SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

PREDICTORS OF SULPHADOXINE-PYRIMETHAMINE UPTAKE AMONG PREGNANT WOMEN, ASANTE AKIM NORTH DISTRICT

BY

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THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PHILOSOPHY IN APPLIED EPIDEMIOLOGY AND DISEASE CONTROL DEGREE

DECEMBER, 2021

DECLARATION

I, Abraham Frimpong Baidoo, declare that this thesis is my original work undertaken under supervision, except for duly referenced works. No form of this work has been presented for another degree in this university or elsewhere.

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ABSTRACT

Background: Given the public health implications of malaria in pregnancy (MiP), Intermittent Preventive Treatment of Malaria in Pregnancy using Sulphadoxine Pyrimethamine is one of the three interventions recommended by the World Health Organization for the prevention of MiP. However, uptake levels have generally been low in Ghana over the years including the Asante Akim North district. The district recorded 55.0% IPTp-SP3 uptake in 2019which is far below the 80% national targets. This study assessed the predictors of IPTp-SP uptake among pregnant women in the Asante Akim North District.

Methods: A hospital-based cross-sectional study was conducted, involving 423 randomly sampled postnatal women in selected health facilities in the Asante Akim North District from September to October, 2021through interview using a structured questionnaire and records review with an observational checklist. Continuous variables were presented as means and standard deviation, with categorical variables presented as frequencies and proportions. Chi square test was computed to determine association between IPT3 uptake and independent variables, whiles logistic regression was used to determine strength of associations at a significance level of 95% Confidence interval and 5% p value.

Results: Out of the 423 postnatal women studied, 271 (64.7%) received 3 or more doses of IPTp-SP. Majority 371 (87.7%) made at least four antenatal visits throughout their entire pregnancy. A total of 316 (74.7%) had been multigravid whilst179 (42.3%) of the respondents, had at least three children. Postnatal women who made four or more ANC visits had 6.57 times increased odds of uptake compared with women who made less than four ANC visits (aOR = 6.57, 95% CI 1.13, 38.09, $p < 0.036$). Multigravid postnatal women had 94% reduced odds of uptake compared to primigravid postnatal women (aOR = 0.06, 95% CI 0.01, 0.49, $p < 0.010$). Women who made

payments for ultrasound scan had 98% reduced odds of uptake compared with those who made no payment (aOR = 0.02, 95% CI 0.004, 0.87, p <0.042) whilst those who made payment for other medications had 12.57 times increased odds of uptake (aOR = 12.57, 95% CI 2.40, 65.93, p <0.003) compared to those who did not make payment.

Conclusion: The uptake of IPTp-SP3 in the Asante Akim North district was less than the 80% recommended uptake level. Gravidity and antenatal attendance were positively associated with uptake of three or more doses of IPTp-SP whiles co-payments for ultrasound scan and other medications was negatively associated with taking IPTp-SP3. Midwives and other stakeholders including the National Malaria Control Programme should target multigravida women, those who are economically dependent, those who pay for other services and those who do not make the recommended ANC visit to improve uptake.

Keywords: IPTp-SP, Asante Akim, postnatal, Ghana

DEDICATION

This work is dedicated to my wife and children

ACKNOWLEDGEMENT

My utmost gratitude goes to the Almighty God for his blessings and infinite mercies throughout this work.

To my able supervisor Dr. Bismark Sarfo, I am highly grateful for the time dedicated to making my work great.

To my secondary supervisor Dr. Adolphina Addo-Lartey, I say thank you for the support

To the entire staff of the Department of Epidemiology and Disease Control and the Ghana Field Epidemiology and Laboratory Training Program, I say thank you for the tireless support.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

ACT - Artemisinin-based combination therapy

ANC - Antenatal care

CCAP – Church of Central African Presbyterian

CDC - Centre for Disease Control and Prevention

DHIMS - District Health Information Management System

DOT - Directly Observed Therapy

GHS – Ghana Health Service

IPT – Intermittent Preventive Therapy

IPTp-SP - Intermittent Preventive treatment with sulphadoxine-pyrimethamine

IRS - Indoor residual spraying

ITN – Insecticide treated bed nets

LLIN - Long lasting insecticide treated nets

MCH – Mother and child health

MDGs – Millennium development goals

MiP - Malaria in Pregnancy

MIS - Malaria indicator survey

NMCP - National Malaria Control Programme

OR - Odds ratio

RBM - Roll back malaria

RDT - Rapid Diagnostic Test

SDG - Sustainable Development Goal

SP - Sulphadoxine- Pyrimethamine

WHO - World Health Organization

CHAPTER ONE

1.0 Introduction

1.1 Background

Malaria is an endemic disease in Ghana and is caused by the plasmodium parasite and transmitted by the female anopheles mosquito. The most vulnerable group are pregnant women, children under five years of age, and travelers (Akande & Musa, 2005). In 2018, the World Health Organization (WHO) approximated that nearly half of the world population was at risk of malaria infection. It is estimated that about 228 million malaria cases had occurred in 2018 alone, resulting in 405,000 deaths. The WHO African Region (WHOAFROA) accounted for a disproportionate burden of 94% of these cases and 93% of the deaths (WHO, 2019).

Pregnant women are a sub-population most vulnerable to malaria (WHO, 2011). Malaria infection in pregnancy affects both the mother and the fetus (CDC, 2019). In 2018, an estimated 11 million pregnant women living in 38 countries with moderate-to-high malaria transmission in Sub-Saharan Africa were infected with malaria (WHO, 2018). The impact of malaria infection on the fetus' health during pregnancy can lead to pre-term birth and low birth weight, which are significant contributors to neonatal and infant mortality (De Beaudrap et al., 2013). In 2018 alone, malaria in pregnancy resulted in an estimated 872,000 low birth weight children in 38 African countries (WHO, 2019).

The WHO has made tremendous efforts to control and manage malaria infections across the globe over the years with targeted interventions towards malaria in pregnancy. In 2004, WHO rolled out several interventions to curb the transmission of malaria and reduce its effect. These interventions included: the intermittent preventive treatment of malaria in pregnancy using sulphadoxine-

pyrimethamine, insecticide-treated nets (ITNs) and the prompt and effective management of malaria cases (Azizi, 2020). Ghana has since 2004 adopted these preventive interventions to help control and manage malaria (WHO Global Malaria Program, 2013).

The Intermittent preventive treatment of malaria in pregnancy using sulphadoxine-pyrimethamine (IPTp-SP) is a longstanding, clinically-proven, safe, cost-effective, life-saving medical intervention for the prevention and management of MiP. The WHO IPTp-SP guidelines recommends that pregnant women in areas of moderate-to-high transmission in sub-Saharan Africa receive SP, ideally by directly observed therapy, at each antenatal care visit beginning in the second trimester (WHO Global Malaria Programme, 2013).

Estimates show that 31% of pregnant women in 36 African countries received the recommended three or more doses of IPTp-SP, up from 22% in 2017 and 2% in 2010 (Global Malaria Programme: WHO Global, 2019). In Ghana, the level of uptake of IPTp-SP3 has increased over the years from 39.0% in 2014 to 60.0% in 2016 and 61.0% in 2019(NMCP, 2021). In a study conducted in the Brong Ahafo region of Ghana, the uptake of IPTp3 and IPTp4 were 47.6% and 19.8% respectively, which are far below the set national targets (Dapaa, 2017). In a similar study conducted in rural Northern Ghana among pregnant women, the uptake of IPTp-SP3 was 66.4%, which is below the national target of 80%(Stephen et al., 2016).

Several factors are associated with the uptake of IPTp-SP. These factors include: health service-related factors, individual-level factors, and obstetric factors. The uptake of at least three or more doses of IPTp-SP in 2019 in the Asante Akim North District was 55.0% (DHIMS 2- GHS), hence the need for this study, to assess the factors contributing to the low uptake of IPTp-SP

1.2 Problem Statement

The uptake of "intermittent preventive treatment of malaria in pregnancy" (IPTp) in Ghana is generally low (Darteh, Buabeng, & Akuamoah-Boateng, 2020), though the level of uptake nationwide has increased over the years from 39.0% in 2014 to 60.0% in 2016 and 61.0% in 2019 (MIS, 2019). The uptake of at least three or more doses of IPTp-SP in 2019 in the Asante Akim North District was 55.0% (DHIMS 2- GHS) which is far below the 2015 National Malaria Control Programme objective of reaching 100% of pregnant women with at least 3 doses of SP despite the implementation of various measures to increased uptake over the years (MIS, 2019).

The low uptake of IPTp-SP by pregnant women has been attributed to a number of factors in previous studies. Some of these factors include, level of knowledge, parity, availability of SP, maternal education, income level, distance to health facility and number of ANC visits (Azizi, 2020; Diengou et al., 2020a; Mubyazi et al., 2012; Stephen et al., 2016).

Low uptake of IPTp-SP during pregnancy has been reported by various studies to be associated with poor outcomes such as low birth weight, pre-term births and maternal anaemia (Anto, Agongo, Asoala, Awini, & Oduro, 2019; Arnaldo et al., 2018). Uptake of IPTp-SP is associated with numerous demand and supply factors that are context-specific (Azizi, 2020; Owusu-Boateng & Anto, 2017).

Given the adverse effects of low uptake, this study aims to determine the associated factors of IPTp-SP uptake among pregnant women in Asante Akim North District of Ghana.

1.3 Conceptual Framework

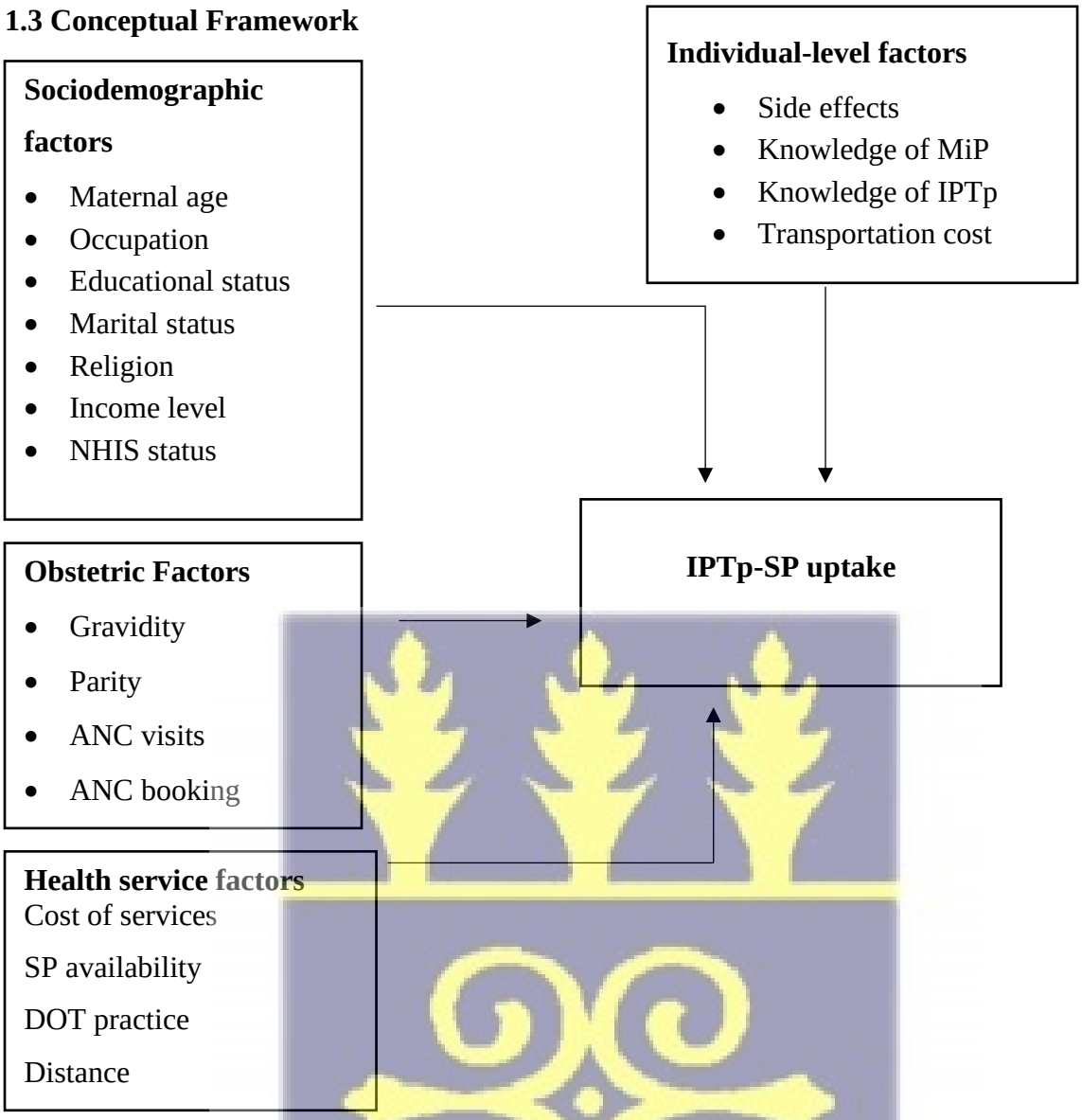

Figure 1.1: Conceptual framework of factors associated with uptake of IPTp-SP, Asante Akim North, 2021

The Narration of the Conceptual Framework

The conceptual framework is an overview of some of the factors that contribute to the utilization of IPT in the district. It provides a framework for conducting this study.

The socio-demographic factors of the respondents provide their general characteristics such as age, income level, marital status, educational background and occupation. These factors influence the

healthcare-seeking attitude of the respondents and may likely affect ANC attendance as well as IPTp-SP utilization.

The obstetric factors of the respondents (gravidity, parity, gestational age at booking and the number of ANC visits may also influence the level of uptake of IPT by pregnant women. Multiparous pregnant women are more likely to adhere to the uptake of higher doses of IPT compared to nulliparous women. Also, the number of times a pregnant woman visits the ANC units throughout her pregnancy is likely to influence the number of doses of IPT that will be taken by the woman.

The individual-based factors of the respondent such as knowledge of malaria in pregnancy, knowledge on IPTp-SP for prevention of malaria in pregnancy and side effects of the drug influence the level of uptake of IPT by pregnant women. Women who are well aware of IPT and its importance in pregnancy are likely to take higher doses of IPT compared to pregnant women with little or no knowledge of IPT.

Health service factors such as the availability of SP, the practice of Directly Observed Therapy (DOT), the cost of ANC services and the distance of the woman from the healthcare facility may also influence the uptake of IPT by pregnant women. The availability of SP at various health facilities that provides ANC services is likely to increase the uptake of IPT by pregnant women compared to health facilities without SP.

1.4 Significance of the study

Studies conducted across Africa and different parts of Ghana have reported an association between the level of uptake of IPTp-SP among pregnant women and adverse pregnancy outcomes (Azizi S.C, 2020). From a study in Hohoe, Ghana, by Agbozo et al., (2016) pregnant women who took only one dose of IPTp-SP had an increased risk of low birth weight. In achieving the Sustainable

Development Goal 3 of ensuring healthy living and promoting well-being for all ages, the relevance of increasing uptake levels of IPTp-SP cannot be underestimated. Hence the findings from our study will contribute to this achievement.

Since factors associated with IPTp-SP uptake are context-specific, this study is necessary to identify the factors associated with uptake in the Asante Akim North District.

This would contribute to the growing body of evidence and guide practice in the health facilities in which the studies have been conducted and the Asante Akim North District as a whole. This can also direct the Asante Akim North District Health Directorate in its maternal malaria prevention activities. The finding will provide an overarching guidance in policy development and implementation towards scaling up IPT-SP3 by stakeholders including the National Malaria Control Programme and the Ghana Health Service.

1.5 Research questions

1. What is the level of uptake of IPTp-SP3 among respondents in the Asante Akim North District?
2. Which individual-based factors influence the uptake of IPTp-SP among the respondents?
3. What are the obstetric characteristics of the respondents that influence their uptake of IPTp-SP?
4. Which health service factors influence the uptake of IPTp-SP3 among the respondents?

1.6.1 General objective

The general objective of this study was to assess the predictors of IPTp-SP3 uptake among pregnant women in the Asante Akim North District

1.6.2 Specific objectives

1. To determine the level of uptake of IPTp-SP3 among pregnant women in the Asante Akim North District?
2. To assess the association between pregnant women individual factors and their utilization of IPTp-SP3
3. To determine the association between obstetric history of respondents and their uptake of IPTp-SP doses
4. To assess health service factors on the uptake of IPTp-SP

CHAPTER TWO

2.0 Literature Review

2.1 Introduction

South of the Sahara, Africa accounts for about 90% of all malaria deaths worldwide. The bulk of infections in Africa are caused by Plasmodium falciparum, the most severe of the four human malaria parasites (Global Malaria Programme: WHO Global, 2019). It is possible to employ the antigen-based Rapid Diagnostic Test (RDT). Microscopy, on the other hand, remains the gold standard (Perez-Jorge, 2014). In areas with steady transmission, the WHO recommends that strategies for malaria prevention during pregnancy prioritize an intermittent preventive treatment (IPT) and insecticide-treated bed nets (ITNs) package, as well as adequate case care (WHO Global Malaria Program, 2013).

2.2 Policies on Malaria in Pregnancy Prevention

2.2.1 Targets for Malaria Control

The Roll Back Malaria collaboration's major goal has been to reduce mortality by half by 2010. Although there are three evidence-based choices for malaria control in pregnancy (IPT, ITNs, and competent case management), widespread adoption of successful programs remains a substantial challenge. Many African women, particularly those living in rural regions, have limited access to medical treatment and malaria prevention equipment like ITNs (NMCP, 2013).

An ITN is a mosquito net (typically a bed net) that has been treated with a safe, residual pesticide to kill and repel mosquitos, which are mosquito carriers for malaria parasites. A long-lasting

insecticide-treated net (LLIN) is an ITN that can be used for several years without needing to be retreated. They (ITNs) are the most effective malaria prevention technique since the introduction of indoor residual spraying (IRS) and chloroquine in the 1940s, and have been a key component of global and national malaria control efforts since the mid-1990s (Hill et al., 2013).

According to the RBM partnership, the following should be accomplished by 2010, notably in the lowest two income quintiles: Up to 80% of those at risk of malaria should be protected using effective vector control strategies, such as ITNs and, where applicable, indoor residual spraying (IRS), as well as environmental and biological approaches.

The goal of the Roll Back Malaria (RBM) collaboration was to achieve the malaria-related Millennium Development Goals (MDGs) by 2015. Preventing malaria during pregnancy is a major public health concern and a top priority for the Roll Back Malaria collaboration, as it can have devastating consequences for both the mother and the unborn child. The World Health Organization has suggested a package of measures since 2000, including the promotion of insecticide-treated bed nets (ITNs), intermittent preventive treatment in pregnancy (IPTp), and good malaria case management.

Many countries in Sub-Saharan Africa have made IPTP-SP (Intermittent Preventive Treatment in Pregnancy with Sulphadoxine Pyrimethamine) a policy. Aside from ITNs, Intermittent Preventive Treatment (IPT) is the most popular technique (Oppong et al., 2019).

IPTp entails giving a single curative dosage of an effective anti-malarial medicine to a pregnant woman, regardless of whether she is infected or not. During antenatal care visits, the medication is given under supervision. While SP-IPTp appears to be a good technique, it still has a lot of room for improvement.

2.2.3 Drug Policy for Malaria Control

To prevent malaria, every malaria-endemic country should implement a medicine policy. As a result, the population at risk will have access to safe, high-quality, and affordable medicines (WHO, 2014). Ghana committed to the WHO's Roll Back Malaria (RBM) Initiative in 1998, which expands on the Global Malaria Strategy with a focus on Africa and aims to halve the global malaria burden by 2010. It also supports the Abuja Declaration on Malaria Control in Africa, which aims to accomplish specific malaria preventive and control goals.

Malaria is hyper-endemic in Ghana, and it is the major cause of death and morbidity, especially among children under the age of five and pregnant women, despite these efforts (Awine, Malm, Bart-Plange, & Silal, 2017).

In this regard, Ghana began using ACTs in 2002, following WHO recommendations for all countries suffering monotherapies resistance in the treatment of falciparum malaria. The medicine artesunate-amodiaquine was chosen as the first-line treatment for uncomplicated malaria. Adverse medication reactions, a lack of alternate therapeutic options, and safety concerns all hampered the implementation process. As a result, it's become important to revisit the drug policy and address all of the issues that have been raised (Ministry of Health, 2009).

Artemether Lumefantrine and Dihydroartemisinin/Piperaquine were chosen as two other ACTs. Nonetheless, for the treatment of uncomplicated malaria, artesunate-amodiaquine remains the preferred ACT. One of the key tactics for controlling malaria in the country has been and continues

to be case management. Treatment is usually prophylactic, with cases of fever being treated as malaria with the approved anti-malaria medicine (Ministry of Health, 2009).

In 2004, Ghana updated its anti-malaria treatment approach, choosing Artesunate-Amodiaquine as the first-line medicine for uncomplicated malaria control. Oral quinine, as well as a combination of Artemether-Lumefantrine or Artesunate Amodiaquine, is an option. In the case of malaria, pregnant women with HIV and sickle cell anemia are treated as described above (Ministry of Health, 2009).

2.2.4 The Revised Anti- Malaria Drug policy for Ghana

IPT, which is based on the administration of anti-malaria drugs to pregnant women in prespecified treatment doses at predetermined intervals after quickening (16 weeks' gestation) to reduce malaria parasitemia and improve pregnancy outcomes, is the most preferred intervention for preventing malaria in pregnancy after ITN. IPT is also most effective when combined with other hematenics and anthelminthics as part of a comprehensive prenatal treatment. "Directly Observed Therapy" refers to the administration of medicine under the supervision of qualified health professionals. ITNs should be available to pregnant women and used as a supplemental malaria prevention approach during their pregnancy.

During pregnancy, the Ghana Health Service (GHS) recommends taking at least three doses of SP at monthly intervals. The NMCP has identified a number of obstacles to complete implementation of IPTp, including a lack of human, technical, and financial resources (NIMPE, 2016).

A new plan for lowering the malaria burden in Ghana was devised in response to changing implementation conditions (e.g., the rising use of ACTs, IRS, and Ghana's revised Poverty Reduction Strategy). The strategy's main goal was to reduce malaria disease burden (morbidity and mortality) by 75% by 2015 (using 2006 as a baseline), with the most important goal being to ensure that all pregnant women received appropriate IPT (at least two doses or more of SP under DOT) by that year (Awine et al., 2017).

2.3 Intermittent Preventive Treatment of Malaria in Pregnancy (IPTp)

Whether or not pregnant women are infected with malaria, intermittent malaria preventative treatment during pregnancy is a systematic clinical course of antimalarial medicine administered to them during normal pregnancy. IPTp reduces maternal and fetal malaria, maternal and fetal anemia, placental parasitemia, low birth weight, and neonatal mortality (WHO, 2019b).

For all pregnant women living in areas with moderate to high transmission of malaria in Africa, the WHO recommends three or more doses of IPTp. Preventive therapy should begin at the beginning of the second trimester and should be performed at monthly intervals up to the time of delivery. IPTp has been shown to minimize anaemia and low birth weight – a significant cause of infant mortality

Antimalarial medication (Sulphadoxine–Pyrimethamine) is given in treatment doses at predetermined intervals in Ghana's Intermittent Preventive Treatment in Pregnancy (IPTp).

Dosing of IPTp

Three SP tablets, each containing 500 mg of sulphadoxine and 25 mg of pyrimethamine, must be taken. SP will be given to pregnant mothers as directly observed treatment (DOT) during routine prenatal consultations (WHO, 2016). SP can be given monthly until delivery.

2.4 IPTp-SP uptake, Placental Malaria and Pregnancy Outcomes

The use of IPTp has been shown to reduce the burden of malaria in pregnancies while also enhancing pregnancy outcomes. The comparative benefits of preventative techniques versus not employing them have been established in several research studies (WHO, 2016). According to a study conducted in Ghana by Agbozo et al., the relative risk of giving birth to LBW babies among pregnant women who took only one dosage of IPTp was 1.57, but those who did not take any IPTp throughout pregnancy had a relative risk of 1.57, compared to those who took three doses (Agbozo et al., 2016). In a comparable study, Mosha et al. discovered that mothers who were exposed to quinine during the first trimester of pregnancy had a 2.5-fold greater incidence of stillbirth (Mosha, Chilongola, Ndeserua, Mwingira, & Genton, 2014).

Pregnant women who had taken at least three doses of IPTp-SP had a malaria prevalence of 16.9% at 36 weeks of pregnancy, compared to 35.8% of those who had not taken IPTp-SP, according to a study conducted in Ghana's Northern region by Agyeman, Newton, Annor, and Owusu-Dabo (2020). In a multivariate logistic regression, individuals who took three doses of SP had a 56 percent lower risk of late gestational peripheral malaria (aOR 0.44) than those who did not take SP. IPTp-SP given in three or more doses showed dose-dependent protection of 56% against maternal peripheral malaria parasitemia detected later in pregnancy (36 weeks).

IPTp was linked to a decreased incidence of placental malaria (OR 0.3) in another Tanzanian investigation; the effect was stronger in the high transmission area (OR 0.2) than in the low transmission area (OR 0.1). (OR 0.4). However, regardless of transmission intensity, IPTp usage was not linked to a lower risk of maternal anemia or low birth weight (Mosha et al., 2014).

2.5 Factors Associated with IPTp-SP3+ Uptake

2.5.1 Socio-demographic characteristics

Socio-demographic factors influence women's overall attitudes and actions in response to a perceived problem. Mothers with previous pregnancies or births may be influenced by their previous experiences and lessons learned in terms of health-seeking behaviour. Women's educational attainment influences their level of knowledge and may have a favorable impact on their attitude about seeking medical help.

In a study of 463 postpartum mothers in Malawi's Zomba area, educational levels and religion were found to have an impact on their use of IPTp-SP services. Women with a senior primary school education showed a lower likelihood of uptake than women with a junior primary school education (OR = 0.58). In addition, being a member of a Christian denomination other than the Church of Central Africa Presbyterian (CCAP), Seventh Day Adventist, or Baptist (OR = 0.52) was linked to a lower likelihood of uptake. Distance to a health facility (OR = 0.37) and transportation problems to a health facility (OR = 0.42) were also factors that influenced IPTp-SP uptake in the same study (Azizi, 2020).

2.5.2 Individual-based factors associated with uptake of IPTp-SP

Pregnant women who are informed about IPTp and have a higher level of understanding are more likely to attend ANC and obtain SP on a regular basis. The ANC, where health workers are expected to educate them, is their best and most practical source of this information. Over half of

the pregnant women interviewed (52.0 percent) had a reasonable understanding of malaria and Malaria in Pregnancy (MiP), 42.8 percent had a poor understanding, and only 5.2 percent had a strong understanding, according to a study done in Ghana's Keta district. The IPTp-SP and its benefits were familiar to the majority of responders (83.5 percent, 308/375). The ANC/Health facility was the primary source of malaria information, followed by the media. Pregnant women's knowledge of IPTp-SP was substantially linked with adherence to higher IPTp-SP dosages (AOR=2.74) (Vandy et al., 2019).

Maheu-Giroux and Castro (2014) investigated the factors that influence pregnant women's use of ITNs and IPTp-SP, as well as the impact that individual knowledge and socioeconomic position play in each. Attendance at health education sessions was shown to be the only feature that predicted IPTp-SP use. Individual awareness of malaria was found to be an important determinant in ITN uptake, but not in IPTp-SP use. Severe anemia postpartum was reduced by 69 percent when both therapies were taken.

A cross-sectional survey of 293 women was conducted at the Kibaha district hospital in Tanzania. Attendance at health education sessions was revealed to be the sole predictor that predicted IPTp-SP use in a logistic regression model (OR 1.8). Individual awareness of malaria was found to be an important determinant in ITN uptake, but not in IPTp-SP use. Attendance at MCH clinic health education sessions was discovered to be the sole determinant of IPTp-SP use. As a result, it is critical that health education sessions for pregnant women at clinics be increased, and that pregnant women be encouraged to attend these programs (Mubi et al., 2013).

2.5.3 Obstetric factors associated with IPTp-SP uptake

The obstetric factors of women such as gravidity, parity, ANC booking and ANC attendance are some of the factors that influence their ANC attendance and inevitably the uptake of IPTp-SP. Uptake of adequate SP dosage varied significantly ($p < 0.001$) according to the timing of ANC initiation and the number of clinic visits (Anchang-Kimbi et al., 2014). In the multivariate logistic regression model, after adjusting for characteristics of participants, having ≥8 ANC visits (AOR=4.51) was significantly associated with adherence to IPTp-SP (Vandy et al., 2019).

In a study conducted in Accra by Owusu-Boateng & Anto, (2017), gestational age at first ANC visit, total number of ANC visits, and gestational age at receiving the first dose of SP were all found to be substantially linked with IPTp- SP uptake (p 0.001). There was no correlation between IPTp-SP uptake and any of the socio-demographic factors ($p > 0.05$). According to a univariate logistic regression analysis, respondents who registered their first ANC in the third trimester were six times less likely than those who registered in the first trimester to take three doses of IPTp-SP during pregnancy (aOR = 0.06). The uptake of three doses was 10.76 times higher among women who went to the ANC four times during pregnancy than among those who went four times. Women who received the first dose in the third trimester had a five-fold lower chance of receiving three doses of SP than those who received it in the second trimester.

Ghana's IPTp policy states that IPT should only be provided to pregnant women after 16 weeks of pregnancy (Ministry of Health, 2009). The onset of ANC visits among pregnant women is linked to the timing of IPTp (Azizi, 2020). An increase in the proportion of women receiving at least two doses of IPT with SP can be achieved by educating clients and staff about the importance of attending ANC sooner. Women who are pregnant for the first time may be concerned about rapid

physiological changes that may occur as a result of the developing fetus and will arrive at the hospital earlier than those who have previously been pregnant (Mubi et al., 2013).

2.5.4 Knowledge of MiP and IPTp-SP

Pregnant women who are informed about IPTp and have a higher level of understanding are more likely to attend ANC and obtain SP on a regular basis. The ANC, where health workers are expected to educate them, is their best and most practical source of this information (Amankwah & Anto, 2019). A cross-sectional survey of 293 women was conducted at the Kibaha district hospital in Tanzania. Attendance at health education sessions was revealed to be the sole predictor that predicted IPTp-SP use in a logistic regression model (OR 1.8, 95 percent CI 1.1-2.9). While having a good understanding of malaria predicted the use of ITNs (OR 2.3, 95 percent CI 1.1-4.9). Individual awareness of malaria was found to be an important determinant in ITN uptake, but not in IPTp-SP use. Attendance at MCH clinic health education sessions was discovered to be the sole determinant of IPTp-SP use (Mubi et al., 2013). This emphasizes the importance of intensifying health education programs for pregnant women in clinics, as well as encouraging pregnant women to attend these sessions. In East Africa, 90.1 percent of the women polled were aware that SP was the substance used in IPT, and 77.2 percent believed that IPT with SP had health benefits; however, 70.0 percent were unaware of the IPT time. As a result, the administration of SP is incomplete (Tarimo, 2007). Pregnant women's attendance at the ANC for SP is influenced by their understanding of IPTp timing. In a survey in Kampala, Uganda, only 21% of pregnant women were informed about malaria preventive medications, 31.5 percent were aware of the recommended drug for malaria prevention during pregnancy, and only 4.5 percent were aware of the required SP dosages. Over 95% of pregnant women said they did not get any IPT-related health

instruction at the ANC. The coverage of IPT1 and IPT2 was discovered to be 61 percent and 31.5 percent, respectively, in 2008. (2008, Nankwanga and Gorette)

2.5.5 Health Service delivery factors

The only service-related feature shown to be substantially associated with uptake of IPTp-SP in a study done in the Tema metropolitan, among 323 respondents, was education/counselling offered to the women on the importance of IPTp-SP by the attending midwives at the ANC. 31.9 percent of individuals who said they had had prior SP education/counselling took three doses, compared to 13.6 percent of those who said they had not received any prior SP education/counselling (p=0.001) (Amankwah & Anto, 2019).

In an ethnographic study spanning two administrative regions in Ghana, the cost of ANC services was observed to influence ANC visits and, usually, the uptake of IPTp-SP. Women who could afford maternity care and MiP services, as well as those who had previously benefited from them, were relieved to be able to keep them. Women who couldn't afford maternal healthcare sought treatment elsewhere, postponed ANC, and skipped regular ANC visits. As a result, some consumers did not receive the required 5+ doses of SP, LLINs were not delivered on time, and MiP treatment was not provided. Healthcare practitioners got disappointed when they were unable to deliver comprehensive therapy to women who could not afford full maternal and MiP care (Aberese-Ako, Magnussen, Gyapong, Ampofo, & Tagbor, 2020).

CHAPTER THREE

3.0 Methods

3.1 Study Design

A hospital based cross-sectional study design involving 423 randomly sampled postnatal mothers who delivered in the selected health facilities in the Asante Akim North District was conducted. Data was collected on IPTp-SP uptake, sociodemographic, obstetric, individual, and health service-related factors associated with uptake of IPTp-SPs through interviews, records review and observation. A chi-square test and logistic regression analysis was performed to determine factors associated with level of uptake. The study was conducted from September to October 2021.

3.2 Study Area

The research was carried out in Ghana's Ashanti Region's Asante Akim North District. The district is 600 square kilometers in size and borders Sekyere East, Sekyere Kumawu, and Sekyere Afram Plains to the north, Asante Akim South to the south, Asante Akim Central to the west, and Kwahu East to the east. It is expected to have an estimated population of 83,315 people, with 64 settlements. The district is divided into four sub-districts with population distribution by sub-district (Agogo- 46656; Ananekrom- 10415; Juansa-13580 and Amantenaman- 12664). The number of women in fertility age is 19995 (with an expected pregnancy of 3333), and the number of children under 5years of age is 16663 (District Annual report, 2020).

There are two hospitals- with Agogo Presbyterian Hospital being a referral center for the three districts in Asante Akim and beyond; three health centers and seven Community-based Health Planning and Service (CHPS) compounds. There are four pharmacies, 30 chemical sellers, 47 trained TBA and 71 community-based surveillance volunteers.

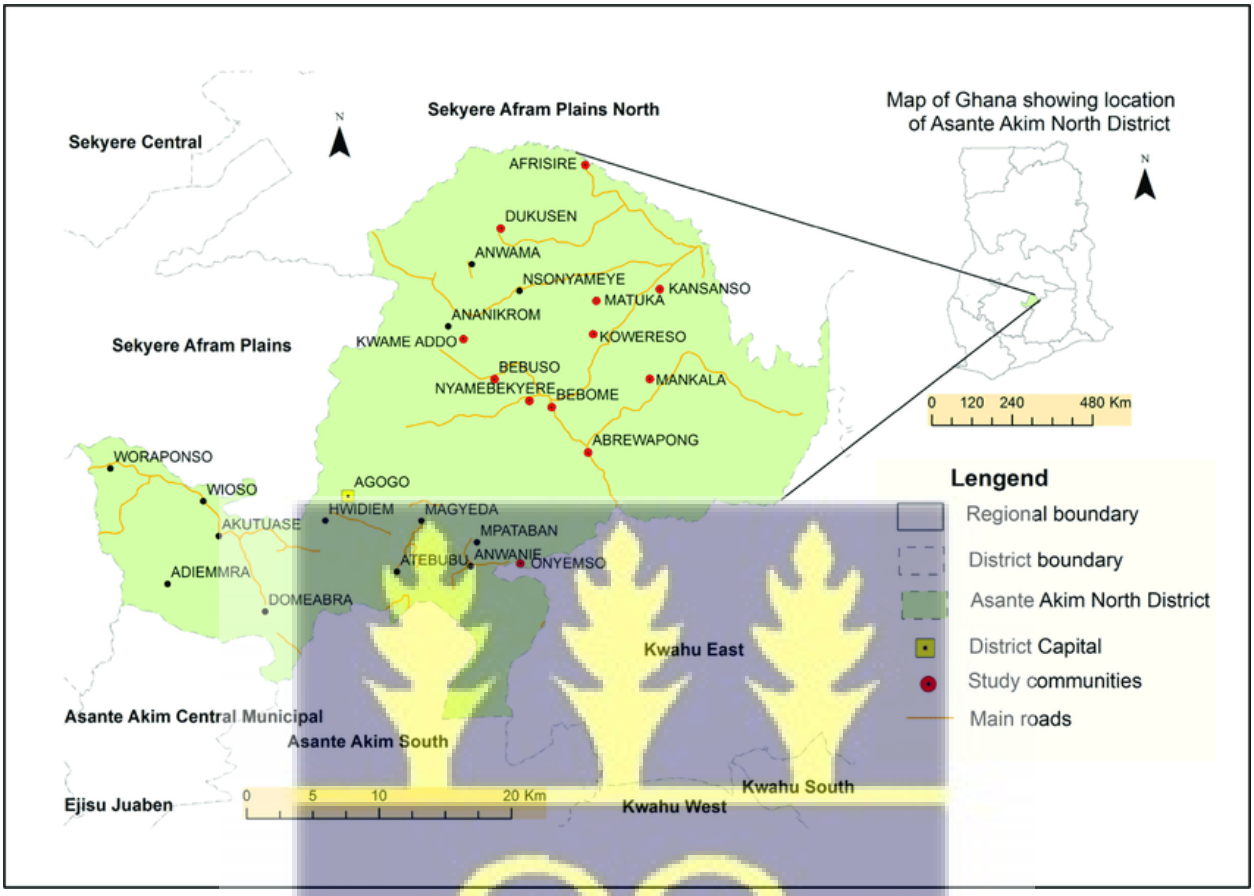

Figure 3.1: Map of Asante Akim North District. Sources(Bukari & Kuusaana, 2018)

3.3 Study Population

The study included all postnatal women who delivered from August to October, 2021 and consented to be part of the study. The district had a population of 88,069 with an expected pregnancy of 3523 in 2021 (District Annual report, 2020).

3.4 Selection criteria

3.4.1 Inclusion Criteria

Women who delivered from September to October 2021 and were in the postnatal wards and postnatal clinics of the selected health facilities and consented to participate in the study were included.

3.4.2 Exclusion Criteria

Post-delivery women in whom the use of SP was contraindicated in pregnancy (due to Sulphur allergy) and HIV-infected women were excluded from the study.

3.5 Study Variables

Table 3.1: List of variables measured in the study

Variable	Operational definition	Type of variable	Scale of measurement
Background characteristics			
Age	The number of years the mother has spent on earth	Independent	Continuous
Marital status	If the postnatal mother is married or not	Independent	Categorical
Education	The level of education attained by the postnatal mother	Independent	Categorical
Occupation	The occupation of the postnatal mother	Independent	Categorical
Religion	The religion of the mother	Independent	Categorical
Income level	The income level of the mother	Independent	Categorical
NHIS status	Participants insurance status with the national health insurance scheme	Independent	Categorical
Postnatal women obstetric factors			
Gravidity	Number of pregnancies a mother has had including the just ended one	Independent	Continuous

ANC Visits	Number of times a mother had visited the antenatal care clinic during the just ended pregnancy	Independent	Continuous
Parity	The number of times the woman has given birth	Independent	Continuous
ANC booking	Gestational age per trimester at mothers' first ANC attendance	Independent	Categorical
Postnatal women Individual factors			
Side effects of SP	Adverse reactions from taking SP	Independent	Categorical
Knowledge of MiP	Study participants knowledge on MiP	Independent	Continuous
Knowledge of IPTp	Study participant's knowledge on IPTp-SP	Independent	Categorical
Transportation cost	Cost of transport from place of residence to health facility	Independent	Categorical
Health service factors			
Cost of services	How much money is spent in accessing healthcare?	Independent	Categorical
SP Availability	The availability of SP at the health facility	Independent	Categorical
DOT practice	Whether SP is administered under DOT	Independent	Categorical
Distance	Time taken to arrive at health facility from place of residence	Independent	Categorical
Dependent variable			
IPTp-SP	Number of doses of SP a mother took during the pregnancy	Outcome	Categorical

3.6 Sampling

Sample Size Determination

An uptake of 55.0% for at least 3 doses of IPTp-SP was reported in the Asante Akim North District for the year 2019 (DHIMS 2).

The 55.0% was used as the proportion of postpartum mothers on IPTp-SP

The sample size was determined using Cochran's formula:

$N = Z^2(\{P\}\ \{1\text{-}P\})/e^2$

Z is the (Standard value for 95% confidence level) = 1.96

P is (uptake of IPTp-SP in the district) = 55.0% (0.55)

e= (Margin of error) = 5% (0.05)

$N= 1.96^2\ (\{0.55\}\ \{1\text{-}0.55\})/0.05^2$

3.8416 {0.55} {0.45}/0.0025 = 380.32

A 10% non-response rate was added bringing the minimum sample size to 418.4 ~ approximately 420 women

3.7 Sampling Procedure

A multi-stage sampling method was used with a proportionate to size approach.

Stage I: Sampling of sub-districts

The Asante Akim North district has four sub-districts. All the four sub-districts were selected for the study. The four sub-districts are; Amantena, Agogo, Ananekrom and Juansa

Stage II: Sampling of health facilities

There are five health facilities in the Asante Akim North district where delivery and postnatal services are conducted. These health facilities are distributed among the four sub-districts with the Juansa sub-district having two of the health facilities. To ensure the representativeness of the study, all the five main health facilities that render delivery and postnatal services were included in the study. These facilities were Amantenaman Health Centre, Agogo (Asante Akim North) Presbyterian Hospital, Ananekrom Health Centre, Juansa Health Centre and Tanoah Baptist Medical Centre (in the Juansa sub-district).

The number of respondents selected from each health facility was computed using the formula below

$$\text{Number to be sampled} = \frac{\text{Number of deliveries in 2020 from the facility (X)}}{\text{Total number of deliveries in 2020 from the 5 facilities}} \text{X Sample size}$$

Table 3.2: Proportionate sampling of study respondents

Health facility	Sample size calculated	Number selected
Agogo (Asante Akim North) Presbyterian Hospital	$(^{2170}/_{2815})$ x 420	324
Amantena Health Centre	$(^{145}/_{2815})$ x 420	22
Ananekrom Health Centre	$(^{205}/_{2815})$ x 420	31
Juansa Health Centre	$(^{273}/_{2815})$ x 420	41
Tanoah Baptist Medical Centre	$(^{22}/_{2815})$ x 420	3

Stage III: Sampling of study participants

Contacts were established with all the health facilities to be used in the study. Research assistants visited each of the health facilities on daily basis from September to October 2021. A simple random sampling approach was used to recruit postnatal women. The online random generator was used to determine which postnatal women to recruit. This was facilitated by the lag time for client education during postnatal clinic sections after clients had been registered. Two research were assigned to each health facility however, four research assistants were assigned to the Agogo Presbyterian Hospital based on the proportions to be sampled per health facility.

The table below presents the average postnatal attendance for each of the facilities visited, the number of postnatal women sampled per visit and the number of postnatal days the team used in sampling the required postnatal women from each of them.

Table 3.3: Sampling of postnatal women from health facilities

Health facility	Average attendance	Number selected per postnatal day	Number of days postnatal days used
Agogo (Asante Akim North) Presbyterian Hospital	60	30	10 days
Amantena Health Centre	4	2	10 days
Ananekrom Health Centre	5	3	10 days
Juansa Health Centre	8	4	10 days
Tanoah Baptist Medical Centre	3	1	4 days

3.8 Quality Control

Research assistants were recruited from the Agogo Presbyterian Hospital and trained for data collection. Research assistants were trained on how to administer questionnaires, conduct interviews and observations. The questionnaire for the collection of data was pretested a week before the actual data collection, among 20 postpartum mothers at the Konongo-Odumasi Government Hospital. This was to allow for modification of the data collection instrument before actual data collection for the study. The pretested questionnaire was analyzed to inform the content and formatting of the final questionnaire that was used for the data collection.

3.9 Data Collection Methods &Tools

Data was collected using a semi-structured questionnaire through interviews of participants and a review of the maternal health records. Research assistants were recruited and trained to assist in data collection. For women who did not understand English, the questionnaire was interpreted into the appropriate local language. The questionnaire collected data on socio-demographic, obstetric, individual, and health service-related factors. The independent variables included educational status, age, antenatal visits, maternal occupation, gravidity and parity, booking at ANC, number of ANC visits, and knowledge of malaria in pregnancy and IPTp-SP and DOT practice. The dependent variable was the uptake of SP.

3.10 Data Processing and Management

All questionnaires were checked to ensure completeness before they were collated. Data were entered into Microsoft Office Excel, cleaned and exported to STATA software version 15.1for analysis. Variables that required to be coded were coded as such. Age was categorized into <24, 25-34, >35 years.

3.11 Data Analysis

Categorical variables were analyzed and summarized into proportions and frequencies. The continuous variables were descriptively analyzed into means and standard deviations.

Chi-square test was used to test the association between categorical independent variables and dependent variable. Logistic regression analysis was performed to test the strength of association between study participants' socio-demographic characteristics, health service factors, individual-based factors, obstetric factors and the level of IPTp-SP uptake. Statistical significance for associations was determined at a 95% confidence interval and p-value of5%.

3.12 Ethical Consideration

Ethical clearance was obtained from Ghana Health Service Ethics Review Committee with approval number GHS-ERC 044/07/21. The administrative authorization was sought from the Asante Akim North district health directorate and permission was also obtained from the management of the selected health facilities. Informed consent was obtained from study participants and personal identifiers such as names and phone numbers were not collected. Data was stored on a hard drive under lock and key, and soft copies under a password.

Confidentiality

Every bit of information was handled with strict discretion. Participants' contact information was not collected.

Withdrawal from the exercise

The fact that participation in the study is entirely voluntary was fully disclosed to participants. At any time, they could opt to leave without providing a reason. There were no repercussions if someone made the decision to leave during an interview.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-Demographic Characteristics of Postnatal Women, Asante Akim North, 2021

A total of 423 postnatal women were recruited for this study. More than two-thirds 81.1% (343/423) of the study participants were living together with their partners (married or co-habiting) whiles Junior High School was the highest level of education among 40.2% (170/423) of postnatal women, and 10.6% (45/423) had no formal education. Almost all,98.8% (418/423) of the study participants interviewed were insured under the National Health Insurance Scheme. Regarding employment, 32.2% (136/423) of postnatal women interviewed were traders, whiles 11.1% (47/423) of them were unemployed. Most, 86.8% (367/423) of the postnatal women studied, were Christians. (**Table 4.1**).

Table 4.1: Socio-demographic characteristics of study participants, Asante Akim North, 2021

Variable	Frequency (N)	Percentage (%)
Age Group (years)		
≤24	121	28.6
25-34	228	53.9
≥35	74	17.5
Marital Status*		
Married	343	81.1
Single	80	18.9
Education Level		
None	45	10.6
Primary	79	18.7
JHS	170	40.2
SHS	68	16.1
Tertiary	61	14.4
Occupation		

Unemployed	47	11.1
Farming	87	20.6
Trading	136	32.2
Gov. workers	58	13.7
Student	28	6.6
Artisan	67	15.8
Income status (Salary)		
No regular income	145	34.3
Regular income	278	65.7
Religion		
Muslims	56	13.2
Christian	367	86.8
NHIS status		
Uninsured	5	1.2
Insured	418	98.8

4.2 Obstetric Factors of the Postnatal women studied, Asante Akim North, 2021

Regarding the obstetric factors, 74.7% (316/423) of the study participants had been multigravid. Of all 423 participants,42.3% (179/423) had at least three children, approximately half 50.1% (212/423) had their first ANC visit during the first trimester, whilst only 5.4% (23/423) booked for ANC during the third trimester. With the number of ANC visits throughout pregnancy, 87.7% (371/423) of the respondents made at least four visits whilst 12.3% (52/423) made less than four ANC visits. Furthermore, 42.1% (167/397), 42.2% (130/308) and 61.2% (178/291) respondents were anaemic at the time of ANC booking, at 36 weeks and at delivery, respectively (**Table 4.2**).

Table 4.2: Obstetric Characteristics of study participants, Asante Akim North, 2021

Variable	Frequency (N)	Percentage (%)
Gravida		
Primigravida	107	25.3
Secundigravida	107	25.3
Gravida 3+	209	49.4
Parity		
None/One Child	138	32.6
Two Children	106	25.1
3+ Children	179	42.3
Gestational age at booking		
1st Trimester	212	50.1
2nd Trimester	188	44.4
3rd Trimester	23	5.4
Number of ANC visits		
<4 visit	52	12.3
≥4 visit	371	87.7

4.3.1 Postnatal women's knowledge of malaria in pregnancy, Asante Akim North, 2021

The study assessed respondents' knowledge on malaria in pregnancy using 12 response items. In terms of the dangers of malaria in pregnancy to the mother, 68.3% (289/423), 61.7% (261/423), 84.9% (359/423) and 51.1% (216/423) indicated malaria in pregnancy could cause anaemia, preterm labour, maternal illness and maternal death respectively. On the dangers of malaria in pregnancy to the unborn baby, 75.4% (319/423), 57.9% (245/423), 54.6% (231/423) and 61.5% (260/423) of them mentioned malaria in pregnancy could cause spontaneous abortion, intrauterine death, low birth weight and prematurity, respectively. When asked about the means of preventing malaria in pregnancy, 96.7% (409/423), 96.7% (409/423), 60.5% (256/423) and 58.2% (246/423) of the respondents respectively indicated draining of stagnant water, sleeping under LLINs, use of mosquito repellents and wearing of protective clothing as a way of protecting themselves from

getting malaria. Overall, 44.2% (187/423) had good knowledge of malaria in pregnancy (**Table 4.3**).

Table 4.3: Respondents Knowledge of malaria in pregnancy, Asante Akim North, 2021

Variable	Frequency (n=423)	Percentage (%)
Dangers of malaria to the pregnant woman		
Anaemia		
Do not cause anaemia	134	31.7
Causes anaemia	289	68.3
Preterm labour		
Do not cause Preterm labour	162	38.3
Causes Preterm labour	261	61.7
maternal illness		
Do not cause maternal illness	64	15.1
Causes maternal illness	359	84.9
maternal death		
Do not cause maternal death	207	48.9
Causes maternal death	216	51.1
Dangers of malaria to the unborn baby		
Spontaneous Abortion		
Do not cause Spontaneous Abortion	104	24.6
Causes Spontaneous Abortion	319	75.4
Intra-Uterine Death		
Do not cause Intra-Uterine Death	178	42.1
Causes Intra-Uterine Death	245	57.9
Low birth weight		
Do not cause low birth weight	192	45.4
Causes low birth weight	231	54.6
Prematurity		
Do not cause prematurity	163	38.5
Causes prematurity	260	61.5
Other means of Malaria prevention:		
Drainage of stagnant water		
Do not prevent	14	3.3
Prevent	409	96.7
Sleep under an insecticide-treated net		
Do not prevent	14	3.3
Prevent	409	96.7
Use mosquito repellent		

Do not prevent	167	39.5
Prevent	256	60.5
Wear protective clothing		
Do not prevent	177	41.8
Prevent	246	58.2
Overall knowledge level		
Poor	140	33.1
Adequate	96	22.7
Good	187	44.2

4.3.2 Postnatal women Knowledge of IPTp-SP, Asante Akim North, 2021

The study assessed respondents' knowledge of IPT-SP in pregnancy using 7 response items. On the commencement of IPTp-SP, 37.6% (159/423) indicated before 13 weeks gestation, 31.4% (133/423) indicated 16 weeks and above, and 23.2% (98/423) did not know. On the doses of IPTp-SP during pregnancy, almost half, 49.4% (209/423) of the respondents indicated 2-3 times, 31.4% (133/423) indicated 4-5 times, and 1.4% (6/423) indicated once. More than two-thirds 89.4% (378/423) of the respondents indicated there should be a month interval between consecutive doses of SP; however, 6.9% (29/423) did not know the interval between two successive doses of SP. Regarding the consequences for not taking SP on the postnatal woman, 76.6% (324/423), 46.8 (198/423), 19.6% (83/423) and 50.6% (214/423) of the respondents, indicated not taking SP could result in malaria, anaemia, death and adverse effect on the fetus respectively. Overall, majority 79.9% (338/423) of the women had poor knowledge of IPTp-SP (**Table 4.4**).

Table 4.4: Respondents Knowledge of IPTp-SP, Asante Akim North, 2021

Variable	Frequency (n=423)	Percentage (%)
Commencement of IPTp -SP		
Before 13 weeks	159	37.6
16weeks and above	133	31.4
After 24weeks	33	7.8
Don't Know	98	23.2
Total doses of IPTp-SP required		
Once	6	1.4
2-3times	209	49.4
4-5times	133	31.4
Several as applicable	10	2.4
Don't know	65	15.4
Interval for IPTp-SP		
Weekly	7	1.7
Monthly	378	89.4
Bi-monthly	9	2.1
Don't know	29	6.9
Consequences of non-uptake of IPTp-SP		
Malaria		
No	99	23.4
Yes	324	76.6
Anaemia		
No	225	53.2
Yes	198	46.8
Illness/Death		
No	340	80.4
Yes	83	19.6
Effects on the fetus		
No	209	49.4
Yes	214	50.6
Overall Knowledge level		
Poor	338	79.9
Adequate	85	20.1

4.4 Individual-level factors influencing IPTp-SP uptake

Regarding distance to healthcare facility, the study revealed that 61.2% (259/423) and 60.5% (256/423) of respondents spent less than 30 minutes from their residence to the health facility and

less than GHC 5 on transportation respectively. However, 9.7% (41/423) mentioned they spent more than GHC 10 on transportation. A total of 76.4% (323/423) respondents had means of readily available transport system to the facility but 12.8% (54/423) of the respondents indicated difficulty accessing transport to the health facility. Half 50.76% (214/423) of the respondents did not need to seek permission before attending ANC services. With those who indicated they needed to seek permission, 78.6% (162/204) of them sought permission from their partner/spouse (**Table 4.5**).

Table 4.5: Individual-level factors of ANC attendance by postnatal women, Asante Akim North, 2021

Variable	Frequency (N=423)	Percentage (%)
Distance to the health facility		
<30 mins	259	61.2
30min-1 hour	133	31.4
>1 hour	31	7.3
Transportation cost		
GHC 0.0	60	14.2
< GHC 5	256	60.5
GHC 5-10	66	15.6
> GHC 10	41	9.7
Accessibility of transport		
No need for transport	46	10.9
Readily accessible	323	76.4
Difficult to access	54	12.8
Permission before attending ANC		
No	214	50.6
Yes	209	49.4
Authority granting permission		
Spouse/partner	162	78.6
Work	44	21.4

4.5: Health service-related factors of IPTp-SP uptake, Asante Akim North, 2021

On the health service-related factors of IPTp-SP uptake, 94.8% (401/423) of the study participants indicated SP was available at all their scheduled ANC visits to the facility. Also, 94.8% (401/423) never made payment for SP at any point in time; although 5.2% (22/423) indicated they had paid for SP at a given point before. Out of pocket payments were made for laboratory investigations, ultrasound scans and for other medications in 92.0% (389/423), 94.3% (399/423) and 79.4% (336/423) of the respondents respectively. On the practices related to SP uptake at the various facilities, 92.9% (393/423) of the postnatal women indicated SP was always given to them under DOT, whiles 2.6% (11/423) mentioned DOT was practiced sometimes. Most 83.7% (354/423) of the respondents indicated the availability of water at the clinics to take the drug, whilst 66.9% (283/423) of the respondents had to purchase water to take the SP (**Table 4.6**).

Table 4.6: Health service-related factors of IPTp-SP uptake, Asante Akim North, 2021

Variable	Frequency (n=423)	Percentage (%)
Availability of SP		
Unavailable	22	5.2
Available	401	94.8
Payment for SP		
No	401	94.8
Yes	22	5.2
Prescribed SP to purchase		
No	414	97.9
Yes	9	2.1
Payment for Laboratory investigation		
No	34	8.0
Yes	389	92.0
Payment for Ultrasound scan		
No	24	5.7
Yes	399	94.3
Payment for Other medication		
No	87	20.6
Yes	336	79.4

DOT practice		
Not all	19	4.5
Sometimes	11	2.6
Always	393	92.9
Availability of water		
No	69	16.3
Yes	354	83.7
Purchasing water		
No	140	33.1
Yes	283	66.9

4.6 Respondents uptake of IPTp-SP, Asante Akim North, 2021

The study revealed that the uptake of IPTp-SP1, and IPTp-SP2 were both 71.2% respectively. On the uptake of 3 or more doses, 64.7%, 41.8%, 18.7% and 0.5% took, IPTp-SP3, IPTp-SP4, IPTp-SP5 and IPTp-SP5+ respectively (**figure 4.1**).

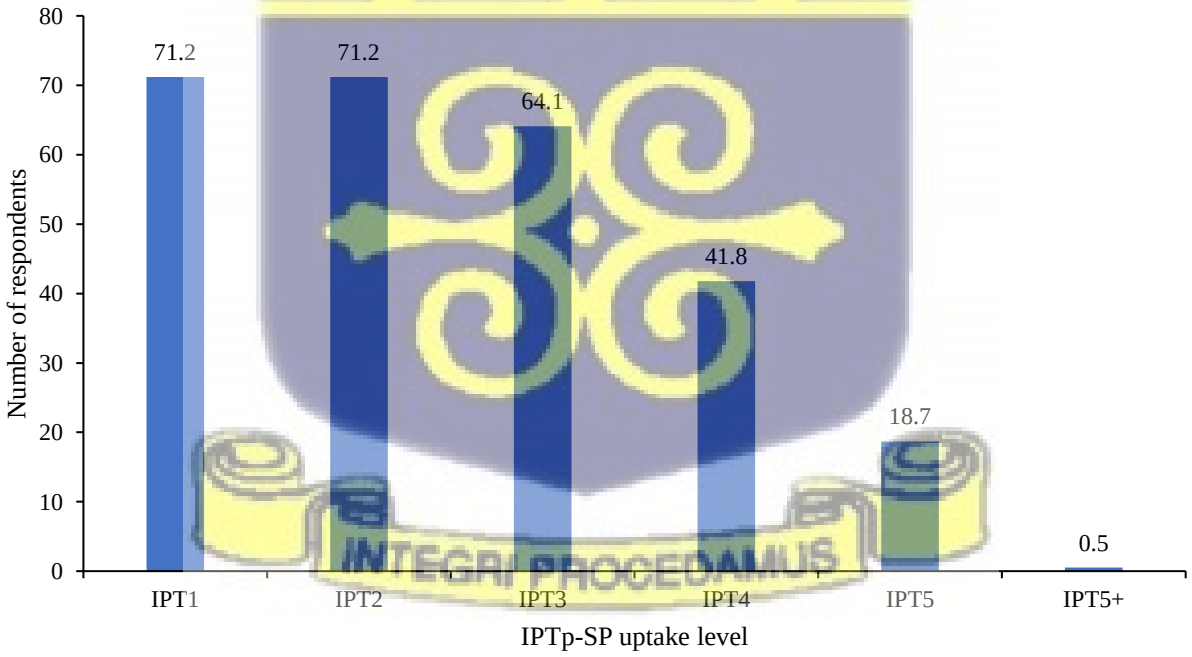

Figure 4.1: Uptake of IPTp-SP Doses among Respondents, *Asante Akim North, 2021*

4.7 Chi square test for association between participant's demographic characteristics and uptake of IPTp-SP

The Chi-square analysis showed that age group ($\chi 2$= 9.35; p<0.009), occupation ($\chi 2$= 15.56; p<0.008) and income ($\chi 2$= 22.89; p<0.001) were significantly associated with the uptake of IPTp-SP. However, marital status, educational level, religion and NHIS status were not associated with postnatal women's uptake of IPTp-SP (p>0.05) (**Table 4.7**)

Table 4.7: Chi-square test for association between participant's demographic characteristics and uptake of IPTp-SP, Asante Akim North, 2021

	IPT-Uptake		
Variable	**≤2 Doses**	**≥ 3 Doses**	**X^2(p – value)**
Age Group			**9.35 (0.009)**
≤24	66 (36.3)	55 (22.8)	
25-34	86 (47.3)	142 (58.9)	
≥35	30 (16.5)	44 (18.3)	
Marital Status			**0.81 (0.369)**
Married	144 (79.1)	199 (82.6)	
Single	38 (20.9)	42 (17.4)	
Education Level			**9.32 (0.054)**
None	21 (11.5)	24 (10.0)	
Primary	23 (12.6)	56 (23.2)	
JHS	83 (45.6)	87 (36.1)	
SHS	27 (14.8)	41 (17.0)	
Tertiary	28 (15.4)	33 (13.7)	
Occupation			**15.56 (0.008)**
Unemployed	27 (14.8)	20 (8.3)	
Farming	33 (18.1)	54 (22.4)	
Trading	46 (25.3)	90 (37.3)	
Gov. workers	24 (13.2)	34 (14.1)	
Student	17 (9.3)	11 (4.6)	
Artisan	35 (19.2)	32 (13.3)	
Income (GHS)			**22.89 (<0.001)**
No income earning	78 (42.9)	67 (27.8)	
<300	33 (18.1)	94 (39.0)	

≥300	71 (39.0)	80 (33.2)	
Religion			**2.18 (0.140)**
Muslim	19 (10.4)	37 (15.4)	
Christian	163 (89.6)	204 (84.6)	
NHIS status			**1.09 (0.396)**
Uninsured	1 (0.5)	4 (1.7)	
Insured	181 (99.5)	237 (98.3)	

4.8 Chi-square test for association between participant's obstetric characteristics and uptake of IPTp-SP

Parity ($\chi2$= 9.41; p<0.009), ANC booking ($\chi2$= 9.73; p<0.008) and number of ANC visits ($\chi2$= 38.05; p<0.001) were significantly associated with the uptake of IPTp-SP. However, gravida showed no association with postnatal women uptake of IPTp-SP (p>0.05) **(Table 4.8)**

Table 4.8: **Chi-square test for association between participant's obstetric characteristics and uptake of IPTp-SP, Asante Akim North, 2021**

	IPT-Uptake		
Variable	**≤2 Doses**	**≥ 3 Doses**	**X^2(p – value)**
Gravida			**0.45 (0.503)**
Prim gravida	49 (26.9)	58 (24.1)	
Multigravida	133 (73.1)	183 (75.9)	
Parity			**9.41 (0.009)**
None/One Child	73 (40.1)	65 (27.0)	
Two Children	36 (19.8)	70 (29.0)	
3+ Children	73 (40.1)	106 (44.0)	
Booking			**9.73 (0.008)**
1st Trimester	90 (49.5)	122 (50.6)	
2nd Trimester	75 (41.2)	113 (46.9)	
3rd Trimester	17 (9.3)	6 (2.5)	
ANC visit			**38.05 (0.001)**
<4 visit	43 (23.6)	9 (3.7)	
4++ visit	139 (76.4)	232 (96.3)	

4.9 Chi-square test for association between participant's knowledge of malaria in pregnancy, Knowledge of IPTp-SP and uptake of IPTp-SP

The results from figures 4.2 and 4.3 shows that knowledge of malaria in pregnancy ($\chi 2$= 116.11; p<0.001) and knowledge of IPTp-SP among postnatal women ($\chi 2$= 39.28; p<0.001) were significantly associated with uptake of IPTp-SP **(Table 4.9)**

Table 4.9: **Chi-square test for association between participant's knowledge and uptake of IPTp-SP, Asante Akim North, 2021**

	IPT-Uptake		
Variable	**≤2 Doses**	**≥ 3 Doses**	**X^2(p – value)**
Knowledge of IPTp-SP			**39.3 (0.001)**
Poor	94.0	69.3	
Adequate	6.0	30.7	
Knowledge of Malaria			**116.1 (0.001)**
Poor	51.6	19.1	
Moderate	34.1	14.1	
High	14.3	66.8	

4.10 Chi square test for association between participant's other individual-based factors and uptake of IPTp-SP

The distance to the health facility ($\chi 2$= 10.86; p<0.004) and the cost of transport to the facility ($\chi 2$= 8.49; p<0.037) were significantly associated with the uptake of IPTp-SP. However, seeking permission before attendance and accessibility of transport were not significantly associated with postnatal women uptake of IPTp-SP (p>0.05) (**Table 4.10**)

Table 4.10: **Chi-square test for association between participant's individual-based factors and uptake of IPTp-SP, Asante Akim North, 2021**

Variable	IPT-Uptake		
	≤2 Doses	**≥ 3 Doses**	**X^2(p − value)**
Distance			**10.86 (0.004)**
<30 mins	99 (54.4)	160 (66.4)	
30min-1 hour	62 (34.1)	71 (29.5)	
>1 hour	21 (11.5)	10 (4.1)	
Transportation cost			**8.49 (0.037)**
GHC 0.0	34 (18.7)	26 (10.8)	
< GHC 5	101 (55.5)	155 (64.3)	
GHC 5-10	25 (13.7)	41 (17.0)	
> GHC 10	22 (12.1)	19 (7.9)	
Accessibility of transport			3.84 (0.146)
No need for transport	26 (14.3)	20 (8.3)	
Readily accessible	134 (73.6)	189 (78.4)	
Difficult to access	22 (12.1)	32 (13.3)	
Permission seeking			0.0002 (0.533)
No	92 (50.5)	122 (50.6)	
Yes	90 (49.5)	119 (49.4)	

4.11 Chi-square test for association between participant's Health service delivery characteristics and uptake of IPTp-SP

Direct Observation Therapy (DOT) practice ($\chi 2$= 16.11; p<0.001), free water for DOT ($\chi 2$= 4.88; p<0.027), purchasing water for DOT ($\chi 2$= 22.57; p<0.001) and availability of SP ($\chi 2$= 17.78; p<0.001) were significantly associated with the uptake of IPTp-SP. However, payment for SP services was not significantly associated with postnatal women uptake of IPTp-SP (p>0.05) (**Table 4.11**)

Table 4.11: Chi-square test for association between participant's Health service delivery characteristics and uptake of IPTp-SP, Asante Akim North, 2021

Variable	IPT-Uptake		$X^2(p-value)$
	≤2 Doses	≥ 3 Doses	
DOT practice			**16.11 (0.001)**
Not at all	16 (8.8)	3 (1.2)	
Sometimes	7 (3.8)	4 (1.7)	
Always	159 (87.4)	234 (97.1)	
Free water provided for DOT			**4.88 (0.027)**
No	38 (20.9)	31 (12.9)	
Yes	144 (79.1)	210 (87.1)	
Purchasing of water for DOT			**22.57 (0.001)**
No	83 (45.6)	57 (23.7)	
Yes	99 (54.4)	184 (76.3)	
Availability of SP			**17.78 (0.001)**
No	19 (10.4)	3 (1.2)	
Yes	163 (89.6)	238 (98.8)	
Payment for SP			**0.46 (0.497)**
No	171 (94.0)	230 (95.4)	
Yes	11 (6.0)	11 (4.6)	

4.12 Factors influencing the uptake of IPTp-SP among participants, Asante Akim North, 2021

In a multivariate logistic regression, income status, gravidity, parity, ANC visit, SP availability and distance to health facility were significantly associated with the uptake of IPTp-SP among the study participants.

Postnatal women who had two children had 22.05 times (aOR = 22.05, 95% CI 2.77, 175.50, p = 0.003) increased odds of uptake of IPTp-SP compared to postnatal women without children or one child. Also, women who had three or more children had 27.43 times (aOR = 27.43, 95% CI 3.34, 225.46, p = 0.003) increased odds of IPTp-SP uptake compared with postnatal women with one or no child.

Postnatal women who made four or more ANC visits during pregnancy had 6.57 times (aOR = 6.57, 95% CI 1.13, 38.09, p = 0.036) odds of IPTp-SP uptake compared to postnatal women who made less than four ANC visits.

However, postnatal women who travelled more than one hour to access ANC services had 87% reduced odds (aOR = 0.13, 95% CI 0.02, 0.81, p = 0.028) odds of uptake compared to those who travelled less than 30 minutes. Similarly, respondents who had been multigravida had 94% reduced odds (aOR = 0.06, 95% CI 0.01, 0.49, p < 0.010) odds of uptake compared to primigravid women (**Table 4.12**).

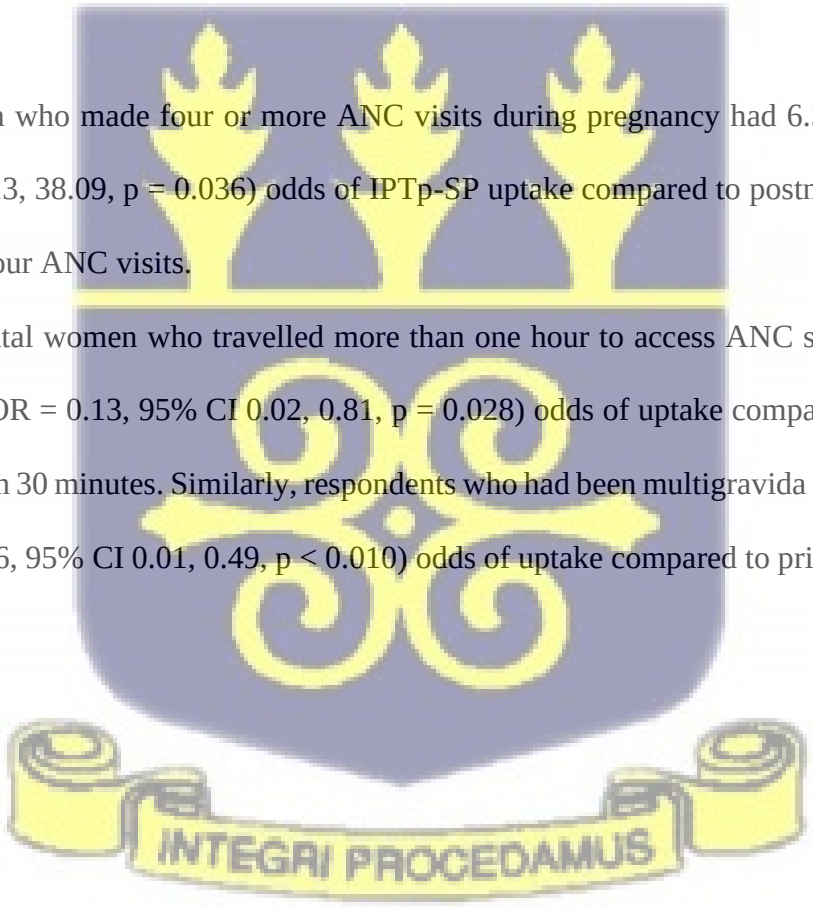

Table 4.12a: Factors influencing the uptake of IPTp-SP3+ among participants, Asante Akim North, 2021

	IPT UPTAKE (≥ 3 DOSES)	
Variable	**COR (95 % C.I) p-value**	**AOR (95 % C.I) p-value**
Age Group		
15-24	Ref	
25-34	1.98 (1.27, 3.10) 0.003	-
35-45	1.76 (0.98, 3.16) 0.059	-
Marital Status		
Living together	Ref	Ref
Not living together	0.80 (0.49, 1.30) 0.370	3.15 (0.81, 12.28) 0.099
Education Level		
None	Ref	Ref
Primary	2.13 (1.00, 4.56) 0.051	2.79 (0.50, 15.55) 0.241
JHS	0.92 (0.47, 1.77) 0.797	0.41 (0.07, 2.56) 0.341
SHS	1.33 (0.62, 2.84) 0.464	1.18 (0.15, 9.30) 0.877
Tertiary	1.03 (0.48, 2.23) 0.938	0.38 (0.02, 7.71) 0.529
Occupation		
Unemployed	Ref	Ref
Farming	2.21 (1.07, 4.55) 0.032	0.21 (0.03, 1.75) 0.150
Trading	2.64 (1.34, 5.21) 0.005	0.20 (0.03, 1.35) 0.099
Gov. workers	1.91 (0.88, 4.17) 0.103	0.88 (0.03, 24.74) 0.939
Student	0.87 (0.34, 2.27) 0.781	0.28 (0.03, 2.61) 0.264
Artisan	1.23 (0.58, 2.62) 0.583	0.40 (0.05, 2.96) 0.370
Income state		
No income earning	Ref	Ref
< 300	3.32 (1.98, 5.54) <0.001	6.71 (1.52, 29.58) 0.012
≥300	1.31 (0.83, 2.07) 0.244	2.19 (0.54, 8.90) 0.272
Religion		
Non-Christian	Ref	
Christian	0.64 (0.36, 1.16) 0.142	-

Table 4.12b: Factors influencing the uptake of IPTp-SP3+ among participants, Asante Akim North, 2021

	IPT UPTAKE (≥ 3 DOSES)	
Variable	**COR (95 % C.I) p-value**	**AOR (95 % C.I) p-value**
NHIS status		
Uninsured	Ref	
Insured	0.33 (0.04, 2.95) 0.320	-
Gravidity		
Prim gravida	Ref	Ref
Multigravida	1.16 (0.75, 1.81) 0.504	0.06 (0.01, 0.49) 0.010
Parity		
None/One Child	Ref	Ref
Two Children	2.18 (1.29, 3.68) 0.003	22.05 (2.77, 175.50) 0.003
3+ Children	1.63 (1.04, 2.55) 0.032	27.43 (3.34, 225.46) 0.002
Gestational Age at booking		
1st Trimester	Ref	Ref
2nd Trimester	1.11 (0.75, 1.66) 0.604	1.37 (0.54, 3.48) 0.505
3rd Trimester	0.26 (0.10, 0.69) 0.007	0.40 (0.06, 2.83) 0.362
ANC visit		
<4 visit	Ref	Ref
≥4 visit	7.97 (3.77, 16.86) <0.001	6.57 (1.13, 38.09) 0.036
Malaria knowledge		
Poor knowledge	Ref	Ref
Moderate knowledge	1.12 (0.65, 1.94) 0.683	0.35 (0.11, 1.13) 0.079
High knowledge	12.65 (7.34, 21.80) 0.000	1.48 (0.40, 5.45) 0.551
IPT knowledge		
Poor knowledge	Ref	Ref
Adequate knowledge	6.89 (0.00, 3.53) 5.660	1.76 (0.52, 5.96) 0.366
DOT practice		
Not at all	Ref	
Sometimes	3.05 (0.53, 17.37) 0.210	-
Always	7.85 (2.25, 27.38) 0.001	-
Free water		
No	Ref	-
Yes	1.79 (1.06, 3.01) 0.028	-
Accessibility of transport		
No need for transport	Ref	Ref
Readily accessible	1.83 (0.98, 3.42) 0.057	2.07 (0.54, 7.88) 0.288
Difficult to access	1.89 (0.85, 4.19) 0.117	4.64 (0.72, 29.84) 0.106

Table 4.12c: Factors influencing the uptake of IPTp-SP3+ among participants, Asante Akim North, 2021

	IPT UPTAKE (≥ 3 DOSES)	
Variable	**COR (95 % C.I) p-value**	**AOR (95 % C.I) p-value**
Free water		
No	Ref	-
Yes	1.79 (1.06, 3.01) 0.028	-
Purchasing water		
No	Ref	
Yes	2.71 (1.78, 4.10) 0.000	-
Availability of SP		
No	Ref	Ref
Yes	9.25 (2.69, 31.76) 0.000	42.39 (2.18, 825.00) 0.013
Payment of SP		
No	Ref	
Yes	0.74 (0.31, 1.75) 0.499	-
Laboratory investigation (pay)		
No	Ref	Ref
Yes	8.95 (3.39, 23.62) 0.000	7.64 (0.59, 98.33) 0.119
Ultrasound scan (payment)		
No	Ref	Ref
Yes	10.35 (3.04, 35.27) 0.000	0.02 (0.00, 0.87) **0.042**
Other medication		
No	Ref	Ref
Yes	22.34 (10.41, 47.92) 0.000	12.57 (2.40, 65.93) **0.003**
Distance		
<30 mins	Ref	Ref
30min-1 hour	0.71 (0.46, 1.08) 0.110	0.86 (0.32, 2.33) 0.765
>1 hour	0.29 (0.13, 0.65) 0.003	0.13 (0.02, 0.81) 0.028
Transportation cost		
GHC 0.0	Ref	
< GHC 5	2.01 (1.14, 3.54) 0.016	-
GHC 5-10	2.14 (1.05, 4.37) 0.036	-
> GHC 10	1.13 (0.51, 2.51) 0.765	-

CHAPTER FIVE

5.0 DISCUSSION

IPTp-SP uptake in pregnancy

The current study revealed that the uptake of IPTp-SP3+ doses was 64.7%. This finding is below the 80.0% national target and is inconsistent with the findings of a study conducted in the Sunyani municipality in Ghana, where 71%of the respondents received the optimal IPTp-SP doses at the time of the study (Ibrahim et al., 2017).In a similar study conducted in the Keta district of the Volta region, about 82.1% of participants adhered to the WHO policy recommendations of at least three doses of IPTp-SP (Vandy et al., 2019) which is higher than the results obtained from the current study. Furthermore, a study conducted by Diengou et al., (2020) showed that 54.9% of the women studied had received at least three doses, of IPTp which is lower than what was observed in the present study. The 64.7% observed in the current study could be attributed to several factors including low ANC attendance, inadequate knowledge of malaria and IPTp-SP among respondents, stock out of SP at health facilities, the cultural perception of the pregnant women, and the cost of the services. The low uptake of the required doses of IPTp-SP in the district could lead to an increased prevalence of maternal malaria, maternal deaths and poor birth outcomes. In an attempt to address the low uptake levels, more efforts should be channeled into addressing the modifiable predictors of IPTp-SP uptake such as ANC attendance, availability of SP and the cost of ANC services.

Uptake of IPTp-SP and the gravidity of the Postnatal Women

The present study reported an association between the uptake of IPTp-SP and the gravidity of the study participants. Women who had been multigravid were less likely to take 3 or more doses of IPTp-SP compared to those who had been primigravid. This is inconsistent with the findings of a study conducted in the northern region of Ghana on IPTp-SP uptake levels, where single gravidae women had 3.4 times increased odds of inadequate SP uptake compared to multigravida women (Stephen et al., 2016). The reduced uptake among multigravida women could be probably due to their previous pregnancy and child birth experience. They believe they have all the experience and this may be at the detriment of their health and that of their unborn children.

Uptake of IPTp-SP and the Parity of the Postnatal Women

This study has demonstrated that, postnatal women who had two children were more likely to receive IPTp-SP compared to their counterparts who had not delivered previously or had one child. Women with more children are likely to be more experienced, knowledgeable on ANC attendances and services rendered to pregnant women. With previous encounters with healthcare workers on the benefits of the recommended doses of SP during ANC visits, it is unarguably understandable to have such women adhere to SP uptake during each pregnancy.

Uptake of IPTp-SP and the ANC attendance of the Postnatal Women

The number of ANC visits made by the postnatal women studied during their pregnancy was also significantly associated with the uptake of IPTp-SP. Postnatal women who made four or more ANC visits were more likely to receive IPTp-SP compared to their counterparts. This corroborates the findings of a study conducted in the Keta district, Ghana where having higher ANC visits was significantly associated with adherence to IPTp-SP (Vandy et al., 2019). In a similar study conducted by Owusu-Boateng & Anto, (2017), uptake of ≥3 doses was 10.76 times higher among

women visiting the ANC for ≥4 times during pregnancy than those visiting the ANC for <4 times. Per the recommendations on IPTp-SP administration, SP should be given during ANC visits under DOT. Therefore, women who make more ANC visits will have more contacts with healthcare workers and receive all pregnancy related services including making the recommended doses of SP. Starting from the second trimester, pregnant women who make four visits are likely to take four doses of IPTp-SP as against two for pregnant women who make only two visits to the ANC unit. This implies that to help increase the uptake of the required doses of IPTp-SP, more efforts should be made to help increase ANC attendance among pregnant women. This can be achieved through community sensitization and education at the health facilities. The engagement of community volunteers to demystify superstitious beliefs and encouragement of women to go for ANC services will also help increase attendance and hence increase uptake of IPTp-SP.

Health service-related factors associated with uptake of IPTp-SP

Various health service-related factors were found to be significantly associated with the uptake of the required doses of IPTp-SP. The constant availability of SP at ANC units was significantly associated with the uptake of IPTp-SP by the postnatal women. Postnatal women who visited ANC units where there was constant availability of SP were more likely to receive IPTp-SP compared to their counterparts who attended ANC units where SP was not constantly available. This is consistent with the findings of a study conducted in Sunyani Municipality of Ghana, where the availability of SP was found to be significantly associated with the uptake level of IPTp-SP(Ibrahim et al., 2017). With the constant availability of SP at the ANC unit, pregnant women who visit the unit are likely to take the dose. In the absence of SP at the facility, irrespective of the knowledge or experience level of the pregnant woman or the number of ANC attendance made, the woman could be denied access to the required IPTp-SP doses. To increase uptake of the

required IPTp-SP doses, more efforts should be channeled into the constant provision of SP at the facility by the District and Regional Medical stores.

The availability of free and safe water at the ANC unit is a requirement for the practice of the directly observed therapy of IPTp-SP administration. Giving SP to postnatal women and providing them with water to take the drug makes it possible for the health worker to monitor and ensure the client actually takes the drug. The availability of free and safe water for SP services was significantly associated with the uptake of IPTp-SP in the current study.

The cost of services at the ANC unit is also one of the factors that influence the uptake of the required doses of IPTp-SP as reported in this study. Aside from the no-cost policy of IPTp-SP, some pregnant women make out-of-pocket payments for services such as ultrasound scan and other medications when they go for ANC services as they are either not covered or partly covered by the national health insurance scheme. Women who mentioned they made out of pocket payment for ultrasound scan and other medications aside their routine ANC medication had a reduced odds of taking the required doses of IPTp-SP compared to those who made no such out-of-pocket payments. The women who make these payments might not go for subsequent doses of IPTp-SP if they are economically insufficient to bear these additional costs. Though SP might be given to them for free, the possibility of payment for other services or drugs can deter some of these women from going to ANC clinics and therefore will not have access to free SP.

A few limitations were identified with this study. The study collected data on respondents past IPTp-SP experiences, and this information could have been influenced by recall bias. To curtail this limitation, research assistants reviewed the ANC booklets of the study participants to affirm some of the responses provided to some questions. The number of antenatal visits could likely have been influenced by the COVID-19 pandemic restrictions that limited the number of routine

ANC visits. Also, wide confidence intervals and odds ratios for parity and availability of SP at the health facilities which could have resulted from the data collection process made it difficult to conclude on these two variables.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The uptake of the recommended dose of IPTp-SP3+ based on the study was 64.7%.

ANC visits, parity and gravidity were the obstetric variables found to be significantly associated with the uptake of IPTp-SP. The payment for ultrasound scan services and other prescribed medications were health service-related factors found to be significantly associated with the uptake of IPTp-SP

6.2 Recommendations

1. Health professionals (nurses, midwives and community health nurses) should intensify education on malaria in pregnancy and IPTp-SP uptake to enlighten and sensitize pregnant women on the relevance of the services to increase uptake levels.
2. Ghana Health Service should extend health education on Malaria in pregnancy to the communities. This would encourage partners and families to support the pregnant women in their access of ANC services.
3. The Ghana Health Service and National Malaria Control Program should ensure the constant availability of SP at the health facilities to increase access that could influence uptake of the drug.

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APPENDIX I

Questionnaire for Data Collection

Questionnaire Code No: Sub-district: ……

Health facility……

SECTION1: SOCIO-DEMOGRAPHIC FACTORS.

Age: ……. yrs. **Place of residence**: ……

Marital Status: 1. Married [ ] 2.Widowed [ ] 3.Single [ ] 4. Co-habiting [ ]

5.Divorced [ ] 6.Separated [ ]

Highest level of education: 1.Tertiary [ ] 2. SHS [ ] 3. JHS [ ] 4.Primary [ ]

5. None [ ]

Occupation:1. Farming [ ] 2. Trading [ ] 3. Government worker [ ]

4.Student [ ] 5. Unemployed [ ] 6. Other, specify: ……

Income level

1. More than 1000 cedis [ ] 2. 300-1000 cedis [ ] 3. Less than 300 cedis [ ]

4. No regular income [ ] 5. Totally Dependent [ ]

Religion: 1. Christianity [ ] 2. Islam [ ] 3. African Traditional [ ]

4. Other, specify: ……

Ethnicity……..

NHIS status 1. Insured [ ] 2. Non- insured [ ]

Place of ANC……

Place of delivery……

SECTION 2: OBSTETRIC FACTORS

Gravidity:……. Parity:……..

Gestational age starting ANC 1. 1st Trimester [ ] 2. 2nd Trimester [ ] 3. 3rd Trimester [ ]

Number of ANC visits during pregnancy: ……

Maternal Hemoglobin level(g/dl) 1. Booking [ ] 2. At 36wks [ ] 3. Delivery [ ]

Underlying medical conditions (**Tick all that apply**)

1.Hypertension [ ] 2. Diabetes [ ] 3. Sickle cell disease [ ] 4. Not applicable [ ]

SECTION 3: INDIVIDUAL FACTORS

Knowledge of malaria in pregnancy

How is malaria transmitted?.....

What are the dangers of malaria to the pregnant woman? **(Tick all that apply)**

1. Can cause anaemia [ ] 2. Preterm labour [ ] 3. Can cause maternal illness [ ]

4. Can cause maternal death [ ]

What are the dangers of malaria to the unborn baby? (**Tick all that apply**)

1. Spontaneous Abortion [ ] 2. Intra Uterine Death [ ] 3. Low birth weight [ ]

4. Prematurity [ ]

By what other means can one prevent malaria in pregnancy? (**Tick all that apply**)

1. Drain stagnant water [ ] 2. Sleep under insecticide treated net [ ] 3. Use mosquito repellent [ ] 4. Wear protective clothing [ ]

Knowledge of IPTp-SP

When should a pregnant woman start IPTp -SP?

1. Before 13 weeks [ ] 2. 16weeks and above [ ] 3. After 24weeks [ ]

4. Don't Know [ ]

How many times is IPTp-SP given during a pregnancy at the ANC?

1. Once [ ] 2. 2-3times [ ] 3. 4-5times [ ] 4. Several as applicable [ ]

5. Don't know [ ]

At what regular interval should IPTp-SP be given?

1. Weekly [ ] 2. Monthly [ ] 3.Bi-monthly [ ] 4. Don't know [ ]

How were you informed about SP? 1.Through staff at ANC [ ] 2. Radio [ ] 3. Television [ ] 4. Mobile health service van [ ]

What are the consequences if you do not take SP as a pregnant woman?

1. Malaria[ ] 2. Anaemia [ ] 3. Death [ ] 4. Effects on foetus [ ]

IPTp-SP uptake in pregnancy

1. Gestational age (months) at first SP intake……
2. How many doses of SP were taken in pregnancy? Tick all that apply

1.IPT1[ ] 2.IPT2[ ] 3. IPT3[ ] 4.IPT4[ ] 5.IPT5[ ] 6.More than 5[ ]

3. Were you given IPTp-SP under DOT each time? 1. Yes [ ] 2. No [ ] 3. Sometimes [ ]

4. Were you served water to take the medicine? 1. Yes [ ] 2. No [ ]

5. Did you have to buy the water? 1. Yes [ ] 2. No [ ]

Distance to Healthcare Centre

1. How far is your residence from the health facility (by transport) ?

1. Less than 30 mins [ ] 2. 30min-1 hour [ ] 3. More than 1 hour[ ]

2. How much do you spend on transportation to and from the health facility?

1.No money spent [ ] 2. less than 5 cedis [ ] 3. 5 to 10 cedis [ ] 4. More than 10 cedis[ ]

3. How difficult is it Accessing transport to the health facility?

1. No need for transport[ ] 2. Readily accessible [ ] 3. [ ] Difficult to access

4.a. Do you need to seek permission before attending ANC? 1. Yes [ ] 2. No [ ]

4.b. If yes, from who? 1. Spouse/partner [ ] 2. Work [ ]

Side effects with SP

1. Did you experience any allergy after taking the dose(s) of SP 1. Yes [ ] 2. No [ ]

If yes, please specify…….

2. G6PD test result (please refer ANC book) …….

SECTION 4: HEALTH SERVICE FACTORS

1. Was SP available at all scheduled times during your ANC? 1. Yes [ ] 2. No []
2. Did you have to pay for the SP at any point? 1. Yes [ ] 2. No [ ]
3. Were you prescribed SP to purchase? 1. Yes [ ] 2. No [ ]
4. Did you make out of pocket payment for the following healthcare services during pregnancy? **(Please tick all that apply).**

1. Laboratory investigation [ ] 2. Ultrasound scan [ ] 3. Other medication [ ] 4. None [ ]

5. Was IPTp-SP administered under DOT throughout? 1. Yes [ ] 2. No [ ]

SECTION 5 DELIVERY AND OUTCOME

Gestational age at delivery……..

Birth outcome: 1. Live birth [ ] 2. Still birth [ ]

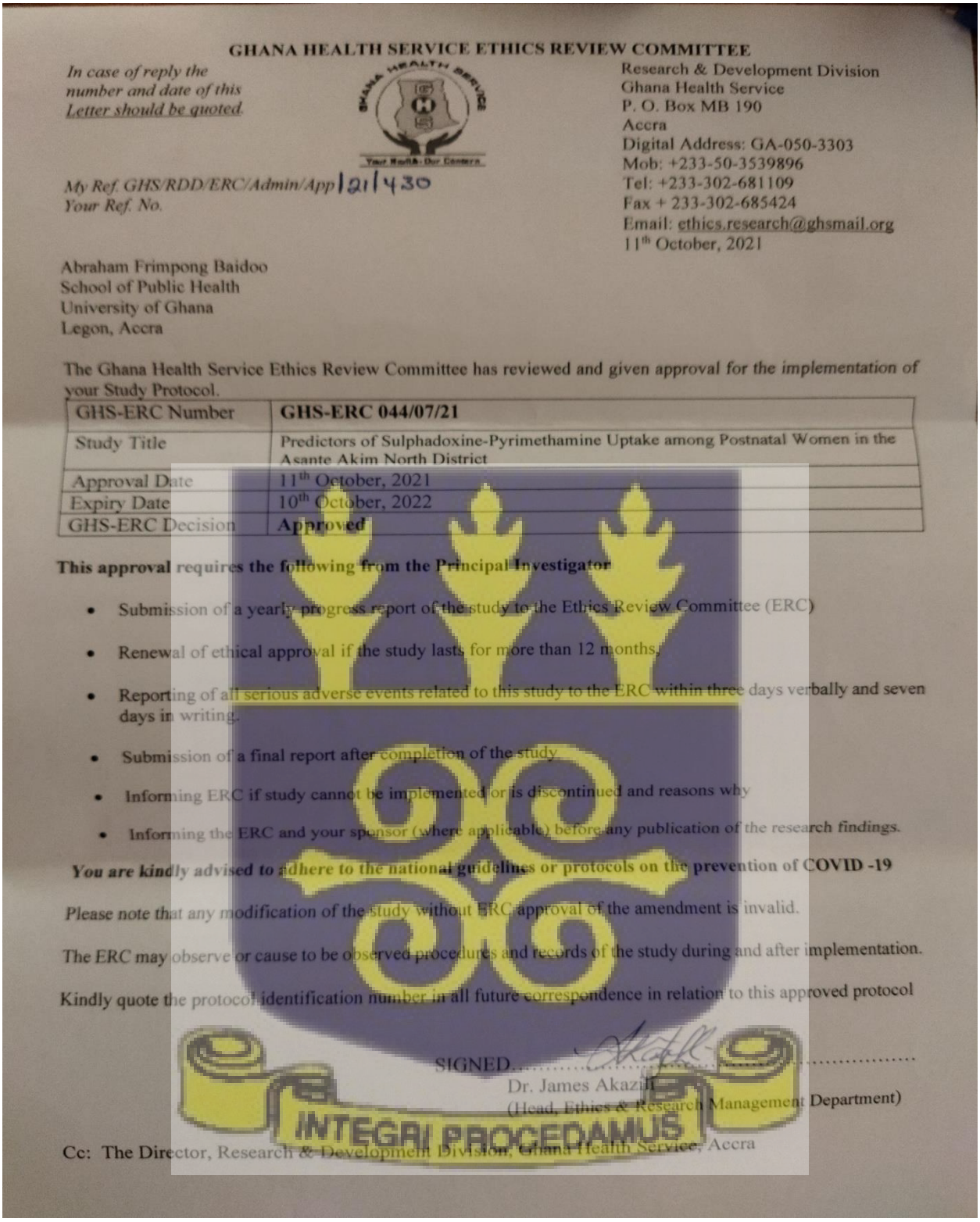
If still birth, type? 1. Fresh [ ] 2. Macerated [ ]

Birth weight of baby…… kg

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

APPENDIX II

Ethical Clearance Letter



GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

My Ref. GHS/RDD/ERC/Admin/App/21/430
Your Ref. No.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Digital Address: GA-050-3303
Mob: +233-50-3539896
Tel: +233-302-681109
Fax + 233-302-685424
Email: ethics.research@ghsmail.org
11th October, 2021

Abraham Frimpong Baidoo
School of Public Health
University of Ghana
Legon, Accra

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC 044/07/21**
Study Title	Predictors of Sulphadoxine-Pyrimethamine Uptake among Postnatal Women in the Asante Akim North District
Approval Date	11th October, 2021
Expiry Date	10th October, 2022
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of a yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months.
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

You are kindly advised to adhere to the national guidelines or protocols on the prevention of COVID -19

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
Dr. James Akazili
(Head, Ethics & Research Management Department)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra