A STUDY OF PREGNANT WOMEN AND HEALTH WORKERS KNOWLEDGE ON MALARIA PREVENTION AND TREATMENT GUIDELINES DURING PREGNANCY

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Master of Science by Research in Pharmacology and Therapeutics Thesis

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By

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A thesis submitted in fulfillment of the requirements for the Degree of Master of Science by Research in Pharmacology and Therapeutics of Muhimbili University of Health and Allied Sciences.

Muhimbili University of Health and Allied Sciences

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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a thesis entitled *"A study of pregnant women and health workers knowledge on malaria prevention and treatment guidelines during pregnancy"* in fulfillment of the requirements for the degree of Master of Science by Research in Pharmacology and Therapeutics of Muhimbili University of Health and Allied Sciences.

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DECLARATION AND COPYRIGHT

I, **Ritah Francis Mutagonda**, hereby solemnly declared that this thesis is my original work and it has not been presented nor will it be presented to any other University for similar or any other degree award.

Signature……..

Ritah Francis Mutagonda

Date …….

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LIST OF ACRONYMS

ACT	Artemisinin-based Combination Therapy
ALu	Artemether-Lumefantrine
ANC	Antenatal clinic
CDC	Centre for Disease Control
DOT	Direct Observed Therapy
FGD	Focus Group Discussion
IPT	Intermittent Preventive Treatment
IPTp	Intermittent Preventive Treatment in Pregnancy
LBW	Low Birth Weight
MDGs	Millennium Development Goals
MOH	Ministry of Health
NMCP	National Malaria Control Programme
NSGRP	National Strategy for Growth and Reduction of Poverty
RDSS	Rufiji Demographic Study Site
SP	Sulfadoxine-Pyrimethamine
WHO	World Health Organization
MOP	Malaria Operational Plan
THMIS	Tanzania HIV/AIDS and Malaria Indicator Survey

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EXECUTIVE SUMMARY

Background: The standard treatment guideline for Tanzania mainland which was released in 2007 indicated that Artemether-Lumefantrine (ALu) should be used as the first line for malaria treatment instead of Sulphadoxine-Pyrimethamine (SP). With this change it was still advocated that pregnant women should continue to take SP for Intermittent Preventive Treatment (IPT) of malaria during pregnancy. A number of studies have stated that artemisinin derivatives are not recommended for treatment of malaria in pregnant women in the first trimester which is quite contrary to the use of SP which is safe in all pregnancy stages. The challenge most likely to be faced is the knowledge on when it is safe to use ALu during pregnancy and the compliance to ALu dosage and the time intervals in between doses. Another challenge is the continuation of SP use for IPT in pregnant women, while SP was said to be ineffective in treatment of malaria and hence replaced with ALu.

Purpose: To assess the level of knowledge of pregnant women and health care providers regarding the use of SP for IPT and ALu for treatment of malaria during pregnancy.

Methods*:* The study was conducted in Rufiji district, southern Tanzania from March 2010 to February 2012. This was a facility based descriptive cross sectional study which was carried out in 2 hospitals, 4 health centers and 8 dispensaries which were selected based on cluster sampling technique. Both qualitative and quantitative data were collected in this study. Four hundred and seventy (470) pregnant women in their second and third trimesters were interviewed when attending antenatal clinics at the selected health facilities using semi structured questionnaires written in Swahili. Four focus group discussions (FGDs) were also conducted with 46 pregnant women involved in discussions. A focus group discussion guide was prepared based on the objectives of the study.

Fourteen health facilities were assessed using a formatted health facility assessment form and 22 health care providers working at the antenatal clinics in these facilities were also

recruited in this study. Self administered questionnaires written in Swahili were used to collect data from the health care providers.

Results: More than half (54.3 %) of pregnant women did not know if SP was used for IPT. Most women (76.6 %) did not know the use of SP for IPT in relationship with gestation age. Overall, the results show that most women had very low knowledge about the use of SP for IPT. Forty three (9.1 %) pregnant women reported to have had malaria during their current pregnancies. The antimalarials reported to be used by pregnant women were quinine 42.9%, SP 23.8%, ALu 21.4% and sulphamethoxyprazine-pyrimethamine 2.4%. Irrespective of the gestation age of pregnancy, almost all (98.3%) pregnant women had low level of knowledge on the use of ALu and perceived it as unsafe drug to be used during pregnancy.

Out of 22 interviewed health care providers, 17 had high level of knowledge on IPT policy and the rest (5) had medium level. With regards to the use of ALu during pregnancy, 9 health care providers had medium knowledge and the rest (13) had low level of knowledge. Frequent stock out of SP and ALu, late enrollment of pregnant women to ANC and lack of trained health care providers were among major factors causing poor implementation of the national guidelines at the health facilities.

Conclusion: Most pregnant women had minimum knowledge on the use and benefits of SP for IPT and ALu for treatment of malaria during pregnancy. Most health care providers had low level of knowledge on the correct use of ALu in pregnant women. Views on ALu safety for use during pregnancy where also sorted out among pregnant women and health care providers. For effective implementation of IPT policy and treatment of malaria during pregnancy, pregnant women and health care providers should be sensitized and educated on the rational use of antimalarial drugs especially in pregnant women.

Since most of the health facilities reported frequent stock outs of antimalarials it is suggested that there should be a mechanism established by both public and private health facilities to ensure uninterrupted supply of antimalarial drugs at the health facilities even when these medications are not supplied by the medical stores department. On behalf of

the government the Ministry of Health and Social Welfare should ensure that there is a mechanism that will monitor proper implementation of the guidelines, this will save a lot of cost incurred when changing guidelines simply because there was no proper monitoring mechanism leading to failure of the treatment guideline.

CHAPTER ONE: BACKGROUND

1.1. Introduction

1.1.1. Current malaria situation in Tanzania

Malaria remains a major public health problem in sub-Saharan Africa, with approximately 1 million deaths and more than 400 million cases a year. Tanzania is one of the malaria endemic countries with the world's third largest population at risk of stable malaria, it is estimated that about 35 million Tanzania's population are at risk of malaria. Malaria is responsible for more than one-third of deaths among children under 5 years and for up to one-fifth of deaths among pregnant women [MOH, 2006]. Malaria accounts for over 30% of the national disease burden, making it a top health priority for allocation of resources for its prevention and control. However control of malaria in Tanzania appears difficult, and prospects for a lasting solution have in the past decade diminished with the advent of widespread antimalarial drug resistance [NIMR, 2006; Schönfeld *et al.* 2007].

Due to increasing *Plasmodium falciparum* resistance to antimalarial drugs, Tanzania changed the first line treatment from chloroquine to sulfadoxine-pyrimethamine (SP) in August 2001. The change was also accompanied with the re-introduction of amodiaquine as second line drug and quinine remained as the drug of choice for the treatment of severe malaria. The shift was necessary following research results, which indicated very high malaria parasite resistance to chloroquine. By then the parasite resistance to SP averaged 10% [Mubyazi *et al.* 2005]. However, after 4 years, resistance to SP was also reported to be on the increase. In 2004, studies in Tanzania indicated that the mean SP treatment failure was 25.5% and molecular markers of SP resistance had recorded high levels of mutation [Mubyazi *et al.* 2005]. As a result of *P. falciparum* resistance to SP, Artemether Lumefantrine (ALu) was chosen to replace SP as the first-line regimen for malaria treatment in Tanzania in November 2006. ALu was the first fixed-dose artemisinin combination therapy (ACT) to be prequalified by the World Health Organization (WHO) ALu has been adopted as the ACT of choice in most of the countries using ACT regimen

for treatment of malaria since it is highly efficacious and well tolerated for uncomplicated malaria [MOH, 2004, Anders *et al.* 2008].

1.1.2. Malaria treatment in pregnant women

In 2006, WHO published guidelines recommending artemisinin combination therapies (ACTs) for the treatment of malaria in the second and third trimester of pregnancy, whilst acknowledging the urgent need for more information on safety and dosing [MOH, 2006]. In 2007, Tanzania released a modified standard treatment guideline, whereby ALu was recommended as the first line drug to be used for the treatment of uncomplicated malaria. For the use of ALu during pregnancy, the guideline recommends its use during the second and third trimesters of pregnancy. Quinine is recommended as the drug of choice for the treatment of uncomplicated malaria during the first trimester.

Treatment with ACTs in the first trimester is not recommended because of concerns raised by animal experiments which suggested that artemisinin might be teratogenic and cause foetal resorption if given to experimental animals during a narrow time window in early gestation [WHO, 2008]. Studies have confirmed embryotoxic effects of artemisinin and its derivatives in animals, including primates, with risk being confined to a defined period of gestation [Ndyomugenyi *et al.* 2010]. The teratogenic effect is thought to involve red blood cells production (erythropoiesis), which implies the human sensitive period would be within the first trimester of pregnancy [Khatib *et al.* 2009]. Compared to other previously used antimalarial drugs such as chloroquine and SP, ALu is also perceived by some people as unsafe antimalarial drug to be used by pregnant women. The main reason for this belief is due to lack of proper counseling by the health care providers [Kamuhabwa and Mnyusiwalla, 2011]. Unlike SP, ALu has also a complicated 3-days dosage regimen, a factor that may lead to non-adherence to the full dose of the drug by patients [Ndyomugyenyi *et al.* 2011].

With this policy change the government is currently facing the challenge to ensure that these antimalarial drugs are readily available to the public, they are safe, cheap and

are of good quality. The government has to not only guarantee the sustainable availability of ALu, but also make certain that there is rational use of these drugs so as to avoid drug resistance which has been experienced with chloroquine and SP.

The community and health care providers must have adequate knowledge on the proper use of antimalarial drugs in order to ensure that side effects caused by irrational use of medications is avoided at all cost. More attention is given when prescribing and dispensing ALu for pregnant women, as there is still ambiguity over the safety of artemisinin derivatives in the first trimester of pregnancy. Based on this information it is necessary for the community and health care providers to be aware of the effects these drugs may have on the fetus and pregnancy and should know when ALu is safe for use during pregnancy [Ratakonda, 1998].

Available data indicate that artemisinin and its derivatives are safe and remarkably well tolerated though there have been reports of mild gastrointestinal disturbances, dizziness, anorexia, headache, muscle or joint pain, tinnitus, and bradycardia [Dellicour *et al*. 2007]. Moreover, a complicated dosage regimen which requires a lot of information to patients makes it difficult for health care providers to prescribe and dispense these drugs correctly.

Malaria infection in a pregnant woman is associated with poor pregnancy outcome and an increased risk of complications which necessitates early diagnosis and proper management of malaria cases. Due to variations and non specific malaria signs and symptoms, malaria cases are more likely to be misdiagnosed especially in health facilities that lack malaria diagnostic tests such as malaria rapid diagnostic tests (MRDT) and/or light microscope. In the absence of laboratory diagnostic services clinical presentation is used as a diagnostic tool [McGregor, 1984]. This has important implications for the management of febrile illnesses, and over-diagnosing malaria patients may also distract from other causes of fever, some of which may be fatal [Wang *et al.* 2006]. Some of the prescribers have been practicing polypharmacy due to lack of diagnostic tools, whereby in this case most of prescriptions consist of antimalarial and one or more antibiotics used

as broad spectrum treatment. Also a substantial number of unnecessary treatments can lead to an introduction of the more expensive artemisinin-based combination therapies [Mboera *et al.* 2006].

1.1.3. Malaria prevention in pregnant women

A study conducted in 2007, in which Tanzania was one of the study sites, reported that there were about 32 million pregnancies in malaria-endemic areas in sub-Saharan Africa [Dellicour *et al*. 2010]. Intermittent preventive therapy (IPT) was recommended by WHO as one of the key strategies for malaria prevention and control in pregnant women, especially those who live in malaria endemic areas. In these areas most of the residents have high immunity and therefore *P. falciparum* infection during pregnancy is generally not associated with acute symptoms, and therefore remains undetected and untreated. Therefore, IPT is the most effective way of reducing malaria associated complications such as anaemia and risk of delivering premature or low birth weight (LBW) babies in pregnant women [WHO, 2004].

It is recommended in Tanzania that two doses of SP be given for IPT whereby the first dose is given in the 20^{th} week of pregnancy and the second dose in between the 30^{th} and 36^{th} weeks under a directly observed therapy (DOT). This is done so as to significantly decrease the risks of maternal malaria to the fetus [NMCP, 2006]. SP administered in the 2^{nd} and 3^{rd} trimesters has consistently been shown to be safe and effective for protection against peripheral and placental infection and anemia during pregnancy and as well as reducing the incidence of LBW [WHO, 2006]. WHO recommends two to three SP doses for IPT in pregnant women residing in malaria endemic areas [Crawley, 2007, WHO, 2008].

Analysis of national survey data which was conducted in 2007 showed that the ambition was to increase provision of the second dose of SP for IPT in pregnant women in Tanzania by 60% in 2007 and to 80% by 2013 [Eijk *et al.* 2011]. The most recent data for malaria interventions in Tanzania comes from the 2007-08 Tanzania HIV/AIDS and Malaria Indicator Survey (THMIS). The survey showed that the provision of the second dose

of SP for IPT in pregnant women in Tanzania was 30% in the year 2007-2008 [MOP, 2009]. Based on this survey the goal of the roll back malaria initiative which aimed to ensure that all pregnant women receive IPT by 2010 has not been achieved. However, a number of factors have been reported to affect compliance to SP given for IPT, these factors can be classified as drug induced, pregnant women induced, health system related and health providers induced factors. The commonest drug induced factors causing poor compliance are the SP related side effects. The reported side effects include Steven Johnson Syndrome referred to as '*burning of the skin*', abortion, dizziness, fever, body weakening and gastrointestinal disturbances [Mubyazi *et al.* 2005). Patient factors causing poor compliance are mainly due to lack of knowledge on the correct use of SP for IPT and the fear of SP related side effects [Tarimo, 2007]. Health system induced factors include periodic shortage of drugs, lack of clean water at the health facilities, lack of cups for drinking water and health providers' underperformance which is mainly attributed to inadequate knowledge on the correct use of SP for IPT and partly due to fear of side effects of SP [Mubyazi *et al.* 2005].

While the malaria prevention and treatment guideline still advocates for the use of SP for IPT in pregnant women, it has been pointed out that the change of malaria treatment regimen from SP to ALu due to increasing malaria parasite resistant to SP might have reduced willingness of health care providers and pregnant women to use SP for IPT [Rwagacondo, 2004]. Also the complicated dosage regimen and the ambiguities on the safety of ALu in pregnancy have made it difficult for most of the providers to give this antimalarial to pregnant women [Kamuhabwa and Mnyusiwalla, 2011].

It is with this concern that the study was designed to assess the level of knowledge of pregnant women and health care providers on the current guidelines for malaria prevention and treatment in pregnancy. In addition the factors causing poor implementation of the national guidelines focusing on pregnant women, health care providers and health facilities were evaluated.

1.2. Statement of the problem

Pregnant women are particularly vulnerable to malaria as pregnancy reduces immunity to malaria making them more susceptible to infection and increasing the risk of illness, severe anemia and death. For the fetus, maternal malaria increases the risk of spontaneous abortion, still birth, premature delivery and low birth weight which is the leading cause of child mortality [Mbonye *et al.* 2006].

The world health organization recommendations for the control of malaria in pregnancy have been adapted by the endemic countries. However, IPT with SP is mitigated by the challenges which endemic communities have to overcome through development of informed strategies.

Tanzania is one of the malaria endemic countries that have adapted the WHO guidelines for the prevention of malaria in pregnant women and the national guidelines stipulates that the first dose of IPT with SP be given at 20 – 24 weeks of gestation. The implementation of this strategy is mitigated by the looming parasite resistance to SP and the knowledge of this by some health workers who raise questions on the continued use of SP for IPT in pregnancy when it has been replaced by artemether/lumefantrine combination therapy as a fist line antimalarial drug. It is therefore important to assess the level of knowledge of pregnant women and health care providers on the national guidelines for malaria prevention and treatment during pregnancy.

Perceived problems with drugs interfere with compliance. Poor compliance leads to drug resistance. Direct observation therapy is recommended for IPT/SP, but a study in Tanzania indicted that this was not practiced [Mubyazi *et al.* 2005]. Monitoring acceptability of the guidelines and compliance is important to ascertain the factors influencing non – compliance and to inform the national malaria control program.

Also since ALu safety in pregnant women is still uncertain especially in the first trimester; its use requires high level of knowledge and acceptability to both health care providers and pregnant women. Therefore, the study aimed to assess the level of

knowledge of pregnant women and health care providers on the current guidelines for malaria prevention and treatment in pregnancy. The study also addressed issues such availability of clean water at the facility, antimalarials (ALu and SP), presence of trained health care providers and availability of malaria diagnostic tools and dispensing pattern of antimalarials on pregnant women.

1.3. Rationale of the study

Maternal and Child health is a critical public health challenge in Tanzania. Malaria remains one of the major contributors to high morbidity and mortality for children under five years and pregnant women. Every year an estimated 1.7 million pregnant women suffer from malaria in the country and malaria in pregnancy is linked with anemia, spontaneous abortion, low birth weight and neonatal death. Approximately 20% of maternal deaths in Tanzania are linked to malaria.

The high maternal and under five children morbidity and mortality is a serious challenge to development not only in Tanzania but for all developing countries. As an intervention for preventing malaria in pregnancy, in the year 2000 the Tanzania Ministry of Health and Social Welfare adopted a policy requiring IPT for pregnant women during antenatal care visits; in line with the WHO guidelines and in response to the United Nations Millennium Development Goals (MDGs) and the National strategy for Growth and Reduction of Poverty (NSGRP). MDG4 and MDG5 focus specifically on reduction of child mortality and improvement of maternal health respectively. The NSGRP strategies are to improve health services, combat HIV and AIDS, Malaria and other diseases and provide services and environment which will impact on non- income poverty in line with Tanzania Vision 2025 and MDGs.

Even though there is a national advocacy on the efficacy and safety of SP use for IPT in pregnancy coverage and adherence are not yet optimal. This study aimed to assess the level of knowledge of pregnant women and health care providers on the national guidelines for malaria prevention and treatment in pregnant women. Evaluation of factors influencing the acceptance and adherence of SP for IPT and use of ALu as the first line drug for malaria treatment was also carried out.

The findings of this study serve as the evaluation report of the current level of implementation of the national guidelines and the challenges affecting implementation. The findings can be used by policy makers to indicate on whether or not the guidelines proposed are implemented to the level that was projected and what challenges need to be

addressed inorder to ensure that the targeted goal that was set on introduction of the malaria prevention and treatment guidelines in pregnant women is achieved.

The findings can also be used by implementers who are health care providers to see what needs improvement on their part in order to ensure that the guidelines are implemented as directed. The community can also reflect on the findings so that they can be able to see the role they play in the overall outcome of the guidelines implementation.

1.4. Objectives

1.4.1. Broad objective

To assess the level of knowledge of pregnant women and health care providers on the current guidelines for malaria prevention and treatment during pregnancy.

1.4.2. Specific objectives

I. To evaluate the level of understanding for the correct use of SP for IPT during pregnancy after the 1st trimester focusing on health care providers.

II. To assess the level of knowledge of health care providers on malaria treatment guidelines using ALu in pregnancy after the 1st trimester.

III. To determine the proportion of pregnant women who are aware of the correct use of SP for IPT in pregnancy after the 1st trimester.

IV. To appraise the level of knowledge of pregnant women on the use of ALu for the treatment of malaria in pregnancy.

V. To identify the factors that affect implementation of IPT using SP in pregnant women.

VI. To identify the factors that affect implementation of the use of ALu for treatment of malaria in pregnancy after the 1st trimester.

CHAPTER TWO

2.0. Literature review

A number of studies have been conducted regarding IPT policy using SP in Tanzania. In one study whose main focus was to measure coverage of IPTp at national level in Tanzania and the role of individuals, facility, and policy level influences on achieved coverage showed that the national IPTp coverage had declined over the survey period [Marchant *et al.* 2008]. In this study it was reported that coverage of the first dose of IPT with SP in 2005 was 71% and declined to 65% in 2007. For the second dose coverage was 38% in 2005 but declined to 30% in 2007. This reduction was evident in rural but not urban clinics.

Another study which addressed prospects, achievements, challenges and opportunities for scaling-up malaria chemoprevention in pregnancy in Tanzania revealed several challenges in implementation of IPT [Mubyazi *et al.* 2008].
These challenges included:

(i) The national antenatal care (ANC) guidelines emphasizing two IPTp doses during a woman's pregnancy, while other agencies operating at district level were recommending three doses. This confuses frontline health workers.

(ii) Focused ANC guidelines have been revised, but printing and distribution to districts has often been delayed.

(iii) Reports from district management teams demonstrate constraints related to women's late booking, understaffing, inadequate skills of most health care workers and their poor motivation.

(iv) Other problems were unreliable supply of free SP at private clinics, clean and safe water shortage at many government ANCs thus limiting direct observed treatment and occasionally pregnant women asked to pay for ANC services.

A study conducted at Kibaha district in Tanzania to appraise the prevalence of malaria and anemia in pregnant women; and the factors influencing coverage of IPT with

SP under operational conditions in the national program for malaria control in pregnancy [Tarimo, 2007] reported to have a total of 395 mothers who were recruited. About a third (40.0%) of these did not receive SP for IPT because of the unavailability of the drug. Among those who received IPT 40% did not swallow the tablets at the clinic because of sharing of water cups and fear of taking the drug in an empty stomach. Majority (90.1%) were aware that SP was the drug of choice for IPT and 77.2% had the perception that IPT with SP has health benefits. However, 70.0% were not aware on the timing for IPT.

A study conducted in five countries – Malawi, Kenya, Uganda, Tanzania and Zambia pointed out that in East Africa, policy change to ACT for the first-line treatment of uncomplicated malaria took place within the context of high clinical failure rates with SP [Rwagacondo, 2004] SP was consequently seen as a "failed drug", which might have reduced the willingness of health care workers and pregnant women to use the drug for IPTp. Another study which was conducted in Korogwe District in Tanzania whose aim was to assess the knowledge, attitudes and practices of health managers, ANC service providers and pregnant women in relation to malaria control with emphasis on IPTp services reported that majority of respondents linked low compliance with IPTp to poor acceptance of SP because of perceived association of SP with side effects [Mubyazi *et al.* 2005]. It was also reported that pregnant women threw away drugs after leaving the clinic because of their belief and fear of the Steven-Johnson Syndrome, which was referred to as '*the burning of the skin*'. It was further argued that some women believed that taking SP during pregnancy could cause abortion, whilst others decided to take smaller dosage than what is recommended. Other identified factors influencing compliance included late enrolment, periodic shortages of drugs and health workers underperformances. Low compliance with the use of SP was partly attributed to health care providers' and users' fear of side effects of SP and their inadequate knowledge of the correct dose.

A review study by Dellicour *et al.* 2007, reported that 945 pregnancies were exposed to an artemisinin compound (123 in the 1st trimester and 822 in 2nd or 3rd trimesters). The most frequent complaints according to these studies were dizziness 59%, headache 73.5%; anorexia 54%, nausea 35% and muscle/joint pain 63.5%. Ninety-six percent of

the 945 women exposed to an artemisinin in pregnancy were followed up to delivery. Twenty (2.1%) had miscarriages, 19 (2%) stillbirths and 11 (1.2%) neonatal deaths. Congenital abnormalities were reported including one left aural atresia, one polythelia and one epidermoid cyst. Of the 214 infants examined up to at least one year of age, only one was reported to be developmentally delayed. In conclusion the author stated that most of the information on artemisinin exposure during pregnancy comes from studies conducted in Southeast Asia. Unfortunately, most countries in sub-Saharan Africa do not have the infrastructure and resources for routine pharmacovigilance and very few have a formal system for routine collection of data on possible drug related adverse effects. Therefore, special pharmaco-epidemiological studies are needed to assess the safety profile of a product's use outside the controlled environment of clinical trials.

Based on these studies it was vital to conduct this study to assess concurrent implementation of these national guidelines for malaria prevention and treatment in pregnant women five years after introduction of ALu. The main focus was to describe the current level of knowledge of pregnant women and health care providers on the IPT policy using SP and ALu for malaria treatment. It was also essential to identify factors affecting implementation of these guidelines as reports from pregnant women and health care providers and top it up by conducting health facility assessment.

CHAPTER THREE: METHODOLOGY

3.1. Study design

In assessing the uptake and adherence to the national policy for the prevention and treatment of malaria in pregnant women a facility based descriptive cross sectional study was carried out to both pregnant women and health care workers at the ANCs. This cross sectional study was suitable due to study time limitation and was best selection since the aim was to describe the current level of knowledge and implementation the guidelines.

Pregnant women were selected using convenient sampling technique since there was limited number of pregnant women in their second and third trimester. Interviews were conducted to obtain their level of knowledge on the use of SP for IPT and ALu for uncomplicated malaria case management in pregnancy. On the use of SP for IPT, the focus was on obtaining their knowledge on the benefits of SP use for IPT, dose schedule and number of doses to be taken, timing for IPT and the necessity of early booking for antenatal attendance. Focus was also on their views on efficacy and safety of SP use on the mother and unborn baby and barriers for DOT approach for IPT with SP. For ALu, the focus was on the awareness of artemisinin combination therapy (ACT), dosage schedule and necessity of meals before ACT intake, with special focus on the knowledge of use of fatty meals when using ALu to increase drug absorption. Focus was also on their perceptions of multiple dosage regime of ALu, efficacy and safety to the unborn baby. Other barriers such as frequent stock-outs of SP and ALu and lack of clear water for SP DOT at the health facilities were also assessed.

Availability and use of the national malarial prevention and treatment guidelines for the use of these drugs and availability of malaria diagnostic tools was also conducted at the health facilities. Records on ANC use, IPT use and the number of deliveries at the facility was also recorded. Malaria induced mortality rate and number of babies born with LBW was also recorded. Focus was also on health care provider’s implementation of the national policy, knowledge on drug safety (observed side effects or rumors on side effects of these drugs), efficacy; dosage schedules for SP and ALu and the other barriers to adherence were also assessed.

3.2. Study site

Rufiji district lies in southern Tanzania about 178 km south of Dar-es-Salaam, the country's primary commercial centre and the biggest city. According to the Rufiji demographic surveillance studies 2008 projections, the district had a population of 47935 female of child bearing age. Rufiji was selected as the study site based on the routine health records collected across the country regarding information on disease patterns for the purpose of health policy planning and monitoring. The records show that the district has one of the highest rates of outpatient consultations for malaria in the country (826 diagnoses per annum per 1,000 populations), hence one the malaria endemic area [NMCP 2004]. Also the area being largely rural with a peri-urban environment it can be used to represent rural and urban areas in Tanzania.

The population of Rufiji is clustered around Utete (District headquarters), Ikwiriri, Kibiti and Bungu townships.

Figure 1: Map of Rufiji District indicating key health facilities

3.3. Study population

The study population involved primigravid and multigravid pregnant women in the second and third trimester attending antenatal clinics at the selected health facilities during the study period. All health care providers working at the ANC in these facilities were automatically included in the study due to a small number of health care providers present in these facilities. These providers included nurse midwifes, enrolled nurses, registered nurses, nurse attendants and maternal child and health nurses.

3.4. Study period

The study was conducted from March 2010 to February 2012 in rufiji district.

3.5. Sampling technique

The district has a total of 62 health facilities, including 2 hospitals, 5 health centers and 55 dispensaries. Of the two hospitals one is a district hospital located at Utete town (the district headquarter) and the other is Mchukwi Mission Hospital run by the Pentecost Church of Tanzania. 1 health centre and 13 dispensaries located at Rufiji Delta were excluded from the study due to poor infrastructure around that location.

Cluster sampling was used for selection of health facilities in Rufiji district. The health facilities were divided into three clusters which were hospitals, health centers and dispensaries. All (2) hospitals and 4 health centers in the district were included in the study. Eight dispensaries were obtained using simple random sampling without replacement technique whereby 42 dispensaries located outside Rufiji Delta were written in the piece of paper then the papers were folded and 8 pieces of paper were picked randomly to select 8 dispensaries. Table 1 shows the selected health facilities that were involved in the study;

Table 1: Health facilities in Rufiji district which were involved in the study

S/N	Hospital	Health centre	Dispensary
1.	Utete	Mohoro	Bungu
2.	Mchukwi	Kibiti	Nyambunda
3		Ikwiriri	Ikwiriri Mission
4.		Nyaminywili	Ndundunyikanza
5.			Mkongo
6.			Kilimani
7.			Mlanzi
8.			Mjawa

Four hundred and seventy pregnant women were recruited using convenient sampling technique due to limited number of pregnant women attending ANC at the health facilities in their second and third trimester who were also willing to be recruited for the study. Health facility assessment was conducted in the mentioned selected health facilities and 22 health care providers working at the ANC in those facilities were all recruited for the study. Due to scarcity of health care providers in these facilities, all health care providers working at the ANC were automatically recruited in the study after giving their consent.

3.6. Sample size

3.6.1: Pregnant women

Sample size was precalculated to give us the minimum number of pregnant women that must be recruited for the study. The sample size was estimated based on a 51.0% prevalence of uptake of the national malaria control policy (IPT) in pregnant women (RDSS 2008) that gave the minimum sample size using the formula for cross-sectional surveys:

$$N = \frac{(Z^2 \text{ X } P \text{ X } q)}{E^2}$$

Whereby:

Z (standard normal deviate) =1.96,

P (prevalence) = 0.51,

q (1-P) = 0.49 ≈ 0.5 and

e (error margin) = 0.05 that gave N = 392 pregnant women in their 2nd and 3rd trimester who were to be recruited. Adding a 20% for those who were expected to refuse to respond to some questions, a total of 470 pregnant women in their 2nd and 3rd trimester were recruited. Sample size calculation was carried out so as to give the minimum number of pregnant women required to be interviewed so as to give the power to the study.

3.6.2: Health care workers

The samples size for health care providers was not calculated due to a very small number of health care providers working on these facilities.

3.7. Data collection

This study used multi approaches in data collection so as to reduce the chances of bias and give a more comprehensive understanding on the research issue and therefore the information obtained will enrich the qualitative method and give us a clear picture on the level of implementation of the national policy on malaria prevention and treatment in pregnant women.

3.7.1: Interviews of pregnant women

Semi structured questionnaires written in Kiswahili containing both closed and open-ended questions were used to interview and generate data from pregnant women attending ANCs. The questionnaires are attached as Annex IA and B. A knowledge scale was prepared; one point was awarded for each correct answer and a zero point for a

wrong answer. The pregnant women knowledge scale was then graded as low (0-1), medium (2-3) and high (4-5) on the basis of the questions in the check list.

On the use of SP for IPT the questions were mainly based on understanding on necessity of early booking for antenatal attendance in relation to the use of SP for IPT, awareness on the benefits of SP use for IPT, number of SP tablets required for IPT, number of doses to be taken and timing for IPT. On the use of ALu for malaria treatment the questions were mainly based on the antimalarials of choice for use in pregnant women, ALu dosage regimen, intervals in between doses, recommended trimester for ALu use and the use of fatty meal before ALu administration.

3.7.2: Focus group discussions

Focus group discussions (FGDs) which were conducted by a social scientist and the researchers using a prepared guided format containing probes based on the objectives of the study. Four FGDs were conducted, two at the hospitals and the other two at the health centers. There were at least ten participants in each focus group. Participants were pregnant women attending antenatal clinics at the health centers and hospitals. Selection of participants took into account a mix of pregnant women with different socio-demographic characteristics that were regarded to be important determinants of pregnant women's knowledge and awareness regarding the use of SP and ALu for treatment of malaria and IPT, respectively. These included level of education, current trimester, gravida, marital status and occupation. The main themes for FGDs were on the importance of early antenatal attendance, the use of SP for IPT, the use of ALu for malaria treatment in pregnant women and other pregnant women-related factors that are likely to affect implementation of IPT policy using SP and ALu for malaria treatment. The guided format that was used to conduct FGDs are appended to this proposal as annex IIA and B.

3.7.3: Facility assessment

3.7.3.1: Interviews of health care providers

Self administered questionnaires written in Kiswahili were filled in by the health care providers working at the ANCs (Annex IIIA and B). A knowledge scale was prepared consisting of closed ended questions; one point was awarded for each correct answer and a zero point for a wrong answer. The health care providers knowledge scale was then graded as low (0-1), medium (2-3) and high (4-5) on the basis of the questions in the check list.

On the use of SP for IPT the questions were mainly based on the understanding of SP use for IPT, number of SP tablets given for IPT, number of doses required for IPT, timing for IPT and implementation of DOT. On the use of ALu for malaria treatment the questions were mainly based on the antimalarials of choice for use in pregnant women, ALu dosage regimen, intervals in between doses, recommended trimester for ALu use and the use of fatty meal before ALu administration.

3.7.3.2: Facility assessment

Facility assessment form (Annex IVA and B) was used in assessing the availability of all essential resources (trained human resources, antimalarials and malaria diagnostic tests) which enable precise implementation of the national guideline. Observation was also made on the storage and handling of antimalarials at the health facility. Records on malaria morbidity and mortality in pregnancy, ANC attendance, IPT use, deliveries and number of low birth weight babies obtained from MTUHA records were also noted. Antimalarials prescribing pattern in pregnant women was also assessed by using MTUHA OPD register.

3.8. Data analysis

Data were coded and entered in the computer for analysis using statistical package for social sciences (SPSS) program version 17, and microsoft excel was used for analysing of multi-response data. Descriptive statistics was carried out for all quantitative data.

Pearson Chi-square test was used to test for an association between the level of knowledge of pregnant women against a number of social demographic factors such as marital status, age, gravid, education level and occupation. The level of knowledge of pregnant women was also tested against the attendance of pregnant women at the antenatal clinics. A *p*-value of < 0.05 was regarded as significant association between the dependent and independent variables.

Due to small sample size Fischer's exact Chi-square test was used to test for an association between the knowledge of health care providers against the study variables.

3.9. Study limitation

These interviewes and discussions were conducted at the heath facilities. This might have caused biases in answering some of the questions due to fear of disclosure of information given by pregnant women to health care providers. This was minimised by interviewing these pregnant women on a private place whereby a high degree of privacy was observed. The use of multi approaches such as FGDs enabled most of pregnant women to open up more to the discussions.

Mtuha records were used as one source of data during the study. Data on number of ANC attendance in 2011, IPT use and prescribing pattern of antimalarials were all collected from MTUHA records. In few of the facilities MTUHA records were not properly filled, therefore the information obtained was incomplete. It was almost impossible to establish the prescribing pattern of antimalarials in pregnant women using OPD MTUHA records since most of prescibers did not indicate whether the patient was pregnant at that time. We had to use the help of health care providers working at the ANC to cross check the information on MTUHA ANC attendance records. The analysis of antimalarials prescribed based on the trimester of pregnancy could not be carried out since there is no part in the MTUHA books requiring a prescriber to indicate such information and therefore that information was never reported.

Due to the small sample size of both facilities and health care providers recruited in this study, the data on the knowledge and awareness about IPT and use of ALu among health care providers reported here is limited in its generality beyond the study population. However, antenatal clinics were selected to represent a range of settings and levels of health facility, and sampling was done randomly in the district and therefore may have minimized source of bias. In addition, the national guidelines determining the timing of delivery of IPT and use of ALu for treatment of malaria apply throughout Tanzania. This suggests that the results presented here may apply elsewhere in Tanzania, especially in the rural areas where there is scarcity of health care providers, and therefore justify the need to conduct a larger survey to further investigate use of SP for IPT and rational use of antimalarial drugs during pregnancy.

CHAPTER FOUR: RESULTS

On assessment of the implementation of the national guidelines for malaria prevention and treatment in pregnant women the level of knowledge of pregnant women and health care providers on IPT policy using SP and on the use of ALu for malaria treatment was assessed. With this a number of factors causing poor implementation of these guidelines were reported by both pregnant women and health care providers. Data collected on facility assessment showed lack of both human resources and non human resources which have a big impact on failure of the guidelines implementation.

4.1. Level of knowledge of pregnant women on malaria prevention and treatment in pregnant women policy

Out of the 470 women who were interviewed, 227 (48.3 %) were in the second trimester and 243 (51.7 %) were in the third trimester of pregnancy. More than half 258 (54.9%) of these women were multigravidae who have had 3 or more pregnancies at the time of interview. Two hundred and seventy three (58.1 %) participants were in the age group of 20 - 35 years, and 58.1 % of all women had attained formal education. Two hundred and thirty six (50.2 %) were self-employed (farmers, pastoralists, petty business), and 229 (48.7%) were housewives (Table 2).

Table 2: Socio-demographic characteristics of pregnant women who were recruited in the study (N = 470)

Socio-demographic characteristic	N	%
Age group (years)		
<20	107	22.8
20-35	312	66.4
>36	51	10.9
Education		
No formal education	197	41.9
Not completed primary education	60	12.8
Completed primary education	196	41.7
More than primary education	17	3.6
Current trimester		
Second	227	48.3
Third	243	51.7
Gravida		
First pregnancy	120	25.5
Second pregnancy	92	19.6
Third or more pregnancy	258	54.9
Marital status		
Married	370	78.7
Unmarried	92	19.6
Cohabiting/Divorced	8	1.7
Occupation		
House wife	229	48.7
Self employed	236	50.2
Employed	5	1.1

The level of knowledge of pregnant women was analyzed on both the interviews and FGDs conducted on pregnant women. Only 110 (23.4 %) pregnant women correctly understood that early antenatal clinic attendance enables women to get the recommended courses of SP for IPT on time. Others reported health checkup (42.6 %), counseling (17.7 %), vaccination (2.8 %) and treatment of various health conditions (13.6%) as the benefits of early antenatal clinic attendance (Figure 1).

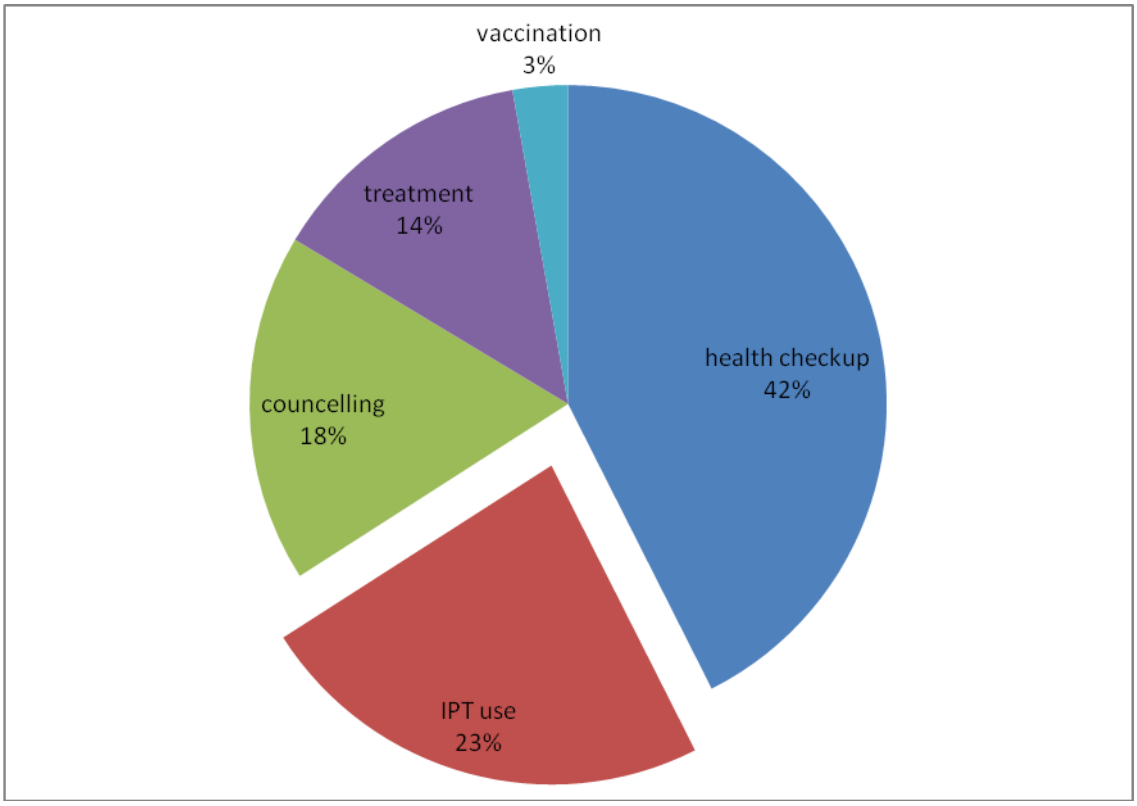

Figure 1: Importance of early antenatal attendance as reported by pregnant women during interviews (N= 470)

In expressing what they are being told by the health care providers, pregnant woman from Bungu dispensary said,

"*There are tablets which we are given when the pregnancy is 5 or 6 months old, if you don't come early for registration let's say you wait till the pregnancy is 6 months old or more it means you won't be able to get these tablets*."

Pregnant women were also interviewed about their awareness of the different methods that have been advocated for prevention of malaria during pregnancy. Hundred and fifty one (32.1 %) pregnant women mentioned the use of SP for IPT as one of the methods for protecting pregnant women from malaria. Others mentioned untreated bed nets (31.1 %), insecticide-treated bed nets (36.6 %) and indoor spraying with insecticides (0.2 %). Although 251 (53.3 %) pregnant women reported to have used SP when visiting antenatal clinics, most women did not know the advantages of using SP when pregnant. Two hundred and fourteen (45.5 %) pregnant women were aware that SP is given for IPT purposes. As an indication that pregnant women did not know why they were given SP, one of the participants in the focus group at Mohoro health centre said,

"*We were given three tablets and we were told to swallow them in front of the nurse, but we do not know why we were given those tablets."*

In terms of the number of SP tablets to be taken for IPT, 245 (52.1 %) pregnant women mentioned that 3 tablets should be taken at once, 4 (0.9 %) mentioned 2 tablets and the rest 221 (47 %) did not know how many tables should be taken. It was only 91 (19.4 %) pregnant women who knew that 2 doses of SP are given for IPT, whereas 220 (46.8 %) did not know and the rest 158 (33.6 %) said that one dose of SP should be given. Only 80 (17 %) pregnant women mentioned that SP is given during the 2nd and 3rd trimesters, although they were also unable to indicate the exact weeks during which SP should be taken. Others did not know the correct timing of SP, with some women mentioning only the 1st trimester (0.2%), 2nd trimester (29.6 %), third trimester (6 %) and all the three trimesters of pregnancy (0.2 %). The rest 221 (47 %) pregnant women were unable to mention the trimester during which SP should be provided. One FGD participant reported, "*SP is given when you attend the ANC at the first visit*", but it is

obvious that not all women start attending clinic at the same time. With regard to direct observation therapy for SP, 232 (49.4 %) pregnant women mentioned that SP is taken under direct observation therapy to improve compliance, 221 (47 %) did not know and 17 (3.6 %) indicated that it is taken at home.

According to the knowledge scale based on the range of the answers provided by pregnant women for the correct use of SP for IPT, it is shown that 210 (44.7 %) pregnant women had very low knowledge, 117 (24.9 %) had moderate knowledge and 143 (30.4 %) had high level of knowledge. The level of knowledge regarding the use of SP for IPT correlated with age (p = 0.005), gravida (p = 0.032) and marital status (p = 0.001) of the pregnant women (Table 3).

Table 3: The levels of knowledge about IPT policy using SP with respect to marital status, age and gravida of pregnant women (N = 470)

Characteristic	**Knowledge level**		
	Very low	**Medium**	**High**
Marital status			
Single	177 (37.7%)	77 (16.4%)	116 (24.7%)
Married	31 (6.6%)	35 (7.4%)	26 (5.5%)
Co-habiting/widowed	2 (0.41%)	5 (1.1%)	1 (0.2%)
Age			
<30 years	158 (33.6%)	91 (19.4%)	88 (18.7%)
>30's years	52 (11.1%)	26 (5.5%)	55 (11.7%)
Gravida			
Primigravida	51 (10.9%)	40 (8.5%)	29 (6.2%)
Multigravida	159 (33.8%)	77 (16.4%)	114 (24.3%)

Out of 470 pregnant women who were interviewed, 43 (9.1 %) have had episode(s) of malaria fever during their current pregnancies. It was only 9 (1.9 %) pregnant women who reported to have used ALu for treatment of malaria. Out of 9 women who reported to have used ALu when pregnant, 3 (0.6 %) were in the first trimester of pregnancy. All 470 women did not know the gestation period in which ALu is indicated for treatment of malaria during pregnancy. During focus group discussions, most women mentioned that ALu is not safe to be used by pregnant women. This was echoed by a 27 year-old multigravidae participant at Ikwiriri mission, who said;

"*I got malaria when I was 5 months pregnant, but I was told by the nurse that I cannot take ALu until the pregnancy was 7 months old. I was therefore given sulphamethoxyprazine-pyrimethamine (metakelfin).*"

Only a small proportion (1.9 %) of pregnant women knew the correct dose and dosage regimen of ALu. Among those who knew the correct dose and dosage regimen of ALu, only 8 (1.7 %) pregnant women knew that ALu should not be taken in an empty stomach. Two multigravidae participants who had used ALu when pregnant mentioned the dosage of ALu that were prescribed to them. One of them mentioned that she was told to take four tablets of ALu after every 8 hours till she finishes all the 24 tablets. The other participant said that she was told to take four tablets at 2:00pm then another four tablets at 10:00pm, and then take the rest of the doses after every 12 hours for two consecutive days.

Quinine was mentioned by 202 (42.9%) pregnant women as the most commonly used drug, followed by SP (23.8 %), ALu (21.4 %) and sulphamethoxyprazine-pyrimethamine) (2.4 %). Forty five (9.5%) pregnant women could not remember the names of antimalarial drugs that they used when pregnant (Figure 2).

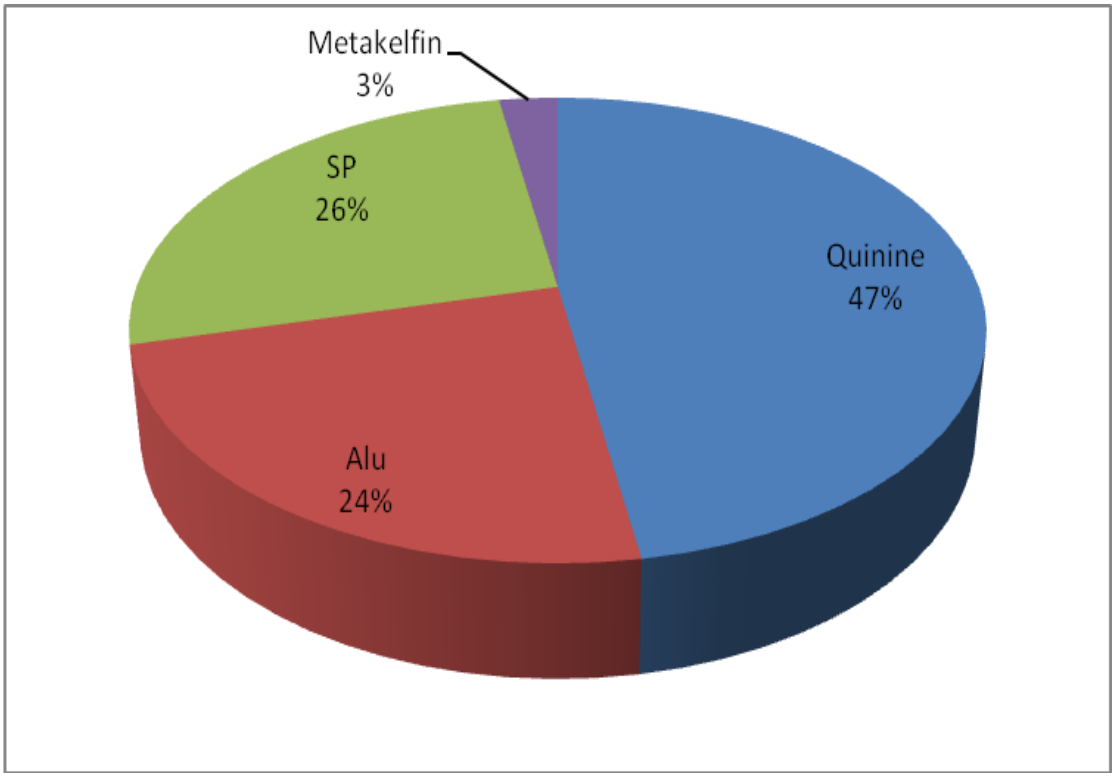

Figure 2: Commonest antimalarial drugs reported to be used by pregnant women (n = 425)

In the focus group discussions it was reported that the commonest diseases that cause death to pregnant women in Rufiji were malaria, eclampsia, anaemia, post partum hemorrhage and heavy bleeding when pregnant. Most referral hospitals are far from where most of the residents reside, and therefore some deaths are mainly due to delays in referring patients to hospitals with qualified health care personnel and adequate facilities for diagnosis and treatment.

4.2. Level of knowledge of health care providers on malaria prevention and treatment in pregnant women policy

The data obtained from the health care providers was essential in assessing implementation of the national guidelines since they are the main policy implementers and thru them the entire community can have a better understanding on the importance of these guidelines on malaria management in pregnant women. The reported data included factors faced by them that cause poor implementation of the guidelines.

Twenty two health care providers working at the ANCs in 14 health facilities were interviewed to assess their level of knowledge regarding malaria prevention and treatment in pregnant women. About ten participants were more than 40 years old and 15 were married women. Thirteen health care workers had the working experience of more than 20 years as health care providers (Table 4).

Table 4: Socio-demographic characteristics of the health care providers who were interviewed at the antenatal clinic (N = 22):

Socio-demographic characteristic	Number of respondents	Percent
Age group (years)		
30-40	9	40.9
41-50	7	31.8
>50	6	27.3
Work experience (years)		
< 10	2	9.1
10-20	7	31.8
> 20 years	13	59.1
Marital status		
Married	15	68.2
Not married	7	31.8
Designation		
Clinical officer	1	4.6
Registered nurse	3	13.6
Maternal Child and Health nurse	3	13.6
Public health nurse	1	4.6
Enrolled nurse	7	31.8
Nurse assistant	3	13.6
Nurse attendant	4	18.2

Out of 22 health care providers who were interviewed, 21 mentioned that they have read the national guidelines for malaria prevention and treatment. They commented that the guidelines are well writen and can be easily understood. Based on the usage of the guidelines, 19 heath care workers agreed that they are using these guidelines for management of malaria cases in pregnant women. Fourteen health care providers mentioned that they have attended training on malaria prevention and treatment in pregnant women.

All 22 participants knew that SP is used for IPT in pregnant women and that 3 tablets are given to pregnant women twice throughout the pregnancy period. When asked about the timing of IPT, half of them reported that SP is given during the second and third trimester of pregnancy, while 10 participants reported that it is given during the second trimester only. Twenty health care providers reported that all pregnant women must take SP under direct observed therapy. Based on the knowledge scale, the level of knowledge of health care providers for IPT using SP was graded as medium (5) and high level of knowledge (17) (Figure 3). There was an association between the level of knowlegde of health care providers and training on malaria prevention in pregnancy policy ($p = 0.02$). Out of 17 health care providers who had high level of knowledge on IPT policy, 14 of them reported to have been trained on malaria prevention and treatment in pregnant women.

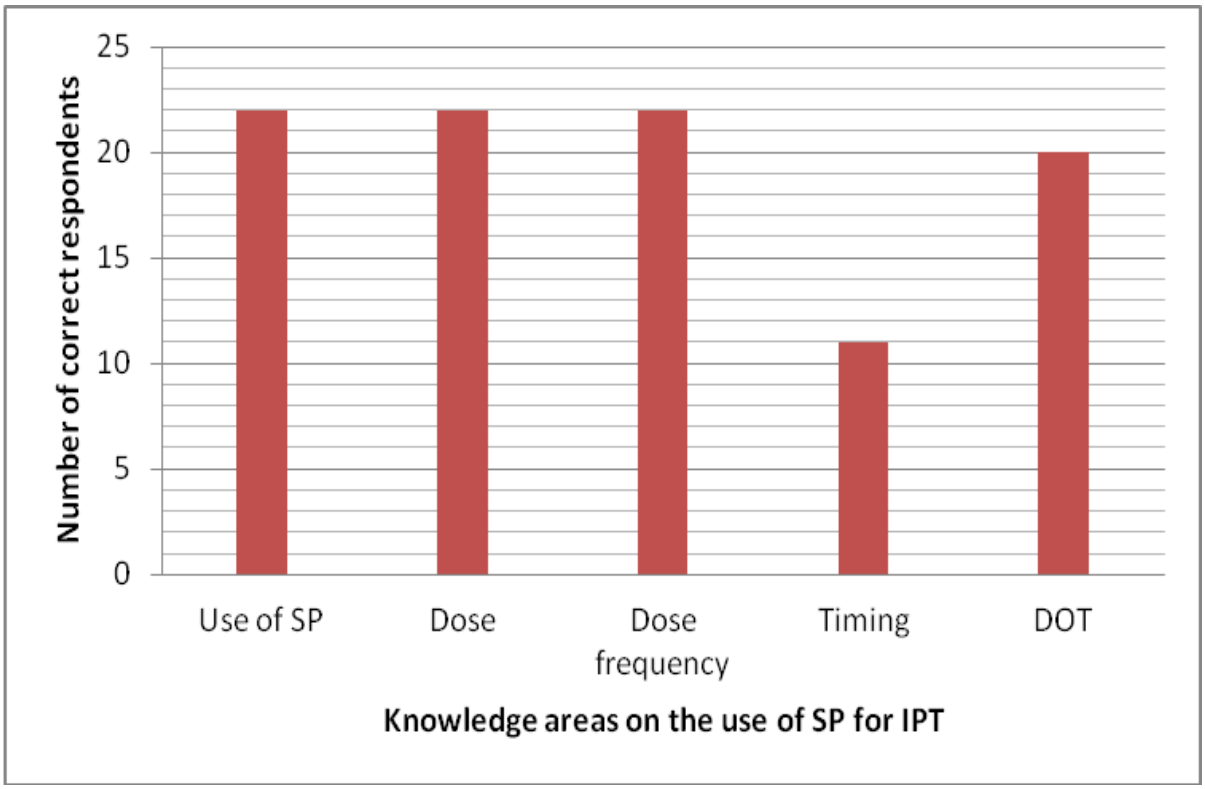

Figure 3: Level of knowledge of health care providers on IPT policy using SP (n= 22)

In assessing the level of knowledge of health care workers regarding the drugs of choice for treatment of uncomplicated malaria in pregnant women, only two health care providers mentioned both ALu and Quinine as antimalarials of choice based on the trimester of pregnancy; nine mentioned ALu only, five reported Quinine only, two reported SP and the rest (4) did not know the antimalarial drug of choice for treatment of malaria in pregnant women (Figure 4).

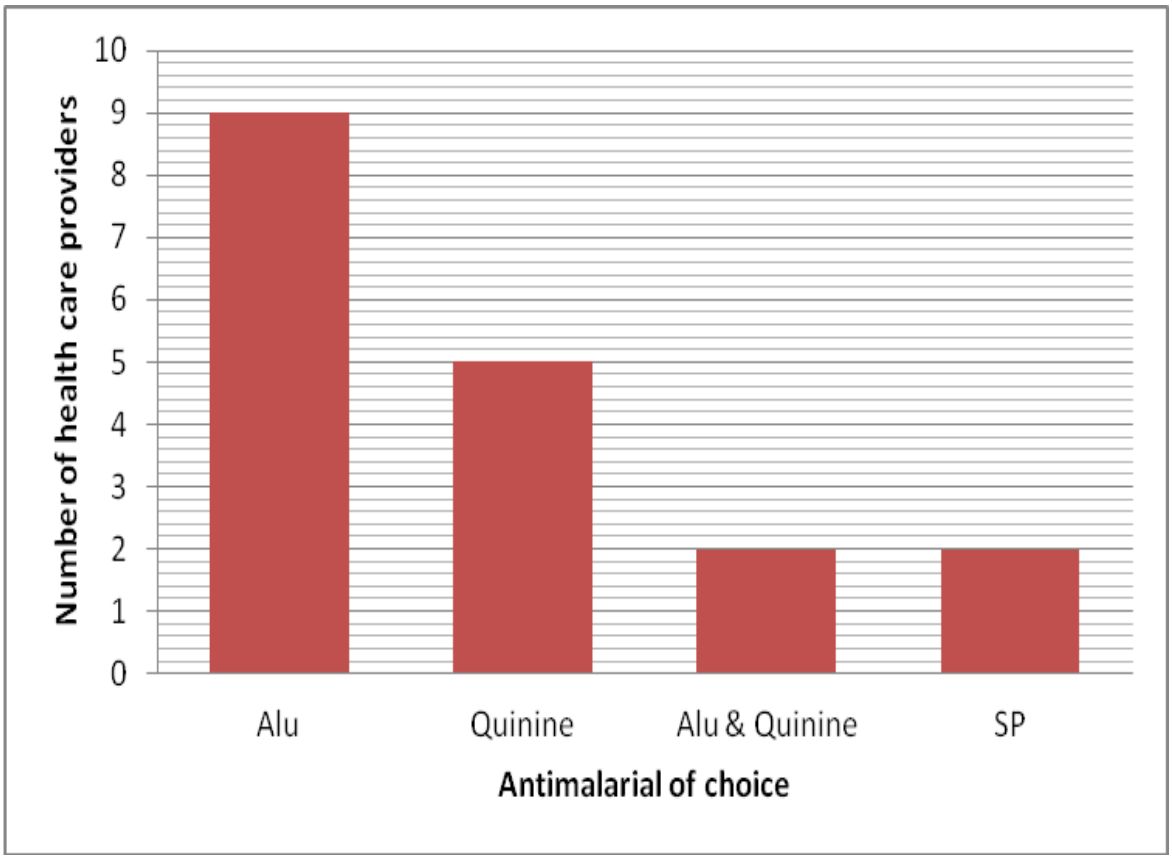

Figure 4: Antimalarial drugs of choice for treatment of uncomplicated malaria in pregnant women as reported by health care providers (n = 18)

Regarding the number of tablets for ALu to be used by pregnant women, it was only 10 participants who knew that 4 tablets are given at once, while the rest (12) did not know how many tablets are given. Ten health care workers knew the correct dosage regimen of ALu in which 4 tablets (containing 20mg of artemether and 120mg of lumefantrine) are given at 0, 8, and 12 hourly until 24 tablets are completed. The rest 12 health care workers did not know the correct dosing intervals of ALu. Half of the respondents did not know the safe period to prescribe ALu during pregnancy. Only one participant correctly mentioned the 2nd and 3rd trimesters as the safe period when ALu is recommended for use during pregnancy. Based on the knowledge scale regarding antimalarial drugs of choice for treatment of malaria during pregnancy, 13 health care workers had low level of knowledge while 9 had medium level of knowledge. There was

no association between the level of knowledge of health care providers with any of the study variables.

4.3. Health facility assessment

The main purpose of this assessment was to identify the level of implementation of the national guidelines at the health facilities and the challenges encountered. In assessing the health facilities for effective implementation 2 hospitals, 4 health centers and 8 dispensaries were assessed. Majority (eleven) are government owned facilities and three are owned by religious groups. Nine facilities serve more than 3 villages within their catchment area. Seven health facilities were under supervision of Clinical officers, 4 were under Assistant medical officer (AMO) / Medical Doctor (MD) and 3 were under supervision of a nurse. Eleven health facilities had not more than three staff working at the ANC (Table 5).

Table 5: An overview of the assessed health facilities (n = 14):

Variable	Number of respondents	Percent
Facility type		
Hospital	2	14.3
Health center	4	28.6
Dispensary	8	57.1
Catchment Area (villages)		
1 – 2	5	35.7
3 – 9	8	57
>10	1	7.1
In-charge of antenatal clinics		
Maternal child health nurse	1	7.1
Public Health Nurse	4	28.6
Enrolled Nurse	4	28.6
Nurse Assistant	4	28.6
Registered Nurse	1	7.1
Number of staff at the antenatal clinics		
1 – 2	7	50
3 – 4	5	35.7
>4	2	14.3

Out of 6,183 pregnant women that were enrolled at the antenatal clinics in 2011, only 2,659 (43%) pregnant women received the first dose of SP for IPT. Only 1322 (21.4%) of all enrolled pregnant women at the health facilities received the second dose of SP for IPT (Figure 5).

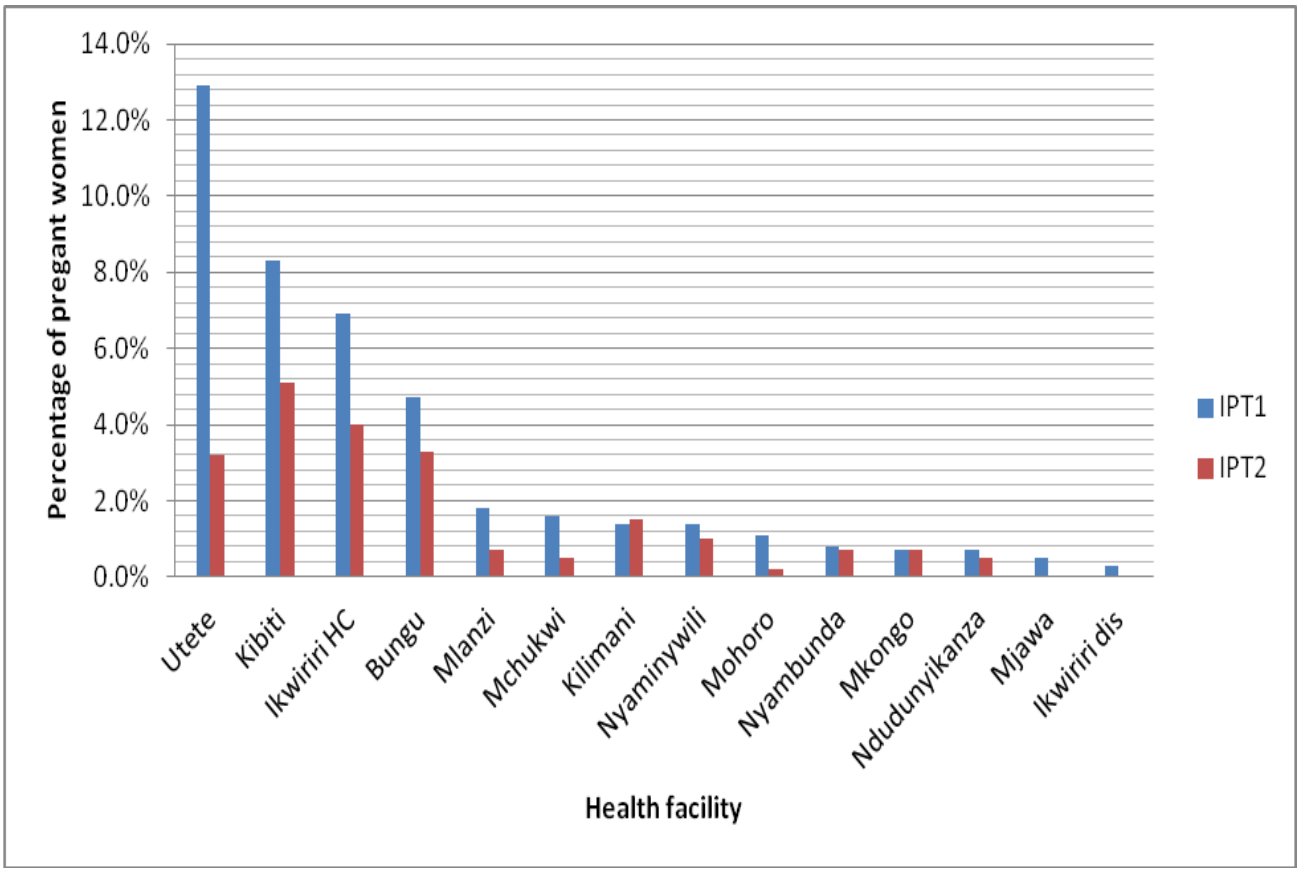

Figure 5: Proportion of pregnant women who were provided with the first (IPT1) and second (IPT2) dose of SP for IPT in 2011 (n = 14)

The reports show that out of 6,183 pregnant women who were enrolled at ANC at these facilities, it was 4,540 (73.4%) who were registered to deliver at the health facility. The proportion of pregnant women who delivered at the facility in relation to those who were attending at the ANC is shown in figure 6.

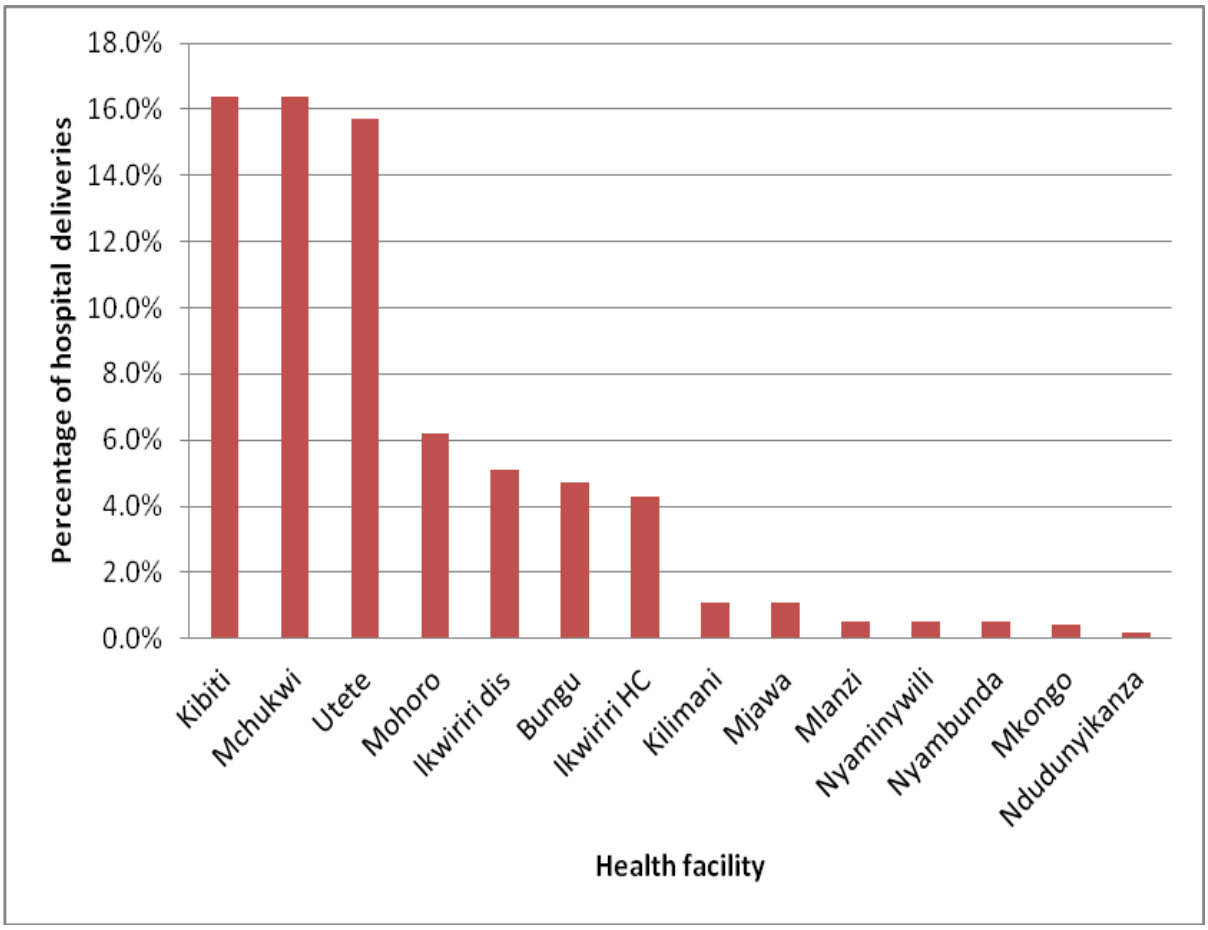

Figure 6: Proportion of pregnant women who delivered at the health facilities in 2011

Out of 4,540 pregnant women who were admitted to deliver at the health facilities in the year 2011, 47 (1.04%) of them lost their lives due to maternal complications including two deaths caused by malaria complications. The data also showed that out of 4,424 live babies born at the health facilities, 269 (6.1%) babies had low birth weight.

In assessing storage conditions of antimalarial drugs it was observed that 9 facilities had the separate main store for proper storage of medication at the health facility. It was only one facility that had the air condition and refrigerator for proper storage of medication. Ten health facilities placed the medications on the shelves and racks but it was in only three facilities in which the medications was arranged based on their pharmacological activities, the rest had no proper arrangement. Nine facilities managed to keep the medications away from rodents and pests and it was in 7 facilities where the expired drugs were kept in a separate room. Eleven health facilities had well documented store ledgers and on the three facilities the store ledgers was either absent or was poorly documented (Figure 7).

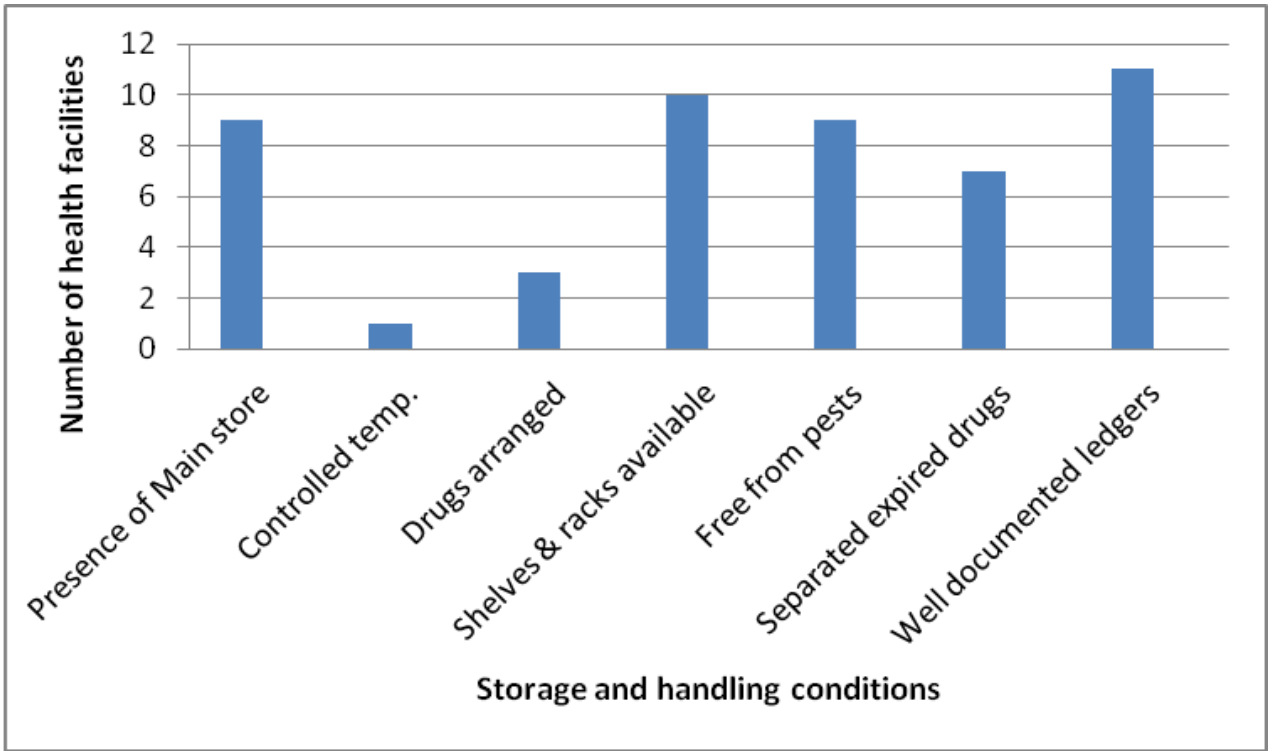

Figure 7: Assessment of storage conditions and proper handling of medication in the health facilities (N=14)

Laboratory facilities were available in 8 facilities but all 14 health facilities were able to detect malaria infections using Malaria rapid diagnostic test (MRDT). Seven health facilities use MRDT only, two use light microsope only and five use both MRDT and light microsope. Seven health facilities reported that MRDT is commonly absent, 5 facilities reported that it is commonly present and 2 facilities reported that it is always absent.

There were about 54 records of prescriptions given to pregnant women diagnosed to have uncomplicated malaria infections at the OPD in these health facilities. The commonest antimalarial prescribed in these prescriptions was ALu 22 (40.7%). There was concurrent prescribing of painkillers in fourty (74.1%) prescription whereby the commonest prescribed painkiller was paracetamol tablets. Concurrent prescription with an antibiotic was observed in six (11.1%) prescriptions whereby amoxylline capsules were commonly prescribed (Figure 8).

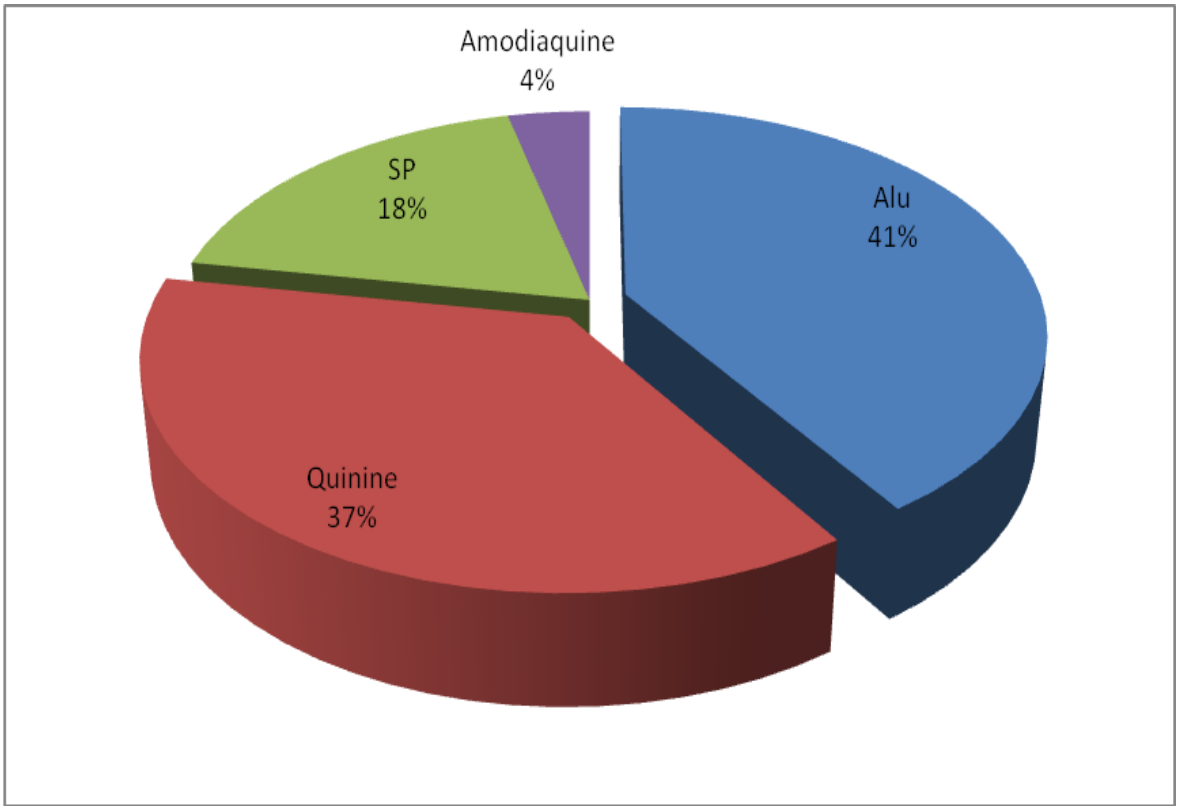

Figure 8: Prescribing pattern of antimalarial drugs to pregnant women at the Out Patient Department (N = 54)

4.4. Factors causing poor implementation of the national guideline

4.4.1. Pregnant women reported factors:

The study explored a number of women related factors which could be affecting the implementation of IPT policy using SP, including attendance of pregnant women at the antenatal clinics. Two hundred and eighty eight (61.2%) pregnant women started attending antenatal clinics after 20 weeks of gestation (Table 6).

Table 6: Frequency of attendance to the antenatal clinics in relation to gestation as reported by pregnant women during interviews (n = 470)

Variable	N	%
Number of visits to ANCs		
First	141	30.0
Second	179	38.1
Third	105	22.3
Fourth and more	45	9.6
Gestation age (weeks) when attending ANCs* for the first time		
4 – 15	88	18.7
16 – 27	356	75.7
28 and above	26	5.5

**Antenatal Clinics*

During the day of interview, 179 (38.1 %) pregnant women were attending antenatal clinics for the second time (Table 3). The rest 141 (30%) were attending antenatal clinics for the first time, 105 (22.3 %) for the third time and 45 (9.6%) for the fourth or more times. There was an association between the level of knowledge about IPT policy using SP and the number of antenatal clinic visits by pregnant women ($p = 0.041$) (Table 7).

Table 7: Comparison of the levels of knowledge of respondents about IPT policy using SP in relation to the number of antenatal clinic visits they had made (N = 470).

Level of knowledge	Number visits			
	1st	***2nd***	***3rd***	***≥4th***
Very low	72(15%)	86(18.3%)	34(7.2%)	18(3.8%)
Moderate	37(7.9%)	41(8.7%)	28(6.0%)	11(2.3%)
High	32(6.8%)	52(11.1%)	43(9.1%)	16(3.4%)
Total	***141(30.0%)***	***179(38.1%)***	***105(22.3%)***	***45(9.6)***

Pregnant women were asked if they had taken SP for IPT for their current pregnancies. It was reported that 220 (46.8 %) pregnant women had not taken SP, 157 (33.4 %) had taken a single dose, 92 (19.4 %) had taken two doses and 1 (0.2 %) reported to have been given three doses of SP when pregnant. The number of SP doses taken had an association with the level of knowledge of pregnant women for IPT policy using SP *(p* < 0.0001). Out of 220 pregnant women who had not been given SP during their current pregnancies, 214 (97.3 %) of them reported that the medication was out of stock when they attended antenatal clinics, 2 (0.91 %) refused to take the medication and 4 (1.82 %) did not attend the clinics on the day they were to be given the tablets. During the focus group discussion, a 45 years old pregnant woman at Utete district hospital said:
"*Today I was supposed to take a dose of SP but when I came here I was told that the drug was out of stock. I was then told to buy the tablets from the neighboring pharmacy and then bring them to the clinic to be taken under direct observed therapy".*

Pregnant women were asked to mention the measures they take when SP is out of stock at the antenatal clinics. Most (94.1 %) of them reported that they do nothing, whereas 28 (5.9 %) said they would go to another health facility to look for SP if they are directed by the nurse. Other factors reported by pregnant women to be affecting the implementation of IPT policy include lack of bus fare to attend antenatal clinics (5.3 %) and unavailability of reliable transport to the health facilities (1.9 %).

In assessing acceptability of SP for IPT, pregnant women were asked to provide their views regarding SP-induced side effects and its tolerability. Two hundred and thirty one (49.1 %) pregnant women indicated that the tablets are well tolerated, while 222 (47.2 %) did not know any SP-induced side effects and could therefore not provide any response. It was only 16 (3.4 %) pregnant women who reported to have had experienced SP-induced side effects including rashes (12.5 %), fever (25 %), headache (12.5 %) and stomach cramps (50 %). During the focus group discussion, a middle-aged multigravidae woman at Ikwiriri mission reported:

"*There were women who took SP on an empty stomach and started vomiting, they felt dizzy and became weak. Due to this problem, some women would not take SP, unless it is given under directly observed therapy at the health facilit*y."

During the focus group discussions it was learnt that issues such as cost sharing, scarcity of health care providers, and long distances travelled to the health facilities are the main causes for poor attendance of pregnant women to antenatal clinics. As a result, this affects timely provision of SP for IPT to pregnant women. Family responsibilities including taking care of young children were commented to be another reason for pregnant women not attending ANCs on time. In some health facilities pregnant women were required to go to the antenatal clinics with their spouses. This was seen to be a challenge since many husbands are usually not willing to escort their spouses to the clinics.

4.4.2. Health care providers reported factors

Most (15) of health care providers were not guided by any strategy that will ensure correct administration of IPT to pregnant women. The reported strategies from the remaining included 6 participants who asked pregnant women to take SP under direct observed therapy and recording of frequence of schedled SP intake during ANC attendancein MTUHA record books. The rest give health education and advice to pregnant women on the importance of early ANC attendance in relation to the use of SP for IPT during pregnancy. The estimated mean percentage of pregnant women using at least one dose of SP for IPT in the year 2011 as reported by the interviewed health care providers is 70%.

The reported factors causing poor implementation of the national guidelines on malaria prevention and treatment in pregnant women as reported by health care providers were, Frequent stock outs of antimalarial drugs, lack of trained health care providers, delay in antimalarial deliveries from Medical store department (MSD), lack of cups and clean drinking water for providing SP under direct observed therapy. To tackle these

problems 8 participants said that they make follow up on their orders at MSD via Utete Hospital, two borrow antimalarial drugs from other health facilities, 6 request the patients to buy the medications at the medical stores or pharmacies and 6 prescribe Quinine instead of ALu for treaatment of uncomplicated malaria.

Health care providers views on the pregnant women social demographic factors that might affect poor IPT policy adherence revealed that nine health care providers reported that primigravid women comply more to IPT use than multigravid women. Ten participants reported that younger women comply better to SP use than older women. It was reported by 13 participants that the more educated the pregnant woman (that is pregnant women who had received formal education), the better the compliance to IPT, even though there was no statistical association between pregnant women's education level and the level of knowledge on IPT use. Eleven reported that long distances from the health facility to where pregnant women reside contribute to poor IPT policy adherence. SP induced side effects experienced by pregnant women does sometimes contribute to poor SP intake for IPT as it was reported by five participants.

On factors contributing to poor ALu usage as the antimalarial of choice in treatment of uncomplicated malaria in pregnant women in their second and third trimesters, it was reported by five health care providers that ALu side effects such as nausea, abdominal discomfort and vomiting may contribute to poor compliance. Five health care workers reported that pill burden might cause poor adherence to Alu, while 12 health care workers believed that ALu is not safe for use by pregnant women. Ten health care workers reported that in order to ensure ALu is taken correctly by pregnant women, the first dose should be taken at the health facility.

4.4.3. Health system related factors

Half of the facilities that were assessed did not have safe and clean drinking water for providing SP for IPT under direct observed therapy. With regards to availability of antimalarial drugs at the health facilities, quinine tablets and injections were mostly

available in ten facilities compared to ALu which was present in only 8 facilities during the time of the study.

Eleven out of 14 health facilities use ILS to order antimalarial drugs from the Medical Stores Department, but it was only in 6 health facilities where health care providers had adequate knowlegde on how to use ILS to estimate the correct amount of antimalarial drugs. Staff working on three facilities indicated that ILS causes overestimation of the required order; and the rest (five) were not sure whether ILS is helpful or not. Eleven facilities order antimalarial drugs at the intervals of three months and the orders are delivered to the facilities in more than a month after the order has been placed at the MSD. The expiry of antimalarial drugs is not common in 10 facilities. However, 4 facilities reported that the expiry of drugs is due to the fact that they are supplied with short expiry medications from MSD.

Out of fourteen facilities only five facilities conducted routine malaria check up to all pregnant women attending at the ANC. Out of 6,183 pregnant women who were enrolled at the ANC in 2011 it was only 769 (12.4%) pregnant women who were tested for malaria and 11 (1.43%) were reported to test positive for malaria parasites in 2011.

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECCOMENDATION

The aim of the study was to assess the implementation of the national guidelines for malaria prevention and treatment in pregnant women. The results obtained show that almost half of the pregnant women had very low knowledge regarding the importance of IPT. Majority of pregnant women did not know why SP was provided, the correct timing of IPT and number of SP doses that are required for IPT during pregnancy. During focus group discussions it was evident that health care workers did not adequately sensitize and counsel pregnant women regarding the use of SP for IPT. The level of knowledge of most of health care providers on IPT policy was very good. Therefore poor level of knowledge of pregnant women on IPT can simply be due to other reasons such as poor dissemination of information and not due to lack of knowledge of health care providers on the IPT policy. The study supports that there is poor dissemination of information on the importance of IPT policy using SP among stakeholders including pregnant women in Tanzania [Anders *et al.* 2008].

The guidelines for maternal and child health stipulate that the first visit by pregnant women at the ANC should be at the 16^{th} week. The second visit should be at 20^{th} -24^{th} weeks, third visit at 28^{th} -32^{nd} weeks and the fourth visit at 36^{th} - 40^{th} weeks of gestation [WHO, 2006]. It was stated by health care providers that late ANC attendance does contribute to poor implementation of IPT policy. An observation was made in this study whereby about two-third of pregnant women started attending ANC after 20 weeks of gestation. Because of late and irregular attendance to ANC, a large number of pregnant women did not receive the recommended two doses of SP for IPT at the pre-determined times. A similar study that was conducted in Uganda in 2010 also indicated that late and irregular attendance to ANCs disrupt antenatal schedules for proper delivery of IPT [Ndyomugyenyi *et al.* 2010]. In the present study, pregnant women who had attended antenatal clinics for at least 3 times had better knowledge on IPT policy compared to those who had attended once or twice, suggesting an association between the number of antenatal visits and the level of knowledge on IPT policy among pregnant women.

It was also observed that there is an association between marital status, age and gravida of a woman and the level of knowledge on IPT policy. This association was also reported by health care providers, who in addition, reported an association between the compliance to IPT and the level of education of pregnant women. Majority of single pregnant women had very low knowledge compared to married ones. Results obtained from focus group discussions indicated that married women did get extra support from their spouses for attending ANCs and subsequent use of SP for IPT. It was also observed that sensitization carried out at the ANCs in most of the health facilities whereby pregnant women are encouraged to attend the clinics with their spouses helps to improve health education and support of pregnant women at the family level. This practice should be encouraged as it appears to have positive outcome on the overall health care given to pregnant women at the antenatal clinic and at home.

The results also show that overall, older pregnant women had better understanding of IPT policy than the younger ones. In addition, multigravidae were more knowledgeable than primigravid women regarding IPT. Similar to the findings of this study, other studies have also reported that the age of the pregnant woman, time of registration with an antenatal provider, gravida and transport facilities available in the village were important predictors significantly affecting the utilization of minimum recommended antenatal care services [Khatib *et al.* 2009, Ndyomugyenyi *et al.* 2010]. These results indicate the need to have sensitization programs that are designed to target different groups of pregnant women at the antenatal clinics.

The level of implementation of IPT for the first and second doses of SP as recorded in MTUHA was below the targeted percentage stipulated by the roll back malaria [Eijk *et al*. 2011]. The observed records which was 43% for IPT1 and 21.4% for IPT2 support other studies by stating that the target that was set by the Roll back malaria initiative stating that by 2010 IPT2 should be given to all pregnant women has not been reached. As the matter of fact the IPT2 observed was even less than that reported on 2007-08 Tanzania HIV/AIDS and Malaria Indicator Survey (THMIS) reporting that 30% of

pregnant women in Tanzania mainland receive two or more doses of IPTp at ANC visits [Eijk *et al*. 2011, Gutmana *et al*. 2011, Mboera *et al.* 2007].

For successful provision of IPT in pregnant women, it is imperative to ensure adequate and uninterrupted availability of SP at the health facilities [Hill *et al.* 2006, Ndyomugyenyi *et al.* 2009]. In this study, unavailability of SP was the main reason for about 50% of pregnant women not to have taken SP for IPT at the health facilities. Frequent stock outs were also reported by majority of health care providers as a major drawback towards implementation of IPT policy. These findings support the hypothesis that poor quality of healthcare services such as unavailability of medications and other basic services contribute to poor attendance of pregnant women at antenatal clinics [Anders *et al.* 2008]. Subsequently, pregnant women do not receive SP for IPT at the pre-determined time, as a result increased risk of malaria infections and complications in pregnancy.

Unless the benefits outweigh the risks, it is recommended that artemisinin should not be used in the first trimester of pregnancy because of its teratogenic effects including foetal resorption [Clark *et al.* 2006]. Most of health care providers had low knowledge when it comes to the use of ALu for treatment of uncomplicated malaria. In the present study, about a quarter of pregnant women were given ALu for treatment of malaria in the first trimester of pregnancy. As shown by recent studies, the main reason for irrational use of antimalarial drugs in Tanzania is the lack of knowledge among health care providers [Kamuhabwa and Mnyusiwalla, 2011, Guerrin *et al.* 2002]. It has also been reported that some pregnant women do not understand the instructions given by drug dispensers regarding the dosage and duration of use of ALu [Kamuhabwa and Mnyusiwalla, 2011]. Incorrect use of ALu in pregnant women has an impact on the overall malaria treatment in pregnant women which might cause drug resistance and increase in malaria morbidity and mortality cases in the country due to under/overdosage of ALu [Nosten *et al.* 2007].

Lack of knowledge of antimalarial drug use during pregnancy is a serious problem, especially in areas of intense transmission such as Rufiji and other parts of Tanzania, where antimalarial drugs are given repeatedly to treat frequent fevers (even in the absence of malaria), thus increasing the risk of resistance and adverse drug reactions [Kamuhabwa and Mnyusiwalla, 2011]. Lack of proper counseling of patients on the benefits of ALu for the treatment of malaria, does contribute to other pregnant women preferring using other antimalarial drugs such as sulphamethoxyprazine-pyrimethamine and SP which are ineffective and have been ruled out for treatment of malaria in Tanzania. Unlike SP which was taken as a single dose for treatment of malaria, ALu is a multi-dose regimen taken over a period of three days. For many patients, this makes adherence a problem.

Maternal death in Rufiji as per the records is about 1%, whereas malaria fatality rate was about 4%. The objectives of the National Road Map Strategic Plan states that by 2015 maternal mortality should be reduced by three-quarters, reduce neonatal mortality by two-thirds, and reduce mortality of children less than 5 years by two-thirds. Moreover the number of low birth weight was about 6% which is also lower compared to previous studies [Koheleth, 2011]. More than half of pregnant women were recorded to deliver on health facilities and therefore the study supports the fact that majority of pregnant women deliver at the health facilities compared to the past situation.

Facility assessment revealed that there is insufficient number of health care providers working at the antenatal clinic. This might be one of the factors causing poor execution of the guidelines because of high patient load, lack of motivation and limited level of knowledge. The study supports the suggestion that serious obstacles in most disease control strategies are mainly contributed by lack of effective health information, education, insufficient resources and communication programs. Providers need to comprehend the importance of malaria control in pregnant women and be knowledgeable on how to prevent and treat malaria in pregnant women having all the resources [Mboera *et al.* 2007].

The poor storage and handling of medicines observed in most of the facilities might be one of the factors contributing to poor implementation of the national guidelines. Proper storage of medications enables the store keeper to be able to apply first expired first out rule (FEFO) and first in first out (FIFO) rule efficiently, and thus enabling monitoring of medications available at the store. There are cases whereby it was reported in some facilities that there has been overordering or underordering of antimalarials. This can be contributed by poor handling of the medication whereby the ordering officer orders the antimalarials without having the knowledge of how much is required for use at the facility. The consequences of this are increasing stock-outs of antimalarials due to underordering or increase in expired drugs due to overordering.

The limited supplies of MRDTs which was observed in this study might contribute to irrational use of antimalarials, since most of febrile illnesses are associated with malaria infection. Some of the observed antimalarials prescriptions were mainly based on the clinical presentation rather than confirmed tests. This was also reported by another study indicating that misdiagnoses are likely to occur especially in health facilities that lack malaria diagnostic kits and/ or light microscope [McGregor, 1984]. The study supports that unnecessary treatments using both antimalarials and antibiotics may lead to an increase of drug resistance [Mboera *et al.* 2006].

In conclusion, the study supports the fact that barriers to improvement in the guidelines performance can be overcome by improved health-worker training and targeted health promotion. Interventions such as provision of clear and simplified instructions to health-care providers about when to give such treatment might be associated with increased uptake [Ouma *et al.* 2010]. Most of the health care providers reported that they have read treatment guideline for malaria in pregnant women, but did not have sufficient knowledge on the correct use of ALu during pregnancy. Even though some have received training on how to use ALu their low level of knowledge was not different from those who had not receive training. This raises a question of the quality of trainings that have been conducted. It is therefore important for the MOH to develop

quality training programmes and continue engaging health care providers to ensure correct use of ALu for proper management of malaria in pregnancy.

Sustainable supervision and continuous mentoring at these facilities will help to update health care providers on a number of issues that must be considered in malaria prevention and treatment in pregnant women. Constant supervision will help these providers to continuously provide quality health care, while mentoring will facilitate dissemination of information among health care providers.

Studies on the assessment of the public knowledge on different health interventions are advocated inorder to identify the gaps in knowledge so as to institute the appropriate interventions where necessary. Moreover, the use of community health workers should be highly encouraged since they are the perfect people to disseminate information on malaria management in the community. The community health care workers can disseminate malaria education at ease since most of them live in these communities and are well known and respected in their communities, and therefore can easily communicate with them.

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ANNEX 1

ANNEX 1A

QUESTIONARE FOR PREGNANT WOMEN

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

THE IMPLEMENTATION OF NATIONAL POLICY ON MALARIA PREVENTION AND TREATMENT IN PREGNANT WOMEN

DATE:_____ NAME OF THE FACILITY:_____

Personal history of pregnant woman:

1. Questionnaire number: _____
2. How old are you?_____
3. What is your level of education?
    a. I have never attended school
    b. I have been to Madras
    c. Primary education – not completed
    d. Primary education – completed
    e. Secondary education – completed
    f. Secondary education – not completed
    g. Higher education – completed
    h. Higher education – not completed
    i. Others _____
    j. What do you do for living?
4. What do you do for living:
    a. House wife
    b. Self employed
    c. Employed
    d. Studying
    e. Other, please mention _____

5. Marital status
    a. Married
    b. Single
    c. Divorced
    d. Widowed
    e. Cohabiting
6. Which village are you coming from? _____
7. Do you incur any cost when travelling to the health facility from home?
    a. Yes
    b. No
8. If yes, how much does it cost you? _____

9. Is there a time when you fail to come to the hospital because of travelling expenses?
    a. Yes
    b. No
10. Is there a time when you fail to come to the hospital because of difficulties in means of transport?
    a. Yes
    b. No

Pregnancy history:

11. In which gravida are you?_____
12. Have you lost any pregnancy?
    a. Yes
    b. No
13. If yes, how many pregnancies? _____
14. How many deliveries have you had? _____
15. How many children died? _____
16. How many children do you have? _____

Antenatal clinic attendance:

17. How many times have you visit the ANC during this pregnancy? _____
18. What is your gestation age?_____
19. How old was your pregnancy when you started attending ANC? _____
20. Do you think its important to attend early at the ANC?
    a. Yes
    b. No
    c. I don't know
21. If yes, what is the importance of early ANC attendance?

_____

_____

Knowledge of pregnant women on malaria:

22. How do you protect yourself from getting malaria?
    a. I don't use any protection
    b. I use unprotected bed nets
    c. I use insecticide treated bed nets
    d. I take IPT using SP when pregnant
    e. I spray insecticides in the house
    f. Others, please mention_____

The level of understanding of pregnant women on medications used for IPT:

23. Do you know the antimalarial used for IPT
    a. Yes
    b. No
24. Please mention it _____
25. How many doses of this medication are given throughout pregnancy?
    a. One
    b. Two

c. More than two

26. How many tablets are given at once?

a. 1
b. 2
c. 3
d. 4
e. Others _____

27. At what pregnancy stage is this medication given? (months)

a. 1- 3
b. 4- 6
c. 7- 9

28. Do you pay for medications used for IPT or you get them for free?

_____

29. Have you been given SP tablets during this pregnancy

a. Yes
b. No

30. How many tablets did you take at once?

a. 1
b. 2
c. 3
d. 4

31. How many SP doses have you had during this pregnancy?

a. 1
b. 2
c. 3
d. Others _____

32. Did you swallow these medications infront of a health care provider

a. Yes
b. No

33. If no, then where did you take these medications?

_____

34. What was the reason of not swallowing the medications infront of health care provider?
    a. I was not required to do so
    b. Lack of clean water
    c. Lack of glasses/utensils
    d. I was told to have my meal first
    e. Other reasons, mention _____
35. Do you get any problems when using these medications?
    a. Yes
    b. No
    c. I don't know
36. If yes, what problems do you get when using these medications?
    a. Rashes
    b. High fever
    c. Headache
    d. Stomach discomfort
    e. Other problems, please mention _____
37. What problems have you heard that other pregnant women face when using these medications?
    a. Rashes
    b. High fever
    c. Headache
    d. None
    e. Other problems, please mention _____
38. Do you believe this medication is safe for the unborn baby?
    a. Yes
    b. No
    c. I don't know
39. What problems have you heard occurring to the unborn babies when these medications are taken by a pregnant woman
    a. Poor health

b. Death of unborn baby

c. Blindness

d. Skin discolouration

e. Other problems, mention _____

Knowledge on medications used for malaria treatment:

40. Have you had malaria infection during this pregnancy period?

    a. Yes

    b. No

41. What medication were you given when suffering from malaria?

    a. Quinine

    b. SP

    c. Metakelfin

    d. ALu

    e. I don't know

    f. Others_____

42. Have you use ALu when pregnant?

    a. Yes

    b. No

    c. I don't know

43. If yes, how old was the pregnancy?

    a. 1-3

    b. 4-6

    c. 7-9

44. Were you instructed on how to take the medication?

    a. Yes

    b. No

45. How many tablets of ALu are taken as adult dose?

    a. 1

    b. 2

    c. 3

d. 4

46. Do you know the importance of taking food before administering ALu?

    a. Yes

    b. No

47. Did you get any complications when you took these medications when pregnant?

    a. Yes

    b. No

48. What problems do pregnant women get when taking ALu?

    a. Muscle aches

    b. Abortion

    c. Death of unborn baby

    d. No problem

    e. Others _____

49. In your views, what are the shortcomings of ALu when used for malaria treatment?

    a. Pill burden

    b. Very long dose

    c. Complicated dosage regimen

    d. Malaria recurrent

    e. No shortcomings

    f. Others _____

50. Do you believe these medications are safe to the unborn baby?

    a. Yes

    b. No

    c. I don't know

51. What complications have you seen or heard occurring to the unborn babies due to ALu when taken by pregnant woman?

    a. Death of unborn baby

    b. Premature birth

    c. Baby born without some of the organs

    d. Child born with malaria

e. Others _____

Quality of service offered by the health facility:

52. What do you do when the drugs for treatment of malaria are unavailable at the health facility?
    i. I buy at the medical store/pharmacy
    ii. I go to another health facility
    iii. I don't do anyting
    iv. Other options, mention _____
53. What do you do when the drugs for treatment of malaria are unavailable at the health facility?
    v. I buy at the medical store/pharmacy
    vi. I go to another health facility
    vii. I don't do anyting
    viii. Other options, mention _____
54. Is the information on how to prevent yourselves from malaria given by the health care providers sufficient enough?
    a. Yes
    b. No
55. Use of SP tablets as recorded on ANC cards:

    _____

    _____

ANNEX IB

DODOSO KWA MAMA WAJAWAZITO

CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI MUHIMBILI

UTEKELEZAJI WA MPANGO WA TAIFA WA KUDHIBITI MALARIA KWA MAMA WAJAWAZITO KWA KUTUMIA DAWA YA SP NA KUTIBU MALARIA KWA KUTUMIA DAWA YA MSETO

TAREHE:_____ JINA LA KITUO:_____

Historia ya mama mjamzito:

1. Namba ya utambulisho_____
2. Una miaka mingapi?_____
3. Una kiwango gani cha elimu?
    a. Sijaenda shule
    b. Elimu ya dini (Madrasa)
    c. Elimu ya msingi sikumaliza
    d. Nimemaliza elimu ya msingi
    e. Elimu ya sekondari-Nimemaliza
    f. Elimu ya sekondari-Sijamaliza
    g. Elimu ya Juu-Nimemaliza
    h. Elimu ya Juu-Sijamaliza
    i. Nyingineyo, tafadhari taja _____
4. Unafanya kazi gani?
    a. Mama wa nyumbani
    b. Nimejiajiri (Biashara ndogondogo)
    c. Nimeajiriwa
    d. Niko masomoni
    e. Nyingineyo, tafadhari taja _____
5. Hali ya ndoa?
    a. Nimeolewa
    b. Sijaolewa
    c. Nimeachika

d. Mjane
e. Naishi na mwenza

6. Unaishi kijiji gani?_____
7. Kuna gharama yoyote unaingia kutokea hapo unapoishi kuja hapa kituoni?
    a. Ndiyo
    b. Hapana
8. Kama ndiyo huwa unalipa kiasi gani? _____
9. Kuna wakati unashindwa kuja hapa kituoni sababu ya gharama ya usafiri?
    a. Ndio
    b. Hapana
10. Kuna wakati unashindwa kuja hapa kituoni sababu ya ukosefu wa usafiri
    i. Ndiyo
    ii. Hapana

Historia ya mimba:

11. Hii ni mimba yako ya ngapi?_____
12. Je umeshapoteza mimba yoyote?
    a. Ndio
    b. Hapana
13. Kama ndio kwa swali la juu je, ni mimba ngapi zilipotea? _____
14. Umezaa watoto wangapi?_____
15. Umezaa watoto wafu wangapi_____
16. Una watoto wangapi?_____

Mahudhurio ya kliniki:

17. Hii ni mara ya ngapi kuhudhuria kliniki?_____
18. Mimba yako ina miezi mingapi sasa?_____
19. Umeanza kuhudhuria kliniki wakati ujauzito wako ukiwa una miezi mingapi? _____.
20. Unadhani ni muhimu kuhudhuria kliniki mapema?

d. Ndio
e. Hapana
f. Sijui

21. Kama jibu hapo juu ni ndio je, kuna faida gani ya mama mjamzito kuhudhuria kliniki mapema?

_____

_____

_____

Uelewa wa mama mjamzito kuhusiana na malaria:

22. Ni vipi unajikinga na malaria hasa wakati wa ujauzito?
    a. Situmii kinga yeyote
    b. Natumia chandurua cha kawaida
    c. Natumia chandarua kilichowekewa dawa
    d. Nakunywa dawa za kujikinga na malaria
    e. Napuliza dawa ya kuua mbu ndani ya nyumba
    f. Njia nyingine, taja _____

Uelewa wa mama mjamzito juu ya dawa zinazotumika kama kinga ya malaria wakati wa ujauzito:

23. Je unafahamu dawa yoyote inayotumika kama kinga ya malaria kwa ujauzito?
    a. Ndio
    b. Hapana
    c. Sijui
24. Tafadhali taja _____
25. Je ni dozi ngapi hutumika wakati wa ujauzito?
    a. 1
    b. 2
    c. 3 na zaidi
26. Je ni vidonge vingapi humezwa kwa mara moja?

a. 1

b. 2

c. 3

d. 4

e. Nyinginezo _____

27. Hupewa ujauzito ukiwa na umri gani? (miezi)

    a. 1- 3

    b. 4- 6

    c. 7- 9

28. Dawa hizi huuzwa au hupatikana bure? _____

29. Je umepatiwa dawa hizi katika kipindi hiki cha ujauzito

    a. Ndio

    b. Hapana

30. Umepatiwa vidonge vingapi kwa mara moja?

    a. 1

    b. 2

    c. 3

    d. 4

31. Umepatiwa dozi ngapi za SP katika kipindi hiki cha ujauzito?

    a. 1

    b. 2

    c. 3

    d. Nyingine _____

32. Umemeza dawa hizi mbele ya muhudumu wa afya?

    a. Ndio

    b. Hapana

33. Kama hapana, je umemezea wapi dawa hizi?

    _____

34. Kama hapana, je ni sababu zipi zilifanya usimeze dawa hizo mbele ya mtoa huduma?

    a. Sikuambiwa nimezee dawa hizo mbele ya mtoa huduma

b. Ukosefu wa maji safi ya kumezea dawa
c. Ukosefu wa vikombe/glass za kumezea dawa
d. Niliambiwa kwanza nikale chakula nyumbani
e. Sababu nyingine, tafadhali zitaje _____

35. Je unapata matatizo yoyote unapomeza dawa hizi?
    a. Ndio
    b. Hapana
    c. Sijui
36. Kama jibu ni ndio, taja matatizo unayopata kutokana na matumizi ya dawa hizi?
    a. Vipele
    b. Homa kali
    c. Kichwa kiliuma
    d. Tumbo linauma
    e. Taja matatizo mengine _____
37. Kama jibu ni hapana kwa swali namba 24 je, sababu zipi zilifanya usipate dawa hizo wakati wa ujauzito?
    a. Hazikuwepo kituoni
    b. Nilikataa kumeza
    c. Napata matatizo ninapotumia dawa hizo
    d. Sikwenda kliniki
    e. Taja sababu nyingine _____
38. Je, unaamini dawa hizi ni salama kwa mtoto aliye tumboni?
    a. Ndiyo
    b. Hapana
    c. Sijui
39. Ni matatizo yapi uliosikia au kuona yamepatikana kwa mtoto aliyetumboni kutokana na kumezwa kwa dawa hizi?
    a. Afya mbovu anapozaliwa
    b. Kufa tumboni
    c. Kupofuka macho

d. Matatizo ya ngozi
e. Taja tatizo lingine _____

Maelezo ya dawa zinazotumika kutibu malaria wakati wa ujauzito:

40. Je umeshawahi kuumwa homa ya malaria katika kipindi hiki cha ujamzito?
    c. Ndio
    d. Hapana
41. Ulipoumwa malaria wakati wa ujauzito ni dawa ipi/zipi ulipatiwa kama tiba katika kituo cha afya?
    g. Quinine
    h. SP
    i. Metakelfine
    j. Dawa mseto
    k. Sijui
    l. Nyinginezo, tafadhari zitaje_____
42. Umeshawahi kutumia dawa mseto za malaria wakati wa ujauzito?
    d. Ndio
    e. Hapana
    f. Sijui
43. Kama jibu ni ndiyo je, mimba ilikuwa na miezi mingapi?
    d. 1-3
    e. 4-6
    f. 7-9
44. Je ulielekezwa namna ya kunywa hizo dawa mpaka ziishe?
    c. Ndiyo
    d. Hapana
45. Je ALu inamezwa vidonge vingapi kwa mtu mzima?
    e. 1
    f. 2
    g. 3

h. 4

46. Unafahamu umuhimu wa kula chakula kabla ya kumeza dawa hizi?
    c. Ndiyo
    d. Hapana
47. Kuna madhara yeyote uliyoyapata ulipokunywa dawa za mseto ukiwa mjamzito?
    a. Ndiyo
    b. Hapana

48. Kama ndio kuna matatizo gani ulipata kutokana na umezaji wa dawa mseto kwa mama mjamzito?
    a. Kuumwa sana na mwili
    b. Kuharibika ujauzito
    c. Mtoto kufia tumboni
    d. Hakuna tatizo
    e. Sijui
    f. Taja mengine_____
49. Kuna mapungufu yapi unayoyaona katika hizi dawa mseto za malaria zinazotumika kutibu malaria?
    a. Vidonge vingi
    b. Dozi ya siku nyingi
    c. Masaa ya kumeza dawa yanachanganya
    d. Malaria hurudia baada ya mda mfupi
    e. Hakuna tatizo
    f. Sijui
    g. Taja mengine_____
50. Je, unaamini dawa hizi ni salama kwa mtoto aliye tumboni?
    a. Ndiyo
    b. Hapana
    c. Sijui

Utolewaji huduma ya afya katika kituo:

51. Madawa ya kinga ya malaria kwa akina mama wajawazito yanapokosekana kliniki huwa unafanyaje?
    a. Nanunua kwenye duka la dawa
    b. Naenda kwenye kitu cha afya kingine
    c. Sihangaiki kutafuta dawa
    d. Maelezo mengine, tafadhari taja_____
52. Madawa ya tiba yanapokosekana kliniki huwa unafanyaje?
    a. Nanunua kwenye duka la dawa
    b. Naenda kwenye kitu cha afya kingine
    c. Sihangaiki kutafuta dawa
    d. Maelezo mengine, tafadhari taja_____
53. Je maelekezo yatolewayo na wahudumu wa afya kuhusu kujikinga na malaria kwa wajawazito yanatosheleza
    a. Ndiyo
    b. Hapana
    c. Sijui
54. Maelezo ya matumizi ya SP kwenye kadi ya kliniki

    _____

    _____

ANNEX II

ANNEX IIA

FOCUSED GROUP DISCUSSION

PROBES FOR PREGNANT WOMEN

NAME OF HEALTH FACILITY:_____ DATE:_____

1. **Use of health facility:**

a. When do you come to the health facility?

b. At what pregnancy stage do women start attending the ANC?

c. Are you aware of any obstacle that might force pregnant women not to attend the ANC?

2. **Level of knowledge of pregnant women on Malaria:**

a. Mention diseases causing deaths among pregnant women and children under 5?

b. How do we get malaria?

3. **The awareness of pregnant women on the drugs used for IPT:**

a. What is your understanding on the drug used for IPT?

b. Have you heard or experience any problems caused by the use of the drugs whether to the pregnant woman or the unborn baby?

4. **The level of knowledge of pregnant women of the drug used for malaria treatment:**

a. What medication do you take when suffering from malaria?

b. Have you heard or experience any problems when using these drugs?

c. What are the shortcomings of ALu when used as the first line drug for malaria treatment?

5. **The quality of health care at the health facility:**

a. Are you satisfied with the quality of care you get when attending the ANC in this health facility?

ANNEX IIB

FOCUSED GROUP DISCUSSION

MASWALI KWA MAMA WAJAWAZITO

JINA LA KITUO:_____ TAREHE:_____

1. **Matumizi ya vituo vya afya:**
    a. Ni wakati gani hasa mnakuja katika vituo vya afya?
    b. Kwa kawaida akina mama wengi huanza kuhudhuria kliniki ujauzito ukiwa na wiki ngapi?
    c. Unafahamu vipingamizi vyovyote vinavyofanya akina mama wajawazito wasitumie vituo vya afya?
2. **Elimu ya mama mjamzito kuhusiana na malaria:**
    a. Ni magonjwa yapi yanayosababisha vifo kwa wingi Tanzania hasa kwa mama wajawazito na watoto?
    b. Malaria husababishwa na nini?
3. **Uelewa wa mama mjamzito juu ya dawa zinazotumika kama kinga ya malaria kwa mama mjamzito:**
    a. Je mnafahamu nini kuhusu dawa wanazopewa wajawazito kama kinga ya malaria?
    b. Mmeshasikia matatizo yoyote yanatokea kutokana na umezaji wa dawa hizo kwa mama mjamzito au mtoto alie tumboni?
4. **Elimu ya dawa zinazotumika kutibu malaria:**
    a. Ni dawa ipi/zipi hunapatikana kutibu malaria katika kituo hiki?
    b. Kuna matatizo gani yanapatikana kutokana na umezaji wa dawa mseto kwa mama mjamzito au mtoto alie tumboni?
    c. Kuna mapungufu yapi unayoyaona katika hizi dawa mseto za malaria zinazotumika kutibu malaria?
5. **Utolewaji huduma ya afya katika kituo:**
    a. Mnaridhika na huduma mnayopatiwa katika kituo hiki cha afya hasa unapokuja kliniki?

ANNEX III

ANNEX IIIA

QUESTIONNAIRE FOR HEALTH CARE PROVIDERS

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

MASTERS BY RESEARCH-2010

THE IMPLEMENTATION OF NATIONAL POLICY ON MALARIA PREVENTION AND TREATMENT IN PREGNANT WOMEN

DATE: _____ NAME OF THE FACILITY: _____

Personal history:

1. Questionnaire number _____
2. Sex: Male _____/ Female _____
3. What is your age?_____
4. What is your education level?_____
5. When did you finish your professional studies? _____
6. How long have you been working as a heath care provider? _____
7. What is your designation as the health care provider? _____
8. What is your professional level? _____
9. Marital status _____
    a. Single
    b. Married
    c. Cohabiting
    d. Separated
    e. Widowed
    f. Divorced

Implementation of national guidelines for malaria prevention and treatment at the health facility:

10. Do you have the national guideline on malaria prevention and treatment in pregnancy?
    a. Yes
    b. No
    c. I don't know

11. Is the language used in guideline understandable?
    a. Yes
    b. No
    c. I don't know

12. Do you use it?
    a. Yes
    b. No
    c. I don't know

13. Have you attended any special training in relation to Malaria treatment in pregnant women?
    a. Yes
    b. No

14. Have you attended any special training in relation to Malaria prevention in pregnant women?
    a. Yes
    b. No

If the answer is yes to question 13 and 14 answer question 15 and 16

15. When did you attend that training? _____
16. How long was the training? _____

17. Which drug (IPT) do you give pregnant women for prevention of malaria? _____
18. How many tablets? _____
19. How many doses are given throughout pregnancy? _____
20. At what stage of pregnancy do you give this medication? _____
21. Are these drugs administered at the health facility (Directly Observed Therapy)? Yes/No:_____
22. Can you estimate the percentage of women administering these drugs at home? _____
23. What could be the reason(s) for other women to administer this drug at home? _____ _____
24. Do you face any problems when dispensing these drugs used for IPT? a. Yes
    c. No
25. If the answer is yes, please list the problems faced: _____ _____
26. What is the drug that you normally give to pregnant women with uncomplicated malaria? _____
27. How many ALu tablets are administered at once by an adult? _____
28. How many doses are administered in 24 hours? _____
29. What is the dose duration? _____
30. At what stage of pregnancy is this ALu given in pregnant women?
    a. 1st trimester
    b. 2nd trimester
    c. 3rd trimester
31. Where are ALu administered? _____
32. Do you face any problems when dispensing these drugs used for malaria treatment?
    a. Yes

b. No

33. If yes, list the problems you are facing:

_____

_____

34. Was the training received sufficient enough to enable you to work efficiently at the ANC?
    a. Yes
    b. No
35. If not, what more should be included in these trainings?

_____

_____

36. Do you face any challenges while implementing these national guidelines?
    a. Yes
    b. No
37. List problems faced:

_____

_____

38. As the health provider how do you address these problems?

_____

_____

Availability of drugs at the health facility:

39. What comment do you have in relation to drug availability at the facility especially Sulphadoxine- pyrimethamine (SP).
    a. Very sufficient
    b. Satisfactory
    c. Insufficient
    d. I don't know
40. What comment do you have in relation to drug availability at the facility especially Artemether- Lumefantrine (ALu).
    a. Very sufficient

b. Satisfactory
c. Insufficient
d. I don't know

41. What do you do when these drugs are out of stock?
    a. Borrow from the neighboring health facility
    b. Advise the patient to buy from private pharmacies
    c. Advise the patient to go to another clinic
    d. Advise the patient to come after sometime
    e. Other _____

Adherence of pregnant women to IPT and Alu for malaria treatment:

42. Do you have a standard adherence strategy at the ANC in this facility to support your patients to adhere to IPT?
    a. Yes
    b. No
43. If yes, is it documented?
    a. Yes
    b. No
44. How do you make sure that pregnant women take SP for IPT as required?

    _____

    _____
45. Estimate the percentage of pregnant women attending ANC in this facility who adhere to IPT using SP:_____
46. Are there any factors causing women not to adhere to IPT using SP?
    a. Yes
    b. No
    c. I don't know
47. If yes, what factors contribute to none-adherence of pregnant women to IPT using SP.

    _____

_____

_____

48. Do you have a standard adherence strategy at the ANC in this facility to support your patients to adhere to malarial treatment?
    a. Yes
    b. No
    c. I don't know
49. If yes, is it documented?
    a. Yes
    b. No
    c. I don't know
50. How do you make sure that pregnant women adhere to malaria treatment as required? _____
51. Are there any factors causing women not to adhere to malaria treatment using ALu.
    a. Yes
    b. No
    c. I don't know
52. What factors contribute to none-adherence of pregnant women to malaria treatment.

_____

_____

Please give your views on the following (probe):

53. How would you compare IPT adherence between women on their 1st pregnancy and to those who already have children?

    _____

    _____

54. How would you compare adherence to IPT between older women and younger one?

_____

_____

55. Do you think patient's educational level affect adherence to IPT?
    a. Yes
    b. No
    c. I don't know
56. Do you think the distance to the health facility affects adherence to IPT?
    a. Yes
    b. No
    c. I don't know
57. Could the side effects of SP affect adherence?
    a. Yes
    b. No
    c. I don't know
58. Could the side effects of Alu affect adherence?
    a. Yes
    b. No
    c. I don't know
59. Does lack of injectables and syrup formulations affect the adherence of malarial treatment using ALu?
    a. Yes
    b. No
    c. I don't know

Safety and efficacy of antimalarials to pregnant women:

60. Do you think ALu is safe enough to be given to pregnant women?
    a. Yes
    b. No
    c. I don't know
61. List any side effects you have encountered due to the use of ALu

_____

_____

62. Have you received any complains in relation to the usage of SP for IPT?
    a. Yes
    b. No
    c. I don't know

63. If yes, list the problems stated:

_____

_____

_____

64. Since the introduction of ALu as the first line drug in treatment of malaria, would you say malaria cases have:
    a. Decreased
    b. Been constant
    c. Increased
    d. I don't know

ANNEX IIIB

DODOSO KWA WAFANYAKAZI

CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI MUHIMBILI

UTEKELEZAJI WA MPANGO WA TAIFA WA KUDHIBITI MALARIA KWA MAMA WAJAWAZITO KWA KUTUMIA DAWA YA SP NA KUTIBU MALARIA KWA KUTUMIA DAWA YA MSETO

TAREHE:_____ JINA LA KITUO:_____

Historia ya mfanyakazi:

1. Namba ya utambulisho_____
2. Jinsia: Mume_____/ Mke_____
3. Una umri wa miaka mingapi? _____
4. Una kiwango gani cha elimu? _____
5. Umemaliza mafunzo yako ya awali mwaka gani? _____
6. Umekuwa ukifanya kazi kama muhudumu wa afya kwa muda gani?_____
7. Taaluma yako ni ipi kama mtoa huduma ya afya? _____
8. Je una cheo gani?_____
9. Hali ya ndoa_____
    a. Sijaolewa
    b. Nimeolewa
    c. Naishi na bwana/ bibi
    d. Tumetengana
    e. Nimefiwa na mwenza
    f. Tumeachana

Utekelezaji wa muongozo wa taifa katika kuzuia na kutibu malaria kwa mama wajawazito katika kituo cha afya:

10. Je hapa kituoni kuna mwongozo wa taifa wa kuzuia na kutibu malaria kwa mama wajawazito?
    a. Ndio
    b. Hapana

c. Sijui

11. Lugha inayotumika katika muongozo huo ni ya kueleweka?
    a. Ndio
    b. Hapana
    c. Sijui
12. Je muongozo huo unatekelezeka?
    a. Ndio
    b. Hapana
    c. Sijui
13. Umehudhuria mafunzo yoyote kuhusiana na kinga ya malaria kwa wajawazito?
    a. Ndio
    b. Hapana
14. Umehudhuria mafunzo yoyote kuhusiana na tiba ya malaria kwa wajawazito?
    a. Ndio
    b. Hapana

Kama jibu ni ndio kwa swali namba 13 na au 14 jibu swali la 15 na 16:

15. Mafunzo hayo ulienda lini?_____ (Mwaka)
16. Mafunzo hayo yalikuwa ya siku ngapi?_____
17. Ni dawa ipi mnatoa kama kinga ya malaria kwa wajawazito? _____
18. Mnatoa vidonge vingapi kwa mara moja?_____
19. Mnatoa dozi hiyo mara ngapi katika kipindi chote cha ujauzito?_____
20. Mnatoa dawa hii ujauzito ukiwa na miezi mingapi:_____
21. Je mnapowapatia wajawazito dawa hizi uwa wanazimezea wapi?_____.
22. Unaweza kukadiria asilimia ya wajawazito wanaomeza dawa hizi nyumbani?_____.

23. Ni sababu zipi zinawafanya wajawazito kumeza dawa hizi nyumbani?
    _____
    _____
24. Unapata matatizo yoyote unapokuwa unawapatia dawa hizi za kinga kwa wajawazito:
    i. Ndio
    ii. Hapana
25. Kama ndio, tafadhali taja matatizo unayopata:
    _____
    _____
26. Ni dawa ipi mnawapatia wajawazito wanapokuja wanaumwa malaria _____
27. Dawa hii inamezwaje vidonge vingapi kwa mara moja? _____
28. Inamezwa mara ngapi kwa siku? _____
29. Dozi yake ni ya siku ngapi? _____
30. Inapewa katika kipindi gani cha ujauzito?
    a. Miezi mitatu ya mwanzo
    b. Miezi mitatu ya kati
    c. Miezi mitatu ya mwisho
31. Je dawa hizi za mseto za tiba wanapopatiwa wajawazito uwa wanazimezea wapi?
    _____.
32. Mnapata matatizo yoyote mnapotoa dawa hizi kutibu malaria.
    i. Ndio
    ii. Hapana
33. Kama ndio taja matatizo unayopata:
    _____
    _____
34. Je mafunzo uliyopata kuhusiana na kinga na tiba ya malaria yanakuwezesha kufanya kazi kwa ufanisi zaidi:

a. Ndio

b. Hapana

35. Kama hapana unadhani ni mambo yapi yangeweza kuongezewa kuboresha mafunzo haya?

    _____

    _____

36. Je unapata matatizo yoyote katika kutekeleza mpango huu wa taifa?
    a. Ndio
    b. hapana
37. Kama ndio taja mambo yanayokwamisha utekelezaji wa mpango huu wa taifa katika kituo hiki:

    _____

    _____

38. Kama muhudumu wa afya unatatua vipi matatizo hayo?

    _____

    _____

Upatikanaji wa madawa katika kituo cha afya:

39. Unamaoni gani kuhusiana na upatikanaji wa SP katika kituo hiki cha afya
    a. Yanatosheleza
    b. Yapo kiasi
    c. Hakuna
    d. Sijui
40. Unamaoni gani kuhusiana na upatikanaji wa dawa mseto-Alu katika kituo hiki cha afya
    a. Yanatosheleza
    b. Yapo kiasi
    c. Hakuna
    d. Sijui
41. Mnafanyaje madawa haya yanapokosekana kituoni?
    a. Tunaomba kutoka kituo kingine cha afya

b. Tunashauri wajawazito wajinunulie
c. Tunawashauri waende kwenye kituo kingine cha afya
d. Hatufanyi chochote
e. Hatua ingine, taja _____

Ufuatiliaji wa mama wajawazito katika matumizi ya SP kwa kinga na dawa mseto kwa tiba ya malaria.

42. Je kuna mkakati wowote kuhakikisha wajawazito wanaokuja kliniki katika kituo hiki cha afya wanatumia SP kwa wakati unaotakiwa?
    a. Ndio
    b. Hapana
    c. Sijui
43. Kama ndio, je mkakati huo uko kwenye maandishi?
    a. Ndio
    b. Hapana
    c. Sijui
44. Ni kwa vipi mnahakikisha wajawazito wanatumia SP kama inavotakiwa?
    _____
    _____
    _____
45. Tafadhali kadiria asilimia ya wajawazito wanaohudhuria kliniki katika kituo hiki wanaofuatilia matumizi ya SP ili kujikinga na malaria.
    _____
46. Je kuna sababu zozote zinazosababisha wajawazito kushindwa kuzingatia matumizi ya SP kwaajili ya kujikinga na malaria:
    a. Ndio
    b. Hapana
    c. Sijui
47. Kama ndio taja sababu hizo:
    _____
    _____

48. Je kuna mkakati wowote wa kuhakikisha wajawazito wanaokuja kliniki katika kituo hiki cha afya wanazingatia matumizi sahihi ya ALu wanapokuwa na malaria?
    a. Ndio
    b. Hapana
    c. Sijui
49. Kama ndio, je mkakati huo uko kwenye maandishi?
    a. Ndio
    b. Hapana
    c. Sijui
50. Ni kwa vipi mnahakikisha wajawazito wanatumia ALu kama inavotakiwa kutibu malaria?_____
51. Je kuna sababu zozote zinazosabashia wajawazito kushindwa kuzingatia matumizi sahihi ya Alu kujikinga na malaria:
    a. Ndio
    b. Hapana
    c. Sijui
52. Kama ndio, taja sababu hizo: _____

Tafadhali tupe mtazamo wako katiko maswali yafuatayo:

53. Linganisha ufatiliaji wa matumizi ya SP kama kinga kwa wale wajawazito wa mara ya kwanza na wale ambao tayari wana watoto wengine?
    a. Wajawazito wa mara ya kwanza wanazingatia zaidi matumizi ya SP.
    b. Wajawazito wenye watoto wengine wanazingatia zaidi matumizi ya SP.
    c. Wajawazito wote wanazingatia sawasawaya SP.
54. Linganisha ufatiliaji wa matumizi ya SP kama kinga kwa wale wajawazito vijana na watu wazima?
    a. Wajawazito wa vijana wanazingatia zaidi matumizi ya SP.
    b. Wajawazito watu wazima wanazingatia zaidi matumizi ya SP.
    c. Wajawazito wote wanazingatia sawasawaya SP.

55.Unadhani kiwango cha elimu cha mama mjamzito kuhusiana na kinga na tiba ya malaria kinachangia katika ufatiliaji wa SP kwa kinga?

a. Ndio

b. Hapana

c. Sijui

56.Unadhani umbali kutoka makazi ya mjamzito na kituo cha afya unachangia katika ufuatiliaji wa SP kwa kinga?

a. Ndio

b. Hapana

c. Sijui

57.Inawezekana madhara ya SP yanachangia kutofatilia umezaji wa dawa hizi kwa wajawazito?

a. Ndio

b. Hapana

c. Sijui

58.Inawezekana madhara ya Alu yanachangia kutofatilia umezaji sahihi wa dawa mseto?

a. Ndio

b. Hapana

c. Sijui

59.Inawezekana ukosefu wa sindano na dawa ya maji ya Alu kuchangia kutofatilia matibabu ya malaria kwa kutumia dawa mseto hasa kwa watoto?

a. Ndio

b. Hapana

c. Sijui

Usalama na ubora wa madawa yanayotumika kwa kinga na tiba ya malaria:

60. Unadhani dawa mseto ni salama kwa mama mjamzito?

a. Ndio

b. Hapana

c. Sijui

61. Kama jibu ni hapana, taja matatizo uliyowahi kuona/kusikia yanapatikana kutokana na umezaji wa dawa mseto.

_____

_____

62. Umeshawahi kupata malalamiko yoyote yanayotokana na matumizi ya SP kwa mama wajawazito?

a. Ndio

b. Hapana

c. Sijui

63. Kama ndio,taja matatizo:

_____

_____

64. Tokea Alu imetambulishwa kama dawa ya kutibu malaria unadhani tatizo la malaria katika kituo hiki

a. limepungua

b. liko kawaida

c. limeongezeka

d. sijui

ANNEX IV

HEALTH FACILITY ASSESSMENT FORM

ASSESSMENT OF THE IMPLEMENTATION TO THE NATIONAL POLICY FOR THE PREVENTION AND TREATMENT OF MALARIA IN PREGNANT WOMEN IN TANZANIA

A. Description of the health facility: *(To be answered by in-charge of the facility)*	
1.Name of the facility:	2.Type of the facility:
	a. Hospital b. Health centre c. Dispensary
3.Place/township:	4.Ownership:
	a. Government b. Private c. NGO
5.Closest referral facility:	6.Date of the assessment:
7.Accessibility to the facility:(Infrastructure)	8.The catchment area for the facility (How many villages does the facility serve)
a. Means of Transport i.) Available/ ii.)Unavailable b. Road networks i.) Available/ b.) Unavailable c. Other means of transport available: _____	
9. Does the facility currently offer the ANC services:	10. Designation of the in-charge of the facility:
a. Yes b. No	a. Medical doctor b. Assistant medical doctor c. Clinical officer

	d. Nurse e. Other _____
11. Designation of the incharge of the ANC:	12. Qualification and number of staff working at the ANC:
a. Medical doctor b. Assistant medical doctor c. Clinical officer d. Nurse e. Other _____	

B. Staffing at the facility: *(To be answered by the incharge of the facility)*		
Designation	1.Present/2.Absent	Number of staff
13. Medical doctors		
14. Assistant medical officers		
15. Clinical officers		
16. Pharmacists		
17. Pharmaceutical technicians		
18. Pharmaceutical assistants		
19. Nursing officers		
20. Assistant Nursing officer		
21. Nurse-midwives		
22. Nurse assistants		
23.Public health nurse		
24. Others: _____		

C. ANC RECORDS AND USE OF SP FOR IPT: *(To be answered by incharge of ANC)*	
25. The approximation number of child bearing women present within the catchment in 2011:	26.The approximate number of pregnant women who attended at ANC at the year 2011:
27.The number of pregnant women enrolled at the ANC in 2011:	28. The number of pregnant women who delivered at the facility in 2011:
29. The number of pregnant women who were given atleast one dose of SP for IPT in 2011:	30. The number of pregnant women in the second and third trimester who have not been given SP for IPT to date:
One dose _____, Two doses _____	
31. Total number of maternal death at the facility in 2011:	32. Total number of maternal deaths due to malaria in 2011:
33. Total number of babies born at the facility in 2011:	34. Total number of LBW babies born at the facility in 2011:

D. Training: *(To be answered by training coordinator or DAC at the facility)*

35. How many staff at the facility have attended training on malaria treatment for pregnant women for the last 5 years? _____.

36. Please give the following details of the staff that have attended training at the facility:

Designation:	Type of training (year) and organizers:	Duration of training
a.		
b.		
c.		
d.		
e.		
f.		
g.		
h.		
i.		
j.		

37. How many staff <u>at the ANC</u> have attended training on malaria prevention for pregnant women for the last 5 years? _____.

38. Please give the following details of the staff that have attended training at the ANC at the facility:

Designation:	Type of training (year) and organizers:	Duration of training
a.		
b.		
C.		
d.		
e.		
f.		
g.		
h.		
i.		
j.		

E. Availability of drinking water at the facility: *(To be answered by the incharge of ANC)*	
39. Is clean water available:	1. Yes 2. No
40. The source of clean water if available:	1. Tape water 2. Hand pump 3. Deep well 4. Shallow well 5. Others _____
41. Walking time to the available source of water:	_____/ min

F. Availability and management of antimalarials at the health facility : *(To be answered by the store manager)*

42. Which antimalarial drugs are used in your health facility for treatment of malaria?

a. Metakelfin- (Sulphamethoxyprazine pyrimethamine)

b. Fansidar- (Sulphadoxine pyrimethamine)

c. ALU

d. Quinine tabs

e. Quinine injection

f. Artemether injection

g. Others: _____

43. What method(s) do you regularly use to estimate quantities of antimalarial drugs required at the health facility?

a. Consumption data method

b. Morbidity data method

c. I don't know

d. Others: _____

44. Do you use Integrated Logistics System (ILS) when ordering antimalarials at the health facility?

a. Yes

b. No

c. I don’t know

45. If YES, does ILS help you to make a good estimation of quantities of antimalarial drugs to be used in the facility?

a. Yes, it helps to reach my target

b. No, there is over estimation of the amount required.

c. No, there is underestimation of the amount required.

d. I don’t know.

e. Others_____

46. At what interval do you place the order for the supply of antimalarials?

a. Monthly

b. Quarterly

c. After six months

d. Yearly

e. Others: _____

47. How much time it normally takes when you place the order to the time when the antimalarials are delivered at the facility:

a. Less than a month

b. In one month

c. More than a month

d. Others: _____

48. Which method(s) do you use when supplying drugs from the store to be dispensed?

a. First In-First Out (FIFO)

b. First expiry-First Out (FEFO)

c. Batch-to-Batch System

d. I don’t know

e. Others: _____

49. Is expiring of antimalarials a common problem in your facility?

a. Yes

b. No

50. Which of the following antimalarials have expired in the facility:

a. Metakelfin

b. Fansidar

c. ALU

d. Quinine tabs

e. Quinine injection

f. Artemether injection

g. Others: _____

51. Why do antimalarials expiry in your health facility?

a. Poor ordering system as a result there the stock is too big.

b. Fluctuation in malaria infection pattern.

c. We are supplied with short expiring drugs.

d. Other reasons: _____

52. Does the disposal of expired drugs take place in the facility?

a. Yes

b. No

53. If yes, how are the expired drugs disposed?

_____

_____

_____

54. After what interval are expired drugs disposed?

a. Monthly

b. Quarterly

c. Six months

d. Yearly

e. Others, _____

55. What is your comment regarding the process of disposing expired drugs at your facility?

_____

_____

G. Storage conditions of antimalarials at the health facility: *(Data obtained by observation)*	
Checklist for good storage conditions	
56. There is a store for storage of medications at the facility	a. Present b. Absent
57. Controlled temperature observed:	a. Windows present; 1. Yes/ 2. No b. Electric fans; 1. Yes/ 2. No c. Air condition; 1. Yes/ 2. No d. Refrigerator; 1. Yes/ 2. No e. Temperature control charts; 1. Yes/ 2. No
58. Drugs placed in order; 1. Yes/ 2. No If yes indicate type of order	a. Pharmacologically b. Alphabetically c. Others
59. Shelves and racks are available and in use	a. Yes /b. No
60. Free from pests and rodents	a. Yes /b. No
61. The expired drugs are kept in a separate area of the room	a. Yes /b. No
62. The ledgers are well documented (Dates showing when medications were received/ dispensed, the amount received/ dispensed is indicated)	a. Yes / b. No

H. The dispensing of antimalarials at the facility: *(To be answered by the in-charge of the facility)*

63. How many dispensers are there at the facility: _____

64. What is their designation? (Circle and indicate the respective number of staff per designation)

a. Pharmacist

b. Pharmaceutical Technician

c. Pharmaceutical Assistant

d. Nursing Officer

e. Nurse Midwife

f. Nurse Assistant

g. Rural Medical Aid

h. Others _____

65. How many have been trained on malarial treatment regimen in Tanzania:

_____

66. The dispensing room is available at the facility: 1. Yes / 2. No

I. The diagnosing of malaria parasites at the facility: *(To be answered by the incharge of laboratory/ in-charge of the health facility)*

67. Does the facility offer laboratory services

a. Yes

b. No

If yes answer the following questions:

68. Do you carry out laboratory tests for confirmation of malaria parasites?

a. Yes

b. No

69. What malaria diagnostic tools do you use?

a. MRDT

b. Light microscope

c. Both

e. Others; _____

70. What would you say about the availability of MRDT at the facility?

a. Always present

b. Frequently present

c. Frequently absent

d. Always absent

e. Others; _____

J. The ANC assessment: *(Data collected by observation)*

71. Health education is provided

    a. Yes

    b. No

72. If yes, health education includes:

    a. Danger signs

    b. Birth control

    c. Preparations of child birth

    d. STDs and HIV

    e. The correct use of condoms

    f. Malaria prevention using different mechanisms

    g. Malaria signs and symptoms

    h. Others; _____

73. Posters explaining the purpose and benefits of IPT using Sp are present at the ANC:

    a. Yes

    b. No

74. The facility conducts the outreach clinic to provide antenatal services to women in remote areas

    a. Yes

    b. No

75. Services provided on outreach clinic include:

    a. Pregnancy checkup

    b. IPT using Sp

    c. Vaccination

    d. Health education

    e. PMTCT services

    f. Others; _____

ANNEX V

ANNEX VA

STUDY PARTICIPANTS INFORMED CONSENT FORM

ASSESSMENT OF THE IMPLEMENTATION TO THE NATIONAL

POLICY FOR THE PREVENTION AND TREATMENT OF MALARIA

IN PREGNANT WOMEN IN TANZANIA

NAME OF INVESTIGATOR: RITAH MUTAGONDA
SPONSOR: SIDA SAREC
ADDRESS: MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
P.O BOX 65001,
DAR-ES SALAAM.

Identification number:_____

Introduction:
Hello! This consent form contains information about the research named above. In order to be sure that you are informed about being in this research, we are asking you to read or have read to you this consent form. You will also be asked to sign it or make a mark in front of the witness. You will be given a copy of this form. This consent form might contain some words that are unfamiliar to you. Please ask us to explain anything you might not understand.

Reason for the research:
You are being asked to take part in this research that aims to assess the extent to which the national policy on malaria prevention and treatment in pregnancy is implemented and what are the challenges on the implementation of the policy.

General information and your part in research:
If you agree to be in this research you will be required to answer a series of questions in the interview guide or questionnaires. The interview will be conducted at the health facility where you will be working or visiting at the antenatal clinic. Therefore there will be no additional costs for travelling. In the case of pregnant women, some will be requested to provide blood samples for assessment of SP in the blood.

Risks:
We do not expect any harm to happen to you because of joining this study

Benefits:
Like all participants in the study, you will benefit from gaining more knowledge about use of SP and Alu for prevention and treatment of malaria in pregnant women, respectively. Also, the information you give will contribute on improving the proper malaria prevention and treatment guideline in pregnant women. We hope that the information obtained from this study will help to reduce the death caused by malaria in pregnant women.

Right to withdraw and alternatives:
Taking part in this study is completely your choice. You can stop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty.

Confidentiality:
All the information obtained from this study will be used for the research purpose only, and will not be shared to any one without participant consent.

Who to contact:
If you have any questions about your rights as a participant, you may call Ms. Ritah Mutagonda (Tel: 0713 816481), Dr. Appolinary Kamuhabwa or Prof. Siriel Massawe who are the coordinators of this study, MUHAS PO BOX 65001, Dar es Salaam.

Your right as participant:
This research has been reviewed and approved by the IRB of Muhimbili University of Health and Allied Sciences. An IRB is a committee that reviews research studies in order to help protect participants. If you have any questions about you rights as the participant you may contact Porf. E. F. Lyamuya, Chairman of the College Research and Publications Committee, P.O Box 65001, Dar-es-salaam, Tel: 2150302-6.

Signature:
Do you agree?
Participant agrees..... Participant does not agree.....

I, _____I have read the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of participant _____

Signature of research assistant _____
Date of signed consent _____

ANNEX VB

FOMU YA KIBALI CHA KUSHIRIKI KATIKA UTAFITI

UTEKELEZAJI WA MPANGO WA TAIFA WA KUDHIBITI MALARIA KWA

MAMA WAJAWAZITO KWA KUTUMIA DAWA YA SP NA KUTIBU MALARIA

KWA KUTUMIA DAWA YA MSETO

JINA LA MTAFITI: RITAH MUTAGONDA
MFADHILI: SIDA SAREC
ANUANI: CHUO KIKUU CHA AFYA NA SAYANSI YA TIBA CHA MUHIMBILI
P.O BOX 65001,
DAR-ES SALAAM.

Namba ya utambulisho: _____

Utambulisho:
Habari! Fomu hii inamaelezo juu ya utafiti uliotajwa hapo juu. Ili kuwa na uhakika unataarifa juu ya utafiti huu unaombwa kusoma au kusomewa maelezo ya fomu hii. Vilevile utaombwa kusaini au kuweka alama ya dole gumba mbele ya shahidi. Utapatiwa nakala ya fomu hii. Fomu hii inaweza kuwa na maelezo ambayo hujayaelewa, tafadhali uliza chochote ambacho utakuwa hujaelewa.

Madhumuni ya Utafiti:
Utafiti huu unalengo la kukadiria ni kwa jinsi gani mpango wa taifa wa kudhibiti na kutibu malaria kwa wajawazito unatekelezwa. Katika utafiti huu, changamoto katika utekelezaji wa mpango huu pia zitabainishwa.

Kushiriki katika utafiti huu kunahitaji:
Ili kushiriki katika utafiti huu inabidi kukubali na kujiunga kwa kujibu maswali toka kwenye muongozo wa maswali yaliyotungwa kwa ajili ya utafiti huu. Majadiliano hayo yatafanyika katika vituo vya afya ambapo mnafanya kazi au mnapokuja kuhudhuria kliniki ya wajawazito. Kwa hiyo hakutakuwa na ongezeko la nauli au gharama zozote za usafiri. Kwa baadhi ya wajawazito, kiasi kidogo cha damu kitahitajika kwa ajili ya kupima uwepo wa SP katika damu hiyo.

Hatari:
Hatutarajii matatizo yoyote ya kiafya kukutokea sababu ya kushiriki katika utafiti huu.

Faida za kushiriki:
Kama utakubali kushiriki kwenye utafiti huu itakuwa ni faraja sababu utapata faida ya elimu zaidi kuhusiana na matumizi ya SP na Alu katika kuzuia na kutibu malaria kwa

wajawazito. Pia maelezo utakayotoa yatasaidia kuchangia uboreshaji wa huduma za afya kwa kuhakikisha mama wajawazito wanapatiwa kinga na tiba sahihi dhidi ya malaria. Tunatumaini taarifa itakayopatikana itasaidia zaidi kupunguza vifo vinavosababishwa na malaria kwa wajawazito.

Haki ya kujitoa katika ushiriki:
Kushiriki katika utafiti huu ni uamuzi wako. Unaweza kujitoa katika ushiriki muda wowote ule hata kama umeshaidhinisha kibali cha kushiriki. Kukataa kushiriki au kujitoa katika ushiriki hakutasababisha kuchukuliwa hatua yoyote.

Usiri:
Maelezo yoyote yatakayotolewa yatatumika kwa faida ya utafiti huu tu, hakuna maelezo yoyote yatakatolewa maali popote bila idhini ya mshiriki.

Kama kuna tatizo au swali lolote wasiliana na:
Ms. Ritah Mutagonda (Simu: 0713 816481), Kama unahitaji msaada zaidi wasiliana na Dr. Appolinary Kamuhabwa au Prof. Siriel Massawe ambao ni wasimamizi wa utafiti huu, Chuo Kikuu Cha Afya na Sayansi Shirikishi Muhimbili, S.L.P 65001, Dar es Salaam.

Haki zako kama mshiriki:
Utafiti huu umepitiwa na umepitishwa na kamati ya utafiti na uchapishaji ya Chuo Kikuu Cha Afya na Sayansi Shirikishi Muhimbili. Hiki ni kitengo kinachopitia tafiti zote kuhakikisha kuwa kinalinda haki za washiriki. Kama unaswali lolote wasiliana na Prof. E.F. Lyamuya, Mwenyekiti wa kamati ya utafiti na uchapishaji, S.L.P 65001, Dar-es-salaam, simu 2150302-6.

Sahihi:

Je umekubali? Mshiriki amekubali..... Mshiriki hajakubali.....

Mimi, _____ Nimesoma/kuambiwa maelezo yote yaliyopo kwenye fomu hii. Maswali yangu ote yamejibiwa. Nimekubali kushiriki katika utafiti huu.

Sahihi ya mshiriki _____

Sahihi ya mtafiti _____
Tarehe ya kutia sahihi ya kushiriki _____