CHAPTER ONE

1.0 INTRODUCTION

This chapter consists of the background information, problem statement, study justification, conceptual framework study questions and objectives.

1.1.0 Background Information

The healthy future of society depends on the health of the children of today and their mothers, who are guardians of that future. However, despite much good work over the years, 10.6 million children and 529,000 mothers are still dying each year, mostly from avoidable causes (WHO Report, 2005). Malaria is one of the avoidable causes of maternal and child mortality. Yet, its devastating effects are so enormous and very fatal on the most vulnerable group – children under five and pregnant women. A mother's death is a tragedy unlike others, because of the deeply held feeling that no one should die in the course of the normal process of reproduction and because of the devastating effects on her family (Carroli et al., 2001). Malaria is serious diseases of wide distribution caused by sporozoa of the genus Plasmodium. There are four species of parasites that affect man: P. falciparum, P. vivax, P.malariae and P. ovale. The predominant parasite species is P. falciparium, which causes the most severe form of malaria and this causes high fever and chills through the bite of Plasmodium falciparum. It is most predominant in Africa, Southern Asia, Central America, and South America. 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. Malaria in pregnancy also increases the risk of stillbirth, spontaneous abortion, low birth weight and neonatal death.

Approximately 40% of the world population is at risk of malaria whilst about 500 million people become severely ill with malaria (Korenromp et al., 2005). Globally, a child dies of

malaria every 30 seconds and more than one million people die of malaria annually and these are mostly infants, young children and pregnant women in Africa (Korenromp et al., 2005, Rugemalila et al, 2006). About 90% of these deaths occur in sub Saharan Africa and nearly 25% of all childhood mortality in Africa (WHO, 2000; Byrne N, 2007).

Moreover, approximately 50 million women living in malaria-endemic countries throughout the world become pregnant in each year. It is worth noting that, malaria worsens during pregnancy and together with anaemia is responsible for 10, 000 maternal deaths and 200, 000

infant deaths per year (Steketee RW et al., 2001: Murphy SC and Breman JG, 2001). The risk of severe malaria is increased in pregnant women co-infected with HIV.

Africa bears 90% of the world's burden of malaria. Pregnant women and children in Africa are particularly vulnerable to the adverse consequences of malaria caused by the most lethal parasite, Plasmodium falciparum. The African Region of the World Health Organization (WHO), experiences the majority of the global burden of malaria-associated maternal illness and low birth weight. Pregnant women in malaria-endemic areas do not always receive the necessary prevention and treatment they need, and this contributes to the extremely high numbers of maternal and infant deaths caused by malaria (Schellenberg et al, 1999; Bojang et al., 1997; Newton et al., 1997). Thus, in each year, approximately 25 million African women become pregnant in malaria-endemic areas (Snow RW et al., 1999).

According to the World Health Organization's World Malaria Report 2005, at the end of 2004, some 3.2 billion people lived in areas at risk of malaria transmission in 107 countries and territories. Also, between 350 and 500 million clinical episodes of malaria occur every year and at least one million deaths occur every year due to malaria. About 60 percent of the cases of malaria worldwide and more than 80 percent of the malaria deaths worldwide occur in Africa, south of the Sahara. The burden of malaria contributes substantially to the poor

health situation in Africa and still remains a major global problem (WHO/UNICEF, 2005). It has devastating effects on both health and development, exacting its greatest toll on the world's poorest and most marginalized (WHO/UNICEF, 2005). Again, malaria costs Africa 12 billion dollars lost in GDP every year.

In Ghana, the incidence of clinical malaria is about three (3) attacks per child per year. About 44% of out-patient cases is due to malaria and is the leading cause of cases admitted to hospital. Malaria accounts for about 25% of all deaths in children under- five years. In pregnancy, it can cause anaemia and placental parasitaemia which puts the mother and foetus at a substantial risk (GHS/NMCP, 2004). Malaria is the highest cause of death in health institutions with a mortality rate of 17.1%. (GHS Annual Report, 2004).

Malaria among pregnant women in Ghana accounts for 13.8 percent of outpatient attendance, 10.6 percent of admission and 9.4 percent of maternal deaths (GHS, 2005). Again, it has

been found out that out in every hour, four (4) persons die from malaria from which two (2) are children in Ghana (GHS, 2002).

Over the years, there has not been much change with the top ten (10) diseases reported at the outpatient department. Malaria is still leading as the number one cause of OPD attendance in Kumasi Metro. In 2005, 2006 and 2007, there was a total 306,187, 277,350 and 347,108 OPD cases of uncomplicated malaria (KMHD Annual Report, 2007). However, malaria in pregnancy accounted for 1.29%, 1.37% and 1.69% out of the total reported cases of the disease in 2005, 2006 and 2007 KMHD annual reports respectively. Malaria prevention in pregnancy, thus, remains a major public health challenge for the roll back malaria partnership (RBM). The RBM constitutes a single most cost effective intervention to address this public health problem. The prevention of malaria which is a primary objective of the programme

(RBM) is therefore, necessary in achieving the 4th and 5th Millennium Development Goals (MDGs).

The basic elements of malaria control are prevention and prompt treatment. Prevention-Indoor Residual Spraying of long acting Insecticides (IRS), use of insecticide treated nets (ITNs) and Intermittent Preventive Treatment (IPT) used in pregnant women. (WHO media centre, 2007).

The current recommended preventive therapy for malaria during pregnancy is the drug Sulfadoxine-Pyrimethamine (SP), given in two doses for intermittent preventive treatment in the second and third trimesters. However, HIV also has an impact on the efficacy of SP, and it has been suggested that at least three doses of SP may be required for HIV-positive women (Parise et al., 1998). Malaria may also worsen HIV infection. With a recent study in Blantyre, Malawi, indicated that malaria may increase the HIV load in adults (Hoffman et al., 1999). In addition, concerns that malaria infection of the placenta may contribute to mother-to-child HIV transmission remain (Brahmbhatt et al., 2003).

1.1.1 Review of Malaria Control Initiatives

In the past years, a number of global and national efforts aimed at reducing the burden of the disease in vulnerable groups, especially pregnant women and children under 5 years, have been initiated (WHO/UNICEF, 2005). This includes the Roll Back Malaria (RBM) Partnership, the African Summit on RBM, and quite recently the Millennium Development

Goals (MDGs). The RBM Partnership, launched in October, 1998 by the then WHO Director General Dr. Gro Harlem Brundtland, targets to halve the 1990 malaria morbidity and

mortality by the year 2010. The elements of the RBM strategy are early case detection, rapid treatment, multiple prevention, well coordinated action, and focused research. The WHO recommends a three-pronged approach for reducing the burden of malaria in pregnancy. A number of strategies have been developed to more effectively control the adverse effects of malaria during pregnancy, and these can serve as the basis for highly effective programmes in the African Region.

The development of the IPT approach constitutes a major advance for achieving high programme coverage and effectiveness (WHO 2000; Shulman et al., 1999). Similarly, the demonstrated success of ITNs used during pregnancy to reduce both maternal and infant morbidity due to malaria infection provides a powerful prevention approach for Africa [D' Alessandro U et al., 1996; ter Kuile FO et al., 2003). All the above are to be delivered in the context of focused antenatal care.

In an attempt to achieve the targets of the RBM partnership, African Heads of States in 2000 at Abuja resolved to strengthen national health systems to ensure that by the year 2005, 60% of malaria patients will have access to appropriate treatment within 24 hours of onset of symptoms; 60% of children and pregnant women at risk of malaria will be protected using insecticide-treated nets (ITNs); 60% of pregnant women will have access to appropriate malaria chemoprophylaxis or presumptive intermittent treatment; and 60% of epidemics will be detected within two weeks of onset, and responded to within two weeks of detection(The African summit on Roll Back Malaria, 2000).

The United Nations MDGs for 2015 which addresses poverty, hunger, primary education, sex equity, under-five and maternal mortality, combating infectious diseases, safe water, environmental sustainability, and global partnerships for development, targets to have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.

1.1.2 Use of insecticide-treated nets (ITN)

Between 1999 and 2003, distribution of insecticide-treated mosquito nets increased 10-fold in sub-Saharan Africa. Despite this progress, urban dwellers are six times more likely to use the nets than their rural counterparts, according to data available from a number of countries in the region. Similarly, the richest fifth of the population are 11 times more likely to use them than the poorest fifth (MDG Report, 2006)

Sleeping under an ITN is probably the most effective method for preventing mosquito bites because mosquitoes bite at night when the pregnant woman is asleep. ITNs prevent mosquito bites by repelling them or killing them if they land on the net. The use of an ITN by a pregnant woman benefits the woman as well as her family. The demonstrated impact of ITNs, the infant who sleeps under the net with the mother will also have marked benefits: reduced malaria exposure, decreased incidence of anaemia, decreased risk of death and enhanced development. For instance, a study conducted in highly malarious western Kenya, indicated that women who were protected by insecticide-treated bed nets every night in their first four pregnancies delivered approximately 25% fewer babies who were either small for gestational age or born prematurely than women who were not protected by ITNs (ter Kuile FO et al., 2003).

Again, ITNs reduce the overall risk of morbidity and mortality among pregnant women and their infants if used during pregnancy in areas of stable malaria transmission. A trial in the Gambia found that, during the rainy season in villages where ITNs were used, the prevalence of malaria infection among pregnant women was lower and fewer babies were classified as premature (D'Alessandro U et al., 1996).

1.1.3 Use of Intermittent Preventive Treatment (IPTp)

The most promising preventive approach using antimalarial drugs for pregnant women is

intermittent preventive treatment (IPT). IPTp is based on the use of antimalarial drugs given in treatment doses at predefined intervals after quickening. WHO recommends that in areas of stable transmission, IPT with an effective, preferably one-dose, antimalarial drug be provided as part of antenatal care, starting after quicken.

Intermittent preventive treatment (IPT) of malaria during pregnancy is based on the assumption that every pregnant woman living in areas of high malaria transmission has malaria parasites in her blood or placenta, whether or not she has symptoms of malaria. Thus, IPTp is given to all asymptomatic pregnant women who report at the antenatal clinic in the second or third trimester but more especially those of low gravidity (i.e primigravida and secundigravida), HIV infected pregnant women, adolescents and the sicklers.
Intermittent Preventive Treatment of malaria in pregnancy (IPTp), a new approach to malaria control in pregnancy, has currently been adopted in malaria control programmes in most malaria endemic countries. It has been identified as a cost-effective tool both for the control and prevention of malaria in pregnancy in regions of stable malaria transmission such as sub-Saharan African States like Ghana. This RBM strategy emphasize that all pregnant women in areas of stable (high) malaria transmission should receive at least two doses of intermittent preventive treatment after quickening, the first noted movement of the fetus (WHO, 2004). WHO recommends a schedule of four antenatal clinic visits, with three visits after quicken. Intermittent preventive treatment at each scheduled visit after quickening will ensure that a high proportion of women receive at least two doses. Doses should not be given more frequently than monthly. Currently, the recommended drug for intermittent preventive treatment is Sulfadoxine–Pyrimethamine, because it is safe for use during pregnancy, effective in women of reproductive age and can be delivered as a single dose under

observation by a health worker.

1.1.4 Case Management of Malaria Illness

Malaria in pregnant women requires immediate treatment, focusing on complete cure of the infection. Each country in malaria-endemic areas of Africa needs a policy that guides effective management of malaria in pregnant women. Collaboration between malaria control programme and reproductive health programme staff can facilitate the development of systematic management protocols and drug supply strategies (World Health Organization, 2000).

Despite preventive measures, some pregnant women will still become infected with malaria. These women should adequately be treated to prevent them getting complicated malaria. Complicated malaria is more difficult to manage and therefore, requires immediate referral.

1.1.5 Malaria Control Policies in Ghana

WHO recommended in 2005 that pregnant women in malaria-endemic areas receive full anti malarial treatment on their first contact with antenatal service followed by weekly chemoprophylaxis (WHO/UNICEF, 2005). Until 2004, the anti-malaria drug policy in Ghana recommended Chloroquine prophylaxis (300 mg Chloroquine base) weekly throughout pregnancy and six weeks post partum. The compliance was low, around 11.6%, outside the clinical setting (GHS/NMCP/GFATM/JHPIEGO, 2005). The low compliance was due to unfounded fear on the part of pregnant women that Chloroquine causes abortion; the unpleasant itching (pruritus) due to Chloroquine; the bitter taste and the fact that they had to swallow too many tablets. These made the malaria prevention programme ineffective. This coupled with the increasing incidence of resistance by Falciparum malaria to Chloroquine necessitated a change in policy (WHO, 1994). The impairment of the development of natural immunity to plasmodium parasites associated with weekly chemoprophylaxis using

Chloroquine was a major concern to health authorities (Greenwood, 2004).

The WHO 20th Malaria Expert Committee now recommends Intermittent Preventive Treatment (IPT) of malaria in pregnancy in place of the previous policy of weekly Chloroquine chemoprophylaxis in pregnancy. Intermittent Preventive Treatment of malaria in pregnancy (IPTp), a new approach to malaria control in pregnancy, has currently been adopted in malaria control programmes in most malaria endemic countries (WHO, 2000). It has been identified as a cost-effective tool both for the control and prevention of malaria in pregnancy in regions of stable malaria transmission such as sub-Saharan African States like Ghana.

Under the IPTp strategy, WHO 20th Malaria Expert Committee recommended that, all pregnant women in malaria endemic areas receive an efficacious, full three tablets single dose of Sulfadoxine–Pyrimetamine (SP) as the preferred approach to reduce the adverse consequences of malaria during pregnancy at predefined intervals beginning after 16weeks of conception. The potential of IPTp programme to attain high levels of coverage and its benefits in reducing maternal anaemia and Low Birth Weight (LBW) makes it a preferred strategy to the failed strategy of weekly Chloroquine chemoprophylaxis. IPTp ensures that the placenta is cleared of parasites at the time of rapid fetal growth. Again 2-3 doses of SP provide maximum benefits, even though a single dose is beneficial. This reduces maternal

anaemia, placental malaria, and low birth weight by approximately 40% (Shulman et al, 1999).

The World Health Organization recommends a schedule of four (4) antenatal clinic visits, with three visits occurring after quickening. At least two doses of IPT could be delivered at scheduled antenatal care visits after quickening until delivery. Ghana has, however, adopted a three-dose regimen that is in line with WHO's recommended scheduled antenatal visits after quickening. Demographic and Health Survey (DHS) reports in about two-thirds of African countries indicated that more than 70% of women attend ANC at least once during pregnancy. The GDHS, 2003 indicated that about 92% of pregnant women in Ghana receive ANC Services at least once in during pregnancy. Hence, the RBM has targeted the Ante Natal Clinic (ANC) for the accelerated programme implementation of malaria control during pregnancy (WHO-The Africa Malaria Report, 2003).

In Ghana, the current malaria drug policy prescribes Sulphadoxine-Pyrimethamine (SP) as the drug of choice for IPT in line with the fact that GHS/MOH is committed to making of pregnancy safer by reducing the burden of malaria through IPT using Sulphadoxine-Pyrimetamine. SP has a good safety profile in pregnancy. The single-dose regimen allows the health worker to directly observe treatment (DOT). IPTp, in which full therapeutic doses of SP are given at defined intervals, has the potential to provide some of the benefits of sustained chemoprophylaxis in pregnant women without some of its drawback like impaired development of naturally acquired immunity and sustainability.

It involves the administration of a curative treatment dose of an effective anti-malaria drug (SP) at pre-determined intervals during pregnancy, beginning after quickening in the second trimester (16-18 weeks). This should be administered regardless of whether the woman is infected or not. SP is not to be given more frequently than every four weeks. SP is not given after 36 weeks even though the concern about neonatal jaundice resulting from SP given after 36 weeks of gestation does not appear to be a major one at this time (Shulman et al., 1999).

The potential of IPT programme to attain high levels of coverage and its benefits in reducing malaria episodes in pregnancy makes it a preferred strategy to the failed strategy of weekly Chloroquine chemoprophylaxis.

In Ashanti region, a pilot project of the IPT programme with SP was started in the Offinso district by Ghana Health Service (GHS) in 2004 after a series of field trials in Ejuisu. In April 2005, the IPT programme was extended to cover most of the districts in the region including Kumasi Metro. Currently, the Ashanti Regional Health Administration (RHA), in collaboration with the Ghana National Malaria Programme with support from the Global Fund aims at providing IPT to 70% of pregnant women by 2008 (Asare, 2006). Limitations of the usefulness of IPT include shortages of SP in the facilities and the rapidly increasing resistance to SP which has been reported in many countries. Hence there is the need to constantly evaluate the IPT programme to ascertain some these limitations so as to effectively address some of these challenges.

1.2 Problem Statement

Of the estimated 50 million pregnancies that occur each year globally, approximately 25 million is thought to occur in developing countries. The pregnant women and children are thought to be the most vulnerable to malaria. Whereas several initiatives have been implemented over the years to control malaria in pregnancy, none of these has succeeded in its entirety. Without any intervention, malaria would cause 10, 000 of these women and 200, 000 of their infants death as a result of malaria infection and severe malarial anaemia. Developing countries (or rather tropical countries) are thought to bear the global brunt of malaria in pregnancies in addition to the unfinished business of HIV/AIDS and other communicable disease like Tuberculosis.

Malaria in Ghana is recognized as the leading public health problem. Ghana implemented anti malaria control programme (IPT) for the last three (3) years. In spite of the successes chalked in the implementation, there is still a lot to be achieved by way of reduction in the incidence of malaria. Apart from the uptake of IPT by the pregnant women, there is also a default in the doses of those who take the SP drug. A significant proportion of the expectant

mothers take IPT only once, twice or sometimes the thrice which is the recommended dosage regimen of IPTp.

Kumasi Metropolis is the second largest city in Ghana. The city is densely populated with estimated population of 1,478,869 within 213 communities (KMHD Annual Report, 2007). Most of the inhabitants are farmers and traders but because it is an urban area the educational

status of the area is quite high. According to KMHD Annual Report, 2007, malaria is the first line disease in the Metropolis and it affects the adults, aged, children and pregnant women who are most vulnerable. The Metropolitan health services are organized around many hospitals, clinics and maternity homes. There are 6 public hospitals including KATH, 6 public health centres, 3 mission hospitals, 3 quasi government hospitals and more than 200 private hospitals and maternity homes.

Services offered include clinical care, prevention of disease and health promotion activities. The health system is also supported by about 672 pharmacy and 510 chemical shops. The health care system of the metropolis is quite encouraging as the city is endowed with public health nurses, doctors, antenatal, health education, disease control and commonly health nurses who have involved in outreach services (KMHD Annual Report, 2007)

Control of malaria in pregnancy in the metropolis is still a problem as a lot of efforts have been put in to control the incidence of malaria so as to reach the point of achieving the MDG-5 goal. In 2007 alone, the Metro recorded 110 maternal deaths and between January and March, 2008, 30 maternal deaths have been recorded so far (GNA/KMHD Quarterly Report, 2008). However, the main objective of this MDG-5 goal is to improve maternal health by a

reduction in the maternal mortality ratio by three quarters, between 1990 and 2015. This approach may seem not to achieve its goal partly due to lack of knowledge of malaria effects on pregnancy outcomes by most pregnant women. It is worth noting that malaria accounts for a significant morbidity in pregnancy. It accounts for 2-15% of maternal anaemia (WHO, 2004). Low birth weight is an important contributor to infant mortality (McCormick, 1985; McDermott et al, 1996) which may be due to malaria.

In Ghana, malaria accounts for 13.8% of OPD attendance, 10.6% admissions and 9.4% of deaths (GHS/NMCP/GFATM/JHPIEGO, 2005). In the Kumasi metropolis, malaria accounts for 1.2% (3,948 pregnancy cases out of 306,187 total malaria cases; 1.4% (3,813 pregnancy malaria cases out of 277,350 total malaria cases and 1.7% (5,895 pregnancy malaria cases out of 347,108 malaria cases) in 2005, 2006 and 2007 respectively (KMHD Annual Report, 2005, 2006 and 2007).

It has been three years since IPTp programme was implemented in the Kumasi metro of the Ashanti Region, however, no evaluation has been conducted to assess the processes, outcomes and impacts of the programme. Although, reports say there has remarkable improvement in the utilization of IPTI, IPT2 and IPT3 doses from 2005 to 2007, it is still necessary to evaluate the programme as this is believed to provide a good insight on current performance so as to guide managers in their planning.

This study is being carried out to assess the processes and outcomes of IPTp programme in the Kumasi Metro.

1.3 Justification

In spite of the tremendous effort being put into the control of malaria over the last five years,

malaria continues to be the leading cause of morbidity and mortality accounting for 43.70% of all out patients attendance in 2006. In 2006, there was a total of 195,065 malaria admission compared to 183,662 in 2005. This translates into a 6.2% increase in admission due to malaria. This may partly be due to increase in health education to promote early reporting. Malaria contributed up to 33.4% of all causes of admission and was the highest cause of deaths including maternal mortality, accounting for 13.1% of all deaths compared with 16.4% in 2005 (GHS Annual Report, 2006).

The World Health Organization (WHO) currently recommends a package of interventions for controlling malaria during pregnancy in areas with stable high transmission of P.facilparium (WHO, 2004) which includes the use of Insecticides Treated Nets (ITNs), intermittent preventive treatment (IPT) and effective case management of malaria and anaemia. However, the IPTp programme involves an effective implementation of the recommended strategy for malaria in pregnancy and this also requires a close collaboration between malaria control and reproductive health programmes at all levels including policy development, planning, logistics, procurement, training and service delivery. Again expanding programme coverage will require careful monitoring of implementation and evaluation of impact. Though the IPTp programme is ongoing in the Kumasi metropolis, monitoring evaluation, awareness, knowledge and acceptability of IPT programme by a portion of health staff and pregnant women are not satisfactory. Again, assessment of outcomes and impacts is also needed to document periodically whether defined strategies and implemented activities are leading to expected results.

In order to achieve the set objectives, there is the need for an assessment to measure progress in terms of effectiveness of the IPT programme. In effective, the impact of the implementation of the programme is not only seen from the systemic prospective but also

reflected in the awareness, knowledge and the acceptability of the target groups. In the case of IPTp programme, this should be reflected on health staff and pregnant women who are directly involved.

According to key informant interview conducted with the Metropolis Health Director, Dr Oduro it was revealed that the IPTp programme in the Kumasi metro has not been assessed since the inception of the programme. This is very necessary if the success achieved by the programme in reducing the incidence of malaria, still births, LBW and maternal anaemia are to be measured. It is thus; envisage that this study would help identify facilitating factors and operational challenges for improving IPTp delivery in the metro. Thus, the need for evaluation of the IPT programme after its implementation in the metropolis and this would go a long way in achieving the MDG 4, 5 and 6. Again, the outcomes from the evaluation of the IPTp programme after its implementation which would provide scientific data to support or otherwise the current GHS/MOH commitment in making pregnancy safer by reducing the burden of malaria through IPT using SP. Having known the results, policy makers would also have an idea how material resources, human resources and other logistics could be allocated to enhance efficiency and effectiveness in the IPTp programme and the health care system in general.

Figure 1 Conceptual framework

1.4 Conceptual framework

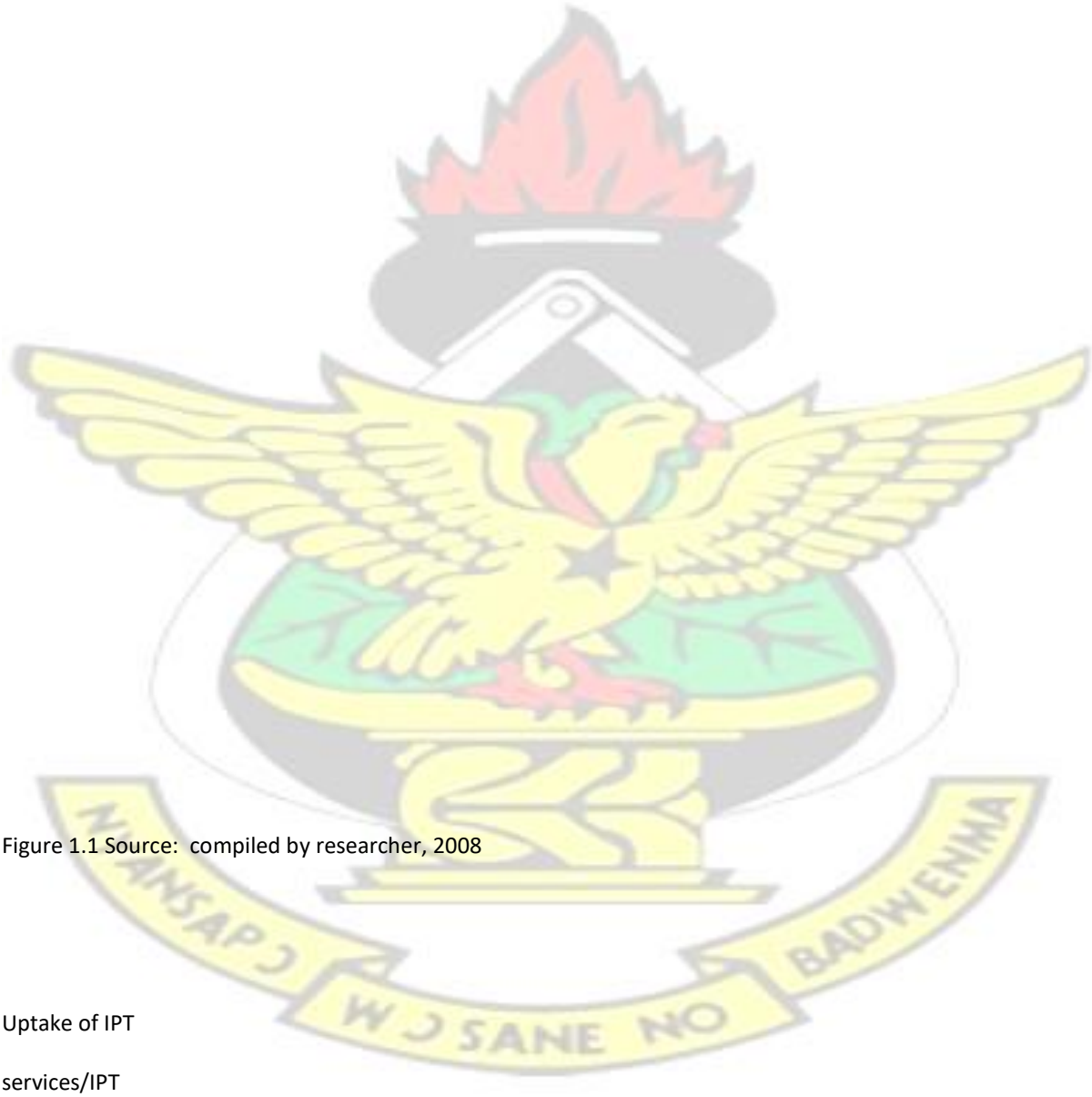


Figure 1.1 Source: compiled by researcher, 2008

Uptake of IPT

services/IPT

Reduced Low

birth weight

Reduced Maternal

anaemia

Awareness of

benefits of IPT

Utilization of

ANC services

Supply

Management

Quality of IPT

services

Human resource

training

Policy,

Guidelines and

Strategies

1.5 Research Questions

1. What is the proportion of health staff trained for the IPTp in the Metropolis?

2. What is the knowledge and awareness level of pregnant women, and health staff towards malaria in pregnancy?

3. How is the supply management of SP in the Metropolis carried out?

4. What is the proportion of pregnant women who have been given IPTp1, IPTp2 and IPTp3 and how many have reacted adversely to SP?

5. What is the current prevalence rate of malaria in pregnancy after three years of IPTp inplementation in the Metropolis?

6. What is the rate of utilization of ANC services in the Metropolis?

1.6 General Objective

The main objective of the study is to evaluate the processes and outcomes of the IPTp programme using SP for malaria control in pregnancy.

1.7 Specific Objectives

1. To assess the implementation of IPTp programme in respect of:

(i) The proportion of health staff trained for the IPTp programme in the Metro.

(ii) The awareness and knowledge level of healthcare providers and pregnant women towards malaria in pregnancy and the IPTp programme.

(iii) The supply management of SP in the district.

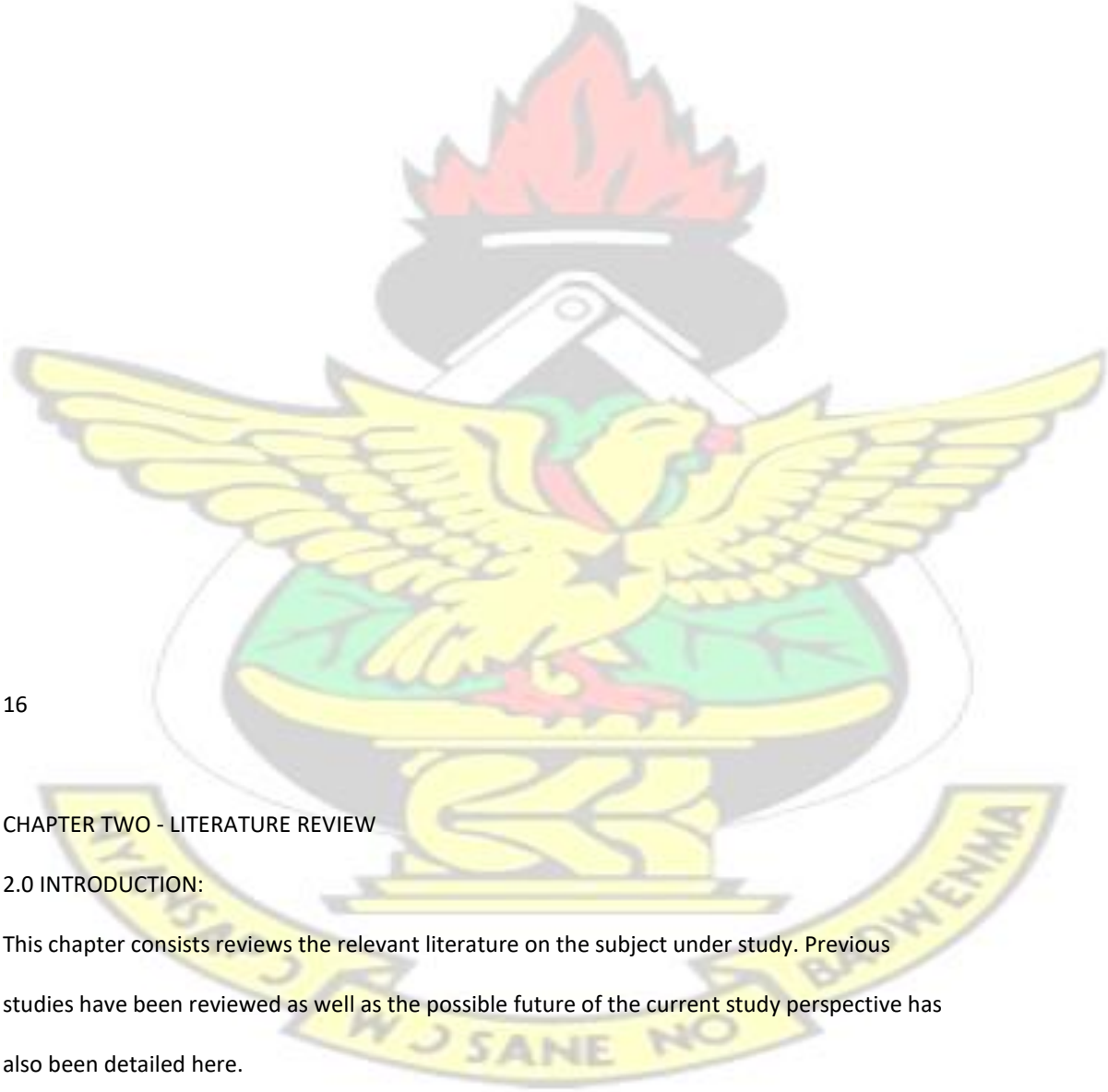
(iv) The proportion of pregnant women and nursing mothers who received IPT1, IPT2 and IPT3.

(v) To ascertain the incidence of adverse drug reactions to SP in IPTp

2. To determine whether the pregnant women attend ANC regularly.

3. To determine malaria in pregnancy before and after the implementation of IPTp programme.

4. To assess the birth weights of newly born babies of the nursing mothers and to determine the haemoglobin (Hb) levels of pregnant women before and after the implementation of IPT programme.



CHAPTER TWO - LITERATURE REVIEW

2.0 INTRODUCTION:

This chapter consists reviews the relevant literature on the subject under study. Previous studies have been reviewed as well as the possible future of the current study perspective has also been detailed here.

2.1.0 Literature Review: The relevant literature on the subject under study is reviewed under the following sub-headings.

2.2.0 Effect of Malaria on pregnant woman and unborn baby.

Malaria infection with Plasmodium falciparum during pregnancy results in a wide range of adverse consequences for the pregnant woman, the developing foetus and the neonate. It has been found to increase the risk of placental aneamia, spleen rates, spontaneous abortion, maternal ameamia, morbidity, cerebral malaria and febrile malaria. Low birth weight, stillbirth, congenital infection, prematurity, intrauterine growth retardation and foetal aneamia are also found to be associated with the foetus. Thus, in areas with stable malaria transmission, where malaria prevalence during pregnancy ranges from 10% to 65%, malaria during pregnancy contributes to approximately 2% to 15% of maternal anaemia and 8% to 14% of LBW (Steketee et al., 2001; Steketee, Wirima and Campbell, 1996).

The clinical effects of malaria in pregnancy depend to a large extent on the immune status of the woman, which in turn is determined by her previous exposure to malaria or transmission intensity (Steketee et al., 1996). Again, acquired antimalaria immunity depends on the number of previous pregnancies and the presence of other conditions such as HIV infection which may further weaken the efficacy of immune responses during pregnancy (van Eijk A et al., 2002; van Eijk A et al., 2003; Verhoeff FH et al., 1999). . Studies in Kenya and Malawi have shown that the prevalence and density of malaria parasites are higher in pregnant women who are also HIV positive (Parise et al., 1998:, (Steketee et al., 1996).: The risk of infants dying during the postneonatal period has also been shown to be 3.4-fold higher in children born to HIV-positive mothers with placental malaria than in those born to HIV-positive mothers without placental malaria (Bloland et al., 1995). Anaemia is more common in pregnant women than non-pregnant women for a variety of reasons, including the

delusional effects of increased intravascular volume during the second trimester as well as the increased demand on iron and folate stores (Shulman CE, 1999; Menendez C, 2003).

Malaria in pregnancy in Sub-Saharan Africa is associated with maternal anaemia and low

birth weight in infants and the single greatest risk factor for neonatal and early infant mortality (McCormick 1985). The spread of Chloroquine resistance and the low adherence to antimalarial prophylaxis during pregnancy has led to the reconsideration of the role of chemoprophylaxis in malaria control in pregnancy. Studies of intermittent preventive treatment (IPTp) with sulphadoxine–pyrimethamine (SP) have demonstrated that this regimen is efficacious in many settings, safe, affordable and deliverable (Schultz et al., 1994; Parise et al., 1998; Verhoeff et al., 1998; Shulman et al., 1999). The World Health Organization (WHO) now recommends that pregnant women in malaria endemic areas receive IPT: 'the administration of full, curative-treatment doses of an effective antimalarial drug at predefined intervals during pregnancy'.

In areas of moderate or high transmission or hyper-endemic areas which includes large parts of sub-Saharan Africa, adults who have regularly been exposed to malaria since childhood have usually developed a high level of immunity to it. Infection is frequently asymptomatic and severe disease is uncommon. During pregnancy this immunity to malaria is altered. Infection is still frequently asymptomatic, so may go unsuspected and undetected, but is associated with heavy placental parasitisation, suggesting evasion of the immune system. In these settings the main maternal infection is anaemia, which is often severe, and that on the baby is low birth weight (LBW), which is a leading cause of poor infant survival and development in Africa (McCormick, 1985 and Steketee et al., 1996). These complications are more common in primigravidae than multi-gravidae.

Even asymptomatic infections (those that do not produce fever or clinical illness) frequently worsen maternal anaemia (Fleming, 1989). Anaemia is more common in pregnant women than non-pregnant women for a variety of reasons, including the delusional effects of increased intravascular volume during the second trimester as well as the increased demand on iron and folate stores (Shulman, 1999; Menendez, 2003). Although anaemia during pregnancy may have multiple causes (HIV infection, inadequate nutrition, haemoglobinopathies and hookworm infection), the contribution of malaria is substantial. Severe maternal anaemia increases the mother's risk of death, and malaria-related anaemia is

estimated to cause as many as 10 000 maternal deaths each year in Africa (Guyatt and Snow, 2001). Studies in eight countries in Africa on the prevalence of placental malaria in African Women by gravidity indicated that in virtually all the countries listed, primigravid women had a higher prevalence of placental parasitaemia when compared to multigravid women (Steketee et. al,. 2001.)

2.3.0 Malaria in Pregnancy in Different Epidemiological Settings

The symptoms and complications of malaria in pregnancy vary according to transmission intensity and the level of acquired immunity. Although these are presented as discrete epidemiological entities, the reality is usually more of a continuum, with a range of transmission intensity, acquired immunity, and clinical presentation occurring within the same country.

2.3.1 Areas of low or unstable transmission

Pregnant women living in areas of low or unstable malaria transmission have little or no immunity to malaria, and are at a 2 to 3-fold higher risk of developing severe disease as a result of malaria infection than are non-pregnant adults living in the same area. This however, depends on the epidemiological settings (Luxemburger et al., 1997)

Malaria in pregnancy can also result in stillbirth, spontaneous abortion, low birth weight (birth weight < 2.5 kg), and neonatal death. In areas of low or unstable transmission, control of malaria during pregnancy is achieved primarily by prompt and effective treatment of acute episodes of malaria, since IPT will be relatively ineffective in such settings. Since malaria in a non-immune pregnant woman can rapidly progress to severe disease, any pregnant woman with symptomatic malaria must receive urgent treatment with an effective antimalarial drug plus appropriate supportive treatment.

A study on the effects of malaria during pregnancy on infant mortality in an area of low

malaria transmission showed that malaria during pregnancy contributes to early infant mortality in this area of low malarial transmission. Malaria from both species reduces birth weight and indirectly influences neonatal mortality. All gravidae are affected. Moreover, when maternal malaria occurs close to term and is associated with symptoms, the risk of premature birth and infant death increases. It further went on to suggest that, malarial control

programmmes in areas such as this should focus on the prevention of malaria in pregnancy, because this will increase infant survival. (Luxemburger et al., 2001)

In other surveys carried out in 17 districts in Uganda by MOH/WHO/UNICEF revealed that the prevalence of malaria in pregnancy ranged between 15-55.4% among ANC attendees while the prevalence of severe anemia during pregnancy was 18%. In the same survey, of 2316 pregnancy records examined at health units, malaria related pregnancy outcomes observed included; still births (3.4%) with incidence highest in northern and central Uganda; abortion (4.2%) with incidence highest in western and central Uganda; and low birth weight < 2.5 kgs (12.3%) with incidence highest in northern Uganda (22.4%) and among teenagers (Mufubenga et al, 2001).

2.3.2 Areas of high or moderate (stable) transmission

Most pregnant women in malaria-endemic regions of Africa live in areas of relatively stable transmission. In these settings, the deleterious impact of malaria is particularly apparent in first and second pregnancies. Although parasite prevalence and density are higher among pregnant women compared to non-pregnant women, infection with P. falciparum is usually asymptomatic. Partial clinical immunity acquired during years of exposure to the malaria parasite prior to pregnancy does not prevent infection, but does reduce the risk of severe disease. Clinical malaria is not, therefore, a prominent feature of infection during pregnancy,

and the major detrimental effects of infection are low birth weight (LBW) and maternal anaemia. In areas of stable transmission, it is estimated that malaria during pregnancy causes maternal deaths each year, mainly as a result of severe anaemia, and also accounts for approximately 8–14% of LBW, 3–8% of infant mortality, maternal aneamia 2-15%, preterm 8-36% and 18-36% intrauterine growth retardation. (Steketee RW et al., 2001; Steketee RW, Wirima JJ and Campbell CC. 1996)

ITNs and IPT are the key components of the preventive package for pregnant women living in areas of stable transmission. P. falciparum parasites may be present in the placenta and contribute to maternal anaemia even in the absence of documented peripheral parasitaemia. Any pregnant woman with severe anaemia from a malaria-endemic area must therefore be treated presumptively with an effective antimalarial drug, whether or not peripheral parasitaemia is present, and whether or not she has a history of fever.

In a large randomised trial recently conducted in an area of intense perennial malaria transmission in western Kenya, use of IPT by pregnant women was associated with a 38% reduction in the incidence of malaria parasitaemia, 47% reduction in malarial anaemia (Hb <8 g/dl plus parasitaemia), and 28% reduction in the prevalence of LBW (ter Kuile et al, 2003). Intermittent preventive treatment in pregnancy (IPTp) with sulfadoxine–pyrimethamine has recently been adopted by many African countries to reduce maternal and neonatal morbidity and mortality associated with malaria in pregnancy. The impact of a newly established national IPTp program on maternal and neonatal health in Gabon was assessed.

Data on
prevalence of maternal Plasmodium falciparum infection,
anemia, premature birth, and birth
weight were collected in
cross-sectional surveys in urban and rural regions of Gabon
before
and after the implementation of IPTp in a total of 1403
women and their offspring. After
introduction of IPTp, the prevalence
of maternal Plasmodium falciparum infection decreased
dramatically
(risk ratio 0.16, $P < 0.001$). Whereas only a modest effect
on the rate of anemia
in pregnant women was observed, there
was a marked benefit on the prevalence of low birth
weight and
premature birth for women adhering to national recommendations.

These effects
were most pronounced in primi- and secundigravid
women. (Bouyou-Akotet et al, 2003).
Whereas only a modest effect
on the rate of anemia in pregnant women was observed, there
was a marked benefit on the prevalence of low birth weight and
premature birth for women
adhering to recommendations.

These effects were most pronounced in primi- and

secundigravid

women (Ramharter et al., 2007).

2.4 0 Implementation of IPTp

This is done through the training of the health staff, assessment of the level of knowledge, awareness and perception of healthcare providers, pregnant women and nursing mothers on malaria in pregnancy and the IPTp programme.and the proportion of pregnant women who received IPT1, IPT2 and IPT3, supply management of SP and lastly the incidence of adverse drug reactions to SP of pregnant women on IPTp

2.4.1 Training of Health Staff in IPTp

This is a systematic process of molding a person who will acquire some knowledge through education for a smooth implementation of the IPTp. Training of healthcare providers and support efforts to raise awareness of malaria in pregnancy especially among women of reproductive age is crucial for the effective implementation and success of the IPTp

programme at the levels. Training of healthcare staff is very crucial in the implementation of IPTp programme for the prevention and control of malaria in pregnant women and this should at a least include guidelines for the IPTp programme. Again, the training should include procedures for data collection, analysis, interpretation and use for local decision-making.

To avoid duplication of efforts, the training should be integrated as much as possible into predefined or existing curricula (e.g. pre-service and in-service programmes) or other Making Pregnancy Safer training orientation courses. It should also be a part of malaria control training programmes for implementing new anti-malarial drug policies. If possible, quality assurance methods and tools for improving the quality of malaria in pregnancy service

delivery should be put in place to strengthen supervision of health workers.

A study conducted in Western Kenya discovered that, training ANC staff to increase the awareness of earlier attendance for ANC has the potential to substantially increase the proportion of women receiving at least two doses of SP in order to prevent the adverse effects of malaria during pregnancy (Peters et al., 2007). A survey conducted in Uganda indicated that 64 percent of the clients seen by trained providers received SP during the correct time according to the Ministry of Health guidelines as compared to only 42 percent of the clients seen by providers who had not received in-service training. This study highlights the significance of capacity building for service providers towards strengthening and scaling up IPTp services including malaria in pregnancy control (WHO, 2004).

2.4.2 Knowledge, Awareness and Perception of Healthcare Providers, Pregnant women and Nursing Mothers on Malaria in Pregnancy and the IPTp Programme.

Knowledge, attitude and perception about a disease quite often play a significant role in the healthcare seeking behaviour of individuals and communities as a whole. Attitudes are complex and have three main components which is the knowledge or intellectual beliefs an individual might have about an object; the affective component which refers to the emotion connected with an object or task; and the behavioural component which refers to how a person acts. The components of attitudes are interrelated. A change in one of the components will trigger off a change in another. This means that peoples' behaviour is influenced by knowledge, attitude and perception about an issue. Amongst these are psychological variables and social influences (Perreault and McCarthy, 2002).

Community members' attitude towards a disease is important in understanding their health seeking behavior and use of preventive methods. Most research however indicated a

relatively low level of knowledge about the severity and risks of malaria in pregnancy, the safety of IPT, and the importance of IPT to ensuring healthy pregnancies. Again, there is low level of knowledge regarding malaria in pregnancy with the levels much lower among men.

Perception refers to how people gather and interpret information from the world around them. It is defined as the understanding a person gains from the communication of a message in written or verbal form, or from observing a situation (Lucey, 1997). The process of perception in individual and varies from time to time. People attach meanings to messages and situations in accordance with their attitudes, expectations, experiences and value systems. In general people see and understand what they want to see and understand. People are constantly being bombarded by stimuli advertisement, products etc, - yet they may not hear or see anything. This is because they apply the following selective processes: selective exposure – their eyes and minds seek out and notice only information that interest them; selective perception – they screen out or modify ideas, messages, and information that conflict with previously learned attitudes and beliefs; selective retention – they remember only what they want to remember.

A qualitative study conducted in North East Tanzania revealed that, the successful implementation of the IPTp progrmme in that country was based on the proper planning, the training of health staff and sustained sensitization of pregnant women at health facility and community levels about the benefits of IPTp for the women and their unborn babies. The study revealed that malaria was commonly known among the respondents making it seem that it was a communicable disease. Anaemia in under-fives and pregnant women, fever, joint pains, fatigue, loss of appetite and general body malaise were reported by the majority of the participants to be prominent malaria-related conditions. A section of the pregnant women had knowledge about SP as well as IPTp programme and had received the information through attendance at ANC clinics and from announcements on the national radio. However, some of the pregnant women were uninformed or misinformed about the standard dosage of SP and the IPTp programme (Mubyazi et al., 2005).

Another qualitative study by Delivery of Improved Services for Health II (DISH II) in Uganda in 2002 indicated that malaria in pregnancy is recognized and classified in the local

languages with terminologies that represent broad symptom complexes. Several community members perceive mild fever (malaria) and general weakness as a normal sign of pregnancy, but they also recognize that severe malaria can be fatal in pregnant women. The majority of respondents associated malaria with mosquitoes both in pregnant and non-pregnant people. However, some respondents perceived malaria to be sexually transmitted or to be caused by the foetus in the womb. Whereas mild fever was perceived as a normal sign of pregnancy, which would heal by itself, severe malaria was recognized as a dangerous illness that can lead to miscarriages, premature delivery, stillbirths or the eventual death of a baby.

2.4.3 Proportion of Pregnant Women who received IPT1, IPT2 and IPT3

The malaria control and prevention policy during pregnancy in areas of stable transmission is that, all pregnant women should receive at least two doses of SP after quickening. The WHO recommends a schedule of four ANC visits with three after quickening but current scientific evidence have shown that, at least two doses of SP are required to achieve optimal benefit in most women. A study in Malawi showed that women receiving SP during pregnancy had significantly lower rates of placental infection (reduced from 32% to 23%) and low birth weight babies (a reduction from 23% to 10%). SP during pregnancy also reduced the rates of maternal anemia (Rogerson et al., 2000).

According to another study conducted in Tanzania it was found that despite high awareness about the IPTp strategy, only 5% of pregnant women had received two or more doses of SP as preventive treatment and only 14% of the women received at least one dose (Guyatt HL, Noor AM, Ochola SA, Snow RW, 2004).

Again, there was another study in Kenya also showed that, out of 1498 women who delivered between June 1999 and June 2000, 23.7%, 43.4% and 32.9% received more 2, 1 or no dose of

SP, respectively. Late first ANC attendance was the most important factor contributing to incomplete IPT; 45% of the women started attending ANC in the third trimester. The study concluded that education of pregnant women and ANC staff to increase earlier attendance for ANC has the potential to substantially increase the proportion of women receiving at least two doses of IPT with SP (van Eijk et al., 2003).

However, in Ghana, the GHS annual report, 2006 indicated that out of the 176,622 ANC registrants in the Ashanti Region, (28.9%, N=51,131) received IPT1, (17.1%, N=30,195)

received IPT2 whereas (9.6%, N=16,914) received IPT3. In addition, at the national level, just over 40% ANC registrants received the first dose of SP and less than 16% received the third dose (GHS, 2006).

2.4.4 Supply management of SP

The provision and uptake of IPTp services largely depends on the availability of the recommended drug Sulfadoxine-Pyrimethamine at health facilities. In other words, the success of the IPTp programme, like any other programme which involves the use of drugs, depends to a large extent on uninterrupted drug supply. Surveys have indicated that, more than 90 percent of pregnant women in Ghana attend ANC at least once during pregnancy therefore drug supply management is a very crucial factor required for high IPTp coverage.

As a policy of the MOH/GHS, under the IPTp programme, SP should be given at no cost to clients during antenatal clinics. All health facilities are supplied drugs from the Regional Medical Stores (RMS). At the end of each quarter, forms are filled as to how the drugs were used in order to request another batch. Any break in the supply chain may deny health facilities of the drug. It is important to note that to achieve an uninterrupted supply of SP for IPTp use, there should be an effective team in place comprising of doctors, pharmacists, nurses, health workers and storekeepers. Each staff member should know how to correctly

manage the drug supply at the facility by checking stock levels frequently, estimate for stock and dispense SP using the general principles for stock management and control. The WHO recommends that the percentage of health facilities reporting no disruption of stock of anti-malarial drugs for more than one week, during the previous three months should be employed as the indicator for assessment of drug supply management during facility surveys (WHO, 2000).

2.4.5 Incidence of Adverse drug Reactions to SP of Pregnant Women on IPTp

Drugs given on regular basis to large numbers of pregnant women must be exceptionally safe. A study conducted showed that SP has a good safety profile in pregnancy, good efficacy in reproductive-age women in most areas of Africa with stable transmission of P. falciparum malaria where resistance to SP is low (Newman et al., 2003). Both sulfonamides and pyrimethamine are generally considered safe in the second and third trimesters of pregnancy (Morley et al., 1964). Although there are concerns that Sulfa drugs may be associated with

Kernicterus when given to premature neonates, this problem has not been noted in studies of IPT where SP has been administered to the mother (WHO, 2004).

Several studies examining the risk to the foetus from inutero exposure to SP combinations have generally not found an increased risk to spontaneous abortions or congenital defects (Schultz et al, 1994). When given as weekly prophylaxis, SP has been associated with rare severe coetaneous reactions such as toxic epidermal necrolysis and Stevens-Johnson syndrome (Miller et al., 1986). However, there is no evidence that the risk of severe coetaneous reactions is any greater in pregnant women or when SP has been used for treatment. Studies in pyrimethamine alone have also found no increase in adverse pregnancy outcomes (Morley et al, 1964). In addition, pyrimethamine is considered to be compatible

with breastfeeding (Briggs et al, 2002).

More than a few studies have been conducted to detect adverse reactions to SP, including cutaneous reactions and other potentially serious conditions that would either pose risks to the pregnant woman or infant or limit programme effectiveness. No evidence has been found of increased risk for serious cutaneous side effects or for increased jaundice in the newborn when SP has been delivered in the second and third trimesters (Parise et al., 1998). Although no serious adverse events attributable to SP administration have been reported during trials, the possibility that occasional serious adverse effects may have been missed or ignored cannot be excluded.

A study in Sierra Leone revealed that chemoprophylaxis with Maloprim resulted in hyper pigmented skin lesions, which disappeared when patients were put off the drug (David KP, Marbiah NT, Lovtren P., 1997). There are a few data on the safety of antimalarials when used for chemoprophylaxis in pregnancy because most studies have involved only relatively small numbers of women and did not have the ability to detect uncommon effects or a small increase in an adverse outcome of pregnancy (Greenwood, 2004). Thus, even though there are reassuring data on the safety of SP, there is still the need for an ongoing monitoring of the safety of SP to ascertain its usefulness.

2.5.0 The burden of malaria in pregnancy and low birth weight

In areas where the prevalence of malaria is high, malaria is likely to reduce birth weight. Low birth weight is defined as birth weight less than 2.5 kg in a live born infant. It is an important

indicator of the health status of a pregnant woman and the adequacy of ANC services. Birth weight strongly influences the chances of survival and growth of the newborn. The lower the birth weight, the higher the risk of dying. It is estimated that each year over 30 million women become pregnant in malarious areas of Africa, with most living in areas of stable

malaria transmission (WHO/UNICEF Report, 2003). Although the vast majority of women with malaria infections during pregnancy remain asymptomatic, infection increases the risk of maternal anemia and delivering a low-birth-weight (LBW) baby. LBW is an important risk factor for infant mortality, and this review focuses on the impact of malaria during pregnancy on LBW and subsequent infant mortality in sub-Saharan Africa (WHO/UNICEF Report, 2003).

As much as 50 percent of low birth weight among primigravidae has been attributed to malaria in some malaria endemic areas (Brabin, 1991). Cross-sectional data on the associations between placental malaria infection and birth weight outcome have been collected for all gravidity groups since the late 1940s. A previous analysis showed that a baby is twice as likely to be born with a LBW if the mother has an infected placenta at delivery (Guyat and Snow, 2001). This finding has been found true both for primigravidae only and for all gravidities.

LBW is fourth leading cause of death and 5th leading cause of disease burden globally in children under 5 years. It accounted for 1,025,488 deaths globally in 2000. In Africa, it ranked as the 6th leading cause of death and 7th leading cause of disease burden in children under 5 years. It accounted for 247,798 deaths in under 5's in 2000 (WHO, 2000).

The main causes of LBW in sub- Saharan Africa are malaria in pregnancy, maternal malnutrition, pre-maturity and HIV/AIDS. There has been a consistent decline in the proportion of LBW babies in Ghana since it peaked at 10% in 2002 (GHS/RCH, 2004). LBW is the single greatest risk factor for neonatal and infant mortality (McCormick, 1985). Although most of the evidence arises from studies in the developed world, a recent analysis of cross-sectional data on birth weight and survival from five sites in sub-Saharan Africa showed that infant mortality is three times higher for LBW babies than for those of normal weight (Guyatt and Snow, 2001). The effects on neonatal mortality are even more marked,

with a LBW baby being nine times more likely to die in the first month of life than a normal-weight baby. The risks for mortality increase steadily as the birth weight decreases to below the LBW threshold, though the data are limited.

2.5.1 Burden of anaemia during pregnancy

Anaemia is one of the world's leading causes of disability (Kowalewski M, 2001) and thus one of the most serious global public health problems. It affects nearly half of the pregnant women in the world: 52% in non-industrialized countries as compared with 23% in industrialized countries (Pathmanathan et al., 2003). The commonest causes of anaemia are poor nutrition, iron and other micronutrient deficiencies, malaria, hookworm and schistosomiasis. HIV infection (Loudon I., 1992) and haemoglobinopathies make important additional contributions. Anaemia during pregnancy has serious clinical consequences. It is associated with greater risk of maternal death, in particular from haemorrhage (Seneviratne HR, 2000).

The most significant effect of malaria in pregnancy on the mother is anemia and WHO defines anaemia in pregnancy as haemoglobin levels of 11g/dl or less. Anaemia that complicates pregnancy threatens the life of both the mother and the foetus and is associated with increased risk of preterm delivery and low birth weight. In sub-Saharan countries, anaemia in pregnancy is mainly due to iron deficiency resulting from poor diet and malaria. In Pakistan, a study showed that, the risk of preterm delivery and low birth weight among anaemic pregnant women was 4 and 1.9 times more respectively than the non-anaemic women. The GDHS 2003 revealed that forty-five percent of Ghanaian women age 15- 49 are anaemic (GSS/NMIMR/ORC Macro, 2004).

However in Ghana, 26 percent and 12.2 percent of all ANC registrants had haemoglobin levels less than 11 g/dl at registration and at 36 weeks respectively (GHS/RCH, 2004).

2.6.0 Utilization of ANC services

Antenatal care (ANC) is the healthcare and education given during pregnancy. It can be more

effective in preventing adverse pregnancy outcomes when it is sought early in the pregnancy and continued through to delivery. Utilization of ANC services is vital to the success of the

IPTp programme since pregnant women are required to take the drug under directly observed therapy (DOT) during ANC.

To reduce maternal morbidity and mortality and better health for the baby, focused ANC package advocates for the timely and appropriate care during pregnancy and timely attendance at ANC clinics is a key factor for the effective delivery of IPTp services (Hotz TH et al., 2004). However, inadequate or irregular attendance has been noted in some sub-Sahara African countries (van Eijk AM et al., 2004). According to a study conducted in Tanzania, only 40% of pregnant women deliver at health facilities although some records show a high antenatal clinic attendance rate (Ministry of Health, 2004).

In Ghana, ANC services are provided by both public and private healthcare facilities and trained TBAs. Nearly two-thirds (64.8%) of pregnant women received ANC from GHS facilities and the Teaching hospitals in 2004. The CHAG and quasi-government institutions and TBAs contributed 17.3 percent and 6.0 percent respectively (GHS/RCH, 2004). The Ashanti Regional annual report for the years 2004, 2005 and 2006 indicated that out of target population 165,196, 170,814 and 176,622 of pregnant women, 131,778, 130,980 and 130,698 registered for ANC services respectively. Thus, the percentage ANC coverage for those years was 79.8%, 76.7% and 74.0% respectively. It is worth noting that there was a general decline in ANC services. One would have expected that good ANC attendance would correspond to a higher uptake of IPTp. However there is a school of thought that goes by good ANC attendance does not guarantee IPTp coverage by a published experience from Luwou, Uganda. The study shows the difficulty of getting two appropriate times doses of IPTP to

women even if they attend ANC clinics frequently. Among over 750 postpartum women who were surveyed in 2005, 94% had attended ANC once and 88% at least twice. Only 36% of them received two or more doses of SP and 31% used bed nets during pregnancy. These figures were below the 605 target for 2005 IPTp and ITN used by the RBM partnership. However, a study in Ethiopia demonstrated that the utilization of maternal healthcare services is inadequate in Ethiopia, as clearly depicted by the major maternal healthcare indicators (antenatal, delivery, and postnatal care services). The situation is worst in the rural areas, where more than 80 percent of the population resides. This study shows that the most important factors influencing the use of maternal health services in Ethiopia are demographic and socio-cultural in nature.(Mekonnen, Yared, and Asnaketch, 2002)

2.7.0 IPTp Coverage

The Ghana Demographic Health Survey (GDHS) 2003 indicted that the use of malaria preventive measures during pregnancy in Ghana is low. The survey revealed that only 1% of pregnant women use SP for chemoprophylaxis during pregnancy, while 11.6 % used Chloroquine. The survey also revealed that only10% of pregnant women slept under a net, 4 % slept under an ever-treated net, and 3% slept under an ITN the night before the interview (GSS/NMIMR/ORC Macro, 2004). The Abuja declaration targeted to provide IPT for 60% of pregnant women by the year 2005 could not be achieved since the IPT programme scaled up to cover all the districts in the year 2005.

Five main approaches are recommended for the collection of data to collecting data for IPT coverage determination (WHO, 2000). These are the

(i) regular health information system,

(ii) Demographic Surveillance Systems,

(iii) community surveys,

(iv) health facility surveys and

(v) review of documents.

2.7.1 Routine Surveillance (Health Information System)

Only a few countries in Africa have well developed Health Care System and Health Information System. Thus effective reporting systems are often not in place which are adequate for the purpose of RBM. In facilities and districts where the HIS is developed and reliable, these data can provide information relevant to monitoring trends and evaluation of IPT coverage (WHO, 2000).

2.7.2 Demographic Surveillance Systems

One option for monitoring trends in malaria where the quality and reliability of information generated by the HIS is poor, and the HIS rarely provides information on the burden of malaria at the community level is through Demographic Surveillance Systems (DSS) in sentinel sites. However, such DSS are now operational in only 28 sites in 14 African countries (WHO, 2000).

2.7.3 Community and Household Surveys

Most efforts of Health Management Information Systems (HMIS) are directed at attendance data that is then used as a proxy for population health. This is rather deceptive since the problems of the population attending health services are representative of the health problems of those who do not attend (De Savigny and Binka, 2004). For instance most deaths in Africa occur at home, and many without any health-seeking behavior at formal health services monitored by HMIS. A recent study in Ghana revealed that for every case of febrile illness seen in the health facilities, there were approximately 4−5 in the community (Agyepong and Kangeya-Kayondo, 2004). The proportion of febrile children less than five years old who are

treated with antimalarials ranges from approximately 2.5% to a maximum of 65% in sub-Saharan Africa (De Savigny and Binka, 2004). People may be differentially deflected or repelled from these services by a whole range of issues including geographic and physical access, socioeconomic access, temporal access, sex, age, belief systems, quality of health services, and availability of drugs. Community-based information on prevention and treatment practices are therefore critical for monitoring the effectiveness of related RBM interventions. Such information is especially important for monitoring the outcomes and the effects of RBM action in areas where a large proportion of cases are managed at the home and where the burden of malaria is usually most severe. Some community surveys have already been conducted but there is a need to replicate these studies in other countries for this purpose.

Community surveys tend to be time consuming and relatively costly, and they can therefore only be undertaken in selected sentinel sites in each country and at intervals of 2-3 years. RBM has developed a methodology for situation analysis which includes instruments for community level assessment of indicators such as percentage of children under five sleeping under ITNs, provision of intermittent treatment in pregnancy, provision of timely and appropriate treatment of children with fever and community action against malaria.

2.7.4 Health Facility Assessment

The WHO Regional Offices designed Monitoring and Evaluation systems to monitor the progress, evaluate the outcomes and impact of their respective Regional Strategies for the Prevention and Control malaria. The instruments include an assessment of the clinical skills of health care staff, as well as an assessment of the available supplies and equipment at the

health facility. The application of the method requires special skills, and it cannot be done in every facility. The WHO recommends therefore, to combine the health facility assessment

with the community-based surveys, and to undertake them in the same districts and at the same interval (WHO, 2000).

In case the indicator on technical skills of health care staff is not selected, the health facility assessment becomes much simpler and consists only of an assessment of the presence of the required antimalarials. But it is recommended that the technical skills of health care staff be evaluated at least every two years.

2.7.5 Review of Documents

This is the easiest and cheapest of the data collection methods. The main requirement is that the necessary documents exist and are available, and some special efforts and travel may be needed to ensure that this is indeed the case. It will also be important to retain copies of the relevant documents so that these can be made available as supporting evidence for the monitoring findings on the selected indicators.

3.0 CHAPTER THREE – METHODOLOGY

This chapter consists of the study methods and design

3.1 Research Methods and Design

The study had both qualitative and quantitative components. The quantitative study involved a descriptive cross sectional study of all records of IPT programmes in the selected health centres. The qualitative components comprised of interviewing of some key informants by the administration of questionnaires. Finally, there was also interviewing of pregnant women, nursing mothers and other health staff using checklist as part of the qualitative process.

3.2 Study Area and Population

The study was conducted in the Kumasi Metropolis of Ashanti Region. Kumasi, Ghana's second biggest city is 300km from the National Capital, Accra. The city is 150sq km in size. Kumasi is bounded by four districts, to the north the Kwabre, on the south the Bosomtwe Atwima Kwanwoma, on the east the Ejisu Juaben and on the west the Atwima districts. Politically, Kumasi has ten sub metropolitan areas namely: Manhyia, Tafo, Suame, Asokwa, Oforikrom, Asawase, Bantama, Kwadaso, Nhyiaeso and Subin. But for the purposes of health services activities, it is been divided into five sub-metropolitan areas namely; Manhyia North, Manhyia South, Asokwa, Bantama and Subin.

In terms of population, it is the largest of the 21 districts in the Ashanti Region. It has an estimated 2007 population of 1,478,869 with an annual growth rate of 3.4%. The population figure is however applicable during the night since day time population is above 2,000,000. There are 213 communities in Kumasi. Kumasi is a cosmopolitan city with trading being the main occupation of the inhabitants (KMA D Plan Final, 2006-2009).

The Asokwa sub metro has 56 communities with an estimated population of 448,097. The Manhyia North sub metro has 25 communities with an estimated population of 236,619 whilst the Manhyia South sub metro has 59 communities with an estimated population of 275,070. The Bantama Sub Metro, on the other hand, has 50 communities with an estimated population of 357,886 whereas the Subin sub metro 23 communities with an estimated population of 161,197 (KMHD,Annual Report, 2007).

Table 3.1 Malaria cases that were reported from 2005-2007

Indicators	2005	2006	20007
Number of malaria cases	306,187	277,350	347,108
Children < 5yrs reporting with malaria	63,519	61,874	73,140
Children < 5yrs admitted with malaria	3,786	3,029	3,594
Children < 5yrs dying with malaria	58	31	20
Under 5 Malaria Case Fatality Rate	0.09	0.05	0.02
Malaria in pregnancy	3,948	3,813	5,895
Percentage of			

malaria in

pregnancy

1.29 1.37 1.69

Source; Annual Report 2007 – Kumasi Metro Health Directorate

Table 3.2 Safe Motherhood Programme Indicators in the Metro between 2004 -2007

INDICATOR 2004 2005 2006 2007

Total Population 1,337,729 1,429,575 1,430,24

1

1,478,86

9

WIFA (24% of total population) 321,055 343,098 331,816 345,948

Expected pregnancies (4% of total

population)

53,509 55,328 57,210 59,155

Total Registrants 42,638 47,227 41,913 43,818

Total Attendances 167,048 190,460 181,277 172,760

Average Number of Visits per client 3.9 4.0 4.3 3.9

Haemoglobin level at Registration less

than 11 g/dl (%)

23.3 23,82 16.30 13.90

Haemoglobin level at 36 weeks less

than 11g/dl (%)

15.3 11.77 9.90 7.30

Total Deliveries 29,409 30,819 29,119 30,693

Total Still Births 645 686 637 640

Still Birth Rate (%) 2.2 2.2 2.18 2.08

Low Birth Rate [less than 2.5 Kg] (%) 11.3 7.2 8 8.6

Source; Annual Reports, 2004-2007 Metro Health Directorate, Kumasi.

Kumasi as a nodal city with major arterial routes linking it to other parts of the country and also the fact that it is an educational centre with two State Universities, a Private University, a Polytechnic, two Teacher Training Colleges, Secondary Schools and a host of Basic Schools.

The Ghana Health Service provides clinical and public health services through hospitals and clinics notably the Komfo Anokye Teaching Hospital, static and outreach stations (Public and Private). Kumasi Metro is endowed with many Hospitals, Clinics, Maternity Homes and Outreach Stations and therefore accessibility to services in terms of distance is good. Thus, the Kumasi Metropolis has five (6) Government Hospital, four (4) Quasi Government Hospitals/ clinics, three (3) Mission hospitals/clinics, forty-three (43) private hospitals, sixty-

seven (67) Private clinics, fifty-five (55) Maternity Homes, twenty (20) Homeo-pathic clinics, fifteen (15) private laboratories (KMHD Annual Report, 2007).

3.4 Data collection Techniques

Data was collected through in-depth interviews with key informants such as Metro Health Director, Pharmacists, the Metro malaria control co-ordinator and health facility-based midwives who had the opportunity to express their experiences and opinions independently by virtue of their positions in the health sector. Community and health facilities survey was conducted by administration of questionnaires to pregnant women, nursing mothers and some heads of health centers. Some key health staffs on the IPT programme were also interviewed using closed ended questionnaire, check list and interviewing guide.

3.5 Data Collection Tools

Two field assistants were trained on basic principles of research and data collection and deployed for data collection within the study area. Field supervisor who was mainly health personnel knowledgeable in this kind of research supervised all field activities. The conceptualization, planning and operationalization of the study were monitored by the Principal Investigator (PI), the academic and field supervisors. Data collection was done systematically to ensure that reliable responses were obtained from respondents. For the purpose of standardization and accuracy, guided interviews were conducted. The main data collection instrument used in gathering data to achieve our stated objectives was face-to-face interview with self administered structured questionnaires. The respondents provided independent answers to some of the questions, while they selected responses from given options where questions were close-ended.

Three (3) main approaches were employed to collect data. These were;

3.5.1 Administration of questionnaires

(i) Community survey

Two well structured close ended written questionnaires were used. They were used for the community survey involving mothers and pregnant women in the selected communities in the sub metro. Some of the information obtained included the background information of the respondent, their awareness and knowledge about the effects of malaria in pregnancy, whether they had been given SP and their knowledge about the IPT programme in general.

(ii) Health facility survey: A third questionnaire was used to assess the adequacy of training of healthcare providers on the IPT programme and their knowledge on the effects of malaria in pregnancy. Some selected health facilities both private and public centres within the study area which offer maternity services of which the three (3) sub-metro hospital were included. Key informants such as pharmacists, doctors, dispensing technicians and medical assistants were engaged for in-depth interview as well. Again, 47 checklists were distributed to some selected hospitals including the 3 sub-metro hospitals, namely the Maternal and Child Hospital, Tafo Hospital and North Suntreso Hospital, 7 Private hospital, 15 clinics and 22 Maternity Homes for the facility survey. Also, some selected midwives, heads of institution and some healthcare providers were interviewed using close ended questionnaire.

(iii) Desktop study and review of available information

This involved reviewing data using data compilation forms to monitor and assess the IPT programme at the health facilities. Information obtained included ANC attendance, proportion of pregnant women who received IPT1, IPT2 and IPT3, haemoglobin levels of pregnant women and recorded birth weights of the infants.

Using a checklist of selected key indicators, facilities (both private and public) which offered maternity services were surveyed to check the supply management of drugs both at the facility level by way of in-depth interviews with heads of the various health facilities

3.6 Study population

The study population comprised of doctors, pharmacists, Metro malaria control co-ordinator, midwives at the service delivery level, pregnant women, irrespective of age, gravidae or parity and nursing mothers.

3.7 Study Variables

Table 3.3 Logical Framework of Study Variables

Variables	Indicators	Operational definition	Scale of measurement	Method of data collection	Data collection tool	Objective
Demograph-ic						

Age	Age in years	Completed years	Continuous
Residence	Place of permanent abode for the past 6 months	i.Community survey ii.Questionnaire	Nominal

Parity	Number of live births	Ratio	
Socio Economic	Occupation	Ones occupation for the past 6 months	Nominal
Education	The highest level of education attained		

	Nominal	
	Religion	
	The religious organization respondent belongs to	
	Nominal	
38		
	Trainin g of health staff	
	Adequacy of training received by health staff on	

IPT	Proportion of health staff who have had training on IPT	Ratio	Interview
Questionnaire	One	Awaren	

ess and knowledge of health staff and expectant mothers towards malaria in pregnancy and IPT

Level of awareness

Awareness as measured by answers to questions

Ordinal

i.Commun

ity Survey

ii.Facility

Survey

Questio

nnaire

One

Level of knowledge	Knowledge as measured by answers to questions	Ordinal	Questionnaire	One
Supply management of SP	% of health			

facilities

reporting

no

disruption

of stock of

SP for

more than

1 week

during the

previous 3

months

% of health

facilities reporting

no disruption of

stock of SP for

more than 1 week

during the previous

3 months divided

by the total number

of health facilities

visited multiplied

by 100

Ratio

Health facility survey

Checklist

Data Compilation form One

IPT coverage	% of pregnant women receiving IPT1, IPT2 and IPT3 under direct observation	% of women receiving IPT1,		

IPT2 and IPT3 under direct observation divided by total number of pregnant women in the population multiplied by 100.			
Ratio			
Health facility survey			
Questionnaire			
One			

Incidence of side effects	% of pregnant women reacted adversely to SP (confirmed or perceived)
Proportion of pregnant women reacted adversely to SP (confirmed or perceived) divided by the total number of	

pregnant women

multiplied by

100

Ratio

i.Health

facility

survey

ii.

Communit

y survey

Questio

nnaire

Questio

nnaire

One

40

Source: Adopted from WHO 2004

Utilizati

on of

ANC

ANC

coverage

Number of

visits per

pregnant

woman		
Proportion of pregnant who received ANC services from a health facility		
Average number of times a pregnant woman assessed ANC services during pregnancy		
Ratio		
Ratio		
i.Community survey ii. Health		

facility

survey

i.Commun

ity survey

ii. Health

facility

survey

Questio

nnaire

Questio

nnaire

Two

Two

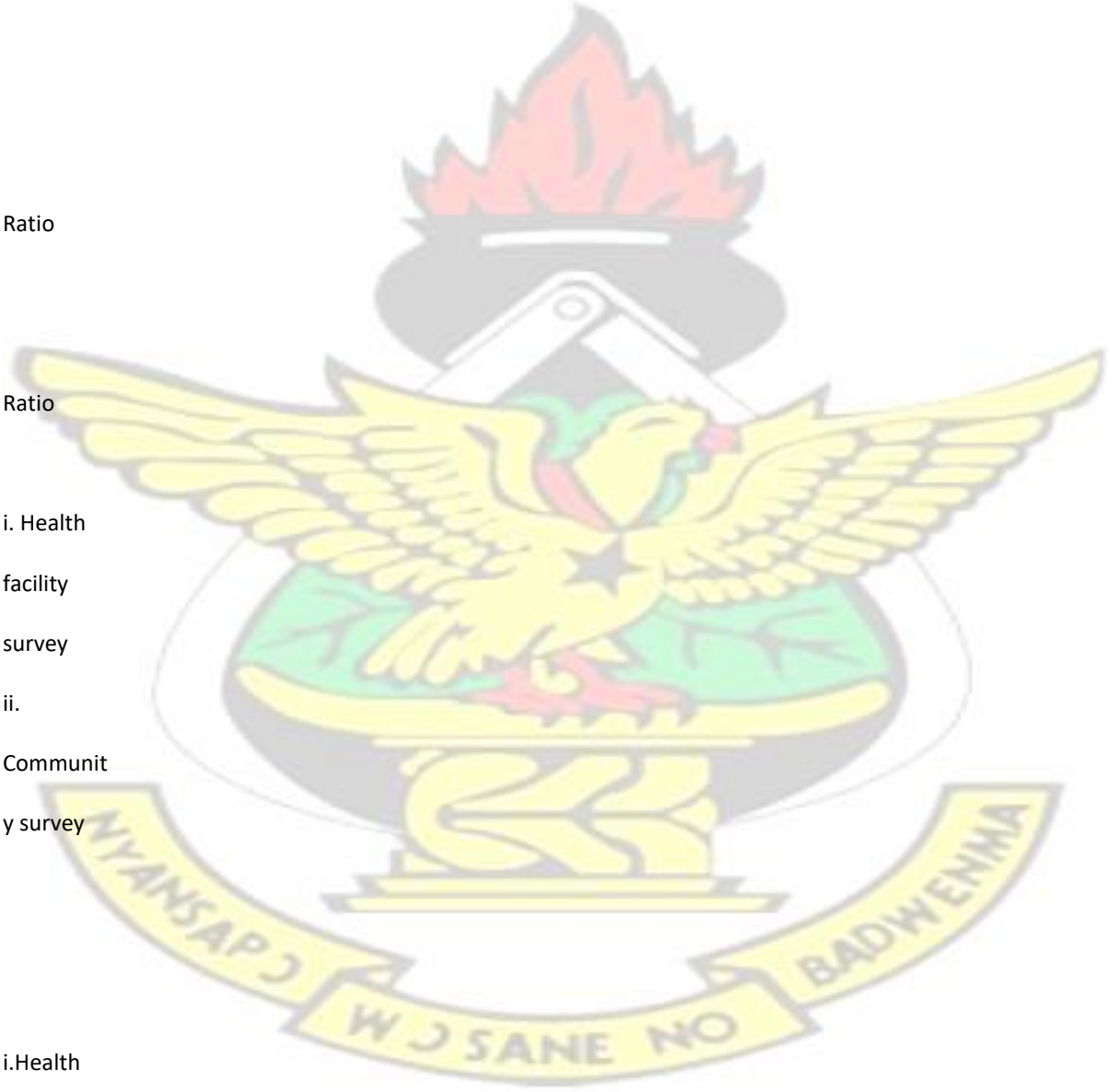
Prevale
nce of
malaria

Incidenc
e of Low
Birth
Weight
and
Matern
al
Aneami
a

Proportion
of
pregnant
women
who
reported
having

malaria during pregnancy	
Proportion of low birth weight	
Proportion of maternal anaemia	
% of pregnant women who reported having malaria during pregnancy divided by the total number of pregnant women multiplied by 100	
Birth weight of a live birth less than 2.5kg irrespective of gestational age	

Haemoglobin level	less than 11g/dc	Ratio	i. Health facility survey ii. Community survey
		Ratio	
		Ratio	



i.Health facility survey			

ii.Commu

nity

survey

Data

compila

tion

Questio

nnaire

Three

Four

3.8 .0 Sampling Technique and Sample

3.8.1 Sample Size determination

Using a confidence interval of 95 percent and allowing a 5% percent margin of error, the calculated sample size of 384 was obtained. The anticipated population proportion of pregnant women and nursing mothers for the metro was estimated to be 4 percent of the total population. However, a total number of four hundred (400) respondents were interviewed. These 400 respondents were conveniently randomized sampled from the community. At the health facility level, 70 midwives, 22 key informants and 47 checklists were used to the level of training, IPT utilization and supply chain of SP.

3.8.2 Sampling Technique

Purposive sampling technique was employed to select the key informants and other health care providers in the three (3) sub metro to determine the progress of the IPTp programme, management of supply chain of the SP and utilization level IPTp. Thus, 70 midwives and 22 key informants including pharmacists, doctors, dispensing technicians and medical assistants were engaged for in-depth interview. 47 checklists were distributed to some selected hospitals including the 3 sub metro hospitals which are the Maternal and Child Hospital, Tafo Hospital and North Suntreso Hospital, 7 Private hospital, 15 clinics and 22 Maternity Homes for the facility survey.

The three sub-metros included Bantama, Subin and Manhyia North were selected using a simple random sampling. Each of the sub-metro is divided into communities. Thus Bantama, Subin and Manhyia North have 50, 23 and 25 communities respectively. However, only twenty-two (22) communities within the selected sub-metro were also chosen using the EPI (Expanded Programme on Immunization) cluster survey method (Hoshaw-Woodard, 2001). Out of the 22 communities selected, thirty (30) clusters were formed. For each of the

communities selected all of them had only one cluster except Amakom, Breman, Kronum, and Tarkwa Maakro had 2, 5, 2 and 3 respectively because of the magnitude of the population. For each of the clusters, 13 households were again selected using simple random sampling with the aid of this procedure.

That is the centre of each community was located with the help of a community surveillance volunteer. A direction was chosen in a random manner by spinning a bottle on the ground and

choosing the direction in which the bottleneck indicated. Depending on the size of a particular community, every second or third household was selected until thirteen (13) households were selected. One pregnant woman or nursing mother was interviewed from each household. However, if there was no pregnant or nursing mother in the household, then, the next nearest one would be chosen until the needed sample size is obtained. At the end of the day 280 pregnant women and 120 nursing mothers were selected and interviewed.

3.9 Pre-testing

The data collection tools and the techniques were pre- tested in a non-study zone, that is, Manhyia South sub-Metro within the study area. A random selection of pregnant women and some nursing mothers in the community were interviewed. Again, some of the key informants were interviewed to gather the needed information. The household clustering and simple random sampling techniques were also pre-tested as well. All other data collection techniques were pre-tested as well. The format or presentation of the checklist, data compilation forms and questionnaires were all pre-tested too and then revised accordingly the need arose. After this, the study area was then piloted in the Manhyia South sub-Metro. No major problem was encountered so the questionnaires was maintained

3.10 Ethical Consideration

Ethical consideration was sought from the Committee of Ethics and Human Research, at the

School of Medical Sciences, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. For all the hospitals under the Ghana Health Service, ethical approval was sought from the Ethics Review Committee of the Ghana Health Service through the Regional Health Administration. Again, ethical clearance was obtained from the Kumasi Metropolitan Assembly. Detailed explanation of all the procedures of the protocol were explained to the pregnant women and mothers and only those who gave written informed consent be included in the study. In addition, the field assistants were trained to educate the pregnant women and nursing mothers on the prevention and control of malaria in pregnancy at the end of each interview session.

3.11 Data Handling and Analysis

Data collectors recruited from the respective study areas were trained to administer the questionnaires very well. They were particularly coached on ways of administering the questionnaire and conducting the interviews through house-to-house visits. Completed questionnaires were checked for consistency and completeness by the principal investigator before entered into a template designed using STATA Version 9

3.12 Limitations of the study

The instrument may be limited in determining the anthropological details in relation to the use of health services considering the limited use of qualitative tools however; this was minimized through extensive interview. Further, the use of local language (Twi), may have led to misunderstanding or misinterpretation of the import of the set questions and therefore lead to inaccurate results. These limitations were however mitigated through training of field workers for standardization of the interpretation of the questions and through close

monitoring by researcher of the data collected.

3.13 Assumption

1. That all participants would be truthful in their responses.

2. Medical records are accurate.

3. All pregnant women and nursing mothers prior to the beginning of the research are not on any kind of malaria prophylaxis.

4.0 CHAPTER FOUR – RESULTS

The results presented in this chapter cover data on 120 mothers nursing babies six months old or younger, 280 pregnant women, 70 midwives, 22 key informants and 47 checklists for facility survey.

4.1.0 Background characteristics of respondents

4.1.1 Communities of residence

The respondents for the community survey of the study resided in 22 communities. These are Abrepo Kuma, Adamanu, Adoato, Ampabame, Bantama, Bohyen, Bohyen Kropo Ampabame, Patasi, South Suntreso, Tikese, Adum, Amakom, Asafo, Bompata, Fankyenebra,

Fanti New Town, Breman, Kronum, New Suame, Tarkwa Maakro and Anomangye. The demographical data of the respondents collected were on the variables such as age, religion, occupation and educational background. The table 4.1 below shows the background characteristics of the pregnant and nursing mothers

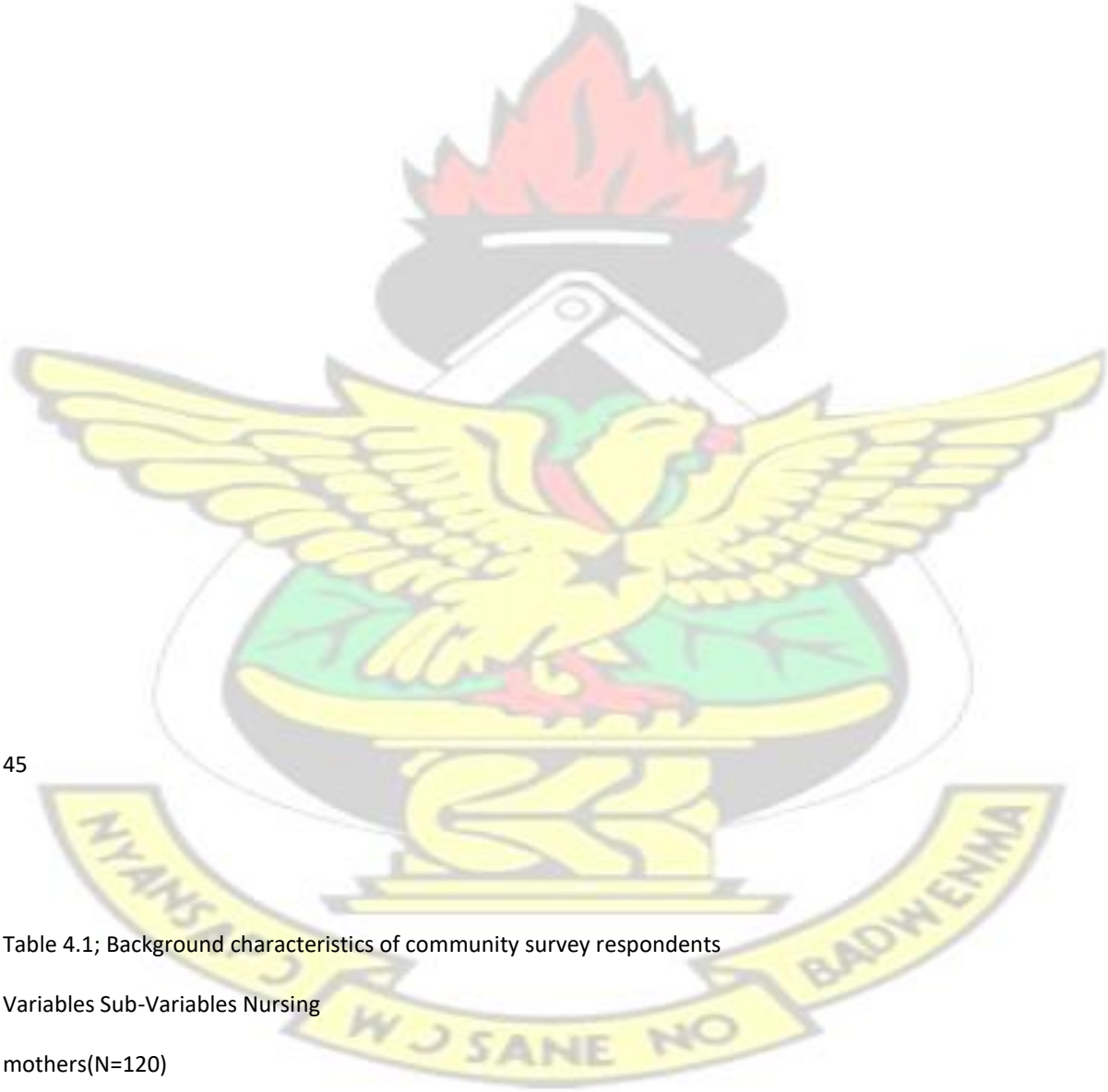


Table 4.1; Background characteristics of community survey respondents

Variables	Sub-Variables	Nursing mothers(N=120)		Pregnant Women (N=280)	
		Frequency	Percent (%)	Frequency	Percent (%)
Age group	<20	9	7.50	24	8.57

20-24 21 17.50 50 17.86

25-30 51 42.50 116 41.43

31-34 20 16.67 47 16.79

35-39 13 10.83 34 12.14

>39 6 5.00 9 3.21

Religion Christian 102 85.00 237 84.64

Muslim 17 14.17 41 14.64

Others 1 0.83 2 0.72

Education Primary 9 7.50 21 7.50

JHS 63 52.50 161 57.50

SHS 29 24.17 49 17.50

Tertiary 9 7.50 11 3.93

None 10 8.33 38 13.57

Occupation Trading 38 31.67 123 43.57

Teaching 9 7.50 10 3.57

Health Workers 4 3.33 3 1.07

Hairdressing 14 11.67 25 8.93

Dressmaking 12 10.00 27 9.64

Unemployment 31 25.83 72 25.71

Others 12 10.00 20 7.5

Source: Author's Field Work, 2008.

A total of 400 respondents consisting pregnant women (N=280, 70%) and nursing mothers (N=120, 30%) were interviewed. The data from the table shows that majority of the pregnant women and nursing mother was between the ages of 25-30. Thus, out of the 280 pregnant

women interview 42.5% and 41.43% were within the ages of 25-30. 8.75% and 7.5% of pregnant women and nursing mothers respectively were below 20 years. However quite a significant proportion of the respondents were above 39 years.

84.64% of the pregnant women were Christians whilst 14.17% and 14.64% were Muslims respectively. The rest of the respondents constituted a small proportion of other religion. The table also shows that majority of the respondents have at least have a formal education in order words, 63% of the nursing mother attained a formal education to the Junior High School (JHS) whilst that of the pregnant women is 57.50%. A significant proportion of 8.33% of the nursing mothers and 13.58 of the pregnant women had any formal education. At the highest proportion of 31.67% nursing mothers and 43.57 of the pregnant women were traders. This was followed by 2.83% of the nursing mothers and 25.71% of the pregnant women. Who did not have any gainful employment? Other occupations reported were hair dressing, dressmaking, and teaching and health workers.

Table 4.2 Knowledge about malaria by pregnant women and nursing mothers

Variable Number Percentage

a. Heard of malaria

(N=400)

Yes 397 99.25

No 3 0.75

Total 400

c. Prevention of malaria in pregnant women and nursing mothers

(N=397)

IPT 313 78.84

Using insecticide treated

net (ITN)

276

69.52

Avoiding mosquito bite 354 89.16

All of the above 289 72.79

Don't know 14 3.52

Source: Field survey, 2008.

The respondents gave multiple responses for some of the questionnaires.

Of the 400 respondents, (99.25%, N=397) indicated that they know malaria as a disease condition. 78.84 mentioned that it could be prevented by the uptake of IPTp, 69.52% by sleeping under ITN, 89.16% by the avoiding of mosquito bites and 3.52% showed their ignorance about the means of preventing malaria.

Table 4.3 Knowledge of the effect of malaria on feotus and expectant mothers

Effect of Malaria	Nursing Mother (N=120)		Pregnant Women(277)	
	Frequency	Percent	Frequency	Percent
On feotus				
Spontaneous Abortion	85	70.83	171	61.73
Prematurity	79	65.83	180	64.98
Still Birth	58	48.33	142	51.26
Low Birth Weight	65	54.16	157	56.68
Don't know	9	7.50	24	8.66
All of the above	71	59.16	168	60.64
On Mother				
Maternal anaemia	72	60.00	123	44.40
Maternal death	81	67.50	167	60.28

Source: Author's Field Work, 2008.

The respondents gave multiple responses for table 4.3. A larger proportion of the (N=65, 54.16%) and N=157, 56.68%) of the nursing mothers and pregnant women asserted that malaria can cause low birth weight and still birth respectively. Only 7.50% of the nursing mothers and 8.66% of the pregnant women indicated that they did not know the effects of malaria on pregnancy. Again, 67.50% of the nursing mothers indicated that malaria can trigger maternal death whilst 60.28% of the pregnant women confirmed this phenomenon.

Maternal anaemia was also identified as one of the serious effects of malaria on pregnancy through questionnaire interview.

4.2.0 Implementation of IPTp

4.2.1 Awareness and knowledge of IPT programme by nursing mothers and pregnant mother

Table 4.4 Awareness and knowledge of IPT programme by nursing mothers and pregnant mothers

	Nursing mothers (N=120)		Pregnant mothers (N=280)		Average%
Awareness and knowledge of IPT	Frequency	Percent	Frequency	Percent	
Yes	95	79.16	218	77.86	78.51
No	25	20.83	62	22.14	21.24
Medium	(N=95)		(N=218)		
Television	5	5.26	16	7.33	6.30
Radio	12	12.63	6	2.75	7.69
Magazine/Newspaper	1	0.01	1	0.40	0.21
Posters	1	0.01	3	1.37	0.69
Leaflets or Brochures	1	0.01	5	2.29	1.15
Health worker/Clinic	75	78.94	187	85.77	82.36

Source: Author's Field Work, 2008.

Out of the 400 respondents interviewed, 95 (79.16%) of the nursing mothers and 218 (77.86%) of the pregnant women mentioned they are aware of IPT programme in pregnancy. But the majority of the respondents said they become aware of the programme at the health

facilities. Thus, an average of (82.36%, N= 262) respondents said they heard it after attending

ANC services. However, the rest indicated that they got the message by means of radio, followed by the television.

4.2.2 Knowledge of benefits of SP by nursing mothers and pregnant women

Table 4.5 Knowledge of benefits of SP by nursing mothers and pregnant women

Benefits of SP	Nursing mothers(N=120)		Pregnant mothers(N=280)	
	Frequency	Percent	Frequency	Percent
Malaria episode reduced	36	30.00	11	3.92
Reduces prematurity	3	2.50	10	3.57
Birth weight is improved	4	3.30	67	23.92
Reduced maternal anaemia	11	9.16	12	4.20
Maternal death due to malaria is reduced	16	13.33	29	10.35
All of the above	38	31.66	85	30.35
Don't	12	10.00	33	11.78

Source: Author's Field Work, 2008.

About (31.66%, N=38) of the nursing mother and (30.35%, N=85) of pregnant women respondents knew that the SP drug can reduce malaria episodes, prematurely maternal anaemia and maternal death caused by malaria as well as improve birth weight of neonates.

4.2.3 Sulphadoxine-Pyrimethamine side effect

Table 4.6 Sulphadoxine-Pyrimethamine side effect

VARIABLE	Nursing mothers (N=95)		Pregnant mothers (N=218)	
	Frequency	Percent	Frequency	Percent
EXPERIENCE				
Yes	14	14.73	43	21.00
No	79	83.16	151	69.26
Don't know	2	2.10	24	11.09
TYPE OF EFFECT	(N=14)		(N=43)	
Dizziness	3	21.42	9	20.93
Nausea/vomiting	7	50.00	10	23.25
Palpitation	1	7.14	2	4.65
Itching	3	21.42	22	51.15

Jaundice - - - -

Source: Author's Field Work, 2008.

(83.16 %, N=79) of the nursing mothers and (69.26%, N=151) of the pregnant women said they did not experience any side effects after taking the SP drug. (14.73%, N=14) and (21%, N=43) of the nursing and pregnant mothers respectively did experience some side effects such as dizziness, nausea, palpitated, and itching. But nausea and vomiting (50%, N=7) was indicated to be mostly experienced among nursing mothers whereas (51.15%, N=22) of the pregnant women complained of itching.

4.2.3 RANK OF MIDWIVES

Out of 70 midwives interviewed, 8.57%, 7.14%, 7.14%, 29.98%, 2.86%, 11.43% were principal midwife superintendent, senior enrolled nurse, senior nursing officer, staff midwives, senior staff midwife, and private midwives respectively. In addition, 11.43%,

8.57% and 12.85% of the midwives interviewed were senior midwife superintendent, principal enrolled nurse and midwife superintendent respectively (Author's Field Work, 2008).

4.2.4 Knowledge, attitude, training and perception of midwives about IPTp

Table 4.7; Knowledge, attitude, training and perception of midwives about IPT (N = 70)

Variable	Number	Percentage
Training in IPT programme		
Yes	70	100
No	-	-
Time of training		
Less than a month	4	5.71

About three months ago 3 4.28

About six months ago 4 5.71

Almost a year 7 10

Over a year 52 74.29

Current drug of choice for preventing malaria in

pregnancy

SP 70 100

Time to start receiving IPT

After quickening 70 100

Number of times to receive IPT

Three times 70 94.29

Interval to receive IPT

Monthly (four weeks) 70 100

How to administer IPT

DOT 70 100

Contraindications to SP

Before quickening 70 100

Hypersensitivity to sulphur drugs 54 77.14

After 36 weeks 10 14.28

Benefits of IPT

Reduce the incidence of LBW 55 78.57

Reduce maternal anaemia 61 87.14

Prevention of spontaneous abortion 63 90

Source: Author's Field Work, 2008.

The level of knowledge of midwives in the IPT programme was high. About 91.42 have been trained in the IPT programme and ou