

SCHOOL OF PUBLIC HEALTH  
COLLEGE OF HEALTH SCIENCES  
UNIVERSITY OF GHANA

FACTORS INFLUENCING THE UPTAKE OF INTERMITTENT PREVENTIVE  
TREATMENT OF MALARIA AMONG PREGNANT WOMEN IN THE GUSHEGU  
DISTRICT, NORTHERN REGION, GHANA



A THESIS SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF  
GHANA, IN PARTIAL FULFILMENT FOR THE AWARD OF THE MASTER OF  
PHILOSOPHY DEGREE IN APPLIED EPIDEMIOLOGY AND DISEASE CONTROL

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**DECLARATION**

I, STEPHEN AWIN-IRIGU ATASIGE declare that except for other people’s investigations which have been duly acknowledged, this thesis is the result of my own original research undertaken under supervision and that it has neither in whole nor in part been presented for another degree in this university or elsewhere.

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## **DEDICATION**

This research is dedicated to all pregnant women especially those in rural northern Ghana at risk of malaria during pregnancy.



## ACKNOWLEDGEMENT

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Finally, I am grateful to my mother and late father and my family for their encouragement and support throughout my years of education. I wish to particularly thank my wife, Vivian and my daughter, Makayla for all the sacrifices they made to ensure that I complete this course successfully.

## ABSTRACT

**Background:** Despite reducing from 451 in 2007 to 350 in 2010 per 100,000 live births, Ghana has a high maternal mortality rate. NMCP target for IPTp2 is 80%, Ghana's coverage was 64.4% in 2011. This contrasts with 84.7% ANC attendance coverage for at least 4 visits. Northern Regional IPTp2 coverage is lower than the national average at 51.2%. In Gushegu 44% registered pregnant women received IPTp2 in 2013. Low IPTp coverage is a threat to reducing malaria incidence and maternal mortality. The primary objective of the study was to determine the client and facility related factors associated with adequate uptake of IPTp.

**Methods:** A cross sectional study was conducted among ANC clients and staffs of the Gushegu RCH. Questionnaires were administered to 330 conveniently sampled nursing mothers and filled by ANC staff. A checklist was used for health facility observations. Univariate analyses of variables were expressed as frequencies and proportions. Bivariate analysis was used to show associations between the various independent and the dependent variables,

**Results:** A total of 8.5% and 91.5% of respondents took inadequate ( $\leq 1$ dose) and adequate ( $\geq 2$ doses) IPTp-SP respectively. 85.4% respondents made early first ANC attendance, 92% are unemployed and 80% multiple gravidae. Mean ANC visits is 5. Mean gestational age at first attendance for inadequate and adequate dosage is 6 and 4 respectively. 25% and 15.5% reported side effects and malaria infection after SP use respectively. The odds ratios at 95%CI of Unemployment, single gravidae and late first ANC visit to predicting inadequate SP uptake were OR4.9 (1.88-13.14.), OR3.38 (1.52-7.55) and OR6.8 (2.96-15.40) respectively.

DOT practice, good staff attitude and health talks at the facility was observed and confirmed by 96.7%, 94% and 87.2% of clients. ITNs coverage is 23% and usage 72%.

**Conclusion:** Adequate uptake of SP among respondents was high. Majority were unemployed, have had multiple pregnancies and made early first ANC visits. The mean number of ANC visits meets WHO standards. Unemployment, single parity and late first ANC visits are significantly associated with taking inadequate SP dose. ANC staff attitude and practices are satisfactory. The coverage of ITNs is low but its use is high among the respondents.

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## LIST OF ABBREVIATIONS/ACRONYMS

ACT	Artemisinin based Combination Therapy
ANC	Antenatal Clinic
CDC	Center for Disease Control
GDHD	Gushegu District Health Directorate
TBA	Traditional Birth Attendant
CHPS	Community Based Health services and Planning
CQ	Chloroquine
DHMT	District health Management team
DOT	Directly Observed Treatment
GHS	Ghana Health Service
IPT	Intermittent Preventive treatment of malaria
IPTp	Intermittent Preventive treatment of malaria in pregnancy
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Net
JHPIEGO	John Hopkins Program for International Education in Gynaecology and Obstetrics
LLIN	Long Lasting Insecticidal Nets
MDG	Millennium Development Goal
NMCP	National Malaria Control Program
OPD	Out Patient's Department

- PMI President's Malaria Initiative
- RBM Roll Back Malaria
- RCH Reproductive and Child Health
- SP Sulphadoxine- Pyrimethamine
- NRHD Northern Regional Health Directorate
- PCR Polymerase Chain Reaction
- WHA World Health Assembly
- WHO World Health Organization



## CHAPTER ONE

### INTRODUCTION

#### 1.1 BACKGROUND

Malaria is a parasitic infection spread by Anopheles mosquitoes (*Malaria.com, 2011*). The *Plasmodium* parasite that causes malaria is a single-celled parasite that multiplies in red blood cells of humans as well as in the mosquito intestine (Malaria factsheet, 2010 WHO).

When the female mosquito feeds on an infected person, male and female forms of the parasite are ingested from human blood (Malaria factsheet, 2010 WHO). Subsequently, the male and female forms of the parasite meet and mate in the mosquito gut, and the infective forms are passed into another human when the mosquito feeds again. It then enters the bloodstream and invades red blood cells. Eventually, the infected red blood cells burst. This sends the parasites throughout the body and causes symptoms of malaria. Once it is in an infected person, it multiplies in the liver and changes again and can infect a mosquito that bites (*Malaria.com, 2011*). You can only get malaria if you're bitten by an infected mosquito, or if you receive infected blood from someone during a blood transfusion. Malaria can also be transmitted from mother to child during pregnancy (*Malaria.com, 2011*).

There are four species of the *Plasmodium* parasite that can cause malaria in humans: *P. falciparum*, *P. vivax*, *P. ovale*, and *P. malariae* (Malaria factsheet, 2010 WHO). The first two types are the most common in Africa. Symptoms usually appear about 12 to 14 days after infection. People with malaria have the following symptoms: Abdominal pain, chills, sweats and diarrhea, nausea, and vomiting, headache, high fevers, low blood pressure causing dizziness,

muscle aches and poor appetite (*Malaria.com, 2011*). A confirmatory test is by using a blood film or a rapid diagnostic test. People with malaria left untreated may develop severe complications and die.

About 90% of all malaria deaths in the world occur in Africa south of the Sahara. This is because the majority of infections in Africa are caused by *Plasmodium falciparum*, the most dangerous of the four human malaria parasites. It is also because the most effective malaria vector – the mosquito *Anopheles gambiae* – is the most widespread in Africa and the most difficult to control. (The World Health Report 2002, World Health Organization). In 2010 an estimated 219 million cases of malaria occurred worldwide and 660,000 people died, most (91%) in the African region. (CDC's Malaria program, 2010). Malaria is prevalent in Africa, Asia, the Middle East, Central South America, Hispaniola (Haiti and the Dominican Republic), and Oceania (Papua New Guinea, Irian Jaya, and the Solomon Islands) (Malaria factsheet, 2010 WHO).

Ghana's entire population of 25.2 million is at risk of malaria. Transmission occurs year-round with seasonal variations. According to Ghana Health Service health facility data, malaria accounts for about 38 percent of all outpatient illnesses, 36 percent of all admissions, and 33 percent of all deaths in children under five years. Between 3.1 and 3.5 million cases of clinical malaria including malaria in pregnancy are reported in public health facilities each year with seasonal variations (country profile, Presidential Malaria Initiative (PMI), April 2013).

Each year approximately fifty million women living in malaria endemic countries throughout the world become pregnant, of whom over half live in tropical areas of Africa where there is intense transmission of *Plasmodium falciparum*. An estimated ten thousand of these women and two hundred thousand of their infants die as a result of malaria infection during pregnancy and severe

malarial anaemia contributes to more than half of these deaths. (WHO report, 2010). *Plasmodium falciparum*, one of the four main types of the parasite that cause malaria, accounts for ninety to ninety-eight percent of all infections in Ghana, *Plasmodium malariae* 2-9% and *Plasmodium ovale* 1%. (The U.S. President's Malaria Initiative (PMI) Document for Ghana, 2008). The female *Anopheles* species of the mosquito is the vector responsible for the transmission of the *Plasmodium* parasite from human to human through its bite. They are commonly found in the rural and peri-urban areas where socio-economic activities lead to the creation of breeding sites.

It is postulated that physiological and behavioral changes during pregnancy are responsible for increased attractiveness to the *Anopheles gambiae* complex. (Lindsay S. *et al.*, 2000).

Pregnancy is normally followed by suppression of the immune system which may cause the loss of acquired immunity to malaria. Heavy placental sequestration can interfere with nutrient as well as oxygen transport to the fetus. Maternal susceptibility to malaria is responsible for high parasitaemia in pregnancy (Roll Back Malaria Program report, 2002).

*Plasmodium falciparum* infection in pregnancy does not cause symptoms of malaria typically but may lead to maternal anaemia and placental malaria, especially among women having first and second births. Placental malaria leads to the low birth weight, the single greatest risk factor for neonatal death, and a major contributor to infant death. In unstable transmission areas, women do not acquire substantial antimalarial immunity; infection with *Plasmodium falciparum* can cause severe clinical illness and even death and is also linked to poor birth outcomes, including still birth, miscarriages and premature deliveries (Steketee *et al.*, 1996, 2001).

In Ghana, among pregnant women, malaria accounts for 13.8% of outpatients 'department (OPD) attendance, 10.6% of admissions and 9.4% of maternal deaths (National Malaria Control

Program (NMCP) report, 2007). The urgency of the malaria situation among the vulnerable (pregnant women, neonates and infants) has called for several approaches to reducing its burden.

In April 2000, the African Summit on Roll Back Malaria (RBM) adopted the Abuja Declaration in which leaders in the region made a commitment to ensuring that sixty percent of pregnant women in malaria-endemic communities accessed effective prevention and treatment of malaria by 2005. The following approaches were to be adopted:

To support and promote access to correct, affordable and appropriate treatment within twenty-four hours of the onset of symptoms.

To support and promote access to a suitable combination of personal and community protective measures such as insecticide treated nets (ITNs).

To support and promote the use of malaria preventive measures such as chemoprophylaxis or intermittent preventive treatment for pregnant women (IPTp) especially those in their first pregnancies.

However, chemoprophylaxis is no longer the strategy recommended for preventing malaria in pregnancy (country profile, Presidential Malaria Initiative (PMI), April 2013). Chloroquine (CQ) was the prophylaxis that was most used, requiring a weekly or a more frequent dosing. The usefulness of the drug had limitations that included:

The sustainability of the intervention due to difficulty in delivery, secondly, the regimen was being poorly adhered to by the pregnant women. As well as the experience of side effects such as itching due to CQ and rising resistance of *Plasmodium falciparum* to CQ due to possible induction of drug resistance. Lastly is the interference with the generation of natural immunity to malaria.

The WHO recommended that the policy for the prevention of malaria during pregnancy in areas of stable transmission should emphasize a preventive package of Intermittent Preventive Treatment (IPT) and Insecticide Treated bed Nets (ITN's) and ensure effective case management of malaria illness and anemia.

The IPT policy infers that:

All pregnant women in areas of stable malaria transmission should receive at least two doses of IPT after 16 weeks gestation. Secondly four ANC visits should be made with three after 16 weeks of gestation. Also, deliveries of IPT with each visit to the ANC after quickening ensures a high proportion of women receive at least two doses of IPT. Lastly, IPT should be given to pregnant women only monthly and not more.

The most effective drug for IPT currently is Sulphadoxine Pyrimethamine (SP) because of its safety for use during pregnancy, effectiveness in reproductive-age women, and the feasibility for use in programs as it can be delivered as a single- dose treatment under direct observation (DOT) by the ANC staff. In addition to the above, SP is being used because of its demonstrated high levels of acceptance by the pregnant women and its low resistance level in Ghana. (GHS/NMCP/JHPIEGO/GLOBAL FUND, 2005).

Evidence suggests that at least two IPT doses are required to achieve optimal benefit in most women, a third dose will not cause any additional risk and more than three doses does not offer additional benefits (WHO report, 2004). Implementation of IPTp is by the Reproductive Health Division of the Ghana Health Service (GHS) in collaboration with the NMCP in all public health facilities in the country.

IPTp with SP was adopted in 2003, in the same year twenty selected districts were rolled on, in 2005, it was scaled up nationwide. The target of the IPT program globally is 80% IPT2 for

pregnant women by 2010 (World Health Assembly, 2005). 60% of pregnant women with at least two doses of IPT by 2005 is the Abuja target and this has guided IPT implementation in Ghana since 2003. The Strategic Plan for Malaria Control in Ghana (2008) has an objective to reach 100% of pregnant women with IPTp (at least two or more doses) by 2015.

## **1.2 PROBLEM STATEMENT**

Like other countries in sub-Saharan Africa, Ghana has continued to fall short of Millennium Development Goals (MDGs) for reducing child mortality and reducing maternal death. NMCP target for IPTp2 is 80%, while Ghana's coverage was 64.4% in 2011. (PMI, Ghana report 2011). In the Northern Region, IPTp2 is lower than the national average at 51.2%. At the district hospital of Gushegu, only 44% of registered pregnant women in the district took IPTp2 in the year 2013. From 2010-2012, 15127 malaria cases were recorded in the main Gushegu District hospital (GDH), 3234 (21.4%) were pregnancy associated.

Low IPTp coverage is a threat to reducing malaria incidence and maternal mortality in Gushegu. The burden of malaria among pregnant women is eminent in the Gushegu district of Ghana and influenced by the low adherence to IPTp and ITNs. In rural northern Ghana, there is a high rate of illiteracy and poverty which may be related to the socio- demographic, economic and attitudinal factors that influence the inadequate adherence to IPTp resulting to high incidence of malaria in pregnancy and poor maternal health. This jeopardizes the MDG on maternal health.

### 1.3 JUSTIFICATION

The NMCP set a target national coverage of 80% for IPTp2 and reducing the malaria disease burden by 75% by 2015. Rural northern Ghana is one of the poorest areas in the country with high illiteracy rates. Pregnant women and their babies are a vulnerable group in this part of the country and more exposed to malaria infection, malnutrition and other risk factors than in other parts of the country. The burden of malaria among this group requires the delivery of cost effective malaria prevention to pregnant women through strengthened antenatal care, the integration of malaria control with other health programs targeted at pregnant women and infants, increased community awareness, and considerable financial investment. The prize for achieving this will be safer pregnancies and a reduction in infant's deaths. Prevention of malaria during pregnancy remains one of the most important and achievable goals of Malaria control programs and the millennium development goals 4 and 5 of reducing the under-five mortality rate by two-thirds and reducing the maternal mortality ratio by three-quarters, respectively, between 1990 and 2015.

These goals can be achieved through an increased coverage towards universal access and usage of preventive interventions.

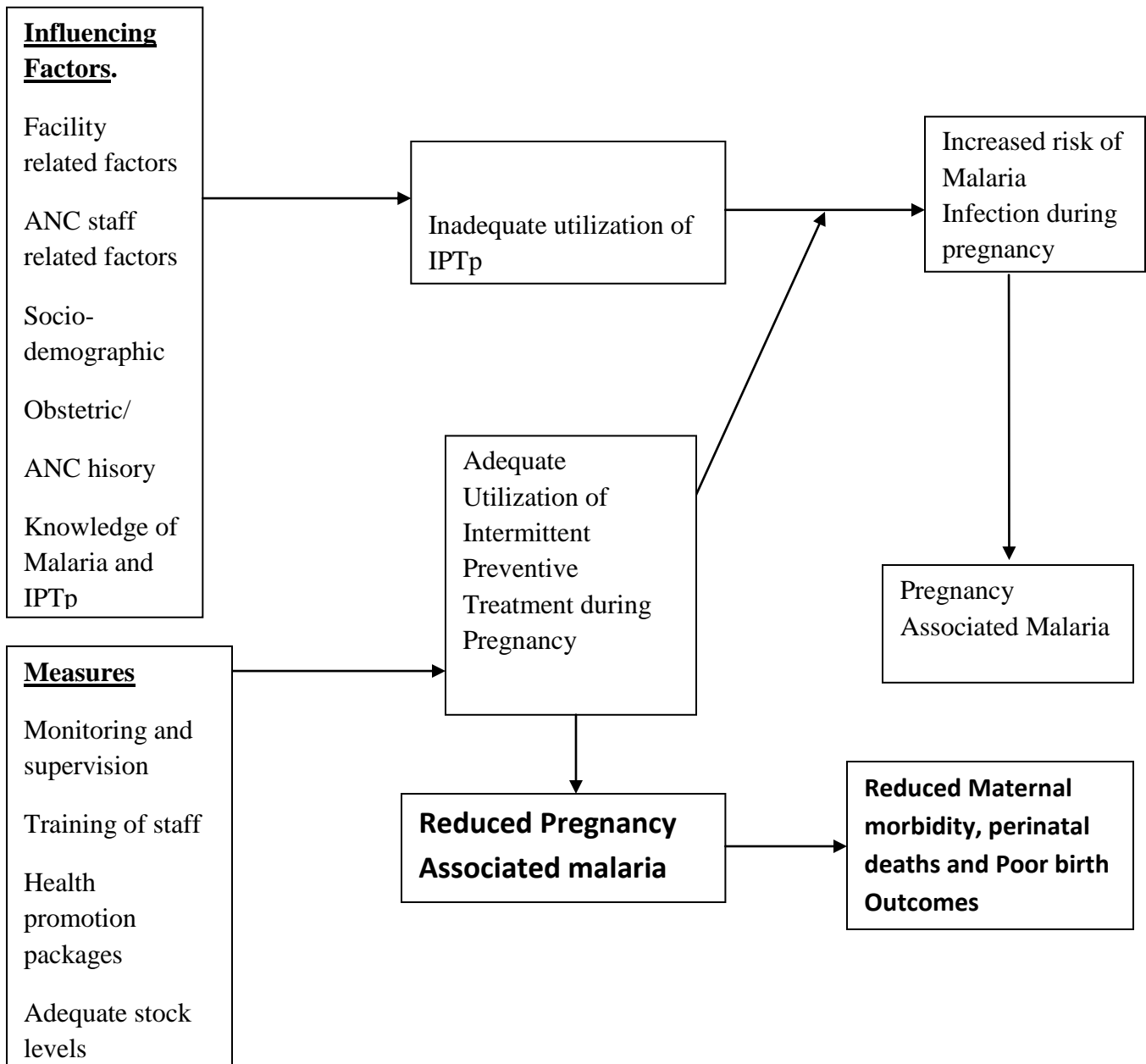
## 1.4 CONCEPTUAL FRAMEWORK

The conceptual framework is an overview of some of the factors that contribute to the utilization of IPT in the district and how these factors influence malaria in pregnancy leading to maternal morbidity, perinatal deaths and poor birth outcomes. It provides a framework within which this study was conducted.

The socio-demographic factors of the respondents provide their general characteristics such as age, place of residence, marital status, parity, educational background and their occupation. The factors influence the healthcare seeking attitude of the respondents and may be likely to affect ANC attendance as well as IPTp utilization.

With appropriate monitoring and supervision of IPTp activities by the District Health Management Team, implementation deficiencies at the facility level such as SP stock outs, non adherence to the IPTp policy by health workers will be identified and resolved. Training of staff in IPTp is relevant to improve upon their knowledge therefore influence their adherence and commitment to the policy implementation.

The attitude of ANC staff towards their clients is also likely to improve. The knowledge that would be imparted to the clients at the ANCs through educational talks will improve the knowledge of the pregnant women about IPTp, their acceptance of the program may be greatly enhanced and thus they may be ready to participate in it to their benefit. Utilization of IPTp will reduce risk of malaria in pregnancy which invariably will influence maternal morbidity, perinatal deaths and poor birth outcomes due to malaria in pregnancy.

**Figure 1.1: Conceptual framework**

## **1.5 RESEARCH QUESTIONS**

1. What is the association between socio-demographic variables and use of IPTp-SP among respondents?
2. Is knowledge of malaria and IPTp-SP associated with its use among respondents?
3. What health facility factors influence the utilization of IPTp-SP?
4. What obstetric history influences the utilization of IPTp-SP?
5. Do experiences from IPTp-SP influence its uptake?

## **1.6 GENERAL OBJECTIVES**

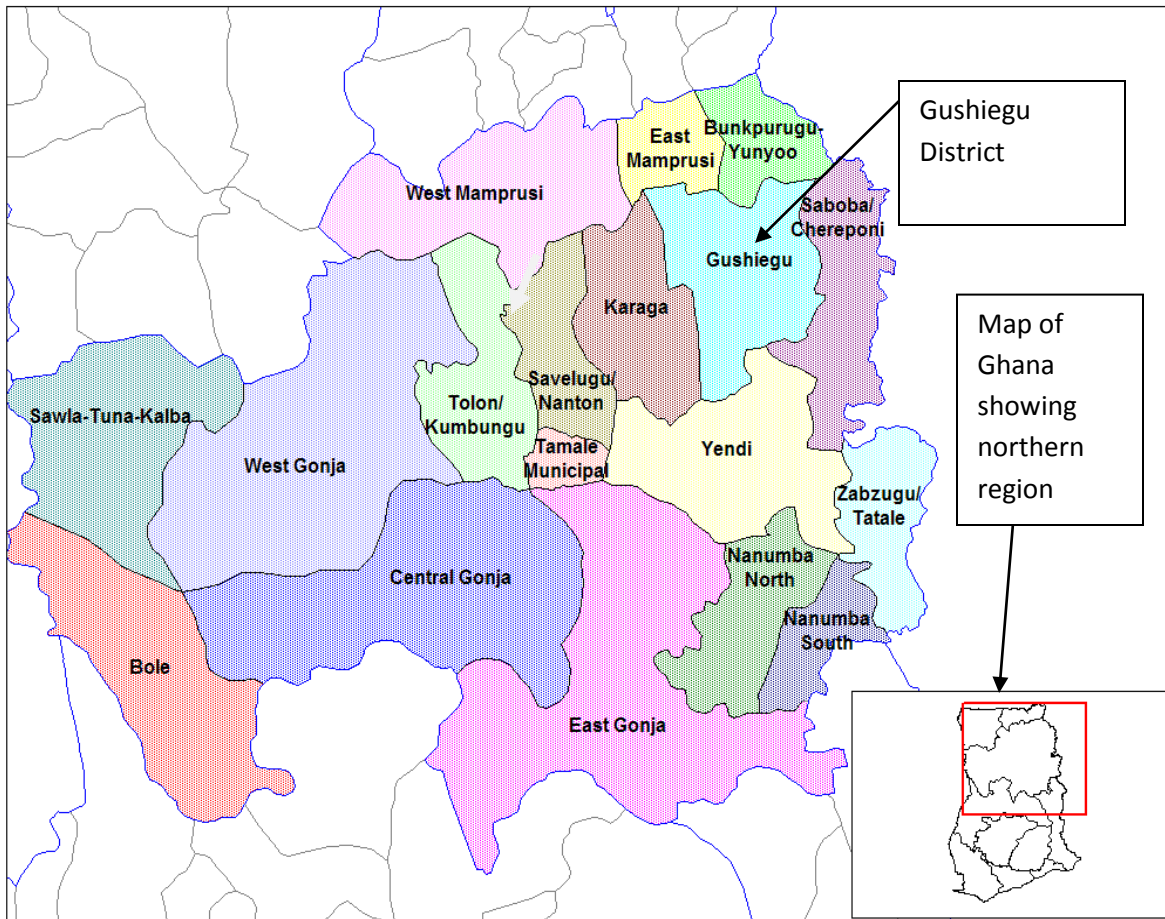
1. To determine factors influencing adequate uptake of IPTp-SP dose.

## **1.7 SPECIFIC OBJECTIVES**

1. To determine the association between socio-demographic characteristics and uptake of IPTp-SP doses
2. To determine the association between knowledge of malaria and IPTp and uptake of IPTp-SP doses.
3. To assess the influence of the facility and ANC staff factors on the uptake of IPTp-SP
4. To determine the association between obstetric/ANC history and uptake of IPTp-SP doses.
5. To assess the association between experiences from IPTp-SP use in recent pregnancy and its uptake

## 1.8 PROFILE OF STUDY AREA

FIGURE 1.2: MAP OF THE NORTHERN REGION GHANA

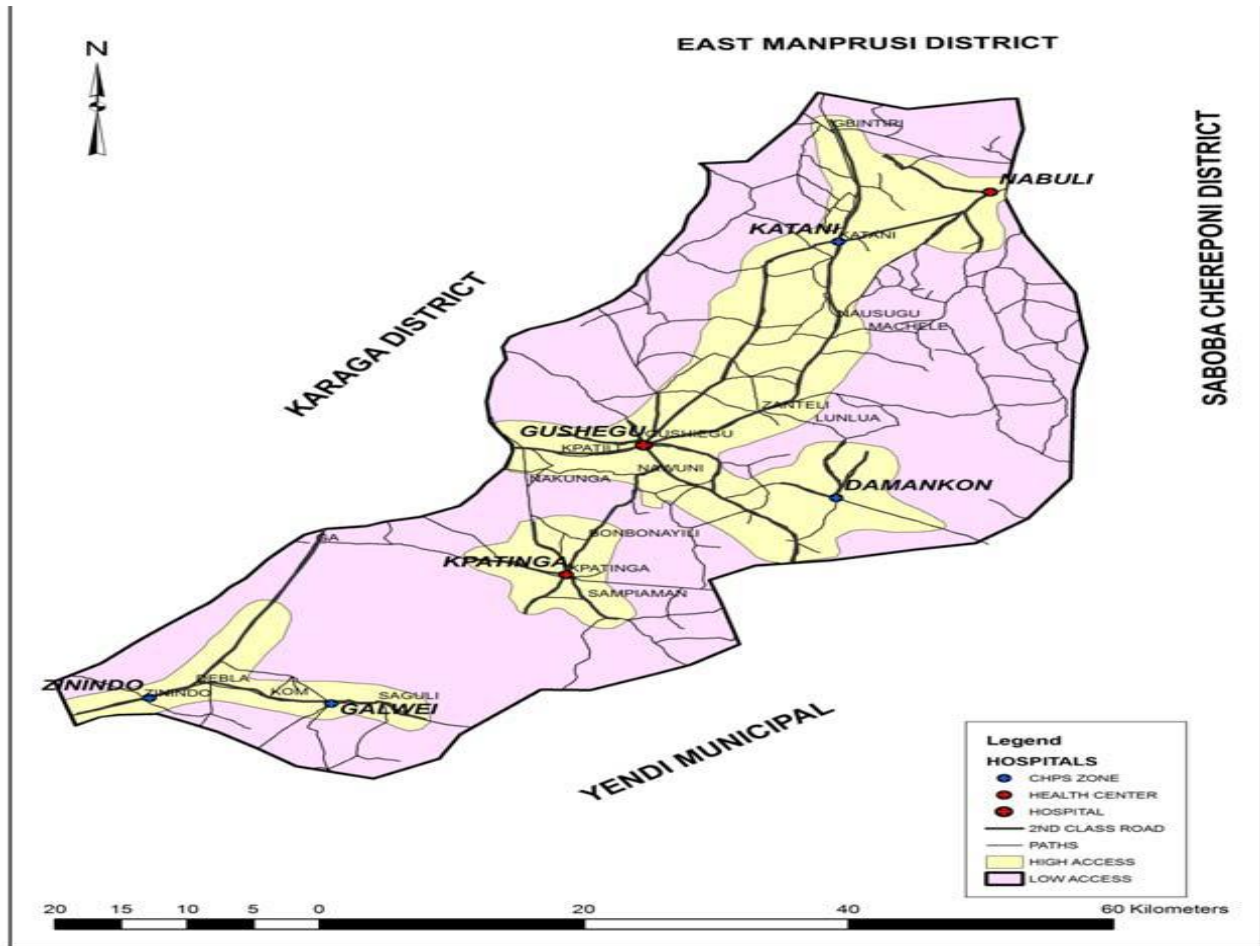


**Source:** wikipedia.org

The northern region is the largest region in Ghana in terms of land area. Specifically it has a total land area of about 70,384 Sq.Km which is approximately 30% of the total land space of Ghana. It lies in the savannah belt. It is bounded to the north by Upper East and Upper West Regions to the south by Brong Ahafo and Volta Regions, to the east by the Republic of Togo and the west by the Republic of La C'ote d'Ivoire. The regions eighteen(18) districts are widely distributed, with disparity in population across them. (*Development concern center Ghana.org*)

FIGURE 1.3

## GUSHEGU DISTRICT MAP



Source: Ghanadistricts.com

## 1.8.1 Background Information of the District

### 1.8.1.1 Political Background

Gushegu District is located in the north eastern corridor of Northern Region. The district was carved out of the then Gushegu/Karaga District in 2004.

The district has eight (8) Area Councils; namely, Gushegu, Kpatinga, Nabuli, Bogu, Kpugi, Galwei, Nawuhigu and Zanteli Area Councils with twenty five (25) Unit Committees and twenty five (25) Electoral Areas.

### **1.8.1.2 Location and Size**

The total land area of the district is approximately 5,796 km<sup>2</sup>. The district has 395 villages. It is bordered by five other districts in the region, namely; Savelugu/Nanton and Karaga districts to the west, Saboba and Chereponi to the east, East Mamprusi to the north, and Yendi to the South. The capital of the district is located in Gushegu, which is about 114 km from the Northern Regional capital, Tamale.

### **1.8.1.3 Relief and Drainage**

The topography of the land is generally undulating with elevations ranging from 140m above sea level at valley bottoms to 180m at highest plateaus. Being mostly watershed of main rivers, the district is endowed with many small valleys. Larger valleys can only be found towards the periphery of the district where the small streams merge into large ones. These large valleys can be found at Gaa, Katani, Sampemo and Sampegbiga areas. The size of all valleys in the district is estimated at 22,000 acres. There are no major rivers in the district, but tributaries and sub-tributaries of Nasia, Daka, Nabogu and Oti rivers run through the district. The main river, Nasia, and the other streams can all be described as intermittent.

The Nasia only reduces in volume during the long dry season, whereas all the other streams dry up completely. In the rainy season however, all the streams increase in volume and flood the immediate surrounding land thereby cutting off most communities during the period. Most roads are also rendered unmotorable.

#### **1.8.1.4 Climate**

Gushegu District is covered by a tropical climate which is marked by the alternation of dry and rainy seasons. The dry season lasts between November and March and is characterized by the predominance of North-East winds in the form of harmattan which is hot and dry. Gushegu District – due to its outlying position in the North-East region has a tropical climate which is typical of the Northern region. The unique rainy season, influenced by South-East winds lasts from May to October (rainfalls vary between 900 and 1,000mm); very strong rainfalls are recorded in July and August.

Temperatures are high throughout the year with a maximum of 36°C recorded mainly in March and April. Low temperatures are recorded between November and February (the harmattan period). In fact, temperatures are, generally very high throughout the year, sometimes close to 40oC between March and April; but lowest temperatures are recorded between November and February.

#### **1.8.1.5 Population**

According to the results of the Population and Housing Census, (PHC, 2010) released by the Ghana Statistical Service, Gushegu, the district has 112,826 inhabitants distributed within the 395 communities. The sex distribution of the population is made up of 55,285 males, representing 49% and 57,541 females also representing 51%. The people are predominantly Dagombas. Other ethnic groups include Fulanis and Konkombas. Malaria is hyper-endemic in the area with perennial transmission.

### **1.8.1.6 Occupation**

The main economic activity of the people is farming. Maize, yam, beans and rice are the major crops grown. The occupations of most women in the communities are petty trading and engaging in local industries like sheabutter, and salt pitter making.

### **1.8.1.7 Soil and Vegetation**

The district lies entirely within the Voltaian sandstone basin dominated by sandstones, shales, siltstones and minor limestone. The northern tip of the district is underlain by lower Voltaian which consists of rocks, dominated by shales and sandstones. The soils are mainly savannah ochrosols, groundwater laterite formed over granite and Voltaian shales. Gushegu District is located in the Guinea savannah area which is characterized by short trees and grasses interspersed with drought resistant trees like shea and dawadawa.

### **1.8.1.8 Culture / Festival**

Culturally the area is influenced by Islam and Inheritance is patrilineal. Prominent festivals they celebrate include the Damba, Bugum (fire festival) and Eid festivals.

Communities in the district have sub-chiefs who owe their allegiance to the chief of Gushegu (Gushie-Naa).The Gushegu chief also owes his allegiance to the paramount chief of Dagbon (Yaa-Naa) in Yendi.

### **1.8.1.9 Religious Groups**

The majority of inhabitants are Moslims. The few Christians in the district are mostly not indigens. Traditional religion is also practiced among the people. The use of traditional and medicine is common.

### **1.8.1.10 Education**

The district currently has one senior secondary school that serves the whole district, six junior secondary schools located spatially in the district and seventy-one (71) primary schools. There are 11571 pupils and students population in the district.

In general there are 359 teachers in the district out of which only 42.6% are trained. The gender disparity is worse as only 7 of the trained are women. Superficially, the teacher/pupil ratio in the district seems to be good which is 1:32 against the national average of 1:33.

### **1.8.1.11 Health System**

#### **1.8.1.11.1 Facilities/Service Providers**

The Gushegu District Hospital is the highest level health facility in the district.

This is supported by Health Centres at Kpatinga and Nabuli. The Tamale Teaching Hospital serves as a referral centre for medical conditions which these facilities are unable to contain. OPD attendance has increased due to the institution of the National Health Insurance which took off in 2002. Other people also assist to provide health services to the population include Trained Traditional Birth Attendants (TBAs), village health workers and volunteers. The table summarizes the location and population served by each facility.

The table below shows the number of antenatal clients registered at the various service delivery centers in the Gushegu district.

**Table 1.1: Location, Type and Population Served By Health Facility**

NO.	Type Of Facility	Total	Location	Pop. Served	Remarks
1	DISTRICT HOSPITAL	1	Gushegu	107,469	Functional
2	HEALTH CENTER	2	Kpatinga	19,343	Functional
			Nabuli	21,492	functional
3	REPRODUCTIVE AND CHILD HEALTH CENTER	1	Gushegu	29,104	Functional
4	CHPS ZONE	5	Galwei	12,895	Functional
			Zinindo	6,447	functional
			Zamashegu	6,253	functional
			Katani	15,044	functional
			Damankung	3,224	functional
TOTAL		9			

**Source: GHS Gushegu 2012**

**Table 1.2: ANC Attendance at Registry of Sub – Districts in the Gushegu District, 2012.**

Gushiegu RCH	2176 (40%)
Katani	937 (17%)
Kpatinga	916 (16%)
Galwei	401 (7%)
Nabuli	400 (7%)
Damankung	332 (6%)
Zinindow	255 (5%)
Zamashegu	92 (2%)
Total	5509 (100%)

**Source: RCH, Gushegu sub-district 2012**

### **1.9 REPRODUCTIVE HEALTH/ CHILD CARE SERVICE**

Out of the 9 health facilities in the district, 5 render specialized reproductive health services to clients. Under safe motherhood, post-natal and antenatal attendance at clinics has been improving over the years. In the year 2009, 100% (4862 registrants) of antenatal care was achieved out of a target of 100% of mothers. An average of 3 visits of pregnant women was recorded for the period. Postnatal care attendance has not been consistent. In terms of supervised deliveries, the coverage was 19.3% in 2010 and 29% in 2011 showing an improvement.

Trained TBAs contributed 17% of the supervised deliveries. (Annual report, GDHD, 2012)

### **1.10 SCOPE OF STUDY**

The study covered the district capital (Gushegu). It involved the Reproductive and Child Health Care Unit where the antenatal clinic (ANC) in the district is held.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 INTRODUCTION

*Plasmodium falciparum* infection in pregnancy does not cause symptoms of malaria typically but may lead to maternal anaemia and placental malaria, especially among women having first and second births. (Malaria factsheet, 2010 WHO). Placental malaria leads to the low birth weight, the single greatest risk factor for neonatal death, and a major contributor to infant death (PMI, Ghana report 2011). Malaria is diagnosed symptomatically and confirmed in a clinical laboratory using microscopy. The Rapid Diagnostic Test (RDT) which is antigen based test can be used however microscopy remains the goal standard. (GHS/NMCP/JHPIEGO/GLOBAL FUND, 2005).

The WHO recommended that the policy for the prevention of malaria during pregnancy in areas of stable transmission should emphasize a preventive package of Intermittent Preventive Treatment (IPT) and Insecticide Treated bed Nets (ITN's) and ensure effective case management. (WHO report, 2004).

#### 2.2 POLICIES, STRATEGIES AND TARGETS OF PREVENTION IN PREGNANCY

##### 2.2.1 Ultimate goal for malaria control globally

The achievement of the malaria related Millennium Development Goals (MDGs) “by 2015 is the vision of the Roll Back Malaria (RBM) partnership. Prevention of malaria in pregnancy, which can have serious consequences for both the mother and her unborn child, is a major public health challenge and a priority for the Roll Back Malaria partnership. (Paola M. *et al.*, 2004).

Since 2000, the World Health Organization has recommended a package of interventions which includes; The promotion of insecticide-treated bed nets (ITNs), intermittent preventive treatment in pregnancy (IPTp) and effective case management of malarial illness.

Intermittent Preventive Treatment in pregnancy with Sulphadoxine pyrimethane (IPT<sub>P</sub>.SP) has been adopted as policy by many countries in sub-Saharan Africa. Apart from ITNs the most preferred intervention is the use of Intermittent Preventive Treatment (IPT). (*Department of International Development (2011). Malaria: Country profiles. Version 1.1*).

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. While SP-IPTp seems an adequate strategy, there are many issues still to be explored to optimize it. (Valerie B. *et al.*, 2007).

### **2.2.2 Global Targets for Malaria Control**

Since 1998, when the RBM partnership was established, the main goal was to reduce mortality by 50% by 2010. The three evidence-based strategies (IPT, ITNs, and effective case management) exist for the control of malaria in pregnancy, but the widespread implementation of effective programs remains a considerable challenge. Many women in Africa, particularly those living in remote areas, have limited access to medical care and effective malaria control tools such as ITNs. (*Department of International Development (2011), Malaria: Country profiles. Version 1.1*).

An ITN is a net (usually a bed net), designed to block mosquitoes physically, that has been treated with safe, residual insecticide for the purpose of killing and repelling mosquitoes, which carry malaria. (Bleakley *et al.*, 2010). A long-lasting insecticide-treated net (LLIN) is an ITN designed to remain effective for multiple years without retreatment. (Cohen *et al.*, 2007).

They (ITNs) are the most powerful malaria control tool to be developed since the advent of indoor residual spraying (IRS) and chloroquine in the 1940s, and as such they have been an important component of global and national malaria control policies since the mid-1990s.

In April 2000, heads of African States, as part of the African Summit on Roll Back Malaria, made commitments in April 2000 “to an intensive effort to halve the malaria mortality for Africa’s people by 2010” (RBM/WHO, 2000). In 2005, the WHA determined to “ensure a reduction in the burden of malaria of at least 50% by 2010 and by 75% by 2015” (Resolution WHA 58.2,23 WHO, 2005).

In 2005 the RBM global strategic plan for 2005–2015 was released. The year 2005 was adopted by the WHO and RBM as the baseline for assessing whether morbidity and mortality is reduced by 75% by 2015. The targets for coverage with preventive measures for malaria were set initially at 60% of all populations at risk by 2005 (RBM/WHO, 2000). In 2005, a review led the WHA to increase those coverage targets to 80% by 2010. (Resolution WHA 58.2, WHO 2005).

By 2010, particularly in the lowest two economic quintiles the following should be achieved:

Up to 80% of the population at risk from malaria should receive protection by appropriate vector control methods which includes ITNs and, where appropriate, indoor residual spraying (IRS) as well as environmental and biological measures. Also, 80% of malaria patients should be diagnosed and treated with effective antimalarial medicines, such as artemisinin-based

combination therapy (ACTs), within one day of the onset of illness and finally, 80% of pregnant women in areas of malaria risk should receive IPT and other relevant preventive measures.

Delivery of cost effective malaria prevention to pregnant women will require strengthened antenatal care, integration of malaria control with other health programs targeted at pregnant women and infants, increased community awareness, and considerable financial investment. (Resolution WHA 58.2, WHO 2005).

The prize for achieving this will be safer pregnancies and a reduction in infant's deaths. Prevention of malaria during pregnancy remains one of the most important and achievable goals of Malaria control programs. The uses of IPTp and ITNs have proven to be beneficial to reducing the burden of malaria in pregnancies.

### **2.2.3 Drug Policy for Malaria Control in Ghana**

Every malaria endemic country should have in place a drug policy for the disease. This will ensure that the population at risk has access to safe, quality and affordable drugs. The policy is needed to ensure that firstly there is a fast and effective treatment for malaria cases, secondly case fatalities are reduced by breaking the progression of uncomplicated to severe malaria, thirdly clinical episodes of malaria are shortened and anemia due to malaria is reduced in those living in high transmission areas, fourthly the burden of malaria infection during pregnancy is minimized and last but not least the development and spread of drug resistance to the anti malaria drug is delayed. (World malaria report, 2008).

The burden of malaria infection during pregnancy can be reduced through the use of prophylactic treatment. (Resolution WHA 58.2, WHO 2005). According to a 2007 publication titled; From Evidence to Action, Challenges to Policy Change and Program Delivery for Malaria in Pregnancy by (*Crawley J et al.*), prophylaxis is relevant due to the fact that malaria in pregnancy

in stable transmission areas can be asymptomatic. Implementation of diagnostic and treatment regimens during antenatal services to clients is mostly difficult and also because malaria parasites in the peripherals may be absent in pregnant women even when they have heavily parasitized placentas.

The factors influencing whether strategies for preventing and treating malaria in pregnancy are successfully translated into national policy and program implementation were discussed and the following recommendations made;

Countries require guidance on how to assess the effectiveness of IPTp whilst at the same time, data on the safety and efficacy of alternatives to sulfadoxine pyrimethamine for prevention and treatment are urgently needed. Also, the systematic examination of cultural and operational constraints to delivery and uptake of IPTp-SP is relevant to review approach to wide coverage. Last but not least, standardized methodology must be used to monitor IPTp coverage and to compare approaches for scaling-up.

The Ghana NMCP and the RCH Unit with support from partners have developed guidelines or strategies for the implementation of IPTp-SP based on WHO recommendations. The general objective of the strategy is to reduce malaria related maternal and perinatal morbidity and mortality. The specific objectives include:

To reduce malaria episodes among pregnant women attending ANC, to contribute to the reduction of maternal anaemia amongst pregnant women attending ANC and to contribute to the reduction of low birth weight amongst pregnant women attending ANC.

More than 90% of Ghana's pregnant women attend ANC at least once during pregnancy hence making this clinic based prevention feasible. (NMCP, 2007).

Components of the strategy include: Foremost, increasing knowledge about the integrated strategies for control and prevention of malaria at all levels, secondly is working towards empowering all health facilities and staff to providing IPT using SP going by the national guidelines, thirdly is assessing the efficacy of the drugs used for IPTp regularly as well as assessing and monitoring the effectiveness of IPTp including its side effects on a regular basis and lastly, the integration of IPT with the following package of interventions within the Safe Motherhood Programme, this includes; Iron and folate supplementation, Deworming, Case management and ITN use.

According to the Revised Anti- Malaria Drug policy for Ghana (June, 2007);

The most preferred intervention to prevent malaria in pregnancy after ITN is the use of IPT which is based on the use of anti-malaria drugs dispensed to pregnant women in defined treatment doses at set intervals after quickening (16 weeks gestation) so as to reduce malaria parasitaemia and improve pregnancy outcomes.

Also, IPT is preferably provided as part of a comprehensive antenatal package with other haematenics and antihelminthics. The drug is administered under the supervision of qualified health workers- “Directly Observed Therapy”. Pregnant women should have access to ITN’s and use them throughout pregnancy as an additional method of malaria prevention.

The Ghana Health Service (GHS) recommends that a minimum of three doses of SP is given during pregnancy at least, at monthly intervals. Inadequate human, technical, and financial resources are challenges indentified by the NMCP to be affecting full implementation of IPTp (NMCP, 2007). Reports indicate that low uptake of IPT2 and IPT3 is as a result of inaccurate reporting by health facilities at the district level and negative attitudes of ANC staff towards

clients who report late for prenatal care. (Ghana National Malaria Strategic Plan 2008-2015 Draft, June 2008).

A new plan for reducing the malaria burden in Ghana was formulated due to the changing implementation environments (e.g., the increasing prominence of ACTs, IRS, and Ghana's revised Poverty Reduction Strategy). The Strategy seeks to reduce the malaria disease burden (morbidity and mortality) by 75% by the year 2015 (using 2006 as the baseline). The main objective as far as IPTp is concerned is that all pregnant women shall be on appropriate IPT (receive at least two doses or more of SP under DOT) by 2015 (Ghana National Malaria Strategic Plan 2008-2015 Draft, June 2008).

#### **2.2.4 Evidence of the Effectiveness of IPT and ITN in Reducing Malaria Burden**

The use of IPTp and ITNs has proven to be beneficial to the reducing the burden of malaria in pregnancies research studies have revealed the comparative benefits of the preventive methods as against not using them. (Lena H. *et al.*, 2007).

(Lena H. *et al.*, 2007), found a decline of placental Malaria in Southern Ghana after the Implementation of Intermittent Preventive Treatment in Pregnancy. Clinical and parasitological parameters were assessed among 839 women delivering at a district hospital in rural southern Ghana in the year 2000 when pyrimethamine chemoprophylaxis was recommended and in 2006, 226 women were assessed, approximately one year after the implementation of IPTp-SP. Examinations were performed in an identical manner in 2000 and 2006 including the detection of placental *Plasmodium falciparum* infection by microscopy, histidine-rich protein 2, and PCR.

The study concluded that, placental malaria and maternal anaemia have declined substantially and birth weight had increased in southern Ghana after the implementation of IPTp-SP. Likely,

these effects can further be increased by improving IPTp-SP coverage and adherence. However, the remnant prevalence of infection in women having taken three doses of IPTp-SP suggests that additional antimalarial measures are needed to prevent malaria in pregnancy in the region.

(Carol G *et al.*, 2007), carried out a systematic review of randomized control trials. Three cluster-randomized and two individually randomized trials met the inclusion criteria; four from Africa and one from Thailand. In Africa, ITNs compared to no nets increased mean birth weight significantly by 55 g, reduced low birth weight by 23%, and reduced miscarriages/stillbirths by 33% in the first few pregnancies. Placental parasitaemia was reduced by 23% in all gravidae. The effects were apparent in the cluster-randomized trials and the one individually randomized trial in Africa. The trial in Thailand, which randomized individuals to ITNs or untreated nets, showed reductions in anemia and fetal loss in all gravidae, but not reductions in clinical malaria or low birth weight. The study concluded that ITNs used throughout pregnancy or from mid-pregnancy onwards have a beneficial impact on pregnancy outcome in malaria-endemic Africa in the first few pregnancies.

These and other research findings have proved the relevance and effectiveness of IPT<sub>P</sub> and ITN<sub>S</sub> in the prevention of malaria in pregnancy and its associated complications. A study by (Nganda RY *et al.*, 2004), showed that when both interventions were used, severe anemia postpartum was reduced by 69%.

In Africa, important progress has been made in the past decade with the introduction of a preventive strategy for malaria in pregnancy yet their coverage is still unacceptably low and malaria continues to have a huge toll on pregnant women and their newborn. (Menendez C. *et al.*, 2007).

## 2.3 DRUG COVERAGE

A Multiple Indicator Cluster Survey (MICS) conducted in Ghana in the year 2006 revealed that use of any drug to prevent malaria during pregnancy was 66.9%. However, only 27.5% of pregnant women had taken two or more doses of SP at that household level.

A health facility survey conducted in 2008 found that 62% of pregnant women who visited health facilities in Ghana were documented to have received IPTp1, 38.1% IPTp2, and 36.3 % IPTp3. (Ghana National Malaria Strategic Plan 2008-2015-Draft, June 2008).

High antenatal clinic (ANC) attendance alone is not sufficient to ensure high IPTp coverage (Hill and Kazembe, 2006). A study conducted in the Luwero district of rural Uganda showed a 94.4% attendance of ANC among postpartum women during their most recent pregnancy, however only 71.7% had taken at least one dose of SP. 35.8% received two or more doses. (Mpungu and Mufubenga, 2007).

In Ghana the use of the first dose of IPT (IPT1) is approximately 60%, but the rate of IPT2 and IPT3 is significantly lower. The Ghana NMCP has made improvements in coverage for IPTp2 and IPTp3 a priority. (PMI, 2007).

A study by (Brentlinger *et al.*, 2008), in Mozambique reported that 92.5 % of women interviewed received at least one dose of SP. Only 22.1% received 1 dose, 30.4% received 2 doses, and 43.6% received 3 doses. In rural Malawi a study reported 75.7% receiving one dose and 43.7% receiving two or more doses. (Holtz *et al.*, 2004).

A survey was conducted by (P. O. Ouma<sup>1</sup> *et al.*, 2002), among women who had recently delivered in the rural neighboring areas of Asembo and Gem in Kenya and reported coverage of 19% of at least one dose and 7% of two or more doses of SP.

## 2.4 INFLUENCING FACTORS TO IPTp UPTAKE

### 2.4.1 Socio-demographic Factors of Pregnant Women

Factors among the study subjects that influence their general attitude and actions in relation to a perceived problem are the socio-demographic factors. The age, gravidity, parity, marital status, educational level and occupation have been considered in this study. Experiences and lessons learnt among women who have had previous pregnancies and births may influence their health seeking behaviors. Educational level among women also contributes to their level of knowledge and may positively influence their attitude towards seeking health care.

Nganda RY *et al.*, 2004, carried out a study that explored the determinants of uptake for both ITNs and IPTp-SP by pregnant women and the role that individual knowledge and socio-economic status has to play for each. A total of 293 women were studied in a cross sectional survey at Kibaha district hospital, Tanzania. In a logistic regression model it was found that attendance at health education sessions was the only factor that predicted IPTp-SP use (OR 1.8, 95% CI 1.1-2.9). While high knowledge of malaria predicted use of ITNs (OR 2.3, 95%, CI: 1.1-4.9). It was concluded that Individual knowledge of malaria was an important factor for ITN uptake, but not for IPTp-SP use. When both interventions were used, severe anemia postpartum was reduced by 69%. Factors of socio-demographic characteristics and obstetric history were not assessed for their associations with the dependent variables. An association between ITN uptake and IPTp-SP use was also not assessed in this study.

A research on Perceptions on use of sulfadoxine-pyrimethamine in pregnancy and the policy implications for malaria control in Uganda by (Mbonye AK *et al.*, 2006) used an exploratory study to assess perceptions on SP in Mukono district, Uganda. This was an initial step towards a

review of the policy aimed at improving access and use of SP in pregnancy, which was low. Results from the study showed that SP is perceived to be an effective drug that cures malaria quickly. However there are negative perceptions related to its use in pregnancy, SP was also perceived to be an effective drug for malaria. SP is believed to be strong and weakens pregnant women, causes abortions and fetal abnormalities. There is also a perception that resorting first to SP for malaria treatment may lead to the development of drug resistance. The study however does not state the association between educational levels of the respondents and negative perceptions of SP. The policy implications of these findings included developing a health promotion package to demystify the misconceptions on the strength of SP, to explain its benefits and side-effects.

A study by (Mbungu *et al.*, 2007), in the Luwero district, Uganda showed that lack of post primary education was associated with failure to use at least one dose of IPTp-SP. [Odds Ratio 2.2, 95%CI (1.4–3.3)]. A Kenyan research also showed that uptake of IPTp-SP increased with higher levels of formal education (Eijla *et al.*, 2002). A study done in Tanzania by (Marchant *et al.*, 2008), rather showed no evidence of any individual factors being associated with second dose coverage beyond living in an urban area. Age, marital status, educational level of the woman and household socio-economic status were all not associated with second dose coverage of SP.

A study conducted in Bosomtwi district by Gifty D. Antwi in 2010 showed that none of the socio-demographic variables was found to be predictive of the number of SP doses received by the nursing mothers ( $p > 0.05$ ). The age was found to be significantly associated with the number of doses of SP received by the pregnant women ( $p = 0.05$ ) in the uni-variate analysis but was not predictive when other socio-demographic factors were adjusted for in the multi-variate analysis.

### 2.4.2 Obstetric History

A study conducted by (Olliaro *et al.*, 2008) in rural Senegal, the median week of pregnancy at which the first ante-natal visit occurred was found to be 20 weeks (quartiles 16–24, n = 394) where 95% received at least one dose and 70% two doses of SP.

IPTp policy in Ghana indicates IPT should be given to pregnant women only after 16weeks and not after 36wks gestation. IPTp timing is associated to the start of ANC visits among pregnant women. Increase in earlier attendance for ANC through the education of clients and staff can lead to the increase of the proportion of women receiving at least two doses of IPT with SP (Van Eijk *et al.*, 2004). Primigravid respondents are more likely than multigravid women to attend ANC early (Anders *et al.*, 2008). Women who are pregnant for the first time may be anxious about sudden physiological changes that they may experience because of the developing fetus and will attend the hospital earlier than those who have had the experience before.

A study conducted in Kisumu, Kenya by van Eijk *et al.*, 2004 showed that 45% of the women started attending ANC in the third trimester and that 23.7%, 43.4% and 32.9% received  $\geq 2$ , 1 or no dose of SP, respectively. Late first ANC attendance was found to contribute to incomplete IPTp.

According to the study conducted in the Bosomtwi district of Ghana by Gifty D. Antwi in 2009, parity turned out to be predictive of the number of SP doses received after adjusting for other variables in the multi-variate analysis ( $p=0.01$ ). Gestation at first ANC interestingly was not found to be a predictor of receiving two or more doses of SP in both categories of respondents either independently or after adjusting for the other socio- demographic factors ( $p>0.05$ ).

### 2.4.3 Level of Knowledge of Pregnant Women in IPTp

If pregnant women are educated about IPTp and their level of knowledge is increased it will influence them to regularly attend the ANC and receive SP. Their best and most practicable source of this knowledge is at the ANC where health workers are supposed to educate them.

(Nganda *RY et al.*, 2004), carried out a study that explores the determinants of uptake for both ITNs and IPTp-SP by pregnant women and the role that individual knowledge and socio-economic status has to play for each.

A total of 293 women were studied in a cross sectional survey at Kibaha district hospital, Tanzania. In a logistic regression model it was found that attendance at health education sessions was the only factor that predicted IPTp-SP use (OR 1.8, 95% CI 1.1-2.9). While high knowledge of malaria predicted use of ITNs (OR 2.3, 95% CI 1.1-4.9). It was concluded that Individual knowledge of malaria was an important factor for ITN uptake, but not for IPTp-SP use. (Nganda *RY et al.*, 2004).

It was realized that attendance at health education sessions at the MCH clinic was the only determining factor for IPTp-SP use. This stresses the fact that it is very crucial that health education sessions at the clinics for the pregnant women are intensified and the pregnant women be encouraged to attend these sessions.

In East Africa, 90.1% of the women interviewed were aware that SP was the drug for IPT and 77.2% held the perception that IPT with SP has health benefits; however, 70.0% were not aware of the timing for IPT. This results in incomplete administration of SP (Tarimo, 2007). The knowledge of the timing for IPTp influences the attendance of pregnant women to the ANC to receive SP.

In a study conducted in Kampala, Uganda, only 21% of the pregnant women interviewed were told about malaria prevention drugs, 31.5% had knowledge about recommended drug used in prevention of malaria in pregnancy and only 4.5% knew the recommended doses of SP to be taken. Over 95% of the pregnant women reported no health education was given to them at the ANC concerning IPT. It was found out that the coverage of IPT1 and IPT2 as at 2008 stands at 61% and 31.5% respectively. (Nankwanga and Gorette, 2008).

#### **2.4.4 Practice of DOT for IPTp**

Direct observation by health workers is a way of ensuring SP is taken by the pregnant woman. It makes it possible for recording and monitoring the number of doses and the timing of the administration of SP. In Tanzania, a study conducted by Tarimo in 2007 showed that about a third (40.0%) of those receiving SP at the ANC did not swallow the tablets at the clinic because of empty stomachs and sharing of water cups.

A study by (Mubyazi *et al.*, in 2005) showed that only 34.4% of pregnant women studied took SP under the supervision of a health worker. Some pregnant women testified that sometimes ANC staff allowed them to swallow SP tablets at home. ANC staff may not adhere to DOT if they are not committed. The WHO recommends that measurement of IPT is based on the number of doses of SP being taken by the pregnant women that are directly observed by an ANC staff.

#### **2.4.5 Facility Based Factors Influencing IPTp Implementation**

##### **2.4.5.1 Availability of SP and Clean, Safe Water for DOT**

A 2008 survey conducted in Ghana showed that IPTp is provided in 94.1% of facilities, SP stock outs however occurred in 27% of health facilities in the previous six months. Stock outs are a

bottle-neck to the successful implementation of IPTp. A Tanzania study showed that 40% of women interviewed had not received SP because of SP unavailability. (Tarimo, 2007).

The unavailability of clean and safe water is another factor that affects the practice of DOT. ANC staff compliance with the direct observed therapy in administering SP for IPTp comes under threat and coverage declines in the face of shortage of clean water and cups at ANC clinics. (Mubyazi *et al.*, 2005).

#### **2.4.5.2 Influence of knowledge of health workers and training in IPTp**

A survey was conducted by (P. O. Ouma1 *et al.*, in 2002) among women who had recently delivered in the rural neighboring areas of Asembo and Gem in Kenya and reported coverage of 19% of at least one dose and 7% of two or more doses of SP. Health care workers (HCW) in Asembo were retrained on IPTp in 2003. The objectives of the study was to evaluate if IPTp coverage increased and if the training in Asembo led to better coverage than in Gem, and to identify barriers to the effective implementation of IPTp.

A Community-based cross-sectional survey among a simple random sample of women who had recently delivered in April 2005 was the method used including interviews with HCW of antenatal clinics (ANC) in Asembo and Gem. In Asembo, SP coverage increased from 19% in 2002 to 61% in 2005 for at least one dose and from 7% to 17% for two doses of SP. In Gem, coverage increased from 17% to 28% and 7% to 11%, respectively.

Training of HCWs of antenatal clinics alone may not be sufficient though necessary for the increase in coverage of SP hence factors like improved knowledge of SP and changes in socio-demographic characteristics can contribute to the increases observed in Asembo and Gem. Interviews of HCW in both Asembo and Gem revealed confusion about appropriate timing, and

lack of direct observation of IPTp. Training of HCW and use of simplified IPTp messages may be a key strategy in achieving Roll Back Malaria targets for malaria prevention in pregnancy.

A study in Uganda by Nankwanga and Gorette, 2008, IPTp one and two was found to be at 61% and 38% respectively. A survey conducted in three health centers in Kampala showed that guidelines on malaria in pregnancy were not referred to and only 1.6% of health workers were trained in the last six months.

Regular training of health care workers is relevant to update and refresh their knowledge on the implementation of IPT. It promotes the adherence of HCWs to guidelines of IPT implementation and positive attitudes towards pregnant women attending the ANC.

## CHAPTER THREE

### METHODS

#### 3.1 STUDY DESIGN

A cross-sectional study was conducted during the months of January to March 2014. Nursing mothers that had infants less than twelve months old and consented to the study were interviewed. The ANC clinic of the RCH was visited and observations were made using a standardized checklist. All ANC staffs of the Gushegu district capital were given self-administered questionnaires to answer after they gave their consent.

#### 3.2 STUDY VARIABLES

Dependent Variable: The Uptake (coverage) of IPT<sub>P</sub>-SP among the study subjects was measured.

Independent Variables:

##### **CLIENT DATA:**

##### **Socio-demographic characteristics:**

Age, Religion, Occupation, Marital status, Ethnicity, place of residence, Educational level and Husband's occupation

##### **Obstetric and ANC history:**

Gestational age at first ANC visit, number of ANC visits, parity and gravidae.

To further investigate the timeliness of first ANC attendance, a categorization of 'early first ANC attendance' is defined as a first visit to ANC at or before 4 months gestation, and those registering at fifth month till delivery were considered as "late first ANC attendance".

### **Knowledge of malaria among pregnant women:**

#### ***Categorization:***

Respondents were rated very good if they knew all four of the following indicators

1. What malaria is?
2. How malaria is transmitted?
3. What encourages malaria transmission?
4. Knows at least three effects of malaria in pregnancy

They were rated good if they had three indicators correct. Fair for two of them and poor if they knew only 1 or none of them.

### **Knowledge of IPTp:**

#### ***Categorization:***

The respondents were rated very good if they had all four of the following indicators right;

1. Heard about IPTp
2. The category of individuals who take it
3. The number of tablets taken at once as a dose

#### 4. When IPTp is recommended to be used during pregnancy

Respondents were rated good if they knew three of them. Fair if they knew two of them and poor if they knew one to none of them.

#### **Experiences from uptake of SP in recent pregnancy among respondents:**

Side effects after uptake in recent pregnancy

Suspected or confirmed Malaria infection after uptake

Fear of complications from SP uptake.

#### **FACILITY DATA:**

SP stock level and patterns of supply at ANC clinics

Training of ANC staff

Staffing capacity at facility level

Knowledge of ANC staff on the appropriate timing for IPTp – SP.

Practice of direct observed administration (DOT) of IPT by ANC staff

Antenatal attendees' observation of the attitudes and activities of ANC staff

### **3.3 STUDY POPULATION**

The study population was nursing mothers with infants less than 12 months old who were visiting the Reproductive and Child Health unit (RCH) of the Gushegu district capital. All ANC

staff at the Reproductive and Child Health care unit of the Gushegu district capital was the study group to determine the influence of health care workers on the dependent variable.

### **3.4 INCLUSION AND EXCLUSION CRITERIA**

The inclusion criteria were a nursing mother with an infant less than 12 months old who lived in the study area at least six months during recent pregnancy and consented to participate in the study. The Exclusion criteria were a nursing mother with an infant above 12 months old or did not live in the study area at least six months during recent pregnancy.

### **3.5 SAMPLING**

#### **3.5.1 Sample Size Determination:**

Administrative data in the 2013 annual report from the Gushegu District Health Administration indicates that the coverage for IPTp3 among registered pregnant women in the year 2013 was 31.2%.

#### **3.5.2 Sample Size Calculation:**

$$N = Z^2 \{P\} \{1-P\} / m^2$$

$$Z \text{ (Standard value for 95\% confidence level)} = 1.96$$

$$P \text{ (IPTp3 coverage in Gushegu sub-district)} = 31.2\% \text{ (0.312)}$$

$$m \text{ (Margin of error)} = 5\% \text{ (0.05)}$$

$$N = 1.96^2 \{0.312\} \{1-0.312\} / 0.05^2$$

$$3.8416 \{0.312\} \{0.688\} / 0.0025$$

$$= 329.8 \approx 330$$

### **3.5.3 Sampling Methods:**

The participants for the client level of the study were conveniently selected. All (six) ANC staff at the Reproductive and Child Health unit were interviewed at the facility.

## **3.6 DATA COLLECTION TECHNIQUES AND TOOLS**

Observations were made at the ANC to document practices and verify logistics availability for the implementation of IPTp. Structured questionnaires guided by an interviewer were administered to the nursing mothers at the RCH (Appendix 1). The questions covered socio-demographic factors, practices of IPTp at the ANC, knowledge about IPTp and malaria, experiences from use of SP in recent pregnancy, staff attitude and ITN use. Health care workers at the ANC were given self administered questionnaires (Appendix 2) to assess their level of knowledge about IPTp, practice of DOT, training in IPTp and supervision and monitoring of IPTp program in the facility.

A check-list was used (Appendix 3) to observe activities including health education talks on days of visit, practice of DOT, recording of DOT in the ANC records books and availability of SP and water for DOT.

## **3.7 DATA QUALITY CONTROL**

### **3.7.1 Training and Pretesting**

Three interviewers were recruited from the study area. They were individuals who understand the English language satisfactorily as well as the local languages of interest, which are Dagbani, Kokomba and Fulani. They were trained for three days to understand the questions and interpret them appropriately.

Sample questionnaires and interview guides were pre-tested for two days among the study population at the Gushegu district capital. After the pre-testing stage, gaps that were identified in the data collection tools were corrected before being used for the actual data collection.

### **3.7.2 Data Handling**

After each day of data collection the questionnaires were collected by a supervisor to ensure that no forms are lost and errors corrected immediately. The supervisor ensured completeness of data elements of the forms filled by interviewers.

Editing or cleaning of the data was done to ensure that no question on a questionnaire is omitted erroneously, that no illegal codes have been used, and that logical inconsistencies in the recorded responses are noted. Data was edited in the field during the collection phase or in a central office after the fieldwork was completed. Data was not double entered, computer editing was structured to check each record as it is entered.

The record book of a respondent carried along to the RCH was reviewed after the administration of questions. This was to confirm information such as age, residential address, age of infant etc. Discrepancies were resolved by further probing.

## **3.8 DATA PROCESSING AND ANALYSIS**

Data was analyzed using Stata 11.0 computer software (Nganda RY *et al.*, 2004). Data was summarized using frequency tables, means and graphs. A bivariate Logistic regression analysis was used to test the association between some of the categorical variables and the utilization of IPTp-SP. The Odds ratios at a confidence interval of 95% were used to test the significance of the associations between the categories of SP uptake and the independent variables.

Coverage, a measure of IPTp uptake, was defined as the percentage number of respondents that were interviewed who had received none, one, two or three doses of SP during their most recent pregnancy for the nursing mothers. For purposes of the logistic analysis, one or no SP dose and two or more doses SP was used for the analysis.

Age was categorized by 10 years intervals; from fifteen years to fifty-five years, educational level into primary, secondary, higher, others and none. Parity is categorized into primiparae (one) and multiparae (two or more). Marital status was categorized into living with partner and living without partner and occupation into unemployed, farmer, trader, formal sector job and artisans were categorized as employed.

Respondents were asked four questions to assess their level of knowledge of IPTp. These were based on the purpose of taking sulphadoxime pyrimethamine at the ANC, the number of doses of SP to be received during pregnancy, when SP is recommended to be used during pregnancy. Knowledge of the effects of malaria on the pregnant woman and the fetus and other ways of malaria prevention in pregnancy among respondents was assessed. A series of five questions were asked to assess staff attitude. These included staff being caring, always polite, taking good care of respondents, shouting at respondents always, giving talks on malaria and any others to be specified by respondents.

Attendance to ANC before or at 4 months gestation is rated early attendance, 5 months or more is rated as late attendance.

### **3.8.1 Interpretation**

The study results have been generalized to pregnant women in the study area (Gushegu district capital) as well as antenatal service points. The independent variables that were found to be significantly or otherwise associated to the dependent variable are stated. The qualitative data

collected through observations in the ANC have been analyzed to find associations between institutional factors and the dependent variables.

### **3.9 ETHICAL CONSIDERATIONS**

Ethical approval for this study was obtained from the Ethical Review Committee of the Ghana Health Service.

#### **Ensuring Confidentiality and Privacy of respondents:**

The interview was conducted in as private a manner as possible and the participants assured that their responses were completely confidential and will not affect the care that they receive.

The respondents were identified by unique identifications and not their names. The results were reported generally with no names mentioned.

#### **Process of Informed Consent:**

The consent form was given to literate participants to read and for illiterate participants it was read and interpreted to them. Nursing mothers seeking postnatal care were included in the study if they provided a verbal consent after being made to satisfactorily understand the terms stated in the consent form. Participants were allowed to withdraw from the study if they find answering the questions uncomfortable. A total of 452 women were approached to obtain the required study sample of 330 participants. A total of 44 women declined and 78 were not qualified to participate in the study.

**Risk and Benefits of the study:**

There is no social harm in participating in this study. Participants may however be required to answer few questions from research assistants who ensured that participants were stable before going ahead to engage them in answering questions.

There are no direct benefits to the participants from this study. However, results from this study will be used to improve IPTp activities in the district and the country as a whole.

**3.10 LIMITATIONS OF THE STUDY**

A recall bias may result from respondents not recollecting all that happened during their ANC visits in their last pregnancy. Showing samples of SP to them so they can relate their responses to the drug minimized the bias.

The generalizability of the study may be limited because it was carried out only in the district capital and may not be representative of the entire district.

The respondents self reported, and verification of some information was not done.

**3.11 ASSUMPTIONS**

It was assumed that all the respondents that were interviewed remembered all that happened at the ANC during their last pregnancy and that the views expressed by them were a true reflection of the situation on the ground. The exhibition of the drug (SP) at the point of interview may have helped to refresh their memories.

## CHAPTER FOUR

### RESULTS

#### 4.1 INTRODUCTION

Among respondents, 78.7% made four or more visits to the ANC with a mean number of attendances being 5. Being pregnant for the first time was found to be negatively associated with the uptake of adequate IPTp-SP among respondents. Late first ANC visits were also associated with taking inadequate IPTp-SP. Most, 197(59.9%) of the respondents were in the age group of 15-24. Majority, 264(80%) of respondents had been pregnant more than once. A very large number, 299(90.6%) lived within the township. The number of respondents without formal education compared to those with some level of it was high at 228(69.1%). Majority, 309(93.9%) of the participants lived with their partners.

This chapter summarizes the findings from the study under the following topics:

1. Uptake of IPTp-SP among respondents
2. Socio-demographic characteristics of respondents and IPTp uptake,
3. Obstetric and ANC history of respondents and IPTp uptake,
4. Level of knowledge of malaria and IPTp among respondents and IPTp uptake,
5. Experiences from IPTp uptake in recent pregnancy among respondents and IPTp uptake,
6. Health facility related factors.
7. ITNs ownership and IPTp utilization

## 4.2 UPTAKE OF IPTp-SP AMONG RESPONDENTS

**Table 1.3: Uptake of IPTp-SP Doses among Respondents**

Inadequate SP dose ( $\leq 1$ dose) N (%)	Adequate SP dose ( $\geq 2$ doses) N (%)
28/330 (8.5%)	302/330 (91.5%)

The WHO recommends that two or more doses of SP taken during pregnancy are adequate to prevent malaria during pregnancy.

The number of respondents who took one or no dose of SP which is defined inadequate dosage was only 28/330 (8.5%). Adequate dosage defined as two or more doses of SP was taken by 302/330 (91.5%) of respondents.

## 4.3 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS AND IPTp-SP UPTAKE

Slightly more than half, 194/330 (59.9%) of respondents were in the age group 15-24. A total of 177/302 (59.7%) of respondents who took adequate SP doses were in the age group 15-24. Muslims were dominant, 259/330 representing 78.4%. Farming was the most common occupation among them, 186/330 representing 56.4%.

Most, 310/330 (93.9%) of respondents live with their partners. A total of 299/330 (90.6%) and 302/330 (92.1%) of respondents live within the Gushegu Township and are employed respectively. The majority, 253/330 (76.7%) of respondents were Dagombas. A total of 228/330 (69.1%) of respondents have not had any formal education while only 12/330 (3.6%) have higher education.

**Table 1.4: Socio-Demographic Characteristics of Respondents and IPTp Uptake**

Socio-demographic variables	Total N=330 n (%)	IPTp-SP Uptake Among Respondents			
		1dose N=26 n (%)	2 doses N=83 n(%)	3 doses N=219 n(%)	0 dose N=2 n(%)
<b>Age(years)</b>					
15-24	194 (59.7)	20 (76.9)	49 (59)	127(58)	1 (50)
25-34	125 (37.9)	5 (19.2)	33 (39.8)	86 (39.3)	1(50)
35-44	8 (2.4)	1 (3.8)	1 (1.24)	6 (2.7)	0
46-55	0				
<b>Religion</b>					
Christian	46 (14)	2 (7.6)	11 (13.3)	32 (14.6)	1(50)
Islam	259 (78.5)	22 (84.6)	62 (74.7)	174(79.5)	1(50)
Traditionalist	24 (7.3)	2 (7.6)	9 (10.8)	13 (5.9)	0
Others	1 (0.30)	0 0	1 (1.22)	0	0
<b>Occupation</b>					
Farmer	186 (56.4)	11 (42.3)	53 (63.9)	121(55.3)	1(50)
Trader	80 (24.2)	6 (23.1)	13 (15.7)	61(27.9)	0
Formal sector	13 (4)	1 (3.8)	3 (3.6)	9 (4.1)	0
Unemployed	26 (7.9)	6 (23.1)	7 (8.4)	12(5.5)	1(50)
Artisan	25 (7.6)	2 (7.7)	7 (8.4)	16 (7.3)	0
<b>Marital Status</b>					
Living with partner	310 (94)	23 (88.5)	76 (91.6)	209(95)	2 (100)
Not living with partner	19 (6)	3 (11.5)	7 (8.4)	9 (4.6)	0
<b>Ethnicity</b>					
Dagomba	253 (76.7)	22 (84.6)	55 (66.3)	176 (80)	0
Fulani	17 (5.2)	1 (3.86)	8 (9.6)	8 (3.7)	0
Kokomba	47 (14.2)	3 (11.5)	13 (15.7)	29 (13.2)	2 (100)
Others	11 (3.3)	0 (0)	6 (7.2)	5 (2.3)	0
<b>Place of Residence</b>					
In the district capital	299 (90.6)	24 (92.3)	74 (89.2)	199(90.9)	2 (100)
Outside the district capital	31 (9.1)	2 (7.69)	9 (10.8)	19 (9.1)	0
<b>Educational Level</b>					
Primary	58 (17.6)	5 (19.2)	18 (21.7)	35 (16)	0
secondary	32 (9.7)	3 (11.5)	11 (13.3)	17 (7.8)	1 (50)
Higher	12 (3.6)	1 (0.38)	2 (2.4)	9 (4.1)	0
Other eg Koranic	56 (17)	6 (23.0)	15 (18.1)	35 (16)	0
None	172 (52.1)	11(42.3)	37 (44.6)	125(57.1)	1 (50)

From table 1.4 respondents living in the township and those employed who received two doses of SP were 74/83 and 76/83 respectively. Those who took three doses from the two groups were 199/219 and 207/219 respectively. Only 12/219 and 19/219 of the unemployed and those living outside the township respectively took three SP doses.

**Table 1.5 Association between Socio-demographic Characteristics and IPTp Uptake**

<b>Socio-demographic Variables</b>	<b>(≤IPTp1) Inadequate</b>	<b>(≥IPTp2) Adequate</b>	<b>Total</b>	<b>OR (95%CI)</b>
	N=28 (%)	N=302 (%)	N=330 (%)	
<b>Age</b>				
15-24 YRS	20 (74.1%)	177 (59.7%)	197 (59.9%)	
25-34 YRS	6 (22.2%)	118 (38%)	124 (37.7%)	0.45 (0.18-1.15)
35-44 YRS	2 (3.7%)	7 (2.4%)	9 (2.4%)	2.52 (0.49-13.01)
<b>Residence</b>				
Outside Township	2 (7.1%)	29 (9.6%)	31 (9.1%)	0.72 (0.16-3.20)
Within Township	26 (92.9%)	273 (90.4%)	299 (90.6%)	
<b>Employment</b>				
unemployed	7 (25%)	19 (6.3%)	26 (7.9%)	<b>4.9 (1.88-13.14)</b>
employed	21 (75%)	283 (93.7%)	304 (92.1%)	
<b>Live with Partner</b>		Missing=1		
Yes	24 (86.2%)	285 (94.7%)	309 (93.9%)	0.33 (0.10-1.09)
No	4 (13.8%)	16 (5.3%)	20 (6.1%)	
<b>Formal Education</b>				
None	18 (64.3%)	210 (69.5%)	228(69.1%)	0.79 (0.35-1.77)
some	10 (35.7%)	92 (30.5%)	102 (31%)	

From the bivariate analysis only unemployment showed to be significantly associated with taking inadequate SP doses among the socio-demographic variables of respondents [OR4.9, 95%CI (1.88-13.14)]. Not having any formal education showed not to be associated with taking inadequate SP [OR0.79, 95%CI (0.35-1.77)]. Those who live outside the township have no association with Inadequate SP dosage [OR0.72, 95%CI (0.16-3.20)]. The other socio-demographic variables are not associated with the number of SP doses taken.

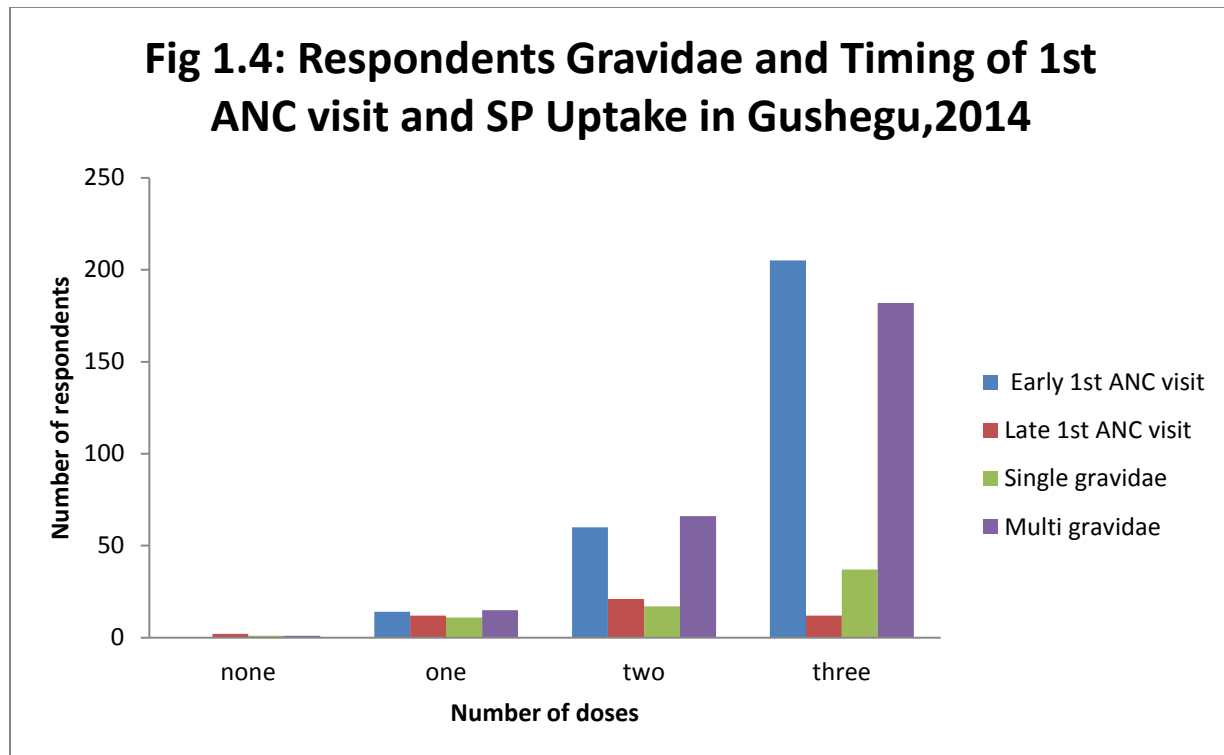
#### 4.4 OBSTETRIC and ANC HISTORY OF RESPONDENTS AND IPTp UPTAKE

Among respondents, 264/330 (80%) have had multiple pregnancies (gravidae) and 247/330 (74.9%) have had more than one delivery (multiple parity). The mean number of ANC visits and pregnancies are 5 (Standard Deviation, SD=2.2) and 3 (Standard Deviation, SD=1.6). The mean gestational age for respondents who took inadequate and adequate SP doses were 6 months (SD=2.5) and 4 months (SD=2.2) respectively.

A total of 280/330 (85.4%) of respondents made early first visits to ANC (before or at 4 months gestation) and 47/330 (14.6%) made late first visits (at or after 5 months gestation). Most, 205/330 (93.6%) of respondents who took IPTp3 made early first visits whilst only 13/330 (5.9%) of them made late first visits.

**Table 1.6: Obstetric History among Respondents and IPTp Uptake**

Obstetric History	Total N=330 n (%)	IPTp-SP Uptake Among Respondents			
		1 dose N=26 n (%)	2 doses N=83 n (%)	3 doses N=219 n (%)	0 dose N=2 n (%)
<b>Parity</b>					
single	82 (24.9%)	12 (46.2%)	23(27.7%)	46 (21.0%)	1 (50%)
Multiple	247 (74.9%)	14 (53.9%)	60(72.3%)	172(78.5%)	1 (50%)
<b>Gravidae</b>					
1 pregnancy	66 (20%)	11 (42.3%)	17(20.5%)	37 (16.9%)	1 (50%)
≥ 2 pregnancies	264 (80%)	15 (57.7%)	66(79.5%)	182(83.10%)	1 (50%)
Timing of 1 <sup>st</sup> ANC visit	Missing=3				
Early attendance	280 (85.6%)	15 (57.6%)	60 (74%)	205 (94%)	0 (0%)
Late attendance	47 (14.4%)	11(42.3%)	21 (25.9%)	13 (5.9%)	2 (100%)



Respondents who made early first ANC visits and took 2 and 3 doses of SP were 60/83 and 205/219 respectively. Only 12/219 of those who made late first visits took three SP doses. The number of respondents who took 1, 2 and 3 SP doses increases for early first ANC attendees and women with multiple gravidae.

**Table 1.7: Association between Obstetric and ANC History and IPTp-SP Uptake**

<b>Obstetric and ANC history</b>	<b>(≤IPTp1) Inadequate</b>	<b>(≥IPTp2) Adequate</b>	<b>Total</b>	<b>OR (95%CI)</b>
	N=28 (%)	N=302 (%)	N=330 (%)	
<b>Parity</b>				
Single	11(41.4%)	70 (23.3%)	82(24.9%)	2.14(0.96-4.77)
Multiple	17(59%)	231(76.7%)	248(74.9%)	
<b>Gravidae</b>				
Single	12 (40.7%)	55 (18.2%)	66 (20.0%)	<b>3.38 (1.52-7.55)</b>
Multiple	16 (59.3%)	248 (81.8%)	264(80.0%)	
<b>Timing of 1st ANC Visit</b>				
Late	13(48.1%)	34 (11.4%)	47 (14.6%)	<b>6.8 (2.96-15.40)</b>
Early (≤4 gest. mths)	15(51.9%)	265(88.6%)	280(85.4%)	
Mean ANC visits			5 (SD=2.2)	
Mean number of pregnancies			3 (SD=1.6)	
Mean gestational age at 1 <sup>st</sup> ANC visit	6	4		

Single gravidae is significantly associated with taking one or no dose (inadequate) IPTp-SP, [OR3.38, 95%CI (1.52-7.55)]. The odds of taking adequate SP dose among those with a single parity is [OR2.14, 95%CI (0.96-4.77)], hence there is no significant association. Late first ANC attendance is significantly associated with taking one or no dose of IPTp- SP, [OR6.8, 95%CI (2.96-15.4)].

#### 4.5 LEVEL OF KNOWLEDGE OF MALARIA AND IPTp AMONG RESPONDENTS AND SP UPTAKE

Poor knowledge is the highest frequency for the categorization of level of knowledge of malaria representing 131/330 (39.8%). A total of 89/330 had very good knowledge of malaria representing 27.1% of respondents. Also 139/330 (42.3%) of respondents have a fair knowledge of IPTp representing the highest frequency in the categorization of the level of knowledge of IPTp but only 46/330 (14.0%) representing the least had very good knowledge of IPTp.

**Table 1.8: Knowledge of Malaria and IPTp among Respondents and IPTp Uptake**

		<b>IPTp-SP Uptake Among Respondents</b>			
<b>Knowledge of malaria</b>	<b>Total N=330 n( %)</b>	<b>1dose N=26 n(%)</b>	<b>2doses N=83 n(%)</b>	<b>3doses N=219 n(%)</b>	<b>0 dose N=2 n( %)</b>
Very good	89 (27.1)	6 (23.1)	24 (29.3)	58 (26.5)	1 (50)
Good	56 (17.0)	6 (23.1)	13 (15.9)	37 (16.9)	0
Fair	53 (16.1)	0 (0)	10 (12.2)	43 (19.6)	0
Poor	131(39.8)	14 (53.9)	35 (42.7)	81 (40)	1 (50)
<b>Knowledge of IPTp</b>					
Very good	46 (14)	0 (0)	6 (7.3)	40 (18.3)	0
Good	67 (20.4)	4 (15.4)	21(25.6)	42 (19.2)	0
Fair	139 (42.3)	13 (50)	39 (47.6)	87 (39.7)	0
poor	77 (23.4)	9 (34.6)	16 (19.5)	50 (22.8)	2 (100)

**Table 1.9: Association between Knowledge of Malaria and IPTp among respondents and IPTp-SP Uptake**

<b>Malaria Knowledge and Practices</b>	<b>(<math>\leq</math>IPTp1) Inadequate</b>	<b>(<math>\geq</math>IPTp2) Adequate</b>	<b>Total</b>	<b>OR (95%CI)</b>
	N=28 (%)	N=302 (%)	N=330 (%)	
<b>IPTp knowledge</b>				
Poor	9 (34.6%)	68 (25.9%)	77 (23.4%)	-
Fair	13 (50%)	125(47.9%)	138 (42.3%)	0.77 (0.32-1.92)
Good	6 (15.4%)	63 (23.9%)	69 (20.4%)	0.48 (0.14 -1.63)
Very Good	0 (0%)	46 ( 2.3%)	46 (14.0%)	0.26 (0.14 -11.69)
<b>Malaria knowledge</b>		Missing= 1		
Poor	15 (53.6%)	116 (38.5%)	131 (39.7%)	-
Fair	0 (0%)	53 (17.6%)	53 (16.1%)	0.15 (0.02 -1.13)
Good	6 (21.4%)	50 (16.6%)	56 (17.0%)	0.93 (0.34 -2.35)
Very Good	7 (24.9%)	82 (27.3%)	89 (27.0%)	0.66 (0.26 -1.69)
<b>ITN ownership</b>				
Yes	6 (21.4%)	70 (23.2%)	76 (23.0%)	
No	22 (78.6%)	232 (76.8%)	254 (77.0%)	
<b>ITN usage (those owning)</b>				
Yes	6 (100%)	48 (69.6%)	54 (72.0%)	
No	0 (0%)	21 (30.4%)	21 (28.0%)	

The categorized levels of knowledge for both IPTp and malaria among the study group are not associated with the number of SP doses taken. Having poor compared to fair, good and very good knowledge of malaria and IPTp does not predict the inadequate uptake of SP doses.

#### **4.6 ANC ATTENDANCE, IPTp UPTAKE AND EXPERIENCES**

The study found that, 26/330 (7.9%) of respondents took only one dose of SP during their most recent pregnancy, not less than 83/330 (25.2%) received only two doses of SP and not less than 219/330 (66.4%) received three doses of SP and 2/330 (0.6%) took none. From this study IPTp1, 2 and 3 uptakes among respondents are 7.9%, 25.3% and 66.4% respectively. In all 323/330

(97.9%) of respondents took 3 tabs for a dose and 5/330 (1.5%) took 2 tabs for a dose. A total of 325/330 (99.4%) and 2/330 (0.6%) reported taking the tabs in the clinic and outside the clinic respectively. However, 290/330 (87.8%) of respondents had no reason for missing appointments, 27/330 (8.2%) said transportation and 13/330 (4.0%) mentioned distance as reasons for missing appointments. Majority, 289/330 (87.8%) admitted they like to take the drugs in the clinic and 39/330 (11.9%) said otherwise.

Out of all respondents, 280/330 (85.1%) were not afraid of complications from using the drug but 49/330 (14.9%) admitted to fear of complications from using it. A total of only 51/330 (15.5%) said they still had malaria after using the drug. Side effects were reported among only 83/330 (25.2%) of respondents.

**Table 1.10: Experiences from IPTp-SP in recent pregnancy and its uptake**

Experiences from SP Uptake	Total N=330 n (%)	IPTp-SP Uptake Among Respondents			
		1 N=26 n (%)	2 N=83 n (%)	3 N=219 n (%)	0 N=2 n(%)
<b>Side effects from SP uptake</b>					
Yes	83 (25.2%)	10 (35.8%)	19 (22.9%)	54 (24.7%)	0
No	247 (74.8%)	16 (64.3%)	64 (77.1%)	165(75.3%)	2 (100%)
<b>Malaria infection after SP uptake</b>					
Yes	51 (15.5%)	7 (26.9%)	17 (20.5%)	26 (11.9%)	1(50%)
No	279 (84.5%)	19 (73.1%)	66 (79.5%)	193 (88.1%)	1(50%)
<b>Afraid of Complications from SP uptake</b>					
Yes	49 (14.8%)	2 (7.7%)	15 (18.1%)	30 (13.7%)	2 (100%)
No	280 (85.1%)	24 (92.3%)	68 (81.9%)	188 (86.3%)	0

From table 1.10, a total of 165/219 and 193/219 of respondents who did not experience side effects and malaria infection after SP uptake in recent pregnancy respectively took three SP doses. The number of respondents taking two to three doses of SP increases with no side effects and malaria infection after SP uptake.

**Table 1.11: Association between Experiences from SP in recent pregnancy and its uptake**

<b>Experiences from SP Uptake in recent pregnancy</b>	<b>(<math>\leq</math>IPTp1) Inadequate</b>	<b>(<math>\geq</math>IPTp2) Adequate</b>	<b>Total</b>	<b>OR (95%CI)</b>
	N=28 (%)	N=302 (%)	N=330 (%)	
<b>Side effects after SP use</b>				
Yes	10 (55.6%)	73 (24.2%)	83 (25.2%)	1.74 (0.77-3.94)
No	18 (44.4%)	229 (75.8%)	247 (74.8%)	
<b>Malaria infection after SP use</b>				
Yes	8 (28.6%)	43 (14.23%)	51 (15.5%)	2.41 (0.99-5.81)
No	20 (71.4%)	259 (85.8%)	279 (84.5%)	
<b>Afraid of complication</b>				
Yes	4 (14.3%)	45 (14.95%)	49 (14.9%)	1.09 (0.365-3.31)
No	24 (85.7%)	256(85.05%)	280 (85.1%)	

The odds ratio of side effects after SP uptake in recent pregnancy to predicting inadequate SP uptake is [OR1.74, 95%CI (0.77-3.94)]. A suspected or confirmed malaria infection after SP uptake in recent pregnancy shows [OR2.41, 95%CI (0.99-5.81)].

None of the odds ratios for the variables of experiences from SP uptake in recent pregnancy of the respondents is significantly associated with the number of SP doses taken with reference to the 95% confident intervals.

## **4.7 FACILITY BASED FACTORS INFLUENCING IPTp IMPLEMENTATION**

### **4.7.1 Observations from the RCH:**

The RCH of the Gushegu sub-district of the Gushegu district has a total of six ANC staff which includes a principal midwifery officer who is head, three community health workers and two health promoting officers.

During the data collection period, the health education program drawn for the quarter included Malaria in Pregnancy (MIP) but not specifically on IPTp. The health talk on the day of visits to the RCH throughout the study included malaria in pregnancy but not IPTp. Posters on IPTp/MIP were not on the walls, there was a report book for ANC daily summaries and monthly data return forms.

During the entire study period SP was unavailable at the RCH this made it impossible to observe DOT. Other routine drugs administered to pregnant women were recorded in the ANC report book for daily summaries. However no adverse event forms for SP was present.

The facility does not provide free, clean, safe water for DOT, however it is available for sale. The facility has no copy of the IPTp national protocol and training manual.

### **4.7.2 ANC Staff Related Factors**

Majority, 287/330 (87.2%) of respondents confirmed nurses give health talks. Most, 310/330 (94.2%) of respondents said the ANC staffs were caring and polite. Only 19/330 (5.8%) said they

shouted at them. A total of 317/330 (96.6%) said the ANC staff practiced DOT but this was not observed.

IPTp was defined wrongly by 33.3% of the ANC staff. All 6 knew SP as the recommended drug for IPTp use in Ghana. Only 1 out of 6 did not know when SP is supposed to be started during pregnancy. All 6 knew the gestation age at which IPTp is not to be given during pregnancy. All knew the number of times during pregnancy that SP is recommended. All admitted DOT is practiced in the facility but there were no records to verify this. Only 2 out of 6 have ever had training in IPTp through in-service training. All 6 indicated there have been supervisory and monitoring visits in the last year. However, the number of ANC staff is too small to make any statistical inferences.

**Table 1.12: Health Facility Factors Related to IPTp Implementation**

<b>Staff Knowledge on;</b>	<b>Confirmation by ANC Staff(N=6) Or Observation</b>
Formal Staff IPTp training	2/6
Correct IPTp definition	2/6
Correct start time for SP doses	5/6
Correct number of SP doses	6/6
Inadequate staff capacity	6/6
Erratic SP supply	6/6
Wall posters/Manual on MIP/IPTp	Absent

**Table 1.13 Client Experiences at prenatal Visits and IPTp Uptake**

Experiences at prenatal visits	Total N=330 n (%)	IPTp-SP Uptake Among Respondents			
		1 dose N=26 n (%)	2 doses N=83 n (%)	3 doses N=219 n (%)	0 dose N=2 n(%)
<b>Facility gave health talks</b>					
Yes	287 (87%)	23 (88.5%)	72 (86.7%)	191(87.2%)	1(50%)
No	43 (13.03%)	3 (11.5%)	11(13.3%)	28 (12.8%)	1(50%)
<b>Attitude of ANC staff</b>				Missing=1	
Caring/Polite	310 (94.2%)	24 (92.3%)	77 (92.8%)	207 (94.5%)	2 100%)
Shout at me	19 (5.8%)	2 (7.7%)	6 (7.2%)	11 (5.5%)	0
<b>Practice of DOT</b>					
Yes	317 (96.6%)	24 (92.3%)	80 (96.4%)	213 (97.3%)	-
No	11(3.4%)	2 (7.7%)	3 (3.6%)	6 (2.7%)	-

A total of 77/83 and 207/219 respondents who admitted to ANC staff being caring and polite took two and three doses of SP respectively. Also 80/83 and 213/219 of those who took two and three doses of SP respectively confirmed the practice of DOT by ANC staff. The number of respondents taking two to three SP doses increases for those admitting to ANC staff being caring and polite as well as their adherence to DOT.

**Table 1.14: Association between Client Experience at Prenatal Visits and Uptake of IPTp-SP**

<b>Client Experience at Prenatal Visits</b>	<b>(≤IPTp1) Inadequate N=28</b>	<b>(≥IPTp2) Adequate N=302</b>	<b>Total N=330</b>	<b>OR (95%CI)</b>
	n (%)	n (%)	n (%)	
<b>Facility gave health talks</b>				
Yes	24 (85.7%)	263 (87.1%)	287 (87.2%)	0.89 (0.29-2.7)
No	4 (14.3%)	39 (13%)	43(12%)	
<b>ANC staff attitude</b>				
Shouted at you	4 (14.3%)	17 (5.6%)	21 (6.4%)	0.084 (0.35-0.22)
Caring/Polite	24(85.7%)	284 (94.4%)	308(93.6%)	
<b>Practiced DOT at facility</b>				
No	2(7.7%)	9 (2.9%)	11 (3.3%)	0.36 (0.08-1.8)
Yes	24(92.3%)	293(97.0%)	319(96.7%)	

None of the experiences at prenatal visits by respondents is associated with the number SP doses taken. The experience of health talks, caring/polite attitude of ANC staff and DOT by clients does not predict the number of SP doses taken.

#### **4.8 ITNs OWNERSHIP AND USE AND IPTp-SP UPTAKE**

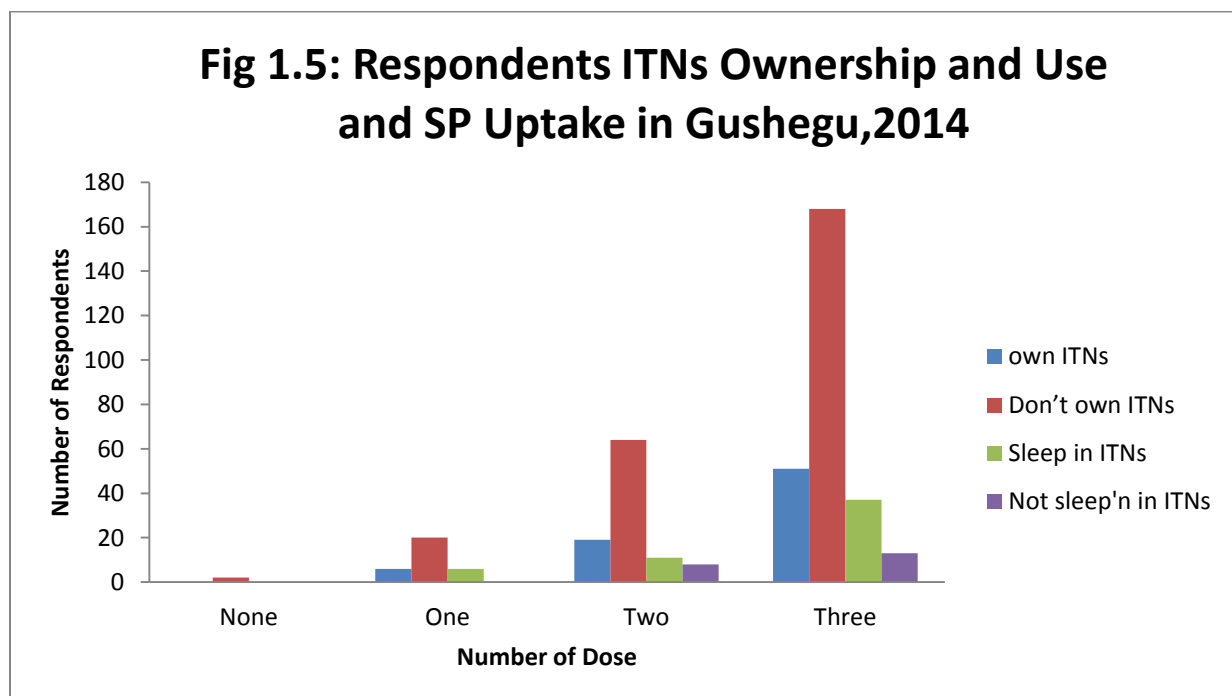
The use of insecticide treated nets (ITNs) is one of the WHO recommended malaria prevention methods. Pregnant women and nursing mothers are required to sleep in ITNs in malaria endemic areas. This study investigated the ownership and use of ITNs among the study subjects.

Only 75/330 (23.0%) of respondents own an ITN and 254/330 (77.0%) of do not own one. An encouraging 54/75 (72%) of the few who owned them slept in it and 21/75 (28%) did not sleep in it the night before. However, 168/219 (76.7%) of those who took IPTp3 do not own ITNs. Out of the number who own ITNs, 37/50 (74%) of those who took IPTp3 used them the night before.

Only 7/54 (12.9%) of respondents with very good knowledge of malaria owned and used ITNs and most, 77/89 (86.5%) of respondents with very good knowledge of malaria do not own ITNs. This implies that level of knowledge of malaria does not influence ownership and use of ITNs among the respondents.

**Table 1.15: ITNs Ownership and Use and IPTp Uptake**

ITNs ownership	N=330 n (%)	1 N=26 n (%)	2 N=83 N (%)	3 N=219 n (%)	0 N=2 n(%)
Yes	75 (25.3)	6 (23.1)	19 (22.9)	51 (23.3)	0 (0)
No	254 (84.6)	20 (76.9)	64 (77.10)	168 (76.7)	2 (100)
ITNs usage	N=75	N=6	N=19	N=50	
Yes	54 (72)	6 (100)	11 (57.9)	37 (74)	0
No	21 (28)	0 (0)	8 (42.1)	13 (26)	0



Majority of the respondents 168/219 (76.7%) who do not own ITNs took IPTp3. Most 37/50 (74%) of those who own and used it the night before also took IPTp3.

## CHAPTER FIVE

### DISCUSSION

This chapter discusses the adequate uptake of IPTp and the factors that influence it as found in this study. The utilization of only two doses of IPTp-SP was found to be below the national target but the uptake of adequate SP doses was generally high.

Clean safe water, commitment to DOT practice, good staff knowledge about IPTp and good staff attitude of IPTp activities in the facility are other factors identified to possibly influence utilization of IPTp. Findings of this study are being compared with some related studies carried out in other parts of Africa and Ghana with possible factors resulting to similarities and disparities discussed.

The study on the factors influencing the adequate adherence to IPTp-SP in the Gushegu district, northern Ghana found out that, IPTp1,2 and 3 are (7.9%), (25.2%) and (66.4%) respectively and only 2 (0.6%) took none. Therefore 91.5% of respondents took an adequate number of SP doses. According to administrative data from the Gushegu district, 2013 figures for the coverage of SP are 24.8%, 44% and 31.2% for IPTp1, 2 and 3 among registered pregnant women. IPTp1 and 2 appear to be higher than those found in the study except for IPTp3.

The WHO's recommendation emphasizes that pregnant women should receive at least two doses of SP during pregnancy. The figure of 25.2% of respondents receiving only two doses of SP is far below the NMCP and RBM target of 80% (Ghana National Malaria Strategic Plan 2008-2015 Draft, June 2008).

However, 66.36% received all three doses which is also below the national target for at least two doses of SP (Ghana National Malaria Strategic Plan 2008-2015 Draft, June 2008).

The recommended approach by WHO to measuring IPT1, 2 or 3 is to use the number of registrants, that is, the number of pregnant women who are attending the ANC for the first time during their most recent pregnancy in a particular year as the denominator and the number of pregnant women receiving one, two or three doses of SP under observation by a health worker as the numerator. Thus a number of pregnant women would be included in the denominator who would be at various gestational ages and who definitely would not have reached the time to have completed all doses of IPT increasing the size of the denominator.

A larger than expected denominator makes the percentage of pregnant women receiving the SP doses smaller. This may have accounted for the apparently lower IPT coverage that is being reported nationally and globally. Using the number of women who have completed 36 weeks of gestation as the denominator may increase the coverage of IPTp. (Gifty Antwi, 2009).

The free maternal care policy that was introduced by the government in July 2008 may have enabled more pregnant women to attend ANCs than would have been. It has improved accessibility to healthcare as the maternal health services are taken care of by the National Health Insurance Scheme (NHIS).

The socio-demographic characteristics such as age, educational level, marital status and place of residence were expected to be associated with taking two or more doses of SP but were found not to be significantly predictive of the number of SP doses received by the respondents.

However being unemployed was found to be significantly predictive for taking inadequate doses of SP [OR=4.9, 95%CI (1.88-13.14)]. This may be attributed to the inability to afford transport fares to the ANC clinic for IPTp-SP without support from a partner or family.

The study done in Tanzania by (Marchant T *et al.*, in 2008), found that age was not associated with second dose of SP. Characteristics such as marital status, educational level and occupation were expected to be significantly associated with receiving more doses of SP but this was not so. Marchant T *et al.*, also showed from their study that marital status, educational level of the woman and household socio-economic status were not associated with a second dose of SP. This was consistent with previous studies done by (Mbonye *et al.*, 2004), in Tanzania where individual or client factors were not found to be associated with second dose SP administration. A study carried out in 2009 by Gifty Antwi in the Bosomtwi district of Ghana also found socio-demographic and economic status as not being predictive of the number of SP doses received by pregnant women.

A Kenyan research also showed that uptake of IPTp-SP increased with higher levels of formal education (Eijla *et al.*, 2002). Findings of this study showed a disparity. The Gushegu district is relatively rural with majority of the women having no formal education hence levels of education has no influence on SP uptake.

As established from findings in this study and Bosomtwi in Ghana as well as Tanzania, other factors rather than socio-demographic factors should be looked out for as influences to SP uptake.

After an assertion of some obstetric and ANC history of the respondents which included number of pregnancies, deliveries and their gestational age at the first ANC attendance, early first ANC visits of pregnant women was found to be significantly predictive of the uptake of two or more doses of SP in this study. Late first ANC attendance has been found to contribute to inadequate IPTp (van Eijk *et al.*, 2004).

A total of 85.41% of respondents in this study attended the ANC early enough (at or before 4 months gestation) this may have contributed to the high adequate uptake of SP. In a Kenyan study where 45% of the women attended their first ANC in the third trimester, only 23.7% received two doses of SP (van Eijk *et al.*, 2004). This can be attributed to the reason that most of the women would have exceeded the recommended gestational age for receiving SP.

However, early first ANC visits alone may be necessary but not sufficient for increased SP utilization. Regular ANC visits by pregnant women are required as well to influence adequate SP utilization. This is because after a first early visit the pregnant women must keep to ANC appointments to receive all three doses of SP. A study conducted by Gifty Antwi in the Bosomtwi district of Ghana found a disparity, gestational age at first ANC visit was not significantly associated with SP doses taken. This may have been due to the urban nature of the study area, commercial activities and distance may have prevented women from attending early first visits but eventually made it to the ANC for adequate SP doses because they are likely to be a more informed population than Gushegu.

From the study a high percentage of 78.78% of respondents made four or more visits to the ANC with a mean number of attendances to the ANC being 5 (Standard Deviation, SD=2.2). This figure conforms to WHO recommendations. ie. If at least three visits are made after 16 weeks of gestation, chances of the pregnant women receiving at least two doses of SP is high.

From the study results women who have a first pregnancy (single gravidae) are significantly associated with taking inadequate SP dose. In the study carried out in Bosomtwi, Ghana, parity was also associated with SP dose taken. An experience of malaria in pregnancy among women who have been pregnant before may influence them to taking adequate SP dose as compared to primi-gravidae.

The levels of education among respondents are generally low. Majority of the respondents have no formal education and this appears to relate with the low level of knowledge of malaria and IPTp among them. This study however found that knowledge of malaria and IPTp are not significantly associated with taking two or more doses of SP.

The health talks at the ANC during clinic days which 87.2% of respondents confirmed attending may have imparted to them the need for visits but with no emphasis on knowledge of malaria and IPTp. The health talk program for the quarter at time of the study included malaria in pregnancy but not IPTp.

Nganda *et al's.*, findings in 2004 in Tanzania indicated that attendance at health education sessions at the MCH clinic was the only determining factor for IPTp-SP use among pregnant women. In this study 87.2% of the respondents confirmed attending health talk sessions in the facility. This may have been a determinant to making required visits and receiving two or more doses of SP as found in Tanzania.

No poster on the IPTp program was seen on the walls of the facility in this study. Hence the opportunity to further educate the respondents through posters was not present although it is required by the IPTp program. In a study by (Marchant *et al.*, 2008) in Tanzania 50% of the facilities visited displayed posters explaining the purpose and benefits of IPTp. This point to the poor use of posters as a means of health education in the Gushegu district.

Among the factors that influence IPTp utilization, the ANC facility and health staff factors are also critical and require discussion.

The availability of SP and clean, safe water as well as commitment from health workers to observe all pregnant women swallow SP at the ANCs is what it takes to ensure DOT as recommended in the guidelines for IPTp. SP was out of stock at the time of the study. The ANC

confirmed occasional stock outs of SP at the facility. Utilization of SP could have been better if there were no stock outs. If stock outs coincided with ANC attendance for some pregnant women it could have interrupted SP dosage for them. SP is no longer supplied free of charge by the NMCP but has to be purchased from the regional medical stores and paid for by the National Health Insurance Scheme (NHIS). The delay in payment of funds by the NHIS influences the supply of the drug.

In this district, the availability of water seemed not to be a problem at all. Water was always available free of charge or for sale in sachets either at the ANCs or nearby the health facility hence if SP was available, the pregnant women could swallow their tablets under observation at the ANCs.

This has a potential of undermining the increase in ANC attendance by pregnant women that this free maternal health care policy seeks to achieve if medicines cannot be procured.

ANC staffs are highly committed to the practice of DOT. The practice of DOT is admitted by respondents. A total of 99.4% of the respondents reported taken the drugs in the clinic and 96.7% admitted to being supervised to take SP. All staff interviewed admitted to observing their clients swallow SP at the ANC. These findings are very encouraging and can contribute to improving SP utilization in the district.

The effectiveness and content of the health talks given at the ANC and keeping to IPTp policy guidelines is dependent on the knowledge and training of the ANC staff in IPTp.

Only 2 out of six staff has formal training in IPTp with only 1 receiving training in the past year before the study. The level of knowledge of the ANC staff was satisfactory though training manuals or IPTp policy guidelines were absent.

In a community-based cross-sectional survey by (Ouma *et al.*, 2005) in Kenya among a simple random sample of women who had recently delivered in April 2005 HCW of antenatal clinics (ANC) were interviewed in Asembo and Gem. In Asembo, SP coverage increased from 19% in 2002 to 61% in 2005 for at least one dose and from 7% to 17% for two doses of SP. In Gem, coverage increased from 17% to 28% and 7% to 11%, respectively. Formal training and retraining of the health workers therefore has the potential to improve on the utilization of IPTp. ANC attendance has increased due to the free maternal health care services in Ghana since July 2008. Increased workload due to the overwhelming turn outs and inadequate staffing as admitted by head of the facility may lead to frustrations of staff resulting to negative attitudes.

The Ghana NMCP has observed that low uptake of IPT2 and IPT3 is partly attributable to negative attitudes of healthcare workers, especially towards pregnant women who report late for prenatal care (NMCP, 2007). The results from this study indicate that a total of 79% respondents admitted ANC staffs are caring, which may influence the high frequency of ANC visits. Only 5.78% of respondents admitted ANC staffs shout at clients.

In a study at the Ejisu Juabeng district in Ghana in 2010 by Smith *et al.*, nursing mothers interviewed said that the warm attitude of the midwives encouraged them to return for repeat ANC visits. The finding in the study at Ejisu Juabeng district may be similar to this study. The caring attitude of the ANC staff as admitted by 79% of the respondents may have influenced their frequent visits to the ANC.

For a successful implementation of the IPTp policy internal and external monitoring and supervision is required.

Monitoring and supervision went on as revealed by the results from the study. All 6 ANC staff admitted there has been supervision and monitoring in the last year and 4 out of 6 said there was a supervisory visit for IPTp once last year by an external team.

These monitoring and supervisory activities could be contributory to a high commitment of the health staff to the program leading to the high utilization of IPTp.

The general awareness of malaria and its prevention may result in the utilization of other malaria prevention methods. IPTp and ITNs are the two main WHO recommended methods for malaria prevention among pregnant women. ITNs usage is relevant and should be combined with IPTp by pregnant women.

From the results of the study it was found that a high level Knowledge of malaria does not influence the ownership of ITNs among respondents. Only 13.48% of respondents with very good knowledge of malaria own ITNs and 86.5% with very good knowledge of malaria do not own ITNs. Overall 77% (majority) of respondents do not own ITNs yet the few (23.0%) that owned them had 72% using them. Hence it may be concluded that utilization of ITNs is influenced by access to it among the pregnant women.

(Nganda RY *et al.*, 2004), in a study at Kibaha district hospital, Tanzania found that the level of knowledge of malaria predicted use of ITNs {OR 2.3, 95% CI (1.1- 4.9)}. This study in Gushegu district, Ghana has results that is statistically different from what was found by Nganda RY *et al.*, This disparity may be due to the lack of access to ITNs in Gushegu hence knowledge is not enough for ITNs utilization.

Side effects and malaria infection after using SP in recent pregnancy are reported among respondents. They are not significantly associated with the number of SP doses received, though unsatisfactory experiences may lead to negative perceptions about IPTp-SP among pregnant

women. This study did not investigate the perceptions relating to the use of IPTp-SP by the respondents

However a study in Uganda by (*Mbonye AK et al., 200*), used an exploratory study to assess perceptions on SP in Mukono district, Uganda. Results from the study showed that SP is perceived to be an effective drug that cures malaria quickly. However there are negative perceptions related to its use in pregnancy, SP was also perceived to be an effective drug for malaria. However there are negative perceptions related to its use in pregnancy. SP is believed to be strong and weakens pregnant women, causes abortions and fetal abnormalities. There is also a perception that resorting first to SP for malaria treatment may lead to the development of drug resistance. The study however does not state the association between educational levels of the respondents and negative perceptions of SP.

## CHAPTER SIX

### CONCLUSION AND RECOMMENDATION

#### 6.1 CONCLUSION

Utilization of SP based on the study shows a 25.2% uptake of at least two doses. Specifically 25.2% took only two doses and 66.4% three doses and only 7.9% took only one dose. Most (92.1%) of respondents took adequate IPTp-SP dose.

Among the socio-demographic characteristics studied only Unemployed women were significantly more likely to have inadequate IPTp-SP dosage. Women in the age range 35-44 were found to be 2.5 times more likely to take inadequate SP, this was however statistically insignificant. The free maternity package of the NHIS has been useful, since it has helped to reduce if not eliminate the bottleneck of access to health care by pregnant women due to poor socio-economic status; this has contributed to high ANC attendance.

Level of knowledge of malaria and IPTp as well as practices among the women were not associated with uptake of SP. This implies that for this study group, taking adequate or inadequate SP is not dependent on the categorized level of knowledge for malaria and IPTp-SP.

Health facility factors are contributory to the effective implementation of the IPTp program. Erratic supply of SP is a limitation to access and may have been the primary factor impeding uptake of SP. IPTp-SP has not been available at some periods of the year prior to the research and this may have influenced the drug uptake generally.

The ANC staff knowledge was satisfactory and their attitude was reported and observed to be good as well, with routine health talks being given. The ANC staff commitment to DOT has been

satisfactory. These factors tend to influence clinic attendance and awareness of pregnant women. Awareness of pregnant women may not necessarily be specific to knowledge of malaria or IPTp but the need for early and regular attendance to the ANC. There is no regular training of health workers in IPTp. Staff capacity is reported to be inadequate and no posters on IPTp in the facility.

The obstetric history and ANC experiences of the population studied showed that, early first visits of pregnant women to the ANC and frequent visits significantly increase the uptake of at least two doses (adequate). Women who make late first ANC visits were more likely to have inadequate SP dose. Women who were pregnant for the first time were significantly more likely to have inadequate uptake of IPTp-SP, this may be due to naivety or fear. The average number of ANC visits was 5 which exceed the WHO standards. The mean gestational age for respondents who took adequate SP dose was 4 and for inadequate dose was 6. Therefore there was adequate time for most women to receive adequate IPTp.

All the experiences from the first uptake of SP in the recent pregnancy of the women studied showed odds ratios greater than one, however none were statistically significant. This implies that the experiences from IPTp1 do not determine whether a woman will return for the second and third doses of SP.

Majority (77%) of the respondents do not own ITNs this point to a poor coverage of ITNs in the district. However 72% of those who owned them slept in them the night before. Access to ITNs is therefore a problem that needs to be addressed since utilization is encouraging.

## **6.2 RECOMMENDATION**

Based on the findings of this study and the conclusions drawn, various recommendations can be made for the improvement in SP utilization and the successful implementation of the IPTp program in the Gushegu district.

The free maternal care policy should be maintained with intense publicity by the NHIS across the district so as to continue to curtail poor socio-economic status as a bottleneck to accessing health care.

To further reach out to clients the RCH should implore the use of posters in local languages to help educate and remind clients of the need for early and regular ANC attendance. Though the level of knowledge of malaria and IPTp was not found to influence SP uptake it remains relevant for the GHS and RCH to ensure that women know more about the negative effects of malaria on them and the unborn baby as well about IPTp and its importance.

IPTp-SP should be made an integral component of any malaria in pregnancy (MIP) health talk by health facilities. Existing staff should be re-trained regularly and all newly posted staff to the RCH unit should be orientated and trained on IPTp using the training manual by the NRHD and at the district level. Emphasis on good staff attitude towards clients should be made at trainings. An increase in staffing is also required, the District Health Directorate in collaboration with the District Assembly should poach more ANC staff to the district. This will help reduce waiting time of clients to encourage attendance and reduce work load of staff to prevent pressure and frustrations that may lead to negative attitudes of staff. Activities of the IPTp program should be monitored and supervised more regularly by the DHMT and NRHD. The DHMT should set targets for SP coverage annually and be evaluated both internally and externally. Stock outs of SP at the regional stores influences its availability at the district for uptake by pregnant women.

The District Health Management Team (DHMT) should set up a fund with the support of the District Assembly to purchase SP on the open markets during stock out periods at the regional stores. This will help prevent disruption in uptake by clients.

With regards to the obstetric history and ANC experiences of women, ways to encourage early ANC attendance should be investigated by the NMCP. Methods that can be considered to increase early first and frequent ANC attendance are planned routine visits to communities in the district and employing the use of trained community based volunteers to register pregnant women and administer SP within communities. Women who are pregnant for the first time should be targeted since they may be more likely to take inadequate SP dose.

The policy direction of findings on factors that may lead to negative perceptions of SP among pregnant women after negative experiences from its uptake is developing a health promotion package to educate pregnant women on the misconceptions on the strength of SP and explain its benefits and side-effects.

The study results found a rather low coverage of ITNs among respondents. Investigation into failure of pregnant women to receive ITNs should be carried out. The GDHD in collaboration with the NRHD and the NMCP should plan a mass ITNs distribution exercise in the district. It should be ensured that the ITNs reach the target population.

Based on the findings of this study, if these measures are taken I am optimistic that coverage of IPTp and ITNs will increase in the district leading to a reduction in malaria in pregnancy and an impact of a reduction in maternal mortality, perinatal deaths and the overall malaria disease burden.

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**APPENDIX**

## Appendix 1: CLIENT QUESTIONNAIRE

**FACTORS INFLUENCING ADEQUATE UPTAKE OF INTERMITTENT PREVENTIVE TREATMENT DURING PREGNANCY IN RURAL NORTHERN GHANA-GUSHEGU DISTRICT****QUESTIONNAIRE-Client based data**

Date: .....

Serial no: .....

**Section A. Socio-demographic**

1. Age-----

2. Religion

(1) Christianity (2) Islam (3) Traditional (4) Others (Please Specify)

3. Occupation? .....

4. Marital status:

1. Living with partner    2.Living without a partner

5. Ethnicity:

1. Dagbani    2.Fulani    3.Kokomba    4.Others

6. Place of residence:

1. In the district capital    2. Outside the district capital

7. Educational level:

1. Primary    2.Secondary    3.Higher    4.others eg. Koranic school

8. Husbands Occupation.....

**SECTION B (Obstetric History)**

9. What is your present gestational age? .....

10. How many deliveries have you ever had? . .....

11. How many pregnancies have you ever had? .....

**SECTION C (Knowledge of Malaria among Pregnant Women)**

12. What is Malaria? .....

.....

.....

13. How is malaria transmitted .....

(a) Mosquito bites (b) house flies (c) termites (d) cockroaches

(e) others, please specify .....

14. The following encourages malaria transmission? .....

(a) Dirty environment. 1. Yes 2. No 3. Don't know

(b) Clean houses 1. Yes 2. No 3. Don't know

(c) Ill ventilated and Ill-lighted houses 1. Yes 2. No 3. Don't know

15. Effects of malaria in pregnancy include

- (a) Maternal anaemia 1. Yes 2. No 3. Don't know
- (b) Still birth 1. Yes 2. No 3. Don't know
- (c) Maternal death 1. Yes 2. No 3. Don't know
- (d) Low birth weight of baby 1. Yes 2. No 3. Don't know

**SECTION E (Antenatal use by pregnant women and attitude of antenatal staffs)**

16. At what age of your pregnancy did you start visiting the ANC clinic.....
17. How many visits did you make to the ANC during pregnancy? 1. 1 2. 2 3.3
18. Was transportation fare a barrier to keeping your appointments? 1. Yes 2. No
19. Do health Nurses give talks on malaria? .....
20. How would you rate the attitude of the ANC staffs in your Clinic?
- (1) Caring 1. Yes 2. No 3. Average
- (2) Always polite 1. Yes 2. No 3. Average
- (3) Takes good care of us 1. Yes 2. No 3. Average
- (4) Always shout at us 1. Yes 2. No 3. Average
- (5) Any other, please specify .....

**SECTION F (Knowledge of IPTp)**

21. Have you heard about Intermittent Preventive Therapy IPT?
1. Yes 2. No
22. Intermittent Preventive Therapy can be given to?
- a).Men b). Infants c). Pregnant women d). I don't know.
23. How many tablets of IPT drug is being used at once as a dose?
1. 1 tablet 2. 2 tablets 3. 3 tablets 4. 4 tablets 5. 5 tablets
24. When is IPT Doses recommended to be used during pregnancy?
1. 1st- 3rd months 2. 4<sup>th</sup> - 6th months 3. 7<sup>th</sup> - 9th months 4. 2nd- 4th months

**SECTION G (Utilization of IPTp)**

25. Did you take the IPTp at each visit?
1. Yes 2.No
26. How many tablets were you being given? .....
27. Where did you use it?
1. Home 2.In the Clinic 3.Outside the clinic
28. When you used it, were you being supervised by ANC staff?
1. Yes 2. No

29. Do you like taking the drugs in the clinic?

1. Yes 2. No

30. Is there any time you didn't take the drugs given to you in the clinic?

1. Yes 2. No

31. Is there any time you were afraid of any complication during pregnancy and so didn't use the drug?

1. Yes 2. No

32. Is there any time you used IPT during pregnancy and still had malaria?

1. Yes 2. No

33. After using IPT, was there any side effect?

1. Yes 2. No

34. Do you sleep in an Insecticide Treated Net every night?

1. Yes 2. No

35. Any other recommendation for the prevention of malaria during pregnancy.....

.....

36. What would you suggest to improve IPT use in the Clinics.....

**Appendix 2:****QUESTIONNAIRE FOR ANC STAFF**

Name of facility.....

Sub-district .....

Type of health facility.....

**SECTION 1: GENERAL INFORMATION**

Age: Sex: Male Female

Staff category: Midwife General Nurse Nurse Assistant

Other, specify.....

Designation: Head of unit General Staff

If head of unit, please answer a to d:

a. Total number of staff in the ANC department

b. Total number of Registrants seen last year

c. Total number of Attendants seen last year

d. Rank of ANC Head .....

**SECTION 2: KNOWLEDGE ABOUT IPTp****Please tick appropriately**

1. What is Intermittent Preventive Treatment of malaria in pregnancy (IPTp)?

Giving curative doses of an effective anti malaria drug weekly during pregnancy ( )

Giving of curative doses of an effective antimalarial drug at predefined intervals during pregnancy ( )

The injection of artesunate to a pregnant woman when she has malaria ( )

Giving of artesunate combined treatment (ACT) to pregnant women when they have malaria ( )

Don't know ( )

2. What medicine is recommended for IPTp use in Ghana?

Chloroquine ( ) Artesunate- amodiaquine ( ) Fansidar (SP) ( ) Lumether ( ) Don't know ( )

3. When is IPTp supposed to be started during pregnancy?

In the first trimester ( ) In the middle of the second trimester ( ) In the third trimester ( ) At 16 weeks of gestation or after quickening ( ) Don't know ( )

4. After what gestation is IPTp not to be given during pregnancy?

32 weeks ( ) 34 weeks ( ) 36 weeks ( ) 38-40 weeks ( ) Don't know ( )

5. Why would you not give the medicine at the beginning of pregnancy?

It will let the woman vomit ( ) It can have a negative effect on the fetus ( ) It will cause the woman to fall sick ( ) It will lead to anaemia in the woman ( ) Don't know ( )

6. How many times during pregnancy is it recommended to give IPT in Ghana?

Once ( ) Twice ( ) Thrice ( ) Four times ( ) Five times ( ) Don't know ( )

7. At what interval is it recommended that IPT is given?

Monthly ( ) Fortnightly ( ) Every three months ( ) Every week ( ) Don't know ( )

*(Please circle appropriately: T= true, F= false D.K= Don't know)*

8. What are some of the known side effects of taking the IPT medicine?

Skin rash (T F D.K)

Vomiting (T F D.K)

Nausea (T F D.K)

9. Which pregnant woman would you not give SP to?

One who is allergic to sulphur drugs (T F D.K)

One in the first trimester (T F D.K)

One who has received SP less than a month ago (T F D.K)

10. What advice should you give to a pregnant woman who cannot take the IPTp medicine?

Sleep under insecticide treated mosquito net (T F D.K)

Wear protective clothing, especially during the night (T F D.K)

Use mosquito repellent (T F D.K)

11. What are some of the benefits of IPTp?

Reduces the incidence of low birth weight infants (T F D.K)

Reduces the incidence of maternal anaemia (T F D.K)

Reduces the incidence of infant and maternal mortality (T F D.K)

**SECTION 3: PRACTICE OF DOT FOR IPTp IN THE ANC**

12. Do you administer IPTp in your facility? Yes ( ) No ( )

If no, skip questions 13 to 22, if yes, continue.

13. If yes, what medicine is used for IPTp in your facility?

Chloroquine ( ) Fansidar (SP) ( ) Artesunate-amodiaquine ( )

Lumether ( )

14. Do you have the medicine at the ANC? Yes ( ) No ( )

15. How is the medicine administered at your clinic?

Given to the pregnant women to take home ( )

We observe the pregnant women take the medicine in clinic ( )

Prescriptions are written for the pregnant women to go and collect at the pharmacy ( )

Prescriptions are written for the pregnant women to go and buy outside the clinic ( )

Other, specify .....

16. Have you ever run out of the medicine for IPTp in your clinic? Yes ( ) No ( )

Don't know ( )

17. If yes

a. How many times during the last year? Once ( ) Twice ( )

Thrice ( ) more than 3times ( ) Don't know ( )

b. What happened to the IPTp programme?

Suspended till we got the medicine ( ) Asked women to buy SP ( )

Referred women to other Health Facilities ( ) other, specify.....

18. Where do you normally get the supplies of medicine for IPTp from?

District pharmacist ( ) Regional medical stores ( ) Health facility in

district ( ) Don't know ( ) Other, specify .....

19. Do you supply clean safe water for the pregnant women to take the IPTp medicine?

Yes ( ) No ( )

20. If no, how do the women get water for the medicine?

Buy water from the clinic ( ) Bring water from home ( )

Fetch water from the tap ( ) Buy water from outside the unit ( )

other, specify.....

21. Have any of the pregnant women ever reported any side effects? Yes ( ) No ( )

22. If yes, what was reported?

Nausea ( ) vomiting ( ) Diarrhoea ( ) skin rash ( )

Other, specify.....

23. What happens if a pregnant woman attends ANC earlier than when IPTp should be started?

She is asked to go and come back in a month's time then IPTp is started ( )

She is asked to go and come back at quickening or at 16 wks to start IPTp ( )

She is encouraged to attend ANC regularly ( )

She is given SP to take at home when she is 16 wks or at quickening ( )

Other, specify.....

#### **SECTION 4: TRAINING IN IPTp**

24. Have you had any training in IPTp before? Yes ( ) No ( )

25. If yes, was it

a. by in-service training? Yes ( ) No ( )

b. by attending a workshop? Yes ( ) No ( )

26. How many times in the last twelve months did you have training in IPTp?

None ( ) Once ( ) Twice ( )

More than twice ( ) Can't remember ( )

#### **SECTION 5: SUPERVISION AND MONITORING OF IPTp PROGRAMME**

27. Did you have any supervisory/monitoring visits at your unit last year?

Yes ( ) No ( )

28. Did you have any supervisory/monitoring visits last year for IPTp?

Yes ( ) No ( )

29. If yes, how many times during the last year did you have monitoring/supervisory visits for IPTp? Once ( ) Twice ( ) More than twice ( ) Don't know ( )

30. Who did the monitoring/supervision?

External team ( ) Internal team- DHMT ( ) Both ( ) Don't know ( )

**(GIFTY ANTWI, 2009)**

**APPENDIX 3: CHECK LIST FOR ANC UNIT OBSERVATION**

Code number: Date:

Name of facility .....

Sub-district .....

Health education program drawn for the quarter includes MIP Yes ( ) No ( )

Health education program drawn for the quarter includes IPTp Yes ( ) No ( )

Health talk given at ANC on day of visit Yes ( ) No ( )

Health talk given that day included malaria in pregnancy Yes ( ) No ( )

Health talk given that day included IPTp Yes ( ) No ( )

Presence of posters of IPTp/MIP on the wall Yes ( ) No ( )

Presence of ANC Report Book for daily summaries Yes ( ) No ( )

Presence of ANC Monthly Data returns form Yes ( ) No ( )

SP available at ANC Yes ( ) No ( )

Practice of DOT observed Yes ( ) No ( )

SP given is recorded in ANC report Book for daily summaries Yes ( ) No ( )

SP given is recorded in ANC book of clients Yes ( ) No ( )

Presence of Adverse Event forms for SP Yes ( ) No ( )

Presence of free, clean, safe water for DOT Yes ( ) No ( )

Presence of safe, clean water for sale for DOT Yes ( ) No ( )

Availability of IPTp National protocol Yes ( ) No ( )

Availability of IPTp training manual Yes ( ) No ( )

Presence of ITNs for distribution to clients Yes ( ) No ( )

Any additional observations made: .....

**Consent Form**

Title of study	Factors Influencing Adequate Uptake of Intermittent Preventive during Pregnancy in the Gushegu District- ,Northern Ghana
Objective	To determine factors influencing the utilization of IPTp among the study subjects
Name of Principal investigator	Atasige Awin-Irigu Stephen
Name of Supervisor	Dr. Fred Wurapa
Information for participants	I am an MPhil student of School of Public Health, University of Ghana- Legon. I am conducting a study to determine factors influencing the utilization of intermittent preventive treatment during pregnancy, in partial fulfill of the requirement of a master of Philosophy Applied Epidemiology and Disease Control. Your participation and honest information in this study will be most appreciated.
Procedure	You will be asked some questions as you are relaxed for information
Risk	There is no direct risk in participating in this study. You may however be required to answer few questions from research assistants that will frequently visit your house during the study period.
Benefits	There are no direct benefits from this study. However, results

	from this study will be used to improve IPTp activities in the district and the country as a whole.
Confidentiality	Be assured that all information obtained from you will be treated with utmost confidentiality and used strictly for the purposes of the study. You will not be associated with the information provided during the study.
Right to refuse	You have the right to refuse to take part in this study. You may also freely withdraw at any point in the study.
Consent	The content of this form and the purpose of the study and the risk and benefits have been read and explained to me in the language I understand. I do hereby give my consent to participate in the study.
Signature/thumb print of participant	
Date	
Signature of Investigator	
Date	
Contact	