study, therefore, examined the influence of social factors such as education, marital status and income on the adoption of the RBM programme.

Social Action theory and Health Belief Model were employed as frameworks. The study adopted a cross sectional survey design using multistage sampling technique. Six health centres (one in each local government areas where the RBM programme is prominent) were purposively selected. A semi-structured questionnaire on background characteristics, knowledge, acceptability and adherence to RBM programme were administered to 407 pregnant women based on attendance records in the health centres. Knowledge of malaria, Acceptability of RBM and Adherence to RBM scales were used for data collection. In-depth interviews were also conducted with 13 RBM staff and 24 pregnant women based on records of malaria incidence. Quantitative data were analysed using descriptive statistics, Chi-square and Logistic regression tests at $p \leq 0.05$, while qualitative data were content analysed.

The age of respondents was 27.9±5.1 years, 79.0% had post-primary education, mean monthly income was ₦8,519:34K, 74.0% were self-employed and 59.2% were primigravidae. Although the respondents did not identify RBM as a distinct programme, their knowledge of malaria (χ^2 = 21.58) significantly influenced their adoption of RBM programme; decision making (χ^2 = 23.03); and use of ITNs (χ^2 = 10.95). There was a significant relationship between knowledge of RBM programme and maternal health (β = 0.22). A unit increase in the knowledge of RBM caused 0.8 unit improvement in maternal health. There was a strong relationship between the acceptability of RBM program and maternal health (β = 0.15); a unit increase in the acceptability of the RBM strategy led to 0.86 unit improvement in maternal health. Respondents' marital status (χ^2 = 16.82), monthly income (χ^2 = 7.04) and parity (χ^2 = 16.39) significantly influenced their adherence to RBM programme, while religion, education, and occupation were not significant. Late registration for Antenatal Clinic made strict adherence to RBM programme difficult; inadequate supply of ITNs, drugs and manpower were major limitations to the effective implementation of the programme.

Social factors largely influenced the adoption of the Roll Back Malaria programme among pregnant women in Ibadan. Increased awareness of the programme and empowerment of women of childbearing age, as well as availability of sufficient tools and services in order to significantly reduce the incidence of malaria are of utmost importance.

Keywords: Maternal mortality, Roll back malaria programme, Social factors, Ibadan Nigeria.

Word count: 470

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

An estimated three billion people, almost half the world's population, live in areas where malaria is endemic, precisely in about 107 countries and territories in tropical and subtropical regions (WHO, 2005). Worldwide, between 350 and 500 million episodes of clinical malaria occur each year, leading to an estimated one million deaths. Most of these deaths are in sub-Saharan Africa, particularly among children under age five (WHO, 2005).

Annually, about 50 million pregnant women experience malaria globally; while 60% of them occur in Africa (Crawley, 2007). At least, 30 million pregnancies occur in malaria endemic regions of Africa every year (WHO, 2003; UNICEF, 2003). Studies on sub-Saharan Africa indicate that 25 percent of deliveries in areas of stable transmission show evidence of *Plasmodium falciparium* malaria infection (Desai, 2007). In malaria-endemic areas, up to 25 percent of severe maternal anaemia cases are attributable to malaria, as are nearly 20 percent of low-birth weight babies (Desai, 2007). Malaria is often associated with other infections in pregnancy with symptoms of malaria overlapping with other diseases like typhoid fever, pneumonia, among others, thus making proper diagnoses very essential (Omolade, 2007).

The symptoms and complications of malaria during pregnancy are directly proportional to the intensity of malaria transmission and the level of immunity of the pregnant woman. Due to immune deficiency during pregnancy, pregnant women are 2-3 times at a higher risk of suffering from malaria than non-pregnant women (WHO, 2005). As a result, an estimated 10,000 pregnant women die each year from *falciparum* malaria (RBM, 2005). In Nigeria, it is reported that around 11% of deaths, among pregnant women, are caused by malaria (NMIS, 2010).

Since malaria intensity may vary within the same country from areas of relatively stable transmission to areas of unstable or epidemic transmission, the picture of malaria infection during pregnancy may likewise range from asymptomatic to severe, life-threatening illness (Africa Malaria, 2003). As a result of the view that malaria is so easily and cheaply curable, surveys of properly diagnosed malaria patients see misleadingly figures of deaths. Most malaria deaths occur among people in rural areas with a sudden severe fever that is never seen by health care workers (Center for Global Health Research, 2010). It shows that malaria kills far more people than previously supposed. What we need is rapid access to healthcare facilities in the population, especially among malaria resident.

In areas of epidemic or low (unstable) malaria transmission, adult women have not acquired any significant level of immunity and usually become ill when infected with *P. falciparum*. For pregnant women in these areas, the risk of developing severe malaria is 2-3 times higher than that for non-pregnant women living in the same area. Maternal death may result either directly from severe malaria or indirectly from malaria-related severe anaemia. In addition, malaria may result in a range of adverse pregnancy outcomes, including low birth weight, spontaneous abortion, and neonatal death (WHO, 2003).

In areas of high and moderate (stable) malaria transmission, most adult women have developed sufficient immunity that, even during pregnancy, *P. falciparum* infection does not usually result in fever or other clinical symptoms. In these areas, the principal impact of malaria infection is malaria-related anaemia in the mother and the presence of parasites in the placenta. The resulting impairment of fetal nutrition contributes to low birth weight and is a leading cause of low infant survival rate and development. In areas of Africa with stable malaria transmission, *P. falciparum* infection during pregnancy is estimated to cause between 75,000 and 200,000 infant deaths each year (WHO, 2003).

In Nigeria, malaria is a significant public health problem, identified to be responsible for the high incidence of other diseases and deaths. It is estimated that 50% of the population (about 170million people) have at least one episode of malaria annually, while the major susceptible groups are children under the age of 5 years and pregnant women (WHO 2006).

The situation of Oyo State malaria is not different from what is obtainable nationwide. The State is in an endemic zone, with stable and persistent transmission all year round. The incidence of malaria in the State is about 4.5 million attacks in a year, while 70% cases seen in health facilities are mothers (Owolabi, 2009, Ladipo, 2012).

On March 13, 1998, a new global initiative, Roll Back Malaria (RBM), was announced by the World Health Organisation. The programme aims at reducing malaria deaths (2.7 million deaths per year) by 50 percent by the year 2010, primarily through control activities, including rebuilding health care services. The RBM initiative is a new opportunity for the African region to control malaria. However, several issues need to be carefully considered in the implementation of this new programme in order to avoid past mistakes, such as, drug resistance and non-effectiveness of various control materials.

The aim of this study is to provide a better understanding of the process through which social and cultural factors influence the adoption of Roll Back Malaria Programme and to proffer solution on how to improve resources and move towards success.

1.2 Statement of the problem

The World Health Organization describes malaria as both a problem of poverty and a cause of poverty (WHO, 2005). Maternal and infant mortality attributable to malaria in Nigeria is very enormous. Studies have shown that malaria is a leading cause of morbidity in the country, with 1858 per 100,000; far more than diarrhea, 896; pneumonia, 208 and Measles, 141 (NMCP, 2005). In year 2000, malaria was the principal cause of the death of about 803,000 African children under five years of age (WHO, 2006).

New developments in the approach to malaria control called for the over hauling of the previous strategies, hence the introduction of the Roll Back Malaria (RBM) programme by the World Health Organisation (WHO). It was launched in Nigeria on the 25thof April 2000, with the goal of packaging effective and efficient malaria intervention backed up with good management skill. But RBM evaluation for the period 2000-2005 showed only minimal progress towards the set target. This, however, was in part due to tremendous challenges which the RBM partnership faced during the period. The main challenges were: phenomenal increase in resistance of malaria parasites to drug, which necessitated a review of the national anti-malaria treatment policy during the period under review; non-availability of the relatively new and more effective anti-malaria commodities such as Artemisnin Based Combination Therapies (ACTs) for treatment and insecticide Treated Nets (ITNs) for prevention; the inability of the Federal Governments to waive taxes, tariffs, and adapt technology for local production of active ingredients; limitation of resources to scale up proven interventions to more than 170million people residing in the 774 local government areas (about 9,555 wards) of Nigeria.

Apart from the above national challenges, the malaria control programme in Oyo State has the additional challenge of low level of awareness on the causes, symptoms and treatment of malaria. Oyo State is a malaria endemic zone with stable and persistent

transmission all year round. The incidence of malaria in the State is about 4.5 million attacks in a year, with mother constituting 70% of the cases seen in health facilities (Owolabi, 2009, Ladipo, 2012). According to the State's Ministry of Health, 20% of all the cases seen in the government health facilities are malaria cases. Most mothers in the State (50% - 60%) obtain their anti-malaria drugs from the Patent Medicine vendors (self medication), as against consulting qualified medical practitioners. On their part, most (55%) health practitioners in the State still use chloroquine, a drug that has been banned worldwide, as the first line drug instead of ACTs (Oyo State Ministry of Health 2009). It implies that most mothers in the State are not properly treated when down with malaria, which translates to constant relapse of the disease and eventual treatment failure.

Furthermore, Owolabi (2009) suggests that malaria treatment expenditure in Oyo State accounts for up to one-third (33.33%) of the income of the low income earners, coupled with inadequate funding of RBM on the part of the government; the scaling up of the programme is, thus, affected. The low level of intra-sectoral and inter-sectoral collaboration among various partners and stakeholders in the RBM programme is also a great challenge to the war against malaria in the State. The issue of parasite resistance to the current first line and second line anti-malaria drugs, namely, chloroquine and sulphadoxine-pyrimethamine, further compounds the problem. The current level of resistance in the state to chloroquine is between 47% and 55% (Owolabi 2009, Ladipo 2012). Thus, the people are seriously drained, financially, since they have to spend much more than necessary to cure the disease and, that, repeatedly.

The issue of political instability also compounds the smooth running of the RBM programme in the State. For the most part of the period 2009 to 2011, the State was engulfed in political turmoil. Sensitization and advocacy efforts of RBM suffered a great setback during the period. Activities such as the annual Malaria Day, meant to further raise awareness

about the disease and the RBM programme, could not be celebrated. Also, the distribution of RBM materials, such as ITNs, to different parts of the State, was grossly affected. The tense political situation in the State made it a little dangerous to embark on a lot of legitimate activities due to the possibility of misinterpretation on the part of rival political groups.

Despite the toll that malaria exerts on pregnant women and their babies, for several reasons, malaria control during pregnancy has not received broad programme support. The fact that malaria infection in women is largely asymptomatic in areas of greatest burden necessitates a preventive approach which has usually been given low priority. In addition, the control approach, weekly chloroquine (CQ) Chemoprophylaxis, has not been fully supported because of implementation difficulties related to delivery and compliance, as well as concerns about the promotion of drug resistance. The evolution of CQ resistance in Africa has posed yet an additional impediment to control efforts due to the limited armamentarium of anti-malarial drugs which have demonstrated both efficacy and safety during pregnancy (World Malaria Report, 2005).

1.3 Research questions

1 What is the influence of the knowledge of RBM among pregnant women?

2 What is the level of the pregnant women's adherence to RBM measures?

3 What is the association between RBM programme and maternal health in Ibadan?

4 What social factors are responsible for the methods used in treating malaria?

1.4 Objectives of the study

The general aim of this study is to examine the influence of social factors on the adoption of Roll Back Malaria programme and maternal health in Ibadan. This is to be achieved through the following specific objectives:

(1) To examine the level of knowledge of malaria among pregnant women in the study area.

(2) To examine the association of knowledge and acceptability of RBM on maternal health status.

(3) To determine the extent to which pregnant women adhere to RBM measures.

(4) To examine the socio-demographic factors affecting the adoption of RBM and the implications for maternal health.

1.5 Justification for the study

The effects of contracting malaria during pregnancy are manifold: increased risk of miscarriage, still birth, premature birth, low birth weight (leading cause of child mortality), malnutrition (low appetite during fevers), anemia (possibly leading to death or causing permanent neurological harm such as speaking disorder, epilepsy, spasticity) (FMOH, 2003; WHO,2003). Infections during pregnancy account for 8-14% of all low birth weight babies and 3-8% of all infant deaths in areas of Africa with stable malaria transmission (RBM, 2005).

In pregnancy, there is a transient depression of cell-mediated immunity that allows fetal allograft retention but also interferes with resistance to various infectious diseases (Africa Malaria, 2003). Furthermore, cellular immune responses to *P. falciparum* antigens are depressed in pregnant women. Although *P. falciparum* infection in pregnancy is usually asymptomatic, it often contributes to adverse perinatal outcomes with a high risk for infant death, particularly in areas of lower malaria endemicity. Pregnancies in women living in malaria endemic regions are associated with a high frequency and density of *P. falciparum* parasitemia, with high rates of maternal morbidity, including fever and severe anaemia, abortion, and placental malaria (Africa Malaria, 2003).

However, there have been short falls in the examination of other pregnancy related problems. For instance, in Nigeria, 95% of maternal mortality is attributable to seven causes, namely: bleeding (heamorrhage) during pregnancy or delivery, infections (sepsis), pregnancy induced hypertension, unsafe abortion, obstructed labour, malaria and anaemia (WHO, FMOH 2003).

It is, therefore, obvious that the efforts of all stakeholders must be mobilized to curb the enormous losses attributable to malaria. This study contributes to the pool of knowledge necessary in adopting strategies and designing policies that will reduce maternal and human losses recorded annually as a result of malaria and, more importantly, help reduce expenditures made annually on infectious diseases treatment which could be channeled to more productive sectors to boost the economy.

The incidence of malaria in Oyo State is about 4.5million attacks per annum. Half of these incidences occur in children under the age of 5 years and pregnant women and the current change in drug policy from chloroquine to artemisinin-based combination therapy has more than triple the cost of malaria treatment in the state (Owolabi, 2009). The roll back malaria programme in Oyo State aims at achieving not less than 80% coverage across all three interventions before the end of 2010.

This study examines the progress made so far against these targets and possibly reveals issues that may be affecting the achievement of the targets. The study identifies key areas of strength, weakness opportunities and threats in the implementation of the State's malaria control programme and makes recommendations that will guide the policy makers in adopting strategies and approaches that will lead to better outcomes. Currently, the Global Fund for AIDS, Tuberculosis and Malaria (GFATM) programme in Nigeria (the biggest malaria control programme donors) is adopting immunization/child welfare clinics (integrated), campaign approach (stand alone) and ante-natal clinics as the service delivery

point for the free distribution of Insecticide-Treated Nets (ITN), Artemisinin based combination therapy (ACT) and the intermittent preventive treatments to children under five and pregnant women. This study reveals the effectiveness or otherwise of the current delivery model of GFATM thereby leading to increase access of the commodities to the targeted populations.

The lack of effective linkages between malaria control and antenatal care programmes has also limited the success of efforts to control malaria during pregnancy. Despite the introduction of the Roll Bach Malaria Programme, evidence shows that the incidences of maternal mortality, due to malaria, persist. Most studies on malaria have focused on preventive behaviour related to environmental and hygiene practices; however, little attention has been paid to how social factors influence adequate treatment procedure, case management and use of insecticide treated nets (ITNs), which are components of the RBM initiative, particularly during pregnancy. This underscores the importance of focusing on this category of people, to examine; (1) their knowledge about malaria diagnosis, other malaria related complication in pregnancy, treatment services, and (2) how far RBM have gone and the limitations of RBM programme in achieving the millennium development goals.

1.6 Conceptual clarifications

1. Roll Back Malaria (RBM): This is a social movement, launched by the WHO-Director General, Dr. Gro-Harlem Brundtland, jointly with the four funding agencies, namely, WHO, UNICEF, UNDP, and the World Bank in New York, USA, in 1998. Even though it is a priority programme of World Health Organization, other partners and multilateral agencies and governments, especially the G8, are fully committed to its course. RBM emphasises the following four primary strategies for Malaria control: (a) Case Management, using Artemisinin-based combination therapies, (b) Insecticide-Treated Net (ITN) and other vector combination therapies, (c) Providing Malaria Treatment and Intermitted preventive Treatment (IPT) for pregnant women, (d) Improving Malaria epidemic preparedness and response.

2. Maternal Health (MH): This refers to the health of women during pregnancy, childbirth, and the postpartum period. It encompasses the health care dimensions of family planning, preconception, prenatal, and postnatal care in order to reduce maternal morbidity and mortality.

3. Maternal Morbidity (MMb): It refers to serious disease, disability or physical damage such as fistula and uterine prolapse, caused by pregnancy-related complications. Morbidity includes all factors affecting the normal development of a person, which does not necessarily lead to death but a direct consequence of malaria. Maternal morbidity is widespread, but not accurately reported.

4. Maternal Mortality (MMt): According to the Tenth International Classification of Diseases, a maternal death is defined as “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site

of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes."

5. Maternal Mortality Rate (MMR): This index, the number of deaths per 100,000 women in the 15-49 age groups. It measures the impact of maternal deaths on the population of women as a whole, not just on pregnant women. The statistic is affected by two factors: the risk of death among pregnant women and the proportion of women who become pregnant each year. The maternal mortality rate can be lowered either by making childbirth safer or by reducing the fertility rate in the population.

6. Maternal Mortality Ratio (MMRo): The number of maternal deaths per 100,000 live births measures the risk of maternal death among pregnant or recently pregnant women. A more precise measurement would be the number of maternal deaths per 100,000 pregnancies, to account for those who die from unsafe abortions. However, data on number of pregnancies are difficult to obtain.

7. Artemisinin Based Combination Therapy (ACT): This is a combination of Two (2) Blood schizonticidal anti-malaria drugs, with synergistic effect to reduce the chances of drug resistance occurring. The two approved ACTs according to the National drug policy are Artemisinin + Amodiaguine and Arthemeter + Lumefantrine.

8. Intermittent Preventive Treatment (IPT): WHO recommends the administration of Sulfadoxine-pyremathamine to pregnant women in malaria endemic areas to prevent malaria in pregnancy. This is based on the assumption that placental parasitaemia in most cases is asymptomatic and could lead to low birth weight, still births and low mental development of the foetus.

9. Primigravidae: Women in their first pregnancies. This group of people is susceptible to malaria morbidity because no immunological memory has been developed as against the multigravidae.

10. Multigravidae: Women in their second or third pregnancies. This group is less affected by malaria because the first pregnancies lead to development of immunological memory which subsequently protects the other pregnancies.

11. Insecticide-Treated Net (ITN): These are bed nets fortified with insecticides to provide not just barrier protection, but are capable of repelling and killing mosquitoes.

12. Home Management of Malaria (HMM): Home management of malaria is a strategy that allows the caregivers to initiate malaria treatment at home, with appropriate anti-malaria drug for children under 5 years of age, within 24 hours of the onset of symptoms, to reduce the chances of disease progression from uncomplicated to severe malaria.

13. Direct Observe Treatment (DOT): WHO recommends that the Intermittent Preventive Treatment in pregnancy should be administered under supervision of trained health personnel as directly observed treatment.

14. Indoor Residual Spray (IRS): This is a vector control measure aimed at coating surfaces where the mosquito is likely to perch with effective concentration of insecticide in such a way that the mosquito is killed on contact. This approach is effective, but could be cumbersome and harmful if the appropriate time range is not observed.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Literature review

The Malaria burden is a challenge to human development. It is both a cause and consequence of under-development. Malaria affects 40 percent of the world population, putting 3.2 billion people at risk in 107 countries (RBM, 2005). Africa is the main home to the most severe and life-threatening form of malaria (*falciparum* malaria, caused by the parasite plasmodium *falciparum*), which has, due to a combination of increasing drug resistance and crumbling health system, actually seen a rise in the number of infections over the last three decades. An estimated 500 million cases of malaria every year lead up to 3 million deaths, of which an estimated 90% occur in sub-Saharan Africa, with 75% being children under the age of five (WHO, 2003;UNICEF, 2003). For malaria-endemic countries, public expenditure is also high as they endeavour to maintain health facilities and infrastructure to manage malaria control campaigns and provide education. For those with a high malaria burden, the disease may account for as much as 40% of public health expenditure (RBM, 2005).

Although malaria is preventable, easily treatable and curable, it accounts for 30% of all childhood deaths (Pediatric Association of Nigeria, 1994) and is associated with about 11% of maternal deaths in Nigeria (FMOH 2001, NMIS, 2010). It also accounts for 50% of all out patient department (OPD) attendance. It is also the leading cause of mortality in children and morbidity in adults, resulting to loss of workdays. It is estimated that 50% of the Nigeria population has at least one episode of malaria each year. Given its total population of 170 million, this translates to 85 million people suffering from attacks of malaria yearly in Nigeria. It is estimated that children under the age 5 years have 2 to 4 attacks of malaria a year (WHO, 2000).

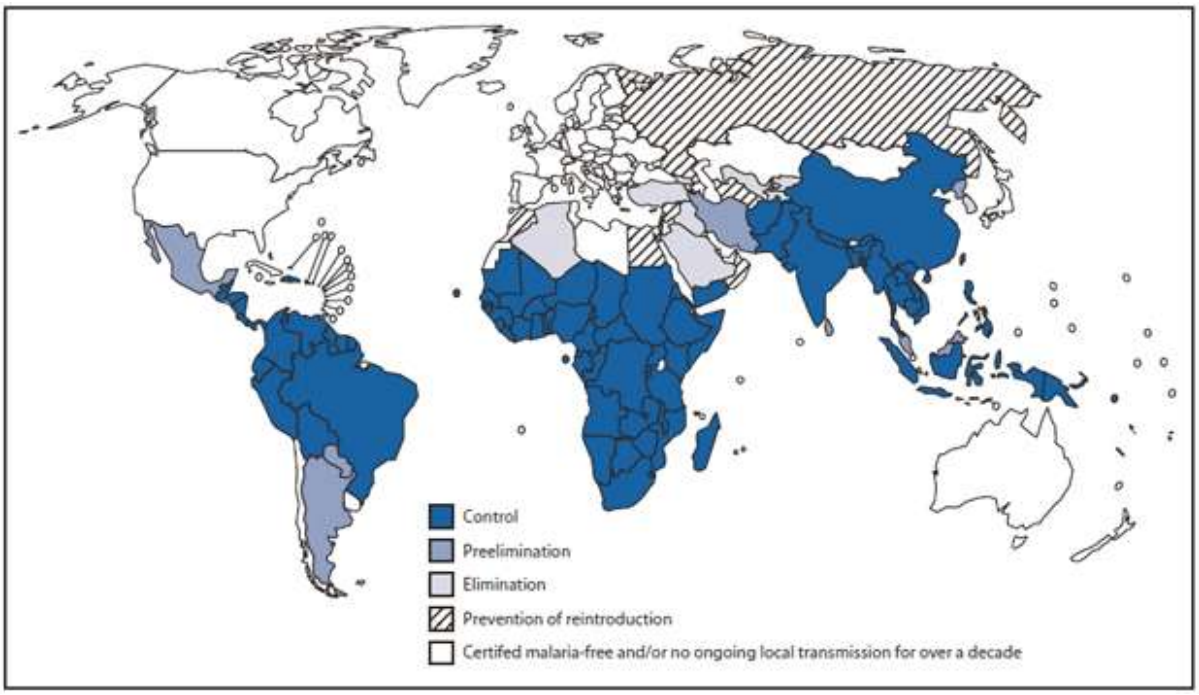


Fig. 2. 1 World Malaria Map, 2008. **Source:** World Health Organization, World Malaria Report 2009.

Malaria is more than a health issue as the activities of other sectors may increase or decrease the malaria disease burden. In addition, malaria impacts adversely on productivity of all sectors of the economy. As a testimony to the debilitating effect of malaria infection on economic growth of affected countries, Nigeria government approved 260 million naira for its national malaria control programme, vector research and control, in year 2010 (FGN, Budget 2010).

2.2 Malaria

Malaria is a life-threatening parasitic disease. The causal vector of malaria is the female *Anopheles* mosquito. The mode of transmission is through the bite of the female *Anopheles* mosquitoes, which requires human blood to facilitate its egg production. Human malaria infection is caused by four different species of protozoan parasites of the genus plasmodium: *Plasmodium falciparum*, *Plasmodium vivas*, *Plasmodium ovale* and *Plasmodium malariae*. *Plasmodium* is a tiny single-celled parasite that infects cells (Wellcome News. 2002).

From observation, it has been discovered that the species differ morphologically, immunologically, and in geographical distribution. *Falciparum* is the most dangerous and toxic of the family; *plasmodium vivax* is the most common; the least common is *plasmodium ovale* (restricted to West Africa); and *plasmodium malariae is* usually found in isolated places, scattered across the globe (Wellcome News, 2002). Noteworthy is the fact that plasmodium parasites are also found in primates, rodents, bats, birds, reptiles and other mammals.

Malaria was once thought to have come from fetid marshes, hence the name Malaria (bad air) (RBM, 2005). However in 1880, the real cause was discovered – a one-cell parasite, called plasmodium. There are more than 2,500 species of mosquito, and only a minority feed on blood. There are approximately 400 species of Anopheles mosquitoes throughout the world; only about 60 of them are vectors of malaria under natural conditions, while some 30 of them are of major importance (Wellcome News, 2002). The female *Anopheles* mosquito needs human blood to fuel her egg production. This, she does, by biting her hosts, usually, between sunset and sunrise. When an infected mosquito bites a human, parasites are injected into the blood stream. The parasites invade the liver, thus infecting red blood cells, where they rapidly develop and multiply. This results in the manifestation of clinical symptoms. Uninfected mosquitoes get infected when they suck infected blood. The parasites develop and mature within 10-14 days, and are ready to be passed on to someone else. Up till now, Sub-Sahara Africa (especially) is still locked up in the trauma of malaria as it is said to kill more than a million people annually in the region (WHO, 2005).

2.2.1 Impact of malaria

Malaria occurs mostly in poor, tropical and subtropical areas of the world (CDC, 2014). Africa is the worst hit area (MMWR, 2011) due to an array of causes, some of which are:

Anopheles gambiae, a very efficient mosquito responsible for high transmission; *Plasmodium falciparum*, the predominant parasite species, causes severe malaria and death in 15%-20% of cases, accounting for an estimated 30% of childhood deaths in the region (MMWR, 2011); the weather conditions across the continent often allow transmission to occur year round; efficient malaria control has been hindered by scarce resources, socio-economic instability and lack of the much needed political will. Unlike in Africa, malaria is a less prominent cause of deaths in other parts of the world, even though it causes substantial disease and incapacitation, especially in rural areas of some countries in South America and South Asia (CDC, 2014). According to the WHO (2013), malaria is one of the most severe public health problems worldwide. It is a leading cause of death and disease in many developing countries, where young children and pregnant women are the groups most affected. In Sub-Saharan Africa, an estimated 28% of women are infected with *P. falciparum* during pregnancy (MMWR, 2011). Half of the world's population (3.4 billion people) lives in areas at risk of malaria transmission in 106 countries and territories (WHO, 2013; RBM, 2015)

In 2012, malaria caused an estimated 207 million clinical episodes, and 627,000 deaths. An estimated 91% of deaths in 2010 were in the African Region (WHO, 2013). Because malaria is a global emergency that affects mostly poor women and children, malaria perpetuates a vicious cycle of poverty in the developing world. For example, malaria related-illnesses and mortality cost Africa's economy alone USD 12 billion per year (RBM, 2015). According to the Centre for Disease Control (CDC, 2014), the most vulnerable are persons with no or little immunity against the disease. In Africa, south of the Sahara (a high transmission region), the most vulnerable groups are young children, who have not yet developed partial immunity to malaria; pregnant women, whose immunity is decreased by pregnancy, especially during the first and second pregnancies; and travellers or migrants coming from areas with little or no malaria transmission, who lack immunity. However, in

areas with lower transmission (e.g. Latin America and Asia), many persons may reach adulthood without having built protective immunity and are thus susceptible to the disease, including severe and fatal illness, because residents are less frequently infected. The burden of malaria comes with a significant economic and social cost to both individuals and governments (CDC, 2014). On the part of individuals, the cost include: the purchase of malaria drugs; transportation to health facilities; lost days of work or schooling (for both the sick and the carers); preventive measures (such as window netting, insecticide purchase, etc.); and, in case of death, burial expenses. The government, on the other hand, shoulders the cost of maintaining the healthcare system; purchase of drugs and supplies; public health interventions (e.g. public enlightenment, insecticide spraying, ITNs distribution); loss of income (due to workers absenteeism, lost joint economic ventures opportunities and decreased tourism). In countries with a high incidence of malaria, economic growth during 1965-1990 was lower by 1.3% per year, compared with countries without high malaria incidence, even after adjusting for other factors (Gallup and Sachs, 2001).

2.2.2 Malaria situation analysis

Situated between 4^0 and 13^0 Northern Latitudes, Nigeria has a suitable climate for malaria transmission from coast to coast. The only exception is the area South of Jos in Plateau State, where some mountain peaks reach 1600 meters above sea level and the altitude of settlements lies between 1200 and 1400 meters above sea level. This area can be considered of low or very low malaria risk.

The five vegetative strata from South to North of Nigeria (mangrove swamps, rain forest, guinea-savannah, Sudan-savannah and Sahel-Savannah) define vector species dominance, seasonality and intensity of malaria transmission. Thus, the duration of

transmission season decreases from South to North, from perennial in most of the South, to only 3 months, or less, in the border region with Chad.

The dominant species of malaria parasites is *Plasmodium Falciparum* (>95%), with *P. ovale* and *P. malariae* playing a minor role; the latter is quite common as a double infection in children (The Garki project). Dominant vector species are *Anopheles gambiae S.I.* and the *A. funestus* group, with some other species (*A. moucheti, A nili. A. Pharaoensis, A, coustani, A. hancocki* and *A. longipalpis)* playing a minor or local role!

Within the *Anopheles gambiae* complex, *A. gambiae S.S.* is the dominant species, with *A. arabiensis* being found more often in the North and *A. melas* only in the mangrove coastal zone. A summary of the entomological inoculation rates (EIR) reported in 86 studies from Nigeria suggests that EIR for *A. gambiae S.I.* ranges from 18 to 145 infective bites per person per year, and for *A. funestus*, from 12 to 54. Based on the climatic and ecological data and historical data on malaria parasite prevalence rates, the MARA project has compiled a model of likely distribution of malaria prevalence. This suggests that malaria endemicity is highest around the two river valleys.

Taking into account this distribution, as well as the population density, it is estimated that approximately 30% of the country's population live in areas of high to very high transmission intensity, and 67% in the moderate transmission zone. Using these proportions in calculations, it results in an estimated number of fever and malaria episodes per person and year of 3.5 and 1.5 respectively for children under 5; and 1.5 and 0.5 for those 5 years and older, a total of 70-110 million clinical cases per year. The current malaria related annual deaths of children under 5 years of age is estimated at around 300,000 (285,000-331,000), and malaria contribution to maternal mortality is 11%. Malaria's economic impact is enormous, with about ₦132 million lost annually in form of treatment cost, prevention, loss of man hours, etc.

Malaria is a major cause of morbidity and mortality in Nigeria (FMOH, 2001). It has continued to be a major public health problem in country and constitutes a major barrier to socio-economic development. Its occurrence in the country is in nature a holo-endemic with perennial transmission. At least, 5 in 10 persons of the population suffer from, at least, one episode of malaria each year (FMOH, 2001). It accounts for about 63% of all outpatient attendances, 30% of all hospital admissions, 30% and 11%, respectively, of under-five and maternal mortality. According to NMIS (2010), malaria prevalence in Nigeria is currently at 42%; higher than Mali's (31%) and Liberia's (32%).

In Nigeria, three major strategic interventions, and other supportive health systems strengthening strategic (cross-cutting) interventions are being used to control malaria. These are:

- Case management of malaria, using Astemisinin Based Combination Therapies (ACTs)
- Integrated Vector Management/Insecticide Treated Nets (IVM/ITNs)
- Malaria in Pregnancy (MIP)
- Supportive health system strengthening (Cross-cutting) intervention:
  (a) Monitoring and Evaluation
  (b) Behaviour Change Communication
  (c) Programme Management Information.

2.2.3 Perception of malaria

To be sick means a deviation from the accepted standard of well-being, changes in the body functioning or social conduct, represented by signs and symptoms which constitute cultural repertoire for recognising, diagnosing or defining the condition (Richman, 1987). Illness is a complete deviation from the societal norms and values, which are usually, manifested

through the failure of an individual to perform his/her normal roles in the society. This signifies that the cause of illness is determined not merely by biomedical factors, but also by the way in which the patients define and respond to the illness.

Adera (2003) reported that malaria beliefs and practices are often related to culture and can influence the effectiveness of control strategies. This is because traditional medical treatment reflects society's medical beliefs about causes of health problems, choices of treatment alternatives and other health-related ideologies. Certain disease with specific and non-disease specific cultural beliefs may influence people's health seeking behaviour. That is why it is important to consider cultural beliefs and practices of people when designing measures and programmes aimed at improving their health (Feyisatan and Adeokan. 1992; Jegede, 2002; Comoro *et al..*, 2003).

It is further noted that adoption of both preventive and curative methods may also depend on people's conception of the causes of ill-health and on their level of conviction about the efficacy of such methods (Feyisatan et al.., 1997, Jegede *et al.,*. 2005). It is significant to understand that people in different societies hold a variety of beliefs about the cause and transmission of malaria, which vary according to cultural, educational and economic factors, and have direct consequences for both preventive and treatment-seeking behaviour as well as for other activities to control malaria (Heggenhougen *et al.* 2003). It is for the same reason, it is further advanced that attention to these perception is critical to public health efforts because, beliefs that differ from scientific explanation may lead to inaction, action delay or ineffective action, all with serious consequences.

Differentials in illness perception have been asserted by various studies (Jayawardene, 1993; Caldwell, 1993; Erinosho, 1998; Jegede 1998, 1999; Jegede *et al,* 2006). Such perceptions can be conceived in terms of definition of illness [its cause(s), vulnerability, severity and modes of transmission]. Societies and their relationship to the sick kill or heal, as

well (Jegede, 1999). It is then further argued that socio-cultural beliefs are not simply outside of and in the space surrounding us, but rather are embodied internally as part of our anatomy and physiology. Illness is, therefore, cultural-bound.

In the event of ill-health, every culture defines it in a peculiar way, which might be different from one another. It can also be observed that the notion that the culture of an individual, specifically, behaviour and lifestyle, could play a major role in determining health and the risk of death is not new. Caldwell (1993) and Jegede (1998) also submit that perceived causes maybe divided into natural causation (blood infection, worm infestation and so on), supernatural causation (induced by supernatural forces like witchcraft), mystical causation (may result from neglect of gods, angered ancestors, broken taboos or ritual errors), and hereditary causation (transferred from one generation to the other). These are differential causations, which may require differential treatments.

Knowledge about illness is a major determinant of the health of the population and it should be a modifying factor if adequate preventive measures would be put in place. Mwensi et al (1995) posit that human behaviour determines the success of many tropical disease control programmes. That is why it is imperative to know how humans define and respond to malaria, in order to be able to build strong multi-disciplinary control programmes.

In many cultures, there is no general term or illness concept that approximates malaria. An illness with symptoms like malaria might be subsumed under a general term. Among the Dangme of Ghana, it was discovered that *Asra* was a contestable illness concept for malaria as it can also be attributed to other illness conditions (McCombie, 1996). Jegede *et al* (2005), in a study conducted among Bodija market women in Ibadan, Nigeria, observed that *Iba* is the concept designated for malaria and there are still a lot of misconceptions about the aetiology of malaria as majority of them (59.1%) attributed it to inappropriate causes. In

Bwatiye, Nigeria, the term *Zazzabi*, a Hausa word, is used to designate malaria, which literally means an ordinary illness that does not kill (Akogun and John, 2005).

The perception of severity may go a long way in affecting community response to malaria as perceived threat of malaria is very low. In a study conducted by Nuwaha (2002) in Uganda with the use of FGDs and semi-structure interviews, malaria was mentioned as a major health problem, but it has no specific name in the two commonest languages used in Mbara, Uganda. Names given to malaria were only descriptive in nature and, therefore, not specific enough.

Malaria, as defined biomedically, is a specific disease with a particular etiology and associated signs and symptoms. However, becoming ill with any disease is a subjective process involving the interpretation of the origin and the significance of the symptoms. These perceptions affect behaviour relating to the illness and contribute to shaping the meaning individuals give to the experience (Helman 1994). In every society, there are socially acceptable behaviours associated with being sick, and specific illnesses are often related to particular culturally acceptable behaviours or sick roles for that

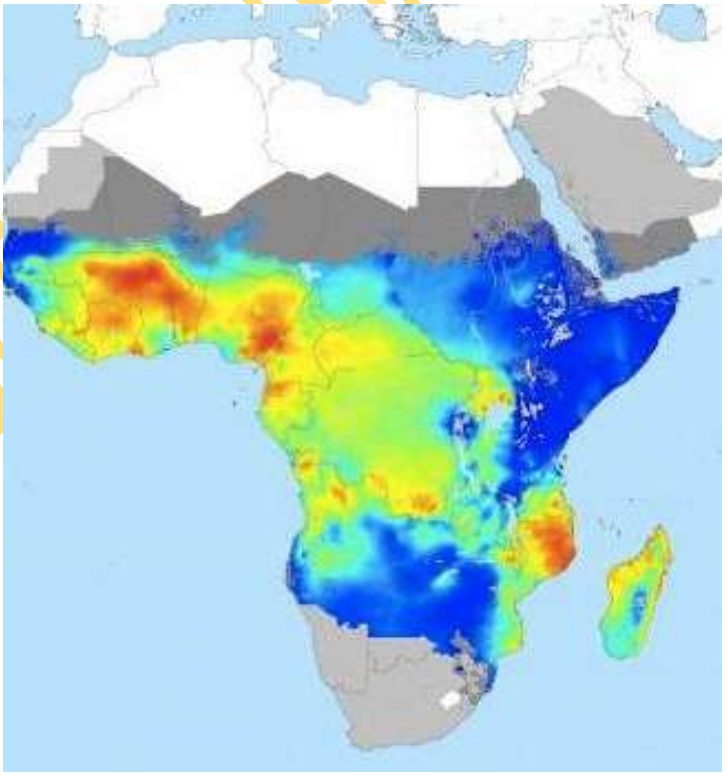


Fig. 2.2 This map shows P. falciparum malaria parasite prevalence among children in Africa. In low areas (blue) we might see one or two infected children out of every 100, while in high areas (red) it might be more than 50. The map demonstrates how entrenched the disease remains throughout much of west and central Africa and parts of Southeast Asia. **Credit:** Malaria Atlas Project, University of Oxford

illness. The sick role is a social process that is governed by the cultural norms of each society. In other words, in every society there are social conventions surrounding how people should behave when they become ill. Social and cultural factors determine which and when symptoms are abnormal or serious enough to frame a response (Kengeya-Kayondo J, Seeley J, Kajura-Banjeja E, *et al 1994*). The acceptable sick role for a particular disease depends partly on the perceived relative risk of the disease, both to the individual and to the health of the community.

2.2.3.1 Uncomplicated malaria

In most endemic areas in sub-Saharan Africa, the term malaria is often used either alone or in conjunction with a local term for fever to refer to a constellation of symptoms that frequently correspond closely with clinically defined mild or uncomplicated malaria (Kengeya-Kayondo J, Seeley J, Kajura-Banjeja E, *et al 1994*). The illness malaria is perceived by most adults as a common illness with a range of signs and symptoms that are seen as within tolerable limits which cause minimal disruption to their lives. Even among children, uncomplicated malaria is frequently seen as a mild everyday illness that is not preventable but treatable (Muela 2000). In this context, uncomplicated malaria is, therefore, socially defined as a normalised illness, with treatment being the responsibility of the individual or close family. In addition, unlike diseases such as human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) or tuberculosis, there is no stigma attached to uncomplicated malaria. It is a well-known and socially acceptable disease, with no social sanctions or associated emotional trauma from stigmatization linked to its presence. As a result, there is low social pressure to seek treatment, provide money for treatment of close relatives, or even to comply with completing malaria treatment (Hartigan, 2001). As previously mentioned, the way in which an illness is perceived has consequences for the sick role that the ill person is expected

to adopt. One of the consequences of viewing uncomplicated malaria as a normalised illness is that people with the illness are not expected to create a huge fuss or deviate significantly from everyday behaviour. However, the accepted sick role for the illness is also affected by the social position and expected social role of the person with the illness (Molyneux CS, Murira G, Masha J, Snow RW, 2002). For example, what is acceptable behaviour for men may not be acceptable for women. In many countries, men may be expected (and have the capacity) to seek treatment quickly so that they can maintain their roles as breadwinners for the family. On the other hand, women are frequently expected to continue in their primary roles as caregivers and they often do not have the resources to make unilateral treatment seeking decisions. They commonly have to consult others in the household about their treatment-seeking decisions and if they admit illness and seek treatment of a common illness such as malaria, this may be considered a sign of weakness. The social standing for such women and their children may be decreased with possible subsequent impact on their long-term welfare (Hall JJ, Taylor, 2003).

2.2.3.2 Severe or complicated malaria

In contrast to uncomplicated malaria, the disease that is biomedically defined as severe or complicated malaria is often perceived by communities in sub-Saharan Africa to be unrelated to the mild disease. Symptoms such as splenomegaly, anemia, and, in particular, convulsions are rarely associated with the disease malaria and are frequently thought to be of supernatural or spiritual origin (Ahorlu C, Dunyo S, Afari E, Koram K, et al 1997). Illnesses of this supernatural (rather than normalized) type are perceived as social in nature and a threat to the larger community. That is, these symptom constellations are a sign that something is wrong in the community and, unless dealt with, others in the community may be at risk (Muela 2000) Given the social interpretation of these symptoms, there is a considerable social

pressure to include a wider group (such as mothers-in-law or elders) in treatment decisions. While on the surface it may appear that having a supernatural illness, such as severe malaria, means that greater resources can be mobilised, it also means that the sick individual (or their caregiver) loses control over the decision-making process. For example, a family has a child with a high fever that is starting to have a seizure, the norm for the village in which they live is to use the services of a traditional healer before visiting the hospital. However, they choose to take action that runs counter to expected behaviours, and they take the child to the hospital. If the child dies, they may be socially isolated because they ignored the social rules governing behavioural expectations in this specific situation. The outcomes that they face may cause the family additional financial obligations because they are unlikely to receive the community support that generally occurs at the time of a death. This may also exaggerate the grieving process because they are mourning the loss of the child, as well as the loss of accustomed and expected social support from their community. These examples demonstrate that perceptions of disease interact with a person's sociocultural reality (their social role and expected behaviours) to shape both behaviour and ability to respond to disease. It is the interaction between the expected behaviour and perceptions of disease, as defined individually and by society, that affects both if and how an individual acts to prevent disease, as well as what they do when they become sick (their illness behaviour). It is these behaviours that influence the distribution of the biomedical burden of disease or disease outcomes.

2.2.3.3 Self-treatment and treatment failures

People's perception of illness and their subsequent reaction to ill-health, such as their treatment seeking behaviour, their selection or acceptance of available treatment options and their adherence to recommended drug regimen, have a tremendous effect on the use of any

antimalarial drug and play an important role in controlling resistance (Bloland et al, 2000). Poor practices of drug use threaten effectiveness of drug and, thus, may result in treatment failure, thereby increasing the cost of treatment. Many factors may contribute to treatment failure. The development and intensification of drug resistance are due to exposure of parasite to suboptimal drug level. Taking an ineffective drug can result in severe or protrated disease and even death (Yeung et al, 2004).

Home is the first source of treatment. In sub-Saharan Africa, self- treatment rates for malaria range from as low as 19% in Guinea to as high as 94% in rural Ghana (Burkmann and Burkmann, 1991). Self-treatment is usually the rule for malaria, rather than exception. Most people that even report to official health sector must have used one form of medicine or the other. It has also been reported that the most widely used anti-malarial is chloroquine (CQ) (Foster, 1995). Cases of self-treatment of malaria have been fraught with non-adherence to drug regimen.

Self-treatment is usually inadequate with under-dosing, which is an etiologic factor of treatment failure. McCombie (1996) observes that perception of wellness, especially when symptoms disappear before a regimen is complete is that treatment may be halted and the remaining drug may be saved for later use. This points to the fact that adherence to anti-malaria dosage is poor. Inappropriate dosing provides increased opportunities for parasites to be exposed to sub-optimal blood levels of the drug, thereby building the parasites against the drug. Drug-drug interaction is another critical etiologic factor during resistance and treatment failure. Simultaneous treatment with both traditional and modern medicine as well as with multiple drugs is a practice. It is further observed that a patient who receives simultaneous treatment from clinic and a traditional healer may put herself at the risk of overdose, or the two types of medicine may interact or naturalise each other. This may lead to Death or Morbidity.

McCombie (2002) observes that knowledge of correct doses is an important variable, and correct dosages are unlikely to be given or taken if they are not known. Incorrect dosages will expose the parasite to sub-thrapeutic level of antimalarial drugs that kill sensitive parasites but allow parasites with resistant mutation to survive and reproduce (Agyepong, 2002 and Yeung et al, 2004). The most common anti-malarial drug used by most mothers, who bought over-the-counter drugs, was chloroquine that was often administered at inappropriate dosage (Clarke et al, 2003 and Akogun and John, 2005). It is further observed that the 3-day course of CQ was never observed in most cases mainly due to access and ignorance of the importance of full-dose. Mothers commonly report stopping the medication following perceived wellness and medicine are saved for future use (Baume, 2000).

In a knowledge, attitude, practice and behaviour survey in Ikabarole and Bundibugyo districts of Uganda, about 40% of mothers stated that they had experienced treatment failure with CQ and up to 30% still believed CQ to be the best drug for treatment of malaria (Killian, 1995). The implication is that local population may even perceive a drug to be efficacious long after resistance has been established and hence in the face of treatment failure may reinterpret the cause of malaria illness. This means that non-efficacious drug will continue to be used in self-treatment, leading to more resistance resulting in more morbidity, severe disease, mortality and inappropriate health-seeking behaviour (Nuwaha, 2001).

Meanwhile, evidence has shown that those who self-treat normally begin treatment earlier than those who attend official health facilities. Such treatment normally starts with left-over or reserved drugs at home. Isha et al (1995) reported that about 50% of household had CQ in their medicine cabinet in Nigeria. Common pattern is to try medicine available at home and go to the official health facility if symptoms do not improve (McCombi, 2002).

In most studies, knowledge of correct doses of anti-malarial is very low (McCombie, 2002; Yusuf et al, 2005). Simultaneous treatments with both traditional and modern

medicines as well as multiple drugs were also common practice in HMM (Nuwaha, 2002). This may account for overdose which could lead to treatment failure or lead to the development of resistance. It is further observed that seeking care from traditional healers and using self-treatment may lead to no or delayed cure, increased spread and occurrence of malaria complications including the development of drug resistance.

2.2.4 Socio-cultural context of malaria

It has long been recognised that non-biomedical factors, such as socioeconomic status, play a significant role in the distribution of the burden of malaria (Walley, 2001). Much recent research has shown that health behaviours are not simply a function of knowledge or beliefs but are also modified and constrained by the social, cultural, economic, and political context in which they occur (Yoder 1997, Nwabuaze 2003, Idowu 2011). While society's perceptions of disease, malaria, and perceived risk influence people's willingness to change their health behaviours, the political and economic context, social organization, and cultural rules regarding roles and expected behaviours affect their ability to change these behaviours. As such, sociocultural factors, such as social organization, culturally defined social roles, and cultural beliefs about disease, all play important roles in the observed variability in the disease burden. It is only when cultural perceptions of illness are considered in conjunction with the social context in which they occur that we can start to understand human illness behaviours and their consequences for observed patterns of disease (Keesing, 1998).

A society is a population that shares a common culture and who organises themselves into various groups, hierarchies, and roles. The members of these groups share a social identity and, in any given society, the behaviour of an individual is mediated by their social identity. That is, social identities are associated with particular roles within the society and these roles are associated with a range of expected norms of behaviour (Munguti 1998).

Individuals move among roles throughout their lives and, within a society, the behaviours associated with particular roles also change over time (that is, neither culture nor social organization are fixed elements. Rather, they are both dynamic systems affected by intrinsic and extrinsic pressures). Much of our behaviour is influenced by our particular social identity and social identity is proscribed by many factors such as sex, age, socioeconomic status, class, ethnicity, and even political affiliation.

In any society, there are groups of people who, because of their socially and culturally defined roles, have limited control over their ability to admit to illness, mobilise resources, access services, and make decisions. This lack of power and personal control places them in a position in which they can be considered to be socially vulnerable. The term social vulnerability was first used in the early-mid 1990s by social scientists working in the HIV/AIDS arena to highlight the importance of social factors that make some groups or individuals more susceptible to infection and more limited in their ability to respond to illness than others (Parker 1996). The notion of vulnerability draws attention to the factors that create inequality and allows us to broaden our focus from individual factors creating the burden to a consideration of the wider social, economic, and political factors that shape the distribution of the burden of disease. Social vulnerability has a significant impact on illness behaviours. In many societies, women may be constrained in their ability to admit to being ill for fear of being thought weak. On the other hand, men may be unable to admit to illness and cannot take time off work for fear of losing their job. The mobilisation and partitioning of resources are also frequently influenced by the social position of an individual within a household (or a household within a community) (Muela, 2000). The ability to access health care and other services is also frequently influenced by sociocultural considerations. In some societies, women are unable to access health care due to cultural constraints on their movement and interaction with men, (Tanner 1998, Vlassof 1998) and in others, certain

ethnic, social, or political groups may be excluded from public health care (Hartigan, 2001) or discouraged from accessing other public health goods. Societal rules that govern behaviour directly impact the ability of individuals and groups to make health care decisions. Socially vulnerable will vary from society to society and, most often, represent the truly marginalised sectors of any population: marginalised economically, socially, and/or politically. From an intervention perspective, the results of such vulnerability is that some groups in the population, due to their social position, may have the willingness to change but not the ability to respond (Hajj 2003,Taylor 2003). Behaviourally, this translates into outcomes such as having limited knowledge about appropriate treatment, needing to delay seeking treatment when illness is recognised (limited options available to them), or having little or no access to preventive measures.

There has been an increased recognition of the fact that the success of any control strategy would depend on a number of factors, among which are: the behaviour of patients, especially, mothers and caretakers of young children, the need to understand treatment seeking behaviours (Oaks et al., 1991) the choice of treatments, etc. Studies have shown that women's choice and time of treatment are dependent on such factors as cost, access to health facilities, attitudes of providers and cultural belief about the cause and treatment of malaria.

According to Akinleye and Ajayi (2011) factors that significantly influence knowledge about malaria are occupation, level of education, month at first appearance at antenatal clinic, and transportation costs. This means that there is a need to intensify efforts to provide health education on malaria and preventive measures as well as to encourage preventive practices among pregnant women.

Findings from a study conducted in Ogun State by Adeneye, Jegede and Nwokocha (2001) also concluded that there is a need to intensify efforts to make adequate information and materials relating to the different malaria control strategies more available and accessible

at the community level to achieve and sustain the RBM goals. It was reported that 63.2% of the 68 respondents (69.7% of mothers of children under five years vs 61.8% of pregnant women) interviewed knew about insecticide treated nets (ITNs); however, only 22.1% were using the material. Reasons given by those not using ITNs included: ignorance of ITN prior to the interview 43.3%, lack of money 41.5% and ignorance of where to get it (7.6%). Only 5.8% of mothers of children less than five years old, and none of the pregnant women, had taken the new combination drug. Eight (23.5%) of the 34 pregnant women interviewed knew about intermittent preventive treatment (IPT) of malaria for pregnant women, while two (25.0%) of these eight women had received a preventive treatment dose.

On the assessment of the progress of malaria control in Nigeria, Jimoh (2011) concluded that scaling up home management of malaria and a community-centred approach to ITN and artemisinin-based combination therapy provisioning should be prioritised. Data from his study showed that the malaria burden is still enormous because of inadequate control efforts. In 2008, only 17% of Nigerians owned, at least, one net, compared with 12% in 2003. Eight percent owned an insecticide-treated mosquito net (ITN), but only 6% of under-five children and 5% of pregnant women slept under an ITN. Only one-third of under-five children with fever received anti-malarial drugs, while one-fifth of pregnant women took anti-malarial drugs for prevention.

Chloroquine is still the most common drug used in malarial treatment, despite its ban as the first-line treatment since 2005. Because malaria is so easily and cheaply curable, surveys of properly diagnosed malaria patients see misleadingly few deaths. Most malaria deaths occur among people in rural areas with a sudden severe fever, they never had seen a healthcare worker (CGHR 2010). What is needed is rapid access to healthcare facilities. Malaria kills far more people than previously supposed. Dr. Simon Hay of Oxford University (Co-founder of the Malaria Atlas Project) explains how the estimate of only 15 thousand

malaria deaths a year previously accepted by the World Health Organization (WHO) could have missed most of the malaria deaths where illness came on quickly and was never seen by any healthcare worker (CGHR 2010). According to him, since most malaria deaths occur far from any healthcare facilities "deaths from malaria are predominantly invisible to the health reporting system". Thus, estimates of malaria deaths worldwide are likely to be serious underestimates, and this could substantially change disease control strategies, particularly in the rural parts of states with a high malaria burden.

However, better estimates of malaria incidence and mortality worldwide can provide a more rational foundation for affordable access to community treatments for both children and adults. According to Kenneth Y. Arrow (2010), Artemisinin combination therapies are strongly efficacious and can be available at low cost through the affordable medicines facility for malaria. The treatment should be made easily accessible to both children and adults through public and private distribution channels.

2.2.5 Management of malaria

The model of health-seeking behaviour is grated in socio-cultural and psychological factors (Erinosho, 1998). The basic goal of health-seeking behaviour is the prevention and treatment of disease, defect, injury and disability. Health behavior stands between the very illusive state called health, and what Mechanic (1978) has termed illness behaviour. In what has been cited as a classic definition, Kasl (1966) posits that health behaviours are those 'activities undertaken by a person believing himself to be healthy, for the purpose of preventing disease or detecting it in an asymptomatic stage. In its other form, it is an individually approved, socially appraised and medically recommended action voluntarily undertaken by a person who believes himself to be healthy that tends to prevent the occurrence of undesirable healthy condition or detecting it in asymptomatic stage (Alonzo, 1993). Management of malaria in

this regard is conceived in terms of health and illness behaviour, both prevention and treatment of malaria. On the other hand, illness behaviour (concept introduced in 1950s) was intended to depict the large variability in reactions to symptoms and illness, and to identify the various socio-cultural, environmental and psychological factors that affect such reactions (Alonzo, 1993). Illness behaviour is further conceived as the varying ways individuals respond to bodily indications, how they monitor internal states, define and interpret symptoms, make attributions, take remedial actions and utilise various sources of informal and formal care (Mechanic, 1993).

The study of health seeking behaviour is further said to be important because it shapes the recognition of illness, the selection of patients into care, patterns of health practice and adherence to medical advice, and the course of illness treatment process. Health-seeking behaviour hinges on the ability of individuals to recognise correctly the illness as regards causes and symptoms (Agypong, 2002 and Afolabi et al, 2004). Beliefs about the aetiology of illnesses invariably dictate the type of therapy and, thus, healers to be consulted. General research in the area of treatment seeking has documented that it is related to cultural beliefs about the cause and cure of illness (Mwenesi et al, 1995). In some cases, certain illnesses are seen as amenable to treatment by modern medical practitioners, while others are considered best treated by traditional methods or mixture of both.

It has been observed that a large proportion of malaria cases are treated outside of the official health care system (Breman and Campbell, 1988; Jegede et al, 2006). Up to 90% of child illnesses are first perceived, defined and treated in the home, mostly by mothers, before being referred to other health care sectors (Kleinman, 1981 and Nwenesi et al, 1995). It is further observed that more than 70% of people with malaria do not seek care from public health institutions (Ndomugyeni et al, 1998).

For the purpose of estimating rates of treatment by source, treatment sources were divided into three categories: traditional, official sector and self (McCombie, 1996). Traditional includes reports of use of traditional remedies or visits to traditional practitioners. Use of official health sector includes reports of use of hospitals, clinics, dispensaries, private practioners and other health workers. Self-treatment on the other hand includes anything from home treatment with herbal remedies to over-the-counter purchase of antimalaria drugs. Self-treatment of malaria is common, sources of self-medication include drugs from retail outlets, market places, drugs shops and health workers (Nuwaha, 2002).

Karanja (2002) observed that among the Kebera population, there was awareness that hospital is the best place to get treatment but a good proportion purchased drugs from shops for self-medication and only went to the hospital when there was no notable improvement. Afolabi et al (2004) in a study conducted in rural communities in Nigeria observed that up to 89% of care-givers have given one form of treatment or the other before visiting official health centres. In a Tanzanian study among 625 caregivers, Nsimba et al (2002) found that a total of 54% of the mothers reported giving medication at home, 21% had taken the children to health facilities prior to this (another) visit and 3% had visited traditional healers. Akogun and John (2005) also observed that in Northern Nigeria, self-medication with herbs and herbal portions was the preferred option for most mothers but young mothers were less inclined to self-mediation with herbs (53.6%) than older women (65.7%). Hence, most mothers went to the health centre as a third-line of action.

In another study (Adera, 2003), 43% had used traditional medicine for the treatment of malaria. The reasons for the use of traditional medicine include greater accessibility, low cost, lack of awareness about modern medicine and the belief that it is better. In all, Jegede et al (2006) indicated that home treatment of malaria is predominant among market women.

Also, in Uganda, the use of herbs, either for drinking or bathing, was the main first treatment among rural women (kengeya – Keyonde et al, 1994).

On the prevention of malaria, Nuwaha (2002) in a study in Mabara, Uganda, claimed that avoiding mosquitoes was the most common method of prevention of malaria. Other preventive strategies mentioned in the study include: improved sanitation, clearing of bushes around houses, avoiding cold weather, taking good nutrition, burning mosquito coils and taking antimalarial drugs. However, respondents expressed ignorance of insecticide treated bed-nets.

Findings from a study among market women in Nigeria also confirmed this as majority of respondents (58.1%) claimed that they have never heard of ITN (Jegede e al, 2006). It was reported that various malaria preventive measures are utilized by market women in Nigeria, which includes herbs, indoor insecticide, coils and ITN. Various efforts (in malaria control) also lay emphasis on hygiene, good nutrition, protection from mosquito bite, accurate diagnosis, prompt treatment, avoidance of abuse or misuse of drugs, less exposure of the body while sleeping, and so on. In all, the fact remains that one can keep away from getting malaria if one can be protected from mosquito bites.

2.3 Reproductive and maternal health

2.3.1 Reproductive health

Against the background of WHO's definition of health as not merely the absence of disease or infirmity, but a state of complete physical, mental and social well-being, Reproductive Health (RH) addresses the reproductive processes, functions and system at all stages of human life. Thus, it means that people are able to have a responsible, satisfying and safe sex life and that they have the capability to reproduce, and the freedom to decide if, when and how often to do so.

The components of Reproductive Health Care (RHC), according to the International Conference on Population and Development (ICPD), are the constellation of methods, techniques and services that contribute to reproductive health and well-being through preventing and solving reproductive health problems. It also includes sexual health, the purpose of which is the enhancement of life and personal relations, **and not merely** counselling and care related to reproduction and sexually transmitted diseases.

However, in the context of primary health care, RHC should include: family-planning counselling, information, education, communication and services; education and services for prenatal care, safe delivery, and post-natal care, especially breast-feeding, infant and women's health care; prevention and appropriate treatment of infertility; prevention of abortion and the management of the consequences of abortion; treatment of reproductive tract infections; sexually transmitted diseases and other reproductive health conditions; and information, education and counselling, as appropriate, on human sexuality, reproductive health and responsible parenthood.

From the foregoing, prominently obvious are the right of men and women to be informed of and to have access to safe, effective, affordable and acceptable methods of fertility regulation of their choice, along with the right of access to appropriate health care services that enable women to go through pregnancy and childbirth in a safe manner, providing couples with the best chance of having a healthy infant.

Reproductive health is a lifelong concern. A mother's reproductive health status has an impact on her children and their health, the better her reproductive health, the better the health status of her entire family. Hence, for healthier families, the reproductive health of mothers must be accorded high priority.

Although the definitions of RH and RHC encompass so much, what is apparent from most literature is the fact that RH and RHC have been reduced to family planning and

contraception, to the detriment of other important components such as information, education and counselling. Increased attention on the obviously neglected components of RH and RHC would certainly improve the effect of current RH and RHC efforts in developing countries of the world.

Contained in the Population Action International's (PAI) "report card" (2007) are the Reproductive Risk Index (Appendix 5) measures of 130 nations of the world (representing 95% of the world's population). Based on the ICPD, MDGs, and WHO/UNFPA core indicators of RH (Appendix 6), the Reproductive Risk Index (RRI) appraises the progress of nations towards achieving the goals set at the ICPD.

Scored on a 100-point scale, the RRI classified countries according to their risk level: very high (60 points or more), high (45-59 points), moderate (30-44 points), low (15-29 points), and very low (less than 15 points).

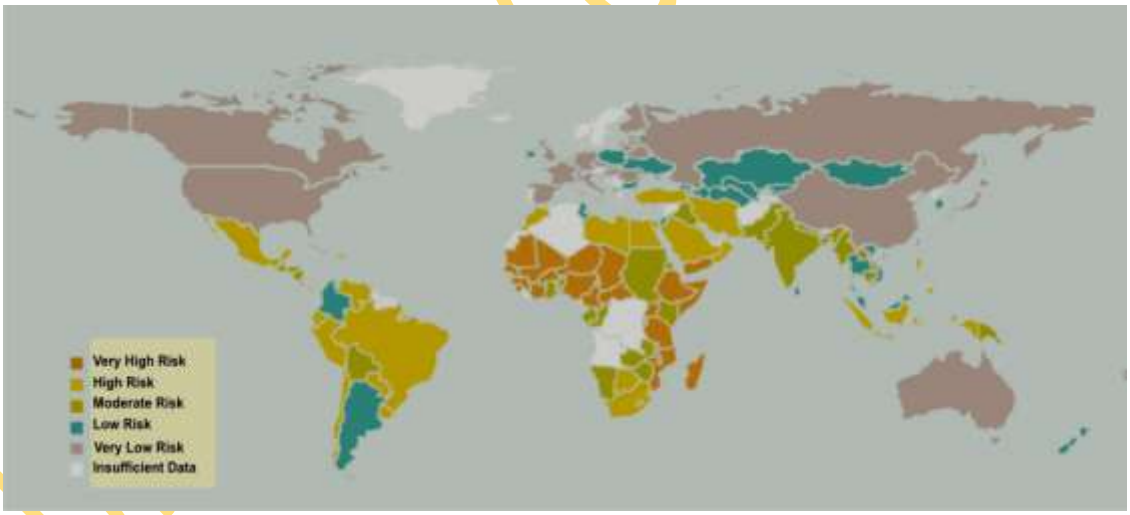


Fig. 2.3: World Reproductive Risk Levels

A close look at the RRI showed that 26 countries are in the Very High risk category. All the countries in this category have low incomes; and 22 of them (84.62%) are in sub-Saharan Africa. This is not surprising giving the indicators (Appendix 6) used in compiling the index.

There are 24 counties in the High risk category. Half of these countries (50%) are in sub-Saharan Africa, while the remaining are among the poorest nations in their respective regions. That this category and the previous one are mostly populated by sub-Saharan African countries shows the direct correlation between poverty and Reproductive risk (RR). The higher the incidence of poverty, the higher the risk involved in the process of reproduction.

The Moderate risk category has 26 countries (including most of South America and the three wealthiest nations in sub-Saharan Africa) spread across nine developing regions of the world. The countries in this category are the ones making progress in their reproductive health systems through improved commitment. In the Low risk category, most of the 26 countries are from Eastern Europe. The rest are from South America, the Middle East, Asia and Oceania. The Very Low risk category has 28 countries with high incomes. As might be expected, the highly industrialised countries of the world are in this category. Also in there, surprisingly, are Cuba, China and Singapore from the developing world. Obvious from the RRI is the fact that the burden of RH is on Africa, South Asia, Central and South America. All the countries in these regions scored 30 points or above in the index. Ranked 12th in the Very High risk category is Nigeria.

Access to quality reproductive health and family planning services remains poor in Nigeria. The 2008 edition of the Nigerian Demographic and Health Survey (NDHS) found that only 9.7% of married women use a modern method of contraception, while 20% of women have an unmet need for family planning services.

2.3.2 Maternal health

Poor maternal health remains a significant problem in developing countries. Worldwide, 585,000 women die during pregnancy and childbirth every year and an estimated 7.6 million children die under the age of five (WHO, 2011). The majority of maternal deaths occur

during or immediately after childbirth. The common medical causes for maternal death include bleeding, high blood pressure, prolonged and obstructed labour, infection and unsafe abortion. A child's risk of dying is highest during the first 28 days of life (about 40% of under-five deaths take place during this period), translating into three million deaths per year. Up to one half of all newborn deaths occur within the first 24 hours of life, and 75% occur in the first week. Globally, the main causes of neonatal death are preterm birth, severe infections and asphyxia. Children in low-income countries are nearly 18 times more likely to die before the age of five than children in high-income countries.

Good maternal health and nutrition are important contributors to a child's survival. The lack of essential interventions to address these and other health conditions often contribute to indices of neonatal morbidity and mortality (including stillbirths, neonatal deaths and other adverse clinical outcomes). The highest maternal, neonatal and under-five mortality rates are in sub-Saharan Africa and in Southern Asia. Although substantial progress has been made towards achieving the Millennium Development Goals (MDGs) 4 and 5, the rates of decline in maternal, new born and under–five mortality remain in-sufficient to achieve these goals by 2015. Interventions and strategies for improving reproductive, maternal, newborn and child health and survival are closely rated and must be provided through a continuum of care approach. When linked together and included as integrated programmes, these interventions, can lower costs, promote greater efficiencies and reduce duplication of resources. However, few efforts have been made to identify synergies and integrate these interventions across the continuum of care. Despite the existing plethora of knowledge, there is a lack of consensus on how best to move forward in a coordinated manner so as to achieve progress towards the MDGs.

Furthermore, consensus is also needed on the level of evidence. There is the need to estimate deaths from many angles such as birth and death registration, census, household

surveys, Reproductive Age Mortality Studies (RAMOS) and Sisterhood Methods. The figure of 545 deaths per 100,000 live births obtained from NDHS, 2008, used the sister-hood method of measurement. Although it is reliable, however, to get a figure with the highest degree of certainty, we need to adopt many methods. It is recommended that by 2015 all countries will take steps to establish a system for the registration of births, deaths, and causes of death, and have well functioning health information systems that combine data from health facilities, administrative sources and surveys.

2.3.3 Socio-cultural context of maternal health

2.3.3.1 Educational status

Education, the product of man's struggle for survival and enlightenment is as old as the human race. According to Gutek (2008), informally, it is the general social process by which man acquires the knowledge and skills needed to function in his culture; while formally it refers to the process by which teachers instruct students in courses of study within institutions. However, opposition to females being formally educated is as old as documented history. From China to India to Europe to Africa to the Middle East, women education was greatly resisted (Woodward, 1912; Lavely *et al*, 1990; Agrawal and Aggarwal, 1992; Mehran, 2001; Keshavjee, 2010). Even though female school enrolment now surpasses that of male in some developed countries (NCES, 2007), barriers to female education still persist in many developing countries of the world despite the fact that research has proved that education for women is the best way to improve the health, nutrition and economic status of a household that constitutes a micro unit of a nation's economy (King and Hill, 1998, Klasen, 2002; Sharmila and Dhas, 2010). Female education greatly impacts the health of women. A study of 24 countries in Africa, Asia and Latin America showed that women with no education had 2.7 times and those with between one and six years of education had twice the

risk of maternal mortality of women with more than 12 years of education (Karlsen, 2011). Female education reduces maternal mortality and morbidity (Caldwell, 1979, 1986; UN, 2003, Gakidou, 2010, Pillai, 2013), reduces early marriage (UN, 2003; Ikamari, 2005; Okereke *et al*, 2013), improves maternal health (UN, 2003; Rowe *et al*, 2005; Ahmed *et al*, 2010; Koch *et al*, 2012), improves life expectancy (UN, 2003; Hurt, 2004; Hendi, 2015), improves women's status, self worth and income (Gakidou, 2010; Lutz and Samir, 2011; Omoniyi and Oloruntegbe, 2014), improves child survival (Bicego and Boerma, 1993; Caldwell, 1994; Monden and Smits, 2012), improves domestic communication and citizenship (Roudi-Fahimi and Moghadam, 2003; UN, 2003; Lutz and Samir, 2011). Despite the universally accepted benefits of female education, 493 million women and 76 million girls are still illiterate worldwide, representing 63% to 64% of global illiterate population (UIS, 2013). About 52.29% (36.15 million) of Nigerian women are illiterate (UNESCO, 2012), a situation that does not augur well for maternal health.

2.3.3.2 Socio-economic status

Socioeconomic status, an economic and sociological combined total measure of a person's work experience and of an individual's or family's economic and social position in relation to others is based on income, education, and occupation (Wikipedia, 2015). Historically and presently, even in developed countries of the world, women earn less than men, even when they have the same level of education and are in the same occupational field (APA, 2015). The 2006 American Community Survey (ACS) revealed that salaries of American women are about 77.3 percent of that of American men. In some states, women make as little as 66% of men's earnings (U.S. Census Bureau, 2006). In less developed countries, coupled with the culture of men's dominance and low educational attainment, women earn far less than men (Fatile *et al*., 2011; Nyaruwata1 and Nyaruwata, 2013; Abebe & Quaicoe, 2014). This greatly

impinges women's health in general (Groh, 2007) and maternal health, in particular (Stewart *et al*, 2007). The disparity in employment is clearly demonstrated by the sharp rise in gender employment gap from 0.2% in 2007 to 0.7% in 2012, destroying 13 million jobs for women (ILO, 2012). Apart from this, most women work at menial and manual jobs due to lack of prerequisite skills (Chen, 2008; Onyenechere, 2011), a situation which further compounds, and, in some cases, compromises maternal health (Lanre-Abass, 2008; Izugbara, 2010), especially in developing countries, due to women's poor financial capacity.

2.3.3.3 Culture

Culture is the characteristics and knowledge of a particular group of people, defined by everything from language, religion, cuisine, social habits, music and arts (Zimmermann, 2015). As important as culture is to the continued survival of humanity, it has been discovered that some cultural practices negatively impinge maternal health (CARMMA, 2013; Vallely 2015). Due to cultural beliefs, some women refuse care from male midwives and health attendants, regardless of whether they are the only skilled attendants available. While some women will only allow doctors and midwives who are from their tribe to attend to them, others are kept from medical care by their husbands (VOA, 2010, CARMMA, 2013). The desire for male children results in frequent pregnancy, even at the detriment of the woman's health. In some communities in Sierra Leone, for example, it is believed that if you give a pregnant woman meat, she will give birth to a child who is a witch (VOA, 2010), a practice that jeopardises the nutrition of would-be mothers. Also, in some tribes, women are left to go through labour alone, as a sign of strength; a practice is quite dangerous to both the mother and child (VOA, 2010). In some other ethnic groups, women are not allowed to inherit properties, thus denying them access to material resources; while some others do not allow women to own land.

2.3.3.4 Age at marriage

The age at marriage has a lot to do with maternal health. Early age of marriage puts women at risk. Most Nigerian women experience their first pregnancy between age 20-34years, but according to FMOH, 10% have their first pregnancy by age 15 (FMOH, 2003). Such early age at marriage is fraught with danger. Such young women may not be biologically and mentally ready for the task of childbearing and may also be subjected to the additional danger of a prolonged period of childbearing (up to age 49).

Due to the high value that the Nigerian society places on having children, women take enormous risks to become mothers. Eight percent of high risk births are to women below 18 years of age and one percent of such births are to women over 34 years of age (FMOH, 2003).

2.3.3.5 Decision making and resources

The inability of most women to take independent decisions, coupled with insufficient access to resources, often prevent them from making the strategic decision to seek medical help at the crucial point, the point of life or death.

Frequently, the male members of the family, who largely control the resources, make such decisions. This underscores the importance of male involvement to ensure that resources (funds, transportation, etc.) are readily available to women in need. As is the case with most of the respondents of this research, effective male involvement ensures that childbearing is made safe for mother and child.

Lack of resources is a major reason why women fail to use available health facilities. Seventy (70%) percent of Nigeria's population (mostly women) live below the poverty line (FOS, 1999). Due to scarce resources, hospital treatment bill does not rank high on the priority list of families, especially where traditional birth attendants (TBAs) are available. It

is noteworthy that as useful as trained TBAs are, they do not possess adequate skills to handle pregnancy related complications and emergency situations (WHO, 2003).

2.3.3.6 Poverty

Consequent upon the generally high level of poverty in the country, a significant proportion of Nigerian women suffer from poor nutrition. Most pregnant women are deficient in Vitamin A, Iron and Iodine (WHO, 2003). This makes the survival of both mother and child very slim. Even though efforts at fortifying some food items with essential vitamins are commendable, it cannot replace the need for the country to lift most of her citizens (primarily women) out of poverty. It is high time Nigerian governments stopped paying lip service to poverty eradication.

Globally, in the last couple of decades, much of the poverty reduction came almost exclusively from China, the most populous nation on earth. China's poverty rate fell from 85% to 15.9%, or by over 600 million people! Most of her present day modern and industrial cities were mere fishing settlements thirty years ago. Similarly, India, the second most populous country in the world has worked assiduously in reducing poverty among her teeming populace. Almost two decades ago (1994), there were 403.7 million people, or 45.3% of her population, in poverty. By the end of the 2012, there were 269.3 million people (21.9% of the population) living below the poverty line. This showed that India successfully halved her poverty level in twenty years. If these more populous countries drastically reduced their poverty level, so can Nigeria if she takes charge of her future.

2.3.4 Health issues in maternal health

2.3.4.1 Modern contraceptive

Low use of modern contraceptive methods contributes to high fertility rate and grand-multiparity, thus increasing the risks for mother and child. It is also the cause of increased

teenage pregnancies among sexually active adolescent, thus contributing to induced and unsafe abortions which result in disability and death. There is the need for a well groomed functional reproductive education for the nation. Though not well publicised, religion has been a great impediment to the general adoption of modern contraceptive. However, this is an irony given the fact that other developing nations, such as Indonesia, have effectively used religion to propagate modern contraceptive (Akinyoade, 2013).

2.3.4.2 HIV/AIDS

HIV/AIDS is fast becoming a significant cause of maternal and newborn deaths. Although, worldwide, more men than women die as a result of HIV/AIDS, the reverse is the case in sub-Saharan Africa. In Nigeria, HIV prevalence among antenatal clinic attendees is 5.8 percent (2001 HIV Sentinel Survey). More alarming is the fact that between 25 and 35 percent of HIV positive mothers pass the virus to their babies during pregnancy, or during delivery and (or) through breastfeeding in the absence of appropriate anti-retroviral drugs (WHO, 2003). The need for greater efforts at reducing stigmatization of HIV/AIDS patients cannot be over-emphasised. The less stigmatised they are the easier it is for them to come out in the society to identify with various initiative geared at reducing mother-child transmission.

2.3.4.3 Place of delivery

The place of delivery is another determinant of maternal and child morbidity and mortality. Only 37 percent of births take place in a health facility as compared to 58 percent at non-health facilities. However, more than half of the births in the Southwest (67%) and Southeast (55%) take place in hospitals, compared to 44%, 12% and 6% in the Northcentral, Northeast and Northwest respectively (WHO, 2003).

Evident from this research is the fact that a significant proportion of pregnant women still prefer to patronise TBAs and Mission Homes for delivery. Religion and tradition still

play a strong role in the choice of place of delivery. However, as stated earlier, a well fashioned strategy must be developed by the country to bring down the level of births outside health facilities. It is a huge task, but the country must undertake it for the well being of her citizenry.

2.3.4.4 Inadequate manpower

Also evident from the research is the inadequacy of manpower. Most health facilities lack sufficient number of staff, skilled and unskilled. This corroborates the available statistics which show that more than half of the health facilities nationwide have no midwives (WHO, 2003). The 1999 Nigerian Demographic and Health Survey shows that only two fifths (40%) of births are attended by trained personnel (NDHS, 1999). However, by 2008, the figure has reduced to 39%, implying that the country is not looking well to the issue of training skilled health personnel for delivery.

This and other factors are responsible for major delays, culminating in the deaths of mothers and newborns. An example is the IDI with a RBM Staff in one of the LGAs studied.

> The problem we have is logistics. Imagine the PHC has just two (2) ambulances. You know what that means? In Akinyele Local Government, we have more than 20 facilities (PHC). So, it is not that easy to move patients from one end to the other. Now, if government really wants a good result from the RBM, they should equip the Monitoring and Evaluation (M&E) units very well in terms of staffing, logistics, vehicles, motorcycles, computers and printers. **All these would make us more effective**. (RBM Staff)

As stated earlier, Nigeria needs to declare a state of emergency in her reproductive health sector. All aspects of reproductive care in the country need serious intervention. There is need to train new hands for the sector, while retraining the existing ones. More resources should be focally pumped into the sector to provide up-to-date equipment and facilities. Given the centrality of manpower, more attention should be given to the training of health workers at all levels.

2.4 Maternal mortality trend in Nigeria (1990 - 2011)

WHO, UNICEF, UNFPA and World Bank estimated Nigeria's maternal mortality thus; 1990 (1100), 1995 (1000), 2000 (970), 2005 (820), and 2010 (630). From a morality ratio of 545 deaths per 100,000 live births (NDHS, 2008), the ratio was estimated to be 487 per 100,000 live births as of September 2011.

Table 2.1: MMt trend in Nigeria

Year	1990	1995	2000	2005	2008	2010	2011
MMR	1100	1000	970	820	545	630	487

From the resultant graph of Table 2.1 (Fig.2.4), it is obvious that Nigeria has experienced a decline in her MMR over the 21year period, which should be heartwarming. However when compared with the global average maternal mortality ratio of 290/100,000 live births, Nigeria's MMR of 487 is unacceptable.

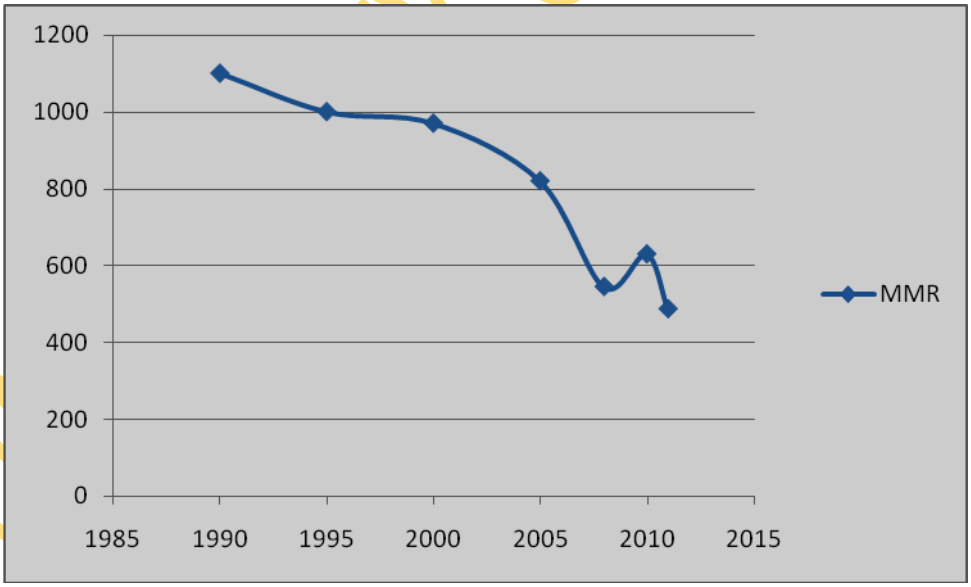


Fig.2.4: MMt Trend in Nigeria

Canada has among the lowest reported MMRs in the world. This reflects the country's universal access to high quality medical care relatively healthy population and the generally favourable economic and social status of her women. The Canadian MMR fluctuated from a

low of 3.4 per 100,000 live births in 1984 – 1986 and 1990 – 1992 to a high of 5.5 per 100,000 live births in 2002 – 2004. Direct obstetric deaths are the most common cause of maternal death in Canada. Pulmonary embolism, diseases of the circulatory system, post partum hemorrhage and hypertension were the most common causes of death for the period 1981 – 1986. Other complications leading to death are obstructed labour, ectopic pregnancy, obstetrical trauma and their treatment, as well as complications of the administration of anesthetic or other sedation in labour and delivery, (Canadian Perinatal Health Report, 2008).

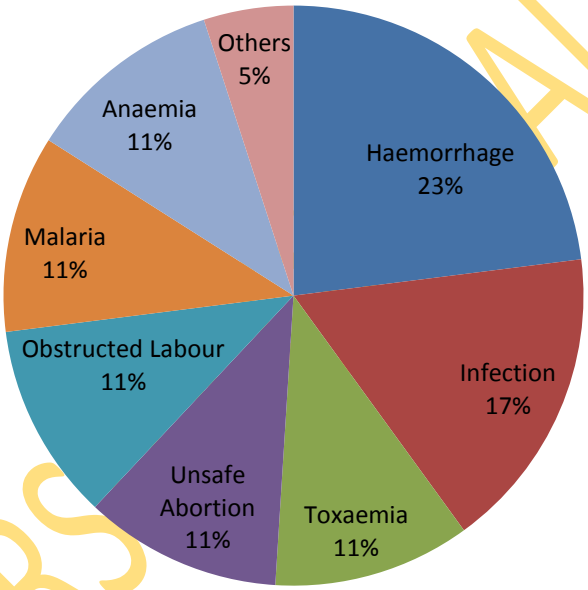


Fig. 2.5: Causes of Maternal Death **WHO/FMOH, 2003**

Every single day, Nigeria loses about 2,300 under-five year olds and 145 women of childbearing age (UNICEF, 2012). This makes the country the second largest contributor to the under five and maternal mortality rates in the world. Underneath the statistics lies the pain of human tragedy for thousands of families who have lost mothers or wives children. Even more devastating is the knowledge that, according to recent research, if essential interventions had reached their women and babies on time, most of the deaths would have been averted.

Although analyses of recent trends show that the country is making progress in cutting down infant and under-five mortality rates, the pace still remains very slow, making the achievement of the Millennium Development Goal of reducing child mortality by a third by 2015 a mirage. Preventable or treatable infectious diseases such as **malaria**, pneumonia, diarrhea, measles and HIV/AIDS account for more than 70 percent of the estimated One Million under five deaths in Nigeria (WHO, FMOH, 2003).

The deaths of newborn babies in Nigeria represent a quarter of the total number of deaths of children under five. The majority of these occur within the first week of life, mainly due to complications during pregnancy and delivery, reflecting the intimate link between newborn survival and the quality of maternal care. The main causes of neonatal deaths are births asphyxia, severs infection including tetanus and premature birth.

Similarly, a woman's chance of dying from pregnancy and childbirth in Nigeria is 1 in 13. Although many of these deaths are preventable, the coverage and quality of health care services in Nigeria continue to fail women and children. Presently, less than 20 percent of health facilities offer emergency obstetric care and only 35 percent of deliveries are attended by skilled birth attendants (FMOH, 2003). This shows the close relationship between the well being of the mother and the child, justifying the need to integrate maternal, newborn and child health interventions.

2.5 Pregnancy threatening health issues

2.5.1 Malaria in pregnancy

The prevalence of malaria is increased during pregnancy compared to the non-pregnant state (Gilles *et al*, 1969; Brabin *et al*, 1988; Kortman 1972; Braain *et al* 1990a). Susceptibility to infection and the severity of clinical manifestations are determined by the level of pre-pregnancy immunity which, in turn, depends largely on the intensity and stability of malaria transmission (Mutabingwa, 1994). In highly endemic areas, such as most of sub-Saharan

Africa, the effects of malaria on mother and foetus are less severe than in areas with low or unstable transmission. But malaria still has important consequences for pregnancy, especially in primigravidae.

It has been repeatedly reported that primigravidea usually have a higher prevalence of malaria infection (peripheral or placental) as compared to multigarvidae (Keuter *et al*, 1990: Mvondo *et al*, 1992; Bulmer *et al*, 1993; Meuris et al, 1993; Mutabwinga *et al*, 1993), and that the difference between infected and non-infected women in mean Hb levels (Kortman, 1972; McGregor *et al*, 1984;Brabin *et al*,1990) as well as in mean birth weight (Jelliffe, 1968; Kortman, 1972; McGregor, 1983) are more marked in primigravidae than in multigravidae. However, multigravidae are also vulnerable to malaria as it has been shown by recent data from Senegal.

The incidence of malaria attacks during pregnancy as compared to control time periods (before or after pregnancy) in the same women was significantly and substantially increased, also, for multigravidae up to their fifth pregnancy (Diagne *et al*, 1997). This makes the proposition of limiting malaria chemoprohylaxis to primigravidae not only impractical from an operational point of view, but also difficult to justify in view of the above. However, there are still a few questions to be answered in terms of the consequences of malaria for pregnant women and their offspring.

For example, the role of malaria as a contributing factor to abortion, perinatal mortality and prematurity, is unknown (Menendez, 1995). Although, for the latter, a significant reduction after the implementation of a national programme on insecticide-treated nets (ITN) has been reported (D'Alessandro et al, 1996). The effect of malaria during pregnancy on the infant's susceptibility to infection and on mortality is also unknown although it is likely that increase in mean birth weight, as a result of malaria prevention, would increase the chances of survival.

Since 1964, about 300 papers reporting, directly or indirectly, on malaria control measures during pregnancy has been published. However, this is still a controversial subject. A recent Cochrane review on malaria prevention in pregnant women identified only 14 trials meeting the author's strict inclusion criteria (Glumezoglu & Garner, 1999). The trials used different anti-malaria drugs (chloroquine, pyrimethamine, mefloquine dapsone-pyrimethamine) and different chemoprophylaxis regimens (daily, weekly, fortnightly and monthly). A significant decrease of antenatal parasitaemia was found in most of the studies (Fleming *et al*, 1986; Greenwood *et al*, 1989; Mutabingwa *et al*, 1993a; Nosten *et al*, 19994; Nyirjesy *et al*, 1993). A small effect on packed cell volume was detected, although it appeared to be confined mainly to primigravide (Hamilton *et al*, 1972; Greenwood *et al*, 1989; Nosten *et al*, 1994). There was a trend towards a higher mean birth weight, mainly in primigravidae (Morley *et al*, 1964; Hamilton et al, 1972; Greenwood *et al*, 1989 cot *et al*, 1992 Nosten *et al*, 1994; Nyirjesy *et al* 1993). None of the trials, because of their relatively small size, had sufficient power to detect a possible effect on perinatal and neonatal mortality, and surrogate and intermediate outcomes of infant death, which include placental parasitaaemia, are of doubtful significance (Gulmezoglu & Garner, 1999). The conclusions of the Cochrane reviews are that, given the existing evidence, the effectiveness of prophylaxis on relevant outcomes is not strong: it seems to protect from illness in the mother and increase birth weight in primigravidea. Study sizes mitigate against any conclusion in terms of obstetric morbidity or fetal/infant mobility (Gulmezoglu & Garner, 1999). However, several trials were not included in the above review because they did not meet the necessary requirements or were published after the review.

This is noteworthy, considering that the result of the largest chemoprophylaxis trial ever done during pregnancy was excluded because of suspected bias in the allocation of the 4 regimens under evaluation. The study, the Mangochi Malaria Research Project, carried out in

Malawi, evaluated three different chloroquine (CQ) regimens against mefloquine (MQ) (Steketee *et al*, 1996). In each of the 4 trial centres, participating where pregnant women were enrolled, one of the three CQ regimens was compared to an MQ regimen by alternation (days of the week). The method reported should have led to a 1:1 ratio of women given mefloquine and chloroquine. However, there were four times as many women in the chloroquine group (3077 vs 1032) and this is the reason why the results were not considered for the Cochrane review (Gulmezoglu & Garner, 1999). Nevertheless, the result can still be of relevance when considering the impact of chemprophylaxis during pregnancy.

At the time of the study, chloroquine resistance in Malawi was already high. The risk of persistent breakthrough from malaria infection was much higher among women on CQ compared to those on MQ (30.9% and 11.1% respectively) (Steketee *et al* 1996). The risk of peripheral or placental parsitaemia was also higher in women on CQ (8.7% and 7.4% respectively). The percentage of low birth weight babies was lower in the MQ than in the CQ group (12.5% versus 15.5%). This result indicates that an effective antimalarial drug can prevent malaria infection during pregnancy and can have a beneficial effect on its outcome. An alternative approach is the administration of intermittent preventive treatment, which may achieve equal efficacy as continuous chemoprophylaxis. This has been investigated in Malawi, where two-dose regimen of sulfdoxine-pyrimethmine (SP) (one dose in the second trimester, followed by second dose at the beginning of the third) were compared with one dose of SP or one treatment of CQ, followed by weekly CQ. The results show a significant impact of the 2-dose SP regimen on peripheral and placental parasitemia and tendency towards a higher mean birth weight and a lower percentage of low birth weight babies (Schultz *et al*, 1994). A published trial carried out in Malawi found significant difference in mean birth weight and percentage of LBW in women who had received two or three doses of SP during pregnancy, compared to those who had received only one dose (Verhoeff *et al*,

1998). However, (1) the study was not a randomised controlled trial and assigned different doses of SP according to the weeks of gestation at the time of first antenatal clinic; (2) data were available only for 31% of the women recruited; (3) the number of SP doses did not have any effect on placenta or peripheral parasitaemia at delivery and on Hb concentration. Two additional trials, carried out in Kenya, compared intermittent treatment SP with placebo or routine case management. One showed a significant decrease of severe anaemia in pregnant women on SP, but not on the occurrence of LBW or on mean birth weight (Shulman *et al*, 1999). The other showed an impact on mean birth weight and the percentage of LBW babies (Parise *et al*, 1998).

Intermittent treatment seems effective in preventing some of the consequences of malaria infection in pregnant women. However, some questions still remain. Before the 16th week of pregnancy, SP is not recommended because of concerns on possible teratogenicity (Phillips-Howard & Wood, 1996). Furthermore, SP intermittent treatment has been compared either with a placebo or with weekly CQ prophyixis, which was likely to be ineffective because of the high level of resistance already present. None of the above studies compared effective weekly malaria chemoprophylxis with effective intermittent treatment. This should caution us in implementing SP intermittent treatment everywhere, even in places where CQ still remains the first line treatment. There have been several reports on the interaction between HIV infection and malaria during pregnancy (Verhoef *et al*, 1999). Two doses of SP during pregnancy seem insufficient to confer adequate protection to HIV+ women and the number of doses to be given to this particular group of women is still unknown. The lower efficacy of SP when given together with folic acid raises the question on whether these two drugs should be given together during pregnancy.

Fig. 2.6: A Mother and Child sleeping under an ITN

Insecticide-treated nets (ITNs), which are effective at reducing malaria in children and adults (D'Alessndro *et al*, 1995), offer a possible alternative approach to the control of malaria in pregnancy. However, the evidence on whether ITNs or just untreated nets, during pregnancy are of any practical benefit is insufficient (Gulmezoglu & Garner, 1999). The first trial was carried out in three refugee camps on the Thai-Burmese border (Dolan *et al*, 1993).

A significant reduction in the incidence of *vivax* and *falciparum* malaria was observed in only one camp, but a significant reduction of anaemia was recorded in all 3 camps. The size of the net significantly influenced the degree of protective efficacy; malaria and anaemia occurred more frequently in the group using untreated single-size bed nets, distributed by the investigators, than in those using family-size untreated bed nets, which were large enough for 2 or 3 persons. No beneficial effect of ITNs on birth weight was shown.

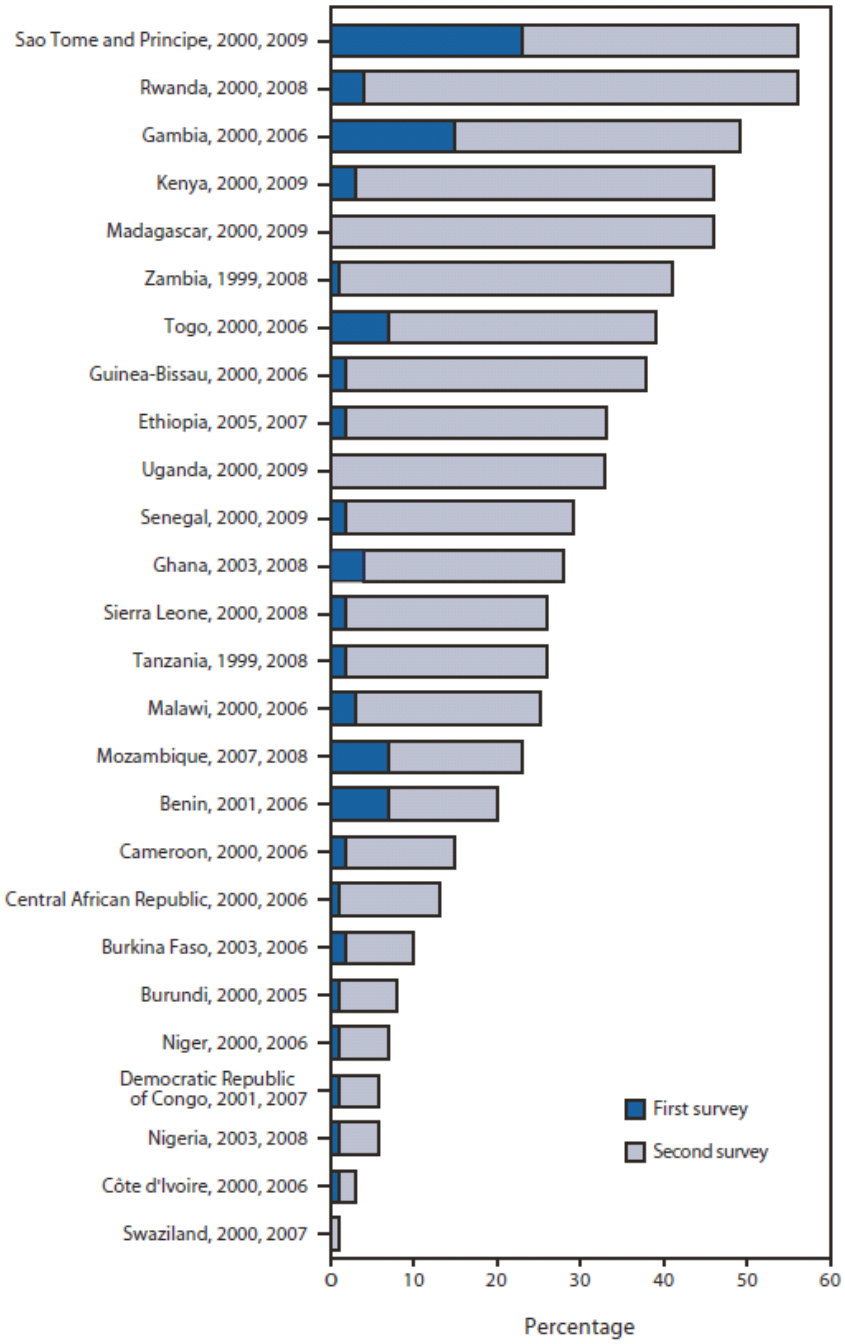


Fig.2.7 Percentage of children sleeping under an insecticide-treated net in countries with more than one survey, 1999—2009. Source: World Health Organization. World malaria report 2010.

Another trial carried out in Kenya and involving about 500 primigravidae, was unable to show any significant impact of ITNs on different factors (severe anaemia, peripheral and placental parasitaemia, birth weight) (Shulman et al, 1998). However, the ITNs national programme in The Gambia had some impact, limited to the malaria transmission seasons, on primigravidae (D'Alessndro, 1996). Mean birth weight, prevalence of parasitaemia at 32

weeks of gestation, and percentage of premature babies, were significantly different in primigravidae living in villages where nets had been treated with insecticide.

Whatever the strategy used to control malaria during pregnancy, and although this should cover all pregnant women, primigrvidae remain the most vulnerable group to be specifically targeted. Unfortunately, this is the group that is more difficult to reach. In The Gambia, for example, the mean age of 651 primigravidae was 17 years; most of them were farmers and illiterate. Although most of them attended an antenatal clinic at least once (mean number of attendance = 4, received some iron and folic acid supplementation, only a small minority received some chemoprophylaxis (D'Alessandro, 1996). The iron and folic acid supplementation did not have any effect on mean PCV levels, the percentage of anaemia (Hb<8) at 32 weeks of gestation was 18%.

2.5.2 Fever in pregnancy

Signs of fever during pregnancy include – high temperature, sweating, shivering, headache, muscle aches, dehydration and fatigue. There is a theory that an increased core temperature, whether from a fever or a dip in the hot tub, can cause neural tube defects, such as spina bifida. In theory, high temperature at a certain point, very early in pregnancy (in the first five to six weeks after conception) could cause the tube to form incorrectly.

In pregnancy, the immune system is doing double duty, trying to protect both the baby and the mother, so the susceptibility to colds and fevers during pregnancy is high. Studies of women who had a high fever during pregnancy have found a higher risk for neural tube defects such as *spina bifida* (Russell Turk, 2008). Researchers have also linked prolonged high fevers, particularly in the first trimester, to miscarriage, especially when the fever gets really high or lasts a long time. This risk occurs mainly when the fever or exposure to high

temperatures happened between the fourth and fourteenth week of the pregnancy i.e. the first trimester.

There is strong evidence that controlling fevers while pregnant may be effective in modifying the risk of having a child with autism or developmental delay. High maternal fever early in pregnancy is a human teratogen. Women who experience fevers of 38.9^{o} C or higher for extended periods of time in the first month of pregnancy should be considered at increased risk for neural tube defects and should be provided appropriate counselling (Chambers C.D *et al*, 1998).

The lack of appropriate knowledge of the cause and effect of fever is evident with some respondents listing the sun as one of the causes of malaria, and this invariably has an adverse effect on their utilisation of both the preventive and curative measures of malaria. Pregnant women observe other health options (like multiple treatment of malaria with both herb and modern medicine) which are not related to malaria for its prevention, which could be detrimental to their health. It shows that the information, education and communication that could enlighten the people have not been effective. Information should empower the people in enhancing appropriate perception which could facilitate taking suitable action in the fight against the scourge of malaria.

Also, against the background that a 2^{o} C increase in temperature could spell doom during the first trimester (Chambers C.D *et al*, 1998), there is the need to empower pregnant women to detect such increase in temperature through the use of thermometers. The knowhow of the use of such a simple instrument would go a long way in preventing damages that may occur from fever, be it sudden rise in body temperature or sustained temperature increase. But as observed during this research, even though malaria/high fever is the most reported pregnancy threatening health issue (86.4%), nowhere is the need for owning a thermometer mentioned in any of the ANC clinics visited, talk less of how to use it.

2.5.3 Anemia in pregnancy

Anaemia in pregnancy is an important public health problem worldwide. WHO estimates that more than half of pregnant women in the world have a haemoglobin level indicative of anaemia, the prevalence may however be as high as 56% or 61% in developing countries. Anaemia in pregnancy is a common problem in most developing countries and a major cause of morbidity and mortality, especially in malaria endemic areas. In pregnancy, anaemia has a significant impact on the health of the foetus as well as that of the mother. Twenty percent of the maternal deaths in Africa have been attributed to anaemia (Idowu *et al* 2005).

When pregnant, women may develop anaemia. The blood does not have enough healthy red blood cells to carry oxygen to the mother's body tissues and the baby. During pregnancy, the body produces more blood to support the growth of the baby. If the pregnant woman is not getting enough iron or certain other nutrients, her body might not be able to produce the amount of red blood cells it needs to make this additional blood.

It is normal to have mild anaemia when pregnant, but more severe anaemia can develop from low iron or vitamin levels or from other reasons. Anaemia leaves the patient feeling tired and weak. If severe anaemia goes untreated, it can increase the risk of serious complications like preterm delivery. Blood loss during and after delivery can also cause anaemia.

Several types of anaemia can develop during pregnancy. These include: Iron-deficiency anaemia, Folate-deficiency anaemia and Vitamin B12 deficiency.

Iron-deficiency anaemia occurs when the body doesn't have enough iron to produce adequate amounts of hemoglobin, a protein in red blood cells that carries oxygen from the lungs to the rest of the body. In iron-deficiency anaemia, the blood cannot carry enough oxygen to tissues throughout the body. It is the most common cause of anaemia in pregnancy.

Folate (folic acid)-deficiency anaemia occurs when the body cannot produce new cells. Folate, also called folic acid, is a type of vitamin B. The body needs folate to produce new cells, including healthy red blood cells. During pregnancy, women need extra folate. But sometimes they do not get enough from their diet. When that happens, the body cannot make enough normal red blood cells to transport oxygen to tissues throughout the body. Folate deficiency can directly contribute to certain types of birth defects, such as neural tube abnormalities (*spina bifida*) and low birth weight.

Vitamin B12 deficiency is when the body cannot produce healthy red blood cells. When a pregnant woman does not get enough vitamin B12 from her diet, her body cannot produce enough healthy red blood cells. Women who do not eat meat, poultry and dairy products, and eggs have a greater risk of developing vitamin B12 deficiency, which may contribute to birth defects, such as neural tube abnormalities, and could lead to preterm labour.

All pregnant women are at risk for becoming anaemic because they need more iron and folic acid than usual. But the risk is higher for these categories of women.

- Those who are pregnant with multiples (more than one child).
- Those that have had two pregnancies close together.
- Those that vomit a lot because of morning sickness.
- Pregnant teenagers.
- Women that do not eat enough foods that are rich in iron.
- Those that had anaemia before they became pregnant.

According to Idowu *et al*, prevalence of anaemia is generally higher among primigravidae than multigravidae. Good nutrition is the best way to prevent anaemia in pregnancy. Eating foods high in iron contents (such as dark green leafy vegetables, red meat, fortified cereals, eggs and peanuts) can help ensure that pregnant women maintain the supply

of iron their body needs to function properly. ANC clinics also prescribe vitamins to ensure that they have enough iron and folic acid. In case of anaemia during pregnancy, taking iron supplements can usually treat it. This brings to the fore the importance of ANC attendance.

In this study, it was found that 10.8% of respondents registered in an ANC during the first three months of pregnancy, which is quite worrisome. About 19.7% and 33.7%, respectively, registered during the 4th and 5th month of pregnancy. Cumulatively, only 64.2% of the respondents registered by the 5th month of pregnancy. Thus, a frightening 35.8% of the respondents did not register for ANC within the first five months of their pregnancy. As shown in Figure 20, after a rather slow take off, ANC enrollment peaks at the 5th month, declining rapidly afterwards. More worrisome is the fact that 19.7% and 12.5% of the respondents waited till the 6th month and 7th months, respectively, to register at ANC. Another 3.6% did not even register still the 8th month!

Obvious from the foregoing is the role of attitude, finance, distance, and knowledge. As stated earlier, many pregnant women do not register early for ANC due to poor financial capability. Since some of them depend on others (husbands, friends, in-laws, etc) to take decision, and such decision makers see pregnancy as an ordinary event, late registration for ANC is inevitable. Also, due to the routine nature of ANC, some pregnant women are deterred by distance. This research found out that only one PHC centre per LGA is dedicated for ANC. Thus, the distance factor is played up, given the expanse of the LGAs and the attendant physical terrain variation. However, it is worthy of note to mention that in all the ANC clinics visited during the course of this research, attending pregnant women were given haematinics along with the IPT, even though it might not suffice to rid the pregnant women of anaemia.

For effective control of anaemia in pregnancy, the need to empower women, financially and educationally, comes to the fore. A well empowered woman is in a better

position to take advantage of modern medical care when pregnant. For nations of the Third World, especially Africa, the need to drastically reduce poverty cannot be over-emphasised. Like in countries such as China, the more Africans that escape poverty, the less the occurrence of such health conditions as pregnancy induced anaemia. African countries, primarily Nigeria, need to stop paying lip service to poverty eradication.

2.5.4 Urinary tract infection in pregnancy

Pregnancy causes numerous changes in a woman's body. Hormonal and mechanical changes increase the risk of urinary stasis and vesicoureteral reflux. These changes, along with an already short urethra (approximately 3-4 cm in females) and difficulty with hygiene due to a distended pregnant belly, increase the frequency of urinary tract infections (UTIs) in pregnant women. Indeed, UTIs are among the most common bacterial infections during pregnancy. In general, pregnant women are considered immunocompromised UTI hosts because of the physiologic changes associated with pregnancy. These changes increase the risk of serious infectious complications from symptomatic and asymptomatic urinary infections even in healthy pregnant women.

A urinary tract infection is an infection in the system of the body that makes and excretes urine. This system includes: the kidneys, the urethras (tubes that carry urine from the kidneys to the bladder), the bladder and the urethra (a short tube that carries urine from the bladder to outside the body). The infection mostly occurs in the urethra and bladder. It can also travel from the bladder into the urethras and kidneys. Bacteria are usually the cause of UTIs. Normally a person's urine does not contain bacteria. Bacteria are naturally present on the skin, in the lower bowel and in the faeces. Sometimes, bacteria from one of these sources enter the urinary system. Once there, they multiply and cause pain and irritation.

In many cases there is no obvious reason for a UTI, but some risk factors can be identified and these are relevant to both pregnant and non-pregnant women. They include sexual intercourse (this can introduce bacteria from the skin into the urethra), contamination by bacteria from faeces (this can happen, for example, if women wipe forward from the anus into the vaginal area after a bowel movement), partial blockage of the urinary system from the pressure of an enlarged uterus (stagnation of urine flow increases the risk of infection), the use of catheters (tubes which are introduced into the bladder to drain it, when it is not working properly), when there is sugar in the urine (for example in diabetes or sometimes in pregnancy).

Pregnancy and urinary tract infections often go hand-in-hand since pregnant women are at an increased risk of developing UTIs. Pregnancy hormones cause changes in the urinary tract which predispose women to infections. In addition, as the uterus grows it presses on the bladder and can prevent complete emptying of urine. This stagnant urine is a likely source of infection. Untreated, these infections may lead to kidney infections. UTIs are associated with risks to both the foetus and the mother, including pyelonephritis, preterm birth, low birth weight, preeclampsia, and increased perinatal mortality. Urinary tract infections in pregnant women should be treated to prevent these complications. The prevalence of UTI during pregnancy increases with maternal age.

Urinary tract infection symptoms include having a burning sensation during urination; feeling an urgent need to urinate or frequent urination; having difficulty urinating; having a burning sensation or cramps in the lower back or lower abdomen; urine that looks cloudy or has an odour. However, in pregnancy, there may be no symptoms from bacteria in the urine. Thus, it is recommended that all pregnant women should be checked for this 'asymptomatic' infection and given treatment, if necessary. Urinary tract infections are only

treatable with antibiotics. An infected woman will need to take the medicine for 3 to 5 days, depending on the antibiotic used or as determined by the caregiver.

This brings to fore once again the issue of poverty and pregnancy as financial constraints is among the major reasons given by pregnant women for late booking and inconsistency in keeping ANC appointments, and also for not adhering to drug use. Admitting the severity of this complication, there is the need for proper counselling on what UTIs are and dangers they portend to pregnant women and their babies, during ANC. Also, a robust advocacy will help sensitise the public on the dangers for UTIs in pregnancy.

As mentioned earlier, UTIs in pregnancy may show no symptoms, hence the recommendation that all pregnant women be checked for this 'asymptomatic' infection and given treatment, if necessary. However, this study found out that most ANC clinics do not have such capability. Most of them lack medical laboratories; talk less of well-equipped ones. Thus, the women attending the clinics could in no wise be screened for UTIs. They are at a high risk of coming down with UTIs without notice and such will go undiagnosed for a considerable length of time, leading to other serious threats to both the health of would-be mothers and their babies. The need for a comprehensive upgrading of both facility and personnel at ANC clinics cannot be over-emphasized since pregnancy and urinary tract infections often go hand -in-hand. Also, given the risk of UTIs to non-pregnant women, PHC centers too should have functional, well-equipped medical laboratories to aid the health of Nigerian women.

2.5.5 Hypertension in pregnancy

Hypertension during pregnancy: whether the condition developed before or after conception, requires special care, hypertension during pregnancy poses various risks, including:

- **decreased blood flow to the placenta.** This reduces the baby's supply of oxygen and nutrients, potentially slowing the baby's growth and increasing the risk of a low birth weight.
- **placental abruption.** With this condition, the placenta prematurely separates from the uterus. Placental abruption can deprive the baby of oxygen and cause heavy bleeding in the mother.
- **premature delivery.** Sometimes an early delivery is needed to prevent potentially life-threatening complications.
- **future cardiovascular disease.** Women who develop preeclampsia — a serious condition characterised by high blood pressure and protein in the urine after 20 weeks of pregnancy — might be at increased risk of cardiovascular disease later in life, despite the fact that their blood pressure returns to normal after delivery.

Sometimes, high blood pressure is present before pregnancy. In other cases, high blood pressure develops during pregnancy. Gestational hypertension, referred to sometimes as pregnancy induced hypertension (PIH), is a condition of high blood pressure during pregnancy. Gestational hypertension can lead to a serious condition called preeclampsia (also sometimes referred to as toxemia). Hypertension during pregnancy affects about 6% to 8% of all pregnant women (APA, 2012). The risk of developing gestational hypertension is increased by being a first-time mother; women whose sisters and mothers had PIH; women carrying multiple babies; women younger than age 20 (teenagers) or older than age 40; and women who had high blood pressure or kidney disease prior to pregnancy.

Given the delicate situation of pregnancy, PIH treatment depends on how close a woman is to her due date. If close to her due date and the baby is well-developed, the health care provider may want to deliver the baby as soon as possible. If the hypertension is mild and the baby has not reached full development, the doctor will probably recommend rest,

lying on the left side to take the weight of the baby off major blood vessels; increased prenatal checkups; consumption of less salt; and the drinking of 8 glasses of water a day.

If hypertension is severe and the due date is far off, the doctor may try to treat the pregnant woman with blood pressure medication until she is far enough along to deliver safely. Severe hypertension can lead to preeclmapsia, which can have much more serious effects on mother and baby. Most women can still deliver a healthy baby if hypertension is detected early and treated with regular prenatal care. Hypertension can prevent the placenta from getting enough blood. If the placenta does not get enough blood, the baby gets less oxygen and food. This can result in low birth weight.

In this study, the low level of the knowledge of other malaria related complication has been demonstrated by the majority of the pregnant women despite their level of education. It was observed that all the respondents are ignorant of other severe malaria related complications in pregnancy, underscoring the need for a more robust policy implementation that includes proper dissemination of information on reproductive health; pregnancy; malaria in pregnancy and its attendant consequences; pregnancy threatening complications; etc. Although, in all the ANC clinics visited in the course of this study, the blood pressure of the pregnant women in attendance were taken, the pregnant women did not know the purpose; thus its importance eludes them. It is the opinion of this researcher that if pregnant women are well informed on PIH and its dangerous upshots, they will readily present themselves for checkups and diligently adhere to medical instructions.

2.5.6 Preeclampsia in pregnancy

Formerly called toxemia, preeclampsia is a condition that pregnant women develop, marked by high blood pressure and a high level of protein in the urine. Preeclamptic women will often also have swelling in the feet, legs, and hands. This condition usually appears during the second half of pregnancy, often in the latter part of the second or in the third trimesters,

although it can occur earlier. If undiagnosed, preeclampsia can lead to eclampsia, a serious condition that can put both the mother and her baby at risk, and in rare cases, cause death. Women with preeclampsia who have seizures are considered to have eclampsia.

The exact causes of preeclampsia and eclampsia (a result of a placenta that does not function properly) are not known, although some suspect poor nutrition, high body fat, or insufficient blood flow to the uterus as possible causes. Also, genetics plays a role, as well. **There is no known cure for preeclampsia yet**, which sounds scary. But when detected early, preeclampsia is easier to manage.

Preeclampsia is most often seen in first-time pregnancies, in pregnant teens, and in women over 40 years of age. Other risk factors include: a history of high blood pressure prior to pregnancy; a history of preeclampsia; having a mother or sister who had preeclampsia; a history of obesity; a n**ew paternity (e**ach pregnancy with a new partner increases the risk of preeclampsia over a second or third pregnancy with the same partner); carrying more than one baby; p**rolonged interval between pregnancies** (this seems to increase the risk of preeclampsia); and a history of diabetes, kidney disease, lupus, or rheumatoid arthritis.

In addition to swelling, protein in the urine, and high blood pressure, preeclampsia symptoms can include rapid weight gain caused by a significant increase in bodily fluid; abdominal pain; severe headaches; change in reflexes; reduced urine or no urine output; dizziness; and excessive vomiting and nausea.

Pregnant women are advised to seek emergency medical care if they have sudden and new swelling on the face, hands, and eyes (some feet and ankle swelling is normal during pregnancy); blood pressure greater than 140/90; sudden weight gain over 1 or 2 days; abdominal pain, especially in the upper right side; severe headaches; a decrease in urine; and blurry vision.

However, the most worrisome aspect of this condition is that **a pregnant woman can have preeclampsia without prior symptoms**. This underscores the importance of regular ANC for periodic blood pressure checks and urine tests. However, the ANC clinic registration and attendance trends observed in the course of this research, and corroborated by literature, leave much to be desired when it comes to the issue of susceptibility to this disease condition. Most pregnant women do not register on time for ANC; they wait till late in the pregnancy to register, giving great room for the possibility of falling victim of preeclampsia since it occurs during the second trimester or very early in the third trimester. The need to get pregnant women to start attending ANC clinic from the time they discover that they are pregnant cannot be overemphasised. Early and regular ANC clinic attendance goes a long way in keeping various diseases away from pregnant women.

Preeclampsia can prevent the placenta from receiving enough blood, which can cause the baby to be born very small. It is also one of the leading causes of premature births, and the complications that can follow, including learning disabilities, epilepsy, cerebral palsy, hearing and vision problems. Not only is this condition dangerous to pregnant women, it can affect their unborn babies in damaging ways. Low birth weight is a popular birth defect in developing countries of the world, Nigeria inclusive. Even though a degree of awareness is being created as to the undesirability of the condition, the long term damage it can inflict on children are yet to be well publicised. Pregnant women are encouraged to eat well, though poverty is still a scourge in our society. However, low birth weight can result from many ways other than poor nutrition. Preeclampsia is one of such ways.

In mothers-to-be, preeclampsia can cause rare but serious complications that include: stroke, seizure, water in the lungs, heart failure, and reversible blindness, bleeding from the liver, and bleeding after delivery. It can also cause the placenta to suddenly separate from the uterus, which is called placental abruption, which can cause stillbirth.

The only cure for preeclampsia and eclampsia is to deliver the baby! This is however subject to how far along the baby is, how well the baby is doing in the womb, and the severity of the preeclampsia. If the **baby has developed enough,** usually by 37 weeks or later, the doctor may want to induce labour or perform a cesarean section. This will keep the preeclampsia from getting worse. If the **baby is not close to term,** there may be the need to treat preeclampsia until the baby has developed enough to be safely delivered. The closer the birth is to the mother's due date, the better for the baby. In the case of **mild preeclampsia,** the doctor may prescribe: bed rest either at home or in the hospital (resting mostly on the left side); careful observation with a fetal heart rate monitor and frequent ultrasounds; medicines to lower blood pressure; and blood and urine tests. However, in the case of **severe preeclampsia,** the doctor may need to deliver the baby right away, even if the mother is not close to term. After delivery, signs and symptoms of preeclampsia go away within 1 to 6 weeks.

As stated earlier, there is yet to be a cure for preeclampsia! All that medical science can do for a victim is to manage the condition to the point the baby can be delivered. However, the requirement for the management of preeclampsia is far beyond the capability and capacity of most health facilities in the country, let alone PHC centers. The equipment and manpower is such that it is better to nip the condition in the bud. As the old saying goes, "prevention is better than cure." Given the enormous dangers associated with this disease condition, all hands must be on the deck to ensure that every pregnant woman registers on time and attends ANC faithfully to prevent falling victim of preeclampsia. The need to inform not just the women folk, but carry the men (decision makers in most African homes) along is long overdue. Men too need to be knowledgeable about the various pregnancy related complications to better appreciate what the women (pregnant or not) in their sphere of influence are in danger of.

2.5.7 Eclampsia in pregnancy

Eclampsia is seizures (convulsions) in a pregnant woman. These seizures are not related to an existing brain condition. Even though medical science does not know the exact causes of eclampsia, the following may play a role: blood vessel problems; brain and nervous system (neurological) factors; diet; and genes. Eclampsia follows a condition called preeclampsia, a serious complication of pregnancy discussed earlier. It is hard to guess which women with preeclampsia will go on to have seizures. Nevertheless, women at high risk of seizures have severe preeclampsia and abnormal blood tests, headaches, very high blood pressure and vision changes.

The chances of getting preeclampsia increase when a woman is 35 years or older, an African American; carrying her first pregnancy; having diabetes, high blood pressure, or kidney disease; having more than one baby (twins, triplets, etc.); or a teenager. The symptoms of eclampsia include: muscle aches and pains; seizures; severe agitation; and unconsciousness. As is in the case of preeclampsia, delivering the baby is the main treatment for preventing eclampsia. Allowing the pregnancy to go on can be dangerous to both the mother and the baby. Women with eclampsia have a higher risk of separation of the placenta (placenta abruption); premature delivery that leads to complications in the baby; and blood clotting problem.

Pregnant women are advised to seek emergency medical care right away if they have any of the following: bright red vaginal bleeding; little or no movement in the baby; severe headache; severe pain in the upper right abdominal pain; vision loss; and nausea or vomiting. It is important for all pregnant women to get early and ongoing medical care. This allows for early diagnosis and treatment of conditions such as preeclampsia, which translates to the prevention of eclampsia.

Once again, the need for prompt ANC registration and faithful ANC clinic attendance cannot be over emphasised. In most traditional African communities, incidences such as eclampsia are attributed to "spiritual" sources! Instead of seeking modern medical help, they resort to sacrifices and such like. It bears repetition, Africa, particularly Nigeria, needs to do more in enlightening her citizenry of the need to embrace modern healthcare. Not that alone, she also needs to give them ample opportunity to take advantage of modern healthcare by making it more accessible to the larger society.

2.5.8 Oedema in pregnancy

Swollen ankles and feet (oedema) happen in pregnancy because the body is holding on to more fluid than usual. As the baby grows, the uterus (womb) puts pressure on the blood vessels in the pelvis. This, particularly, affects the large vein (inferior vena cava) on the right-hand side which receives blood from the lower limbs. This pressure slows blood circulation in the area and causes the blood to pool.

Pressure from this trapped blood forces water down and out through tiny vessels (capillaries), and into the tissues of the feet and ankles. This water is normally absorbed by the body, but because of pregnancy, the body retains more water, which adds to the swelling. Swelling tends to get progressively worse as the day goes on, and is better in the morning, after the pregnant woman had been lying in bed. Later in the day, if the skin around the ankles is pressed, the skin may not spring back straight away. Towards the end of pregnancy, the swelling may affect the hands. If the pregnant woman is wearing rings, they may feel tight on her fingers.

Oedema is very common in pregnancy, particularly in the third trimester. Between 50% to 80% of healthy pregnant women have swelling of some kind, and hot weather can make it worse (Shepherd *et al* 2004). However, it is advised that pregnant women should

seek immediate medical help if they notice sudden or severe swelling in their face, hands or feet because it could be a sign of pre-eclampsia, which can be a serious condition for a pregnant woman and her baby. Medicines to help the kidneys release water and sodium to get rid of fluid (diuretics) are not suitable in pregnancy. Instead, these methods to control the swelling are advised. Pregnant women are advised to:

- Put their feet up whenever possible, as this will help with blood circulation. At work, they should keep a footstool or box under their desk. At home, they should lie down on the left side, as this takes pressure off the inferior vena cava.
- Try **not** to stand for long periods of time. At work, they should take regular breaks.
- Put support tights on before they get out of bed in the morning, so blood has no chance to pool around their ankles. If this does not help, they should see a doctor, who may prescribe compression stockings.
- Exercise regularly, especially walking, swimming or using an exercise bike.
- Take regular breaks to stretch their legs when travelling long distances.
- Ask someone to massage their ankles and feet, if their skin is not too tight and painful, using upward strokes towards your knees. This can help to move the fluid away from their feet.

Pregnant women need to be reminded that the swelling, though uncomfortable, would not last forever. Like many other pregnancies niggle, it should go soon after delivery. However, without proper information, the mismanagement of this seemingly harmless condition can lead to adverse situations. Here again comes the importance of relevant information and early ANC registration! To keep pregnant women from taking to wrong treatment of this condition, the country owes herself the duty of making modern ANC more accessible and affordable. Reducing the number of Nigerians living below the poverty line, mostly women and children, will go a very long way in protecting pregnant women.

2.5.9 Bleeding in pregnancy

Bleeding during pregnancy can be a very scary time for a pregnant woman. However, it is important to know that blood loss does not always translate to experiencing a miscarriage. Bleeding during pregnancy is more common than many might think. Approximately 20-25% of women experience bleeding during pregnancy (Kelly Winder, 2014). The most likely time bleeding occurs is in the first trimester of pregnancy.

Some women may have a once-off bleed; others may bleed throughout their whole pregnancy. This may be in the form of spotting, streaking, period-like blood loss or more. All bleeding should be reported to medical caregivers. Any passage of blood from the vagina of a pregnant woman before 24 weeks will be termed a 'threatened miscarriage' or 'threatened abortion.' After 24 weeks it is termed an 'ante-partum haemorrhage.'

For rhesus negative blood group (e.g. O-, A-) pregnant women, there is the need to seek medical help within 72 hours of any bleeding, to see if there has been a possible mixing of their blood and that of the baby, which results in the rhesus negative body producing antibodies against positive blood (which is the more dominant, likely blood group that the baby will inherit). This, however, has no bearing on first pregnancies, but in subsequent pregnancies, it could lead to fatality.

Some of the more common reasons for bleeding during pregnancy are below, and as it will be observed, it is not always evil. If the bleeding is accompanied by strong cramping, a pregnant woman should speak to her caregiver right away. However, some mild cramping/stretching sensations can be experienced in a healthy pregnancy though.

2.5.9.1 Implantation bleeding or streaking

When a fertilised egg attaches to the uterine lining, this can result in light spotting or streaking (streaks of blood). Usually, this only lasts a day or two and occurs during the time

between implantation no longer than when the normal monthly period was due (some women mistakenly think they have just had a light period). Implantation bleeding is usually bright fresh blood like when one sustains a cut on the finger. It can also be in the form of a pink mucus stain. However, it is advised that pregnant women mention it to their caregiver for safe measure.

2.5.9.2 Breakthrough bleeding

Some women experience what is known as 'breakthrough bleeding' at the times when their period would have normally been due. So, this would be at 4, 8 and 12 weeks of pregnancy. It is often accompanied by the feeling that would normally be associated with their monthly period being imminent, i.e. back ache, cramps, a heavy sensation in the pelvis, feeling bloated and 'off'. Of course, the period does not arrive (even though they feel like it will) because they are actually pregnant! During pregnancy, hormones prevent period from occurring. Sometimes, the hormone levels are not yet high enough to stop the period and, therefore, they have this breakthrough bleeding. It can last for around three months – after this time the placenta begins to take over hormone production from the ovaries. Some women may experience breakthrough bleeding throughout the whole pregnancy and have healthy babies, under the close watch of their caregiver.

2.5.9.3 Threatened or actual miscarriage

Studies indicate that around one third of pregnancies end in miscarriage (the medical term is spontaneous abortion) (Winder, 2014). These figures refer to the first 12 weeks of pregnancy, including very early miscarriages that occur before women even realise that they are pregnant. Often this is a result of a damaged or imperfect foetus – the body may reject a pregnancy that it knows will not be normal. Once it is 14-16 weeks, a pregnancy can be fairly

said to be safe. Common signs of miscarriage include bleeding (being most common), cramping, backache and stomach pains. Women commonly say that they no longer 'feel pregnant' when they have miscarried and are bleeding. The signs of pregnancy disappear, no more nausea, sore breasts or bloated tummy. An ultrasound will usually be reassuringly normal. It is, however, possible to miscarry without any bleeding, which is known as a 'missed abortion.' The foetus dies but is retained by the body. The signs of pregnancy would definitely have disappeared if this happens but the absence of a heartbeat would only be detected on ultrasound.

2.5.9.4 Bleeding after sex

Bleeding after intercourse/sex is one of the most common causes of vaginal blood loss. This is completely harmless and is caused by increased blood supply and softening of the cervix. Although this form of bleeding is not serious, it should always be reported to the caregiver. Pregnant women do not need to cease love-making but may need to reassure their partners that the baby is safely protected in their uterus, well above the vagina.

2.5.9.5 Ectopic pregnancy

An ectopic pregnancy occurs when fertilised egg implants itself outside of the uterus, usually in a fallopian tube. The pregnant woman may experience severe pain down one side of her abdomen, or generalised pain which doubles her over. She may feel faint and nauseous. The pain may suddenly disappear if the tube ruptures but it will return within hours/days and she will feel really unwell. This is an emergency situation as an ectopic pregnancy can rupture the fallopian tube causing internal bleeding, damage to the tube and maternal collapse. The fallopian tube may need to be removed along with the pregnancy but this does not mean that

the woman will have trouble conceiving in future provided the other ovary and fallopian tube are healthy.

2.5.9.6 Bleeding from the placenta

Painless vaginal bleeding can be from an abnormally placed placenta. Sometimes, the placenta implants itself very low down on the uterine wall, occasionally right over the cervical canal. This is called placenta *praevia* and it occurs in about two percent of women. Placenta *praevia* will inevitably result in a bleed at some point in the pregnancy, usually after the 20 week period. There are differing degrees of severity of this condition but all will require repeat ultrasounds to accurately diagnose it. This condition may require bed rest, an induction or a Caesarean if it remains over the cervix in the remaining weeks of pregnancy to prevent the baby from being put at risk.

Another cause of bleeding later in pregnancy is placental abruption (which occurs in approximately one in 200 pregnancies) where the placenta partially or completely separates from the wall of the uterus (Winder, 2014). Symptoms can include generalised severe pain and heavy bleeding. The blood may be visible or concealed in the uterus which will be tense, tight, hard to touch and very painful. Women, who smoke, have high blood pressure, kidney problems or pre-eclampsia, are more at risk. It requires urgent admission to hospital and depending on the severity of the bleeding; they may either be put on bed rest, be induced or have a Caesarean.

If a pregnancy is over 20 weeks, it is strongly advised that medical help be sought immediately in the event of bleeding. Pregnant women should not use tampons (a plug of, say cotton wool) if bleeding or anytime during pregnancy, they should always use pads. If the bleeding is light and painless, they should contact their caregiver to discuss the next step. If the bleeding is heavy (i.e. running out and passing clots) and the bleeding is accompanied

with stomach cramps, backache and period type pains, they should contact the hospital immediately.

There is the need to reassure pregnant women that they are not responsible for a miscarriage happening, they would not have done anything to cause it! But such is not the case in our society. Pregnant women, apart from bearing the trauma of miscarriage, are laden with the guilt of causing it through on form of "carelessness" or the other. The larger society needs to be enlightened that superstitious beliefs such as "pregnant woman walking outdoor at noonday" are not the cause of miscarriage. It must be drummed into their ears that the majority of bleeding in early pregnancy settles spontaneously and the pregnancy continues unharmed. Advocacy at popularising pregnancy related complications should not be limited to pregnant women or the women folk, in general, but must target the men (decision makers in most Nigerian home). The more the number of the men "converted," the better and brighter the future of pregnant women in the country.

2.5.10 Diabetes in pregnancy

This is a type of diabetes that some women get during pregnancy. Between 2 and 10 percent of expectant mothers develop this condition, making it one of the most common health problems of pregnancy (BabyCentre, 2012).

Simply put, diabetes is a health situation where there is an abnormally high level of sugar in the blood. Normally, what happens when we eat is that the digestive system breaks most of the food down into a type of sugar called glucose. The glucose enters the bloodstream and then, with the help of insulin (a hormone made by the pancreas), the cells use the glucose as fuel. However, if the body does not produce enough insulin (or the cells have a problem responding to the insulin) too much glucose remains in the blood instead of moving into the cells and getting converted to energy.

When a woman is pregnant, hormonal changes can make the body cells less responsive to insulin. For most mothers-to-be, this is not a problem. When the body needs additional insulin, the pancreas dutifully secretes more of it. But if the pancreas cannot keep up with the increased insulin demand during pregnancy, the blood glucose levels rise too high, resulting in gestational diabetes. The good news, however, is that most women with gestational diabetes do not remain diabetic after delivery. Although, once a woman has had gestational diabetes, the risk of having it again during a future pregnancy and for developing diabetes later in life is increased.

Like some other pregnancy threatening complications, gestational diabetes usually has no symptoms. That is why almost all pregnant women have a glucose-screening test between the 24th and 28th week of pregnancy. However, for pregnant women that are at high risk of diabetes or are showing signs of it (such as having sugar in their urine), this screening test is recommended at the first prenatal visit and then repeated 24 to 28 weeks if the initial result is negative. That the glucose-screening test result is positive does not necessarily mean that the patient has gestational diabetes. It only means that she will need to take a longer follow-up test (a glucose tolerance test, or GTT) to find out.

Worthy of mention, however, is the fact that none of the ANC facilities visited during the course of this research screened pregnant women for blood sugar levels! Even though the medical personnel in the clinics are qualified and are knowledgeable in this regard, they are handicapped by facility and funds. There was no laboratory in any of the clinics, let alone, standard ones.

A pregnant woman is considered at high risk for gestational diabetes (and should be screened early) if obese (body mass index is over 30); had gestational diabetes in a previous pregnancy; has sugar in her urine; has a strong family history of diabetes. It is advisable to also screen early, pregnant women with other risk factors, such as previously given birth to a

big baby; had an unexplained stillbirth; had a baby with a birth defect; have high blood pressure; over 35 years of age. There is an association between excessive weight gain during pregnancy – particularly in the first trimester – and the risk of gestational diabetes. The risk is highest in women who were overweight to begin with and in nonwhite women, including Africans (BabyCentre, 2012).

Most women who develop diabetes during pregnancy go on to have healthy babies. Dietary changes and exercise may be enough to keep blood sugar levels under control, though sometimes medication is needed, too. It is important to keep blood sugar levels in check because poorly controlled diabetes can have serious short- and long-term consequences for the mother and her baby. If the blood sugar levels are too high, too much glucose will end up in your baby's blood. When that happens, the baby's pancreas needs to produce more insulin to process the extra glucose. All this excess blood sugar and insulin can cause the baby to put on extra weight, particularly in the upper body. This can lead to *macrosomia*, a situation in which the baby may be too large to enter the birth canal. Or the baby's head may enter the canal, but then the shoulders may get stuck, a situation called shoulder *dystocia*.

In addition, babies who have excessive fat stores as a result of high maternal sugar levels during pregnancy often continue to be overweight in childhood and adulthood. Also, shortly after birth, the baby may have low blood sugar (hypoglycemia) because his body will still be producing extra insulin in response to the mother's excess glucose. This is much more likely if the blood sugar levels were high during pregnancy and especially during labour. Normally, the delivery team will test the baby's blood sugar at birth and continue to check it as needed by taking a drop of blood from his heel. Feeding the baby as soon as possible after birth, preferably by breastfeeding, can help prevent or correct hypoglycemia. Breastfeeding increases postpartum weight loss, as well as decreases risk of developing type 2 diabetes and cardiovascular disease.

This brings to the fore the need to continue, and also expand, the advocacy on breastfeeding. Although much is being done to get more women to embrace breastfeeding, the battle seems not yet won! One of the main attractions of most low and middle income earners to breastfeeding is the economic benefit, which is okay. But, there is the need to harp more on the ability of breastfeeding to reduce the risk of many deadly diseases and infections, which include heart related ones and diabetes. Inter-agency collaboration will go a long way in bringing about a greater acceptance of breastfeeding. Although it is not included in the RBM mandate, RBM is a veritable platform for the propagation of breastfeeding given its rich, though untapped, potentials to mobilise and sensitise the people at the grass-root.

In severe cases of hypoglycemia, testing the baby's blood sugar and providing an IV (I*ntravenous*) glucose solution, if necessary, can prevent serious problems such as seizures, coma, and brain damage that might result if the condition were to go unnoticed. The baby may also be at higher risk for breathing problems at birth, particularly if the mother's blood sugar levels are not well controlled or she delivers early (the lungs of babies whose mothers have diabetes tend to mature a bit later). The risk of newborn jaundice is increased, too. If the blood sugar control is especially poor, the baby is at risk for polycythemia (an increase in the number of red cells in the blood) and hypocalcemia (low calcium in the blood), and his heart function could be affected as well.

There is a link between severe gestational diabetes and an increased risk of stillbirth in the last two months of pregnancy (BabyCentre, 2012). And, finally, women with gestational diabetes are at increased risk for developing preeclampsia, particularly those who are obese before pregnancy or whose blood sugar levels are not well controlled.

As stated earlier, pregnant women that develop gestational diabetes are advised to do the following to keep their blood sugar levels where they should be:

- **Eat a well-planned diet.** The diet must have the correct balance of protein, fats, and carbohydrates, while providing the proper vitamins, minerals, and calories.
- **Exercise.** It has been proven that moderate exercise help improve the body's ability to process glucose, keeping blood sugar levels in check. Women with gestational diabetes will benefit from 30 minutes of aerobic activity, such as walking or swimming, each day, but subject to medical advice.
- **Take medication if necessary.** If the blood sugar is not well controlled enough with diet and exercise alone, the caregiver will prescribe medication as well. About 15 percent of women with gestational diabetes need medication.

There may be the need to monitor the baby more intensively during the last two to three months of pregnancy, depending on the severity of the mother's diabetes and whether she has any other medical or obstetrical problems. This will translate to more frequent prenatal visits than normally would have been. Pregnant women are taught how to count their baby's movements at 28 weeks so as to alert their caregivers immediately if they sense that the babies are less active in order to prevent a stillbirth. If the baby seems to be getting very big, the mother might be induced before her due date, or her caregiver may recommend delivering by caesarian section.

As many as a third (33.3%) of women who had gestational diabetes will continue to have diabetes or what is known as impaired glucose tolerance (BabyCentre, 2012). That means their glucose levels are higher than normal, but not as high as they would be with diabetes. In addition, for women who had gestational diabetes and a normal postpartum screening, it is advisable to have a repeat testing at least every three years. About one-third to one-half (33.3% - 50%) of women who have gestational diabetes will have it again in a later pregnancy (BabyCentre, 2012). And up to 50 percent of women with gestational diabetes will develop diabetes at some point in the future.

Despite available data on different interventions, there still remain some uncertainties. It is possible to reduce the burden of malaria among pregnant women, just by using current knowledge. However, one of the major problems for programme managers and implementers remains how to translate the available information into feasible and sustainable programmes; how to improve the delivery and coverage of such interventions, particularly for primigravidae? There is the need for promoting collaboration between scientists and policy makers/health managers in order to answer these questions, and in so doing, contribute to the decrease of the burden of the disease among pregnant women.

2.6 Rolling back malaria in Nigeria

Malaria has been repeatedly described as a major public health problem in Africa. WHO (2000, 2005a; Witty *et al*, 2007) confirms that nine out of ten cases of malaria, worldwide, occur in Africa, south of the Sahara. On the continent alone, the monetary cost of US$ 12 billion is incurred annually due to the malaria menace.

In Nigeria, like other African countries, malaria is a major public health concern, especially among the under-five children. The analysis of malaria in Nigeria shows that over 50% of outpatient attendances and 40% of hospital admissions are due to malaria; Malaria is a major cause of infant and maternal mortality as it accounts for 25% of infant mortality and 30% of maternal mortality; Malaria is both a product of underdevelopment and a cause of underdevelopment; Surveillance to confirm actual local resistance to anti-malaria is still weak (Mosanya, 2000). At least, 50% of the population suffers on the least, an episode of malaria each year.

There have been various efforts at malaria control in the past, especially through the implementation of the primary health care (PCH) system, but the major landmark in malaria control in Nigeria was the country's official joining of the Roll Back Malaria (RBM), along with other African countries. The RBM is a major WHO programme in the global fight

against malaria. The RBM is a partnership designed to reduce the burden of malaria by 50% by year 2010.

Nigeria initiated the African summit on RBM in the year 2000. The summit, which held between April 24th – 25th, had 44 out of the 50 malaria affected countries and territories in Africa present (WHO, 2000); Cuba was also represented. The event was an opportunity for African leaders to show coordinated political will in the fight against the disease and to intensify efforts at rolling it back. It was at the summit that April 25 was declared as African Malaria Day (AMD).

The summit admitted that the burden of malaria has slowed economic growth on the continent. Hence, African leaders resolved to half the burden of malaria by the year 2010, by pursuing the RBM objective through the implementation of its six critical elements which include: evidence-based decision using surveillance appropriate response and building community awareness; rapid diagnosis and treatment close to, or at home; multiple prevention using insecticide-treated mosquito nets and **making pregnancy safer**; focus research to develop new medicines, vaccines and insecticides and to help epidemiological, operational activities and social science research on how to influence the behaviour of those requiring treatment; well-coordinated actions for strengthening existing health services, policies and providing technical support; harmonised actions to build dynamic global movement (WHO, 2000).

Nigeria is one of the countries that signed into the RBM framework, thereby making the objective and strategies of the body as major objective of the national policy on malaria. For instance, the ITN was first unveiled in Nigeria in the year 2000. Hence, the promotion of ITN use is now one of the major strategies in malaria control in the country. Unfortunately, ITN coverage is still very low in Nigeria, with many people unaware of its existence (Jegede

et al 2006). This signifies that the implementation of the strategy has not been effective enough given the country's population (See figure.2.7).

Also, on home management of malaria (HMM), there have not been tremendous efforts in utilising opportunities to scale-up this strategy, even though it has been noted that HMM is a major pattern of malaria management in Nigeria (Jegede et al, 2005).

The national health policy drafted in the year 2003 confirms Nigeria's endorsement of the RBM initiative as a major health plan in fighting malaria in Nigeria. The policy recognises the state of the health services in Nigeria, pointing out that its coverage is still inadequate as only 54% of the population has access to modern healthcare services. The document also stated that the orientation of the services is inappropriate as it tends towards curative than preventive health services. Preventive health tends towards self-responsibility for health as people are expected to accept and use prevention mechanisms. This implies that there is the need to partner with the people/community in order to ensure the success of the policy.

It is in this regard that RBM initiated some specific objectives at the community level. These include: to improve the recognition of malaria illness and provision of appropriate treatment by care givers within 24 hours of the onset of illness; to strengthen the capacity of health systems, particularly at the periphery, so as to support RBM actions at community level, including access to anti-malarial drugs and referral mechanisms; to improve health-seeking behaviour of caregivers, family and community, so they can recognize signs of severe illness, seek appropriate care quickly when referral is indicated; to improve access to ITN and promote their regular and proper use and retreatment; t**o promote intermittent preventive treatment for pregnant women; t**o promote vector control, including environment management, wherever appropriate (WHO, 2002).

Some of the specific objectives outlined above actually have to do with HMM. Specifically, the RBM initiative recognises the important role that HMM plays in malaria control (WHO, 2004). There is now a general global trend towards large scale HMM (Gyapong and Garshong, 2007). This is the line Nigeria is towing in malaria control. But the extent of the demonstrated political will has not attracted the desired results. There is still the need for concerted efforts in order to ensure effective malaria control in Nigeria. The fund provided by the Global Fund to fight malaria in Nigeria, granted to the Yakubu Gowon Centre, has not yielded any meaningful improvement.

2.7 Malaria and millennium development goals

The Millennium Development Goals are a set of eight internationally agreed goals, committing countries to reducing poverty in all its forms by 2015. Reducing Malaria in most countries of the world will undoubtedly aid nations in notching closer to achieving these eight goals. In Africa, Malaria has been linked with six out of these eight goals and plays a vital role in determining whether or not achieving these goals is feasible in most countries on the continent.

Goal 1: Eradicate extreme poverty and hunger

Malaria keeps poor people poor, costing Africa $12billion per year in lost GDP and consuming up to 25% of household income and 40% of government health spending. Malaria also contributes to child malnutrition. While the precise causal links are unclear, nutritional status is affected by vomiting and appetite suppression during bouts of malaria as well as malaria related anaemia (UNICEF, 2007). The World Health Organisation describes malaria as both a problem of poverty and a cause of poverty WHO (2005). Thus, without gainsaying, a significant reduction in malaria on

the continent will really go a long way in making the achievement of this goal feasible.

Goal 2: Achieve universal primary education

Malaria is the leading cause of illness and absenteeism in children and teachers, impairs attendance and learning and can cause lasting neurological damage in children (UNICEF, 2007). The less the exposure of the children of Africa to malaria, the higher the probability of the attainment of the goal of universal primary education on the continent. Also, the less malaria bouts the teacher suffers, the stronger they will be to carry out the duty of educating the children of Africa.

Goal 3: Promote Gender equality and empower women

By eliminating gender disparities in primary and secondary education, preferably, at all levels. Women are the ones at the fore-front of caring for malaria victims. It's the mothers and sisters that attend to malaria sufferers in the home. They are the ones that leave all to care for the sick family member. Reducing malaria on the continent will go a long way in releasing these women to compete in their various fields of endeavour, and thus, get empowered.

Goal 4: Reduce child mortality

Malaria is a leading cause of child mortality in Africa, accounting for nearly one death in five (20%) under age five year olds (UNICEF, 2007). The current malaria related annual deaths of children under 5 years of age is estimated at around 300,000 (285,000-331,000), and malaria contribution to maternal mortality is 11%. Malaria's economic impact is enormous, with about #132 million lost annually in form of treatment cost, prevention, loss of man hours, etc. It's quite obvious from this

statistics that reducing malaria will significantly reduce child mortality in Africa by up to 20%.

Goal 5: Improve maternal health

Malaria is four times more likely to strike pregnant women than other adults and has life -threatening implications for both mother and child (UNICEF, 2007). Due to immune deficiency during pregnancy, pregnant women are 2-3 times at a higher risk of suffering from malaria than non-pregnant women. As a result, an estimated 10,000 pregnant women die each year from falciparum malaria (RBM, 2005). In Nigeria, it is reported that around 11% of death among pregnant women are caused by malaria (NMIS, 2010). Maternal and infant mortality attributable to malaria in Nigeria is very enormous. Studies show that malaria is a leading cause of morbidity in the country, with 1858 per 1,000,000; followed by diarrhea, 896; pneumonia, 208; and measles, 141 (NMCP,2005). As corroborated by one of the objectives of the RBM (to promote intermittent preventive treatment of pregnant women), reducing the malaria burden of Africa will go a long way in improving maternal health. The less malaria pregnant women suffer, the safer pregnancy becomes on the continent and the better the health of mothers.

Goal 6: Combating HIV/AIDS, Malaria and other diseases

Malaria control will reduce morbidity and mortality not only to malaria but to other diseases (for example, people living with HIV/AIDS are at greater risk of contracting malaria due to compromised system) (UNICEF, 2007). Since most mortality from HIV/AIDS is as a result of the victims succumbing to opportunistic infections, the reduction of malaria on the continent will go a long way in reducing such infections. HIV/AIDS is, thus, kept at bay.

Goal 7: Ensure environmental sustainability

Situated between 4^0 and 13^0 Northern Latitudes; Nigeria has a suitable climate for malaria transmission from coast to coast. The five vegetative strata from South to North of Nigeria (mangrove swamps, rain forest, guinea-savannah, Sudan-savannah and Sahel-Savannah) define vector species dominance, seasonality and intensity of malaria transmission. Thus, the duration of transmission season decreases from South to North, from perennial in most of the South, to only 3 months, or less, in the border region with Chad.

A summary of the entomological inoculation rates (EIR) reported in 86 studies from Nigeria suggests that EIR for *A. gambiae S.I.* ranges from 18 to 145 infective bites per person per year, and for *A. funestus*, from 12 to 54. Based on the climatic and ecological data and historical data on malaria parasite prevalence rates, the MARA project has compiled a model of likely distribution of malaria prevalence. This suggests that malaria endemicity is highest around the two river valleys.

Taking into account this distribution, as well as the population density, it is estimated that approximately 30% of the country's population live in areas of high to very high transmission intensity, and 67% in the moderate transmission zone, using these proportions in calculations, it results in an estimated number of fever and malaria episodes per person and year of 3.5 and 1.5 respectively for children under 5; and 1.5 and 0.5 for those 5 years and older, a total of 70-110 million clinical cases per year.

Its occurrence in the country is in nature a holo-endemic with perennial transmission. It accounts for about 63% of all outpatient attendances, 30% of all hospital admissions, 30% and 11% respectively of under-five and maternal mortality. According to NMIS (2010), malaria prevalence in Nigeria is currently at 42%; it is higher than Mali's (31%) and Liberia (32%).

Goal 8: Global Partnership for development.

The Roll Back Malaria partnership was established in 1998 to provide a coordinated global approach to combating malaria, bringing together malaria-endemic countries and their development partners, non-governmental and community-based organisations, the private sector, research and academic institutions and international organisations. In addition, public private partnerships are currently under way to improve access to effective malaria treatment and can serve as a basis for improving access to other essential medicines (UNICEF, 2007). In order to establish sustainable control programme, strong partnerships between local women's groups and health services is necessary. It must be recognised that as stake holders, the lead role must be shared by both in the control of malaria, at least, until Africa can boast of adequate number of trained health staff, and availability of functional facilities at the peripheral levels. At present, the acute shortage of both staff and facility at the peripheral level underscores the need for the role of women in the home treatment of malaria and its control, to be encouraged. In order to circumvent the current anomaly, active involvement of communities, in particular, women's groups, to the fullest extent possible, should be an integral part of the policy on malaria control for every country in the sub-region.

2.8 Malaria situation analysis of Oyo State

The picture of malaria in Oyo State is a reflection of what is obtained nationwide. It affects all age groups with children under-5 years and pregnant women being the most susceptible. Malaria has a far reaching effect on the people's welfare and the economic development of the State. It consumes a lot of health resources since 60% to 70% of the cases seen in the outpatient sections of the state health facilities are malaria patients (Owolabi, 2009).

The state is in an endemic zone with stable and persistent transmission all year round. Plasmodium falciparum is responsible for over 95% of cases. The transmission is holo-endemic both in the rural and urban areas. However, the prevalence of malaria confers partial immunity on the populace.

The state has sentinel site for malaria research, where in collaboration with the National Malaria Control Division, Universities and Research Institutes, operational researches are carried out in areas where there are gaps in knowledge. The incidence of malaria in the State is about 4.5million annually. Half of these cases occur in children under age of 5years. The current change in drug policy from chloroquine to artemishinin-based combination therapy has more than tripled the cost of malaria treatment (Oyo State Ministry of Health, 2009).

The strategies adopted by the State Malaria Control Programme include:

1. Effective case management

Artemisinin-based combination therapy (Coartem) is used for case management of uncomplicated malaria in the State. The drugs, given free at the government health facilities and by the home-based care givers in line with the free PHC programme of the State Government. For the above 5years age group, a total of 8,293,381 doses of Coartem will be required (OSMH, 2009).

2. Intermittent preventive therapy (Ipt) for malaria intermittent prophylaxis

Intermittent Preventive Therapy is already being implemented in all LGA's in the State. The total doses of Sulphadoxine Pyremethamine (SP) required for IPT in pregnancy in the State between the years 2006 and 2010 is 2,088,925. The intervention has been scaled up from 50% to 100%, starting with the public health

facilities, to later involve private health facilities, coupled with Antenatal Care facilities (OSMH, 2009).

3. Integrated vector management

Insecticide treated nets distribution in the state currently stands at over 40,000 units. The state will need a total number of 408,777 to achieve 80% coverage for the under 5-years and 102,196 for the pregnant women by the year 2010 (OSMH, 2009).

4. Monitoring & evaluation, including supervision

The M&E activities of the RBM are being carried out through the malaria control unit of State Ministry of Health. Data are collected and submitted on monthly basis to the state RMB unit through the RMB focal persons at the LGAs (OSMH, 2009).

5. Capacity building

The health personnel in all the 43 general hospitals, 482 primary health centers and 1052 registered private health facilities and the community based PMV, CBOs, TBAs, CHEWs who are involved in the RMB expanded plan in 351 political wards in all the LGAs in the State, have received training, and retraining efforts are being put in place (OSMH, 2009).

2.9 Opportunity ability and motivation model

The Motivation Ability and Opportunity Model was originally applied to information processing and advertising effectiveness. Maclnnis and Jaworski in 1989 examined the impact of consumers' motivation, ability and opportunity to process information on the depth of their processing and their attitude towards advertising. Subsequent studies have explored the relationships among these variables and their impacts on information processing attitude formation and suggested that advertisers can manipulate motivation, ability and opportunity

in order to increase processing of information and advertising. (Maclnnis, Moorman and Jaworski, 1991). Rothschild in 1999 applied this model to social marketing. In this model, **Opportunity** is seen to be related to availability and brand appeal **Ability** comprises affordability, social norms and support, self-efficacy (similar to self-efficacy and cues to action in HBM model) **Motivation** includes awareness of causes and severity, risk perception and product efficacy (similar to perceived susceptibility and perceived severity in HBM model).

Similar to the Health Belief Model, the Opportunity Ability Model is applied in this study to explain how availability, affordability and brand appeal of appropriate anti-malarial drugs (i.e RBM measures) will determine use among individuals. The more available, the more affordable and the more appealing the drug is, the greater the likelihood of acceptance. It also helps to explain the role of culture, social support and peer support in leading individuals (pregnancy women) to accept malaria prevention and control strategies (Ability). The more the information on how-to use the insecticide treated, net the greater the chances of net use. The more an individual perceives self as being at risk (e.g. pregnancy), the better the chances of adopting positive behaviour to prevent malaria (Motivation).

2.10 Structural functionalism

The structural functionalist theory sees shared norms and values as fundamental to society; focus on social order based on tacit agreements, and view social change as occurring in a slow but ordered pattern. This implies that for a society to grow it must consider its norms and values. In the quest for a developmental change, improvement on maternal health through the provisions of necessary infrastructure will boost the health of mother and child.

In order to establish sustainable control programme, structural functionalist sees the need for a strong partnership between local women's group and health services. It must be recognised that as stakeholder, the lead role must be shared by both in the control of malaria, at least,

until Africa can boast of adequate number of trained health staff and availability of functional facilities at the peripheral level.

Talcott Parsons and his student, Robert Merton, maintained that there is functional unity of society, which holds that all standardised social and cultural beliefs and practices are functional for society as a whole as well as for the individuals in the society. It was further argued that all standardised social and cultural forms and structures not only have positive functions but also represent indispensable parts of the working whole and are functionally necessary for the society. The concepts of manifest and latent functions are also components of this theoretical model. In simple terms, manifest functions are those that are intended, whereas 'latent functions' are unintended. This is further related to another of Merton's concepts - 'unanticipated consequences.' Actions, according to him, have both intended and unintended consequences with everyone usually aware of the intended consequences, sociological analysis are, thus, required to uncover the unintended consequences (Merton, 1957; Ritzer, 2000).

In view of the above, the structural functional perspective offers a useful insight into the intended and unintended consequences as well as the functional roles the latter i.e. dysfunctions will play on the quest for equity, quality and effectiveness of the RBM programme as a health policy geared towards the health system reform process, particularly in the area of malaria control in the country. But this research is not so much bothered about this intended and non-intended but instead on the issues not address at all, which is the reproductive knowledge of pregnant women and other salient causes of malaria in pregnancy.

2.11 The theory of planned behaviour

In the TPB, it is stated that behavioural intention is determined by:

- Attitude towards behaviour: These are determined by the belief that a specific behaviour will have a concrete consequence and the evaluation or valorisation of this

consequence. Malaria in pregnancy is a health condition that brings discomfort to life and threatens family income; individuals are, therefore, likely to evaluate actions or behaviour as it relates to choice of a particular treatment options for malaria and the possible consequence of this action on their health, unborn baby(ies), and the family at large.

- Subjective norms: These are the beliefs in whether other relevant person will approve one's behaviour, plus the personal motivation to fulfil the expectation of others. Though, malaria in pregnancy has direct health consequence on the victim, form holistic view, individual members of the family bear the burden through loss of working hours, finance and sometime health of caregiver is stressed. As a result of the above, actions and reactions of family member, peer and members of religion organizations play vital role in the expectant mother' choice and conformity to treatment of malaria.
- Perceived behaviour control: This is determined by the belief about access to the resources needed in order to act successfully, plus the perceived success of these resources. In Oyo State, health care system for treatment of malaria ranges from formal Hospitals government and private to informal TBAs, PMVs, Home treatment etc.
- Social demographic variables and personality trait which condition attitudes subjective norms and perceived behavioural control, Age, Income, level of education parity among other variable play significant roles in health seeking behaviours of expectant mothers. The relationship could either be positive or negative as these variables are sometimes regarded as gate keepers of knowledge which are very important in health seeking behaviour and transmission of culture (Jegede, 1998).

The application of this theory (TPB) is taking into account the motivational aspects of pregnant women in disease control and the influence of social networks and peer pressure which usually manifest in terms of supports from peer, husbands and other family members. Its limitation is a potential overemphasis on psychological factors, while under-valuing structural factors like limited access or availability of resources.

2.12 The health care utilization model

The model was specifically developed to investigate the use of biomedical health services. The socio behavioural or Andersen model (Andersen & Newman, 1973) groups in a logic sequence present three cluster or categories of factors which can influence health behaviour. These are:

- Predisposing factors: these are age, gender, religion, global health assessment, prior experiences with illness, formal education, general attitudes towards health services, knowledge about the illness etc.
- Enabling factor; these include availability of services, financial resources to purchase services, health insurance, social network support etc.
- Need factors: these are perception of severity, total number of sick day for a reported illness, total number of days in bed, day missed from work or school, help from outside for caring etc.
- Treatment actions; these include home remedies (herbal, pharmaceuticals), pharmacy, over the counter drugs from shops, injectionist, traditional healers, private medical facilities, public health services, etc.

The application of this model to the study centres specifically on treatment selection which is highly dependent on both material and structural factors, which are barely taken into account.

2.13 Theoretical framework

2.13.1 Social action theory (SAT)

Weber was preoccupied with the possibility of analysing human actions and relationships scientifically (Abraham and Morgan, 2004). It is for this reason that Weber conceived of sociology as a comprehensive science of social action (Coser, 2004). It is further observed that Weber's primary focus was on the subjective meaning that human actors attach to their actions in their mutual orientations within specific socio-historical context. Weber argued that explanation of social affairs have to account for the way in which individuals attach subjective meaning to situation and direct their actions in accordance with their perception of those situations (Burrell and Morgan, 1979). This also signifies that individuals interpret, define situation and act accordingly. This also suggests that behaviours are moulded within the socio-spatial setting. In other words, human predisposition and cultural frame are exclusive functions of our mutual orientation. Within this context, perception of malaria is a product of the socio-cultural realm. It is the relativity of the socio-cultural milieu that explains differentials in local understanding within and across cultures.

Furthermore, Weber submits that human action is social in nature. Abraham and Morgan (2004) observed that action is social in so far as, by virtue of the subjective meaning attached to it by the acting individual, it takes account of the behaviour of others and is thereby oriented in its course. 'Meaning' is the rationalised reasons advanced by individuals as explanation for specific action. Hence, Weber asserted that absence of assigned 'meaning' by the individuals make the action to be meaningless. As regards sustainable control programme, for instance, RBM, strong partnerships between action, beliefs and health services are necessary. This implies that the management of the programme and its achievement lies on the socio-cultural milieu which will explain the underlying kind of action taken by a pregnant woman.

Practically, the foregoing discussion implies that human behaviour, or action, could be different in divergent socio-spatial frames. Behaviour is clearly related to health, first in terms of its local understanding. In this regard, Weber's typology of social action provides a reference point in the direction of action. Weber identified that behavioural complex or matrix fall into four major categories. Zweckrational, Wertrational, Affective and Traditional actions.

Zweckrational action is that kind of action that determines a definite goal and chooses, means purely in terms of efficiency of attaining the end-in-view (Abraham and Morgan, 2004). This is a goal-oriented rational action, where the actor deliberately acts to achieve a definite goal. In this case, the action is guided by consideration of ends, means and secondary consequences (Labinjoh, 2002). The end-in-view in utilisation of therapeutic regimen is to achieve recovery in the case of ill-health and to avert occurrences of ill-health in case of prevention. The vital concern in this kind of action, especially with Health Belief Model, is that it is based on perceived efficacy of action. The actor assumes, significantly, that the action would lead to the desired consequences.

Action could also be Wertrational action or value-rational action. Labinjoh (2002) observed that in this case, the agent consciously decides on the ultimate goal of his or her action and, in consequence, systematically organises the action to achieve the goal. In this regard, action is based on inherent beliefs, expectations, "social imperatives" or honour. In other words, action is based on collective beliefs, values and sanctions. Action in management of childhood malaria could be value-rational. For instance, a child in the throes of malaria convulsion in East Africa will be said to have *ndege-ndege* (birds/butterflies), for which seeking the help of traditional healer is felt to be the only appropriate treatment, since it is believed that an injection from a doctor might be fatal (Haggenhougen *et al*, 2003). It is, therefore, observed that culture creates illness labels, diagnostic categories and health values.

A mother who consistently uses traditional medicine, no matter how severe the condition, might could be motivated by the value of efficacy of action, based on socio-cultural orientation.

In a case where emotion or impulse determines the means and ends of action, such an action is called affective social action. Coser (2004) argues that affective action is anchored on the emotion of the mother (but could be guided by other kinds of motives). Major responsibility of mothers at the domestic sphere is to provide adequate care for the infant. This is why mothers are usually the first to perceive health status of the child and act accordingly.

The last kind of action is traditional action, which is guided by customary habits of thought, reliance on "the external yesterday" (Coser, 2004). Every society has distinct traditional perspectives which are transferred from one generation to another. This tradition has embedded notions about health and illness. Cohen (1968) observed that Weber typically depicts the process of means-end motivation in social action. He observed that every actor has certain sentiments, or affective dispositions, which affect both his/her choice of goals. It is further averred that action is influenced, not only by the situation alone, but by the actor's knowledge of it. It is for this reason that knowledge of available means and perceived efficacy of action play important role to mothers in determining what course of action to take in malaria treatment.

It is in this regard that Heggenhougen, *et al* (2003) observed that in malaria control, attention needs to be paid to local realities (including cultural characteristics) that constitute major influence in shaping ideas pertaining to health and illness. It is for this reasons that Heggenhougen *et al* (2003) calls for increased attention to the socio-cultural environment (especially behavioural and social factors).

Weber's typologies of social actions are not mutually distinctive, but could be inclusive, as actors might combine different kinds of actions in one entity. Generally, the ideal of social action has been substantively utilised in understanding care and support system, especially in health care system. This study relates the perceived understanding of pregnant women to malaria and its relationship to roll Back Malaria programme.

This implies that good knowledge and quality operation of RBM in its operation should take into cognizance that in malaria control attention needs to be paid to local realities (e.g. herbs, TBA, prayers, beliefs etc), including cultural characteristics that constitute major influence in shaping ideas pertaining to health and illness.

2.13.2 Health belief model (HBM)

The Health Belief Model (HBM) dwells on individual psychological processes in explaining individual behaviour towards health. The model has been used to explain both health and illness behaviour. In this sense, HBM holds that health or illness behaviours is a function of the perception an individual has of vulnerability to an illness and the perceived effectiveness of treatment with respect to deciding whether or not to seek medical attention (Elder et al, 1999). Kasl and Cobb (1976) define health behaviour as 'any activity undertaken by a person believing himself to be healthy, for the purpose of preventing disease or detecting it in asymptomatic stage'. When it is mainly conceived for prevention, it includes 'any medically recommended action, voluntarily undertaken by a person who believes himself to be healthy, that tends to prevent disease or disability and/or disease in asymptomatic stage' (Langlie, 1977).

Furthermore, health behaviour includes activities engaged in and modalities used by the individual voluntarily, and in specific instances, under threat of sanction, and by society to (a) prevent (b) detect disease, defect, injury and disability (c) promote and enhance health

and (d) protect the individual and collectivity from risk of and actual disease, defect, injury and disability (Alonzo, 1993). Some of the key factors are explained below.

(1) Prevention implies going upstream to avoid contracting a disease, avert an injury, prevent a defect or disability and, in general, reduce risk of their contracting the disease is part of the preventive measures of malaria e.g the use of insecticides bed-net to prevent mosquito bites and taking of antimalaria drugs are part of the preventive measures of malaria.

(2) Detection modalities may involve activities such as simple checking of blood pressure to sophisticated genetic screening intended to detect disease, defect an injury before the individual becomes symptomatic. In this regard, it may involve diagnosis to detect the presence of malaria parasites in the blood.

(3) Promotion involves the art and science of helping people change their life style to move towards a state of optimal health.

(4) Protection is the last of the cardinal points of health behaviour. Society protects individuals to reduce incidence of a disease targeting vulnerable individuals and individuals also protect themselves. The ban of CQ in first-line of treatment of malaria is a protective measure from the government

Illness behaviour includes all activities undertaken by an individual considering himself to be ill for the purpose of defining the state of his health and for eventual actions towards recuperation. It is noted that illness is culture-bound. There is always cultural perception of illness which eventually affects action and response towards illness. The HBM has various versions, but a more popular version was advanced by Kasl and Cobb (1976). In providing an explicit account of the HBM, Kasl and Cobb identified two variables and other sub-variables:

(a) Perceived amount of threat: The feeling of the probable consequence of ill-health may motivate an individual to undertake a health behaviour. The perceived effect of the complications of malaria may affect succession of change in behaviour of an individual. Other sub-variables of this first point include:

- Importance of health Matters to individual: The extent of the necessity to stay healthy following the perceived threat will go a long way to discourage or encourage certain health related behaviour. For instance, it may ensure drug adherence i.e taking of full doses to avert treatment failure.
- The perceived Susceptibility (to the Disease): Each individual has his/her own perception of the feasibility of experiencing an adverse effect on one's health. Knowledge of malaria may increase perceived susceptibility and in effect seek malaria treatment and use of preventive measures.
- Perceived Seriousness (of the consequence of a disease): If one contracts malaria, how serious will the effects be? Such pain, discomfort, loss of work time, financial burden, etc, may trigger a change of behaviour. How much will it cost to get first-or second-line treatment? What are the emotional burdens of malaria? These are the major questions when considering perceived seriousness.

(b) The attractiveness or value of the behaviour: In other words, what are the perceived benefits of taking action by using preventive measure or taking steps to avert treatment failure? This, however, depends on two other variables.

- The perceived probability that the action will lead to the desired end of the disease, the beliefs regarding efficacy of action, will dictate the direction of action. If the desired outcome is not achieved (i.e. treatment failure occurs), this may lead to 2nd or 3rd line treatment.

- The unpleasantness, or cost of taking actions, compared with taking no action to solve the consequences. Benefits (minus barriers) provide the path of action. Cues to action will produce the force that will instigate the desired action. How bearable, or severe, is the cost compared with benefit of passivity or action?

These variables and sub-variables propel individuals to act towards health problem in a certain manner. These aforementioned series of perception may trigger an individual to change behaviour as regards the use of preventive measures and adherence or non-adherence to given health prescription. It also goes further to affect the specific choice/measure. Apart from the level of susceptibility, other intervening factors such as level of education, occupation, proximity or otherwise to health centres, income, age, sex, marital status and others, play pivotal roles in the course of action.

In summary, Weberian Social action explains health care, justifying the underlying motives through the typologies of action. Be it described as traditional, affective, goal-oriented rational or value-oriented rational action, the end-in-view is to ensure prevention or treatment of ill-health. HBM also explains both curative and preventive action in line with perception of diseases and other variables. All this explains individual treatment of malaria and how perception of susceptibility of malaria attack which varies among sexes, ages and socio-economic classes of individuals will determine their actions. Older people may likely not be bothered about their vulnerability to malaria attack as much as the younger ones. Women as a result of their biological make up (e.g. pregnancy) are more vulnerable than the men. Socio-economic conditions will also define the individual's perceptions of susceptibility and actions. The poor will likely not act to malaria treatment because of cost of treatment and prevention. It's also used to explain why people will more likely administer appropriate malaria treatment and protect them when they know that malaria can cause death (perceived severity). HBM explained how provision of adequate information and awareness creation on

malaria will lead to positive action among individual (cues to action). Also, the expected positive actions of individuals when perceived barriers e.g. barriers to the use of drugs and side effect, availability and affordability of insecticide treated net are reduced.

2.14 Conceptual framework

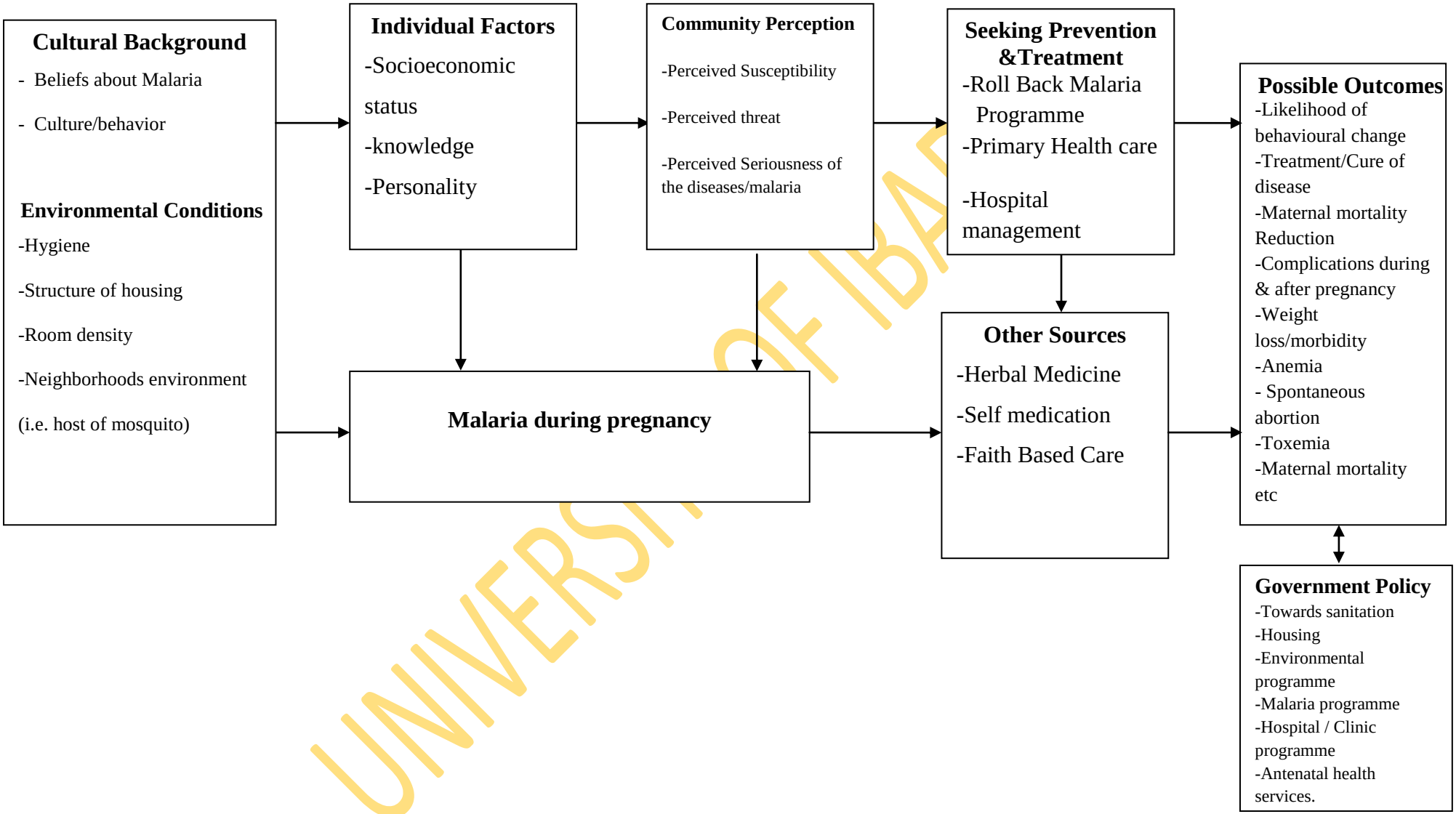
The conceptual framework (Fig. 2.8) starts with cultural background and environmental conditions. This is because it has been proved by past research that these two terms serve as both "receptors" and "effectors" towards maternal health outcomes. Individual definition of malaria is influenced by beliefs and culture which directly depend on the hygiene and housing structure of an individual. This profoundly affects prevention and treatment measures. The theory of Health Belief Model comes into play because it is the way an individual perceived the seriousness of her health that will eventually lead to preventive measure and treatment seeking behaviour.

The framework, however, stipulates that such perception may be a function of some underlying factors in the society ranging from the socio-economic status of the pregnant woman, knowledge about causes of malaria and treatment seeking measures, personality and level of education. The eventual social action against the perceived ill-health may be explained by these factors which are inherent in the society. Social actions are products of the socio-cultural milieu, based on this; actions are enacted in terms of prevention and treatment. In other words, human predisposition and cultural frame are exclusive functions of our mutual orientation. Within this context, perception of malaria is a product of the socio-cultural realm. It is the relativity of the socio-cultural milieu that explains differentials in local understanding within and across cultures. The framework also shows that preventive action may be assessed and accepted. These include the use of herbal remedies, self medication, spirituality and hospitals.

The perceived efficacy of preventive and treatment measures is also link in utilisation and outcome of therapeutic regimen. The end-in-view of social action is to lead its desirable outcome, which is recovery, behavioural change, maternal mortality reduction, in-depth knowledge on what malaria breeds on and how to prevent malaria in pregnancy and also knowledge in other malaria-related pregnancy complication that can lead to death. All these should eventually lead to change in Government policy that will improve the standard of health of pregnant women and safe motherhood.

The framework shows how eventually intervention and control of malaria from socio-cultural perspective will identify those groups in the society or community that are most socially vulnerable to the burden of malaria, and this will necessitate changing approach to intervention development.

Fig.2.8: Conceptual Framework with some variables



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Details of data collection and analytical methods are presented in this chapter. The study adopted methodological triangulation approach, combining quantitative and qualitative methods. The quantitative angle employed cross-sectional design while indepth interview method was used to collect qualitative data. Secondary data were generated from the review of documents and reports from Oyo State Ministry of Health & RBM programme.

3.2 Study area

Figure 3.1: State Map of Nigeria Highlighting Oyo State

The research setting was Ibadan, the capital of Oyo State, also known as the "pacesetter state". Oyo State was originally part of the Western region in the three region structure of 1954. In 1967 with the creation of 12 Federal states by General Yakubu Gowon's Military Government, it became part of Western State. The 1976 Military Government of General Murtala Muhammed created 19 states out of the existing 12 Federal states with Oyo State as one of the new states created. In 1991, the Military Government of General Ibrahim Babangida brought the number of states to 27 by creating 8 new states and Osun State was carved out of Oyo State. Oyo State consists of 33 Local Government Areas. The State covers a total of 27,249 square kilometres of land mass and it is bounded in the south by Ogun State, in the north by Kwara State. In the west, it is partly bounded by Ogun State and partly by the Republic of Benin, while, in the East, by Osun State. The landscape consists of old hard rocks and dome shaped hills, which rise gently from about 500 meters in the southern part and reaching a height of about 1,219 metres above sea level in the northern part.

The topography of the State is of gentle rolling low land in the south, rising to a plateau of about 40metres. The State is well drained with rivers flowing from the upland in the north-south direction. Oyo State has an equatorial climate with dry and wet seasons and relatively high humidity. The vegetation pattern of Oyo State is that of rain forest in the south and guinea savannah in the north. Thick forest in the south gives way to grassland interspersed with trees in the north.

According to the 2006 census, Oyo state has a population of 5,591,589, with a male and female population of 2,809,840 and 2,781.749, respectively. It has a growth rate of 3.4 percent (Official Gazette of the Federal Republic of Nigeria, 2007). As presently constituted, Oyo State has 33 local government areas, out of which 11 are in Ibadan. In terms of health and illness, Ibadan people have cultural perceptions and access to both traditional and modern health care systems. Available records, however, show that malaria is also endemic in this

part of the State (Oyo State Ministry of Health records, 2009). The State is in an endemic zone with stable and persistent transmission all year round. Plasmodium falciparum is responsible for over 95% of the cases. The transmission is holo-endemic both in the rural and urban areas. The prevalence of malaria confers partial immunity on the populace. This is in part due to poor sanitation and also source of water (Owolabi 2009).

Ibadan

Figure 3.2: Map of Nigeria Highlighting Ibadan

Ibadan is the capital city of Oyo State and the third largest metropolitan area, by population, in Nigeria, after Lagos and Kano, with a population of 1,338,659 according to the 2006 census. Ibadan, the largest metropolitan geographical area in the country came into existence in 1829. It became a British Protectorate in 1893. At Nigerian independence, Ibadan was the largest and most populous city in the country and the third in Africa after Cairo and Johannesburg.

Ibadan is 128 km northeast of Lagos and 530 km southwest of Abuja, the federal capital, and is a prominent transit point between the coastal region and the areas to the north. Ibadan had been the centre of administration of the old Western Region since the days of the British colonial rule. The principal inhabitants of the city are the Yorubas even though its population is becoming more heterogeneous. Six local governments in Ibadan were chosen purposively for the study (i.e local government where the RBM programme is prominent), this is because of the challenges faced by the RBM programme i.e limited resources to scale up intervention in the 774 local government areas of Nigeria. They were Akinyele, Egbeda, Ibadan South-West, Ibadan South-East, Oluyole, and Lagelu local government areas.

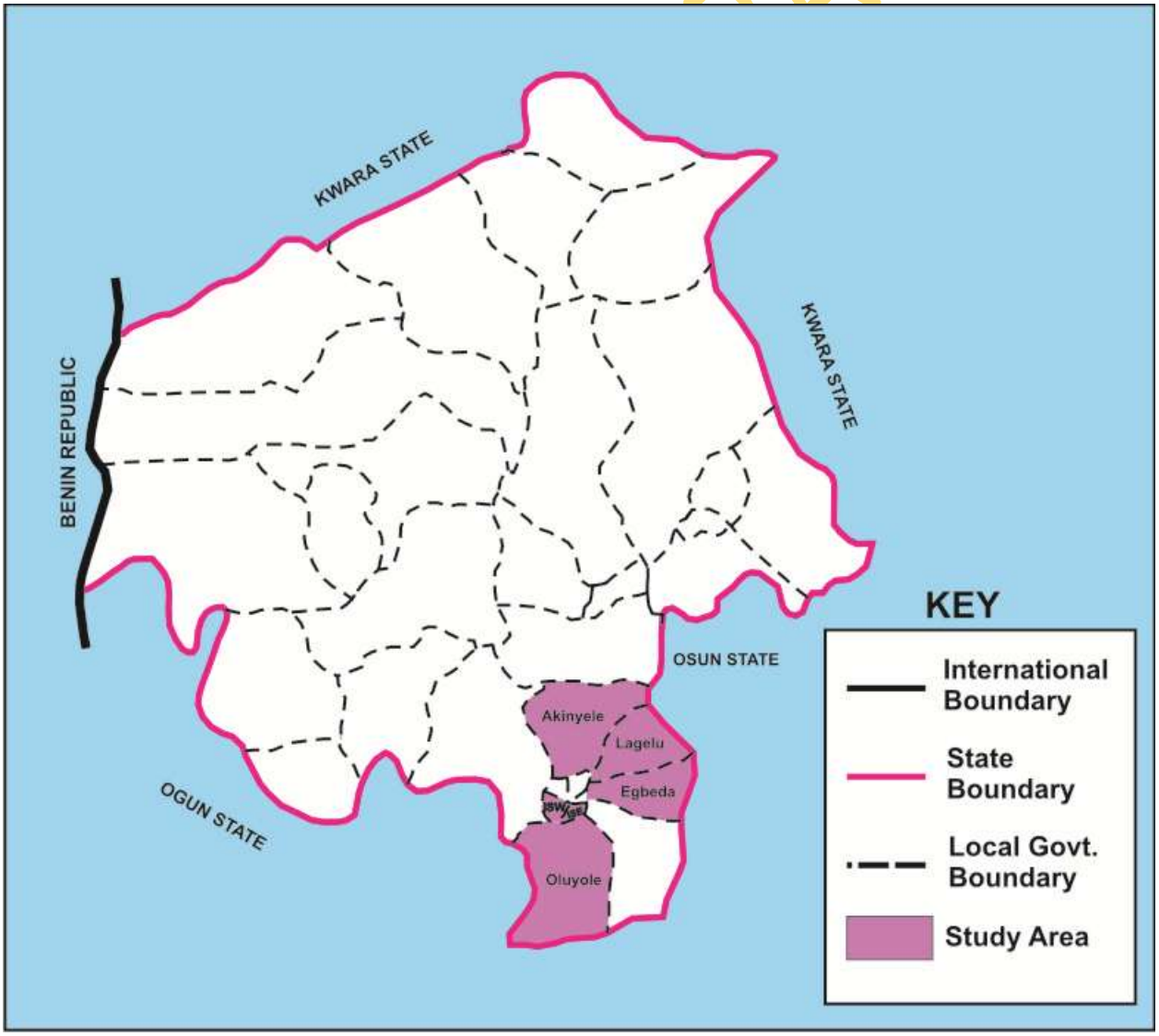


Figure 3.3: Map of the Study Area

Akinyele Local Government is one of the eleven local governments that make up Ibadan metropolis. Its headquarters are at Moniya. Akinyele LGA was created in 1976 and it shares boundaries with Afijio LGA to the north, Lagelu LGA to the east, Ido LGA to the west and Ibadan North LGA the south. It occupies a land area of 464.892 square kilometers with a population density of 516 persons per square kilometer. Using 3.2% growth rate from 2006 census figures, the 2010 estimated population for the Local Government is 211,811. It was named after the late Olubadan, Isaac Babalola Akinyele. Akinyele LGA is subdivided into 12 wards.

Egbeda Local Government, one of the eleven local governments that make up Ibadan metropolis, has its headquarters in the town of Egbeda. It has an area of 191 km² and a population of 283,643 at the 2006 census. Egbeda LGA is subdivided into 11 wards. Egbeda Local Government was created in 1989 when it was carved out of Lagelu Local Government. It is bounded in the east by Osun River, in the north by Lagelu Local Government, in the south by Ona-Ara Local Government and in the west by Ibadan North and Ibadan North East LGAs.

Ibadan South-West Local Government Area, also one of the eleven local governments that make up Ibadan metropolis, has its headquarters at Alesinloye in Ibadan. It has an area of 40 km² and a population of 283,098 at the 2006 census. It is bounded in the west by Ido LGA and in the east by Ibadan North and Ibadan South East LGAs. To its north are Ibadan North West and Ido LGAs; and in the south by Oluyole LGA. Ibadan South-West is one of the five LGAs that were carved out of the defunct Ibadan Municipal Government (IMG) on the 27th of August 1991 and it has 12 wards.

Ibadan South-East Local Government Area has its headquarters at Mapo Hall. The LGA has an area of 17 km² and a population of 266,457 at the 2006 census. It is bounded in the west by Ibadan South West LGA and in the east by Ibadan North East Local Government.

It is bounded in the north by Ibadan North LGA and in the south by Oluyole Local Government. One of the eleven local governments that make up Ibadan metropolis, Ibadan South East LGA was created on 27th August, 1991 following the nationwide broadcast of May 3rd 1989, when the then Head of State and Commander-in-Chief of the Nigerian Armed forces, General Ibrahim Babangida announced the creation of additional One Hundred and Fifty-Nine (159) Local Governments across the Country. Ibadan South East Local Government is one of the five Local Governments that was carved out of the defunct Ibadan Municipal Government (IMG). It is divided into twelve (12) political wards.

Oluyole Local Government Area has its headquarters in the town of Idi Ayunre. Named after Oluyole, a distinguished, dominating army commander who contributed immensely to the military and economic development of Ibadan during the city's formative years, the LGA has an area of 629 km² and a population of 203,461 at the 2006 census. It shares boundaries with four LGAs, viz.: Ibadan South West, Ibadan South East, Ona Ara Local Government and Ido Local Government – all within Ibadan metropolis. It also shares boundaries with Ogun State through Obafemi Owode, Odeda and Ijebu North LGAs. Oluyole LGA has 10 wards.

Lagelu Local Government Area has its headquarters in the town of Iyana Offa. It has an area of 338 km² and a population of 148,133 at the 2006 census. Existing since 1961, it has 14 wards for ease of administration. Named after Lagelu, the *Jagun* of Ife and Yoruba's generalissimo, who founded Ibadan, the LGA is one of the eleven local governments that make up Ibadan metropolis. It is bounded in the east by Osun River, in the north by Akinyele LGA, in the south by Egbeda LGA and in the west by Ibadan North LGA.

Below is a table showing the breakdown of the 2006 National Population Commission census figures for the selected local government areas.

Table 3.1: Population of chosen six LGAs

LGA	Male Population	Female Population	Total Population
Akinyele	105,594	106,217	211,811
Egbeda	137,527	146,116	283,643
Ibadan Southwest	139,622	143,476	283,098
Ibadan Southeast	130,334	136,123	266,457
Oluyole	102,371	101,090	203,461
Lagelu	74,220	73,913	148,133

Common to all the six LGAs are: (i) lack of basic solid waste disposal services in crowded and low income neighbourhood due to poor road network and lack of open dump sites; (ii) sewage and silages from domestic, commercial and industrial sources are flushed into streams and drainage systems accompanied by many hazardous health conditions associated with unsafe sanitation; (iii) lack of or inefficient transport services and infrastructure. With the exception of few stretches of tarred roads, most of the access roads are untarred, with poor drainage system; (iv) given the abundance of rock formations, pollution of surface water is rampant as a result of quarry activities. Also, open ponds from abandoned rock blasting sites pose grave physical dangers to the host communities; (v) the availability of energy (electricity), a key input for development is next to zero. Even though a part of Ibadan metropolis, a lot of artisans in these areas have been grounded by epileptic electricity supply. Light industries like sawmills make use of electricity generating set as survival strategy, thus adding to the cost of production; (vi) pipe-borne water supply is a mirage despite the capacity of the Asejire Water Works and the numerous water supply interventions in Ibadan Metropolis. Residents rely on private deep wells and a few poorly serviced public bore-holes.

3.3 Study population

The study was conducted among pregnant women attending antenatal clinics. For instance, in the first quarter of year 2010, a total of 4,107 cases of severe malaria, involving 4,018 pregnant women were recorded. Consequently, 12 deaths were recorded from this (Owolabi, 2009). Due to immune deficiency during pregnancy, pregnant women are at two to three times higher risk of suffering from malaria than non-pregnant women. The study investigated the knowledge of these categories of women about malaria diagnosis and treatment, and further examined how far the RBM programme has gone and its limitations in achieving the millennium development goals.

3.4 Sample size

Here are the formulae used in determining the sample size.

$$SS = \frac{Z^2 * p * (1-p)}{c^2}$$

where: Z = Z vale (e.g 1.96 for 95% confidence level)

p = percentage picking a choice, as expressed as decimal (e.g. 0.5 used for sample size needed)

c = confidence interval, expressed as decimal (e.g 0.04 = ±4)

Correction for Finite Population

$$\text{new } ss = \frac{ss}{1+\frac{ss-1}{pop}}$$ where: pop = population

For our sample size,

Z = 1.96 for 95% confidence level

p = 0.70 (percentage of women reporting for malaria)

c = 0.04 (confidence interval)

$$SS = \frac{Z^2 * p * (1-p)}{c^2}$$

$$= \frac{(1.96)^2 * 0.7 * (1-0.7)}{(0.04)^2}$$

$$= 504.21$$

$$\text{new } ss = \frac{ss}{1+\frac{ss-1}{pop}}$$

$$= \frac{504.21}{1+\frac{504.21-1}{2095}}$$

$$= 406.56$$

$$new\ ss \approx 407$$

Table 3.2: Breakdown of sample population

Local Govt.	Avg. Monthly Attendance	Proportion	Sample Distribution Based on Proportion
AKINYELE	304	0.1451	59
EGBEDA	185	0.0883	36
IBSW	93	0.0444	18
IBSE	434	0.2072	84
OLUYOLE	268	0.1279	52
LAGELU	811	0.3871	158
Total	**2095**	**1.0000**	**407**

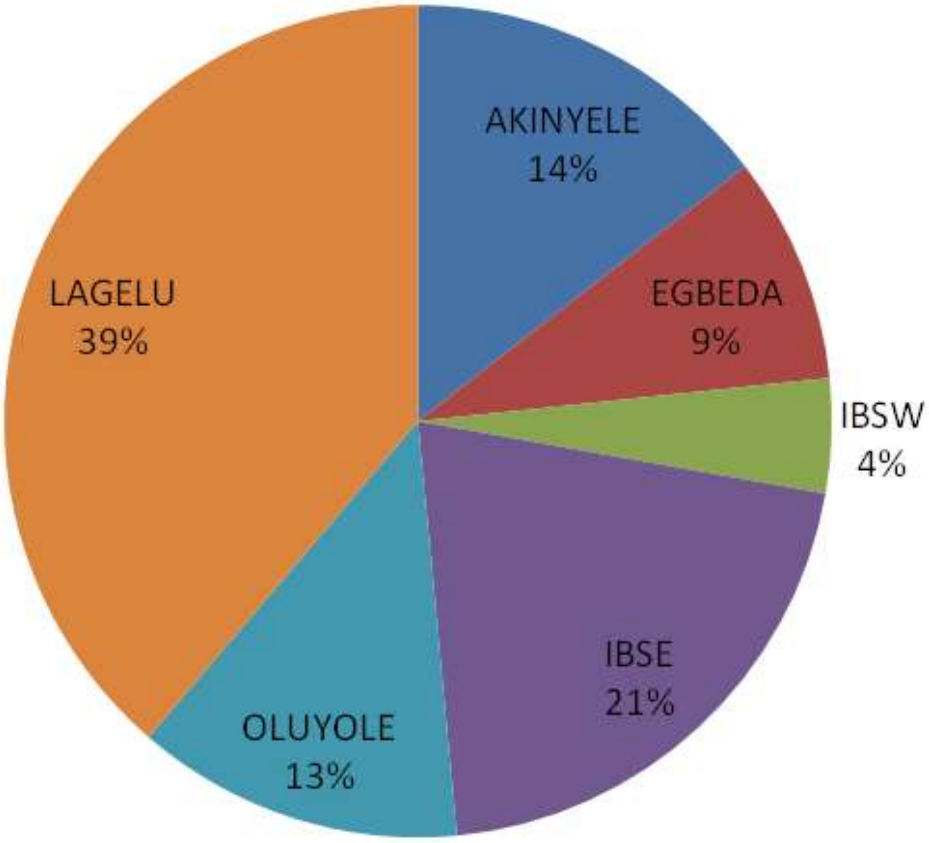


Figure 3.4: Average Monthly Antenatal Clinic Attendance

3.5 Research design

Research that triangulates ameliorates biases inherent in each tradition, the power of numbers and an aim of generalising quantified outcomes balanced with the rich text of livid experiences captured in qualitative inquiry, can yield robust results that may be quite distinct from single–method designs (O'cathain, Murphy, & Nicholl, 2007, Teddlie & Tashakkori, 2003). As such, mixed methods studies are often suggested as a way to disentangle intricate relationships and more fully understand complex social phenomena (Mertens, 2003).

The study, which was cross-sectional, utilized a mixed approach of data collection, analysis and interpretation.

3.6 Sampling technique

Six Local Government Areas (LGAs) where the RBM programme was first introduced were purposively selected from the eleven LGAs in Ibadan. These are: Akinyele (10 centers), Egbeda (10 centers), Ibadan Southwest (10 centers), Ibadan Southeast (10 centers), Oluyole (10 centers) and Lagelu (10 centers). A total of 407 respondents were purposively selected based on the average monthly antenatal clinic records. Inclusion criteria for respondents in this study were that; respondents must be pregnant, must have registered with the clinic; and must be receiving treatment at the ANC.

. These local governments in Ibadan were chosen purposively for the study (i.e local government where the RBM programme is prominent), this is because of the challenges faced by the RBM programme i.e limited resources to scale up intervention in the 774 local government areas of Nigeria.

3.7 Data collection instrument

3.7.1 Survey instrument

The formulation of the survey questionnaire was preceded by a pilot study among pregnant women. Ten percent (10%) of the proposed sample size was used for the study. This was necessary to ensure that the questionnaire adequately provided information that addresses each of the research objectives. The preliminary study was useful in testing the questionnaire to ensure that emerging data were both reliable and valid. The pilot also exposed possible logistic challenges that might occur in the actual survey.

A survey questionnaire comprising both open-ended and close-ended questions were designed and administered on pregnant women. The respondents were drawn from patients attending clinics at primary health centres in the six selected local government areas. The reason behind this is to ensure that the respondents were among those who have been

exposed to intervention activities since the Malaria control programmes in the state are concentrated at the State-owned health facilities.

The questionnaire comprised open-ended and close-ended questions relating to the knowledge about malaria, use of insecticide treated net, use of Artemisinin-based combination therapy and intermittent preventive treatment and variables that determine maternal health.

The six LGAs have a total of sixty PHCs, with a breakdown of ten per LGA. However, based on the arrangement on ground at the time of the study, only one PHC per LGA is dedicated for antenatal clinic. This is adjudged insufficient, given the population expected to be served, their dispersed locations and the physical extent of the LGAs.

A total of Four Hundred and Seven (407) questionnaires, representing the required sample size were analysed. Based on average monthly attendance at the clinics, Lagelu LGA, with an average monthly attendance of 811, had 158 questionnaires (the highest) and Ibadan Southwest LGA, with an average monthly attendance of 93, had 18 questionnaires (the least).

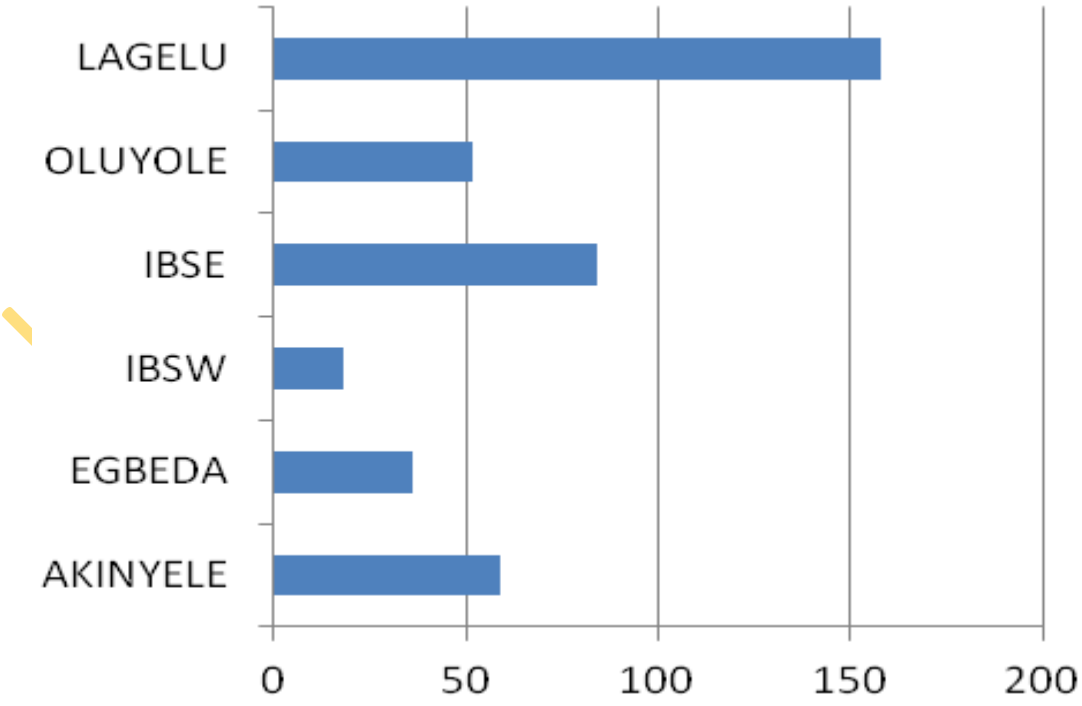


Figure 3.5: Questionnaire Distribution Per LGA

3.7.2 In-depth interview

The in-depth interview (IDI) was conducted in order to gain a deeper understanding of challenges encountered in delivering the malaria control strategies by the implementers and to identify the role of each level of government in implementing the programme. A few structured questions were used to generate explanations and clarifications from the subjects. Thirteen RBM staff, made up off the state RBM manager and twelve RBM officers (2 per local government) was interviewed. This was chosen because they are the staff on ground in each of the local government area, and the State manager is the final authority. Also, twenty four pregnant women using the various primary health cares where the study was conducted were interviewed, given that the majority of the subsidised malaria interventions in the State were directed towards the primary health care.

In-depth Interviews (IDIs) with pregnant women were meant to capture issues around the various thematic areas of the study as a way of gaining deeper insights into certain attitudes and behaviours which the survey may not adequately capture. This was used to validate some of the responses obtained in the survey. The criteria for purposive selection of pregnant women include: respondent must be pregnant, diagnosed for malaria, and receiving treatment in any of the centers selected for the study.

Also, the IDIs were conducted with two medical officers in charge of RBM in each of the LGs and the State RBM manager. This was necessary to provide insight into challenges encountered in implementing the RBM strategies from the implementers stand point.

The interviewers were Medical Research Assistants of the Web National Human Research Protection, an affiliate of the Renal Unit of the Medicine Department of the University College Hospital (UCH), Ibadan.

Table 3.3: Method of data collection and study population

Methods of data collection	Number	Study Population
Questionnaire	407	Pregnant women under RBM
Indepth-Interviews (IDIs)	13	State RBM manager (1) and 12 RBM officers, two per local government
	24	Pregnant Women

Secondary Sources

Secondary data were generated mainly from official and public records of governmental agencies like the Ministry of Health and Roll Back Malaria programme.

3.8 Data analysis

3.8.1 Introduction

This section provides the detailed steps through which results from the field were analysed. Quantitative data were analysed using multivariate regression while content analysis was employed in analysing the data obtained from in-depth interview.

3.8.2 Quantitative data analysis

The quantitative data were analysed using statistical package for social sciences software (SPSS). A descriptive analysis of data was undertaken using frequency distributions tables and cross-tabulation; bivariate and multivariate methods too were used for analysis of variables whose combined influence strongly on maternal health situation in Ibadan. The socio-demography variables examined in the cause of both Univariate and bivariate analysis was used to determine relationships among variables in terms of magnitude and direction.

3.8.3 Qualitative data analysis

The responses of participants in the IDI session were tape-recorded, transcribed and analysed using content analysis. Similar responses to all the issues which flowed from each of the

research objectives were grouped together and analysed. The results were used in validating findings obtained from the quantitative data.

Table 3.4: Variables specification

Objective	Variables	Categories	Indicators
1	Level of knowledge of malaria	High	i. Knowledge of symptoms. ii. Knowledge of causes. iii. Knowledge o prevention. iv. Knowledge of available treatment methods. v. Knowledge of treatment facility.
		Moderate	Has knowledge of 2 or 3 of the above.
		Low	Has knowledge of 1 or none of the above in the list.
2	Effects of acceptability of RBM	High	i. Attendance of ANC at least 4 times during pregnancy ii. Use of ITN iii. Use of IPT drugs iv. Use of ACT drugs
		Moderate	Did at least 3 of the above.
		Low	Did 1 or 2 of the above.
3	Extent of adherence to RBM measures	High	Used ITN and drugs as prescribed by orthodox facility
		Moderate	Used up to 60% of drugs as prescribed and ITN use
		Low	Used below 50% of drugs as prescribed and ITN use or not at all
4	Maternal health status	N/A	i. Sickness during pregnancy ii. Complications during pregnancy iii. Difficulty in labour

3.9 Ethical considerations

After seeking and receiving the full approval of the UI-UCH Ethical Board, the rules of ethics were duly observed in collection of data for the study. The matrons of each centre were fully informed and, in the process, relayed back to the pregnant women, and they, in turn, gave

their consent. None of the respondents were coerced or induced to participate in the study. Voluntary consents of the respondents were sought before the questionnaires were administered and respondents were free to discontinue at any point during the interview. As much as possible, the research ensured that the identities of the respondents were protected and that no respondent suffered any form of physical or psychological harm in the course of the study. The answers to the survey will help design better programmes to improve women's health status in Ibadan.

3.10 Limitations of the study

On the overall, 407 pregnant women in the city of Ibadan were sampled for the study. Given the subject under consideration, Malaria vis-à-vis Maternal Health, the sample was sex specific. Two sets of questionnaires (English Language and Yoruba Language) had to be administered to cater for effective communication with respondents, thus making the process of analysis tedious.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter presents the result of the analysis of the data gathered during the field work with a view to examining the association between Roll Back Malaria programmes and maternal health status of women in Ibadan. The data are presented in frequency distribution tables and cross-tabs, using bivariate and multivariate regression analysis. Where appropriate, the quantitative and qualitative results are discussed together. As stated in Chapter Three, the study was carried out in six LGAs of Ibadan, Oyo State.

4.2 Survey data

4.2.1 Socio-demographic characteristics of respondents

Table 4. 1: Percentage distribution of respondents according to socio-demographic characteristics

Characteristics	Categories	Frequency	Percent
Age Group	≤19 years	17	4.3
	20-24 years	80	20.2
	25-29 years	158	39.9
	30-34 years	90	22.7
	35-39 years	45	11.4
	40-44 years	6	1.5
	Total	**396**	**100**
Marital Status	Single Parent	18	4.5
	Married	377	93.3
	Cohabiting	4	1.0
	Separated/Divorced	4	1.0
	Others	1	0.2
	Total	**404**	**100**
Religion	Christianity	145	35.6
	Islam	261	64.1
	Traditional	1	0.2
	Total	**407**	**100**
Education	No formal education	7	1.7
	Primary	80	19.8
	Secondary	226	55.8
	Post secondary	92	22.7
	Total	**405**	**100**
Occupation	Unemployed	39	9.7
	Civil Servant	51	12.6
	Self-employed	299	74.0
	Others	15	3.7
	Total	**404**	**100**
Monthly Income (N)	≤ 5000	43	51.8
	5001 - 10,000	25	30.1
	>10,000	15	18.1
	Total	**83**	**100**
Age at Marriage	15-19 years	42	11.8
	20-24 years	169	47.3
	25-29 years	131	36.7
	30+ years	15	4.2
	Total	**407**	**100**
Parity	One Pregnancy	158	59.2
	Two Pregnancies	88	33.0
	4-6 Pregnancies	21	7.9
	Total	**267**	**100**

Source: Field Survey 2015

This table shows the socio-demographic characteristics of the sampled population. In terms of the age of the respondents, the majority (82.2%) were within 20-34yrs age bracket.

This implies that most women in the sample married within the age bracket considered being maturity age group. On the marital status of the respondents, about 93.0% of the women are currently married, and only 5.0% are single. 1.0% of the respondents are either cohabiting or separated/divorced. The majority of the respondents being married may be attributed to their age at marriage.

The table shows that the women in the study area were mostly literate; 56.0% and 23.0% of the respondents have secondary and post-secondary education respectively. With respect to religion, 64.0% of the respondents are practising Islam while 36.0% are Christians.

On the nature of employment, although the women in the study area are literate, the majority of the respondents engaged in occupations other than formal employment. The table shows that only 12.6% of the respondents are civil servants. The majority (74.0%) of the respondents are self-employed while 9.7% are unemployed. Education is a key determinant of the life style and societal status an individual enjoys. Studies have consistently shown that educational attainment has a strong effect on health behaviours and attitudes.

Another look at Table 4.1 shows that the monthly mean income is ₦8,519:34k. A significant portion (51.8%) of the respondents earn an income of less than ₦5,000, while the income of 30.1% of them range between ₦5000 and ₦10,000. The remaining 18.1% of the respondents have a monthly income of more than ₦10,000.

On the issues of age at marriage, the table shows that about 50.0% of the respondents married within the 20-24 years age bracket; 36.7% married when they were between ages 25 and 29. A few of them (4.2%) married at above 30 years of age, while 11.8% of them married as teenagers.

On the nature of parity, most of the respondents 59.2% were primigavidae. Those with second pregnancy were 33.0%, while 7.9% were having their third pregnancy.

4.3 Data analysis

Cross-tabulation of variables like education, use of mosquito net, decision making, with knowledge of RBM and maternal health decisions were presented to enhance the clarity of quantitative analysis. Explanations following from these interactions with the objectives of the study were strengthened by chi-square analysis and the in-depth interviews.

4.3.1 Level of knowledge of malaria among pregnant women

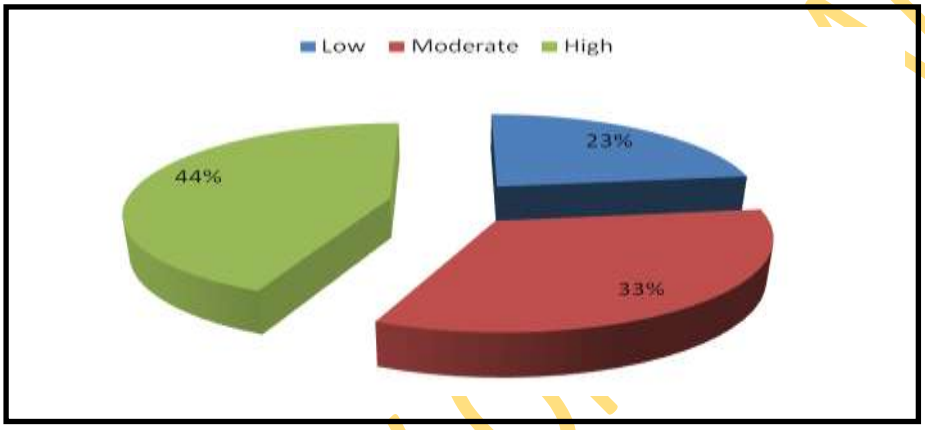


Figure 4.1: Pie Chart showing percentage distribution of respondents by knowledge of Malaria

From the data gathered, 39.0% of respondents have a high knowledge of malaria, while 35.0% and 26.0% of the respondents have moderate and low knowledge of malaria, respectively.

Table 4. 2: Percentage distribution of respondents by knowledge of malaria by selected variables

Selected variables	Knowledge			Total	χ^2	Df	p-value
	Low	Moderate	High				
Decision-maker							
Self	18(42.9)	15(35.7)	9(21.4)	42			
Husband	17(27.9)	21(34.4)	23(37.7)	61	23.029	6	.001
Self and husband	29(17.4)	56(33.5)	82(49.1)	167			
Other family member	-	1(12.5)	7(87.5)	8			
Total	**64(23.0)**	**93(33.5)**	**121(43.5)**	**278**			
Use of Mosquito Net							
Use Mosquito Net	59(21.7)	97(35.7)	116(42.6)	272	10.952	2	.004
Don't Use	47(36.7)	42(32.8)	39(30.5)	128			
Total	**106(26.5)**	**139(34.8)**	**155(38.8)**	**400**			

Source: Field Survey 2015

A cross tabulation of malaria knowledge level by decision maker showed that 49.1% of the respondents that make decision in conjunction with their husband have a high

knowledge of malaria. However, only 21.4% of the respondents that take decision by themselves have a high knowledge of malaria, while 37.7% of the respondents whose husbands take decision for have a high knowledge of malaria. This picture suggests that couples take better decisions compared to individual spouses. "Two good heads are better than one." Table 4.2 shows that χ^2 value = 23.029, df = 6 and p-value calculated = 0.001 indicate a significant association between decision maker and the knowledge of malaria since $p < 0.05$. Knowledge of malaria (low, moderate or high) has a significant influence on who takes health related decision in the family of the respondents.

With respect to the use of mosquito net, 42.6% of the respondents that use it have a high knowledge of malaria. On the other hand, 36.7% of those that do not use it have low knowledge of malaria. Evident again is the fact that relevant information (as shown in Table 4.2) has a great part to play in the success of RBM programme. The more informed or knowledgeable the populace, the higher their inclination to adopt and use the RBM measures in combating the scourge of malaria. Weber argued that explanation of social affairs have to account for the way in which individuals attach subjective meaning to situation and direct their actions in accordance with their perception of those situations (Burrell and Morgan, 1979). This implies that individuals interpret, define situation and act accordingly. This will have a great implication in preventing malaria in pregnancy and reducing it will have an adverse effect on the health of mothers when correct information on how mosquito breeds and how to prevent it is made available.

The analysis of the interaction between the respondents' knowledge of malaria and their use of mosquito nets (ITN and non-ITN) reveals a strong relationship between the two. χ^2 calculated = 10.952, df = 2 and p-value calculated = 0.004. The strength of the relationship between the two variables is established by $p < 0.05$. The higher the respondents' knowledge of malaria, the higher the use of mosquito nets. Without the fear of over emphasis, the need to

resume and step up the publicity for RBM again comes to the fore. The place of relevant information cannot be overlooked.

Table 4. 3: Chi-square analysis of respondents' choice of assistance by level of education

Educational qualification	RBM	Not RBM	Chi square	df	P-value
No formal education	4	3			
Primary	48	31			
Secondary	120	100	9.848	6	0.131
Post Secondary	59	31			

Source: Field Survey 2015

Based on the analysis in Table 4.3 it is clear that formal education has no significant association with knowledge of malaria and where to seek for assistance. What is expected is that the higher the level of education, the greater the tendency to use formal health facilities, however, the contrary is what was seen in the study. This brings to the fore the need to emphasise relevant information above formal education. Even though the respondents were well exposed to formal education, the impact was not felt in their decision as to where, when and how to seek healthcare.

The IDI of pregnant women and RBM staff that revealed the poor coverage of ITN further supports the result.

> I have at home, but I used it only after delivery. I am not even using it now, until when I am delivered of my baby. (Pregnant Woman)

> The government should regularly supply the ITN because of the increasing number of pregnant women and the new set of pregnant women who just registered and have not collected before. For example, those we gave mosquito net to last year have delivered and we have another set of pregnant women who had never collected ITN. So, government should make a regular supply like quarterly. People are now learning how to sleep separately in different rooms, unlike seven in a room like before. So, government has to regularly supply enough ITN and provide money for people to buy.
> ITN has really improved health against malaria to a reasonable extent and what they are trying to do is to cut down the price of this commodity. The government should make drugs and ITN always available and sufficient. (RBM Staff)

The foregoing buttresses what Jegede et al, (2006) noted that ITN usage is still very low in Nigeria with many people not aware of its existence. This signifies that the implementation of the strategies has not been effective enough. Although *The Nation* on

Friday 30, 2010, p. 27, reported that 63 million long lasting insecticide treated mosquito nets, known as LLINs, were being distributed to 32 million households in all the 36 States of the Federation and FCT, only eleven states have already received 19 million nets in the first phase and about 46 million more nets are yet to be distributed before the end of year 2010.

However, the 2008 NDHS reported an increase in household ownership of mosquito nets since 2003. Seventeen percent (17.0%) of households have a mosquito net and 8.0% have an insecticide treated net (ITN), as against 2.0% in 2003. The 2010 Nigeria Malaria Indicator Survey shows that 33.0% of urban and 45.0% of rural households own at least one Insecticide Treated Net (ITN), giving a national average of 42.0%. Conversely, the 2010 WHO, World Bank Report (Table 2.1) showed that less than 5.0% of Nigerian children sleep under ITNs. This leaves much to be desired!

At the zonal level, the South West has the lowest average number of nets per household. The IDI with RBM state manager corroborate this poor coverage of ITN in Oyo State.

> We have not had the ITN distributed yet. As we speak, we have not taken full delivery of the nets that we need. (State RBM Manager)

According to Morbidity and Mortality Weekly Report (MMWR, 2011), ITNs coverage is low in Nigeria, as equally confirmed by this research. ITNs evaluation, through field trials, have demonstrated a protective efficacy of 17.0% against all cause of childhood mortality in sub-Saharan African and could save up to 5.5 lives each year for every 1,000 children protected. Follow up field trial data show that the child survival benefit from ITNs can last for up to 6 years. Additionally, expanding the availability of nets beyond the target group (pregnant women and children aged 5 years) to cover at least 65.0% of older children and adults provides some protection even for those without nets (e.g. by reducing mosquito survival and decreasing community parasitemia).

However, most of the pregnant women interviewed in the course of this research

complained of government not "giving them" ITNs and their inability to afford same due to high procurement cost. This points to the fact that much more still needs to be done to provide ITNs for pregnant women and young children, the most vulnerable population.

4.3.2 Methods used by pregnant women in malaria treatment

When respondents were asked how they were preventing malaria before RBM, Figure 4.2 shows that they were aware of mosquito and well informed on what to use before the programme came on board. With their existing knowledge about what to use, RBM objectives became complementary, i.e. the introduction of:

1. Long lasting insecticide – treated mosquito nets (LLITN)
2. Indoor residual spraying (IRS)
3. Diagnosis and treatment of infected persons with artemusinim-based combination therapy (ACT), and protection of women with intermittent preventive treatment during pregnancy (IPT).

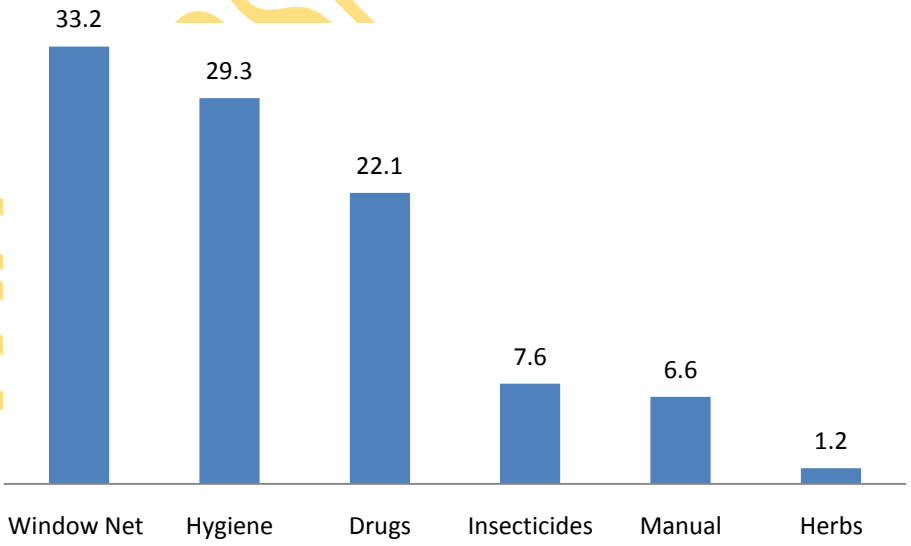


Figure 4.2: Bar Chart of ways of preventing malaria

A closer look at the ways of preventing malaria prior to the introduction of RBM showed that non-chemical intervention (window net, hygiene and manual) was greater

(69.1%) than chemical intervention (drugs, insecticide and herbs). While this is commendable given the side effects of chemicals, it is, however, ironic that RBM has not been able to build on this foundation with its inability to provide sufficient ITNs for the people.

Table 4.4: Frequency table of ways of preventing malaria

Means	Frequency	Percent
Hospital	167	72.3
Self Medication/Chemist	54	23.4
TBA	10	4.3
Total	**231**	**100**

Source: Field Survey 2015

This finding is consistent with other reports from Southwest Nigeria which showed that the majority of the people used screens and sprays to protect against malaria while the use of ITNs was poor. The study confirmed the awareness of vector control measures but poor use of these measures by these pregnant women. Mostly, the reason for not using these measures is prohibitive cost.

IRS is the application of insecticide to the interior walls of houses. Ideally, the insecticide will repel mosquitoes from entering and kill them when they rest on treated walls, thus reducing transmission from mosquitoes that bite and rest indoors. Field studies and programme experience since the 1950s have demonstrated the effectiveness of IRS in reducing malaria in both stable and unstable (epidemic-prone) malaria transmission settings. Like ITNs, IRS is most effective when applied community-wide with high coverage rates. IRS and ITN effectiveness is threatened by the emergency of insecticide resistance. Novel applications of IRS, using rotational (alternating insecticides over time) or mosaic (multiple insecticides in different areas) strategies might preserve the effectiveness of this intervention.

As shown in the chat below (Fig. 4.3), most of the respondents (93.0%) are aware that malaria is preventable, which means that if given the opportunity, armed with the right knowledge on prevention, malaria in pregnancy can be averted, putting a stop to a lot of the salient complications that go with it.

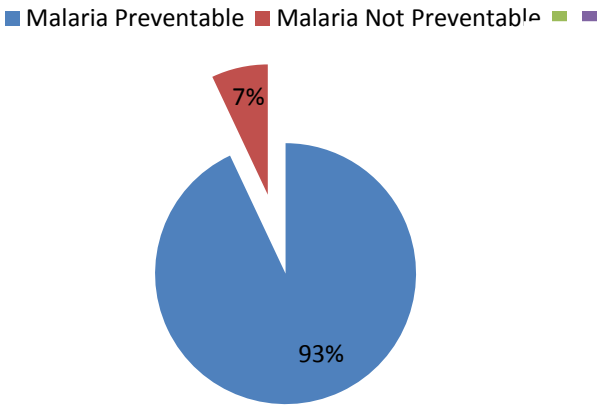


Figure 4.3: Pie chart of Respondents' belief about whether malaria is preventable or not

Diagnosis and management of patients with malaria is a cornerstone of malaria control because this can cure clinical disease and blunt transmission. During a period of poor malaria control in the 1990s, *P. falciparum* infection accounted for an estimated 30.0% of childhood deaths in sub-Saharan Africa; a large proportion of these malaria-related deaths could be attributed to the high prevalence of parasites resistant to chloroquine, the first line treatment during the period. But since the year 2000, a potent new class of drug made from derivatives of artermisinin has been introduced. To forestall the development of resistance to artimisinin derivatives, the World Health Organization (WHO) recommends that the derivatives not be used alone, but rather as arteminsinin based combination therapy (ACT) (using an artemisinm in combination with another anti-malaria with different mode of action). ACT regimens have been adopted as first line treatment globally. Rapid and accurate diagnoses enhance malaria case management by directing ACTs to patients with a confirmed diagnosis of malaria. Malaria rapid diagnostic test based on lateral flow immunochromatography have been introduced. They can detect malaria parasite antigens from finger prick blood specimens in 10-15 minutes, and their availability has begun to increase the ability of health care workers to diagnoses cases, especially in rural area without laboratory capacity. However, this technology is yet to gain ground in Nigeria, thus, still making proper malaria diagnosis a trial and error process.

In sub-Saharan Africa, an estimated 28% of women are infected with *P. falciprum* during pregnancy. Because of pregnancy altered changes in immunity, women living in moderate to high transmission areas who are pregnant for the first or second time are at greater risk of adverse event from malaria than women who have had three or more pregnancies. In these transmission contexts, IPTp, the preventive treatment of all pregnant women with curative regimen of sulfadoxine pyrimethamine (SP) during the second and third trimesters, can decrease both placental malaria parasitemia and maternal anemia. In many areas where SP is used for IPTp, a high prevalence of parasites with SP resistance genes and concomitant failures of SP immunotherapy for clinic malaria treatment in children have been observed. Whether SP resistance might alter the effectiveness of SP for IPTp is unclear and underscores the need to continue monitoring its efficacy in curing *P. falciparum* infection in pregnant women and the need for support to research into new medications for IPTp (MMWR 2011).

Table 4.5: Chi-square analysis of the impact of preventing malaria and RBM use

Seeking Assistance	Malaria prevention		Chi square	Df	p- value
	Yes	No			
RBM	208	127	10.43	1	0.001
Not RBM	19	31			

Source: Field Survey 2015

An analysis of the impact of preventing malaria and the respondents' use of the RBM programme revealed a significant relationship between the two. Table 4.5 shows that χ^2 calculated = 10.43, df =1 and p- value calculated = 0.001. Since the p-value calculated is lower than 0.05, then, there is a significant relationship between seeking assistance and preventing or treating malaria during pregnancy. The impact of RBM is well felt here. Though they are not really known by name to the pregnant women, they are soundly benefited by the intake of the IPT and ACT drugs given at ANC clinics. This can be adduced

to the fact that majority (93.0%) of the respondents believe that malaria is preventable, a result of their having relevant information.

More efforts need to be geared towards education because the research found another outlook on malaria transmission that is not popular. And this is buttressed more through the IDI with the RBM manager:

> The anopheles mosquito breeds in water; it lays its eggs in water. **The anopheles has its preponderance for clean water unlike the cullence which can breed in dirty water**. The anopheles that is more implicated with the falciparum parasite is more interested in clean water. This is pertaining to behavior change communication. That scope has not been well articulated but we intends to start. Now USAID is interested in showing us some supports through the thematic areas of malaria control. (State RBM Manager)

This pertains to behaviour change communication. For instance, an assessment of Nigeria's Roll Back malaria implementation in 2003 identified gaps in malaria information and prompted the country to develop a comprehensive behaviour change strategy. The essential actions needed to reach the intended audiences included mass media campaigns, training of patent medicine vendors, Community Based Organisation mobilisation and advocacy for appropriate medicines and preventive measure. This study found out that the behaviour change communication has not been well utilised, hence, the need for more current information on preventive measures rather than curative.

4.3.3 The influence of the knowledge of RBM and its acceptability on maternal health

This study found a disturbing gap between knowledge and practice. Most of the women were not aware of RBM as a programme; although most of them were aware of the protective nature of ITNs, a significant component of RBM. However, it was discovered that very few of them were actually using ITNs for reasons advanced later in this section.

> No! I just know the free drugs and ITN are from the government. I don't know RBM programme. (Pregnant Women)

It is nonetheless interesting to note that even though the respondents were not aware

of RBM as a programme, there is a significant relationship between the knowledge of malaria and the use of RBM among pregnant women in Ibadan. Table 4.6 reveals that χ^2 value= 21.582, df = 2 and p-value calculated = 0.000. Since the p-value is less than < 0.05, it implies that the respondents' knowledge of malaria is significantly associated with their use of RBM , even though they did not know it as RBM.

Table 4.6: Chi-Square analysis of RBM and the knowledge of malaria

Seeking Assistance	Knowledge of Malaria					
	Low	Moderate	High	Chi square	Df	P-value
RBM	45	78	109	21.582	2	.000
No RBM	62	59	45			

Source: Field Survey 2015

This, once again, brings to the fore the prime place of continued publicity and advocacy. Even though a lot of "noise" was made at the inception of the programme, there is little or no mention of it again in the mass media. Radio and television jingles no longer run to keep the programme in the consciousness of the populace. With the shifts in communication trend, it would have been expected that the coordinators of the programme would have embraced the Social Media and the Internet to keep drumming up awareness for the programme. Thanks to the GSM revolution of the early 2000s in Nigeria, a sizable percentage of Nigerians now use the Internet in one form or the other. Apart from the wider reach they afford, the Social Media and the Internet are quite cost effective.

As earlier stated, scale of preference is involved in taking pregnancy seriously or seeing it as normal occurrence with women. Stocking of adequate anti-malaria drugs in the health facilities has to be ensured by health authorities, as this will help build community confidence and not lead to instances whereby most patients who attended the hospital were provided with referral prescriptions to purchase their drugs from private chemist in the community. Such instances tend to erode the ideals of the RBM programme.

Even though almost every nursing mother had attended antenatal clinic (ANC) at least once during her most recent pregnancy, very few of them attended constantly or even completed the IPTp dosage. According to Ambruoso *et al* (2005), women expect humane, professional and courteous treatment from health professionals and a reasonable standard of physical environment. This may not be available at most of the health facilities due to the impart of the work load on the staff, i.e. the health facilities are short-staffed and the available staff are great under pressure. This is corroborated by an IDI with an RBM staff:

> We are short staff and the government had refused to employ more skilled workers. In an ANC clinic, like this, somebody is doing blood pressure check, another is checking weights, somebody would record the card, while another would be chatting the card, and another is doing the screening, another is administering treatment. If there is any emergency case or visitation are the staff sufficient? (RBM Staff)

Human resources are fundamental to a functioning health system and are in many developing countries a major constraint to scaling up health intervention. Human resources for health must be adequate in number and well-trained. In sub-Saharan Africa, there are only two (2) physicians per 10,000 people, compared with 32 per 10,000 people in the European Region (WHO, 2009). Similarly, accessibility factors like transport for referrer during complications also contribute to the low attendance of pregnant women. The stress involved in getting patients to a bigger facility is such that both patients and health workers are worked up. This is due, in part, to non-availability of comfortable means of transportation (ambulance) at ANC.

Desirous of ascertaining the level of interaction between RBM and maternal health in the study area, a logistic regression analysis of the influence of the knowledge of RBM and its acceptability on maternal health was carried out. It should be noted that knowledge of RBM and its acceptability were continuous variables used in explaining maternal health.

Table 4.7: Odd ratio of logistic regression analysis on the association between maternal health and knowledge and acceptability among women in Ibadan.

	B	S E		df	Sig	*Exp*B
Knowledge	0.218	.046	22.825	1	0.001	1.244
Acceptability	0.150	.007	511.935	1	0.000	1.161
Constant	-5.602	.230	592.966	1	0.000	0.016

Source: Field Survey 2015 ***Dependent variable: maternal health (Yes, No)***

The result shows that in the study area, the knowledge of RBM (B = 0.218, wald = 22.825, $p < 0.05$) and its acceptability (B = 0.150, wald = 511.935, $p < 0.05$), contributed significantly to maternal health. Given resultant odds ratio values 1.244 and 1.161 for the knowledge of RBM and its acceptability, respectively, it implies that a unit increase in the knowledge of RBM causes 0.8 unit increases in maternal health and, a unit increase in acceptability leads to 0.86 unit increases in maternal health. Hence, for maternal health of pregnant women to greatly increase, there is the need to increase their knowledge and acceptability of RBM.

4.3.4 The extent of adherence by pregnant women to RBM measures against malaria

Treatment guidelines from RBM

1. All pregnant women shall receive regular doses of SP as an IPT during the second and third trimesters, while those suffering from malaria infection will be treated according to the national treatment guideline.
2. The IPT using SP should be provided as part of a comprehensive antenatal package with other components such as haematinics and antihelminthics to control maternal anaemia that is highly prevalent during pregnancy in the country.
3. The pregnant woman should be made to swallow the SP under supervision of a health worker as a Directly Observed Treatment (DOT).
4. Every pregnant woman is encouraged to sleep under ITNs throughout the pregnancy and thereafter with the newborn.

The study found out that there would have been 100% adherence of respondents to drug usage with the introductions of DOT – Direct Observation Therapy but this is not so. The introduction of DOT in ensuring adherence of respondents to drug usage is quite laudable. This process ensures that pregnant women attending ANC take the SP regimen in

the presence of health workers. This is buttressed by the following IDIs.

> We practice the Direct Observation Therapy (DOT) here. We do not allow them to take the drugs elsewhere but in our presence here. By that, we are able to monitor their adherence to taking the drugs. (RBM Officer)

> Yes, I have been given anti-malaria tablet here and I was asked to take the drugs right her before the PHC nurse. (Pregnant Woman)

Even though DOT would have ensured 100% adherence of respondents to RBM drug usage/measures, the study found out that such is not the case. It was observed that some preventable barriers make full adherence impossible. The barriers include unavailability of drugs; short supply of drugs or supply of drugs close to expiration, and late registration at ANC. This was established from the IDIs with RBM staff across the study area.

> .
> The drug consignment given is only by the NGO, so it is not enough. And that is why the drugs cannot go round the RBM care givers at the grass root.

> The drugs should be released and dispatched on time, not close to expiration. The road should also be repaired. (RBM Staff)

Table 4.8: Frequency table of enrollment at antenatal clinic

Month	Frequency	Percent
1st	4	1.2
2nd	7	2.1
3rd	25	7.5
4th	66	19.7
5th	113	33.7
6th	66	19.7
7th	42	12.5
8th	12	3.6
Total	**335**	**100**

Source: Field Survey 2015

From the field data gathered on ANC enrollment (Table 4.8), 10.8% of respondents registered in an ANC during the first three months of pregnancy, which is quite worrisome. 19.7% and 33.7%, respectively, registered during the 4th and 5th month of pregnancy. Cumulatively, only 64.2% of respondents registered by the 5th month of pregnancy, when the first dose of SP was due. Thus, a frightening 35.8% of respondents missed the first dose of SP, with the implication that the only dose they received was definitely inadequate. As shown in Figure 18, after a rather slow take off, ANC enrollment peaks at the 5th month,

declining rapidly afterwards. More worrisome is the fact that 19.7% and 12.5% of respondents waited till the 6th month and 7th months, respectively, to register at ANC. Another 3.6% did not even register till the 8th months!

Obvious from the foregoing is the role of attitude, finance, distance, and relevant knowledge. As stated earlier, many pregnant women do not register early for ANC due to poor financial capability. Since some of them depend on others (husbands, friends, in-laws etc) to take decision, and such see pregnancy as an ordinary event, late registration for ANC is inevitable. Also, due to the routine nature of ANC, some pregnant women are deterred by distance. This research found out that only one PHC centre per LGA is dedicated for ANC, thus, the distance factor is played up, given the expanse of the LGAs and the attendant terrain variation.

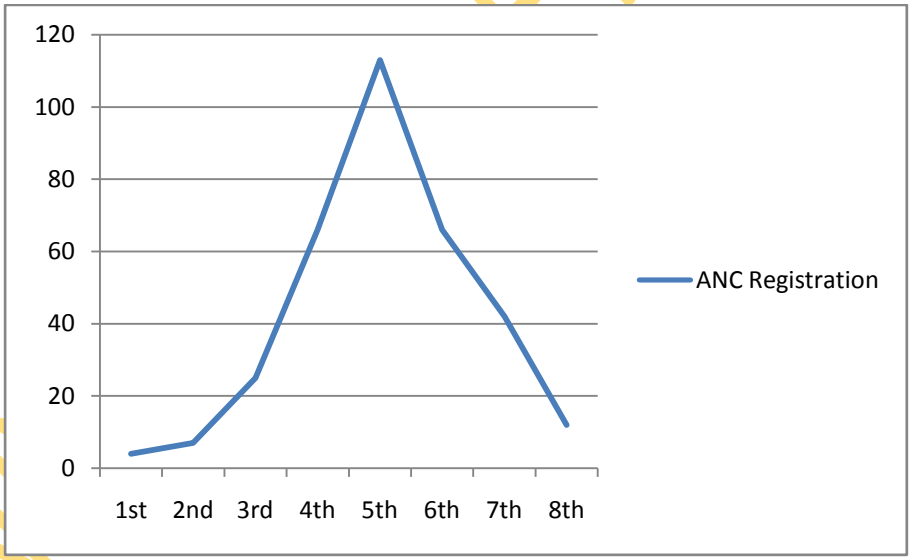


Figure 4.4: Enrollment at ACN

On the issue of availability and Utilisation (accessibility), the study found out that RBM programme is accessible due to the method in use. For instance, in all the health centres, they have an office were their staff resume every day. And in each health centre, there are 2 RBM officers – one medical staff and one monitoring officer. But the results showed that the materials, drugs, and manpower are inadequate. The IDI with an RBM staff attest to this.

> The drug consignment given is only by the NGO, so it is not enough. And that is why the drugs cannot go round the RBM care givers at the grass root.
> Also is the problem of staffing which I have talked about earlier. The government doesn't want to employ much staff, not even unskilled staff. If more are employed, work would be better. To draw the roaster, at times, is difficult. When I was the head of a facility, it was not easy task because of the few or inadequate number of staff. Before I finish the three shift roaster, my brain would be twitchy because I wanted to be fair.
> Also, there should be more training for the RBM officer, so as to encourage and broaden their knowledge.
> Also, the government can make us mobile, even if it is motorcycle and give money to maintain the vehicle. We officers should also be given stipend to encourage our work and logistics.
> I have not seen or collected any support from the Federal, State or Local government.
> Yakubu Gowon is the principal recipient in the global fund grant. They are one of the three principal recipients in the country: the National Malaria Control Programme, the Yakubu Gowon Centre and Society for Family Health. The first two are the recipients for the public section, of which we are part of, while the Society for Family Health is the private sector. As the year went by, there were issues between the principal recipients and the global fund. So, the funding had not been regular as we speak; and for now, we have not had any funding from the Yakubu Gowon Center (YGC) in the last one year 2010/2011. (RBM Staff)

The poor situation, depicted above, is the situation in Ibadan. The RBM manager corroborates this.

> We have not distributed the ITN yet this is due to operational reasons from the Federal Ministry. The campaign of net is from the Federal ministry and as we speak we have not taken the full delivery of the nets that we need yet. So it is only after we have the full delivery that we can distribute the ITN. (State RBM Manager)

Even though the existing structure of the RBM programme in the study area makes the programme accessible, the fact that the required materials for the smooth running of programme are not readily available puts a big question mark on the contributions of the programme to the fight against malaria and the overall success of the programme. For the programme not to go the way of such interventions in the past, it behooves the authorities concerned to put up a greater level of commitment. The availability of drugs and related materials, along with a well motivated team of skilled and unskilled manpower cannot be over emphasised. It is high time the government at all levels paid proper attention to the need of RBM and its success.

In contrast to the poor level of ITN use coverage, a large proportion of pregnant women in this study received prophylactic drugs for malaria. But disturbingly, over half of the drugs were not those currently recommended by the WHO or the Federal Ministry of

Health, i.e. sulphadoxine pyrimethamine. This is in spite of the fact that Nigeria adopted the IPTp strategy in the year 2005. The WHO expects 80% of all pregnant women living in areas of high transmission to receive IPTp during pregnancy by 2010. However, the coverage of the intervention is still low. Various reasons have been proffered for the poor adherence to this simple regimen. These reasons are users' fear of side effect of SP and their inadequate knowledge of the correct dose. Most respondents were said to have believed that anti-malarial drugs, when taken during pregnancy, could be harmful to the pregnant women and the unborn children. This shows a wide gap in the dissemination of information on RBM programme and its goals. If the people are well-enlightened about RBM, the issues of side effect and correct dosage will have been properly dealt with, giving the people the much needed confidence in the programme.

The IPTp strategy, as currently implemented in the study area under consideration, falls short of ensuring that Nigeria achieves the target of 80% coverage by 2010. Issues to be addressed in order to achieve the target include (i) shortage of drug supplied or the expiration of supplied drug date. (ii) Low level of awareness on IPTp, (iii) low uptake among pregnant women, and (IV) late enrolment for antenatal care.

Table 4.9: Frequency table of adherence to drug prescription

Adherence	Frequency	Percent
Did you use the drugs		
No	103	25.3
Yes	304	74.7
Total	**407**	**100**
If not, why?		
Lack of money	129	31.8
Does not believe in drug	7	1.7
Faith in God	3	0.7
Herbs	1	0.2
Others	1	0.2
No response	266	65.4
Total	**407**	**100**

Source: Field Survey 2015

Even though 74.7% of the respondents said they took prescribed drugs, a sizeable portion (25.3%), said they did not. Probing further revealed that lack of money (31.8%) was the major reasons for their non-adherence to the use of prescribed drugs. But worthy to note is the fact that 266 respondents (65.4%) kept mute on why they do not adhere to prescription. Nevertheless, it is safe to assume that shame about their financial status was responsible for the silence since such issues are considered private and not to be discussed, not to talk of with strangers. These conform to what is prevalent in most literature about women and their use of medical facilities and related services. Most women in sub-Saharan Africa do not have the needed financial empowerment to take full advantage of modern medicine. Also, the fact that most of them are products of different cultures that hold one general belief or the other about illness and its treatment hinders them from fully embracing modern medicine and related services. HBM holds that health or illness behaviours is a function of the perception an individual has of vulnerability to an illness and the perceived effectiveness of treatment with respect to deciding whether or not to seek medical attention (Elder *et al*, 1999).

4.3.5 Socio-demographic factors affecting adoption of RBM and maternal health status

An analysis of the socio-demographic attributes of the pregnant women vis-à-vis RBM is presented in Table 4.10.

Table 4.10: Chi-Square analysis of RBM and background of pregnant women

Variables	Chi-Square	Df	p-value
Age Group	5.526	5	0.335
Marital Status	16.823	4	0.014
Religion	3.034	2	0.219
Education	9.848	6	0.131
Occupation	2.237	3	0. 531
Monthly Income	7.041	2	0.030
Age at Marriage	6.063	3	0.109
Parity	16.394	1	0.000

Source: Field Survey 2015

From Table 4.10, with a calculated p value of 0.335 ($p > 0.05$), it is clear that there was no significant relationship between the age group of the respondents and their use of RBM. However, their marital status has a lot to do with whether or not they use RBM. The calculated p value of 0.014, which is less than 0.05, confirms that there is a significant relationship between the marital status of the respondents and their use of the RBM initiative. This is buttressed by existing literatures because the majority (93.3%) of the respondents was married women. Agbonlahor (1995), in his study of maternal health decision-making process in Edo State noted that marital status of women expressed utmost preference in their choice of care (Odubanjo, 2013). Married women are able to take good decision in health seeking treatment because their decisions are mostly joint (husband and wife) decision.

Considering the fact that all the respondents are adherents of one faith or the other (35.6% Christianity, 64.1% Islam, 0.3% Traditional), one would expect that religion would play a role in their use of RBM or otherwise, but the opposite is the case. The result of the analysis of the interaction between the respondents' religion and their use of RBM ($\chi^2 = 3.034$, df = 2 and $p = 0.219$) shows that there is no significant relationship between the two. Their religion ($p > 0.05$) does not in any way influence their use of RBM. This is corroborated by findings of Odubanjo (2013). According to him, "Religion of the respondents had no significant relationship with their treatment options… This finding indicates that religion, though a super structure in African cultural environment is not emphasised in the choice of care…"

Although the educational qualification of the respondents was impressive, and it would have been expected to seriously impinge their health-seeking behavior, analysis result points to the contrary. The interaction of the respondents' level of education and their use of the RBM yielded a p value of 0.131, greater than 0.05. Even though existing literatures (Erinosho; 1991, Jegede; 1991, Isiugo-Abanihe; 2003) point in the direction of education

playing a significant role in health-seeking behaviour in Nigeria cultural environment, this study shows otherwise. In the opinion of this researcher, it is not general education, but specific information, that plays a significant role in health-seeking behaviour in Nigeria cultural environment. Higher education does not necessarily translate to relevant information.

As earlier stated, most of the respondents (74%) were self-employed while 12.6% were Civil Servants and 3.7% did not specify their employment type. Only 9.7% of them were unemployed. Against this background, the occupation of the respondents would have been expected to impinge their RBM use, but the analysis result was to the contrary (χ^2 = 2.237, df = 3 and p = 0.531). With a p-value of 0.531, the occupation of the respondents has no significant relationship with their use of RBM or otherwise.

Most of the respondents (81.9%) earn a monthly income of Ten Thousand Naira (₦10,000) and below. This further buttresses the observed fact that women, generally, lack financial strength (ILO, 1995). The crucial role of finance in healthcare and its affordability cannot be over emphasised. The better the financial status of a woman, the higher her tendency to take advantage of modern healthcare. Women with robust income often patronise modern medicine practitioners as a result of the belief that the care from such is superior (Worall, et al, 2002). The result of the analysis (χ^2 = 7.041, df = 2 and p = 0.030) of the interaction between the monthly income of the respondents and their use of RBM strengthened the fact that finance plays a big role in healthcare, irrespective of the perspective. As expected, there is a strong relationship ($p < 0.05$) between the monthly income of the respondents and their use of RBM, thus buttressing the fact that women need to be enhanced financially to improve their ability to better take advantage of modern healthcare. Consequently, more women in Ibadan will use RBM if they are more financially empowered.

Only 11.8% of the respondents married as teenagers, implying that the majority married as mature women. Even though in the minority (11.8%), teenage-marriage is still a problem in Nigeria. Apart from not being physically, physiologically and emotionally mature, teenage mothers mostly lack the capacity to effectively care for their babies. The decisions on how and where to seek healthcare is mostly out of their hands. Unlike women that married at mature age, they are at the mercy of relations and associates when it comes to their health and that of their babies. Given that the majority of the respondents married as grown-ups, the researcher explored the relationship between the age-at-marriage of the respondents and their use of the RBM. The result ($\chi^2 = 6.063$, df = 3 and p = 0.109) was, however, surprising. Age-at-marriage has no significant impact ($p > 0.05$) on the respondents' use of RBM. The belief that the more mature a woman at marriage the better her chances of taking better decisions healthcare-wise is not supported by the findings of this research. The age at which a woman marries does not impact her use of RBM.

The stronghold of cultural beliefs in the African society came to the fore in the issue of parity. When asked, directly, the number of children they have, a sizeable number of the respondents did not answer. This is in line with the belief of the Yorubas of Southwestern Nigeria that one should not count the number of children a person has. A staggering 34.4% of the respondents did not answer the question about the number ofchildren they have. But when asked indirectly, whether have ever had a child or not, 320 of them, as against 267, responded in the affirmative. Thus, those that did not respond dropped to 21.4%, significant reduction of 13%. Hence, it can be safely assumed that it is this cultural belief that kept the remaining 87 women from responding to the question on parity. The exploration of the interaction between the parity of the respondents and their use of RBM shows that there exists a strong relationship between the two ($\chi^2 = 16.394$, df = 1 and p = 0.000). The findings of Azucena et al (2008) that parity is a major factor influencing care seeking behaviour of pregnant women

corroborates this result. However, this result debunks the belief that it is the primigravidea that are more likely to adopt orthodox form of healthcare as more than 65% of the respondents of this study are multigravidea. Their previous experience(s), positive or negative, must have influenced their decision to seek care from modern health facilities.

Table 4.11: Frequenct table pf pregnancy threatening health issues

Health Issues	Frequency	Percent
Malaria/High Fever	203	86.4
Anaemia	4	1.7
Urinary Tract Infection	3	1.3
Pregnancy Induced Hypertention	1	4
Pre-eclampsia	1	4
Eclampsia	4	1.7
Swelling/Oedema	19	8.1
Total	**235**	**100**

Source: Field Survey 2015

Table 4.11 reveals that the highest reported health issue during pregnancy is malaria (86.4%), followed by Oedema (8.1%), pregnancy induced hypertention (4%) and pre-eclampsia (4%). Aneamia (1.7%), Eclampsia (1.7%) and Urinary Tract Infection (1.3%) are the least reported. Out of the 407 respondents administered questionnaire, only 235 answered the question of pregnancy threatening health issues. That is, 172 respondents (42.3%) were silent on the question. It is safe to believe that those that were silent did so, not because they did not understand the question, but due to ignorance induced fear. This is evident from the information gathered from State Reproductive Health Coordinator. According to her, "Once the medical personnel at the PHC centre starts to educate them (pregnant women) on the symptoms they are exhibiting and the need for them to see Specialists at Medium or Tertiary health facility, due to wrong perception or fear, most of them stop attending clinic." Hence, they would rather keep quiet than run the risk of "exposing" themselves.

According to WHO and other United Nation statistical sources, Nigeria's maternal mortality is estimated to be 630 maternal deaths per 100,000 live births (WHO, 2012). An estimated 40 percent of pregnant women experience pregnancy related health problems

during and after pregnancy and child birth (FMOH 2003). That most of the respondents are unaware of common complications in pregnancy could be the reason why the nation's maternal mortality is still very high. The Oyo State Reproductive Health Coordinator corroborated this in an IDI.

> There is no good statistics on the outcome of women that develop complications during pregnancy. Once the medical personnel at the PHC centre starts to educate them on the symptoms they are exhibiting and the need for them to see Specialists at Medium or Tertiary health facility, due to wrong perception or fear, most of them stop attending clinic. They resort to Faith Houses or Traditional Health Practitioners. Thus, it is difficult to say what the outcome of their pregnancy was. (State Reproductive Health Coordinator)

A good evidence base is essential for planning and monitoring progress. In many sub-Saharan African countries, the evidence base for maternal health is weak. In some countries, data for key indicator is not available and it is difficult to establish the level of achievement in those areas. A strong knowledge base is an essential component of a well functioning health system and forms the foundation for policies, programmes and partnership and is an essential component of health systems.

RBM currently advocates malaria control strategies through prompt recognition of malaria signs/symptoms, recognition and early treatment of fever in children in the home, intermittent preventive treatment of malaria for pregnant women and the use of LLINs and ACTs.

Sequel to efforts at up-scaling the use of LLINs and IPT for the prevention of malaria in Nigeria, and given the unavailability of precise and relevant data on the utilisation of LLINs and other malaria control interventions in Nigeria, particularly Oyo State, this study found out that morbidity and mortality rate in Ibadan is still high due to malaria in pregnancy. IDI with RBM Manager corroborate this:

> Oyo State is an epidemic environment for malaria; we still see that hospital attendances are up to 70% malaria based, we still see that malaria is accountable for up to 10% of maternal death and about 30% childhood death.

Gathered field data (Table 4.11) buttressed this fact. The leading pregnancy threatening health issue among the respondents is malaria, accounting for 86.4%. Given the

ability of malaria to trigger many severe complications in pregnancy, one cannot but be concerned about the state of the RBM programme. As stated earlier, and corroborated by the findings of this research, most pregnant women will experience at least a bout of malaria. Though treated as an ordinary illness, malaria has the power, if not detected early and treated properly, to not only terminate a pregnancy, but to also terminate the life of the pregnant women. Thus, the situation where modern rapid diagnostic methods and kits are scares or completely unavailable in the country is totally unacceptable. Nigeria needs to place a great premium on the lives of her woman and safe motherhood. The country needs to do all it can to make modern malaria diagnostic kits ubiquitous. No matter the amount of drugs provided, the provision level of which is still very poor, if malaria is not detected early, such is waste.

Most importantly, however, it was observed that all the respondents are ignorant of other severe malaria consequences or complication in pregnancy, like oedema, bleeding, anemia, pregnancy induced diabetes, hypertension, etc. This is because when asked the question, "What are common complications in pregnancy that you are aware of and how are they managed?" The respondents could not really answer. The IDI with RBM officer explains further.

> Lack of proper education of the pregnant women; some of them do not know the causes of malaria. Then, lack of awareness from the government herself. The health workers are trying their best.
> Let say lack of awareness on the programme because the programme covers the children and the pregnant women. Government should extend awareness to the doorstep of the pregnant women because **some pregnant women still believe in traditional medicine and so they still go to the traditional birth attendants.** It is only those pregnant women that come to the clinic that we treat, but at the later hour, when the traditional birth attendant cannot handle their health situation again, then they will be transferred to the health centre. (RBM Officer)

4.4 Discussion

It is generally believed that a woman's level of education helps in her ability to recognise symptoms of pregnancy, associated complications, healthy nutrition during pregnancy and how and when to use contraceptives to control fertility. However, it is noted that the depth of

knowledge is influenced by cultural values, norms and practices. Individuals and communal values, norms and perceptions, in addition, are noted as responsible for the persistence of some cultural and religious practices and demographic behaviour in Africa and other parts of the world (McQuillan, 2004). For instance, female circumcision, which is commonly practised in Africa and Middle East, has been implicated in maternal deaths (Odebiyi and Aina, 1998). It has been observed that infection and obstetric complications that arise, as a result of such practice, place considerable strain in already inadequate health facilities (Erinsoho, 1996; Odebiyi and Aina, 1998).

The foregoing highlights the role of culture in shaping maternal health conditions among individuals in sub-Saharan Africa. In addition, it has been pointed out that since over 60 percent of our populations are rural-based, cultural norms and practices still exert a strong influence on reproductive health care, especially in relation to pregnancy, delivery and child rearing. The implication is that women's contribution to maternal health is limited (Njikam, 1994). Such limitation affects pregnancy-outcomes, generally, considering that some of these women are compelled to observe culturally approved activities, even when they undermine safe motherhood (Nwokocha, 2007).

Low level of information and education among individuals in most rural communities in sub-Saharan Africa are implicated as proximate variables affecting a woman's ability to recognise symptoms of pregnancy, especially at very early stages and even of related complications later in pregnancy. As the United Nations (2000) and UNICEF (2000) noted, the socioeconomic status of women in terms of low education impinges negatively on women's health, including reproductive events: studies show that the socioeconomic status of women in terms of education, involvement in reproductive health decision, nutrition and work as revealed in their subordinate statues contributes to poor pregnancy outcomes and maternal health (United Nations, 2000).

The effect of low education on the health of women, for instance, and especially, during maternal periods has particularly been emphasized (UNICEF, 2000). This is given that the level of one's education has implications for her knowledge, perception, attitude and maternal activities. Bongaarts (1997) confirmed this assertion by stating that the higher women's educational level, the more likely women are to be knowledgeable about contraceptive methods; the more likely also they are to be independent in decision-making regarding reproduction and other aspects of their lives and equally the more likely they are to be innovator of new behaviours, including the adoption of birth control. It has been observed that "education leads to autonomy as it helps women to stand up to their husbands and provides them a forum to learn about fertility control and make effective use of the health care system" (Riyami et al, 2004; 145).

Also in this study, an investigation into the general healthcare facility use of the respondents reveals that 39.3% of the respondents make use of Government hospitals, 13.8% make use of Private hospitals, 6.4% claim home treatment, 0.2% use TBAs and 6.9% patronise others (Mission Homes, Chemists, Patent Medicine, etc). However, the observed challenge is the sizeable number of those that gave no response (33.4%). It implies that they make use of unorthodox healthcare facilities, otherwise they should have been bold enough to mention where they generally seek healthcare. This is noteworthy because there could be many reasons for their action. According to Ambruoso (2005), women expect humane, professional and courteous treatment from health professionals and a reasonable standard of physical environment. This may not be available at most of the health facilities due in part to the work load on the staff, i.e., the health facilities are short staffed and the available staff are greatly under pressure. Human resources are fundamental to a functioning health system and are in many developing countries a major constraint to scaling up health intervention. Human resources for health must be adequate in number and well-trained. In sub-Saharan Africa,

there are only two (2) physicians per 10,000 people compared with 32 per 10,000 people in the European Region (WHO, 2009).

An effort was made at exploring the interaction between birth attendance and the place of the respondents' last delivery. The result ($\chi^2 = 221.63$, df =16 and p = 0.000) reveals a strong relationship between both variables since $p < 0.05$. As would be expected, where delivery takes place has a lot to do in determining who attends such a birth. It is highly unlikely that qualified medical personnel would be the birth attendants in a TBA home or other unorthodox facilities. Majority of the respondents made use of orthodox healthcare facilities, but a significant portion (34.9%) kept mute. This may be due in part to the fact that 13.5% of the respondents are primigravidae, leaving a difference of 19.4% of multiparious respondents who kept silent. This is bothersome given the fact that 19.4% is a very significant portion of the respondents.

Information on the knowledge of malaria on maternal health cannot be overemphasised. That is why in social action theory, action is said to be guided by customary habit of thought, reliance on "the external yesterday" (Coser, 2004). It is further averred that action is influenced not only by the situation but by the actor's knowledge of it. It is for this reason that knowledge of means and perceived efficacy of action play important roles to mothers in determining what course of action to take in malaria treatment.

Information on the adverse effect of malaria, during pregnancy, will go a long way to reducing maternal anaemia, fetal loss, premature delivery, intrauterine growth retardation, and delivery of low birth-weight infant. It is a particular problem for women in their first and second pregnancies and for women who are HIV positive (Lawrence *et al*, 2008). This is the reason why HBM explained how provision of adequate information and awareness creation on malaria will lead to positive action among individual (cues to action). It is also used to explain why people will more likely administer appropriate malaria treatment and protect

them when they know that malaria can cause death (perceived severity). However in this study, it was found that most mothers do not go early (most wait till the seventh month of pregnancy) for ANC and after delivery, most of them do not attend post-natal clinic. It is the first time most of the mothers attend post delivery clinic.

This pertains to behaviour change communication. For instance, an assessment of Nigeria's Roll Back malaria implementation in 2003 identified gaps in malaria information and prompted the country to develop a comprehensive behaviour change strategy. The essential actions needed to reach the intended audiences included mass media campaigns, training of patent medicine vendors, Community Based Organisation mobilisation and advocacy for appropriate medicines and preventive measure. This study found out that the behaviour change communication has not been well utilised; hence, the need for more current information on preventive measures rather than curative.

Similarly, accessibility factors like transport for referrer during complications also contribute to the low attendance of pregnant women. The stress involved in getting patients to a bigger facility is such that both patients and health worker are worked up. This is due, in part to non-availability of comfortable means of transportation (ambulance) at ANC. Accessibility is another challenging difficulty in reaching maternal health centres that can take proper care of pregnancy related complications.

The UN (2000), for instance, posited that, most often, families spend considerable time and resources moving from one health facility to another, reaching life-saving care only after long delays. In some cases, the woman's condition is worsened, irreversibly, leading to avoidable maternal-related deaths. The view in some quarters is that most families do not take good care of pregnant women because, pregnancy is perceived as a common event and, as such, does not need anything special in the way of health care (UN, 2000). Such perception impedes the recognition of complications and the risk associated with pregnancy

and childbirth. This research found out that only one PHC centre per LGA is dedicated for ANC. Thus, the distance factor is played up given the expanse of the LGAs and the attendant terrain variation. This is what Opportunity, Ability and Motivational model implies that opportunity is seen to be related to availability and brand appeal. Similar to the Health Belief Model, the Opportunity Ability Model is applied in this study to explain how availability, affordability and brand appeal of appropriate anti-malarial drugs (i.e. RBM and its measures) will determine use among individuals. The more available, the more affordable and the more appealing the drug is the greater the likelihood of acceptance. It also helps to explain the role culture, social support and peer support in leading individuals (pregnancy women) to accept malaria prevention and control strategies (Ability).

The importance of male role and pregnancy/maternal health decision is seen in all of these findings/results as posited by Isiugo-Abanihe, (2003). Male role is felt in virtually all aspects of human endeavour. In most societies, men dominate and, in some cases, absolutely control the interactions and actions of members of their families in virtually all spheres of social relationships (Nwokocha, 2007). This is reflected in this study. Male role is seen to have influence in decision making concerning maternal health. But men should do more to improve upon the present situation. For instance, they should encourage their women to attend antenatal at every stage of pregnancy and in all pregnancies. The view in some quarters is that most families do not take good care of pregnant women because, pregnancy is perceived as a common event. As such, does not need anything special in the way of health care (UN, 2000). Such perception impedes the recognition of complications and the risk associated with pregnancy and child birth.

The standard of living of each respondent was a determining factor in the choice of delivery place. As stated earlier, education and information are significant factors in maternal health care. The better enlightened the people, the greater the chances of their seeking

medical help from certified medical facilities. This is what Jegede (1998) refers to as gatekeepers of knowledge which are very important in health seeking behaviour of expectant mothers.

The need to Roll Back Malaria is still pertinent in Nigeria based on this study. However, all indications show that there is still a lot to be done for the impact of RBM to be felt in maternal mortality reduction, a result of salient malaria complications in pregnancy. Due to the low level of immunity of pregnant women and their susceptibility, it is expedient of the RBM programme to modify its operational focus. As it is observed in the Nigeria Health Policy Handbook that more than 50.0% of Nigerians suffer from at least an episode of malaria each year, it is, thus, apparent that all cases of malaria cannot be catered for in the limited health centers in the country. Moreover, given the fact that over 70.0% of cases seen in PHC facilities are malaria related, there is an urgent need to broaden the RBM objectives to include counselling in the areas of Reproductive Health, pregnancy related complications, malaria induced pregnancy complications and recent findings on mode of malaria transmission.

Specifically, this study found that most pregnant women are ignorant of the implications of other malaria related complications which cannot be treated at unorthodox health options like TBA, Faith Homes, etc. As mentioned earlier and corroborated by RBM staff, most pregnant women run away from ANC clinics to unorthodox health practitioners once they start to exhibit pregnancy related complication symptoms, forgetting that such places as TBAs, Faith Homes, Tradomedical Clinics, etc. are not equipped to handle such complications.

Obvious from the foregoing is the fact that there is no appropriate information and appropriate enlightenment about pregnancy related complications, causes and mode of malaria transmission, vulnerability to and severity of malaria induced pregnancy related

complications. It is the absence of these that lead most pregnant women to taking inappropriate actions, seeking help from TBAs, Faith Homes, etc., the fall-out of which is the high maternal mortality level in the country.

Globally, it has been established that access to healthcare is skewed in favour of urban areas against rural areas (Okafor, 1987, 1989; Watt, 1992). However, the situation is worse in developing countries like Nigeria where issues such as politics, economy, history and ethnicity determine the location of health facilities. If pregnant women in urban areas where access to modern healthcare is better, still resort to unorthodox forms of pregnancy care, as shown in this study and others, what is the fate of pregnant women in rural areas, where there is little or nothing of modern healthcare? Little wonder why Nigeria's MMR is still very high! Given the reality on ground, most maternal mortalities in the country are not accounted for! The true picture is that the county's real MMR figure is quite higher than what is paraded, given the percentage of pregnant women that patronise unorthodox pregnancy caregivers. It is high time Nigeria domesticated the RBM programme!

Like any international convention or treaty, domesticating RBM will make it more attuned to our national peculiarities. It will afford us the opportunity to tailor the programme to our obvious needs, such as creating synergy between various health programmes and interventions. It will make for the maximisation of the nation's investments in this vital sector, delivering more relevant and better executable health options to the teeming populace. As mentioned earlier, while RBM lacked mobility is some of the LGAs, there were other special health intervention programme in the same LGAs that had vehicles that were grossly under-utilised! Undue officialdom need be reduced, if not totally eliminated, from Nigeria's health sector.

More than 70 percent of all maternal death is due to some major complications: hemorrhage, infection, unsafe abortion, obstructed labour, with 15 percent of them suffering

serious or long-term complications such as pelvic inflammatory disease and infertility (FMOH, 2001). Low level of access to and utilisation of quality reproductive health play significant roles in the high maternal mortality in Nigeria. Only 31 percent of deliveries, for example, were recorded by the 1999 NDHS to have taken place within health facilities (NDHS, 1999). Nevertheless, by 2008, thirty-five percent of births in Nigeria were delivered in a health facility; 20 percent of the deliveries occurred in public health facilities and 15 percent occured in private health facilities. Three in five births (62 percent) occured at home (NDHS, 2008).

By age, women 20-34 years old are most likely to deliver in a health facility (38 percent). Most women have their first baby within this age range, and are more likely than others to deliver in a health facility because they are "inexperienced." This is corroborated by the findings of this research as most of the respondents (82.8%) were aged 20-34 years.

However, the proportion of births occurring in a facility decreases sharply as birth order increases. Women in urban areas are more than twice as likely to deliver in a health facility compared to their rural area counterparts (60 percent compared with 25 percent: NDHS, 2008). South-East Nigeria has the highest proportion of institutional deliveries (74.0%), followed by South-West (70.0%), while North-West has the lowest proportion (8.0%). The proportion of births occurring in a health facility also increases steadily with increasing wealth (NDHS, 2008).

According to NDHS, 2008, 62% of deliveries in Nigeria occur at home. This paints a very gory picture, given the endemic situation of malaria in the country, along with possible associated complications. If the country will make real progress in combating malaria and stemming maternal mortality, she ought to declare a state of emergency in the reproductive health sector with the aim of funding and developing foolproof strategies to drastically bring

down the 62% home delivery within a very short period of time. And, central to the success of such a strategy is **functional** education (enlightenment).

The level of utilisation of modern contraceptive in Nigeria is still low. From 1990 to 1999, contraceptive prevalence increased from 3.5 percent to 8.6 percent (NDHS 1990:1999). The level of contraception among sexually active adolescents is particularly low, contributing to high level of teenage pregnancy, unsafe abortions and maternal mortality, among others. On the whole, the total demand for family planning is still relatively low as only 29 percent of women demanded for family planning in 1999 as shown by the NDHS. The level of unmet needs for family planning reduced from 21 percent to 13.3 percent between 1990 and 1999. Unmet need for family planning in Nigeria is as high as 18% (Population Report, Series J, 2005), although it might have been as low as 13.3% in 1999 (National Population Commission, 2000).

Factors affecting the level of utilisation of family planning service in Nigeria included low level of knowledge, myths and misconceptions, low quality of service, including non-availability of contraceptive commodities and poor attitude of service providers and low status of women. But according to NDHS 2008, the use of modern family planning method is higher for sexually active unmarried women than for currently married women (61% versus 15%). The most notable difference among these two groups of women is that 35% of sexually active unmarried women use male condoms compared with two percent of married women. The contraceptive prevalence rate for modern method has increased from six percent in 1990 to 13 percent in 2003 and to 15 percent in 2008.

As clearly illustrated above, the reproductive health situation, which is highly correlated to the maternal morbidity and mortality in Nigeria, is poor. More energy needs to be geared towards Health Education as early as Primary School to achieve a good result and reduction on maternal mortality, which will lead to a favourable maternal health outcome.

Also, the RBM programme is not making positive significant contribution to the maternal morbidity and mortality situation of the country, even though it has the capacity, if well provided for and properly executed.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Diverse partnership platforms have facilitated the development of the foundation on which malaria control is achieving unprecedented results, but the work is still far from done. While some countries have not yet begun to scale up malaria intervention, others that have scaled up are now struggling to achieve efficiency in order to sustain high coverage rates and take necessary steps to further reduce malaria transmission, illness and malaria associated deaths (Fig.2.1) Resistance to drugs and insecticides is also threatening the gains. And the global partnership is challenged by the forces of the global economic downturn and donors shifting funding priorities, placing at risk even some of the most successful health initiatives. While policy adoption for the prevention of malaria during pregnancy progressed rapidly during the last decade, coverage of women with IPTp has been slow and not as well supported as should have been. Efforts in this area need to be redoubled to protect susceptible women and their newborns.

5.2 Summary of findings

5.2.1 Level of knowledge of malaria among pregnant women

The study found out that:

1. With respect to malaria treatment, couples take better decisions compared to individual spouses.

2. The respondents' use of ITN suggests that the more informed the populace, the higher their inclination to adopt and use the RBM measures in combating the scourge of malaria.

3. Data from this study indicated that the majority of the respondents used screens and sprays to protect against malaria, while the use of ITNs is poor. This confirms their awareness of vector control measures, but it is however ironic that RBM programme has not been able to build on this foundation.

4. Most of the respondents (93%) were aware that malaria is preventable, which means that if given the opportunity, armed with the right knowledge on prevention, malaria in pregnancy can be averted.

5. In the area of drug use, though the pregnant women did not really know RBM programme by name, they are soundly benefited by the intake of the IPT and ACT drugs given at ANC clinics.

5.2.2 The influence of the knowledge of RBM and its acceptability on maternal health

1. There exists a disturbing gap between knowledge and practice. Most of the women were aware of the protective nature of ITNs, a significant component of RBM, but a very few of them were actually using ITNs.

2. The respondents' knowledge of malaria was significantly associated with their use of RBM programme measures, even though they did not know the RBM programme by name.

3. A unit increase in the knowledge of RBM causes 0.8 unit increases in maternal health, while a unit increase in acceptability of RBM leads to 0.86 unit increases in maternal health. Hence, for maternal health of pregnant women to greatly increase, there is the need to increase their knowledge and acceptability of RBM.

4. There was inadequate supply of anti-malaria drugs at the health facilities visited. This erodes the community's confidence in the ideals of the RBM programme, leading

to instances where patients are asked to go and purchase prescribed drugs from private chemists.

5.2.3 The extent of adherence by pregnant women to RBM measures against malaria

1. Even though DOT would have ensured 100% adherence of respondents to RBM drug usage/measures, the study found out that such is not the case. The preventable barriers were unavailability of drugs and late registration at ANC.

2. Many pregnant women do not register early for ANC due to poor financial capability. Since some of them depend on others (husbands, friends, in-laws etc) to take decision, and such see pregnancy as an ordinary event, late registration for ANC is inevitable.

3. The routine nature of ANCs deters some pregnant women due to distance, as only one PHC centre per LGA is dedicated for ANC. The distance factor is played up given the large expanse of the LGAs and the attendant terrain variation.

4. The RBM programme is accessible due to the method and structure in use. In all the health centres, there is an RBM office with staff (one medical staff and one monitoring officer).

5. Even though the existing structure of the RBM programme makes the programme accessible, the fact on ground is that the required materials for the smooth running of programme are not readily available.

6. A large proportion of pregnant women received prophylactic drugs for malaria. But disturbingly, over half of the drugs were not those currently recommended by the WHO or the Federal Ministry of Health, i.e. sulphadoxine pyrimethamine. This is in spite of the fact that Nigeria adopted the IPTp strategy in year 2005.

7. The IPTp strategy, as being implemented, falls short of ensuring that Nigeria achieves her set coverage target. Issues to be addressed in order to achieve the desired coverage target include (i) shortage of drug supplied or the expiration date of supplied drug. (ii) Low level of awareness on IPTp, (iii) low uptake among pregnant women, and (IV) late enrolment for antenatal care.

5.2.4 Socio-demographic factors affecting adoption of RBM and maternal health

1. It was clear that there was no significant relationship between the age group of the respondents and their use of RBM. However, their marital status has a lot to do with whether or not they use RBM.

2. The religion of the respondents had no significant relationship with their treatment options. This finding indicates that religion, though a super structure in African cultural environment is not emphasized in the choice of care.

3. Even though literatures point in the direction of formal education playing a significant role in health seeking behaviour in Nigeria cultural environment, this study revealed otherwise. It is not formal education, but specific information, that plays a significant role in health seeking behaviour in the Nigerian cultural environment.

4. The occupation of the respondents has no significant relationship with their use of RBM or otherwise.

5. As expected, there is a relationship between the monthly income of the respondents and their use of RBM, thus buttressing the fact that women need to be empowered financially to improve their ability to better take advantage of modern healthcare.

6. The stronghold of cultural beliefs in the African society came to the fore in the issue of parity. This result debunks the belief that it is the primigravidea that are more likely to adopt orthodox form of healthcare as more than 65.0% of the respondents of this

study are multigravidea. Their previous experience(s), positive or negative, influenced their decision to seek care from modern health facilities.

7. The highest reported health issue during pregnancy is malaria (86.4%). Most pregnant women experience at least a bout of malaria. Though treated as an ordinary illness, malaria has the power, if not detected early and treated properly, to not only terminate a pregnancy, but to also terminate the life of the pregnant women.

8. All the respondents were ignorant of other severe malaria consequences or complication in pregnancy, like oedema, bleeding, anemia, and pregnancy induced diabetes, hypertension, etc.

5.3 Conclusion

At the dawn of the 21st century, maternal mortality is still unacceptably high in Nigeria. For every 100,000 live births, about 630 women die in the process of bringing these babies into the world (WHO, UNICEF, UNFPA and World Bank, 2012). This means that out of about 27 million women of reproductive age in Nigeria, over 1.7 million will not survive either pregnancy or childbirth. This is unacceptably high, even by African standard; it is tens of times worse than in most of the industrialised countries of the world. But of utmost concern is the fact that many of the non-industrialised countries of the Middle East, Central America and Oceania have far lower MMR compared to Nigeria (Appendix 4).

In the year 2001, the Human Development Index (HDI), using indicators such as per capital income, access to health facilities, portable water and school attendance, Nigeria was ranked 136th out of 162 countries (NPC, 2012). The 2011 HDI, titled "Sustainability and Equity: A Better Future for All," ranked Nigeria 156th out of the 187 countries surveyed (NPC 2012). It implies that over the ten-year period (2001-2011), the country did not really

develop. In other words, Nigerians remained poor irrespective of increased oil earnings during the period.

From the foregoing, it is obvious that improvement in maternal health is not just a function of the wealth, or increase in wealth, of a nation. Nigeria, with all her oil wealth, has an MMR far higher than that of many countries of the world with lesser wealth.

It is focused commitment to well grounded, all encompassing, health policies, sustained over time that can bring about the desired improvement in Nigeria's maternal health condition, thus lowering her MMR.

For every woman who loses her life, approximately 20 more will suffer short and long term disabilities, such as:

- Chronicanaemia (long standing shortage of blood)
- Stress incontinence (involuntary leakage of urine with increase abdominal pressure, e.g. when coughing)
- Vesico-Vaginal Fistulae or Recto-Vaginal Fistualae (VVF or RVF) (involuntary leakage of urine or faecal matter through the vagina due to injury sustained during a prolonged labour)
- Chronic pelvic pain (long standing pain in the pelvic area)
- Emotional depression
- Maternal exhaustion or physical weakness. (WHO, 2003)

For every woman who dies as a result of pregnancy and related causes, a man is widowed, disoriented and devastated; her children are orphaned and vulnerable; unfortunately, the causalities are not only those who have died.

At current estimates, if Nigeria does not implement effective interventions to avert maternal deaths, and disabilities are implemented, the loss in her productivity will be almost 341 million US Dollars (about 52 billion Naira) due to maternal deaths, plus 1.9 billion US Dollars (about 295 billion Naira) due to maternal disabilities (WHO, 2003). However, UNICEF 2009 reveals that women who survive pregnancy and childbirth face compromised health; studies have shown that between 100,000 and 1million women in Nigeria are suffering from obstetric fistula.

Inadequate health facilities, lack of transportation to institutional care (i.e. proximity/distance), inability to pay for services and resistance among some populations to modern health care are key factors behind the country's high rates of maternal mortality.

Therefore, the need for remarkable improvements in maternal health care in Nigeria is an emergency!

5.4 Recommendations

Based on the findings of this research, to preempt the calamities that could result from the present high MMR in the country, the following actions are recommended:

- Increased advocacy on the need for cleaner environment. Not only must the environment be clean, but also the re-education of the public to always cover their sources of clean water, given the propensity of the Malaria causing mosquito for clean water.
- General health care service improvement across all tiers of health facilities. Infrastructure and equipment should be upgraded, from Primary Health Care Centres through Tertiary Health Centres. This will, among other things, aid effective referrals of critical obstetric cases.

- Given the enormity of the loss (human and monetary) the country is suffering due to high MMR, maternal and newborn health must become a high priority on the agenda of all tiers of government in the country. No longer should the health of pregnant women and newborns be treated with triviality.
- RBM has the capacity to greatly impact maternal health outcomes if properly executed, with few additions. More skilled and unskilled (Community Health Extension Workers) hands should be employed to increase the effect of the programme, with provision for continuous capacity improvement. Also, reproductive health education should be infused into the programme to aid improved maternal health outcomes.
- Knowing the high risk involved, all obstetric emergencies must be treated free. Not again must a woman die as a result of her inability to afford medical care.
- Obvious is the fact that increased budgetary allocation does not necessarily translate to improved health care. Governments at all levels should constitute community based supervisory bodies to oversee the judicious use of money allocated to the Health Sector.
- Though a laudable programme, obvious to this researcher is RBM's low popularity. Most of the respondents, even though partakers of the RBM trimester based anti-malaria dosage, are not really aware of RBM. More needs be done to popularise the programme so that many more people will be aware of it and its operations.
- Programmes succeed more when the people for which it is meant are well carried along. Therefore, existing policy guidelines and programmes related to maternal health should be made more people-participatory. Most especially at the LGA level, communities should be aided in "owning" maternal health initiatives nationwide.

- Improving maternal health in Nigeria is a task for all. Thus, the government must actively involve the private sector, civil society, religious and other community-base organizations in the task of reducing maternal mortality and death of newborns.

5.5 Contribution to knowledge

This research contributed to existing body of knowledge on the impact of social factors on the adoption of RBM and maternal health. Though RBM has a great potential in transforming the health of mothers and their babies, its poor outlook on enlightenment and advocacy is an albatross to a stellar performance.

Contrary to the popular belief that mosquitoes thrive in dirty environment, this research unearths the information that the Anopheles mosquito, implicated with the *falciparum* parasite responsible for malaria, has propensity for clean water.

The research adds to existing knowledge in the area of contraception. Even though there is increased awareness of modern contraceptive methods, it was discovered that women are increasingly using non-modern contraceptive means.

The data and statistics obtained from the research are additions to existing literature and statistics on the nexus between RBM and maternal health.

It also contributed in the area of methods of controlling malaria and other pregnancy-related complication through giving out relevant information because that is what will liberate pregnant women from maternal morbidity and mortality.

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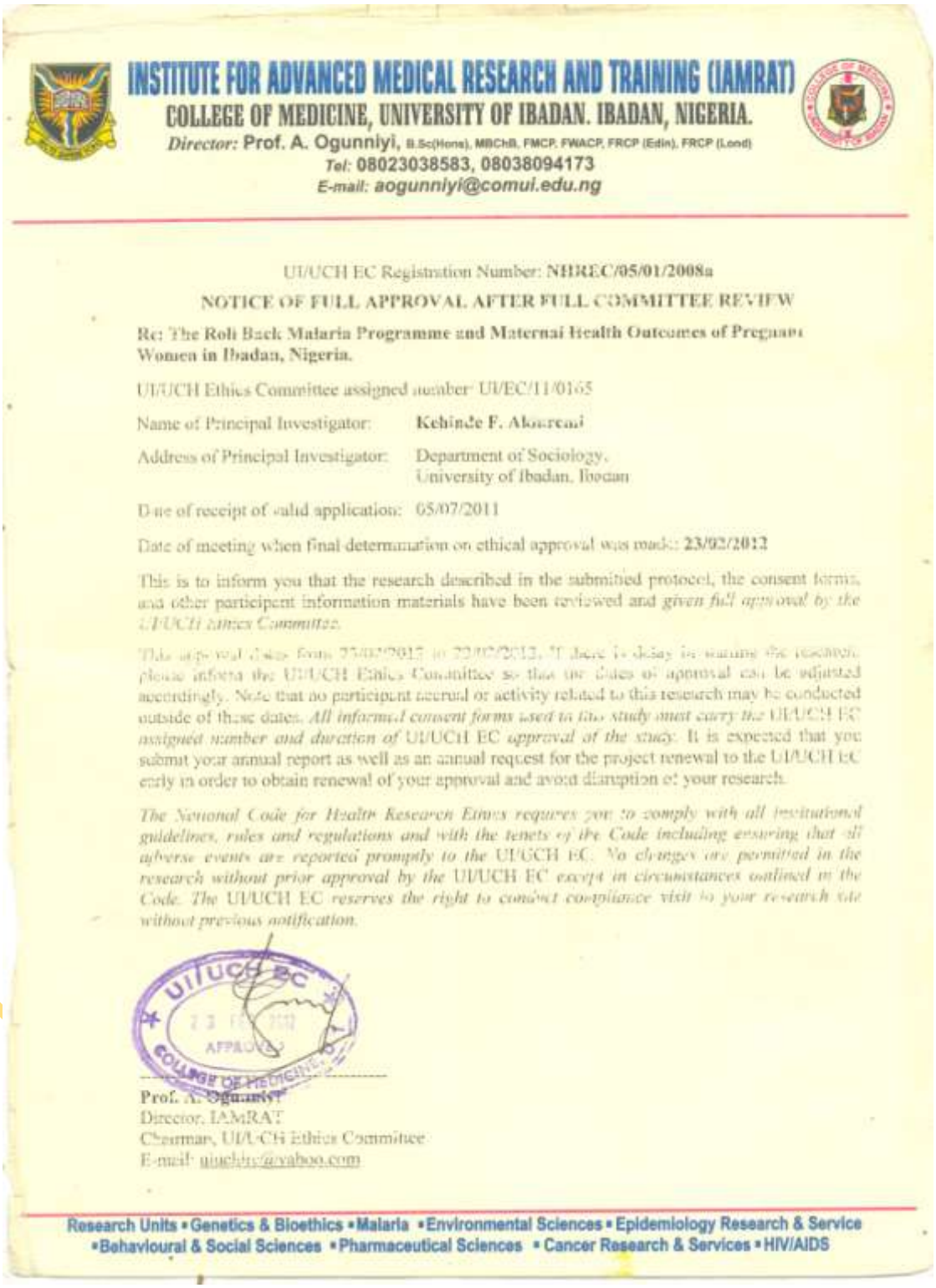
APPENDIX 1

ETHICAL APPROVAL



INSTITUTE FOR ADVANCED MEDICAL RESEARCH AND TRAINING (IAMRAT)
COLLEGE OF MEDICINE, UNIVERSITY OF IBADAN. IBADAN, NIGERIA.
Director: Prof. A. Ogunniyi, B.Sc(Hons), MBChB, FMCP, FWACP, FRCP (Edin), FRCP (Lond)
Tel: 08023038583, 08038094173
E-mail: aogunniyi@comui.edu.ng

UI/UCH EC Registration Number: NHREC/05/01/2008a

NOTICE OF FULL APPROVAL AFTER FULL COMMITTEE REVIEW

Re: The Roll Back Malaria Programme and Maternal Health Outcomes of Pregnant Women in Ibadan, Nigeria.

UI/UCH Ethics Committee assigned number: UI/EC/11/0165

Name of Principal Investigator: Kehinde F. Akinremi

Address of Principal Investigator: Department of Sociology, University of Ibadan, Ibadan

Date of receipt of valid application: 05/07/2011

Date of meeting when final determination on ethical approval was made: 23/02/2012

This is to inform you that the research described in the submitted protocol, the consent forms, and other participant information materials have been reviewed and *given full approval by the UI/UCH Ethics Committee.*

This approval dates from 23/02/2012 to 22/02/2013. If there is delay in starting the research, please inform the UI/UCH Ethics Committee so that the dates of approval can be adjusted accordingly. Note that no participant recruit or activity related to this research may be conducted outside of these dates. *All informed consent forms used in the study must carry the UI/UCH EC assigned number and duration of UI/UCH EC approval of the study.* It is expected that you submit your annual report as well as an annual request for the project renewal to the UI/UCH EC early in order to obtain renewal of your approval and avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the UI/UCH EC. No changes are permitted in the research without prior approval by the UI/UCH EC except in circumstances outlined in the Code. The UI/UCH EC reserves the right to conduct compliance visit to your research site without previous notification.

UI/UCH EC
23 FEB 2012
APPROVED
COLLEGE OF MEDICINE

Prof. A. Ogunniyi
Director, IAMRAT
Chairman, UI/UCH Ethics Committee
E-mail: ajuchiv@yahoo.com

Research Units • Genetics & Bioethics • Malaria • Environmental Sciences • Epidemiology Research & Service • Behavioural & Social Sciences • Pharmaceutical Sciences • Cancer Research & Services • HIV/AIDS

APPENDIX 2

INTERVIEW GUIDE FOR ROLL BACK MALARIA PROGRAM STAFF

1. Briefly tell me your name, your designature and how long you've been with RBM.
2. What do you know about RBM in Nigeria?
3. What do you know about malaria in Oyo?
4. Where you trained on malaria programme?
5. Briefly explain the programmes that instruct pregnant women on how well they should prepare for pregnancy.
6. Briefly tell me how you are expected to advice a pregnant woman about malaria.
7. How would you describe malaria treatment for pregnant women in your local government area?
8. At what trimester are you supposed to administer drugs to pregnant women?
9. What are you follow-up mechanism to monitor your patients adherence to treatment?
10. What are the barriers to the treatment of malaria among pregnant women in the local government?
11. What do you know about ITN? How much do you charge for services rendered?
12. What are the difficulties faced in this programme (RBM)?
13. What are the administrative difficulties/challenges in this programme (RBM)?
14. What level of support do you get from Federal or State Government?

APPENDIX 3

INTERVIEW GUIDE FOR PREGNANT WOMEN

1. Name
2. Age
3. Marital Status
4. How prepared were you and your husband before marriage?
5. What do you understand by the word Malaria?
6. How do you treat Malaria before you get married?
7. What other method do you use to prevent Malaria now that you are married?
8. How many children do you have?
9. Have you ever had a still birth? Yes/No
10. What was the cause of the still birth?
11. Have you had malaria during this pregnancy? Yes/No
12. How were you treated?
13. Which anti-malaria drug where you given at this PHC?
14. Did you pay for the drugs? Yes/No
15. Where did you take the drugs
16. Please explain what you were told about causes, treatment and prevention of malaria during ANC.
17. Do you have ITN at home? Yes/No
18. Were you given ITN or you bought it?
19. Which traditional method of curing malaria do you use along with orthodox medicine?
20. What other pregnancy complications have you heard aside malaria
21. What do you understand by the Roll Back Malaria programme by the Government?

APPENDIX 4

QUESTIONNAIRE
University of Ibadan, Ibadan, Nigeria
Faculty of the Social Sciences
Department of Sociology

Dear Respondent,
My name is AKINREMI, KEHINDE FUNMILAYO, a Ph.D student of the Department of Sociology, University of Ibadan. I am working on THE ROLL BACK MALARIA PROGRAMME AND MATERNAL HEALTH OUTCOMES OF PREGNANT WOMEN IN IBADAN, NIGERIA. This study is for the award of Ph.D in Sociology. Information given will be treated with upmost confidentiality. Would you like to participate? Yes □ No □

Address of Respondent ……..
Name of Health Centre ……
L.G.A……Hospital File No……

S/N	QUESTIONS	CODING/CATEGORIES	CODE
	Age		
	Religion	Christianity Islam Traditional Other (specify)……	
	Education	No formal education Pry Education School cert. NCE/OND HND Degree Post Graduate Other (specify)	
	Occupation	Unemployed Teaching Petty Trading Farming Civil Servants Other (specify)……	
	Monthly Income	Specify	
	What is your Marital Status	Never been married Married Cohabitating Widowed Separated/ divorced Other (specify)……	
	Type of marital union	Monogamy Polygamy	
	If polygamy, what is your position?		
	How old is your marriage?		
	Past number of pregnancy ever had		

	Is your husband/partner living with you now or is he staying elsewhere?	Yes No (specify where) …..……	
	How old is your husband		
	What is your husband's highest educational qualification?		
	What is your husband's occupation?		
	What is your husband's monthly income?		
	At what age did you first get married?		

SECTION2: HOUSEHOLD INFORMATION

	What type of house do you live in?	Single room Two rooms Self contain 2/3 bedroom flat Duplex Other (specify) ……	
	Type of accommodation	Rented Self owned Parent owned Other (specify) ……	
	Accommodation wall	Mud wall not plastered Mud wall plastered Cement blockwall not plastered Cement block wall plastered	
	How many rooms are available to your family?		
	How many people are sleeping in a room?		
	How many are you in your family?		
	What is your source of drinking water?	Water from open well Water from closed well Pipe/Borehole water Stream/Rain water Bottled water/ Pure water Other (specify) …….	
	What kind of toilet facilities does your household use?	Water closet Pit latrine Open field/ Bush River Other (specify) ……	
	What is the main source of cooking fuel in your household?	Electricity Kerosene Charcoal Firewood, straw Gas Dung Other (specify) ……..	
	How do you dispose garbage?	Burning Burying Dumping ground	

		Behind your house Dumping water ways Others (specify) …….	
	How do store your cooked food?	Refrigeration Screened cabinet Open Interval warming Others (specify) …….	
	What type of mosquito net do you use?	Ordinary mosquito net Insecticide treated net No, I don't use	
	How do you use it?	Always Often Sometimes	
	Who sleeps under the mosquito net?		
	Why are some of your other family members not sleeping under the mosquito net?	Too expensive Not available Don't like it Others (specify) …….	

SECTION3: PREGNANCY AND BIRTH HISTORY

	Have you ever given birth?	Yes No	
	What was the outcome of your last pregnancy?	Live birth Still birth Abortion Other, specify…….	
	What is the interval between this pregnancy and your last pregnancy?	…… Don't know/Remember	
	What health problem did you experience in your last pregnancy?	…… …….	
	Where do you usually deliver your baby?	Govt. Hospital Private Hospital Other, specify……..	
	What is the reason for the choice of place for delivery? Multiple answers allowed	Low cost Convenience Proximity Good service Suggested by others Other, specify……..	
	Who made the decision about where you would give birth?	Self Husband Self and Husband Mother Mother-in-law Other family member	

		Health worker Other, specify……..	
	Have you ever had a	Miscarriage Pre-term delivery Cesarean delivery Assisted delivery	
	Which family planning/birth spacing methods do you use?	Pill IUD Injectables Implants Male condom Female condom Diaphragm Periodic Abstinence Withdrawal Don't use any Other, specify……..	
	How old were you when you had your first child?		
	What is the outcome of child delivery?	Favorable Child died immediately after birth Discovered dead at delivery Others (specify)……	
	What is the mode of child delivery?	Caesarian section Vaginal Instrument Others (specify) ……	
	Where did you deliver?	Govt. hospital Private hospital Others (specify) ……	
	What is the reason(s) for the choice of place of delivery?	Low cost Convenience Good service Suggested by others Work place of husband Others (specify) ……	
	What symptoms made you realize you were pregnant?	Cessation of menstruation Nausea, vomiting Morning sickness Swelling of the belly Breast changes Urine test (pregnancy test) Others (specify) ……	
	What month of pregnancy did you recognize first symptoms?		

	Who did you first consult on knowing you were pregnant?	Elder relatives Husband Friends/ neighbours Parent Father/mother in law Others specify	
	For what issues did you seek consultation with others?	How to behave when pregnant Abortion Complications of pregnancy Symptoms of pregnancy How to take care of baby Gender of baby Food and medicine Method of delivery Others (specify) ……	
	What advice did you get from such consultations?	Nothing See a doctor To go for abortion Not to go for abortion Suggest place for prenatal care Food during pregnancy Cleaning/Hygiene Family planning Others (specify) ……	
SECTION4: PRESENT PREGNANCY STATUS			
	At the time you became pregnant, did you want to become pregnant then, did you want to wait until later, or did you want to have any more children?	Wanted pregnancy Wanted to wait Did not want more children	
	How old was your pregnancy when you first received antenatal care for this pregnancy?	Don't know/Remember	
	Whom did you first see for a check-up on this pregnancy?	Doctor Nurse Midwife TBA Other, specify…….	
	Where else are you receiving antenatal care for this pregnancy?	No other place Home TBA's place Faith maternity Private Hospital Other, specify……	
	How often do you see your health care provide for this pregnancy?	……. Don't know	

	During this pregnancy, what health problems related to the pregnancy have you experienced?	Malaria/High fever Anemia Sexually Transmitted Infections Urinary Tract Infections Hemorrhage/Bleeding Diabetes Hypertension Pre-eclampsia Eclampsia Swelling Other, specify…….....	
	Which one of these problems was the most severe?		
	Where did you seek for assistance?	Govt. Hospital Private Hospital TBA Self-prescription Chemist Other, specify…….	
	Why did you not seek for assistance?	Did not think it necessary Husband did not think it necessary Too expensive Used Home remedy Did not know where to go No time to go Other, specify……	
	Since you became pregnant, have you taken any vitamin/mineral/iron supplements?	Yes No	
	During this pregnancy, did you take any drugs to prevent or treat malaria?	Yes No	
	How did you know you have malaria?		
	What drugs did you take?		
	Before your present pregnancy, were you doing any of the following? (Multiple answers allowed) Smoking Drinking Alcohol Drinking Beverage Taking drugs Taking herbal medicines	 Yes (1) No(2) Yes (1) No(2) Yes (1) No(2) Yes (1) No(2) Yes (1) No(2)	
	During your present pregnancy, have you or are you doing any of the following? Smoking Drinking Alcohol Drinking Beverage Taking drugs Taking herbal medicines	 Yes (1) No(2) Yes (1) No(2) Yes (1) No(2) Yes (1) No(2) Yes (1) No(2)	

	Does your partner do any of the above?	Yes No If yes, specify……....	
SECTION5: KNOWLEDGE OF MALARIA IN PREGNANCY			
	Have you register for ante-natal	Yes No	
	If yes where	……	
	If no why?	Too costly Too far from home My husband says no Relatives says no Other, specify	
	Have you been treated on malaria?	Yes No	
	Which of these drugs were prescribed for you?	Chloroquine Amodiaquine/Camoquine Sulpha/Pyrimeth (Fansidar /amalar etc. Artemisinin based therapy Antibiotics Artiretrovirals (HAART) Antiretrovirals (prophylaxis) Anti-B drugs Anti-fungal Anti-helminthics ACT Coartem Local herbs Others (specify)	
	How many times were you to take them?	Once Twice Can't remember	
	Did you use the drugs?	Yes No	
	If No, why?	Lack of money Drugs not available I don't use drugs I use herbs I use faith in God Others (specify)……	
	At what month of your pregnancy were you given these drugs?		
	How many times have you been treated on malaria during your pregnancy		
	How were you treated?		
	Did the malaria reoccur after treatment?	Yes No	
	If yes what did you do?		

	Do you combine drugs with herbs?	Yes No	
	If not with herbs what do you combine it with?		
	Which of these symptoms do you experience when you think you had malaria and for how long?	**Duration** Fever Vomiting Chills and Rigors Diarrhea Headache Abdominal pain Irritability Loss Appetite Others (specify)	
	Do you have contact with animal like:	Dog Goat Cattle Cat Poultry Pigs Others, specify ……	
	Do you think a person can get malaria through this? (You can tick more than a word)	Mosquito Animal(pls name the animal) Stagnant water Witchcraft Other specify……	
	In what ways do you think malaria can be prevented?	……..	
	Do you agree malaria can cause death?	Yes No	
	If no, what do you think	……..	
	What do you do to protect you and your family from malaria?		
	Is any of this a cause or reason for not been able to protect your family from malaria	Lack of money Does not believe in drug Faith in God Herbs Others (specify)	

SECTION6: INFORMATION ON DELIVERY (LAST PREGNANCY)

1. What were the signs of beginning of labour (Multiple answers allowed)
   a. Breaking of the bag of water Yes….. No…..
   b. Abdominal pain Yes….. No…..
   c. Seeing the baby's hair Yes….. No…..
   d. Heat/Flushing/Sweating Yes….. No…..
   e. Others, specify Yes….. No…..
   f. No symptoms whatsoever Yes….. No…..

2. Where did you deliver? Health centers
Private hospital
Others specify

3. Who attended to you? Doctor
Nurse
Midwife
Relatives
Others specify

4. By what means did you deliver?
Normal delivery
Caesarian
Instrument
Others specify

5. What position did you adopt during labour?
Standing/vertical
Kneeling
Supine
Squatting
Others specify

6. What procedure were taken to induce the delivery (starting from arrival at the place of delivery)?
……
……

7. How long was the labour? …….Hours

8. Did you have any difficulty in labour?
Yes
No

8b. If 'yes,' please specify in details

……

8c. What were the causes of labour difficulty?

……..……

9. During your current or last pregnancy, have you ever been ill or sick from causes not related to pregnancy? Yes
No

9b. If 'yes,' give details

Preganancy order	Illness type	Management
Current pregnancy Or Last pregnancy		

10. What are common complication of pregnancy that you are aware of and how they are managed?

Perceived complications	Perceived causation	Perceived management
1.		
2.		
3.		
4.		
5.		

Complication refers to symptoms, which are due to pregnancy such as swelling, bleeding, high blood pressure, etc.

11. Have you ever experience complications such as swelling, bleeding, while being pregnant?

Yes
No

If 'yes,' please specify by order of pregnancy

Pregnancy No	Complications	Management	Cause
1.			
2.			
3.			
4.			
5.			

APPENDIX 5

ÌBÉÈRÈ IZẸ́-ÌWADÌÍ
University of Ibadan, Ibadan, Nigeria
Faculty of the Social Sciences
Department of Sociology

Olùkópa,
Orúkọ mi ni AKINREMI , KEHINDE FUNMILAYO , ọ̀kan lára àwọn akẹ́kọ̀ọ́ tó fẹ́ kẹ́kọ̀ọ́ gboye Ọ̀mọ̀wé (Ph.D)ní Ẹ̀ka -Ẹ̀kọ́ Sociology , ni Yunifásítì ti Ìbádàn. Mò ń zizẹ́ lórí ÈTÒ FÍFÒPIN SÍ ÀÌSÀN IBÀ ÀTI ÀWỌN ÀBÁJÁDE ÌLERA ÀWÓN ALÁBOYÚN NÍ ILÚ ÌBÀDÀN, NÍ NÀÍJÍRÍÀ. Izẹ́ ìwádìí yìí wá fún kíkẹ́kọ̀ọ́ gboyè Ọ̀mọ̀wé nínú ẹ̀kọ́ Sociology .
Gbogbo àláyé tí ẹ bá ṣe fún wa ni a ó dáàbòbò tí a sì lò lónà tí awo rẹ̀ kò fi ní lu síta.
Àdírẹ́sì Olùkópa ……..
Orúkọ Ibúdó Ilera ……
Ijóba Ìbílẹ̀…… Nọ́mbà Fáìlì Ọ̀sibítù……
N jv v fv la ti ko pa? Mo fv □ N o fv □

S/N	ÌBÉÈRÈ	IPELE	KÓÒDÙ
	Age		
	Ẹ̀sìn	Kristeni Musulumi Ẹ̀sìn Ìbílẹ̀ Òmíràn (tọ́kasí i)……	
	Ẹ̀kọ́	N ò kàwé Ẹ̀kọ́ Alákọ̀ọ́bẹ̀rẹ̀ Ẹ̀kọ́ Girama. NCE/OND HND Degree Post Graduate Òmíràn (tọ́kasí i)……	
	Izẹ́	Kò sízẹ́ Izẹ́ olùkọ́ Okòwò Izẹ́ Àgbẹ̀ Òzízẹ́ Ìjọba Òmíràn (tọ́kasí i)……	
	Owó tó ń wọlé lózoozù	Tọ́kasí i	
	Kín ni ipò ìgbeyàwó rẹ?	N ò tí ì zègbeyàwó Mo ti zègbeyàwó Alájọgbé Opó A ti pínyà/ A ti kọra Òmíràn (tọ́kasí i)……	
	Irú ìgbeyáwó tó jẹ́	Aláya kan Aláya púpọ̀	
	Bí ó bá jẹ́ aláya púpọ̀, ipò wo lo wà?		
	Ó di ọ̀dún mélòó tí o ti zègbeyàwó?		

	Ìgbá mélòó lo ti lóyún rí?		
	Njẹ́ ọkọ rẹ ń gbé pèlú rẹ àbí ó gbé ibòmíràn?	Bẹ́ẹ̀ni Bẹ́ẹ̀kọ̀ (sọ ibi tó ń gbé) …..…….	
	Ọmọ ọdún mélòó ni ọkọ rẹ		
	Kín ni ilé-ẹ̀kọ́ tó ga jù tí ọkọ rẹ lọ		
	Izẹ́ wo ni ọkọ rẹ ń ṣe?		
	Èló ni ọkọ rẹ ń gbà lózù?		
	Kín ni ọjọ́-orí rẹ nígbà tí o kọ́ zègbeyàwó?		

ABALA 2: ÀLÁYÉ NÍPA IBÙGBÉ

	Irú ilé wo ni ẹ ń gbé?	Yàrá kan Yàrá méjì Ilé Aládàálò Fúláàtì oníyàrá méjì/meta Dúpúlẹ́ẹ̀sì Òmíràn (tọ́kasí i) ……	
	Taa ló níle?	Àyágbé Ilé àwọn òbí Òmíràn (tọ́kasí i) ……	
	Ohun tí wọn fi kọ́lé náà	Ilé alámọ̀ tí wọn kò rẹ́ Ilé alámọ̀ tí wọ́n rẹ́ Ilé búlọ̀ọ̀kù tí wọn kò rẹ́ Ilé búlọ̀ọ̀kù tí wọ́n rẹ́	
	Yàrá mélòó ni ẹbí yín ń lò?		
	Ènìyàn mélòó ló sun inú yàrá kan?		
	Mélòó ni yín nínú ẹbí yín?		
	Irú omi wo ni ẹ ń mu?	Omi kanga to ni ìdérí Omi kanga tí kò ní ìdérí Omi ẹ̀ro/omi bọ́ọ́hoòlù Omi odò/Omi ojò Omi inú ike/ Omi inú ọ̀rá Òmíràn (tọ́kasí i)…….	
	Irú ilé-ìgbọ̀nsẹ̀ wo ní ẹbí rẹ ń lò?	Ilé-ìgbọ̀nsẹ̀ igbálódé Ilé-ìgbọ̀nsẹ̀ oníhò (Làtín-ìn) Ilẹ̀ pẹrẹsẹ/ Inú igbó Odò Òmíràn (tọ́kasí i)…….	
	Kín lẹ fi ń dáná nílé yín?	Iná mọ̀nàmọ́ná Epo kẹrosín Èèdú Igi ìdáná, kùùkù agbàdo Gáàsì Ìgbẹ́ màlúù Òmíràn (tọ́kasí i)……....	
	Báwo ní ẹ ṣe ń da ilẹ̀ nù ?	Sísun Rírì mọ́lẹ̀ Dídà sórí akìtàn	

		Kíko sí ẹyìn ilé Dídà sínú omi Òmíràn (tọ́kasí i)……...	
	Báwo ni o ze ń ṣètọ́jú oúnjẹ rẹ ?	Títọ́jú sínú fìríìjì Screened cabinet zísí sílẹ̀ Gbígbé kaná lóòrèkóòrè Òmíràn (tọ́kasí i)……..	
	Irú àpò ẹ̀fon wo lẹ ń lò?	Àpò ẹ̀fọn tí kò lóògùn Àpò ẹ̀fọn olóògùn N kò lo àpò ẹ̀fọn	
	Báwo ni o ze ń lò ó?	Gbogbo ìgbà Ọ̀pọ̀lọpọ̀ ìgbà Ẹ̀ẹ̀kọ̀ọ̀kan	
	Taa ló máa ń sùn lábẹ́ àpò ẹ̀fọn?		
	Kín ló dé tí àwọn ẹbí rẹ yòókù kì í sún lábẹ́ àpò ẹ̀fọn?	Ó wọ́n jù Kò sí N kò féràn rẹ̀ Òmíràn (tọ́kasí i) ……..	

ABALA3 ÌTÀN OYÚN NÍNÍ ÀTI ÌBÍMỌ

	Njẹ́ o ti bímọ rí?	Bẹ́ẹ̀ni Bẹ́ẹ̀kọ́	
	Kí ni àbájáde oyún tí o ni kẹ́yìn?	Àbíyè Àbíkú Oyún sízẹ́ Òmíràn (tọ́kasí i)…….	
	Àlàfo ọdún mélòó lo máa fi sáàrin oyún tí o ní gbẹ̀yìn?	…… N ò mọ̀/N ò rántí	
	ìpènijà ìlera wo lo ní nígbà tí o lóyún gbẹ̀yìn?	…… …….	
	Níbo lo sábà máa ń bímọ sí?	Ilé Ilé-Iwòsàn Ijọba Ilé-Iwòsàn Aládàáni Ibùdó TBA Ilé Agbẹ̀bí Òmíràn (tọ́kasí i)……..	
	Kín ni ìdí tí o fi yan ibi tí o máa ń bímọ sí? O lè yan ọ̀pọ̀ ìdáhùn.	Owó pọ́ọ́kú Ó rọrùn O wà ni tòsí Izẹ́ tó péye Wọ́n darí mi síbẹ̀ Òmíràn (tọ́kasí i)……..	
	Taa ló máa ń yan ibi tí o máa ń bímọ sí?	Èmi Ọkọ mi Emi ati ọkọ mi Iya mi Ìyá Ọkọ mi Àwọn ẹbí	

		Onízẹ́ Ìlera Òmíràn (tọ́kasí i)……..	
	Njẹ́ o ti ní ọ̀kan nínú àwọn wọ̀nyí rí	Oyún bíbàjẹ́ Bíbímọ-láìtásìkò Fífi-abẹ-gbẹ̀bí Bíbímọ-pẹ̀lú-ìrànlọ́wọ́	
	Ìrú ètò ìfètò-sọ́mọ-bíbí wo lò ń lò?	Oníkóró IUD Alábẹ́rẹ́ Implants Ọ̀rá Ìdáàbòbò ọkùnrin Ọ̀rá Ìdáàbòbò obìnrin Rọ́bà Alátìbọnú Onífifàyọ N kò lo ọ̀kankan Òmíràn (tọ́kasí i)……..	
	Ọmọ ọdún mélòó ni ẹ nígbà tí o bí àkọ́bi?		
	Kín ni àbájáde ọmọ bíbí?	Ó dára Ọmọ kú lẹ́yìn ìbímọ Ọmọ ti kú sínú Òmíràn (tọ́kasí i)……	
	Irú ìlànà wo lò gbà bímọ̀?	Izẹ́-abẹ Àtábẹ́bí Lílo irin-izẹ́ Òmíràn (tọ́kasí i)……	
	Níbo lo bímọ sí?	Ilé Ilé-Iwòsàn Ijọba Ilé-Iwòsàn Aládàáni Ibùdó TBA Òmíràn (tọ́kasí i)……..	
	Kín ni ìdí tí o fi yan ibi tí o bímọ sí?	Owó pọ́ọ́kú Ó rọrùn Izẹ́ tó péye Wọ́n darí mi síbẹ̀ Ibi-izẹ́ ọkọ mi ni Òmíràn (tọ́kasí i)……..	
	Àwọn àmì wo lo rí tí o fi mọ̀ pé o ti lóyún?	Dídúró nnkan ozù Inú dídàrú, èébì Àìsàn Àárọ̀ Ikùn yíyọ Àyípada ọyàn Àyẹ̀wò ìtọ̀ (àyẹ̀wò fún oyún) Òmíràn (tọ́kasí i)……..	
	Oyún di ozù mélòó kí o tó ṣàkíyèsí àwọn àmì wọ̀nyí?		
	Taa ni o kọ́ sọ fún nígbà tí o mọ̀ pé o lóyún?	Àgbàlagbà Ẹbí Ọkọ Àwọn ọ̀rẹ́/ alájọgbé Obí Baba ọkọ/Ìyá ọkọ	

		Òmíràn (tọ́kasí i)……..	
	Ìrú àwọn nnkan wo lo máa ń lọ ri àwọn ènìyàn fún?	Bí a ze le huwà nínú oyún Oyún sízẹ́ Àwọn ipò ẹlẹgẹ́ nípa oyún Àwọn àmì oyún Bí a selè tọjú ọmọ Irúfẹ́ ọmọ (obìnrin/ọkùnrin) Oúnjẹ àti òògùn Ọ̀nà ìbímọ Òmíràn (tọ́kasí i)……..	
	Irú ìmọ̀ràn wo ni wọn fún ọ nígbà tí o zèwádìí?	Kò sí ìmọ̀ràn kanka Lọ rí dókítà Lọ zéyún Má ze zẹ́yún Suggest place for prenatal care Oúnjẹ nínú oyún Ìmọ́tótó/Hygiene Ìfètò-sọmọ-bíbí Òmíràn (tọ́kasí i)……..	
ABALA4: IPÒ ÌLÓYÚN			
	Âjẹ́ o ti ṣetán oyún nígbà tí o lóyùn, ǹjẹ́ o fẹ́ dúró di ìgbò mìíran bí, tàbí o sì fẹ́ bímọ sí i bí?	Mo fẹ́ lóyún N ò tí ì zetán oyún N kò fẹ́ bímọ sí i	
	Oyún rẹ di oṣù mélòó nígbà tí o kọ gba ìtọ́jú oyún?	N kò mọ̀/N kò rántí	
	Taa lo kọ́kọ́ rí fún àyẹ̀wò lórí oyún yìí?	Dókítà Nọ̀ọ̀sì Agbẹ́bí TBA Òmíràn (tọ́kasí i)……..	
	Níbo lo tún ti ń gba ìtọ́jú oyún yìí?	Kò sí ibòmíràn Ilé Ibùdó TBA Ilé Agbẹ̀bí Ilé-ìwòsàn Aládàáni Òmíràn (tọ́kasí i)……..	
	Báwó lo ze máa ń lọ rí awọn eléto ìlera tó?	…… N ò mọ̀	
	Nínú oyún yìí, àwọn ìrírí ìpènijà iléra wo ló tí ni?	Ibà Àìsàn ẹ̀jẹ̀ Àìsàn Ìbálòpọ̀ Àìsàn ilé-ìtọ̀ Ẹ̀jẹ̀ yíya Ìtọ súgà Ẹ̀jẹ̀ ríru Pre-eclampsia Eclampsia	

		Ara wíwú Òmíràn (tọ́kasí i)……..	
	Èwo nínú àwọn àìsàn yìí ló burú jù?		
	Níbo ló wá ìrànlọ́wọ́ lọ?	Ilé-Iwòsàn Ijọba Ilé-Iwòsàn Aládàáni Ibùdó TBA Òògùn àdálò Ìlé-ìtajà òògùn Òmíràn (tọ́kasí i)……..	
	Kín ló dé tí o kò bèèrè ìrànlọ́wọ́?	N kò rò ó pé ó ze pàtàkì Ọkọ mi kò rí i bí ohun tó ze pàtàkì Ó wọ́n jù. A fi ẹsẹ̀ ilé tọ̀ ọ́ N kò mọ ibi tó yẹ láti lọNo Kò sí àsìkò láti lọ Òmíràn (tọ́kasí i)……..	
	Láti ìgbà tí o ti lóyún, njẹ́ o ti lo nínú awọn èròjà azàfikún okun bí vitamin/mineral/iron?	Bẹ́ẹ̀ni Bẹ́ẹ̀kọ́	
	Nínú oyún, njẹ́ o lo òògùn tó lè dáàbò bò ọ́ lọ́wọ́ àìsàn ibà?	Bẹ́ẹ̀ni Bẹ́ẹ̀kọ́	
	Báwo lò ze mọ̀ pé o ní àìsàn ibà?		
	Òògùn wo ni o lò?		
	Kí o tó ní oyún tí o ní yín, âjẹ́ ò ń ze ọ̀kankan nínú ìwọ̀nyí? (Ààyé wà fún ọ̀pọ̀ ìdáhùn) Sígá mímu Ọtí mímu Tíì mímu Òògún mímu Àgbo mímu	 Bẹ́ẹ̀ni (1) Bẹ́ẹ̀kọ́(2) Bẹ́ẹ̀ni (1) Bẹ́ẹ̀kọ́(2) Bẹ́ẹ̀ni (1) Bẹ́ẹ̀kọ́(2) Bẹ́ẹ̀ni (1) Bẹ́ẹ̀kọ́(2) Bẹ́ẹ̀ni (1) Bẹ́ẹ̀kọ́ (2)	
	Bí o ze wà nínú oyún yìí, âjẹ́ ò ń ze ọ̀kànkan nínú ìwọ̀nyí tàbí o ti ṣe é? Sígá mímu Ọtí mímu Tíì mímu Òògún mímu Àgbo mímu	 Bẹ́ẹ̀ni (1) Bẹ́ẹ̀kọ́(2) Bẹ́ẹ̀ni (1) Bẹ́ẹ̀kọ́(2) Bẹ́ẹ̀ni (1) Bẹ́ẹ̀kọ́(2) Bẹ́ẹ̀ni (1) Bẹ́ẹ̀kọ́(2) Bẹ́ẹ̀ni (1) Bẹ́ẹ̀kọ́(2)	
	Âjẹ́ ẹnikejì rẹ ń ze ọ̀kankan nínú ohun tó wà lókè yìí?	Bẹ́ẹ̀ni Bẹ́ẹ̀kọ́ Bí ó bá rí bẹ́ẹ̀, tọ́kasí i……	
ABALA5: KNOWLEDGE OF MALARIA IN PREGNANCY			
	Zé o ti lọ forúkọ sílẹ̀ fún ìtọ́jú oyún?	Bẹ́ẹ̀ni Bẹ́ẹ̀kọ́	
	Bí ó bá jẹ́ bẹ́ẹ̀ni, níbo ni?		

		……	
	Bí ó bá jẹ́ bẹ́ẹ̀kọ́, kín ló dé?	Ó wọ́n jù Ó jínnà sílé mi Ọkọ mi kò gbà Ẹbí mi kò gbà Òmíràn (tọ́kasí i)……..	
	Âjẹ́ o ti gba ìtọ́jú fún àìsàn ibà?	Bẹ́ẹ̀ni Bẹ́ẹ̀kọ́	
	Irú òògùn wo ni wọ́n ní kí o rà?	Chloroquine Amodiaquine/Camoquine Sulpha/Pyrimeth (Fansidar /amalar etc. Artemisinin based therapy Antibiotics Artiretrovirals (HAART) Antiretrovirals (prophylaxis) Anti-B drugs Anti-fungal Òògùn aràn ACT Coartem Àgbo Òmíràn (tọ́kasí i)……..	
	Ẹ̀ẹ̀melòó ló yẹ kí o lò wọ́n wọ́n?	Ẹ̀ẹ̀kan Ẹ̀ẹ̀mejì N kò rántí	
	Âjẹ́ o lo àwọn òògùn náà?	Bẹ́ẹ̀ni Bẹ́ẹ̀kọ́	
	Tí o kò bá lò ó, kín ló dé?	Kò sówó Òògùn náà kò sí lórí àtẹ Èmi kì í lo òògùn Àgbo ni mo máa ń lò Ìgbagbọ́ nínú ọlọ́run ni mo gbẹ́kẹ̀lé Òmíràn (tọ́kasí i)……..	
	Oyún rẹ tó osù mélòó kí wọ́n tó fún ọ ní àwọn òògùn náà?		
	Ó ti tó ìgbà mélòó tí o tí gba ìtọ́jú fún àìsàn ibá nínú oyún yìí?		
	Báwo ni wọn ze tọ́jú rẹ?		
	Âjẹ́ àìsàn ibà náa tún padà nígbà tí wọn tọ́jú rẹ̀ tán?	Bẹ́ẹ̀ni Bẹ́ẹ̀kọ́	
	Bí ó bá rí bẹ́ẹ̀, kín lo ze sí i?		
	Âjẹ́ o lo àgbo àti òògùn òyìnbó pọ̀ bí?	Bẹ́ẹ̀ni Bẹ́ẹ̀kọ́	
	Bí kò bá rí bẹ́ẹ̀, kín ni o lò mọ́ àgbo?		
	Èwo nínú àwọn àmí wọ̀nyí ní o rí nígbà tí o rò pé o ní àìsàn ibà., báwo ló ze pẹ́ sí?	**<u>Àkókò</u>** Ara gbígbóná Èébì Otútù àti ara gbígbóná Ìgbẹ́ gbuuru	

		Èfórí Inú kíkan Ara yíyún Àìlèjẹun Òmíràn (tọ́kasí i)……..	
	Âjẹ́ o máa ń bá àwọn ohun-ọ̀sìn wọnyí zeré:	Ajá Ewúrẹ́ Mààlúù Olóńgbò Ohun-ọ̀sìn abìyẹ́ Ẹlẹ́dẹ̀ Òmíràn (tọ́kasí i)……..	
	Âjẹ́ o rò pé èníyàn lè ní àìsàn ibà nípasẹ̀ ìwọ̀nyí? (O lè mú ju ọ̀kan lọ)	Ẹ̀fọn Ohun-ọ̀sìn (Dárúkọ ohun-ọ̀sìn náà) Omi adágún Àjẹ́ Òmíràn (tọ́kasí i)……..	
	Ọ̀nà wo ni o rò pé o lè gbà dáàbòbo àra rẹ lọ́wọ́ àìsàn ibà?	……..	
	Âjẹ́ o gbà pé àìsàn ibà lè pani?	Bẹ́ẹ̀ni Bẹ́ẹ̀kọ́	
	Bí kò bá rí bẹ́ẹ̀,kín ni èrò rẹ?	……..	
	Ọ̀nà wo ni òń gbà dáàbòbo ẹbí rẹ lọ́wọ́ àìsàn ibà?		
	Âjẹ́ ọkankan nínú ìwọ̀nyí lè fa kí o ma le dáàbòbo ẹbí rẹ lọ́wọ́ àìsàn ibà?	N kò nígbàgbọ́ nínú òògùn Ìgbagbọ́ nínú ọlọ́run ni mo gbẹ́kẹ̀lé Àgbo lílò Òmíràn (tọ́kasí i)……..	

ABALA6: ÀLÀYÉ NÍPA ÌBÍMỌ (OYÚN TÍ O NÍ KẸ́YÌN)

12. Kín ni àwọn àmi ibẹ̀rẹ̀ ìrọbí (Multiple answers allowed)

g.	Dída omira	Bẹ́ẹ̀ni…..	Bẹ́ẹ̀kọ́…..
h.	Ìsàlẹ̀ ikùn kíkanni	Bẹ́ẹ̀ni …..	Bẹ́ẹ̀kọ́ …..
i.	Rírí irun orí ọmọ	Bẹ́ẹ̀ni …..	Bẹ́ẹ̀kọ́ …..
j.	Ara gbígbóná/Ojú pípọ́n/Òógùn	Bẹ́ẹ̀ni …..	Bẹ́ẹ̀kọ́ …..
k.	Àwọn nâkan mìíràn (tọ́kasí i)…	Bẹ́ẹ̀ni …..	Bẹ́ẹ̀kọ́ …..
l.	Kò sí àmì Kankan	Bẹ́ẹ̀ni …..	Bẹ́ẹ̀kọ́ …..

13. Níbo lo bímọ sí? Ilé-Iwòsàn Ijọba

Ibùdó ìlera

I Ilé-Iwòsàn Aládàáni

Ibùdó TBA

Òmíràn (tọ́kasí i)……..

Taa ló dá ẹ lóhùn? Dókítà

Nọ̀ọ̀sì

Agbẹ̀bí

Ẹbí
Òmíràn (tọ́kasí i)……..

14. Báwo lo ze bímọ?
Fúnra mi
Izẹ́ Abẹ
Irinzẹ́
Òmíràn (tọ́kasí i)……..

15. Irú ipò wo lo fi bímọ?
Ìdúró
Ìkúnlẹ̀
Mo fẹyin sùn kọjú sókè
Mo kúnle dojú bolẹ̀
Òmíràn (tọ́kasí i)……..

16. Àwọn ìgbésẹ̀ wo ni wọ́n gbé láti gbẹ̀bí fún ọ (Bẹ̀rẹ̀ láti bí o ṣe dé ibẹ́ àti àwọn ìgbésẹ̀ yòókù)?
……
……

17. Báwo ni ìrọbí náà ze pẹ́ tó? Wákàtí ……

18. Ńjẹ́ o ní ìsòro kankan lásìkò ìrọbí?
Bẹ́ẹ̀ni
Bẹ́ẹ̀kọ́

8b. Bí ó bá jẹ́ 'bẹ́ẹ̀ni,' zàlàyé

……

8c. Kín ló fa ìsòro lásìkò ìrọbí náà?

……

9. Nínú oyún tí o wà yìí tàbí èyí tó kọja lọ, njẹ́ o tilẹ̀ sàìsàn tí kò jẹmọ́ oyun?
Bẹ́ẹ̀ni
Bẹ́ẹ̀kọ́

9b. Bí ó bá jẹ́ 'bẹ́ẹ̀ni,' zàlàyé

Oyún	Ẹyà àìsàn	Ìtọ́jú
Oyún tí mo ní yìí tàbí Oyún tó kọjá lọ		

10. Kín ni àwọn ìsòro tí o ní nínú oyún tí o mọ̀ àti bí wọn ze mójú tó wọn?

Ìpènijà tí a rí	Okùnfà ìpènijà	Àmójútó
1.		
2.		
3.		
4.		
5.		

Ìpènijà ni àwọn àmì tí a rí nípazẹ̀ bí: kí ibi kàn wú, ẹ̀jẹ̀ dídà, ẹ̀jẹ̀ ríru, abbl.?

11. Âjv o ti ni iru ìpènijà yii ri?

Bẹ́ẹ̀ni
Bẹ́ẹ̀kọ́

Bí ó bá jẹ́ 'bẹ́ẹ̀ni,' tókasí i nípa bí o ze lóyún náà sí

Númbà Oyún	Ipènijà	Àmójútó	Ohun tó fà á
1.			
2.			
3.			
4.			
5.			

APPENDIX 6

WORLD MATERNAL MORTALITY RATES BY BLOCKS

EUROPE		
Country Name	MMR	Year of Estimate
Belarus	190	2010
Moldova	41	2010
Latvia	34	2010
Ukraine	32	2010
Albania	27	2010
Romania	27	2010
Hungary	21	2010
Turkey	20	2010
Luxembourg	20	2010
Croatia	17	2010
United Kingdom	12	2010
Serbia	12	2010
Slovenia	12	2010
Denmark	12	2010
Bulgaria	11	2010
Macedonia	10	2010
Malta	8	2010
Montenegro	8	2010
Portugal	8	2010
Belgium	8	2010
Bosnia and Herzegovina	8	2010
Lithuania	8	2010
France	8	2010
Switzerland	8	2010
Germany	7	2010
Norway	7	2010
Netherlands	6	2010
Spain	6	2010
Slovakia	6	2010
Ireland	6	2010
Iceland	5	2010
Czech Republic	5	2010
Finland	5	2010
Poland	5	2010
Sweden	4	2010
Italy	4	2010
Austria	4	2010

Greece	3	2010
Estonia	2	2010

ASIA		
Country Name	MMR	Year of Estimate
Laos	470	2010
Afghanistan	460	2010
East Timor	300	2010
Pakistan	260	2010
Cambodia	250	2010
Bangladesh	240	2010
Indonesia	220	2010
India	200	2010
Burma	200	2010
Bhutan	180	2010
Nepal	170	2010
Philippines	99	2010
Korea, North	81	2010
Kyrgyzstan	71	2010
Turkmenistan	67	2010
Georgia	67	2010
Tajikistan	65	2010
Mongolia	63	2010
Vietnam	59	2010
Kazakhstan	51	2010
Thailand	48	2010
Azerbaijan	43	2010
China	37	2010
Sri Lanka	35	2010
Russia	34	2010
Russia	34	2010
Armenia	30	2010
Malaysia	29	2010
Uzbekistan	28	2010
Brunei	24	2010
Iran	21	2010
Korea, South	16	2010
Japan	5	2010
Singapore	3	2010

AFRICA		
Country Name	MMR	Year of Estimate
Chad	1,100	2010
Somalia	1,000	2010
Sierra Leone	890	2010
Central African Republic	890	2010
Burundi	800	2010
Guinea-Bissau	790	2010
Liberia	770	2010
Sudan	730	2010
Cameroon	690	2010
Nigeria	630	2010
Lesotho	620	2010
Guinea	610	2010
Niger	590	2010
Zimbabwe	570	2010
Congo, Republic of the	560	2010
DR Congo,	540	2010
Mali	540	2010
Mauritania	510	2010
Mozambique	490	2010
Malawi	460	2010
Tanzania	460	2010
Angola	450	2010
Zambia	440	2010
Cote d'Ivoire	400	2010
Senegal	370	2010
Kenya	360	2010
Gambia, The	360	2010
Ghana	350	2010
Benin	350	2010
Ethiopia	350	2010
Rwanda	340	2010
Swaziland	320	2010
Uganda	310	2010
Burkina Faso	300	2010
Togo	300	2010
South Africa	300	2010
Comoros	280	2010
Equatorial Guinea	240	2010
Eritrea	240	2010
Madagascar	240	2010

Gabon	230	2010
Djibouti	200	2010
Namibia	200	2010
Botswana	160	2010
Morocco	100	2010
Algeria	97	2010
Cape Verde	79	2010
Sao Tome and Principe	70	2010
Egypt	66	2010
Mauritius	60	2010
Libya	58	2010
Tunisia	56	2010

CENTRAL AMERICA		
Country Name	MMR	Year of Estimate
Haiti	350	2010
Dominica	150	2010
Dominican Republic	150	2010
Guatemala	120	2010
Jamaica	110	2010
Honduras	100	2010
Nicaragua	95	2010
Panama	92	2010
El Salvador	81	2010
Cuba	73	2010
Belize	53	2010
Barbados	51	2010
Saint Vincent and the Grenadines	48	2010
Bahamas, The	47	2010
Trinidad and Tobago	46	2010
Costa Rica	40	2010
Saint Lucia	35	2010
Grenada	24	2010
Puerto Rico	20	2010

NORTH AMERICA		
Country Name	MMR	Year of Estimate
Mexico	50	2010
United States	21	2010

Canada	12	

SOUTH AMERICA		
Country Name	MMR	Year of Estimate
Guyana	280	2010
Bolivia	180	2008
Suriname	130	2010
Ecuador	110	2010
Paraguay	99	2010
Colombia	92	2010
Venezuela	92	2010
Argentina	77	2010
Peru	67	2010
Brazil	56	2010
Uruguay	29	2010
Chile	25	2010

MIDDLE EAST		
Country Name	MMR	Year of Estimate
Yemen	200	2010
Syria	70	2010
Iraq	63	2010
Jordan	63	2010
Oman	32	2010
Lebanon	25	2010
Saudi Arabia	24	2010
Bahrain	20	2010
Kuwait	14	2010
United Arab Emirates	12	2010
Israel	7	2010
Qatar	7	2010

OCEANIA		
Country Name	MMR	Year of Estimate
Papua New Guinea	230	2010
Tonga	110	2010
Vanuatu	110	2010
Samoa	100	2010
Solomon Islands	93	2010
Fiji	26	2010

New Zealand	15	2010
Kiribati	9	2008
Australia	7	2010

APPENDIX 7

Reproductive Risk Index

highest risk category

All countries in this category have low incomes, all are in sub-Saharan Africa except Haiti, Yemen, and Laos—the poorest countries in their respective regions—and Bangladesh. Skilled care during pregnancy and childbirth is limited, especially in Ethiopia. Infant and maternal mortality are high or very high. Contraceptive use is generally low and there is very high unmet need for contraception. At about 40 percent, Yemen, Rwanda, Laos and Haiti have the highest unmet need for contraception in the world. Very early marriage is common, adolescent fertility is high and abortion policies are mostly restrictive. Levels of HIV infection are moderate to high.

high risk category

Half of the countries in this category are in sub-Saharan Africa. Skilled care during pregnancy and childbirth is generally available, except in Nepal and Cambodia. Maternal and infant mortality is high and very high in three quarters of the countries. Unmet need for contraception is relatively signifcant and is highest in Western Africa. Proportion of family planning demand met is highest in Central America and lowest in West Africa and India and Zimbabwe. Very early marriage is common and adolescent fertility is generally high. Abortion is generally restricted to save a woman's life or health. All countries with low levels of HIV/AIDS are outside sub-Saharan Africa.

	HIV Prevalence Among Adults 15-49 (%) 2005	Adolescent Fertility (birthsper 1000women aged15-19) 2000–2005	Women married before age 18 (%)	Antenatal Care Coverage—at least 4 visits (%) Mostrecent yearsavailable	Family planning demand met (%)	Births Attended by Skilled Health Personnel (%) Mostrecent yearsavailable	Grounds on which abortion is permitted*	Maternal Deaths per 100,000 Live Births (MMR) 2005	Infant Mortality Rate (IMR) (infantdeaths perthousand livebirths) 2005	Reproductive Risk Index (RRI)
27 Eritrea	2.4	86	47	49	23	28	II	High	50	43
28 Zambia	17.0	148	42	71	56	43	IV	ExtremelyHigh	102	47
29 Nepal	0.5	122	66	15	56	19	V	ExtremelyHigh	56	45
30 Benin	1.8	136	37	61	41	66	II	ExtremelyHigh	89	46
31 Burundi	3.3	55	NoData	79	NoData	25	II	ExtremelyHigh	114	46
32 Kenya	6.1	104	25	52	62	42	I	VeryHigh	79	44
33 Togo	3.2	104	31	48	44	49	II	VeryHigh	78	44
34 Pakistan	0.1	22	24	18	46	31	II	High	79	43
35 Congo	5.3	129	31	NoData	73	83	I	VeryHigh	81	43
36 Swaziland	33.4	38	15	NoData	NoData	70	III	High	110	43
37 Gabon	7.9	96	34	63	54	86	I	VeryHigh	60	41
38 Zimbabwe	20.1	72	29	64	81	80	II	ExtremelyHigh	81	41
39 Cambodia	1.6	49	25	9	44	44	V	VeryHigh	98	40
40 Guatemala	0.9	115	34	68	65	41	I	High	32	39
41 Papua New Guinea	1.8	70	NoData	78	NoData	42	I	High	55	38
42 Iraq	NoData	42	20	78	NoData	72	I	High	102	38
43 Ghana	2.3	70	28	69	43	47	III	VeryHigh	68	37
44 Sudan	1.6	69	NoData	75	NoData	57	I	High	62	37
45 India	0.4	69	60	30	78	48	IV	High	66	34
46 Nicaragua	0.2	119	43	72	82	67	I	Moderate	30	34
47 Honduras	1.5	103	39	84	79	67	I	High	31	33
48 Myanmar	1.3	19	NoData	76	68	68	I	High	75	32
49 Bolivia	0.1	84	26	69	72	61	II	High	52	32
50 Namibia	19.6	70	10	69	66	76	III	High	46	31

*grounds on which abortion is permitted, ranging from the most to the least restrictive: I. To save the woman's life or health; II. To preserve the woman's physical health; III. To preserve the woman's mental health; IV. To preserve the woman's physical or mental health, taking into consideration her socioeconomic circumstances; V. On request.

moderate risk category

Nine developing regions (including most of South America and the three wealthiest nations in sub-Saharan Africa) are represented in this category. Antenatal care and skilled attendance at delivery are generally high. The countries are split between low and moderate levels of maternal mortality. Infant mortality is low. A significant proportion of family planning demand is met. Levels of contraceptive use, unmet need for family planning, very early marriage, and adolescent fertility vary across countries. Abortion is generally restricted to cases where they are necessary to save a woman's life or health. HIV prevalence and infant mortality are low except in South Africa and Botswana.

	HIV Prevalence Among Adults 15-49 (%) 2005	Adolescent Fertility (birthsper 1000women aged15-19) 2000–2005	Women married before age 18 (%)	Antenatal Care Coverage—at least 4 visits (%) Mostrecent yearavailable	Family planning demand met (%)	Births Attended by Skilled Health Personnel (%) Mostrecent yearavailable	Grounds on which abortion is permitted*	Maternal Deaths per 100,000 Live Births (MMR) 2005	Infant Mortality Rate (IMR) (infantdeaths perthousand livebirths) 2005	Reproductive Risk Index (RRI)
51 Panama	0.9	89	37	72	NoData	91	I	Moderate	19	25
52 Egypt	<0.1	49	17	41	85	74	I	Moderate	28	25
53 Philippines	<0.1	52	14	70	74	60	I	High	25	23
54 El Salvador	0.9	87	27	76	88	69	I	Moderate	23	25
55 Botswana	24.1	61	7	97	NoData	99	III	High	87	23
56 Indonesia	0.1	47	24	81	88	66	I	High	28	24
57 Dominican Republic	1.1	114	41	93	86	98	I	Moderate	28	27
58 Ecuador	0.3	85	37	NoData	94	74	II	Moderate	22	26
59 Iran (Islamic Republic of)	0.2	24	30	77	NoData	90	I	Moderate	31	25
60 Venezuela	0.7	92	29	90	79	94	I	Moderate	18	25
61 Brazil	0.5	90	24	76	91	97	I	Moderate	31	25
62 Oman	NoData	13	26	71	NoData	98	I	Moderate	10	25
63 Peru	0.6	64	19	69	89	71	II	High	23	24
64 Paraguay	0.4	82	20	89	92	77	I	Moderate	20	24
65 Mexico	0.3	70	29	86	88	93	I	Moderate	22	24
66 South Africa	18.8	71	8	72	79	92	V	High	55	23
67 Morocco	0.1	29	16	NoData	86	63	II	High	36	23
68 Costa Rica	0.3	78	19	70	NoData	98	II	Low	11	21
69 Lebanon	0.1	27	NoData	87	NoData	98	I	Moderate	27	21
70 Saudi Arabia	NoData	32	10	73	NoData	96	II	Moderate	21	20
71 Turkey	NoData	48	23	42	92	83	V	Low	26	19
72 Libyan Arab Jamahiriya	NoData	4	2	81	NoData	99	I	Moderate	19	19
73 Chile	0.3	62	NoData	95	NoData	100	I	Verylow	8	19
74 Kuwait	NoData	14	22	81	NoData	100	II	Verylow	9	18
75 Mauritius	0.8	38	17	NoData	90	89	I	Verylow	13	18
76 Uruguay	0.5	64	22	94	NoData	99	II	Low	14	18

*grounds on which abortion is permitted, ranging from the most to the least restrictive: I. To save the woman's life or to preserve the woman's physical health; II. To preserve the woman's physical health; III. To preserve the woman's mental health; IV. To preserve the woman's physical or mental health, taking into consideration her socioeconomic conditions; V. Without restriction as to reason

low risk category

Six developing and four developed regions in the world are represented in this category. Antenatal care and skilled attendance at delivery are generally high. Three quarters of the countries in this category have low levels of deaths during pregnancy and childbirth. Infant mortality is low to moderate except in five Central Asian countries. A significant proportion of family planning demand is met. More than half the countries in this category allow abortion unrestricted. With a few exceptions, HIV prevalence is low.

	HIV Prevalence Among Adults 15-49 (%) 2005	Adolescent Fertility (birthsper 1000women aged15-19) 2000–2005	Women married before age 18 (%)	Antenatal Care Coverage—at least 4 visits (%) Mostrecent yearsavailable	Family planning demand met (%)	Births Attended by Skilled Health Personnel (%) Mostrecent yearsavailable	Grounds on which abortion is permitted*	Maternal Deaths per 100,000 Live Births (MMR) 2005	Infant Mortality Rate (IMR) (infantdeaths perthousand livebirths) 2005	Reproductive Risk Index (RRI)
77 Colombia	0.6	76	23	79	93	91	III	Moderate	17	17
78 Azerbaijan	0.1	29	22	NoData	83	74	V	Moderate	74	17
79 Jordan	NoData	27	11	91	84	100	II	Moderate	22	17
80 Argentina	0.6	61	NoData	96	NoData	99	II	Moderate	15	16
81 Sri Lanka	<0.1	26	NoData	99	93	97	I	Low	12	16
82 Ireland	0.2	19	1	NoData	NoData	100	I	Verylow	5	15
83 Viet Nam	0.5	21	15	29	94	85	V	Moderate	16	15
84 Thailand	1.4	45	19	88	NoData	99	III	Moderate	18	15
85 Georgia	0.2	35	27	NoData	74	92	V	Moderate	41	15
86 Kyrgyzstan	0.1	32	21	81	84	98	V	Moderate	56	14
87 Albania	NoData	16	16	42	98	94	V	Moderate	18	14
88 Kazakhstan	0.1	28	14	71	88	99	V	Moderate	63	13
89 Armenia	0.1	31	19	65	80	98	V	Low	28	13
90 Jamaica	1.5	88	1	99	82	97	III	Low	17	13
91 Turkmenistan	<0.1	17	9	83	86	97	V	Moderate	61	12
92 Uzbekistan	0.2	37	15	NoData	83	96	V	Low	57	12
93 Poland	0.1	15	3	NoData	NoData	100	II	Verylow	6	12
94 Bulgaria	<0.1	44	17	NoData	85	99	V	Verylow	12	11
95 Trinidad and Tobago	2.6	35	NoData	98	NoData	97	III	Low	17	11
96 Republic of Korea	<0.1	3	1	NoData	NoData	100	II	Verylow	5	11
97 Malaysia	0.5	15	9	NoData	NoData	100	III	Moderate	10	9
98 Mongolia	<0.1	50	9	97	87	100	V	Low	39	9
99 Tunisia	0.1	8	5	79	84	90	V	Moderate	20	8
100 New Zealand	0.1	27	1	NoData	NoData	97	III	Verylow	5	8
101 Republic of Moldova	0.1	37	19	NoData	91	100	V	Low	14	8
102 Ukraine	1.4	30	13	NoData	62	100	V	Verylow	13	8

*grounds on which abortion is permitted, ranging from the most to the least restrictive: I [illegible] II [illegible] III [illegible] IV [illegible] V [illegible]

lowest risk category

Countries in this category have high incomes; Cuba, China and Singapore are the only countries in the developing world. Motherhood is safe; skilled care at childbirth is universal and the risk of death from pregnancy or delivery is extremely low. Infant mortality is rare. Contraceptive use is high. Early marriage is rare. Abortion is unrestricted. Adolescent fertility and HIV prevalence are low.

	HIV Prevalence Among Adults 15-49 (%) 2005	Adolescent Fertility (births per 1000 women aged 15-19) 2000–2005	Women married before age 18 (%)	Antenatal Care Coverage—at least 4 visits (%) Most recent years available	Family planning demand met (%)	Births Attended by Skilled Health Personnel (%) Most recent years available	Grounds on which abortion is permitted*	Maternal Deaths per 100,000 Live Births (MMR) 2005	Infant Mortality Rate (IMR) (infant deaths per thousand live births) 2005	Reproductive Risk Index (RRI)
103 Spain	0.6	10	2	NoData	90	NoData	III	Verylow	4	2
104 Russian Federation	1.1	30	13	NoData	NoData	99	V	Low	14	2
105 TFYR Macedonia	<0.1	25	15	NoData	NoData	99	V	Verylow	15	4
106 Romania	<0.1	36	7	NoData	93	98	V	Low	16	6
107 China	0.1	2	2	NoData	NoData	83	V	Low	23	4
108 Lithuania	0.2	21	3	NoData	79	100	V	Verylow	7	3
109 United States of America	0.6	44	5	NoData	NoData	99	V	Verylow	6	3
110 Belarus	0.3	24	11	NoData	NoData	100	V	Verylow	10	3
111 Latvia	0.8	17	2	NoData	82	100	V	Verylow	9	3
112 United Kingdom	0.2	27	2	NoData	NoData	99	IV	Verylow	5	3
113 Cuba	0.1	50	NoData	100	NoData	100	V	Low	6	4
114 Australia	0.1	17	1	NoData	NoData	100	IV	Verylow	5	2
115 Estonia	1.3	23	2	NoData	NoData	100	V	Low	6	3
116 Italy	0.5	7	1	NoData	89	NoData	V	Verylow	4	3
117 Finland	0.1	11	1	NoData	NoData	100	IV	Verylow	3	2
118 Slovakia	<0.1	21	3	NoData	NoData	100	V	Verylow	7	3
119 Hungary	0.1	21	2	NoData	NoData	100	V	Verylow	7	3
120 Canada	0.3	13	5	NoData	NoData	100	V	Verylow	5	3
121 Japan	<0.1	4	2	NoData	NoData	100	IV	Verylow	3	2
122 Croatia	<0.1	15	4	NoData	NoData	100	V	Verylow	6	3
123 Czech Republic	0.1	12	1	NoData	90	100	V	Verylow	3	3
124 France	0.4	8	1	NoData	93	NoData	V	Verylow	4	2
125 Slovenia	<0.1	6	0	NoData	92	100	V	Verylow	3	2
126 Belgium	0.3	8	0	NoData	NoData	99	V	Verylow	4	2
127 Germany	0.1	11	1	NoData	NoData	100	V	Verylow	4	2
128 Singapore	0.3	6	2	NoData	NoData	100	V	Verylow	3	1
129 Switzerland	0.4	5	1	NoData	NoData	100	V	Verylow	4	1
130 Netherlands	0.2	5	1	NoData	NoData	100	V	Verylow	4	1

*grounds on which abortion is permitted, ranging from the most to the least restrictive. I: [illegible] II: [illegible] III: [illegible] IV: [illegible] V: [illegible]

Source: [illegible]

APPENDIX 8

THE INDICATORS

- Total fertility rate.
- Contraceptive prevalence rate.
- Maternal mortality ratio.
- Percentage of women attended, at least once during pregnancy, by skilled health personnel for reasons relating to pregnancy.
- Percentage of births attended by skilled health personnel.
- Number of facilities with functioning basic essential obstetric care per 500,000 population.
- Number of facilities with functioning comprehensive essential obstetric care per 500,000 population.
- Perinatal mortality rate.
- Percentage of live births of low birth weight.
- Positive syphilis serology prevalence in pregnant women attending for prenatal care.
- Percentage of women of reproductive age screened for haemoglobin levels that are anaemic.
- Percentage of obstetric and gynaecological admissions owing to abortion.
- Reported prevalence of women with FGM.
- Percentage of women of reproductive age at risk of pregnancy who report trying for a pregnancy for two years or more.
- Reported incidence of urethritis in men.
- HIV prevalence in pregnant women.