

**FACTORS ACCOUNTING FOR THE DECLINE IN  
IPTp2/IPTp3 AMONG PREGNANT MOTHERS IN THE KETA  
MUNICIPALITY - GHANA**

By

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**A Thesis submitted to the Department of Community Health, Kwame  
Nkrumah University of Science and Technology in partial fulfillment of  
the requirements for the degree of MASTER OF SCIENCE  
HEALTH SERVICES PLANNING AND MANAGEMENT**

**MARCH, 2009**

## DECLARATION

I hereby declare that this submission is my own work towards the MSc degree and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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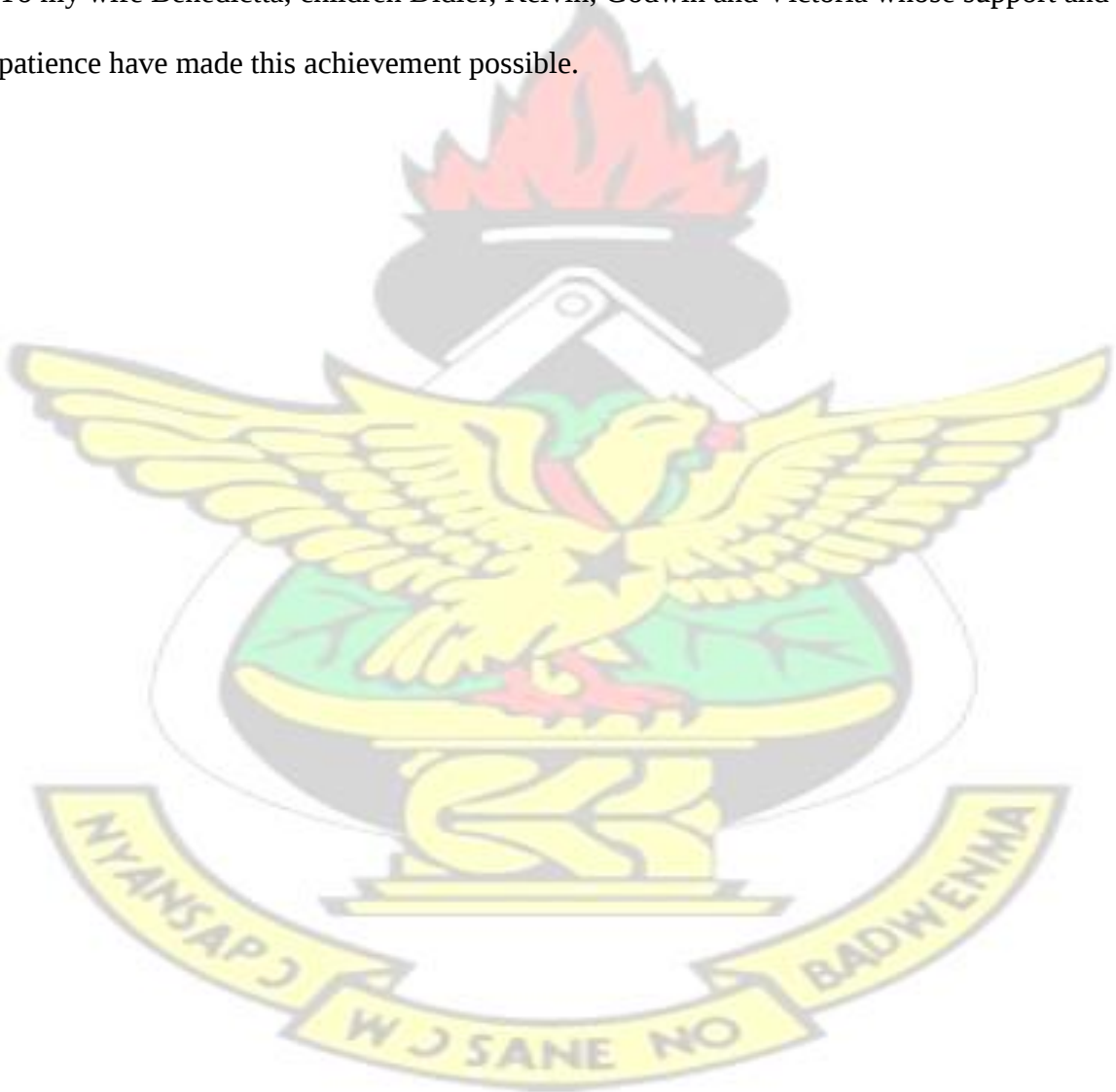
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## DEDICATION

With love and humility, I dedicate this work:

Posthumously to my parents whose toil and sacrifice have brought me this far.

To my wife Benedictta, children Didier, Kelvin, Godwin and Victoria whose support and patience have made this achievement possible.



## ACKNOWLEDGEMENT

I wish to acknowledge the contributions of very important personalities and organizations that have made this assignment a success.

First to mention is my academic supervisor, Dr. Harry Tagbor who subjected this work to constant scrutiny at various stages to ensure that a quality work had been done. Quite apart from that your financial assistance played an immense role in this study; thank you very much. To the Municipal Director of Health Services, Dr. Atsu Seake-Kwawu, I say thanks. I cannot forget to mention the contributions of Madam Agatha, George, Carlin and Mr. Amesie all of the Keta Municipal Health Directorate.

Additionally, I wish to express my deepest gratitude to the Honourable Professors of Department of Community Health, headed by Dr. Easmon Otupri for the stock of knowledge imparted me in diverse ways has brought me this far. I'm also grateful to Mr. Richard Gyamfi, a final year student in Chemistry, who helped me a lot in computer skills and also, Mr. Samuel Apetorgbor whose constant pressure of always reminding me to hurry up has been the source of my strength.

And finally, I appreciate the contributions of key personalities in Keta Municipal Government Hospital and the Sacred Heart Hospital in Weme.

## ACRONYMS

|          |     |                                                                  |
|----------|-----|------------------------------------------------------------------|
| ANC      | ... | Antenatal Care                                                   |
| ASU+AQ   | ... | Artesunate and Amodiaquine Combination                           |
| CI       | ... | Confidence Interval                                              |
| DOT      | ... | Directly Observed Treatment                                      |
| EPI      | ... | Expanded Programme of Immunization                               |
| GHS      | ... | Ghana Health Service                                             |
| HIV/AIDS | ... | Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome |
| IPTp     | ... | Intermittent Preventive Treatment in Pregnancy                   |
| ITN      | ... | Insecticide Treated Net                                          |
| LBW      | ... | Low Birth Weight                                                 |
| MPH      | ... | Master of Public Health                                          |
| NMCP     | ... | National Malaria Control Programme                               |
| OPD      | ... | Out-Patient Department                                           |
| PW       | ... | Pregnant Women                                                   |
| RBM      | ... | Roll Back Malaria                                                |
| SP       | ... | Sulfadoxine Pyrimethamine                                        |
| WHO      | ... | World Health Organization                                        |
| WHO AFRO | ... | World Health Organization African Office                         |
| WIFA     | ... | Women In Fertility Age                                           |

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# **ABSTRACT**

## **BACKGROUND**

Malaria in pregnancy is one of the major causes of maternal morbidity and adverse birth outcomes. In high transmission areas, its prevention has recently changed, moving from a weekly or bimonthly chemoprophylaxis with chloroquine to intermittent preventive treatment in pregnancy (IPTp) with sulfadoxine-pyrimethamine (SP) as recommended by the WHO. The Keta Municipal Health Directorate initiated the SP/IPTp in 2004 with the help from Global Fund for Malaria. Statistics on the coverage revealed a consistent decline in the subsequent two doses (IPTp2 and IPTp3). This study was undertaken to identify factors that influenced the decline in IPTp2 and IPTp3 in the Keta Municipality.

## **METHODS**

In a cross sectional study, 900 eligible women, comprising 302 pregnant women with a gestational age of 28 weeks and more and 598 mothers nursing babies not more than seven months were selected to respond to structured questions on ANC attendance, SP availability and the dosage of SP taken. The Statistical Package for Social Science (SPSS) (version 15.0) was used for data entry and analysis.

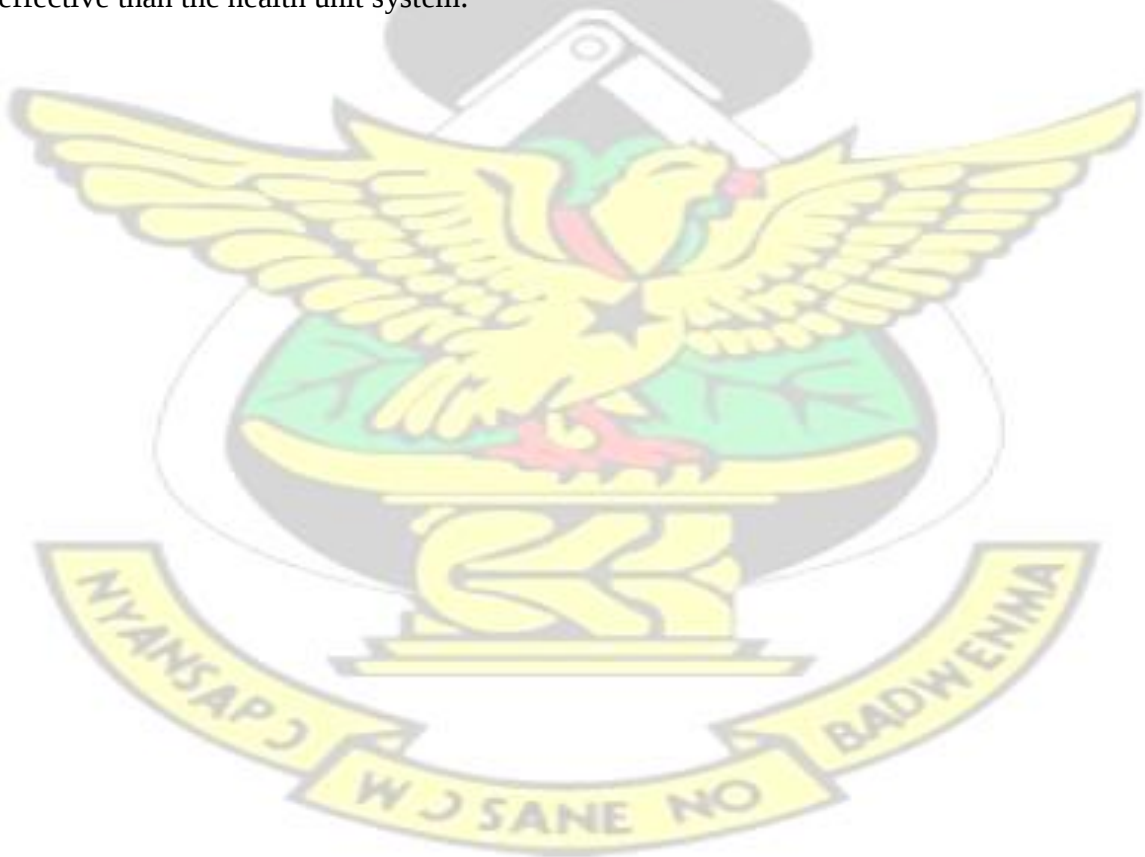
## **RESULTS**

Among 893 pregnant mothers, 45%, 51% and 3% of them had their first ANC visit in the first, second and the third trimesters respectively. One percent of them did not attend ANC at all. Over all, ANC attendances were high, 99% at least once; 95% twice and 87% had it three times. The study revealed shortage of SP in ANC facilities. The gestational age at first ANC attendance is significantly associated with SP/IPTp coverage

( $p < 0.0001$ ). Also, the long distance from home to ANC clinic determined the decline in IPTp2/IPTp3.

## CONCLUSION

The decline in IPTp2/IPTp3 could be attributed to late ANC booking, shortage of SP in the clinics and the distant location of ANC clinics from many of the communities. There is the need to strengthen SP supplies, making sure it is always available at the health facility level. ANC attendees should be given a holistic education on intermittent preventive treatment in pregnancy. Lastly, community health workers who are all over the communities may be engaged to administer the drug as studies revealed were more effective than the health unit system.



# 1. CHAPTER ONE – INTRODUCTION

## *1.1 Background Information*

More than 125 years after the discovery of the causative parasites, human malaria remains a major global-health problem (Walther and Walther, 2007). For many tropical countries, malaria remains one of the most difficult health challenges. It is endemic in about 90 countries of the world, half of which are in Africa (WHO, 1993). Malaria affects between 300 and 500 million people Worldwide every year; with 90 percent of all cases occurring in Africa (WHO, 2001). About 90% of the one million annual deaths from malaria are in Africa, mostly in young children and pregnant women. Malaria infection is equally estimated to cause 400,000 cases of severe maternal anaemia and 75,000-200,000 infant deaths annually (Guyatt and Snow, 2001; Steketee et al. 2001). Apart from the human cost, the social and economic costs of malaria in Africa are equally huge. The World Health Organization estimates that malaria retards African economic growth by 1.3 percentage points per year. Besides, the sub-Saharan Africa's gross domestic product (GDP) in 2000 might have been 32 percent greater had malaria been eliminated 35 years ago, an estimated increase of \$100 billion in the region's current GDP of \$300 billion (WHO, 2000).

The disease is endemic throughout Ghana and continues to be a major public health concern. It is a leading cause of morbidity and mortality, especially among pregnant women and children under the age of five. The Ministry of Health (MoH) estimated that over the past ten years, there have been 2-3 million cases of malaria each year,

representing 40 percent of outpatient cases, while severe malaria accounts for 33-36 percent of in-patients. Malaria also accounts for 25 percent of the deaths in children under the age of five (GHS, 2001).

Among pregnant women, malaria accounts for 13% of OPD attendance, 10.6% of admission and 9.4% of deaths (GHS/NMCP/JHPIEGO, 2004).

### ***.Reasons for Failure of Previous Strategies***

The effectiveness of the previous policy of weekly chemoprophylaxis with chloroquine (CQ) was limited by poor compliance outside the clinic setting (Steketee et al. 1996; WHO 1994). In addition, the expansion of drug resistance of *Plasmodium falciparum* to CQ and other drugs has further eroded the effectiveness of CQ prophylaxis (Steketee et al. 1996; WHO 1994). Studies equally revealed that pregnant women complained about the unpleasant itching; the bitter taste and the fact that they have to swallow too many tablets.

### ***Current Strategies for Preventing Malaria***

The World Health Organization in partnership with the Africa Region recommended a multi-pronged approach to reduce the burden among all pregnant women and children under five (WHO 2004). Two relatively simple interventions during pregnancy to reduce the incidence of malaria attributable-anaemia and low birth weight: intermittent preventive treatment (IPTp) using sulfadoxine-pyrimethamine (SP) in the second and third trimesters and the use of insecticide treated nets (ITN) were recommended by WHO (Gamble et al. 2006; Garner and Gulmezoglu 2006). IPTp consists in the administration

of a single curative dose of an efficacious anti-malarial drug at least twice during pregnancy - regardless of whether the woman is infected or not. The drug is administered under supervision during antenatal care visits (Briand et al. 2007).

Several research reports confirmed the practicability and effectiveness of IPTp and ITN in controlling malaria during pregnancy and in children under five. It is an effective strategy such that even a course during pregnancy works (Shulman et al. 1999). In areas of stable endemic malaria, where most malaria infections in adults are asymptomatic, use of ITNs by pregnant women has been shown to reduce malaria-related maternal morbidity significantly and improve birth outcomes, including the incidence of low birth weight. African leaders desirous to control malaria, in April 2000, adopted the Abuja Declaration in which the regional leaders committed to ensuring that 60% of pregnant women in malaria-endemic communities accessed effective prevention and treatment of malaria by 2005 (WHO 2004).

### ***The Ghanaian Situation***

Since 1999, Ghana has been involved in the international efforts to control malaria under the Roll Back Malaria (RBM) initiative. The strategy involves multi-sectoral and inter-sectoral partnerships working together with the goal of reducing death and illness caused by malaria by 50% by the year 2010. In this instance, the focus has been on research, case management, prevention and inter-sectoral collaboration among all stakeholders. Intermittent preventive treatment of malaria during pregnancy (IPTp) with sulfadoxine-pyrimethamine (SP) is a key component of the national strategy for malaria control by the

National Malaria Control Programme (NMCP). In 2004, the use of SP/IPTp and ITN in preventing malaria during pregnancy was implemented throughout the country. SP is administered in the second and third trimesters of pregnancy at one-month interval during antenatal visits (ANC) by Directly Observed Treatment method. We aim to identify in this thesis factors responsible for the decline in coverage of IPTp2/IPTp3 in the Keta Municipality.

## ***1.2 Problem Statement***

It is estimated that 500 million cases of malaria occur each year; and out of this one million persons loose their lives each year worldwide (Greenwood et al. 2008). Young children and pregnant women are two groups most at risk of infection. The result was the development of certain preventive strategies to control malaria during pregnancy. These included intermittent preventive treatment of malaria during pregnancy (IPTp) with sulfadoxine-pyrimethamine and the use of ITN. IPTp involves the administration of a full treatment dose of an effective anti-malarial drug at predefined intervals during pregnancy, beginning after quickening in the second trimester. SP ensures that the placenta is cleared of malaria parasites at the time of rapid fetal growth. Ghana adopted these preventive strategies some few years ago, where all pregnant women were supposed to receive at least two doses of SP in the second and third trimesters of pregnancy, ideally under direct observation at the time of routinely scheduled antenatal clinic visits.

The expectation was that this would lead to a reduction in malaria reported cases especially among pregnant women; unfortunately, that was not the case. Reports suggest that there has been increase in the annual malaria reported cases. A critical evaluation of the SP/IPTp programme revealed a phenomenon where the coverage of IPTp declines after the initial dose. Several research studies confirmed this phenomenon. A typical of them was the recent research study carried out in southern Ghana which reported of 77% of pregnant women taken IPTp1; 26% for IPTp2 and only 24% took IPTp3 (Hommerich et al. 2007).

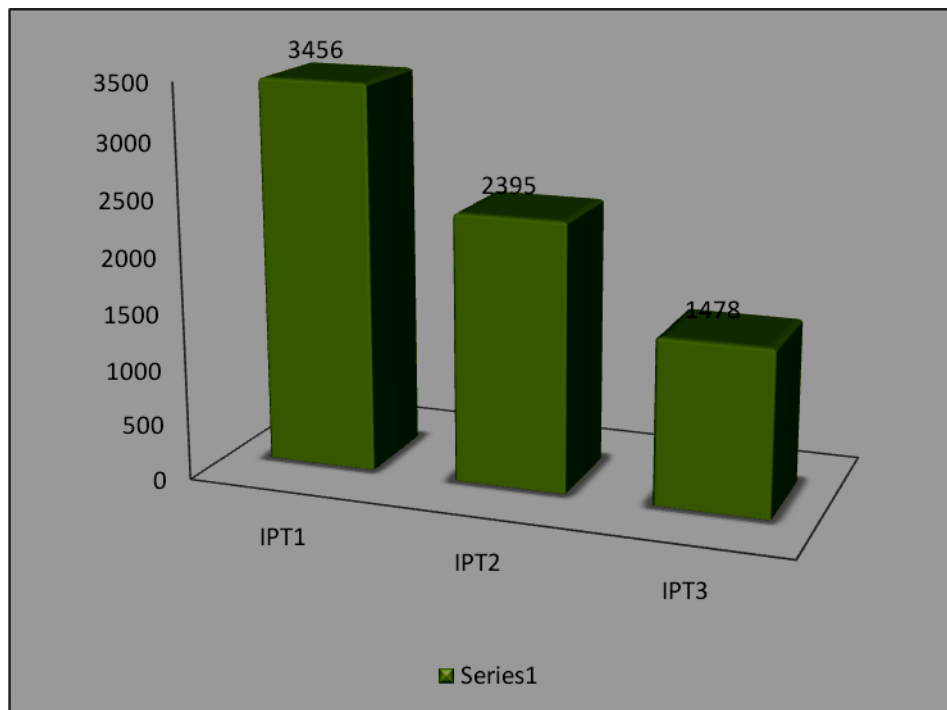
The Keta Municipality was not unique. In 2004 SP/IPTp and ITN were introduced to prevent malaria among pregnant mothers with the support from the Global Fund for Malaria. Data collected on the coverage over the past three years revealed a trend of continuous decline in IPTp2/IPTp3 confirming the general trend in the country. The table and the figure below illustrate what transpired in 2006.

**Table 1-1 IPTp Records - January – December 2006**

| IPTp Types (2006) | Total | % Defaulters |
|-------------------|-------|--------------|
| IPTp 1            | 3456  |              |
| IPTp 2            | 2395  | <b>30</b>    |
| IPTp 3            | 1478  | <b>38</b>    |

**Source: Keta Municipal Health Directorate 2006 Annual Report**

**Figure 1-1 TREND OF IPTp COVERAGE FROM JANUARY – DECEMBER 2006**



**Source: Keta Municipal Health Directorate 2006 Annual Report**

The table reveals a descending nature of IPTp coverage in the municipality. Also, available data from the Municipal Health Directorate indicates that in 2004, 5,551 pregnant women registered for ANC. Out of this figure 2,876 (52%) took IPTp1, while 1321 (24%) took IPTp2 but only 10.3% of them were given IPTp3. While in 2005, 3661 (61%) of 5,986 registered mothers took IPTp1; 2,750 (46%) took IPTp2 and 1,404 (23%) IPTp3. The year 2006 as depicted by the table and the figure was worse. About 3,456 (51%) of 6803 registered mothers took IPTp1, 2,395 (35%) IPTp2 while only 1,478 (22%) took IPTp3 (Keta DHD Annual Report 2006). Meanwhile, statistics available shows that on the average about 90% of the pregnant mothers in the Municipality attend ANC four times before delivery. The record of four times ANC attendance should suffice all pregnant women to receive the three required doses of IPTp holding other factors

constant. However, that was not the case as the number of pregnant mothers who accessed IPTp1 declined as they accessed the subsequent IPTp2/IPTp3. The result was a rise in malaria cases among pregnant women from 975 to 1012 cases in 2006. The question is what accounts for the decline in the subsequent doses – IPTp2 and IPTp3?

The high defaulting rate has the potential to derail or render ineffective yet another malaria prevention strategy in the country just like the previous chloroquine prophylaxis if the triggering factors are not researched into for possible solutions. It is clear that an operational research work such as this is needed to unearth these factors that are responsible for the decline in IPTp2/IPTp3 coverage in the Keta Municipality in particular and in the country as a whole. Mbonye et al. (2005) would not have put it in the right perspective than to say the efficacy of ITNs in malaria prevention was well documented, but the low coverage of ITNs in malaria endemic countries necessitates investigation on factors that limit access to this intervention.

### ***1.3 Justification for Study***

About 90% of the 500 million malaria cases each year occur in Africa. This means that the over 25 million pregnancies recorded in Africa each year are at risk of malaria infection; the results being high maternal death, high stillbirth, high neonatal death, spontaneous abortion, complicated malaria or placental infection as well as maternal anaemia. It is in the light of this that health managers over the years have made tremendous efforts of controlling malaria infection in pregnancy. In recent time, chloroquine prophylaxis was replaced by intermittent preventive treatment (IPTp) using

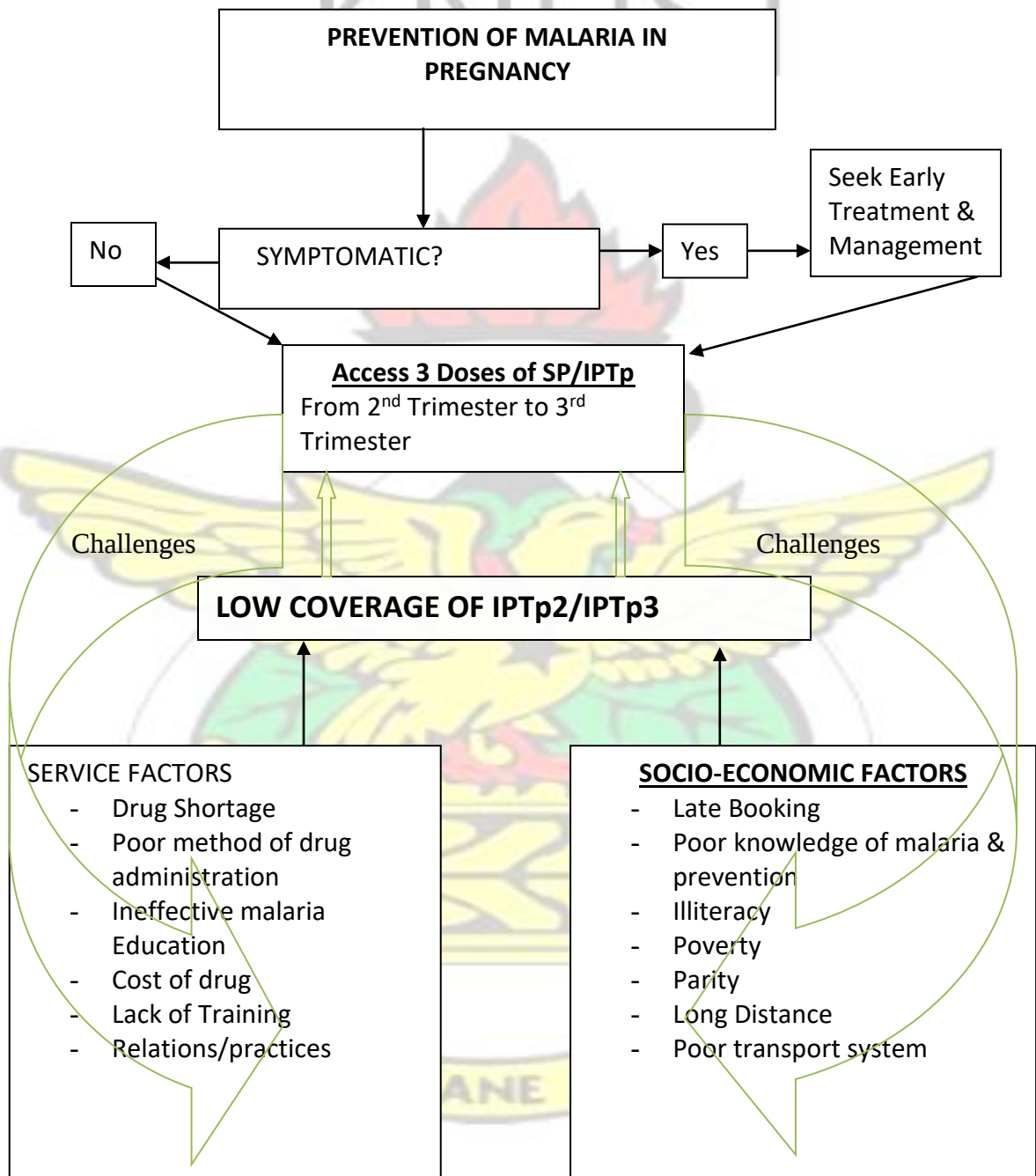
sulfadoxine-pyrimethamine as a result of parasite resistance and non-compliance from the pregnant mothers in taking the full doses. IPTp consists in the administration of a single curative dose of an efficacious anti-malarial drug at least twice during pregnancy - regardless of whether the woman is infected or not.

Several studies have shown the high efficacy of IPTp with SP, compared to CQ prophylaxis on placental infection, LBW, and severe maternal anaemia. Studies in Kenya and Malawi have shown that IPTp with (SP) has a beneficial impact on maternal and infant health. The report further showed that when SP/IPTp was delivered as part of antenatal care, it reduced significantly the prevalence of maternal anaemia and placental parasitaemia and the incidence of LBW (Parise et al. 1998; Verhoeff et al. 1998 and Shulman et al. 1999). Besides, Hommerich et al. (2007) in a study conducted in Ghana revealed that placental *P. falciparum* infection has reduced by 43-57% ( $P < 0.0001$ ) and maternal anaemia by 33% ( $P = 0.0009$ ), and median birth weight was 130 g higher ( $P = 0.02$ ), in women who had taken  $\geq 1$  dose of SP/IPTp. Sulfadoxine-pyrimethamine has proven to have a good safety profile in pregnancy and the regimen allows the health worker to directly observe treatment.

To ensure the achievement of the Abuja target of reducing death as a result of malaria by 50% by the year 2010, there was the need to identify the reasons why over the past four years of SP/IPTp programme implementation, pregnant mothers do not access the full three required doses of IPTp in the Keta municipality. The identification of these factors responsible for the decline in IPTp1 from the annual average of 50% to 22% of IPTp2

and IPTp3 would enable stakeholders to resolve them to be able to achieve the goal of preventing malaria during pregnancy.

#### 1.4 Conceptual Framework



### **1.5      *Explanation to conceptual framework***

Malaria infection in pregnancy as depicted by the conceptual framework could either be symptomatic or asymptomatic. Pregnant mothers with symptoms are advised to seek early treatment and management. Those without symptoms and treated mothers are advised to access three doses of SP after the first four months of gestation to prevent malaria infection. In accessing the three doses of SP, pregnant mothers encounter certain challenges; both service related and socio-economic; which in turn affect the coverage of IPTp most especially; IPTp2/IPTp3.

### **1.6      *Research questions***

1. What accounts for the decline in IPTp2/IPTp3?
2. At what gestational age do pregnant mothers normally book?
3. How many times do pregnant mothers attend ANC clinic before delivery?
4. Do pregnant mothers receive education on malaria and its prevention measures at ANC?
5. Has any ANC facility experienced stock-out of sulfadoxine-pyrimethamine the past 18 months?
6. Is the right method of administering SP being applied?
7. Does the distance from home to ANC clinic affect SP/IPTp coverage? And
8. What percentage of pregnant mothers own and slept under an insecticide-treated net the previous night?

## **1.7 Objectives**

### **1.7.1 General Objective**

To determine factors accounting for the decline in the administration of IPTp2/IPTp3 among pregnant mothers in the Keta Municipality.

### **1.7.2 Specific objectives**

1. To assess quality of ANC service in Keta Municipality with regards to attendance and education on malaria;
2. To ascertain stock availability of SP in the ANC clinics the past 18 months; and whether the right method of administering it is being applied;
3. To ascertain the accessibility of ANC service in terms of distance, time and means of transport; and
4. To determine the percentage of pregnant women who owned and slept under Insecticide-treated nets (ITNs) the previous night

## 2 CHAPTER TWO - LITERATURE REVIEW

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*. Besides, the Africa Region of the World Health Organization (WHO) experiences the majority of the global burden of malaria-associated maternal illness and low birth weight (WHO 2004). In areas of low or unstable malaria transmission, women of reproductive age have relatively little acquired immunity to malaria, and hence all pregnant women are at similar risk for malaria infection. Consequences in these settings include maternal illness, severe malaria with central nervous system complications, anemia and adverse reproductive outcomes, including stillbirths, abortions and LBW (Steketee et al. 1996; Luxemburger et al. 1997). Malaria infection contributes to pregnancy loss in the first trimester, while malaria infection during the third trimester contributes to premature delivery. Other consequences during pregnancy commonly associated with *P. falciparum* infection include hypoglycaemia, hyperpyrexia, severe haemolytic anaemia and pulmonary oedema (WHO 2000).

But stable transmission predominates in Africa south of the Sahara; consequently, this region bears the greatest burden of malaria infections during pregnancy. In these areas of high or moderate (stable) malaria transmission, the ill health effects are particularly apparent in the first and second malaria-exposed pregnancies. Despite the higher prevalence of parasitaemia and higher parasite density in pregnant women than non-pregnant women, *P. falciparum* infection in pregnant women in these areas is usually

asymptomatic (WHO 2004). In Ghana, malaria is a major cause of poverty and low productivity; it is hyper endemic and accounts for more than 44% of reported outpatient visits and an estimated 22% of under-5 mortality (Roll Back Malaria Monitoring and Evaluation Ghana, 2005). Yet, reported malaria cases represent only a small fraction of the actual number of malaria episodes in the population because the majority of people with symptomatic infections treat themselves at home and are not reported.

Although the serious impact of malaria infection during pregnancy has been known for a half century, coverage of pregnancies at risk for malaria infection according to World Health Organization (WHO) and national guidelines has been low in most malaria-endemic countries (WHO 2004). In Africa, the first malaria preventive strategies began in the 1950s. These consisted of weekly or bi-monthly prophylaxis with chloroquine (CQ) in West African countries and dapson-pyrimethamine (SP) in East African countries. A large number of trials demonstrated the efficacy of such a chemoprophylaxis in preventing low birth weight, maternal anaemia and placental malaria infection (Garner and Gulmezoglu, 2003; Cot and Deloron, 2003). Unfortunately, because of the growing resistance of parasites to these drugs and poor compliance of the women with the treatment, the strategies finally showed a low efficacy.

In 1998, it was proposed, but was implemented in 2004, that chloroquine prophylaxis should no longer be recommended, but replaced with Intermittent Preventive Treatment (IPTp) using Sulfadoxine-pyrimethamine (SP) for all pregnant women living in areas of stable malaria transmission (WHO 2004). IPTp involves the administration of a single

curative dose of an efficacious anti-malarial drug at least twice during pregnancy irrespective of whether the pregnant woman is parasitaemia. Currently, the most effective drug for IPTp is sulfadoxine-pyrimethamine (SP) because of its safety for use during pregnancy, efficacy in reproductive-age women and feasibility for use in programmes as it can be delivered as a single-dose treatment under observation by the health worker (WHO 2004). Most important, several studies have shown the high efficacy of IPT with SP, compared to CQ prophylaxis on placental infection, LBW, and severe maternal anaemia. Studies in Kenya and Malawi have shown that intermittent preventive treatment (IPT) with sulfadoxine-pyrimethamine (SP) has a beneficial impact on maternal and infant health. The report further showed that when SP-IPT was delivered as part of antenatal care, it reduced significantly the prevalence of maternal anaemia and placental parasitaemia and the incidence of LBW (Parise et al. 1998; Verhoeff et al. 1998 and Shulman et al. 1999).

Besides, Hommerich et al. (2007) in a study conducted in Ghana revealed that placental *P. falciparum* infection was reduced by 43-57% ( $P < 0.0001$ ) and maternal anaemia by 33% ( $P = 0.0009$ ), and median birth weight was 130 g higher ( $P = 0.02$ ), in women who had taken  $\geq 1$  dose of SP/IPT. Further studies conducted by Mbonye et al. (2008) in Uganda also confirmed the efficacy of SP/IPT in reducing prevalence of malaria episodes from 906 to 160. Anaemia was significantly less prevalent in both arms and the proportion of LBW was low as 6.0% with the new delivery system versus 8.3% with health units. Again, in another study conducted in an area of intense perennial malaria transmission in northern Ghana, Mockenhaut et al. (2007) revealed that the incidences of

malaria and severe anemia reduced by 22.5% (95% confidence interval, 12 to 32%) and 23.6% (95% confidence interval, 4 to 39%), respectively. IPTp with SP has equally been shown through studies to be efficacious in clearing the malarial parasite in HIV infected pregnant women. The first trial to probe the effect of HIV on the efficacy of IPTp showed that HIV-infected women might require at least three courses to achieve the benefits seen in HIV-negative women who receive two courses (ter Kuile et al., 2007). However, HIV-infected persons with a low CD4 cell count and anaemia have an increased risk of anti-malarial treatment failure (Shah et al. 2006).

Other studies revealed that even women who booked late and received only one dose of sulphadoxine-pyrimethamine benefited significantly from the intervention. IPTp with SP is an effective, practicable strategy to decrease the risk of severe anaemia in primigravidae living in malarious areas (Shulman et al. 1999). The observation was that the baby is still growing and needed a protection, and that, there is no longer contraindication in using SP close to delivery. However, a study found an increased risk of kernicterus in neonates treated with sulphonamides, but no further study confirmed it. Besides, two recent studies highlighted the relevance of protection in late pregnancy. Van Eijk et al. (2004) found that IPTp had a higher efficacy when pregnant women took the last dose close to delivery. Again, Filler et al. also confirmed a better protection in women randomized in a SP-monthly group, who received their last dose of SP close to delivery than in women taking the usual two-dose SP/IPTp. Several studies however, have suggested that further studies should be conducted on the timing of the drug

administration, the optimal dosing interval as well as pharmacokinetic data on pregnant women for SP (Briand et al. 2007).

In areas of stable endemic malaria, where most malaria infections in adults are asymptomatic, use of ITNs by pregnant women has been shown to reduce malaria-related maternal morbidity significantly and improve birth outcomes, including the incidence of low birth weight. A number of studies have found that insecticide-treated nets (ITNs) provide varying degrees of protection against malaria morbidity, anaemia and LBW (Heggenhougen et al. 2003). Although, some studies conducted in Gambia, found the untreated nets to reduce the number of effective bites, it was not enough to reduce morbidity from malaria (Snow et al. 1988). Aikins et al. (1993) and Thomson et al. (1996) have also demonstrated that irrespective of the ethnic group, area, habitat and distance from the River Gambia, malaria prevalence decreased with use of ITNs. Insecticide-impregnated mosquito nets were equally found to be the more efficient ways of reducing deaths in children fewer than 10 years in rural Gambia (Aikins et al. 1998). Further studies also demonstrated that the use of ITNs in pregnancy reduces maternal parasitaemia, anaemia and premature deliveries, increases mean birth weight and subsequently reduces neonatal and infant mortality (Dolan et al. 1993; D'Alessandro et al. 1995). In addition, treated nets compared with untreated nets showed a relative risk of 0.77 of child mortality. About six lives can be saved each year for every 1000 children protected with insecticide-treated nets (Lengeler 2000).

In 2000 the Roll Back Malaria (RBM) movement set a target of providing at least 60% of pregnant women with an ITN and at least two courses of IPTp by the year 2010 (WHO 2000). However, reports have it that the coverage in many African countries is very low in spite of the fact that across Africa, an average of 70% of pregnant women attend antenatal clinics at least once during pregnancy, and many attend at least twice (WHO 2004). In Kenya, one of the first countries to implement IPTp, the national coverage with two doses of SP was only 4% five years after implementation. Further more, out of the 1814 women surveyed, only 5% had slept under an ITN while only 5% had received two or more doses of SP as a presumptive treatment; despite 96% of ANC providers were aware of IPTp (Guyatt et al. 2004). Households in The Gambia spend considerable amounts on a range of malaria prevention products and activities throughout the year. But, bed nets represent a relatively small proportion of this expenditure even though they are perceived to be the most efficient and effective method of malaria controls (Wiseman 2006).

Coupled with the low coverage of IPTp and ITN is the report of increasing drug resistance in Eastern and Southern African countries and spreading throughout West Africa. Jima et al. (2005) recommended that in the presence of the low efficacy of sulfadoxine-pyrimethamine, the use of artemether-lumefantrine for the treatment of uncomplicated falciparum malaria is the best choice. More so, it has been detected that the level of treatment failure of SP is higher than the WHO recommended tolerable levels an indication that there is the need for an immediate review of the existing national anti-malarial treatment guideline (Jima et al. 2005). Several studies have proposed further

studies into the efficacy, tolerability, and acceptability of available alternatives such as Artemisinin-based combination therapy, Amodiaquine, Lapdap, Artemether-lumefantrine, and Mefloquine etc. to replace SP.

However, the decision to replace SP for IPTp with other drugs should be evaluated in terms of the ideal properties of the drug such as, having a long half-life; as it has been suggested that IPTp had a prophylactic rather than a treatment effect and that the duration of a prophylaxis was the most important determinant of IPTp efficacy. Secondly, it should be safe during pregnancy, and well tolerated to ensure a high compliance with the treatment in women who are often asymptomatic when infected with malaria; thirdly, being easy to administer (ideally a single dose); and lastly, at an affordable cost (Briand et al. 2007). Mefloquine is presently one of the most attractive options. It has a long half-life and is highly efficacious in African countries. Most studies have revealed that MQ was safe for use in pregnancy (Steketee et al. 1996; Vanhauwere et al. 1998).

However, other studies have established otherwise. That there is a significant excess of adverse neuropsychiatric events of intermediate degrees of severity associated with the use of mefloquine (Barrett et al. 1996). Other studies confirmed that many Western travelers are unwilling to take mefloquine because of the recent public controversy regarding its common serious adverse effects (Shanks and Edstein 2005). Again, Carme et al. (1997) reported that even though all side effects were transient and judged to be mild to moderate by the subjects themselves, these results back up the fact that MQ should be used with caution.

The Artemisinin based combination drug, Artemether-lumefantrine has shown very high (99.1%) clinical and parasitological cure for the treatment of uncomplicated falciparum malaria with no reports of adverse reaction that required withdrawal of treatment or discontinuation of follow up (Jimaet al. 2005; Barnes 2005). That is also one of the alternatives being researched into for use of IPTp. Apart from that, Amodiaquine alone or in combination with sulfadoxine-pyrimethamine, although associated with minor side effects, has been reported to be effective when used to treat malaria in pregnancy (Tagbor et al. 2006). Other alternatives being considered are SP plus Azithromycine, Chlorproguanil-dapsone; Piperaquine-used in combinations with other anti-malarias rather than used alone might be one of the most promising options for IPTp.

Whatever the alternative drug, the hurdle is the high cost associated with these alternatives. Mefloquine remains very expensive in spite of the recent cost decline. Equally, ACT, are still very expensive and less easily deliverable as they require multiple treatment doses that could not be given as a directly observed therapy in the ANC clinic. Proguanil, in addition to problems of compliance, has altered pharmacokinetics during pregnancy, and a higher maintenance doses are required. Until, the final decision is made by the World Health Organization (WHO) as to which alternative drug should be used in place of sulfadoxine-pyrimethamine; SP remains currently the recommended and most effective drug for IPTp in terms of its cost, safety during pregnancy, efficacy in reproductive-age women and feasibility for use in programmes.

### **3 CHAPTER THREE - METHODOLOGY**

#### **3.1 *Profile of the study area***

##### **3.1.1 Name and Location**

The study took place in the Keta Municipality of the Volta Region, Ghana (see maps I and II). The municipality lies at the south-eastern corner of the Volta Region. It is between longitude 0°30E and 1°05E and latitude 5°45N and 6°5N. The municipality shares common boundaries with the Akatsi district to the North, Gulf of Guinea to the South, South Tongu district to the West and Ketu South district to the East. The total population of the area projected from the 2000 census, based on annual growth rate of 1.8% was 149,640 as at 2006. Women in fertility age (WIFA) constitute about 24% amounting to about 35,914 according to 2006 Demography.

##### **3.1.2 Geographical and Administrative Features**

The Municipality is located at the coastal belt of the country. It has a total land area of about 1086Km<sup>2</sup> out of which about a third is covered with water bodies. Among the water bodies, Keta lagoon is the largest- it is about 1.2km wide and 32km long. The Keta lagoon is an important water body in the municipality and is a designated wetland area or RAMSAR site. It is a source of much fish production and wealth creation for communities lying along it. Mr Kofi Ahianbor is the Municipal Chief Executive, while Dr. Atsu Seake-Kwawu is the Municipal Director of Health Services.

### **3.1.3 Ethnicity**

The people in the Municipality are mainly Ewes, constituting about 98.8%. The remaining ethnic minorities are Gas and Akans. A number of other tribes from the West African sub-region like the Kabral, Hausas come to do business such as selling and farming.

### **3.1.4 Economic Activity**

Keta municipality is mainly agricultural district, with the majority of the people engaged in crop farming, fishing, livestock keeping and other related trading activities. Vegetables are the main crops grown under irrigation on the flood plains along the coast, while other crops such as maize, cassava, cowpea and potatoes are grown in the northern parts. The vegetables cultivated are shallot, pepper, tomato and okro. Apart from crop farming, a significant number of the inhabitants are fishermen. Fishing is carried out in the sea, lagoons and creeks. Other occupations that exist in the municipality include processing of fish and cassava, sugar cane juice distilling, coconut-oil extraction, salt mining, sand winning, weaving of kente, straw mat (ketsiba) and pouch (kevi), and pottery. Fish and salt produced from the area are marketed far and wide within Ghana and outside. The people rely mainly on these produce for income. As such poverty levels increase when fish stocks get depleted in the sea and lagoon and this has been the case over the past four to five years; malnutrition in children and pregnant women generally increases during this period. Major markets within the municipality are held at Keta, Anloga, Anlo-Afiadenyigba, and Atiavi every five days.

### **3.1.5 Transport and communication**

There are two modes of transport system in the Municipality – road and water transport. The road transport is the most predominant, accounting for more than 98% of the journeys made. A first class road (66.5km.) traverses the southern part along the coast from Keta through Anloga joining the main Accra-Aflao road at Dabala. However, the middle belt has a difficult terrain since most of the areas are covered with creeks and lagoons. Communication between the district, other district capitals, regional capital and national capital is quite good via telephone or fax. E-mail communication is also available.

### **3.1.6 Health Service Delivery**

#### **3.1.6.1 Sub Municipals**

To speed up administrative activities and reach all the people, the area has been divided into six sub municipals. These sub municipals are headed by the following towns: Keta, Tegbi, Anloga, Anyanui, Anyako and Shime.

#### **3.1.6.2 Health Facilities**

Keta Municipality is endowed with a number of health facilities, which provide various levels of services. Ownership is both private and public. The municipality has 22 static health facilities consisting of 2 Hospitals, 10 Health centers, 5 Private clinics, 4 Private maternity homes, 1 CHPS compound and 94 Outreach clinic sites. The Catholic Church, Ghana Health Service and private medical practitioners manage these facilities.

### **3.1.6.3 Major Causes of Ill Health**

The top ten diseases dominating Out-Patient Department (OPD) attendances are Malaria (28.3%), ARI (5.7%), Skin Diseases /Ulcer(4.5%), Hypertension (2.8%), Diarrhea (2.1%), Home & occ. Acc. (1.2%), Anaemia (1.0%), Typhoid fever (1.0%), Malaria in pregnancy (0.6%) and Rheumatic & joint pains (0.6%).

### **3.1.6.4 Causes of Inpatient Admissions**

Malaria was often the topmost cause of hospital admissions accounting for (19.6%), while Gastro Enteritis is the second leading cause of admission amounting to (4.3%) of the total admissions. Much lower percentages of admission were attributed to other disease conditions in particular, Gastro Enteritis fever, Hypertension, CVA; Road Traffic Accident contributed 3.5%, 3.4%, 2.7% and 1.9% respectively.

### **3.1.6.5 Major Causes of Mortality**

Available statistics indicates CVA is the principal cause of death in the Municipality, constituting (20.0%), Malaria (7.2%), Septicaemia (6.9%), PTB (6.4%), Anaemia (6.1%), and Hepatitis (4.2%). The rest are Pneumonia (3.6%), Gastro Enteritis (3.1%), HIV/AIDS (2.8%) and CCF (2.2%).

### **3.1.6.6 Available Human Resource in the Municipal Health Directorate**

The Keta Municipal Health Services boasts of 4 Medical Officers, 114 Nurses and 236 others consisting of Nursing Assistants, Paramedics, Administration and Support Service Staff and Technical Officers.

### 3.1.6.7 Specialist Services

The level C facilities, namely, Keta Government Hospital and Sacred Heart Hospital provide the necessary surgical and obstetric services and general in-patient care. The Keta Government Hospital has one specialist, while the Sacred Heart Hospital of Abor has one general Medical Doctor.

### 3.1.6.8 Midwifery Services

The Municipality has a total of 29 trained midwives who offer static midwifery services across the length and breathe of the municipality.

### 3.1.6.9 Diseases of Public Health Importance

**Table 1-1 Three years trend of epidemic prone diseases**

| Disease                       | 2004 | 2005                          | 2006 |
|-------------------------------|------|-------------------------------|------|
| Cerebrospinal Meningitis      | 4    | 0                             | 0    |
| Cholera                       | 208  | 1                             | 23   |
| Yellow Fever                  | 0    | 7                             | 5    |
| Measles                       | 13   | 8 suspected<br>5 investigated | 3    |
| Acute Flaccid Paralysis (AFP) | 2    | 3- no wild virus isolated     | 1    |

There has been a downward trend of meningitis, cholera, yellow fever, measles and AFP over the years as a result of very effective health promotional activities such as radio education of the public, immunization and improvement in curative services.

**Table 1-2 Trend of diseases with specific control**

| <b>Diseases</b>  | <b>2003</b> | <b>2004</b> | <b>2005</b> | <b>2006</b> |
|------------------|-------------|-------------|-------------|-------------|
| Guinea Worm      | 0           | 0           | 0           | 0           |
| Buruli Ulcer     | 0           | 1           | 0           | 0           |
| Leprosy          | 4           | 3           | 4           | 2           |
| Neonatal Tetanus | 0           | 1           | 2           | 3           |
| Tuberculosis     | 133         | 197         | 144         | 154         |
| Malaria          | 27,407      | 32,992      | 23,135      | 27,559      |

Guinea worm and Buruli ulcer have been eradicated during the periods under consideration in the Municipality. But Leprosy and Neonatal tetanus appear to be hovering around 2-4 cases a year. Tuberculosis is characterized by ups and downs. For instance, it fell from 197 cases in 2004 to 144 cases in 2005 and climbed up to 154 cases in 2006. It appears the control measures put in place were not being sustained in order to have a continuous decline in it. Malaria which is number one cause of ill health in the municipality, registered a 19% increase in 2006 despite the control measures the Municipal Health Directorate has put in place especially for pregnant mothers.

### ***3.2 Study Type, Design and Method***

A cross-sectional study was employed. It was designed to establish factors accounting for the decline in IPTp2/IPTp3 coverage among pregnant mothers in the Keta Municipality.

### ***3.3 Data Collection Techniques and Tools***

Structured questionnaire was used to collect data from pregnant women with gestational age of 28 weeks and above and nursing mothers whose babies were not more than seven months old. The team, including the principal investigator used the questionnaire to elicit responses from the eligible respondents through direct interviews in the local language. For ease of administration and relaxed interview atmosphere, greater part of the questionnaire was structured. ANC providers were however given loosely structured, self-administered questionnaire to respond to.

### ***3.4 Study Population***

The study involved pregnant women with a gestational age of 28 weeks and above, and nursing mothers whose babies were not more than seven months old. These women aged between 15 and 49 years and attended any of the ANC clinics in the Keta Municipality. To complement data generated from the principal respondents, ANC providers were also interviewed. Pregnant women who were in their first and second trimester as well as mothers nursing children beyond seven months were excluded. The study looked at the socio-economic and service related factors that accounted for the decline in the coverage of IPTp2/IPTp3 in the municipality.

### **3.5 Study Variables**

#### **3.5.1 Dependent or the main outcome variable**

The key dependent variable which was studied was ‘the Decline in IPTp2 and IPTp3’.

#### **3.5.2 Independent variables**

The independent variables outlined for the study included

- Demographic Characteristics
- Antenatal Care Attendance
- Education on malaria prevention
- Availability of SP
- Right method of administering SP (DOT)
- Distance from home to ANC clinics
- Means of transport
- Ownership and use of ITN

### **3.6 Sampling Techniques**

The coverage of IPTp3 was as low as 25% of registrant pregnant women attending ANC clinics in the Keta municipality. We sought to test for an association between some socio-economic and service related characteristics and SP/IPTp coverage. The multistage sampling technique was adopted for selection of respondents. The rationale for adopting this sampling method was to estimate IPTp coverage to within  $\pm 10\%$  points of the true proportion, with 95% confidence. It allowed a small number of target populations to be sampled and at the same time sampled with probability proportionate to size, which

allowed the larger populations to have a greater chance of being selected without compromising the statistical validity of the data to be generated.

All the 128 communities in the municipality with their respective 2007 estimated populations were used as the sample frame. A statistical application software, Stata (version 9) was used in selecting 50 communities randomly from among the municipality's 128 communities with the 2007 estimated population of 152,484. In the second stage of sampling, each of these 50 communities was zoned into four cardinal parts – east, west, south and north. From each part, any household was entered and eligible subjects that met the criteria (seven months and above pregnant as well as mothers nursing babies not more than seven months old) were interviewed. On the average, 18 subjects were interviewed from each community. This process was repeated in all the 50 communities that gave a sample size of 900. A total of 25 midwives in charge and others were equally interviewed at the health facilities to complement data gathered from the principal respondents.

### ***3.7 Pre-testing***

Questionnaires were pre-tested in one of the communities located in the Keta Municipality, Aborlove precisely. This enabled the determination of the suitability of the tools in drawing the right responses from the respondents. In doing so, the eight research assistants who were recruited and trained were engaged to do the pre-testing. Forty-five respondents comprising pregnant and nursing mothers were interviewed. Few corrections

were made to certain questions and two additional questions were introduced to take care of a gap observed during the pre-testing.

### **3.8 Data Handling**

A template was created on the computer using SPSS (version 15.0) application software. Data was entered onto the computer, mindful of the legal values and the appropriate fields. The entries were subjected to serious scrutiny to check for any disparity and correction.

### **3.9 Data Analysis**

Analysis was undertaken using SPSS (version 15.0). Initially, descriptive statistics test was performed to generate the count frequencies and the proportions on the variables. These frequencies were merged into tables that described the same objective. Nonparametric test (Chi-Square test) was undertaken on combined data to examine factors that explained the decline in the coverage of IPTp2/IPTp3 among the pregnant mothers. The significance of differences between proportions was tested using the chi-square test.  $X^2$  statistic with a p-value of less than 0.05 was considered very significant in predicting the outcome measure.

### **3.10 Ethical Consideration**

We sought permission from the Keta Municipal Health Directorate and the Municipal Assembly to permit the exercise to take place. Again permission was sought from the Traditional Rulers, Municipal Assembly Members and Opinion Leaders in the

communities visited for the data collection. An introduction letter bearing the names of the principal investigator and the research assistants was given the community leaders as well as the midwives in charge of the health facilities to enable ease of identification. On every occasion, the purpose of the research work was explained to the participants, their confidentiality assured and informed consent sought before they were interviewed.

### ***3.11 Limitations of Study***

The research assistants saw the exercise as government sponsored and so were a bit difficult as to how much they wanted to take. The pregnant mothers were also of the view that the exercise would line the pockets of the data collectors and so were not willing to response to the questions; some had to be given a token of gift or promised to be given something latter before they accepted to response to the questions. Also, Health personnel were unwilling to reveal the drawbacks of the programme, especially on the issue of shortage of drug.

### ***3.12 Assumptions***

We assumed that the training given the research assistants and the trials they were taken through especially during the pilot test of the research instruments would reduce to the barest minimum the element of bias.

## 4 CHAPTER FOUR - RESULTS/STUDY FINDINGS

### 4.1 Demographic Characteristics of Principal Respondents

The study was conducted in the Keta Municipality. In all, 900 women, of whom 302 were pregnant with a gestational age of 28 weeks or more, plus 598 nursing mothers of babies not more than seven months old; and who attended any ANC clinic in the municipality were sampled and interviewed. They responded to structured questions on face-to-face basis. To augment data generated, 25 midwives in the municipal health facilities were also interviewed. Table 4.1 shows the differences in the demographic characteristics of the pregnant mothers.

**Table 3-3 Demographic characteristics of pregnant mothers**

| Age            | Pregnant<br>Number | Mothers<br>% |
|----------------|--------------------|--------------|
| 15 – 19 years  | 164                | 18.2         |
| 20 – 30 years  | 470                | 52.2         |
| 31 – 35        | 155                | 17.2         |
| 36+            | 111                | 12.3         |
| Marital Status |                    |              |
| Married        | 773                | 85.9         |
| Not Married    | 41                 | 4.6          |
| Separated      | 11                 | 1.2          |
| Cohabiting     | 75                 | 8.3          |
| Religion       |                    |              |
| Christian      | 517                | 57.4         |
| Traditional    | 281                | 31.2         |
| Muslim         | 6                  | .7           |
| None           | 95                 | 10.6         |
| Parity         |                    |              |
| None           | 118                | 13.1         |
| One            | 229                | 25.4         |

|                   |     |      |
|-------------------|-----|------|
| Two               | 218 | 24.2 |
| More than Two     | 334 | 37.1 |
| Educational Level |     |      |
| None              | 169 | 18.8 |
| Primary           | 303 | 33.7 |
| Junior Secondary  | 368 | 40.9 |
| Senior Secondary  | 51  | 5.7  |
| Post Secondary    | 9   | 1.0  |
| Occupation        |     |      |
| None              | 239 | 26.6 |
| Self employed     | 518 | 57.6 |
| Wage earners      | 27  | 3.0  |
| Others            | 115 | 12.8 |

A total of 789 (88%) pregnant mothers were aged between 15 and 35 years, while 111 (12%) were 36 years and above. Majority of them 470 (52.2%) were between 20 and 30 years while, 155 (17.2%) fell between 31 and 35 years. These two groups form part of the human resources of the municipality. The Municipality shared in the alarming rate of teenage pregnancy as a total of 164 (18.2%) of her girl-child of school-going age were pregnant or nursing babies. On the issue of marriage, 773 (85.9%) of the pregnant mothers were married. While 41 (4.6%) of them were not married, 11 (1.2%) of them had a separation and the rest of 75 (8.3%) were cohabitating with their partners. In terms of religion, 517 (57.4%) were Christians, 281 (31.2%) were traditionalists while, 6 (.7%) of them were Muslims and 95 (10.6%) did not belong to any of the religions. On the item of gravidae, 347 (38.5%) of the women were primigravidae, while 218 (24.2%) of them were secundigravidae and 334 (37.1%) were multigravidae.

On educational attainment, 169 (18.8%) had no formal education at all, 303 (33.7%) obtained a primary education, while 368 (40.9%) had a basic or middle school education.

Fifty-one (5.7%) secondary education while 9 (1.0%) of them had a post secondary education. Two hundred and Thirty nine (26.6%) were not engaged in any income generating activity at all, 518 (57.6%) of them were self-employed in productive activities such as fishing, farming as well as petty trading. Only 27 (3.0%) of the pregnant mothers were working in the formal sector mostly as pupil-teachers. The rest, 115 (12.8%) were helping hands to others in the informal sector. This category included women who helped others fry, smoke or dry fish, cook at the chop bars and sell in stores for others.

## 4.2 Quality of ANC service

**Table 3-4 Gestational ages at first attendance and total ANC attendance**

| <b>Gestation age at first ANC attendance</b>                       | <b>Frequency</b> | <b>Percent</b> |
|--------------------------------------------------------------------|------------------|----------------|
| 1. No booking at all                                               | 9                | 1.0%           |
| 2. First trimester                                                 | 402              | 45.0%          |
| 3. Second trimester                                                | 453              | 50.7%          |
| 4. Third trimester                                                 | 29               | 3.2%           |
| <b>Total</b>                                                       | <b>893</b>       | <b>100.0%</b>  |
| <b>Total ANC attendance (women pregnant at the time of survey)</b> | <b>Frequency</b> | <b>Percent</b> |
| None                                                               | 6                | 2.0%           |
| Once                                                               | 22               | 7.3%           |
| Twice                                                              | 66               | 21.9%          |
| Thrice                                                             | 94               | 31.2%          |
| Four Times                                                         | 51               | 16.9%          |
| More than Four Times                                               | 62               | 20.6%          |
| <b>Total</b>                                                       | <b>301</b>       | <b>100.0%</b>  |
| <b>Total ANC attendance (nursing mothers)</b>                      | <b>Frequency</b> | <b>Percent</b> |

|                      |            |               |
|----------------------|------------|---------------|
| None                 | 7          | 1.2%          |
| Once                 | 23         | 3.8%          |
| Twice                | 49         | 8.2%          |
| Thrice               | 109        | 18.2%         |
| Four Times           | 131        | 21.9%         |
| More than Four Times | 279        | 46.7%         |
| <b>Total</b>         | <b>598</b> | <b>100.0%</b> |

Out of the 893 pregnant mothers interviewed, 9 (1.0%) of them did not attend ANC at all, 402 (45.0%) of them made their first ANC attendance in the first trimester, 453 (50.7%) in the second trimester while, 29 (3.2%) had their first attendance in the third trimester. Seven of the women interviewed did not respond to the question. All pregnant women in their second and third trimesters were supposed to access three doses of sulfadoxine-pyrimethamine to clear them of malaria parasites. Holding that SP was always available at the health facilities, it meant that 855 (95.7%) of the pregnant mothers would have benefited from the required three doses by the time they deliver. ANC attendances were higher (99% at least once; 95% at least twice; 87% thrice while 47% attended ANC more than four times) when those currently pregnant were excluded from the analysis. The figures suggest 519 (87%) of the pregnant mothers could benefit from the required three dosage of SP if other factors were in place.

#### 4.2.1 Education on malaria and prevention measures during ANC

4.2.2 Table 3-5 Education of pregnant women on malaria and prevention measures

| Frequency on education of pregnant women on malaria prevention measures | Frequency        | Percent        |
|-------------------------------------------------------------------------|------------------|----------------|
| Yes                                                                     | 695              | 77.6%          |
| No                                                                      | 201              | 22.4%          |
| <b>Total</b>                                                            | 894              | 100.0%         |
| <b>Can you loose your life due to malaria?</b>                          | <b>Frequency</b> | <b>Percent</b> |
| Yes                                                                     | 821              | 91.2%          |
| No                                                                      | 79               | 8.8%           |
| <b>Total</b>                                                            | 900              | 100.0%         |
| <b>Can babies loose their lives due to malaria?</b>                     | <b>Frequency</b> | <b>Percent</b> |
| Yes                                                                     | 843              | 93.7%          |
| No                                                                      | 56               | 6.2%           |
| <b>Total</b>                                                            | 899              | 99.9%          |
| <b>Identification of effects of malaria</b>                             | <b>Frequency</b> | <b>Percent</b> |
| 1. Did not identify any effect                                          | 210              | 23.3%          |
| 2. Identified 5 effects or more                                         | 63               | 7.0%           |
| 3. Identified 4 effects                                                 | 26               | 2.9%           |
| 4. Identified 2-3 effects                                               | 91               | 10.1%          |
| 5. Identified only 1                                                    | 510              | 56.7%          |
| <b>Total</b>                                                            | 900              | 100.0%         |
| <b>Identification of malaria prevention measures</b>                    | <b>Frequency</b> | <b>Percent</b> |
| 1. Did not identify any measure                                         | 79               | 8.8%           |
| 2. Identified 5 measures or more                                        | 76               | 8.4%           |
| 3. Identified 4 measures                                                | 27               | 3.0%           |
| 4. Identified 2-3 measures                                              | 151              | 16.8%          |
| 5. Identified only 1                                                    | 567              | 63.0%          |
| <b>Total</b>                                                            | 900              | 100.0%         |

Six hundred and ninety-five (77.6%) of the pregnant mothers interviewed recalled they were given education on malaria prevention measures any time they attended ANC clinic. While 201 (22.4%) of them said no; they were not given education on malaria prevention measures. Asked whether they could loose their lives as a result of having malaria, 821

(91.2%) of the women interviewed responded in affirmative, while 79 (8.8%) of them said no. Pressed further to confirm their knowledge of malaria, the question of whether the unborn and born babies could also loose their lives because of malaria was asked. Eight hundred and forty-three (93.7%) of them said yes while 56 (6.2%) said no. The study results show that some amount of education on malaria goes on at the ANC resulting in the high level of awareness of malaria among pregnant mothers. However, same levels of awareness were not demonstrated in identifying effects of malaria and prevention measures.

Of the 900 pregnant mothers, 210 (23.3%), 79 (8.8%) of them did not identify any effect of malaria nor prevention measures respectively; 91 (10.1%) of them identified 2 or 3 of the effects, 26 (2.9%) of the eligible women mentioned 4 effects, and 63 (7.0%) were able to identify 5. More than half of the women interviewed 510 (56.7%) could only identify an effect. The trend was the same for prevention measures. More than half 567 (63.0%) of the women interviewed only managed to identify one prevention measure. The results contradicted the earlier results on the level of awareness of malaria among the pregnant mothers; while more than half (90%) of the women knew that malaria was dangerous to both the mother and the unborn child, the same level could not be said of the effects and prevention measures of malaria. This perhaps could be interpreted to mean that education on the topic during ANC was not well carried out or the women simply forgot what they were taught at the ANC clinics.

### 4.3 Drug supply and administration at the health facilities

Table 3-6 SP availability, dosage and the cost incurred

| Information on uptake of SP at ANC clinic                      | Frequency  | Percent       |
|----------------------------------------------------------------|------------|---------------|
| Yes                                                            | 674        | 75.2%         |
| No                                                             | 222        | 24.8%         |
| <b>Total</b>                                                   | <b>896</b> | <b>100.0%</b> |
| Number of SP doses taken                                       | Frequency  | Percent       |
| 1. Did not take any dose                                       | 96         | 10.7%         |
| 2. First dose (IPTp1)                                          | 208        | 23.3%         |
| 3. Second dose (IPTp2)                                         | 300        | 33.6%         |
| 4. Third dose (IPTp3)                                          | 290        | 32.4%         |
| <b>Total</b>                                                   | <b>894</b> | <b>100.0%</b> |
| Number of doses of SP expected to take                         | Frequency  | Percent       |
| 1. One dose                                                    | 14         | 1.9%          |
| 2. Two doses                                                   | 50         | 6.8%          |
| 3. Three doses                                                 | 543        | 74.2%         |
| 4. Do not know                                                 | 125        | 17.1%         |
| <b>Total</b>                                                   | <b>732</b> | <b>100.0%</b> |
| Ever received information on SP stock out at the ANC when due? | Frequency  | Percent       |
| 1. Yes                                                         | 60         | 7.0%          |
| 2. No                                                          | 836        | 93.0%         |

|                                         |                  |                |
|-----------------------------------------|------------------|----------------|
| <b>Total</b>                            | 896              | 100.0%         |
| <b>Payment for SP by pregnant women</b> | <b>Frequency</b> | <b>Percent</b> |
| 1. Yes                                  | 124              | 15.5%          |
| 2. No                                   | 676              | 75.1%          |
| <b>Total</b>                            | 800              | 100.0%         |

Asked whether they were counseled during ANC to take SP at the health center when they were due, 674 (75.2%) of the women interviewed responded positively, while 222 (24.8%) said no; they were not given an information of the sort. On how many times the women interviewed took SP, 96 (10.7%) did not take SP at all; and even though, 798 (89.2%) of them took IPTp1, only 300 (37.5%), 290 (36.3%) benefited from IPTp2, IPTp3 respectively. A confirmation of the defaulter rate in the coverage of the subsequent IPTp2/IPTp3 in the municipality as earlier indicated. More than half 543 (74.2%) of the pregnant mothers recalled they were supposed to take three doses of SP before it was time to deliver, while the rest either did not know or mentioned number of doses that were not correct. Sixty (7%) of the pregnant mothers interviewed confirmed there was a time they went in for SP but were not given because the drug was not there. The malaria prevention programme through SP-IPTp for pregnant women is free but when the question of whether they paid for SP any time they were given, 124 (15.5%) of the women interviewed responded yes.

### 4.3.1 Right method of administering SP

**Table 3-7 Methods of administering SP and source of water**

| <b>Method of Administering SP</b>            | <b>Frequency</b> | <b>Percent</b> |
|----------------------------------------------|------------------|----------------|
| 1. At the ANC clinic - DOT                   | 747              | 93.4%          |
| 2. At home                                   | 51               | 6.4%           |
| 3. Other places                              | 2                | .3%            |
| <b>Total</b>                                 | 800              | 100.0%         |
| <b>Source of water for SP administration</b> | <b>Frequency</b> | <b>Percent</b> |
| 1. Supplied by the health facility           | 471              | 62.0%          |
| 2. Bought my own water                       | 289              | 38.0%          |
| <b>Total</b>                                 | 760              | 100.0%         |

SP is administered using the Directly Observed Treatment (DOT) method of administration. Even though, greater number of the pregnant mothers interviewed claimed to have taken the drug at the clinic under the supervision of a midwife, some others 51 (6.4%) also took the drug in the house and other places. Why didn't they take the drug at the clinic? Some said they had not eaten at the time they were given the drug and so were asked to send it home. Propped further to confirm if the women interviewed really took the drug under a midwife's supervision, the question of how they got water was asked. Four hundred and seventy-one (62.0%) of them recalled they were supplied water by the health facilities either through their standing pipes or the wells they have around, while 289 (38.0%) of the women bought their own water.

#### ***4.4 Distance from home to ANC and the means of transport***

**Table 3-8 Access to ANC with regard to time, distance and means**

| <b>Frequency on time it takes to reach ANC</b>                  | Frequency | Percent |
|-----------------------------------------------------------------|-----------|---------|
| 1. < 30 minutes                                                 | 432       | 48.1%   |
| 2. An Hour (=1 hour)                                            | 356       | 39.6%   |
| 3. More than an hour (> 1 hour)                                 | 111       | 12.3%   |
| <b>Total</b>                                                    | 899       | 100.0%  |
| <b>Distance between ANC clinics and the home</b>                | Frequency | Percent |
| 1. < 5 km                                                       | 639       | 71.1%   |
| 2. >= 5 km                                                      | 260       | 28.9%   |
| <b>Total</b>                                                    | 899       | 100.0%  |
| <b>Means of transport used by pregnant women to ANC clinics</b> | Frequency | Percent |
| 1. Walk                                                         | 388       | 43.2%   |
| 2. Car                                                          | 511       | 56.8%   |
| <b>Total</b>                                                    | 899       | 100.0%  |
| <b>Any inconvenience getting car to ANC clinic</b>              | Frequency | Percent |
| 1. Yes                                                          | 351       | 39.0%   |
| 2. No                                                           | 549       | 61.0%   |
| <b>Total</b>                                                    | 900       | 100.0%  |

On the question of how many minutes/hours it takes to reach the ANC clinic, 432 (48.1%) of the pregnant mothers interviewed claimed it takes less than thirty minutes, 356 (39.6%) of them settled on one hour while, 111 (12.3%) said more than one hour. Six hundred and thirty-nine (71.1%) of the women live less than five kilometers away from the ANC clinic, while the rest of 260 (28.9%) live more than five kilometers away from the ANC clinic. Out of the 899 pregnant mothers interviewed, 388 (43.2%) of them claimed they walk to ANC clinic, while 511 (56.8%) said they use the services of bus and taxi car. Besides, 351 (39.0%) of the respondents claimed it is difficult getting car to the ANC clinic while, 549 (61.0%) of them said otherwise.

#### ***4.5 Ownership and use of insecticide treated net (ITN)***

**Table 3-9 Ownership and use of ITN by pregnant mothers**

| <b>Ownership of ITN</b>                                                      | <b>Frequency</b> | <b>Percent</b> |
|------------------------------------------------------------------------------|------------------|----------------|
| 1. Yes                                                                       | 634              | 70.4%          |
| 2. No                                                                        | 266              | 29.6%          |
| <b>Total</b>                                                                 | 900              | 100.0%         |
| <b>Frequency on whether pregnant mothers used the ITN the previous night</b> | <b>Frequency</b> | <b>Percent</b> |
| 1. Yes                                                                       | 601              | 94.8%          |
| 2. No                                                                        | 33               | 5.2%           |
| <b>Total</b>                                                                 | 634              | 100.0%         |

Six hundred and thirty-four (70.4%) of the women interviewed had insecticide treated nets, while 266 (29.6%) of them did not. On the question of whether they slept in it the previous night, (that is the night before the day of survey), 601 (94.8%) of the pregnant mothers responded yes, while 33 (5.2%) of them said no. Reasons such as these ‘I do not feel comfortable sleeping in it; it is always hot in the net etc.’ were given for not sleeping in the net.

#### ***4.6 Results/Findings from the health facilities***

**Table 3-10 Demographic characteristics of midwives**

| Age               | Midwives in Charge/ANC Providers |      |
|-------------------|----------------------------------|------|
|                   | Number                           | %    |
| 20 – 30 years     | 2                                | 8.0  |
| 31 – 39 years     | 0                                | 0    |
| 40+               | 23                               | 92.0 |
| Marital status    |                                  |      |
| Married           | 17                               | 68.0 |
| Not Married       | 4                                | 16.0 |
| Separated         | 4                                | 16.0 |
| Cohabiting        | 0                                | 0    |
| Educational Level |                                  |      |
| Junior secondary  | 8                                | 32.0 |
| Senior Secondary  | 6                                | 24.0 |
| Post Secondary    | 11                               | 44.0 |

Greater proportion 23 (92.0%) of the midwives in charge of sub-municipal ANC clinics were 40 years and above. Two of them (8.0%) who appeared to be young were between 20 and 30 years. Seventeen (68.0%) of the midwives interviewed were married, 4 (16.0%) were not married while, 4 (16.0%) had a separation. Eleven (44.0%) of them attained a post secondary education, 6 (24.0%) of them had a secondary education while eight (32.0%) attained a basic or middle school education.

**Table 3-11 Training, SP supply and adequacy of ANC providers**

|                                                                                      |                  |                |
|--------------------------------------------------------------------------------------|------------------|----------------|
| <b>Training of midwives in malaria prevention strategies in the past 12 months</b>   | <b>Frequency</b> | <b>Percent</b> |
| 1. Yes                                                                               | 17               | 68%            |
| 2. No                                                                                | 8                | 32.0%          |
| <b>Total</b>                                                                         | 25               | 100.0%         |
| <b>Identification of malaria prevention strategies among ANC providers</b>           | <b>Frequency</b> | <b>Percent</b> |
| 1. Identified SP/IPTp and ITN                                                        | 12               | 48.0%          |
| 2. Did not identify any strategy                                                     | 13               | 52.0%          |
| <b>Total</b>                                                                         | 25               | 100.0%         |
| <b>Ever short of SP the past 18 months?</b>                                          | <b>Frequency</b> | <b>Percent</b> |
| 1. Yes                                                                               | 10               | 40%            |
| 2. No                                                                                | 15               | 60             |
| <b>Total</b>                                                                         | 25               | 100.0%         |
| <b>Availability of the required number of ANC providers at the health facilities</b> | <b>Frequency</b> | <b>Percent</b> |
| 1. Yes                                                                               | 1                | 4.0%           |
| 2. No                                                                                | 24               | 96.0%          |
| <b>Total</b>                                                                         | 25               | 100.0%         |

Out of the 25 midwives interviewed, seventeen (68.0%) claimed they have had training in malaria prevention strategies in the past 12 months, while eight (32.0%) of them recalled

no training of the sort was organized for them. Meanwhile, only 12 (48.0%) of the 17 midwives who claimed to have had the training were able to identify SP/IPTp and ITN as the prevention strategies, the rest 13 (52.0%) could not identify any strategy. This could partly explain the finding on the question of whether pregnant women were given education on malaria prevention strategies particularly, the use of SP/IPTp at the ANC clinics. The drug (SP) shortage as indicated by the pregnant mothers was confirmed by 10 (40.0%) of the 25 midwives that were interviewed. The staff situation was described by all the 25 midwives except one as precarious and that the early something was done about it the better. Asked if they provide an outreach ANC services because the municipality boasts of about 95 outreach clinics, the midwives said no.

#### **4.7 Test of Associations**

**Table 3-12 Influence of Educational attainment on IPTp coverage**

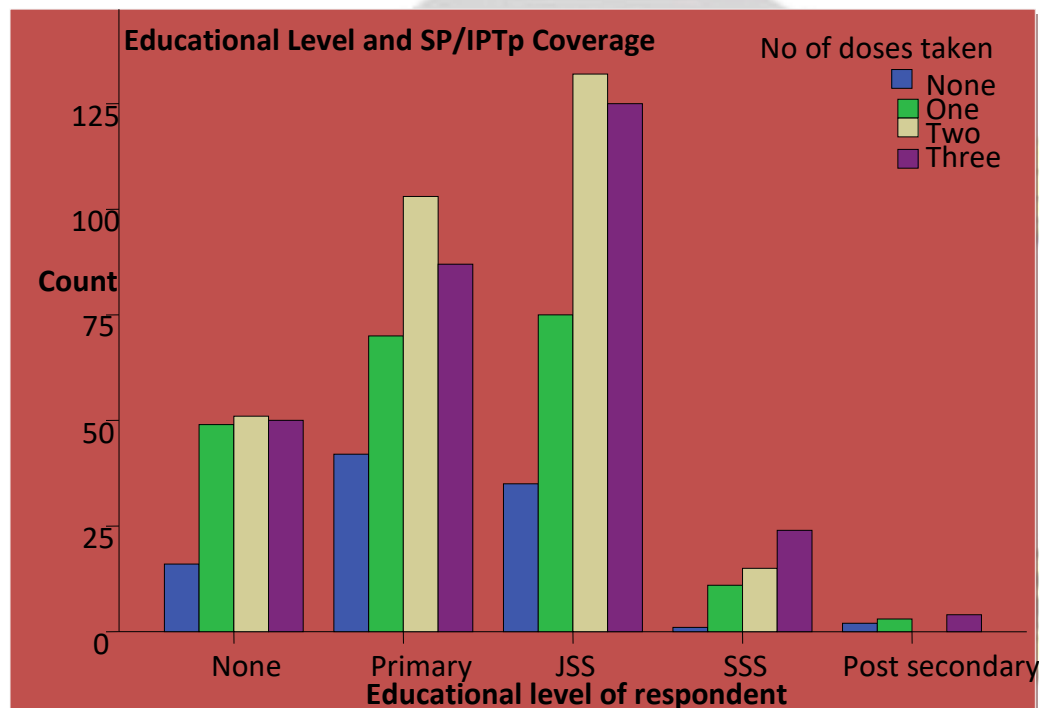
| <b>Number of SP Doses</b> |                                     | <b>None</b> | <b>One Dose</b> | <b>Two Doses</b> | <b>Three Doses</b> | <b>TOTAL</b> |
|---------------------------|-------------------------------------|-------------|-----------------|------------------|--------------------|--------------|
| <b>Educational Level</b>  | <b>No Formal Education (number)</b> | 16          | 50              | 51               | 49                 | 166          |
|                           | % of no formal education & dosage   | 9.6         | 30.1            | 30.7             | 29.5               | 100.0        |
|                           | % of respondents & dosage           | 16.6        | 23.9            | 16.9             | 16.9               | 18.5         |
|                           | <b>Primary(number)</b>              | 42          | 70              | 103              | 87                 | 302          |
|                           | % of primary & dosage               | 13.9        | 23.2            | 34.1             | 28.8               | 100.0        |
|                           | % of respondents & dosage           | 43.7        | 33.5            | 34.2             | 30.1               | 33.7         |
|                           | <b>Junior Secondary (number)</b>    | 35          | 75              | 132              | 125                | 367          |
|                           | % of junior secondary & dosage      | 9.5         | 20.4            | 35.9             | 34.0               | 100.0        |
|                           | % of respondents & dosage           | 36.4        | 35.8            | 43.8             | 43.2               | 41.0         |

|                                  |       |       |       |       |       |
|----------------------------------|-------|-------|-------|-------|-------|
| <b>Senior Secondary (number)</b> | 1     | 11    | 15    | 24    | 51    |
| % of secondary & dosage          | 1.9   | 21.5  | 29.4  | 47.1  | 100.0 |
| % of respondents & dosage        | 1.0   | 5.2   | 5.0   | 8.3   | 5.7   |
| <b>Post Secondary (number)</b>   | 2     | 3     | 0     | 4     | 9     |
| % of post secondary & dosage     | 22.2  | 33.3  | 0     | 44.4  | 100.0 |
| % of respondents & dosage        | 2.0   | 1.4   | 0     | 1.4   | 1.0   |
| <b>TOTAL</b>                     | 96    | 209   | 301   | 289   | 895   |
| Row %                            | 10.7  | 23.3  | 33.6  | 32.3  | 100.0 |
| Col %                            | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Out of the 900 pregnant mothers, five did not respond to the question, 166 (18.5%) of the respondents did not have any formal education at all. Sixteen (9.6%) of those who did not have any formal education did not take SP at all. Fifty (30.1%) of them took IPTp1, 51 (30.7%) benefited from two doses, while 49 (29.5%) were able to complete the three required doses. On the other hand, 33.7% (302) of the respondents did have a primary education or at least had ever had a formal education. Of this number, Forty-two (13.9%) did not take SP at all, 23.2% (70) of them received IPTp1, while 34.1% (103) took two doses and 87 (28.8%) fully received IPTp3. Majority, 367 (41.0%) of the respondents completed basic education. Out of this, thirty-five (9.5%) did not take a dose at all, 75 (20.4%) of them received one dose, while 132 (35.9%) took two doses and 125 (34.05) had three doses. Among those who had secondary education, only one (1.9%) respondent did not take SP, eleven (21.5%) of them took one dose, fifteen (29.4%) received two doses while, 24 (47.1%) were given the three courses of IPTp. Only nine (1.0%) of the pregnant mothers had a higher level of education and out of this, two (22.2%) did not

benefit from IPTp at all, three (33.3%) of them took one dose, none received IPTp2, four (44.4%) of them obtained three doses (chi-squared 535.978 with a degree of freedom of 4 and  $P < 0.0001$ ). This indicates a very strong association between level of education and SP/IPTp coverage.

**Figure 3-1 Influence of educational background on SP/IPTp coverage**



The chart depicted above shows a strong association between the level of education and the number of SP doses that was taken by the respondents. There was not much variation in the first, second and the third doses that were taken by those without formal education. Apart from the fact that not many of them could access IPTp as compared to those with

formal education, the proportions of those who had the first, second and the third doses were almost equal. For instance, only 49 of them took one dose, while the second dose was taken by a little above 50 and the third dose by 50 of the respondents. Moving to those who had formal education the number of those who had accessed IPTp did not only increase tremendously but, also with the respective doses. As observed 70 (23.2%) respondents who did have primary education were able to access one dose, 34.1% (103) of them took two doses while 87 (28.8%) took three doses. Those with junior secondary level attainment equally exhibited the same trend of improvement in the accessibility of IPTp. Their numbers have not only increased but also there was a consistency between the second dose and the third dose. For instance, while 132 (35.9%) of them took two doses, this number only reduced slightly to 125 (34.0%) that took three doses. This group also recorded the highest number of respondents (41.0%) that accessed IPTp and who obtained two and three doses most. The trend continued the same way with those who had secondary education. While the proportion of those who took one dose was much smaller, those who took two and three doses were higher, emphasizing a strong relationship between educational level of pregnant women and the number of SP doses they are able to take. Again, apart from those without any formal education, the rest with some amount of formal education had the least proportionate patronage under single dose.

**Table 3-13 Influence of 1<sup>st</sup> ANC attendance on IPTp Coverage**

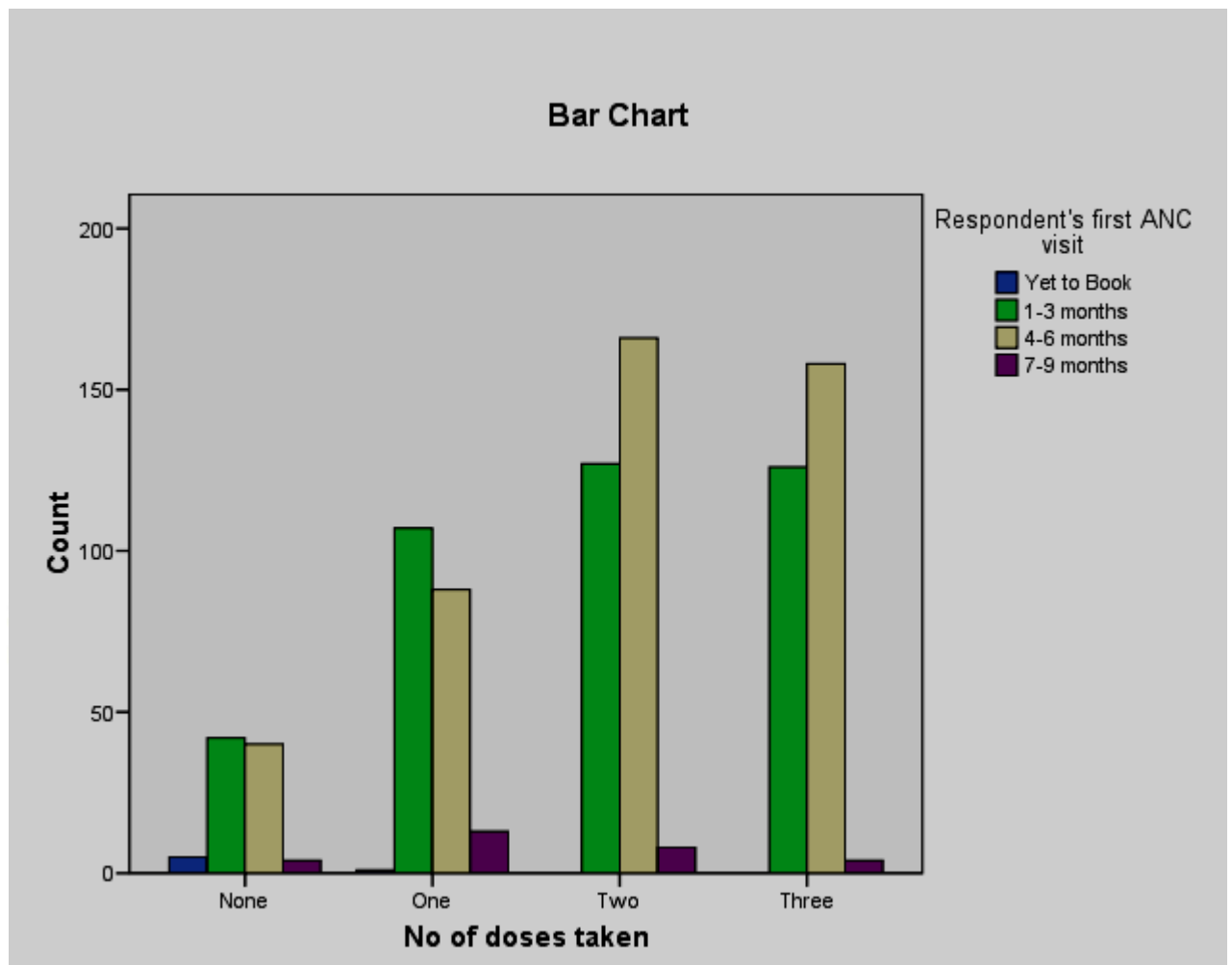
| Number of SP Doses |                                            | None  | One Dose | Two Doses | Three Doses | TOTAL |
|--------------------|--------------------------------------------|-------|----------|-----------|-------------|-------|
| Gestation Age      | <b>1<sup>st</sup> Trimester</b>            | 42    | 107      | 127       | 126         | 402   |
|                    | % of 1 <sup>st</sup> trimester respondents | 10.5  | 26.6     | 31.6      | 31.3        | 100.0 |
|                    | % of total respondents                     | 4.7   | 12.1     | 14.3      | 14.2        | 45.5  |
|                    | <b>2<sup>nd</sup> Trimester</b>            | 40    | 88       | 166       | 158         | 452   |
|                    | % of 2 <sup>nd</sup> Trimester             | 8.9   | 19.5     | 36.7      | 34.9        | 100.0 |
|                    | % of total respondents                     | 4.5   | 9.9      | 18.6      | 17.8        | 51.2  |
|                    | <b>3<sup>rd</sup> Trimester</b>            | 4     | 13       | 8         | 4           | 29    |
|                    | % of 3 <sup>rd</sup> trimester respondents | 13.8  | 44.8     | 27.6      | 13.8        | 100.0 |
|                    | % of total respondents                     | 0.4   | 1.5      | 0.9       | 0.4         | 3.3   |
|                    | <b>TOTAL</b>                               | 86    | 208      | 301       | 288         | 883   |
|                    | % of total respondents                     | 9.7   | 23.6     | 34.1      | 32.6        | 100.0 |
|                    | % of dose respondents                      | 100.0 | 100.0    | 100.0     | 100.0       | 100.0 |

Eleven out of the 900 respondents did not response to the question, while six of them in their third trimester were yet to book. And so, the total respondents were based on 883. Four hundred and two (45.5%) of the pregnant and nursing mothers who responded to the questionnaire, reported the first time for antenatal care during the first trimester of gestation. Four hundred and fifty-two (51.2%) of them reported for the first time in the second trimester of gestation and twenty-nine (3.3%) of the respondents had their first ANC the third trimester of gestation. Out of the 402 who registered for ANC the first time in the first trimester, 10.2% of them did not access SP/IPTp, 26.6% of them took one dose, and 31.6% took two doses while 31.3% were able to benefit from the three required

doses. Forty (8.9%) of the four hundred and fifty-two (51.2%) of the respondents who reported for ANC the first time in the second trimester did not benefit at all from SP/IPTp, 88 (19.5%) of them took only one dose, 36.7% of them obtained two doses while 34.9% received the entire three doses. On the other hand, 29 women respondents had their first ANC visit in the third trimester. Of this number, four did not take SP at all probably because they might have come at the time they were about to deliver; in which case SP could not be administered to them. Thirteen (44.8%) of them had one dose, eight took two doses while four (0.4%) were able to complete the three dosage (chi-squared 754.189 with degree of freedom of 3 and  $P < 0.0001$ ). The gestational age at first ANC attendance is significantly associated with SP/IPTp coverage.



Figure 4-2: Influence of 1<sup>st</sup> ANC on IPTp coverage



It is observed that early booking at the ANC by the pregnant women had bearing on the number of doses of SP they were able to take. Even though, some of the respondents who booked in the first and second trimesters could still not access any dose of SP, the study has shown that majority of them received most of the doses (IPTp1, IPTp2 and IPTp3) than those who reported in the third trimester (refer to figure III). It was not clear why those who booked in the second trimester were able to surpass those who booked in the first trimester in IPTp2 and IPTp3. They obtained more of the second and third doses

than the counterparts who registered in the first trimester. One reason for this phenomenon could be that as pregnant women approach their delivering dates; their period interval of attending ANC is shortened. This may result in more visits to ANC clinic and so the chance of being given more doses. Another reason could be that those who reported in the first trimester might have got better along the line and so felt reluctant to attend ANC and so missed some of the doses. Throughout the three stages of SP dosage, pregnant women who reported for antenatal care in the third trimester had the least of two and three doses.

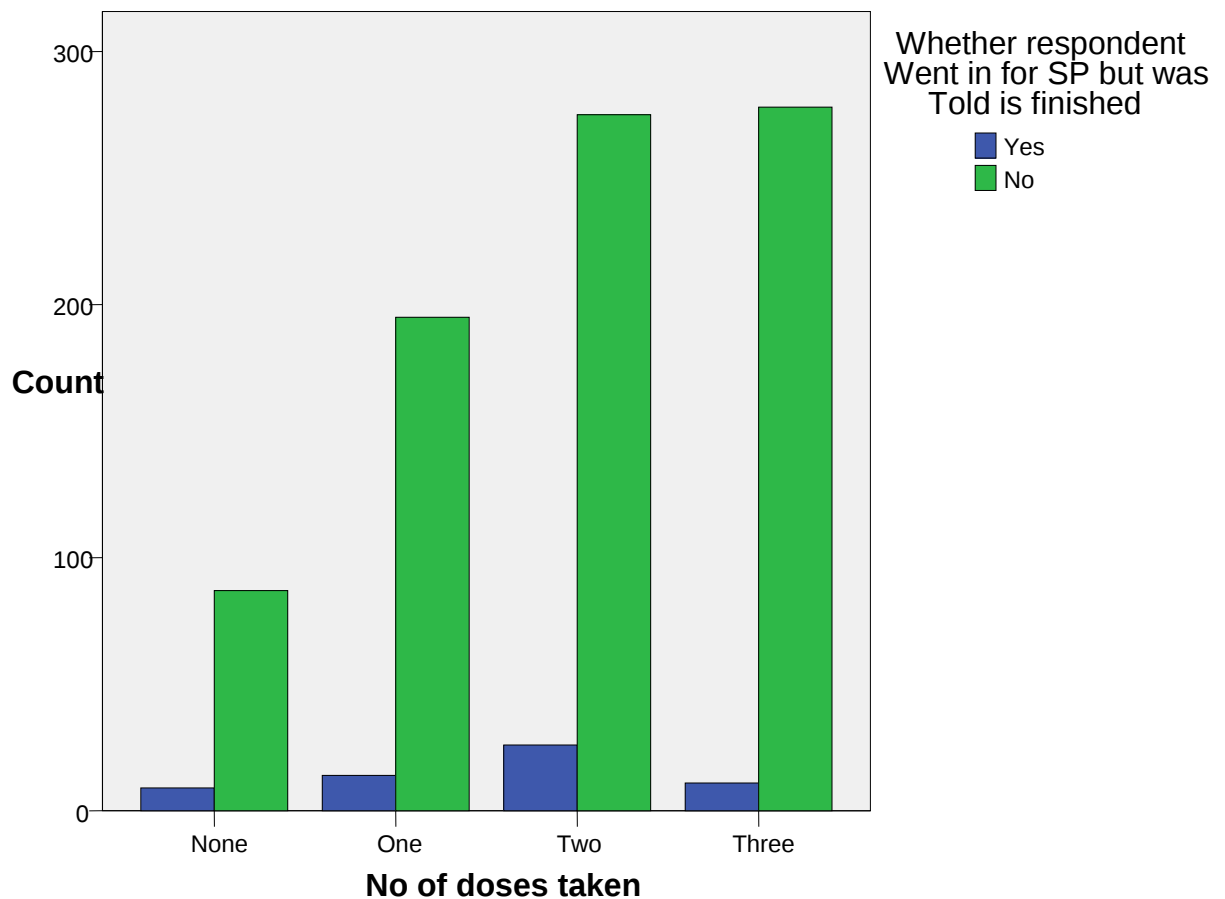
**Table 3-14 Influence of SP supply on number of doses accessed**

| Number of SP Doses |                                              | None | One<br>Dose | Two<br>Doses | Three<br>Doses | TOTAL |
|--------------------|----------------------------------------------|------|-------------|--------------|----------------|-------|
| SP availability    | <b>Number for 100% availability of SP</b>    | 87   | 195         | 275          | 278            | 835   |
|                    | % of <b>Yes</b> Respondents                  | 10.4 | 23.4        | 32.9         | 33.3           | 100.0 |
|                    | % of Total Respondents                       | 9.7  | 21.7        | 30.7         | 31.0           | 93.3  |
|                    | <b>Number against 100% availability - SP</b> | 9    | 14          | 26           | 11             | 60    |
|                    | % of <b>No</b> Respondents                   | 15.0 | 23.3        | 43.4         | 18.3           | 100.0 |
|                    | % of Total Respondents                       | 1.0  | 1.5         | 2.9          | 1.2            | 6.7   |
|                    | <b>Number that accessed various doses</b>    | 96   | 209         | 301          | 289            | 895   |
|                    | % that accessed various doses                | 10.7 | 23.4        | 33.6         | 32.3           | 100.0 |

On the item of availability of SP at the ANC clinics, pregnant mothers were asked whether they went in for SP at the ANC and were told the drug is finished. Majority 835 (93.3%) of them said no which implied drug was always available, while only 60 (6.7%) confirmed that there were times they were asked to come for the drug but were told the

drug has finished. Among those who claimed constant availability of the drug, 87 (10.4%) did not access any dose, 195 (23.4%) could only obtain a single dose, while 275 (32.9%) of them benefited from two doses. Only 278 (33.3%) of the women were able to access the three required doses. Out of the 60 pregnant mothers who denied 100% availability of the drug, nine of them did not access any dose at all, 14 (23.3%) of them took one dose, 26 (43.4%) were able to take two doses, while 11 (18.3%) had fully taken the required three doses (chi-squared 672.071 with degree of freedom of 1 and  $P < 0.0001$ ) signifying an association between SP supply and IPTp coverage.

**Figure 3-3 SP availability and IPTp coverage**



Eighty-seven (10.4%) of the 835 respondents who said the drug was always available did not access a single dose. The rest took one, two or three doses; 195 (23.4%) of them had a single dose, 32.9% (275) took two doses while (278) 33.3% were able to take the three doses. Among those who said they ever went in for the drug and were told the drug was not available, nine (15.0%) of them did not take SP at all, fourteen (23.3%) took a dose, while 43.4% of them took two doses and eleven the three required doses.

#### 4.7.1 Influence of Distance on IPTp coverage

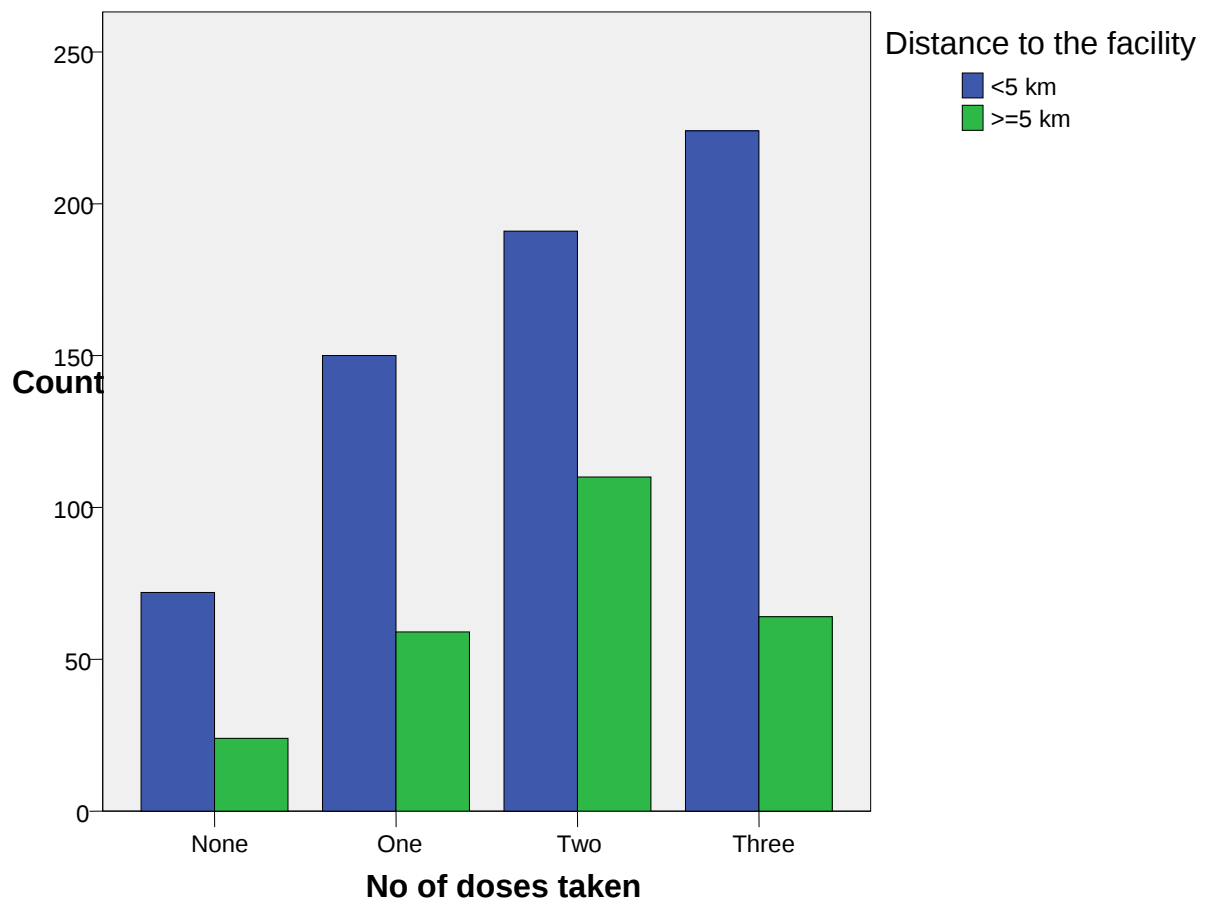
**Table 3-15 Influence of Distance on IPTp coverage**

| Number of SP Doses |                                             | None | One Dose | Two Doses | Three Doses | TOTAL |
|--------------------|---------------------------------------------|------|----------|-----------|-------------|-------|
| SP availability    | <b>Number for those who lived &lt; 5km</b>  | 72   | 150      | 191       | 224         | 637   |
|                    | % of Respondents                            | 11.3 | 23.5     | 30.0      | 35.2        | 100.0 |
|                    | % of Total Respondents                      | 8.1  | 16.7     | 30.7      | 21.3        | 71.3  |
|                    | <b>Number for those who lived &gt;= 5km</b> | 24   | 59       | 110       | 64          | 257   |
|                    | % of Respondents                            | 9.3  | 23.0     | 42.8      | 24.9        | 100.0 |
|                    | % of Total Respondents                      | 2.6  | 6.6      | 12.3      | 7.2         | 28.7  |
|                    | <b>Number that accessed various doses</b>   | 96   | 209      | 301       | 288         | 894   |
|                    | % that accessed various doses               | 10.7 | 23.4     | 33.6      | 32.3        | 100.0 |

The table above reveals the distance that pregnant mothers travelled to attend ANC clinic. Out of 637 (71.3%) pregnant mothers who lived less than five kilometers to the clinic, seventy-two (8.1%) did not take SP, 150 (16.7%) took only one dose, 191 (30.7%) of them took two doses, while 224 (21.3%) were able to access the three doses. Of those who lived five kilometers and beyond, twenty-four (2.6%) could not access SP/IPTp, 59

(6.6%) of them obtained one dose, while 110 (12.3%) and 64 (7.2%) took two and three doses respectively (chi-squared 159.779 with degree of freedom of 1 and  $P < 0.0001$ ) testifying a strong association between the distance from the home to the ANC clinic and IPTp coverage.

**Figure 3-4 Influence of Distance on IPTp coverage**



Out of the 894 pregnant mothers that responded to this question, 637 (71.3%) of them lived less than five kilometers to the ANC clinics they attended. Among these

respondents, 72 (8.1%) of them did not take SP at all, 150 (16.7%) took one dose, 191 (30.7%) of them took two doses, while 224 (21.3%) took the required three doses. Among those who lived five kilometers and beyond from the ANC clinics, 24 (2.6%) did not take SP at all, 59 (6.6%) of them took one dose, 110 (12.3%) took two doses, while 64 (7.2%) were able to take fully the three doses. The chart clearly shows in every stage of IPTp, those who lived nearer or less than five kilometers to the ANC clinics were able to take more doses than those who lived five kilometers and beyond from the ANC clinics.



## 5 CHAPTER FIVE - DISCUSSION OF STUDY FINDINGS

### 5.1 *Quality of ANC service*

#### 5.1.1 ANC Attendance

The study has shown that 45.5% of pregnant mothers in the Keta municipality report for first ANC in the first trimester, 51.2% the second trimester and a little of 3.3% in the third trimester. Overall, ANC attendances were higher (99% at least once; 95% at least twice; 87% thrice while 47% attended ANC more than four times) when those currently pregnant were excluded from the analysis. The 99% ANC attendance at least once, is an improvement over the previous attendance of 90% in the municipality. However, much of these improvements have not been translated into accessing the three required doses of SP. Even though, the study reveals a slight increase in the three doses; 89% IPTp1, 38% IPTp2 and 36% IPTp3 as against 77%, 26% and 24% respectively (Hommerich 2007); we would argue that much higher levels could have been obtained if factors related to service and socio-economic as well as others not reported here but operating at the provider or facility level were minimized.

The study has also shown that a significant proportion of pregnant women in the Keta municipality do not visit ANC at all and deliver in the homes. Six of those currently pregnant were yet to have the first ANC attendance with most of them in their 9<sup>th</sup> month of gestation, while 7 who are nursing mothers never visited the ANC during the last pregnancy. Indeed, we found two of the cases so serious in Aborkutsime and Atiavi, where these teenage girls were pregnant for the past 9 and 10 months but had never visited ANC and yet were suffering from abdominal pains three days to the survey.

### **5.1.2 Education on malaria and prevention measures during ANC**

On the provision of education on malaria and its prevention measures, report shows that some amount of education goes on at the ANC. Six hundred and ninety-five (77.6%) of the pregnant mothers recalled they were given education on malaria prevention measures any time they attended ANC clinic. While 201 (22.4%) of them said no. Overall, there was a high level of awareness of malaria as dangerous to life; 91% of the pregnant mothers confirmed malaria could cause them their live. However, same levels of awareness were not demonstrated in identifying effects of malaria and prevention measures. Of the 900 pregnant mothers, 210 (23.3%), 79 (8.8%) of them did not identify any effect of malaria nor prevention measures; 91 (10.1%) of them identified 2 or 3 of the effects, 26 (2.9%) mentioned 4 effects, and 63 (7.0%) were able to identify 5. More than half of the women interviewed 510 (56.7%) could only identify an effect.

The trend was the same for prevention measures. More than half 567 (63.0%) of the women interviewed only managed to identify one prevention measure. These results contradicted the earlier results on the level of awareness of malaria among pregnant mothers. Varied meanings could be read into this: one, education on the topic during ANC was not well carried out or the women simply forgot what they were taught at the ANC clinics; two, the education was not given at all as claimed by 22.4% of the pregnant mothers. Statistics available on the educational attainment of ANC providers suggests half of them hold Middle School Certificate and General Certificate of Education which might not give them the requisite knowledge on the subject to be shared with the

pregnant mothers. This was confirmed when more than half of them (52%) could not identify malaria prevention strategies in use.

## ***5.2 Drug availability and its administration at the facilities***

### **5.2.1 SP Availability at the facilities**

The study has shown that there has been drug shortage in some of the ANC clinics the past 18 months as reported by the pregnant mothers. Sixty (7%) of the pregnant mothers confirmed there was a time they went in for SP but were not given because the drug was not there. To confirm the availability or otherwise of SP in the ANC clinics, the midwives in charge were asked if they had ever experienced shortage of SP within the past 18 months. Ten (40%) of the midwives confirmed experiencing shortage while, fifteen (60%) of them said no. The shortage of SP at the facilities principally accounts for the decline in IPTp2/IPTp3 in the Keta municipality since the success or otherwise of the whole SP/IPTp programme depends on the availability of the drug at the facilities. If the pregnant mothers are due and are in the facilities but the drug was not there, then of course, nothing but, a fall in the doses that pregnant mothers were expected to take would be the result. As the engine in the SP/IPTp vehicle, it is proper mechanisms are put in place to ensure that the drug is always available at the facility level. Of course, the drug availability alone would not make a success of the programme, it must be supported with the right education of the pregnant mothers on one hand and the service providers on the other hand. The fact that 52% of the ANC providers in the municipality could not identify current malaria prevention measures during pregnancy leaves much to talk about.

### **5.2.2 Right method of administering SP**

SP is administered using the Directly Observed Treatment (DOT) method of administration. The study has shown that greater number of the pregnant mothers took the drug at the clinic under the supervision of a midwife. Propped further to confirm if the women interviewed really took the drug under a midwife's supervision, the question of how they got water was asked. Four hundred and seventy-one (62.0%) of them recalled they were supplied water by the health facilities either through their standing pipes or the wells they have around, while 289 (38.0%) of the women bought their own water. However, there were others 51 (6.4%) who took the drug in the house and other places. Why didn't they take the drug at the clinic? Some said they had not eaten at the time they were given the drug and so were asked to send it home. Again, education is what comes to mind immediately. The question is; is it given the right way, at the right time? There is therefore the urgent need to review educational presentations at the ANCs. Or the burden is on the pregnant woman who simply forgets what she is taught. A school of thought rejects the second argument, that if the pregnant women could simply forget they are supposed to take a particular drug for three consecutive times with one month interval beginning from the 16<sup>th</sup> week of gestation, then how come they are able to follow numerous drugs prescribed them within the same period?

### **5.3 Distance from home to ANC and the means of transport**

On the question of how many minutes/hours it takes to reach the ANC clinic, 432 (48.1%) of the pregnant mothers interviewed claimed it takes less than thirty minutes, 356 (39.6%) of them settled on one hour while, 111 (12.3%) said more than one hour. Six

hundred and thirty-nine (71.1%) of the women live less than five kilometers away from the ANC clinic, while the rest of 260 (28.9%) live more than five kilometers away from the ANC; 388 (43.2%) of them claimed they walk to ANC clinic, while 511 (56.8%) said they use the services of bus and taxi car. Besides, 351 (39.0%) of the pregnant mothers claimed it is difficult getting car to the ANC clinic while, 549 (61.0%) of them said otherwise. The picture painted, describes a very bright future, health wise for a young municipality recently established. Overall, accessibility to ANC in the municipality with regards to distance from the home to the clinic is not bad. Almost half (48%) of the pregnant mothers in the Keta municipality take less than 30 minutes to access health service especially reproductive health service. More so, nearly two-third of the pregnant mothers have access to bus services which is a good news since it makes mobility easier for them. These facilities should be exploited by the ANC providers to advance the course of malaria prevention in the municipality through the use of SP/IPTp programme. Surprisingly, not all pregnant mothers closer to the ANC facilities benefited from the three required doses of SP; which demands looking beyond distance to other operative factors that may not have been dealt with in this report.

Nevertheless, there are equally many pregnant mothers who walk several kilometers to access ANC services in the municipality for the reasons that the roads in the areas are not good and so, drivers do not ply them; and more importantly, the ANC clinics are far away situated from them. The study has shown that 42% of the pregnant mothers in the municipality walk to the ANC clinic; while, 29% of them live beyond 5 kilometers away from the ANC clinics in the municipality. All of these affect their frequencies to ANC

and ultimately the number of doses of SP they can take. The study result has shown that pregnant mothers who live beyond five kilometers away from the ANC clinics took less doses of SP than pregnant mothers who live less than five kilometers away from the ANC clinics. Amongst 637 pregnant mothers who live less than five kilometers away from the ANC clinics, 224 (21.3%) of them received three doses of SP; that is three times (7%) those who live far away (refer Figure V).

#### ***5.4 Ownership and use of insecticide treated net (ITN)***

Six hundred and thirty-four (70.4%) of the women interviewed had insecticide treated nets, while 266 (29.6%) of them did not. On the question of whether they slept in it the previous night, (that is the night before the day of survey), 601 (94.8%) of them responded yes, while 33 (5.2%) of them said no. Reasons such as these 'I do not feel comfortable sleeping in it; it is always hot in the net etc.' were given for not sleeping in the net.

## **6 CHAPTER SIX - CONCLUSIONS AND RECOMMENDATIONS**

### **6.1 Introduction**

The objective of this study is to identify the factors that influenced the decline in IPTp2/IPTp3 coverage among pregnant mothers in the Keta Municipality. To arrive at this objective, 900 eligible women made up of 302 who were pregnant at the time of survey with a gestational age of 28 weeks or more; and 598 mothers nursing babies below seven months and who attended antenatal clinics in the municipality were interviewed to arrive at the conclusions. To augment data generated, 25 ANC providers in the municipality were interviewed to enable valid conclusions to be drawn.

### **6.2 Conclusions**

#### **6.2.1 Characteristics of Respondents**

The adoption of the multistage sampling in selecting the eligible pregnant mothers facilitated fair representation of the respondents from all parts of the municipality with varied backgrounds and circumstances. The age of the subjects was fairly distributed and ranged between 15 and 36+. Thus the respondents included the teen mothers, the young mothers as well as those in the middle age. A third of them were married; very few were not and others separated by death or divorce, while the rest were cohabitating. Also, a little above half were Christians while the rest belonged to the traditional and Islamic religions and yet others do not belong to any religion. More than two-thirds were primigravidae and multigravidae; the rest were secundgravidae with varied educational backgrounds including the uneducated, primary and the basic, secondary as well as post secondary. Besides, there were government employed, self-employed and the

unemployed. On the other hand, majority of the midwives in the municipality were above 40 years; most of them were married and with varied educational backgrounds. A few were diploma holders with the rest having secondary and basic certificates.

## **6.2.2 Quality of ANC Service**

### **6.2.2.1 ANC Attendance**

Less than half (45%) the pregnant mothers in the Keta municipality attend their maiden ANC in the first trimester, 51% in the second trimester and 3% in the third trimester, while 1.0% do not attend ANC at all. Over all, 99% of them attend antenatal care at least once; an improvement over previous attendance that put it around 90% while, 95% do attend twice and 87% at least three times in the municipality. The finding is an improvement upon the 2003 Ghana Demographic and Health Survey that pegged it at 76%.

### **6.2.2.2 Education on malaria and prevention measures during ANC**

A great amount of education on malaria and its prevention measures is given pregnant mothers in the Keta municipality. Almost 78% of the pregnant mothers confirmed this. However, it appears something fundamentally is wrong with the instructional process as most of these pregnant mothers could not recall the effects of malaria and its prevention measures; the knowledge of which would result in behavior change in pregnant mothers. The insufficient education provided the pregnant mothers has partly contributed to the

inability of many of them to access the required doses of SP even though, on average, ANC attendances were high.

### **6.2.3 Drug availability and its administration at the facilities**

#### **6.2.3.1 SP availability at the facilities**

The SP/IPTp programme is intended to reduce the malaria burden among pregnant mothers through the administration of a malaria prevention drug to pregnant women irrespective of whether they have malaria or not. And so, each and every pregnant woman in her 16<sup>th</sup> week of gestation is supposed to be administered three doses of SP with one month interval between each dose before delivery. This laudable objective can only be realized if the ANC clinics have the drug always available to give to the pregnant mothers when they are due. However, that was not entirely the case in the Keta municipality. The study has revealed pockets of drug (SP) shortages in the ANC clinics as 7% of the pregnant mothers confirmed. Indeed, some of the midwives interviewed confirmed the drug shortage in their facilities and were of the conviction that the drug shortage is the principal reason for the decline in the subsequent doses. Apart from the irregular supply of the drug, education on the benefits and how many doses pregnant mothers were supposed to take was inadequate. Most pregnant mothers could not tell why they were given the particular drug.

#### **6.2.3.2 Right method of administering SP**

SP was meant to be taken under direct supervision of the ANC provider; however, the research result has shown that a number of pregnant mothers took the drug at home. Asked why they did not take the drug at the clinic; some said they had not eaten at the

time they were given the drug and so were asked to send it home. Besides, SP was meant to be free; however, the result indicates that some payments were made by some pregnant mothers in respect of the drug. In all 16% of the pregnant mothers confirmed paying one time or the other for the drug. All these put together have contributed to the sharp decline in the coverage of IPTp2/IPTp3 in the Keta Municipality.

#### **6.2.4 Location of ANC facility**

The target of reducing death from malaria to 50% by the year 2010 and making sure that at least pregnant women in malaria endemic areas receive two doses of SP would not be realized if nothing is done to reach as many pregnant women as possible with the malaria prevention programme. But how possible would that be when the few available ANC clinics were situated very far away from the reach of many of these pregnant mothers as the research result has indicated. The current operational strategy of administering SP to pregnant women only when they present themselves at the ANC clinic is a non-workable starter in the full force of the hope of achieving the set targets considering the terrain of the kilometers these pregnant women would have to walk; wait for the market days trotto bus to board to the ANC clinic for the drug. Almost 29% of the pregnant mothers in the municipality live far away from ANC clinic.

In looking at the distance from home to the ANC clinic, the means of transport was equally considered. It came out clearly that the available means of transport to most pregnant mothers was walking. A little below half (43.2%) the pregnant mothers walked to antenatal clinic. This affected number of times they were able to attend ANC and their

chance of receiving the full doses of SP/IPTp. Indeed, the study has shown that many of the pregnant mothers who walked to the ANC clinic could not access the three required doses of SP.

#### **6.2.5 Ownership and use of insecticide treated net (ITN)**

Six hundred and thirty-four (70.4%) of the pregnant mothers in the municipality had insecticide treated nets, while 266 (29.6%) of them did not. On the question of whether they slept in it the previous night, (that is the night before the day of survey), 601 (94.8%) of them responded yes, while 33 (5.2%) of the pregnant mothers said no. Reasons such as these 'I do not feel comfortable sleeping in it; it is always hot in the net etc.' were given for not sleeping in the net.

### **6.3 Recommendations**

SP/IPTp programme implementation in the Keta Municipality has chalked a considerable success. The drawing of programs, guidelines and procedures to the practical evidence of administering SP to pregnant mothers even at the remotest places such as Galo-Sota, Blamezado etc. is enough to commend the Municipal Health Directorate. Quite apart from that, the immediate structures such as training of the midwives, drug procurement and distribution as well as the necessary education on radio were put in place. To achieve 89%, 38% and 36% for IPTp1, IPTp2 and IPTp3 respectively is no mean an achievement; however, the best could have been achieved if service and other socio-economic factors had been reduced to the barest minimum. In the light of this, to ensure a successful scaling up of IPTp2/IPTp3 coverage or halt the decline, it is recommended that the

following agencies consider in their policy proposals and programme implementation the concerns expressed below:

### **6.3.1 Ministry of Health/Malaria Control Programme**

Regular supply of SP is paramount to the success of the SP/IPTp programme. The entire programme will only succeed when there is constant supply of SP. Without it the whole exercise comes to nothing. Studies including the current one show that drug supply from the Ministry of Health to the health facilities is irregular. The Ministry of Health must review the SP supply structure. If the irregularity in supply of SP has its source from the supplier, then other genuine suppliers should be looked for to fill the vacancy. Even though, procurement from one source brings certain economic advantages such as trade and cash discounts on purchases made, homogeneity of the product etc. that should not be at the peril of the objective of the entire programme. Any reasonable means that the drug can be made available all year round should be exploited to curtail the drug shortages at the ANC clinics.

It is imperative to decentralize the procurement of SP to the regional level since the centralized mechanism is impotent in meeting the market demand of the country on time. Further more, if it is procurement funds that are not available, then the Ministry should initiate the necessary actions to secure the needed funds. This would avoid the delays, stock-outs and the frustrations the entire system is going through. In that regard, the Global Fund for Malaria Prevention deserves much commendation. Also, decentralizing

the procurement of SP to the Regions means each would be in the position to accurately determine the consumption rate, the minimum stock level and the lead-time enough to initiate procurement. That would entirely put to a stop the drug shortage being experienced.

Again SP supply can be delegated further to the facility level where ANC providers procure their own drugs (SP) and later on are reimbursed if the free supply policy is to be maintained. More so, the free supply can be discontinued so that pregnant mothers access the drug from the dispensary shelves at a cost that should be covered by the National Health Insurance Scheme.

### **6.3.2 Keta Municipal Assembly**

The Municipal Assembly has a very important role to play in ensuring that pregnant mothers access the SP/IPTp programme. The Assembly should help by financing educational programmes on SP/IPTp. The Assembly should also liaise with the Municipal Health Directorate to have assembly members educated on the SP/IPTp so that members in their own capacity can organize meetings at the community level to have the citizenry educated.

Apart from that the feeder roads in the municipality should be given much attention; especially, those linking very difficult areas like Hatorgodo, Tregue and others where any time it rains they are completely cut off. This would reduce the travelling inconveniences pregnant mothers go through to attend ANC clinic.

### 6.3.3 Keta Municipal Health Directorate

Education on SP/IPTp needs to be intensified. The study proved that several pregnant mothers did not know why they were taking the drug and what it was meant to do. Indeed, majority of them did not know the number of doses they were supposed to take. Greater number of them displayed complete ignorance when it came to identifying the effects of malaria on pregnancy and the current preventive measures in use such as SP/IPTp and ITN. It appeared pregnant mothers do not receive much education on malaria prevention or if they do then their memories were very short. The fact is many of us only become active when we know the unpleasant consequences that await us. Unless the pregnant mothers are made aware through effective education at the ANC clinics of the resulting negative effects of malaria; just giving them the drug would not achieve the desired goal.

It is also recommended that instead of the pregnant mothers being present at the ANC clinic to take the drug, the outreach clinics should be exploited to advance the course of SP administration. The traditional birth attendants and community reproductive health workers approaches should be employed to administer SP/IPTp in the municipality rather than the health unit approach as studies revealed they were more effective than the old method. One of such studies has shown that, through the new approaches, 92.4% of the pregnant mothers received IPT during the second trimester as recommended by the policy, vs. 76.1% at health units,  $P < 0.0001$ . Of the women who received two doses of sulfadoxine-pyremethamine, 39.9% were at health units (control) vs. 67.5% through new approaches ( $P < 0.0001$ ). Women using the new approaches also accessed IPT early: the

mean gestational age when receiving the first dose of sulfadoxine-pyremethamine was 21.0 weeks vs. 23.1 weeks at health units ( $P < 0.0001$ ) (Mbonye et al. 2007).

Besides, training and in-service training is very crucial for the midwives in charge and other ANC providers in the health facilities. More than 50% of the midwives interviewed could not provide answers to the question what the current malaria prevention measures are. Even those who claimed to have received in-service training on the prevention measures the past 12 months could not state them. This underscores the earlier findings on whether pregnant women received education on malaria prevention measures specifically on the benefits of SP and ITN at the ANC clinics. When pregnant mothers are effectively educated, there would not be the need to apply the directly observed treatment method in administering the drug. Mothers would willingly take their drugs when they were due.

Also, there is the need to step up the education on the use of ITN and the benefits to the pregnant mothers. The Municipal Health Directorate should seek help from NGOs and the Municipal Assembly to procure more of the ITNs to distribute to pregnant mothers, especially those living far from ANC clinics as the study has revealed they did not benefit much from the three required doses of SP.

#### 6.3.4 Health Staff

The success of any policy or programme depends on the human capacity and the practices at workplace. In this regard, further training and in-service training should be accorded the importance it deserves to make them not only effective but also efficient. This would not only build a trust between the health staff and the clients they serve but would also complement the psychological satisfaction clients expect to derive from any quality service. Besides, the health staff should always be mindful of service satisfaction which is the driving force behind the attendance to the facility. Interpersonal relationships that encourage the clients to feel relax with the health provider in providing information to solve her health need should be strengthened.



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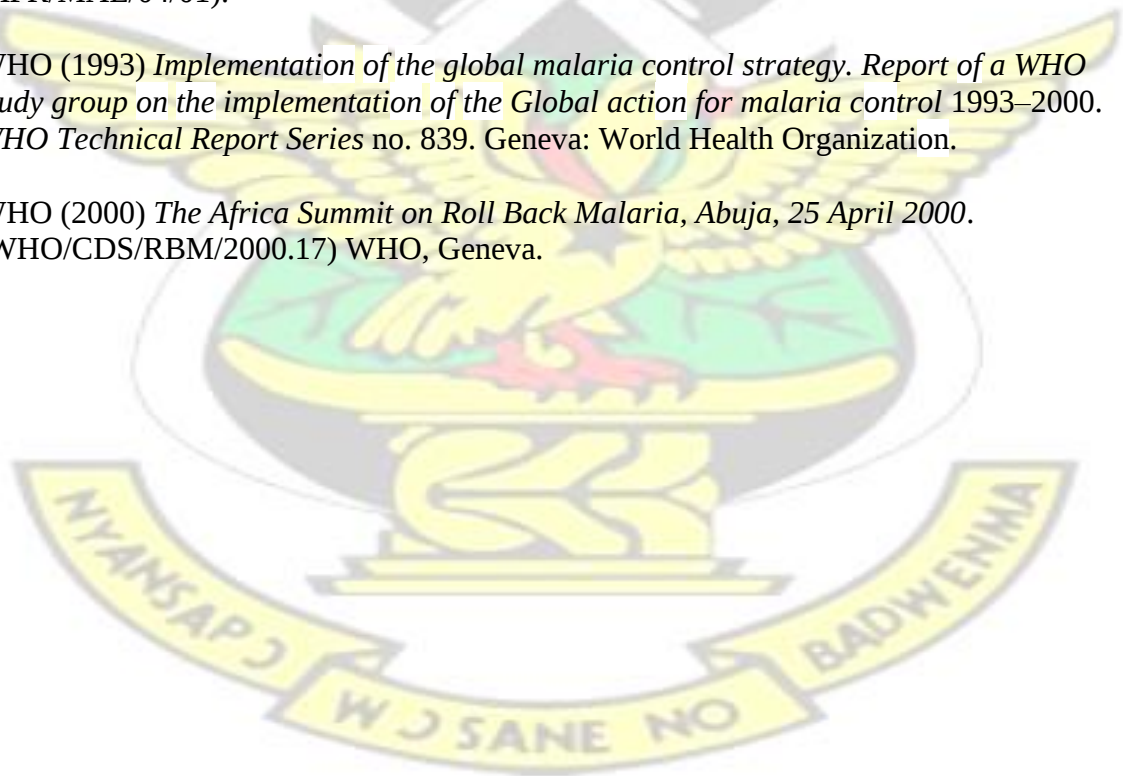
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## 7 APPENDICES

### Appendix I

#### ADDENDUM TO ANTENATAL/MATERNITY MONTHLY DATA RETURNS

Name of Health Facility:

Month

Year

Region

| ANTENATAL RECORD                                                | NUMBER | INDICATOR                                                    |  |
|-----------------------------------------------------------------|--------|--------------------------------------------------------------|--|
| Total ANC Attendance                                            |        |                                                              |  |
| First ANC Attendance                                            |        |                                                              |  |
| Second ANC Attendance                                           |        |                                                              |  |
| Third ANC Attendance                                            |        |                                                              |  |
| First dose of IPT (IPT1)                                        |        | % taking IPT1                                                |  |
| Second dose of IPT (IPT2)                                       |        | % taking IPT2                                                |  |
| Third dose of IPT (IPT3)                                        |        | % taking IPT3                                                |  |
| ITN use on First ANC visit                                      |        | %ITN use on first ANC                                        |  |
| ITN use on second ANC visit                                     |        | %ITN use on second ANC                                       |  |
| All screened in 3 <sup>rd</sup> trimester for                   |        |                                                              |  |
| Primigravidae screened in 3 <sup>rd</sup> trimester for Hb      |        |                                                              |  |
| All with severe anaemia in 3 <sup>rd</sup> trimester (Hb<7g/dl) |        |                                                              |  |
| Primigravidae with severe anemia in 3 <sup>rd</sup> trimester   |        | % Primigravidae with severe anaemia in 3 <sup>rd</sup> trim. |  |
| Multigravidae with severe anemia in 3 <sup>rd</sup> trimester   |        | % Multigravidae with severe anaemia in 3 <sup>rd</sup> trim. |  |
| <b>MATERNITY/IE&amp;C RECORD</b>                                |        |                                                              |  |
| All deliveries                                                  |        |                                                              |  |
| All live births                                                 |        |                                                              |  |
| Live births to Primigravidae                                    |        |                                                              |  |
| Live births to Multigravidae                                    |        |                                                              |  |
| All LBW (birth weight<2.5kg)                                    |        |                                                              |  |
| LBW to primigravidae                                            |        | % LBW in primigravidae                                       |  |
| LBW to multigravidae                                            |        | % LBW in multigravidae                                       |  |
| All still births                                                |        |                                                              |  |
| All new born deaths in first 7                                  |        |                                                              |  |
| Adverse events from SP                                          |        | % of pregnant women                                          |  |
| No. of CBA/staff giving IE&C                                    |        |                                                              |  |
| No. of IE&C visits                                              |        |                                                              |  |
| <b>REPORTING OFFICER:</b>                                       |        | <b>SIGNATURE:</b>                                            |  |
| <b>DATE OF SUBMISSION:</b>                                      |        |                                                              |  |
| <b>OPENING STOCK OF SP</b>                                      |        |                                                              |  |
| <b>CLOSING STOCK OF SP</b>                                      |        |                                                              |  |

## Appendix II

### ANTENATAL CLINIC REPORT BOOK: DATA COLLECTION TOOL FOR DAILY SUMMARIES

| Name of Facility_                                              | District |   |   |   | Region |   |   |   | Month |    |    |    | Year |    |        |
|----------------------------------------------------------------|----------|---|---|---|--------|---|---|---|-------|----|----|----|------|----|--------|
| DATE                                                           | 1        | 2 | 3 | 4 | 5      | 6 | 7 | 8 | 9     | 10 | 11 | 12 | 12   | 14 | Totals |
| Variable                                                       |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| Total ANC attendance                                           |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| First ANC attendance                                           |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| Second ANC attendance                                          |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| IPT1                                                           |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| IPT2                                                           |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| IPT3                                                           |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| ITN use at first visit                                         |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| ITN use at second visit                                        |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| All with severe anaemia at 3 <sup>rd</sup> trimester           |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| Primigravidae with severe anaemia at 3 <sup>rd</sup> trimester |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| Treatment for malaria                                          |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| Treatment for other illness                                    |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |
| Referral out of unit                                           |          |   |   |   |        |   |   |   |       |    |    |    |      |    |        |

### Appendix III

#### 50 SAMPLED COMMUNITIES OF THE KETA MUNICIPALITY

| NO. | COMMUNITY/VILLAGE | 2007 POPULATION |
|-----|-------------------|-----------------|
| 1   | Weme              | 1368            |
| 2   | Abor              | 5411            |
| 3   | Hormenyima        | 469             |
| 4   | Akplowotokor Anui | 715             |
| 5   | Atiteti           | 961             |
| 6   | Anyako            | 6824            |
| 7   | Kpordui           | 354             |
| 8   | Seva              | 651             |
| 9   | Sasieme           | 2034            |
| 10  | Dzita Anui        | 2670            |
| 11  | Asadame           | 786             |
| 12  | Kedzi             | 1603            |
| 13  | Galo Sota         | 608             |
| 14  | Vodza             | 1776            |
| 15  | Heluvi            | 575             |
| 16  | Aklorfudzi        | 510             |
| 17  | Tunu              | 347             |
| 18  | Anlo-Afiadenyigba | 8109            |
| 19  | Keta              | 9242            |
| 20  | Tegbi             | 11472           |
| 21  | Dakordzi          | 353             |
| 22  | Woe               | 9748            |
| 23  | Dzelukope         | 11875           |
| 24  | Atito             | 808             |
| 25  | Bayive            | 732             |
| 26  | Horvi             | 1161            |
| 27  | Havedzi           | 1280            |
| 28  | Anyanui           | 1828            |
| 29  | Tregui            | 987             |
| 30  | Dzita Agbledomi   | 4028            |
| 31  | Trekume           | 776             |
| 32  | Anloga            | 23827           |
| 33  | Avaflakpota       | 164             |
| 34  | Kodzi             | 902             |
| 35  | Atorkor           | 1798            |
| 36  | Benadzi           | 663             |
| 37  | Alakple           | 1447            |
| 38  | Fuveme            | 927             |
| 39  | Dewenu            | 240             |
| 40  | Atsiame           | 350             |
| 41  | Srogbe            | 1712            |

|    |                   |      |
|----|-------------------|------|
| 42 | Hatorgodo         | 2306 |
| 43 | Lawoshime         | 315  |
| 44 | Avakekpota        | 415  |
| 45 | Mamime            | 406  |
| 46 | Atiavi            | 4391 |
| 47 | Salo              | 1075 |
| 48 | Tsiamé            | 2954 |
| 49 | Bleamezado        | 1497 |
| 50 | Anyanui-Agbledomi | 1056 |



## Appendix IV

### DATA COLLECTION TOOLS

KWAME NKRUMAH UNIVERSITY OF SCIENCE & TECHNOLOGY  
SCHOOL OF MEDICAL SCIENCES DEPARTMENT OF COMMUNITY HEALTH  
Decline in IPTp2/IPTp3 coverage among Pregnant Mothers in the Keta Municipality.

#### QUESTIONNAIRE FOR PREGNANT AND NURSING MOTHERS (PNM)

##### *Section A1 – Demographic Characteristics*

|     |                                          |                                                                                                      |  |
|-----|------------------------------------------|------------------------------------------------------------------------------------------------------|--|
| 001 | How old were you at your last birthday?  | <input type="text"/>                                                                                 |  |
| 002 | What is your highest educational level?  | None- ----- 0<br>Primary- -----1<br>JSS- -----2<br>Secondary- -----3<br>Post Sec.- -----4            |  |
| 003 | What is your marital status?             | Married- -----1<br>Single- ----- 2<br>Separated- -----3<br>Cohabiting- ----- 4                       |  |
| 004 | Which of the religions do you belong to? | Christian- ----- 1<br>Traditional- ----- 2<br>Islam- -----3<br>None -----4                           |  |
| 005 | How many times have you given birth?     | None- -----0<br>One- -----1<br>Two- ----- 2<br>More than two- -----3                                 |  |
| 006 | How many children do you have?           | None- -----0<br>One- -----1<br>Two- ----- 2<br>Three- ----- 3<br>Four- -----4<br>More than 4- -----5 |  |
| 007 | What kind of work do you do?             | None- -----0<br>Self Employed- ----- 1<br>Govt. /Private Serv.- --2<br>Others- ----- 3               |  |
| 008 | What kind of work does your husband do?  | None- -----0<br>Self Employed- ----- 1<br>Govt. /Private Serv.- --2<br>Others- -----3                |  |

|     |                                        |                               |  |
|-----|----------------------------------------|-------------------------------|--|
| 009 | Do you have a health insurance policy? | Yes- - - - -1<br>No- - - - -2 |  |
|-----|----------------------------------------|-------------------------------|--|

### **Section A2 – Influence of Household**

|     |                                                      |                                                                                                                  |  |
|-----|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--|
| 010 | Who provides for the family's upkeep?                | Husband- - - - - 1<br>Parent- - - - -2<br>Others- - - - - 3<br>Self- - - - - 4                                   |  |
| 011 | What is the educational level of the household head? | None- - - - - 0<br>Primary- - - - -1<br>JSS/Middle- - - - -2<br>Secondary- - - - -3<br>Post Sec.- - - - -4       |  |
| 012 | What work does the household head do?                | None- - - - -0<br>Self Employed- - - - - 1<br>Govt. /Private Serv.- - -2<br>Others- - - - - 3                    |  |
| 013 | How many adult males are in the house?               | None- - - - -0<br>One- - - - -1<br>Two- - - - - 2<br>Three- - - - - 3<br>Four- - - - -4<br>More than 4- - - - -5 |  |
| 014 | How many adult females are in the house?             | None- - - - -0<br>One- - - - -1<br>Two- - - - - 2<br>Three- - - - - 3<br>Four- - - - -4<br>More than 4- - - - -5 |  |
| 015 | Who incurs your antenatal care expenses?             | Woman only- - - - -1<br>Husband only- - - - -2<br>Jointly- - - - - 3<br>Parents- - - - -4<br>Others- - - - -5    |  |

### **Section B – Objective 1a – ANC Attendance**

|     |                                                                |                                                                                                             |  |
|-----|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--|
| 016 | How old was your pregnancy when you first attended ANC clinic? | Yet to register- - - - - 0<br>1 – 3 months- - - - - 1<br>4 – 6 months- - - - - 2<br>7 – 9 months- - - - - 3 |  |
| 017 | How many times have you attended ANC                           | None- - - - - 0<br>Once - - - - -1                                                                          |  |

|     |                                                                             |                                                                                                             |  |
|-----|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--|
|     | clinic so far?                                                              | Twice ----- 2<br>More than two times- -3                                                                    |  |
| 018 | How many times did you attend ANC clinic altogether during your pregnancy?  | None- -----0<br>Once -----1<br>Twice ----- 2<br>Thrice- -----3<br>Four times-----4<br>More than 4 times- -5 |  |
| 019 | How do you describe the quality of service in terms of provider's attitude? | Very Good- ----- 1<br>Good- ----- 2<br>Bad- -----3<br>Very Bad- -----4                                      |  |

**Section B - Objective 1b – Education on Malaria**

|     |                                                                                                                                                                                                                                                   |                                                                                                                                |                         |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 020 | Do you think malaria can make you loose your life?                                                                                                                                                                                                | Yes- ----- 1<br>No- -----2                                                                                                     |                         |
| 021 | Malaria is dangerous for both the unborn and newly born babies. Do you agree?                                                                                                                                                                     | Yes- ----- 1<br>No- -----2                                                                                                     |                         |
| 022 | Mention some effects of malaria you know (Anaemia, Miscarriage, Low birth weight, Still birth, Pre-term labour, Death from sever anaemia and Pre-term delivery)                                                                                   | No Response- -----0<br>Very good knowledge- -1<br>Good knowledge- ----- 2<br>Poor knowledge- -----3<br>Very poor knowledge- -4 | 0<br>5<br>4<br>2-3<br>1 |
| 023 | What measures can be used to prevent malaria especially during pregnancy? (Indoor residual spraying, The use of ITN, The use of SP/IPTp, Clearing stagnant pools around, Not staying outside during the night and Wearing of protective clothing) | No Response- -----0<br>Very good knowledge- -1<br>Good knowledge- ----- 2<br>Poor knowledge- -----3<br>Very poor knowledge- -4 | 0<br>5<br>4<br>2-3<br>1 |
| 024 | Do you receive education on the means of preventing malaria at the ANC clinic?                                                                                                                                                                    | Yes- ----- 1<br>No ----- 2                                                                                                     |                         |

**Section C - Objective 1c – SP Supply**

|     |                                                                      |                                                                        |  |
|-----|----------------------------------------------------------------------|------------------------------------------------------------------------|--|
| 025 | Were you introduced to any anti malaria drug (SP) at the ANC clinic? | Yes -----1<br>No ----- 2                                               |  |
| 026 | If yes, how many times did you take the anti malaria drug (SP)?      | None- -----0<br>Once- -----1<br>Twice- -----2<br>Thrice ----- 3        |  |
| 027 | How many times were you expected to take the drug before delivery?   | Once- -----1<br>Twice- -----2<br>Thrice ----- 3<br>Don't know- ----- 4 |  |

|                                              |                                                                                     |                                                                          |  |
|----------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--|
| 028                                          | Have you ever been to the ANC clinic for the drug and you were told it is finished? | Yes -----1<br>No ----- 2                                                 |  |
| 029                                          | Did you pay for this special drug?                                                  | Yes -----1<br>No ----- 2                                                 |  |
| <b>Section D - Objective 1d – DOT Method</b> |                                                                                     |                                                                          |  |
| 030                                          | Where did you take the drug?                                                        | At the ANC clinic-----1<br>At home----- 2<br>Others-----3                |  |
| 031                                          | If it is at the ANC clinic, how did you get water?                                  | Supplied by the facility--<br>-----1<br>Bought my own water--<br>----- 2 |  |

**Section E - Objective 2 –Distance, Time and Means of Transport**

|     |                                                              |                                                          |  |
|-----|--------------------------------------------------------------|----------------------------------------------------------|--|
| 032 | What is the distance to the ANC clinic?                      | < 5 km ----- 1<br>> = 5 km----- 2                        |  |
| 033 | How long does it take you to get to the ANC clinic?          | < 30 -----1<br>One hour -----2<br>More than 1hr. ----- 3 |  |
| 034 | What means of transport do you use to get to the ANC clinic? | Walking----- 1<br>Car----- 2                             |  |
| 035 | Do you encounter any inconvenience getting car?              | Yes-----1<br>No ----- 2                                  |  |

**Section F – Objective 3 – Ownership of ITN and Use**

|     |                                                 |                         |  |
|-----|-------------------------------------------------|-------------------------|--|
| 036 | Do you have an insecticide treated net (ITN)?   | Yes-----1<br>No ----- 2 |  |
| 037 | If yes, did you sleep in it the previous night? | Yes-----1<br>No ----- 2 |  |
| 038 | If not, what was the reason?                    |                         |  |

## Appendix V

### DATA COLLECTION TOOLS

KWAME NKRUMAH UNIVERSITY OF SCIENCE & TECHNOLOGY  
SCHOOL OF MEDICAL SCIENCES DEPARTMENT OF COMMUNITY HEALTH  
Decline in IPTp2/IPTp3 coverage among Pregnant Mothers in the Keta Municipality.

#### QUESTIONNAIRE FOR MIDWIVES IN CHARGE OF ANC CENTERS

##### **SECTION A - Demographic Characteristics**

| No  | Questions and Filters                   | Coding Categories                                                                     | ANS |
|-----|-----------------------------------------|---------------------------------------------------------------------------------------|-----|
| 001 | Age                                     | <input type="text"/> <input type="text"/>                                             |     |
| 002 | Marital status                          | Single - - - - - 1<br>Married- - - - - 2<br>Widowed- - - - - 3<br>Divorced- - - - - 4 |     |
| 003 | What is your highest educational level? | JSS- - - - - 1<br>SSS- - - - - 2<br>Diploma- - - - - 3<br>Degree- - - - - 4           |     |

##### **SECTION B: Knowledge of malaria prevention strategies**

|     |                                                                                                             |                                 |  |
|-----|-------------------------------------------------------------------------------------------------------------|---------------------------------|--|
| 004 | Have you had any training in malaria control and prevention strategies during pregnancy the past 12 months? | Yes- - - - - 1<br>No- - - - - 2 |  |
| 005 | If yes, mention the strategies.                                                                             |                                 |  |
| 006 | Do you educate pregnant women on the use of SP/IPTp and ITN?                                                | Yes- - - - - 1<br>No- - - - - 2 |  |

##### **SECTION C: SP Availability**

|     |                                                     |                                 |  |
|-----|-----------------------------------------------------|---------------------------------|--|
| 007 | Have you run out of stock of SP the past 18 months? | Yes- - - - - 1<br>No- - - - - 2 |  |
|-----|-----------------------------------------------------|---------------------------------|--|

##### **SECTION D: Staff Adequacy**

|     |                                                                           |                                 |  |
|-----|---------------------------------------------------------------------------|---------------------------------|--|
| 008 | Do you have the required number of qualified ANC providers at the clinic? | Yes- - - - - 1<br>No- - - - - 2 |  |
| 009 | How will you describe the staff                                           | Adequate- - - - - 1             |  |

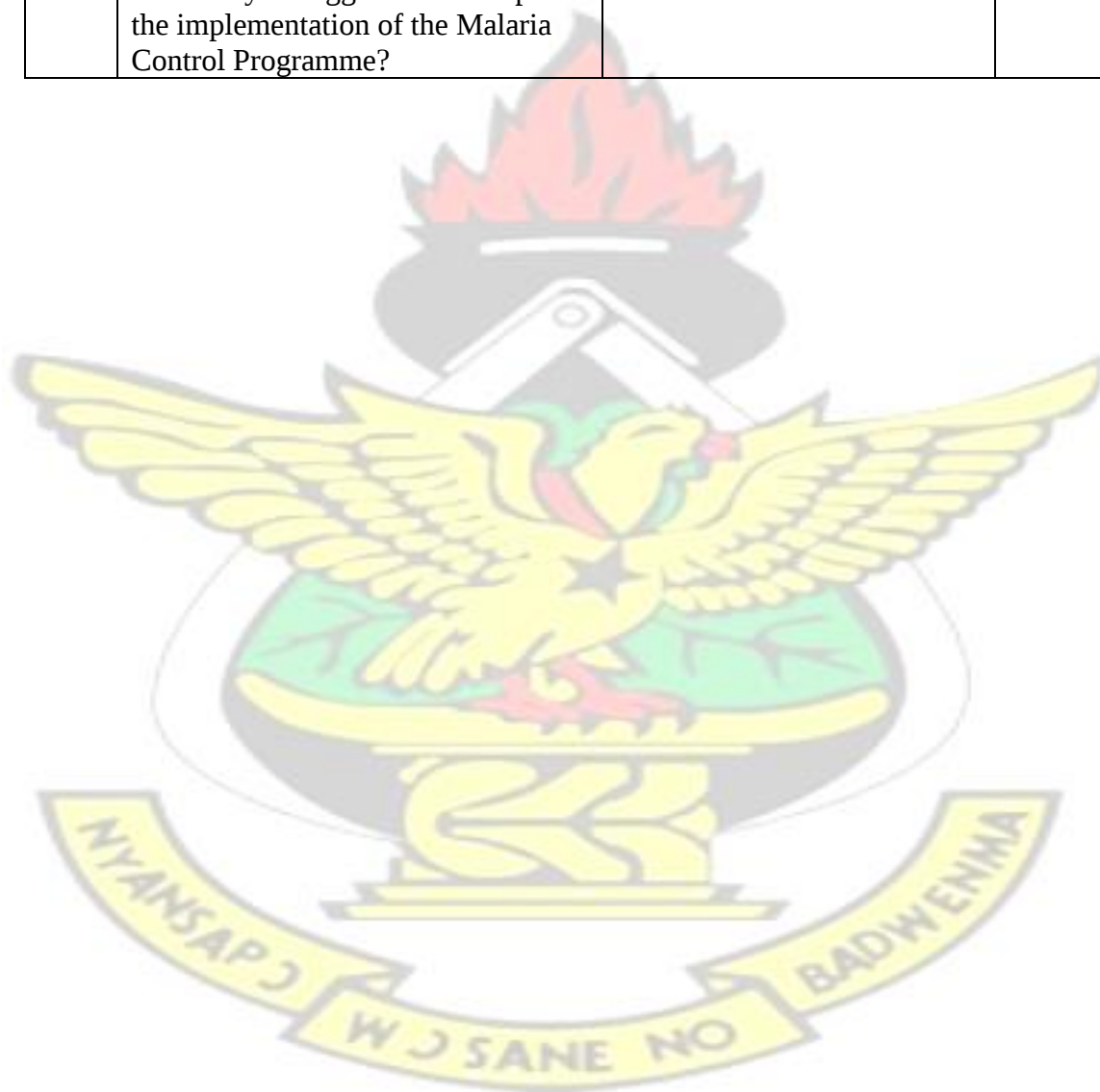
|  |            |                      |  |
|--|------------|----------------------|--|
|  | situation? | Inadequate- - - - -2 |  |
|--|------------|----------------------|--|

**SECTION E: Outreach ANC services**

|     |                                                      |                               |  |
|-----|------------------------------------------------------|-------------------------------|--|
| 010 | Do you provide ANC services at the outreach clinics? | Yes- - - - -1<br>No- - - - -2 |  |
|-----|------------------------------------------------------|-------------------------------|--|

**SECTION F: Suggestions**

|     |                                                                                        |  |  |
|-----|----------------------------------------------------------------------------------------|--|--|
| 011 | What do you suggest would improve the implementation of the Malaria Control Programme? |  |  |
|-----|----------------------------------------------------------------------------------------|--|--|



## Appendix VI

