ASSESSMENT OF FACTORS THAT AFFECT ADHERENCE OF HEALTH WORKERS TO MALARIA TREATMENT POLICY IN HEALTH FACILITIES IN SINGIDA RURAL DISTRICT

Joyce John Massawe

Master of Health Policy and Management
Muhimbili University of Health and Allied Sciences
October 2013

ASSESSMENT OF FACTORS THAT AFFECT ADHERENCE OF HEALTH WORKERS TO MALARIA TREATMENT POLICY IN HEALTH FACILITIES IN SINGIDA RURAL DISTRICT

By

Joyce John Massawe

A dissertation Submitted in (partial) Fulfillment of the Requirements for the Degree of Masters of Health Policy and Management of Muhimbili University of Health and Allied Sciences

Muhimbili University of Health and Allied Sciences
October, 2013

CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled *"**Assessment of factors that affect adherence of Health workers to malaria treatment policy in health facilities in Singida Rural District.**"* in (partial) fulfilment of the requirements for the degree of Master of Science in Health Policy and Management of Muhimbili University of Health and Allied Sciences.

……

Prof. Phare G.M. Mujinja *BA (Hons), CIH, MPH, MA (Econ), PhD*

Supervisor

Date ……

DECLARATION
AND
COPYRIGHT

I, **Joyce John Massawe**, declare that this dissertation is my original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature …….....…….. Date .....

This dissertation is the copyright material protected under the Berne Convention, the Copyright Act of 1999 and other international and national enactments, in that behalf, on the intellectual property. It may not be reproduced by any means, in full or in part, except in short extracts in fair dealings; for research or private study, critical scholarly review or discourse with an acknowledgement, without the written permission of the Directorate of Postgraduate Studies on behalf of both the author and the Muhimbili University of Health and Allied Sciences.

ACKNOWLEDGEMENT

My gratitude and praise to God, without his grace I would have not been able to produce this dissertation.

I wish to express my sincere gratitude to Professor P.G. M. Mujinja, my supervisor for his tireless and critical guidance, assistance and support during the whole period of dissertation preparation and development. I am also thankful to members of staff of the department of Development Studies for constant support during my stay at the school. Thanks are also due to Health Policy and Management participants 2011/13 who offered their support in one way or the other.

Special thanks go to the authority of NOMA programme for offering me sponsorship to pursue the course. In the same line of appreciation, I would like to thank Dr. Mughwira Mwangu, course coordinator for his support since the start of the course to its end.

I am indebted to the office of the District Medical Officer of Singida Rural for allowing and facilitating me in conducting my study in his district. Many thanks go to the health facility in charges and health workers of the facilities that participated in this study and made it possible.

I am deeply grateful to my beloved husband Willbard for his understanding, patience, and support throughout the study period. My children John and Careen I say thank you a lot for your tolerance during the whole period of my study.

Since it is not easy to mention everyone who in any way contributed to make this work a reality; all those not mentioned, thanks to you all.

DEDICATION

This work is dedicated to my beloved mother Lucy Massawe, for her prayers and support that encouraged me to do my research thoroughly.

ABSTRACT

Introduction:

Malaria in Tanzania remains the main cause of morbidity and mortality especially in children below five years of age. The resistance of parasite has resulted into frequent changes in antimalarial regimens in Tanzania, however the adherence of health workers in prescribing antimalarials is likely to be affected by this frequent changes of regimen. The extent to which health workers adhere to malaria treatment policy in Tanzania is not clearly documented.

Objective:

The main objective of this study is to assess factors that affect adherence of health workers on malaria treatment policy in public and private health facilities.

Methodology:

An explorative, cross-sectional study was conducted in the health facilities of Singida Rural District. Convenience sampling technique was applied including: semi structured questionnaires with health workers (n=20) and patient exit interviews (n=240). Also direct observation conducted to health workers using checklist for history taking, counselling and prescription.

Results:

Although 75% of health workers received training, only 13.3% found in private health facilities. Nevertheless 63.7% of clinicians showed to be knowledgeable on malaria treatment policy. The results show that availability of varieties of antimalarials influence health workers adherence to malaria treatment policy. ALU reported to be available in both public and private health facilities; 14.3% of ALU blister prepacked according to weight found in FBO health facilities. About 62.9% of exit patients showed to be prescribed ALU for treatment of uncomplicated malaria, and 1.9% of them in private health facilities received ALU. ALU was also prescribed correctly by majority of health workers. However 43.9% of exiting patients received ALU were not given instructions to follow when using ALU. About 76.5% were not told of any possible side effects and about 81.3% did not take their first dose at the facility.

Conclusion and Recommendation

Public-sector health workers have higher knowledge on malaria treatment policy and prescribing practice on recommended antimalarials. Changes in treatment guidelines should be accompanied by subsequent implementation activities involving all sector players in unbiased strategies. Therefore constant supervision should be done to ensure that the policy continues to be effectively implemented.

TABLE OF CONTENT

CONTENT

Pages

CERTIFICATION.....ii

DECLARATION AND COPYRIGHT.....iii

ACKNOWLEDGMENT.....iv

DEDICATION.....v

ABSTRACT.....vi

TABLE OF CONTENTS.....viii

LIST OF TABLES.....xi

LIST OF ABBREVIATIONS xii

DEFINITION OF OPERATIONAL TERMS xiii

CHAPTER ONE.....1

1.0 INTRODUCTION

1.1 Background 1

1.2 Problem statement 3

1.3 Rationale of the study 4

1.4 Conceptual framework diagram 5

1.5 Research questions 5

1.6 Research objectives 6

CHAPTER TWO.....7

2.0 LITERATURE REVIEW 7

CHAPTER THREE.....14

3.0 STUDY METHODOLOGY 14

3.1 Study area 14

3.2 Study design 15

3.3 Study population 15

3.4 Inclusion and Exclusion criteria 15

3.5 Sample size.....16

3.6 Sampling procedures.....17

3.7 Data collection instruments 18
3.8 Data collection procedure 19
3.9 Study variables 20
3.10 Data management 21
3.11 Ethical consideration 22
3.12 Study limitation 22
CHAPTER FOUR.....23
4.0 RESULTS 23
4.1 Socio-demographic characteristic of the study population on health workers……23
4.2 Socio-demographic characteristic of exist patients..... 25
4.3 In service training of health workers..... 26
4.4 Training by qualification……..27
4.5 Knowledge of health workers on malaria treatment policy..... 28
4.6 Adherence on malaria treatment policy.....30
4.7 Relationship between health workers knowledge and adherence on malaria treatment policy..... 30
4.8 The influence of availability of varieties of antimalarial to health workers adherence on malaria treatment policy..... 31
4.9 Health workers practice on different types of antimalarials.....33
4.10 Practices on ALU.....35
CHAPTER FIVE..... 36
5.0 DISCUSSION.....36
5.1 In service training of health workers..... 36
5.2 Knowledge of health workers on malaria treatment policy.....37
5.3 The relationship between health workers' knowledge and adherence on malaria treatment policy..... 38
5.4 Availability of varieties of antimalarial.....38
5.5 Antimalarial practice.....40
CHAPTER SIX..... 43
6.0 CONCLUNSION AND RECOMMENDATION..... 43
REFERENCES.....45

APPENDICES 48

Appendix 1: Informed consent form (English version) 48

Appendix 2: Informed consent form (Kiswahili version) 50

Appendix 3: Questionnaire for Health workers (English version)..... 52

Appendix 4: Questionnaire for exiting patients (English version) 56

Appendix 5: Checklist (English version) 59

Appendix 6: Questionnaire for Health workers (Kiswahili version)..... 61

Appendix 7: Questionnaire for exiting patients (Kiswahili version)..... 66

Appendix 8: Checklist (Kiswahili version) 69

LIST OF TABLES

Table 1: Socio-demographic characteristic of health workers by sex..... 24
Table 2: Distribution of health workers by type and level of health facility..... 25
Table 3: Socio-demographic characteristic of exist patients..... 26
Table 4: Health workers training by type of health facility..... 27
Table 5: In service training of health workers for the past five years by qualification..... 27
Table 6: Health workers' knowledge on malaria treatment policy..... 28
Table 7: Health workers' knowledge on malaria treatment policy by type of health facility..... 29
Table 8: Health workers' knowledge on malaria treatment policy by cadre.....29
Table 9: Health workers' adherence on malaria treatment policy..... 30
Table 10: The relationship between health workers knowledge and adherence on malaria treatment policy..... 31
Table11: Distribution of reported available antimalarials by type of health facility..32
Table 12: Availability of ALU by checklist..... 32
Table 13: Health workers practice on antimalarials..... 34
Table 14: Antimalarials received by diagnostic test results..... 34
Table 15: Dispensing practice on ALU by type of health facility..... 35

LIST OF ABBREVIATION

ACO	Assistant Clinical Officer
ACTs	Artemisinin Combination Therapy
ALU	Artemether-Lumefatrine
AMO	Assistant Medical Officer
AQ	Amodiaquine
CO	Clinical Officer
CQ	Chloroquine
DOT	Direct Observed Treatment
DHMT	District Health Management Team
HW	Health worker
MO	Medical Officer
MOSHW	Ministry of Health and Social Welfare
NMCP	National Malaria Control Programme
PI	Principal investigator
RAs	Researcher Assistants
SP	Sulfadoxine-Pyrimethamine
WHO	World Health Organization

DEFINITION OF OPERATIONAL TERMS

Health worker

Refers to people engaged in actions whose primary intent is to enhance health. For the purpose of this study a health worker is anyone who diagnose, prescribe and dispense the appropriate treatment for uncomplicated malaria. These included clinicians, nursing staff and pharmaceutical personnel.(WHO,2010).

Malaria treatment policy

In the context of this study this refers to use of combination therapy Artemether-Lumefantrine as the first line drug for the treatment of uncomplicated malaria and Quinine as the second line drug in the event of non response to ALu or where ALu is contraindicated.(MOHSW, 2006)

Knowledge

It refers to what is known by a person in a particular field, the total facts and information regarding the subject or theoretical and practical understanding of a subject.

Uncomplicated malaria

This refers to when the patient is infected with *plasmodium falciparum* and presents with clinical features such as fever, headache, joint pain, malaise, vomiting, body ache, poor appetite and weakness. With appropriate medication mostly oral antimalarials, the patient recovers and does not need to be hospitalised. For the purpose of this study is any patient who is coming to health worker and diagnosed to be infected with malaria parasite.(WHO, 2010)

Adherence

Refers to the extent to which the patient or health care provider follows medical instructions. For the purpose of this study is the relationship between the patient and the health worker at time of service provision whereas the quality of service provided

by health worker should require following instructions guided by the treatment policy. (MOHSW,2006).

CHAPTER ONE

1. INTRODUCTION

1.1 Background

Globally, there are at least 300 million acute cases of malaria each year resulting in more than a million deaths. Around 90% of these deaths occur in Sub Saharan Africa, mostly among young children (WHO, 2010). In Tanzania, malaria contributes to about 36% of all deaths in children under five years of age.

One of the greatest challenges facing Sub Saharan African countries, Tanzania being one of them, in the fight against malaria is the development of drug resistance, which has been among the key factors contributing to malaria morbidity and mortality. Antimalarials such as Chloroquine (CQ), Sulphadoxine-Pyrimethamine (SP) and Amodiaquine (AQ) used as single drug have been changed due to resistance. As a result of resistance, many countries have been forced to change their malaria treatment policies and use drugs which are more effective, including the use of combination drugs which can slow resistance (WHO, 2010)

The malaria treatment guideline in Tanzania is provided by the Ministry of Health and Social Welfare (MOHSW). The guideline indicates drugs of choice for various situations and hence the first and second line treatments. “First-line” treatment refers to the drug officially recommended as the drug of first choice for the treatment of uncomplicated malaria, which is Arthemether/Lumefantrine (ALU). Sulfadoxine/Pyrimethamine (SP) is recommended only as intermittent preventive treatment during pregnancy (IPTp). Quinine (QN) has replaced Amodiaquine (AQ) as second-line treatment, and is further indicated as first-line treatment for children weighing less than five kilograms and their lactating mothers, and during first trimester of pregnancy. Use of AQ is only indicated where no better drug is available “Third-line” treatment typically refers to the drug recommended for severely ill patients (a rescue drug) this includes, injection artemisinin derivatives or quinine. In practice, few treatment failures are recognized and patients are often moved directly from first to third-line treatment, consequently, second-line drug is used compared to the first-line drug.

Tanzania changed malarial policy for the first time in 2001, when Chloroquine first line was replaced by SP as an interim first line policy, while evaluating a long term solution. In 2006, SP was replaced with Artemisinins combination therapy (ACTs) mainly Artemether and Lumefantrine (ALU) as the first line antimalarial option for Tanzania (MOHSW, 2006). In order to increase effectiveness of the policy in 2010 Tanzania government subsidized the price of ALU to affordable price in private health facilities, with the aim of reducing substandard treatment from the market, displace monotherapies and increase demand of ALU (Alba *et al.*, 2010).

The implementation of the policy is a continuous process and involves many activities including, but not limited to, in-service training (to update the personnel in the field with new knowledge) and adoption of new practices (which comes along with changes in treatment policy). Data on evaluation of knowledge and practice before or during implementation of malarial treatment policy shows that there is inadequate knowledge and skills on ALU among health workers found in private sector than public sector (Muyogela and Minzi,2011; Watsierah *et al.*, 2012). In the same studies indicate that knowledge on dosing regimen was influenced by in service training among health workers. Although the other study reported that dispensers have been able to state the dosing schedule of ALU to patients by referring to the pictorial instructions on the package leaflets (Minzi and Haule, 2008).

Zurovac (2004), points out that failure to prescribe ALU was due to insufficient supply of ALU, sometimes these stock outs may lead to patients' preference of SP over ALU because of its simple dosage. Apart from ALU shortage, prescription of drugs such as amodiaquine were still prescribed because they were continuously supplied to the health facilities despite the policy change to ALU.

The outcome of lack of trained health workers responsible for handling the new introduced medicine as per guidelines could lead to administration of wrong doses and incorrect information being given to patients and thus, may lead to drug resistance and drug misuse (Muyogela and Minzi, 2011). The current study will evaluate to what extent health workers' knowledge (in service training, contribution

of guidelines and qualification) may influence adherence to malaria treatment policy in the public and private health facilities as well as to find out the prescribing and dispensing practice of health workers in public and private health facilities.

1.2 Problem statement

Non-adherence to treatment policy has resulted into treatment failure, increase mortality and/or drug resistance. The frequent changes of malarial treatment policy have been due to drug resistance (Zurovac et al 2004). However drug resistance may be accelerated by poor knowledge of health workers in prescribing and dispensing antimalarials. In 2006, Tanzania switched from sulfadoxine-pyrimethamine (SP) to artemether-lumefantrine (ALU) as the first-line treatment recommended for uncomplicated falciparum malaria. The 2006 policy for malaria diagnosis and treatment has been revised in 2010. This treatment policy recommends the use of ALU for only laboratory-confirmed malaria cases, to avoid misuse of drug and to avoid emergence and spread of resistance (WHO, 2010). The policy is also clear that SP is reserved for intermittent preventive treatment in pregnancy, and cases of severe malaria should be treated using quinine injection or artemether injection, otherwise the use of monotherapies is no longer recommended. These new recommendations have been adopted in the country.

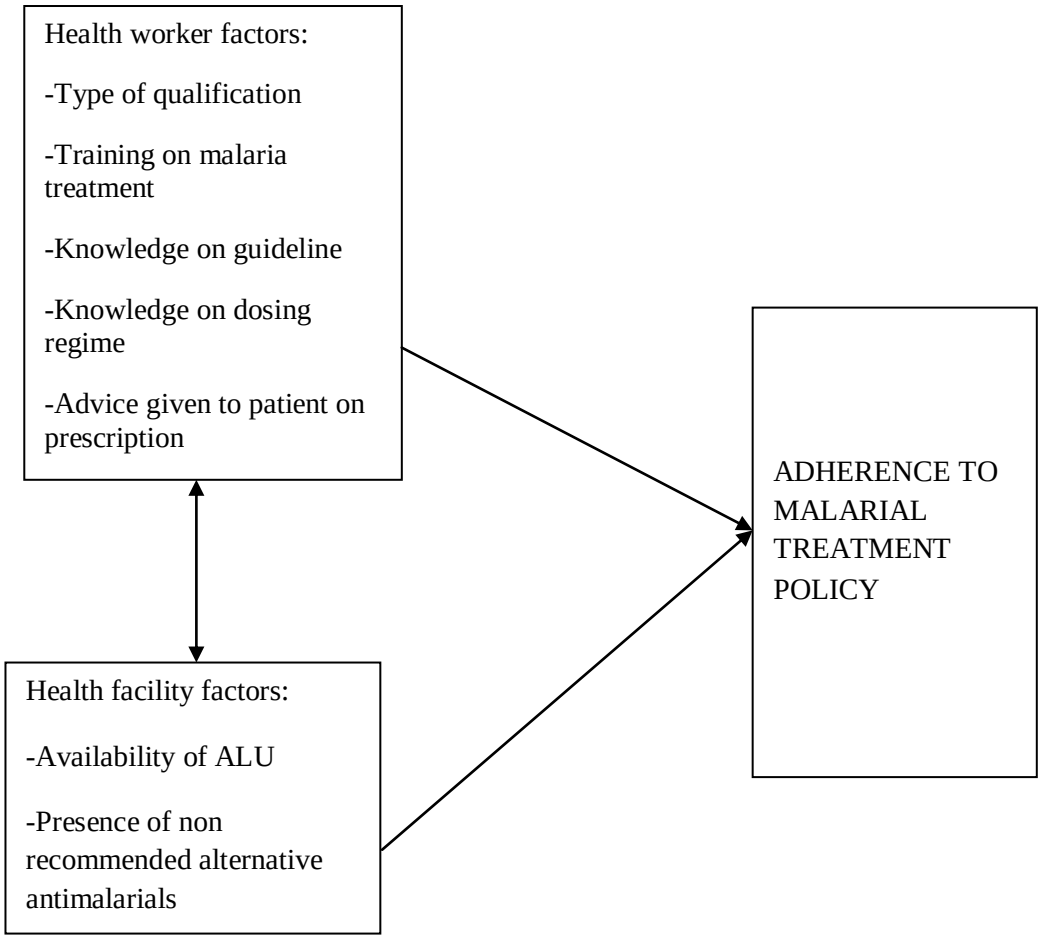
Although this policy is now well established, there is non adherence among health workers with its implementation. Evidence from several settings on malaria case management report non adherence with treatment policy was due to insufficient supply of ALU and many patients continue to receive less effective antimalarials, such as SP (Simba and Kakoko, 2012). There are also concerns about under usage of parasitological diagnosis and dispensing of alternative and non recommended antimalarials for most test negative patients (Skarbinki et al 2009). Non adherence to treatment policy have also been observed on dispensing practice, with patients frequently receiving inadequate doses and without advice on how the medicines should be taken (Simba and Kakoko, 2012).

The adherence to treatment policy is researched with evidence from household survey and health workers at a range of health facilities showing that many febrile patients do not receive the recommended antimalarial (Simba and Kakoko, 2012). Little is known about health workers adherence to Malaria treatment policy. The current study focused on assessing this gap by investigating health workers' qualifications, their working experience, in service training and knowledge of dosing regimen with ALU. The study was also evaluate the practice of health workers in adhering to malaria treatment policy through prescription of outgoing malaria patients.

1.3 RATIONALE OF THE STUDY

This study will produce information on how health workers' knowledge and practice on malaria treatment may influence adherence to malaria treatment policy. Furthermore the research findings will be used to inform Singida rural district management team on factors influencing non adherence among health workers. It may also be used as background information for improvement strategies to comply with national malaria treatment policy, aim is to reduce resistance and misuse of ALU in the district.

1.4 Conceptual framework diagram



1.5 Research questions

What are factors that affect adherence of health workers on malaria treatment policy?

Aims at answering the following questions:

1. What is the proportion of in service training on management of uncomplicated malaria?
2. To what extent do health workers knowledge influence adherence on malaria treatment policy?
3. What is the influence of availability of varieties of antimalarial drugs on health workers' adherence on malaria treatment policy?
4. To what extent do health workers practice the use of malaria treatment policy?

1.6 Research objectives

1.6.1 Broad objective

To assess factors that affect health workers adherence on malaria treatment policy in public and private health facilities in Singida Rural District.

1.6.2 Specific objectives

1. To determine the proportion of health workers who had attended in service training for management of uncomplicated malaria.
2. To assess the relationship between health workers knowledge and their adherence to malarial treatment policy.
3. To assess the influence of varieties of antimalarial drugs available to health workers adherence on malaria treatment policy.
4. To assess health workers practice of using malaria treatment policy on management of uncomplicated malaria.

CHAPTER TWO

2. LITERATURE REVIEW

Over the past decade, a new group of antimalarials - the Artemisinin compounds, especially Artesunate, Artemether and Dihydroatemisinin have been deployed on an increasingly large scale. These compounds produce a very rapid therapeutic response, are active against multi drug resistant *Plasmodium falciparum,* are well tolerated by the patients and reduce gametocyte carriage (and thus have the potential to reduce transmission of malaria). There is no resistance to Artemisinin or Artemisinin derivatives has been reported to date. If used alone, the Artemisinins will cure falciparum malaria in 7 days, but studies have shown that in combination with certain synthetic drugs they produce high cure rates in 3 days with higher adherence to treatment. Furthermore, there is some evidence that use of such combinations in areas with low to moderate transmission can retard the development of resistance to the partner drug (WHO, 2010).

As a response to increasing levels of resistance to antimalarial medicines, WHO recommended that all countries experiencing resistance to conventional monotherapies, such as Chloroquine and Amodiaquine should use combination therapies, preferably those containing artemisinin derivatives (ACTs) for falciparum malaria (WHO, 2010).

Artemisinin based combinations are highly efficacious and have the potential to delay the spread of drug resistance on this basis the combination therapy is recommended (MOHSW, 2006).

2.1. Purpose of antimalarial drug policy and national guidelines

The guiding principal of antimalarial drug policy is to promote safe, effective, good quality, affordable, accessible and acceptable malaria treatment in achieving effective case management of malaria. At the same time to promote rational drug use in order to minimize the development of drug resistance (MOHSW,2006).

The primary objective of the national guidelines for malaria diagnosis and treatment is to provide standard management reference for the care of patients with malaria. The recommendations represent the minimum level of care that patients should expect at different levels of health care in the public and private sectors (MOHSW, 2006).

The goal of appropriate malaria diagnosis and treatment is to reduce morbidity, mortality and the socio-economic loss attributed to the disease and the use of national guideline for diagnosis and treatment of malaria is the key to achieving this goal (MOHSW, 2006).

2.2. Treatment of uncomplicated malaria according to the national guidelines

According to the guidelines (MOHSW, 2006) the objectives of treatment of uncomplicated malaria are:

1. To provide rapid and long clinical and parasitological cure
2. To reduce morbidity including malaria related anaemia
3. To halt the progression of simple disease into severe and potentially fatal disease.

In order to achieve objectives, uncomplicated malaria must be diagnosed early and the correct treatment administrated without delay. The treatment of uncomplicated malaria using combination therapy has been recommended (WHO 2006). The aim of combination therapy is to improve treatment efficacy and also delay the development of drug resistance. The drug indicated as the first line drug is the use of Artemether – Lumefantrine. The second line drug is Quinine which is recommended if the treatment with ALU is contraindicated or failed; Quinine is also the drug of choice in first trimester of pregnancy, in lactating mothers with children below 5kg and in children under weighing below 5kg (MOHSW, 2006).

According to an oral fixed combination of 20mg Artemether- a derivative of Artemisinin and 120mg Lumefantrine combining the benefits of the fast onset of action of Artemether with the long duration of action and high cure rates of

Lumefantrine. The dose being twice a day for three days. Though for practical purpose to improve compliance it is recommended that the first dose be given as Direct observed treatment (DOT) at the health facility, the second dose strictly after eight hours and the subsequent doses to the given twice daily in the second and third day of treatment until completion of six doses. It is recommended in all age groups except in children below 5kg body weight, in the first trimester of pregnancy and in lactating mothers with child below 5kg of body weight (WHO, 2006).

Overall incidence of side effect of ALU is low (MOHSW, 2006). In a study done on integrated assessment of the clinical safety of ALU, the most commonly reported possible side effects were of the gastro intestinal kind such as abdominal pain, anorexia, nausea, vomiting, diarrhoea, and dental nervous systems such as head ache and dizziness. Pruritus and rash was reported in a very minor number of patients, no clinical cardiac events were reported. Majority of the side effects were rated as mild to moderate in intensity (Bakshi *et al*., 2000). It is recommended that ALU has to be taken with fatty meals to enhance its absorption (MOHSW, 2006) especially with the Lumefantrine component whose absorption is greatly enhance by co administration of fats. A study done on how much fat was required to optimize Lumefantrine oral bioavailability showed that a relatively small amount of fat such as soya milk was required to ensure maximum absorption of Lumefantrine (Ashley *et al* ., 2007).

2:3 Training and supervision on malarial treatment policy

In Tanzania prior to introduction of the malaria treatment, MOHSW conducted training to health service providers at all levels (Muyogela et al.,2011). Such as kind of training can equip the health care providers with the relevant knowledge and skills for effective management of malaria. A study done in Sudan on dispensing and prescribing practices support this concept. After the introduction of the new protocol which was the use of Artemisinin based combination therapy, it was seen that out of 20 workers only half of the workers knew the recommended first line, although, 90% were aware of the new protocol but only one tenth had been trained on it, hence there was gap in the understanding and adherence to the new protocol (Abbas, 2006).

Such programmatic interventions such as in service training, constant supervision provision of guidelines and wall charts, may or may not improve the quality of treatment. Some studies have shown strong association while others have shown that these kinds of intervention were not fruitful. A study done by (Zurovac *et al*,.2004)in Kenya showed commonly used interventions such as in – service training, possession of the NMCP guideline, treatment wall charts, and supervision for improving HW practices were significantly associated with prescribing the recommended treatment (Zurovac *et al* ., 2005; Wassuna *et al.*, 2008).

A study done on provision of antimalarial combination therapy with SP and Artesunate in rural Tanzania also highlighted that with the introduction of interventions such as health worker training, simple aid jobs, patient counseling, directly observed therapy with SP plus Artesunate brought about reasonable levels of adherence right from the first weeks of the introduction of the combination drug (Kachur *et al*.,2004). However a study done in Zambia during the period of drug transition to Artemether – Lumefantrine showed that provision of programmatic interventions such as in service training and job aids did not seem to influence ALu use (Zurovac *et al*., 2005).

2:4 Availability of Artemether-Lumefantrine.

The change of treatment policy from SP to ALU resulted to severe stock-outs of ALU in health facilities to only 40% months in stock, compensated by the wide availability of SP in drug shops (Alba *et al*.,2010). After the introduction of ALU subsidy policy the stock levels were relatively high in public health facilities over 80% months in stock and less in drug shops to 30% and none in general shops. This resulted in a low overall utilization of the drug 19% of all anti-malarial sales (Alba *et al*., 2010).

On the other hand, the constant availability of recommended antimalarial may help to ensure effective implementation and usage of these antimalarial. A repeat cross sectional study done in Zambia showed that facilities where Artemather-Lumefantrine was in stock, the proportions of children weighing 10kg or more, who

should have received this drugs, increased from 22% in 2004 to 59% in 2006 (Zurovac *et al*., 2007). However availability on its own may not positively influence the effective use of the recommended drug as shown in the same study done in 2004 in Zambia when the policy was in its transition state from CQ to ALU in children weighing 10kg and above and SP for children below 10kg, despite the availability of ALU in the facilitates it was rarely prescribed (22%) for children above 10kg and most prescribers opted for the familiar SP (68%) in this weight group (Zurovac *et al*., 2005).

2:6 Health workers adherence to the standard recommended treatment regime.

Prescribers' adherence to the treatment guideline remains critical to the success of any drug policy however studies have shown that is not the case. Findings of a study conducted in Kenya (Zurovac *et al*.,2004), showed that clinical officers and nurses were much less likely than nursing aiders to adhere to guidelines. The result even suggested that clinical officers were less adherent than nurses, who were less adherent than nursing aiders (Zurovac *et al*., 2004) and therefore, this study will give insight of the situation in Tanzania.

A study done to describe treatment practices in Zambian children during the transition from CQ to ALU and to SP and examined the factors influencing the prescribed of ALU showed that out of 394 children with uncomplicated malaria, among the children weighing 10kg or more, SP was commonly prescribed (68%), whereas recommended drug, ALU was prescribed (11%) children. The study showed that the change of drug policy toward ALU did not necessarily transition into adequate use of this drug at the point of care in Zambian facilities (Zurovac *et al* ., 2005).

A cross-sectional study to assess the impact of the national protocol for malaria treatment was conducted in a town in Gezira state, Central Sudan, the adherence to the protocol was checked by asking the worker what regimens they used for the treatment of simple malaria and complicated to the standard regimens recommended by the Malaria Administration at the Ministry of Health. Despite the relatively high rate of awareness, just over half of the interviewed health workers (57.5%) showed

no adherence to the protocol, with a significant difference between the different categories of the health workers. When asked about reason for not adhering to the protocol guideline, one-third of health workers mentioned lack of awareness of them. Among the senior hospital staff, however it was due to negative attitude toward the protocol, since 72.0% of consultant and 100% of registrars claimed that the protocol was ineffective. Some health workers (11.5%) said that they did not adhere to the guideline in order to satisfy patients (Ahmed *et al*., 2004).

In Kenya factors influencing prescribers not to prescribe ALU were explored and found that, there was insufficient supply of ALU as a major issue and hence fears of stock outs and concern about ALU costs was an impediment to ALU prescription. Training messages that contradicted the recommended guidelines also led to health worker non-adherence, compounded by a lack of follow-up supervision. In addition, the availability of non-recommended antimalarials such as amodiaquine caused prescription confusion. (Wassuna et al,.2008).

In Tanzania (Simba *et al*.,2012) non adherence was found on health workers' instructions as regards to dose timing. Some health workers' instructions were based on strict hourly schedule which was likely to lead to administering some doses in awkward hours and completing treatment several hours before the scheduled time. Other health workers based their instruction on the existing circumstances which was likely to lead to delays in administering the initial dose with serious treatment outcomes.

However health workers perception regarding the recommended malaria treatment may also contribute to poor adherence to the standard guidelines and can hinder the effective's use of the required drugs. A study done in holoendemic Kibaha district in Tanzania to see how SP was perceived after phasing out of CQ showed that not only the public have confidence in the drug but also some of health workers also expressed fear and negative perceptions towards the drug (Nsimba, 2006).

Effectiveness of the drug alone is not sufficient especially in the control of highly efficacious but costly drugs. Correct diagnostic and prescribed practices are the essence of creating substantial evidence of clinical effects. Prescriber's practices can be improved by an increase in programmatic such as a variety of in service training, availability of the standard national guidelines and supervisory visits. A repeat cross sectional study done in Zambia in 2006 after the initial survey done in 2004, showed that when the correctness of prescribed ALU was assessed according to the weight specific criteria, it was found to be very high (81% to 96%) in all weight groups. Even the number of children who had ALU dispensed to them at the facility rose from 44% in 2004 to 58% in 2006. Majority of the caretakers were also given advise on the dosing schedule (98%) and the advise to take ALU after a meal rose from 31% in 2004 to 71% in 2006(Zurovac *et al* ., 2007).

Giving clear detailed explanations on how to take the dose can be effective in bringing about high levels of adherence to ALU in patients, as was shown by a study done in Nigeria on adherence to the six dose regimens of ALU treatment of uncomplicated malaria, however patient's level of education may have an effect on the understanding of the instructions hence a need to put an extra emphasis on the appropriateness of education message to adherence to the use of the drug (Mangham *et al.,* 2011).

CHAPTER THREE

3. METHODOLOGY

3.1 Study area

The study was conducted in Singida Rural District Council, one of the four councils of Singida Region. The district lies between 3^0 and 7^0 latitudes south of the Equator and 34^0 and 35^0 longitudes east of Greenwich. The District is bordered by five districts, that is, Tabora to the west, Iramba to the north, Hanang to the east, Kondoa to the south – east and Manyoni to the south.

It has an estimated population of 401,850 and total households of 78,494 (National Census, 2012) with 7 division and 28 wards. The District has a total of 61 health facilities owned by government, Faith Based Organizations (FBOs), private and Non-governmental organisation (NGOs) (Table 1).

The health staffing status was Specialist Medical Officers (2), Medical Officers (3), Assistant Medical Officers (13), Clinical Officers (71), Nurse Officers (42), Assistant Nurse Officers (93), Pharmacy and Laboratory Technician (5), and Assistant Technicians (20) make a total of 249 health staffs in the district (CCHP-2011).

The district was chosen for the study because it has higher population than other districts in the region depend on FBO hospitals while health facilities owned by the government are mainly dispensaries.

Table 1: Type of health facility by ownership.

Type of Health facility	Government	FBO	private	NGO	Total
Hospital	0	3	0	0	3
Health centres	5	0	0	0	5
Dispensaries	50	2	1	0	53
Total	**55**	**5**	**1**	**0**	**61**

3.2 Study design

An explorative cross sectional study was conducted in Singida Rural District. Observation of patient-provider interaction was conducted to assess to what extent did health workers apply instructions as recommended by malaria treatment guideline 2006. This malaria treatment guideline was used because the 2010 guideline adopted was not published. Patient exit interview was conducted to assess the prescribing and dispensing practice of health workers. Semi structured questionnaires used to explore the academic qualification, (education/training) of prescriber and the experience she/he had at the study health facility. In addition, availability of varieties of antimalarials at each health facility was recorded by physical checklist.

3.3 Study Population

The study involved all health workers prescribers and dispensers who were available in each of the selected health facility during the time of the study. Exit patients who received antimalarials were also involved. Participants of the study included Medical Officers (MO), Assistant Medical Officers (AMO), Clinical Officers (CO), Assistant Clinical Officers (ACO), Nurse Officers (NO), Assistant Nurse Officers (ANO), Aid Nurse (AN) and dispensers including Pharmacist (PHAR), Pharmaceutical Technician (PHAR-T) and Pharmaceutical Assistant (PHAR-A) in public and private health facilities.

3.4 Inclusion and Exclusion criteria

3.4.1 Inclusion and exclusion criteria for health workers.

Inclusion criteria for Health workers

- Health workers who were involved in prescribing or dispensing antimalarial treatment.
- Health workers who were available at the time of the study.

Exclusion criteria for health workers.

- Health workers who were not involved in managing malaria patients or dispensing antimalarials.
- Health workers who did not provide consent to participate in the study.

3.4.2 Inclusion and exclusion criteria for Health facilities.

Inclusion criteria for health facility.

- Health facility either private or public operating within the district were included in the study.

Exclusion criteria for health facility.

- A temporarily closed health facility was not included in the study.

3.4.3 Inclusion and exclusion criteria for exit patients.

Inclusion criteria for exit patient.

- All patients who reported to seek treatment for a fever during the study were eligible to be included in the study
- Patients reported to receive antimalarial during the study.

Exclusion criteria for exit patient

- Patients who did not provide consent to participate in the study.

3.5 Sample size

Sample size estimation.

The Sample size for exit patients was calculated as follows:

$$n=Z^2 \frac{P(100-P)}{\varepsilon^2}$$

Z = Confidence Interval (95% or 1.96)

P = Expected proportional of exit patients received ALU according to Simba et al (2012) P assumed to be 43%

ε = Margin error of proportional 6%

If P = 43% then n = $1.96 \times 1.96 \times \frac{43(100-43)}{6^2} = 261.54$

n = 262

However due to the fact that sampling frame had no replacement for the respondents who refuse to be interviewed. Hence, the researcher was able to get 240 malaria exist patients, which is 92% of estimated sample size.

3.6 Sampling procedures

3.6.1 Selection of health facility

For studies based on health facilities, Kielman recommends a sample size of 25-30 percent of all health facilities (Kielman,1995). Therefore out of 61 health facilities in the district, 20 facilities were selected to cater for the required sample size, selecting 30% of all health facilities. The district has three (3) hospitals and five (5) health centres both were included in the study. Only one (1) dispensary owned by private also was included in the sample. Simple random sampling was employed to select the government dispensaries to obtain the required study sample. Out of 50 government dispensaries, 11dispensaries were chosen using a ballot method whereby the name of every dispensary was written on a piece of paper and placed in a box, 11 pieces were chosen to reach the required sample.

3.6.2 Selection of health workers

The study conducted observation of patient-provider interactions. The 2 days of observations were chosen at random and were not consecutive; at least one health worker in each study facility was observed. Due to small number of health workers in rural setting and limited time, a total of 20 health workers were included in the study.

3.6.3 Selection of exit patients

Proportional to size sampling was used to obtain the number of patients from each facility that was visited. The number of outpatients treated for malaria sampled from each facility was based on the service population; a sampling frame was obtained by summing up the number of malaria outpatients in all sampled health facilities within a period of one month, the average number of patients treated for malaria per day was then calculated by dividing by 30 days, then only 30% of the number of malaria outpatients attended the facility per day was taken sampled. All outpatients sought for malaria treatment that met on the day of the visit were purposively interviewed until number was obtained.

3.7 Data collection instrument

3.7.1 Research instruments

Adherence to malaria treatment policy to the health workers was the main focus of the study hence the observation was applied on the interaction between health worker and patients. Data were collected using closed and open ended questionnaires and a checklist was used to determine the availability of various antimalarials.

i. Direct observation:

Checklist was developed from National Malaria Treatment Guideline 2006 because 2010 malaria treatment guideline was not yet published although health workers were trained.

During the observation researcher sat in the consultation room observed the interaction and assessed the prescribing practice of the health workers using checklist containing information on patient's history, physical examination, diagnostic test, and counselling. Directly observed treatment was not done during drug dispensing.

i. Open/close ended questionnaires :

a) were used to obtain information of the patients prescribed with antimalarial as they exit from the health facility.

b) questionnaire used to obtain data from health workers in health facilities.

ii. Heath facility: check-list was used to find out availability of varities of antimalarial on the day of the interview.

The questionnaires were produced in English and then they were translated into Kiswahili and retranslated back in English in order to establish the right translation of both versions. After establishment of right translation, a Kiswahili version was used for interview because it was the language which the respondents were comfortable with. The information collected include qualifications, any in-service training in the past five years, and knowledge of treatment policy and dosing regimen with ALU. Prescribing practice of health workers and dispensing ALU were evaluated. Practices evaluated included whether they prescribe ALU, dispense ALU or alternative antimalarials and the advice given to clients when dispensing ALU.

Pre testing of research instrument

Before starting to collect data, pretesting of the research instruments were done to determine the strengths and weaknesses of the questionnaire on question format, relevance, reliability, wording and order. This was done by the investigator and 2 research assistants. The pre test questionnaires and a checklist were administered to 4 prescribers in each 2 public and 2 private health facilities found in Manyoni District which has the same characteristics like that of the study site. After pre testing tools, data collected were reviewed and where necessary modifications were made.

Recruitment and training of research assistants

Two research assistants with previous experience in data collection were recruited after being interviewed for the task; the research assistants were oriented for two days focusing on understanding the study objectives, questions, recording the responses in order to avoid or minimize mistakes**.**

3.8 Data collection procedure

3.8.1 Health Facility and Health workers

An in charge of the selected health facility was visited by the researcher to explain for the purpose of the study and ask for assistance, as well as providing a space for

the observation within the consultation room. After the process of observation health worker interviewed in their place of work, this was done after being asked for his/her written consent and acceptance. The academic qualification (education/training) of prescriber and the working experience was recorded by a researcher. In addition availability of antimalarial and supportive drugs and availability of national malaria treatment guidelines were recorded.

3.8.2 Exit interview

After being informed about the purpose of the study, patients were requested for consent in order for the interview to continue. On exit, after consultation (prescribed and dispensed) the patients were asked to be taken aside and asked what he/she remembered from the information given about the diagnosis and the drugs prescribed. For patients given ALU the researcher captured information on how to take the drug and other advice or information given by health worker. From the patient treatment card or small notebook the prescriber was required to record examination results, diagnosis and treatment. It was from this process the researcher extracted and recorded the diagnosis made and drugs prescribed including type of antimalarial and dose regimens for patients.

3.8.3 Checklist

For all 20 selected health facilities, the researcher went to the dispensing room with an inventory checklist to determine the availability of various antimalarials by doing physical stock observation.

3.9 Study variables

Information collected from prescribers are:

Age, sex, qualification, working experience, in service training, health workers' knowledge, and availability of antimalarials.

Information collected from exit patients:

Age, malaria diagnostic test, antimalarials prescribed, antimalarials received and adherence on treatment policy.

Information collected from health facility:
Availability of guideline, antimalarials and information, education and communication (IEC) materials.

3.10 Data management and analysis

After each day of data collection the Principal Investigator (PI) and the research assistants (RA) discussed the situation of data collection of that day. The PI identified problems encountered in obtaining data from patients and find out solutions for correcting the abnormalities observed. The responses were coded and checked for completeness daily, in each day immediately after the data were collected. After completion of the field work in all the selected areas, questionnaires were given serial numbers before data entry. Data were entered using EPI Info 6 then transferred and analyzed by using SPSS version 15.0 whereby frequency tables were run followed by cross tabulation of different variables. In cases where more than 20% of cells had expected count less than 5, p-value was calculated using Fisher's Exact test.

Assessment of the level of knowledge was done by asking specific questions based on knowledge about malarial treatment guideline (Rajakaruna et al, 2006). Health workers were asked five questions including ability to identify first line and second line for treatment of uncomplicated malaria, ability to mention side effects for first line antimalarial recommended in the guideline, criteria used to prescribe or dispense antimalarial drug, and ability to describe the dose and timings for the first line antimalarial recommended.

A knowledge scale was constructed whereby two (2) scores were assigned to each correct answer and a zero for incorrect or do not know answer. The maximum score was ten while the lowest score was zero. If respondent scored five points and below was categorized as having low knowledge while respondent who scored six points and above considered to be highly knowledgeable.

Assessment of whether health workers adhere to malaria treatment policy was done by using closed ended question. Question was based on clinical response about HWs

prescribe as alternative antimalarial drug for a patient diagnosed with malaria parasite. The response was to chose either ALU, quinine or other antimalarial drug.

3.11 Ethical consideration

Ethical approval was obtained from Muhimbili University of Health and Allied Sciences (MUHAS) Research and Publication Committee. Permission to conduct the study was attained from the District Medical Officer (DMO) of Singida Rural District. Participants were assured anonymity throughout the study period whereby the information provided by them was only going to be used for the intended research purposes. In addition, respondents were assured that no name was appear on the questionnaire and that only the identification number was used instead. Written consent was obtained from the study participants and confidentiality also was maintained on information extracted from the patients' prescriptions and files.

3.12 Study limitations

1. A fact that the criteria used to obtain interviewee was not random, implies that results from this evaluation cannot be generalized for all health workers in the district due to convenient sampling technique used.

2. This study relied on reported information. There was a possibility that respondents could have given responses that do not reflect the reality although this could be overcome by using physical checklist and observation.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio- demographic characteristic of the study population on health workers

A total of 20 health workers from 20 health facilities (3 hospitals, 5 health centres and 12 dispensaries) were interviewed. Facilities that were surveyed include 1 private, 14 government and 5 faith based organizations. Out of 20 health workers interviewed 11 (55%) were male and 9(45%) were female. The age of respondents ranged from 31-40 years while most of respondents (55%) were clinicians cadre.

Table 1summarizes the socio-demographic characteristics of the sample interviewed. The Table indicates that majority of respondents (45%) had working experience of more than 20 years.

The distribution of health workers who were involved in this study by type and level of health facility is as summarized in Table 2. The Table indicates that majority of respondents (80%) were male from FBO health facilities.

Table 1: Socio-demographic characteristics of health workers by sex

Characteristic	Respondents' sex		
	Female	**Male**	**Total**
	n(%)	n(%)	n(%)
Age groups in years			
21-30	0(0)	2(18.2)	2(10.5)
31-40	5(62.5)	3(27.3)	8(42.5)
41-50	3(37.5)	1(9)	4(21.1)
More than 51	0(0)	5(45.5)	5(5.3)
Total	**8(42.1)**	**11(57.9)**	**19(100)***
Cadre			
Clinicians	4(44.4)	7(63.6)	11(55)
Nurses	5(55.6)	3(27.3)	8(40)
Pharmacists	0(0)	1(9.1)	1(5)
Total	**9(45)**	**11(55)**	**20(100)**
Working experience by years			
1-5	3(60)	2(40)	5(25)
6-10	1(50)	1(50)	2(10)
11-15	0(0)	1(100)	1(5)
16-20	1(33.3)	2(66.6)	3(15)
More than 20	4(44.4)	5(55.5)	9(45)
Total	**9(45)**	**11(55)**	**20(100)**

Key:

***** One respondent did not wish to disclose his age

Table 2: Distribution of health workers by type and level of health facility

Facility	**Respondents**		
Type of facility	**Female**	**Male**	**Total**
	n(%)	n(%)	n(%)
Private	1(100)	0(0)	1(5)
Government	7(50)	7(50)	14(70)
FBO	1(20)	4(80)	5(25)
Total	**9(45)**	**11(55)**	**20(100)**
Level of health facility			
Dispensary	7(63.6)	4(36.4)	11(55)
Health centre	2(33.3)	4(66.7)	6(30)
Hospital	0(0)	3(100)	3(15)
Total	**9(45)**	**11(55)**	**20(100)**

4.2 Socio- demographic characteristic of exist patients

A total of 240 exist patients were interviewed in 20 health facilities (11 dispensaries, 5 health centres, 3 hospitals). Table 3 shows the summary of socio-demographic characteristics of patients attended the health facility for malaria treatment. About 72.1% of respondents interviewed aged more than 5 years, also the Table shows that among all patients who sought for malaria treatment in the health facilities during the study 96.3% were given antimalarials (ALU, SP, Amodiaquine, Duocotexcin, Quinine tablets and injection) although there were patients received non recommended antimalarials.

Table 3: Socio- demographic characteristic of exist patients

Characteristics	**Level of health facility**			
Age	**Dispensary**	**Health centre**	**FBO**	**Total**
	n(%)	n(%)	n(%)	n(%)
Patients < 5 years old	39(28)	15(26)	13(30.2)	67(27.9)
Patients > 5 years old	100(72)	43(74)	30(69.8)	173(72.1)
Total	**139(58)**	**58(24.1)**	**43(17.9)**	**240(100)**
Given antimalarials				
YES	133(95.7)	58(100)	40(93)	231(96.3)
NO	6(4.3)	0(0)	3(7)	9(3.7)
Total	**139(57.9)**	**58(24.1)**	**43(18)**	**240(100)**

4.3 In service training of health workers

Table 4 presents the proportion of health workers who had received in service training by type of health facility. Results revealed that three quarter 75% of respondents had received in service training on the use of ALU as a first line treatment of malaria for the past five years since it was recommended as a drug of choice for malaria treatment. The training was mainly conducted by government with workers from district council, although health workers from private facilities offered health briefs during supervision visit at the facility. The proportion of those who received training for the past five years were significantly higher in the public health facilities 13(93%) relative to the FBO 2 (40%) (Fisher's Exact test, p=0.014).

Table 4: Health workers training by type of health facility

Training	Health facility			
	Private	**Government**	**FBO**	**Total**
	n (%)	**n(%)**	**n(%)**	**n(%)**
Received training	0(0)	13(93)	2(40)	15(75)
Not received training	1(100)	1(7)	3(60)	5(25)
Total	**1(5)**	**14(70)**	**5(25)**	**20(100)**

*Fisher's exact test was used to calculate p-value since more than 20 of cells had expected count less than 5

4.4 Training of health workers for the past five years by qualification

Table 5 shows that Clinicians were more trained 10 (66.7%) on malaria treatment policy than nurses 5 (33.3%) while in pharmaceutical technicians there was no training on malaria treatment policy. The results shows that there was significance on training received by health workers (Fisher's Exact test, $p = 0.053$).

Table 5: Training of health workers for the past five years by qualification

Qualification	Received training	Not received training	Total	p-value
	n(%)	**n(%)**	**n(%)**	
Clinicians	10(66.7)	1(20)	11(55)	0.053
Nurses	5(33.3)	3(60)	8(40)	
Assistant pharm technician	0(0)	1(20)	1(5)	
Total	15(75)	5(25)	20(100)	

Key: *Fisher's exact test was used to calculate p-value since more than 20 of cells had expected count less than 5

4.5 Knowledge of health workers on malaria treatment policy

Table 6 shows assessment of the level of knowledge on malaria treatment policy. Of the health workers (20) interviewed about knowledge on malaria treatment policy, 12(60%) found to have high knowledge, while 7(35%) found to have low knowledge.

Table 6: Health workers' knowledge on malarial treatment policy

Level of knowledge	n (%)	Mean	Std deviation
Do not know	1 (5)		
Low knowledge	7 (35)		
High knowledge	12(60)	1.75	0.851
Total	**20 (100)**		

4.5.1 Health workers' knowledge on malaria treatment policy by health facility type

A total 71.4% health workers interviewed from the government facilities found to have high knowledge on malaria treatment policy, while 40% found to have high knowledge from FBO. About 20% of health workers did not know about malaria treatment policy as summarized in table 7. The results shows that there no significant association between health workers' knowledge and types of health facilities they worked.

Table 7: Health workers' knowledge on malarial treatment policy by type of health facility

Level of knowledge	Type of health facility				
	Private	**Government**	**FBO**	**Total**	**p-value**
	n(%)	**n(%)**	**n(%)**	**n(%)**	
Do not know	0(0)	0(0)	1(20)	1(5)	0.364*
Low knowledge	1(100)	4(28.6)	2(40)	7(35)	
High knowledge	0(0)	10(71.4)	2(40)	12(60)	
Total	**1(5)**	**14(70)**	**5(25)**	**20(100)**	

Key:

* Fisher's exact test was used to calculate p-value since more than 20 of cells had expected count less than 5

4.5.2 Health workers' knowledge on malarial treatment policy by cadre

Table 8 shows that clinicians had high knowledge 63.7% than nurses 25% who had high knowledge. At the level of low knowledge nurses had low knowledge 50% than clinicians 36.3% who had low knowledge. These results show significance difference at level of knowledge between clinicians and nurses.

Table 8: Health workers' knowledge on malarial treatment policy by cadre

Level of knowledge	Cadre				
	Clinicians	**Nursing staff**	**Pharmaceutical personnel**	**Total**	**p-value**
	n(%)	**n(%)**	**n(%)**	**n(%)**	
Do not know	0(0)	2(25)	1(100)	3(15)	0.002*
Low knowledge	4(36.3)	4(50)	0(0)	8(40)	
High knowledge	7(63.7)	2(25)	0(0)	9(45)	
Total	11(55)	8(40)	1(5)	20(100)	

Key:* Fisher's exact test was used to calculate p-value since more than 20 of cells had expected count less than 5

4.6 Adherence on malaria treatment policy

Adherence is defined as the extent to which the health worker follows instructions provided by the treatment policy. The assessment of health workers adherence on malarial treatment policy was done by asking a question in the questionnaire. The respondent was given choice to select among ALU, quinine or other antimalarial drug as an alternative drug to prescribe for a patient who had not recovered after malaria episode. Health workers responded either ALU or quinine showed to "adhere" and who choose other drug showed "not adhere". From Table 9, it shows that majority 80% of health workers adhere on malaria treatment policy.

Table 9: Health workers' adherence on malaria treatment policy

Rating of adherence	**n**	**(%)**
Adhere	16	(80)
Not adhere	4	(20)
Total	**20**	**(100)**

4.7 Relationship between health workers knowledge and adherence on malaria treatment policy

Table 10 indicates the relationship between health workers' knowledge and adherence on malaria treatment policy. The Table shows that there is no significant statistically relationship between knowledge and adherence, although respondents 68.8% with high knowledge showed to adhere on malaria treatment policy than respondent of low knowledge 42.9%.

Table 10: The relationship between health workers' knowledge and adherence on malarial treatment policy

Level of knowledge	Adherence			
	Yes	**No**	**Total**	**p-value**
Don't know	1(6.2)	0(0)	1(5)	0.168*
Low knowledge	4(25)	3(42.9)	7(35)	
High knowledge	11(68.8)	1(25)	12(60)	
Total	**16(80)**	**4(20)**	**20(100)**	

*****Fisher's exact test was used to calculate p-value since more than 20 cells had expected count less than 5.

4.8 The influence of availability of varieties of antimalarial to health workers adherence on malaria treatment policy

The responses from health workers show that ALU was available in all health facilities during the time of the interview. There was no significant difference in availability of quinine the second line drug on malaria treatment in all types of health facilities (P>0.05). Although there was significant difference of reported antimalarial on Amodiaquine, Artemesin injection and Duocotecxin for FBO compared to government and private health facilities (P<0.05) as shown in Table 11. From the table, it indicates that availability of non recommended antimalarials influence health workers adherence on malaria treatment policy.

Table 12 shows availability of ALU by checklist. When ALU observed physically in these facilities, it was seen that in the majority of (10) government facilities ALU was available in all four categories of the prepacked weight blister based while in FBO the observation was different, in 3 health facilities ALU was not available in all four categories of the prepacked weight blister based as shown in Table 12.

Table 11: Availability of antimalarials by type of health facility

Available antimalarials	Type of health facility			
	Private	**Government**	**FBO**	**p-value**
	n=1 (%)	n=14 (%)	n=5 (%)	
Quinine	1(100)	13(92.8)	5(100)	0.798*
Amodiaquine	1(100)	2(14.3)	3(60)	0.047*
SP	1(100)	5(35.7)	4(80)	0.139*
Artemesin injection	1(100)	0(0)	4 (80)	0.001*
Duocotexin	0(0)	0(0)	3 (60)	0.005*

*Fisher's Exact test was used to calculate p-value since more than 20 cells had expected to count less than 5

Table 12: Availability of ALU by checklist

Availability of ALU	Type of health facility				
	Private	**Government**	**FBO**	**Total**	**p-value**
Blister prepacked according to weight	2(14.3)	10(71.4)	2(14.3)	14(70)	0.317*
Missing blister prep according to weight	0(0)	3(50)	3(50)	6(30)	
Total	**2(10)**	**13(65)**	**5(25)**	**20(100)**	

*Fisher's Exact test was used to calculate p-value since more than 20 cells had expected to count less than 5

4.9 Health workers practice on different types of antimalarials

Practice was assessed from the reported antimalarial prescribed and dispensed by health workers at the time when the patients exist from the dispensing section. If the response corresponded to the recommendation on the guideline it was scored as "1" and "2" if not.

A total of 240 exiting patients sought for malaria treatment were interviewed when exit from dispensing section and their treatment cards were reviewed. Table 13 shows health workers practice on antimalarials by type of health facilities. It indicates that majority of respondents (62.9%) reported to be prescribed ALU for uncomplicated malaria. SP and Amodiaquine are no longer recommended, though still frequently prescribed (7.1%) and (7.9%) respectively. The proportion of patients that prescribed quinine at FBO facilities was high (67.6%) compared to government (32.3%) and private (5.9%) health facilities. Other antimalarial, such as Duocotexicin (5.8%) was rarely prescribed and only found to be prescribed at FBO health facilities.

Also the Table shows that there was difference from antimalarials dispensed and antimalarials prescribed among health workers. The nature of the patient's diagnosis differed by type of health facility; whereas in public health facilities 74.2% of respondents reported to receive ALU which is different from FBO health facilities where majority of respondents received SP and amodiaquine 84.2% and 77.8% respectively, although the drugs were no longer recommended for treating uncomplicated malaria.

Table 13: Health workers practice on antimalarials

Antimalarials prescribed by type of health facilities

Antimalarials	Type of health facility				
	Private	**Government**	**FBO**	**Total**	**p-value**
ALU	3(2)	113(75)	36(23)	152(62.9)	0.000
Amodiaquine	4(23.5)	0(0)	14(76.5)	17(7.9)	
Duocotexicin	0(0)	0(0)	16(100)	16(5.8)	
Malaridose	4(100)	0(0)	0(0)	4(1.3)	
Quinine	2(5.9)	11(32.3)	23(67.6)	34(14.2)	
SP	2(11.8)	0(0)	15(88.2)	17(7.1)	
Total	**15(6.3)**	**124(51.7)**	**101(42)**	**240(100)**	

Antimalarials dispensed by type of health facilities

Antimalarials	Type of health facility				
	Private	**Government**	**FBO**	**Total**	**p-value**
ALU	3(1.9)	115(74.2)	37(23.9)	155(64.6)	0.000
Amodiaquine	4(22.2)	0(0)	14(77.8)	18(7.5)	
Artemesin injection	0(0)	0(0)	1(100)	1(0.4)	
Duocotexicin	0(0)	0(0)	8(100)	8(3.3)	
Malaridose	4(100)	0(0)	0(0)	4(1.7)	
Quinine	2(5.7)	8(22.8)	25(71.4)	35(14.5)	
SP	2(10.5)	1(5.3)	16(84.2)	19(7.9)	
Total	**15(6.3)**	**124(51.7)**	**101(42)**	**240(100)**	

Key: *Fisher's Exact test was used to calculate p-value since more than 20 cells had expected to count less than 5

4.10 Practices on ALU

Further inquiries on the practices when dispensing ALU was carried out. Results shows that exit patients who were given advice when ALU was dispensed were (74.6%) in public, (3.2%) in private, and (22.2%) in FBO health facilities. Exit patients who were given verbal description on dosage regime were (79.3%) in public, (2.3%) in private and (18.4%) in FBO health facilities (Table 15). Further results demonstrate that (76.1%) of patients who received ALU were not told about side effects of the drug, the same applied to (81.3%) of patients who were not advise to take first dose immediately when observed by health worker. None of the patients mentioned the need to take ALU with milk as advised in the malaria treatment guideline.

Table 15: Dispensing practice on ALU by type of health facility

Dispensing Practice	Private n(%)	Government n(%)	FBO	Total n(%)	p-value n(%)
Advice given when dispensing ALU					
YES	5(83.3)	115(100)	34(100)	154(99.3)	0.042
NO	1(16.7)	0(0)	0(0)	1(0.7)	
Total	**6(3.8)**	**115(74.2)**	**34(22)**	**155(100)**	
Verbal descriptions of dosage regime					
YES	2(33.3)	69(60)	16(47)	87(56.1)	0.213
NO	4(66.7)	46(40)	18(53)	68(43.9)	
Total	**6(3.9)**	**115(74.2)**	**34(21.9)**	**155(100)**	
Side effects					
YES	0(0)	29(25.2)	8(23.5)	37(23.9)	0.368
NO	6(100)	86(74.8)	26(76.5)	118(76.1)	
Total	**6(3.9)**	**115(74.2)**	**34(21.9)**	**155(100)**	
First dose taken at facility					
YES	0(0)	20(17.4)	9(26.5)	29(18.7)	0.239
NO	6(100)	95(82.6)	25(73.5)	126(81.3)	
Total	**6(3.9)**	**115(74.2)**	**34(21.9)**	**155(100)**	

Key : *Fisher's Exact test was used to calculate p-value since more than 20 cells had expected to count less than 5

CHAPTER FIVE

5.0 DISCUSSION

This study tried to explore factors that affect health workers adherence on malaria treatment policy in public and private health facilities in Singida Rural District. It focused on health workers' knowledge and their prescribing and dispensing practices in relation to ALU, also looked at the availability of this drug and other antimalarials in the facilities. The proportion of the health workers who had undergone training on this chemotherapy was also accounted for.

Findings from this study show that most of the health workers knew that the malaria treatment policy had changed although when asked since when the policy changed, only three quarters managed to mention the policy changed more than two years ago.

5.1 In service training of health workers

Training is an essential component not only to ensure that the change in the policy is communicated through the targeted population but also to ensure that it is well understood and would facilitate proper implementation. Some studies have supported this principle. It was shown in a study done in Kenya that several commonly used interventions for improving health workers practices such as in-service training, possession of the guidelines, treatment wall charts, and supervision were significantly associated with prescribing the recommended treatment (Zurovac et al, 2004).

The findings in this study show that almost three quarters of the health workers had received training, and a significant proportion came from the public facilities rather than the private health facilities (93%). Most of health workers reported to attend training organized by district council through MOHSW. This was in line with the study done in Kenya (Wassuna et al 2008) the fact that the ministry had conducted training to health workers at all levels prior to distribution of ALU in public health facilities. It was noted that this study has a significantly greater proportion of the health workers who had received training were clinical officers rather than nurses

and pharmacy staffs. Such findings necessitate that the ministry revisit the outcome and ensure extensive training of other cadres.

5.2 Knowledge of health workers on malaria treatment policy

The assessment of knowledge of health workers on the malaria treatment policy was seen that 60% of them had high knowledgeable on the criteria and the contra indications in prescribing the first line antimalarial drug. However, on knowledge on the possible side effects just above half (54%) mentioned one side effect and very few (6.8%) mentioned more than two side effects. This could be, probably because majority of the health workers had received very little, if any, complains of side effects and since the guidelines also stated that the overall incidence of side effects to ALU was low (MOHSW, 2006), it might have influenced the health worker feel that there was no need to report any adverse effects.

Health workers in the government facilities were found to be more knowledgeable on antimalarial ALU than those of private health facilities. This could be attributed to the fact that majority of the health workers from the public health facilities had received training from the MOHSW. A study done in Sudan found that, only a half of the health workers knew the recommended dose according to the new protocol to treat malaria as only one tenth had received training on it. Hence there was a tendency on many to stick to the old protocol of prescribing Chloroquine to which they were familiar (Abbas, 2006).

Furthermore, findings from this study shows that more than a half of the health workers from FBO and private facilities were having low knowledge regarding the malaria treatment policy. This implies that there was an urgent need to ensure that the health care providers in the private sector, who also carry the burden of treating patients, were well conversant with the policy. If this is not done it could be detrimental to the patients who seek for ALU treatment from these facilities and may lead to further non-adherence of the policy, use of other alternatives by the patients and poor communication regarding the proper usage of the drug.

5.3 The relationship between health workers' knowledge and adherence on malarial treatment policy

This study observes that about 68.8% of health workers with high knowledge could mention to adhere on ALU as first-line treatment for uncomplicated malaria, while 42.9% of low knowledge failed to adhere to ALU. Although the study shows that there is no statistically significant relationship between health workers' knowledge and adherence to the malaria treatment policy.

5.4 Availability of varieties of antimalarial

Availability of ALU was reported to be good in all public and private health facilities as majority claimed that ALU was present in their facility and in addition when this was verified physically it was seen that almost all the facilities did have the drug available during the study period but in some of these facilities some of the pre-packed blisters for different ages/ body weight were missing. However, remarkably it was noted that, despite being the practice, other pre-packed blisters were used to compensate for the dosage requirement.

This study also found that, availability of SP and Amodiaquine were high in the FBO and private facilities. SP continued to be used for intermittent preventive treatment during pregnancy may necessitate its availability, but this could hinder effective implementation of phasing out SP and using ALU implicitly as the first line drug by the health workers. As many, may have still have preferences for the former drug.

Availability of varieties antimalarials could have also contributed to non adherence to malaria treatment policy. A repeat cross sectional study done in Zambia showed that facilities where ALU was in stock, the proportion of children weighing 10kg who should have receive this drug increase from 22% in 2004 to 59% in 2006 (Zurovac et al., 2007) and adding to this the results from this study also shows that since many of the private facilities did not have ALU in stock, more of SP and non recommended Antimalarials were prescribed in respect to ALU.

This study also found that the alternative choice of antimalarial in case of non response to the ALU, majority of respondents choose quinine. However few preferred to repeat ALU. This reflects the recommendations on the malaria treatment guidelines, again on quinine reflects its long term use and its perceived efficacy. Studies have shown that, even during the first policy change of malaria treatment in Tanzania, quinine was significantly perceived by the health workers as the alternative antimalarial drug for the replacement of Chloroquine and not SP or Amodiaquine (Tarimo et al., 2007).

Study findings also show that in majority of the cases, for patients who had been treated with ALU, when their treatment cards were reviewed, showed that the dose of ALU was prescribed correctly according to the body weight or their age, this findings were similar to a repeat cross sectional study done in Zambia where the correctness of prescribed Artemether-Lumefantrine was assessed according to the weight-specific criteria and the correctness was found to be very high (81 to 96%) in all weight groups (Zurovac et al.,2007). This could be because majority of the health workers had undergone training on malaria treatment policy and especially a significant number of clinical staffs had undergone training, hence were knowledgeable on how the drug should be used in each case and thus give the dose correctly.

Disappointingly though, it was noted that 19.3% of the respondent' treatment cards, the dosages were not indicated. Such situations have to be addressed as soon as possible otherwise successful implementation of the policy will be difficult. The dosage regimen of ALU is complex, there is much need to ensure that correct dosages are indicated, otherwise wrong dosages may lead to the drug not being used properly and leading to resistance. Therefore hindering the ultimate aim of reducing morbidity and mortality due to malaria.

5.5 Antimalarial practice

Findings from this study also shows that antimalarials such as ALU, SP and Quinine were commonly given to exiting patients treated for uncomplicated malaria in the public and private facilities. Although ALU being the most commonly prescribed drug, few patients from FBO were given Duocotexcin, which meant the patients paid the drug because they have health insurance. The fact that ALU was being mostly prescribed showed that, the policy change was accepted such that the health workers were adhering to the use of ALU as a first line drug for uncomplicated malaria. This was in contrast to a study done in Zambia in which during the drug transition to Artemisinin – Lumefantrine most clinicians opted for more familiar SP rather than the introduced Artemether – Lumefantrine (Zurovac et al., 2005).

Adding to this it was also noted that when the health workers were asked about their choice of antimalarial for uncomplicated malaria majority mentioned ALU. Practice in the past has been that whenever there is a policy change, adherence in the initial stages is always difficult, as was shown by a study done in Songea Urban on health worker's practices, when the policy changed from CQ to SP, a highly significant percentage of health workers reported continued use of Chloroquine (Tarimo et al., 2007).

Effective policy changes in malaria treatment have been with much difficulty especially when the recommended drugs are viewed with much perceived threats or in terms of individual experiences of successes or failures of the drug, as was shown by a study done in some rural communities, when Chloroquine was being phased out as the first line drug for uncomplicated malaria in Tanzania, people feared adverse reactions from SP and projected a lack of confidence in the drug because of its slow ability of reducing fever. Not only did the public demonstrated lack of confidence in the drug but some of the health workers also expressed obvious fear and negative perception about SP drug (Nsimba, 2006).

The guideline also recommends that the drug should be taken with fatty meals to enhance absorption (MOHSW 2006), co administration of Artemether-Lumefantrine

with a relatively small amount of fat ensures maximum absorption of Lumefantrine component of the drug (Ashley et al., 2007). When the exiting patients were asked, if they were given any special instructions when taking the first line drug more than a half commented that they were not given any, with such findings it becomes necessary that the health worker did not understand the relative importance of giving these instructions to the patients.

Majority of patients interviewed were also not told of any possible side effects as even when the health workers were asked if they knew any possible side effects, majority had reported only one and a very few more than two. The argument could be that the health workers had not yet heard of any significant side effects and since ALU was reported to have low incidences of side effects (MOHSW, 2006) this could be the reason.

The first dose is normally supposed to be taken as Direct Observed Treatment (DOT) under the direct supervision of the health worker as it is instructed by the guideline (MOHSW, 2006) however majority of them did not take their first doses in the health facilities this was in breach of what was recommended by the guidelines. Although the reasons for not doing so, was not asked to the patients.

However, this study also had some limitations that the dispensers were not observed directly while giving instructions, so the patient's level of understanding and education could have compromised on the fact that the message was not efficiently received. This was also highlighted by the findings from the study done in Rural Tanzania (Mujinja, 2008). But again the bottom line is that the patient is the final user hence it is very important that the drug is correctly understood by the user.
Majority of the health workers who participated in this study strongly agreed that ALU should be used as a first line drug rather than SP. And when asked for their opinion, many of the respondents who were prescribing the drug especially in the government facilities were very positive about the drug and felt that it was a good medicine and its use should be continued. However their main concern was that the

tablets were very many per dose and would affect the compliance of the patient. Indeed a minority did complain that some of the patients did not recover fully when given ALU and had to come back for treatment. Reflecting on this, could be that since the dosage regimen is long and after feeling a little better the patient may not finish the required dose or due to the complexity of the dosage timings may not uptake the medication as is required. If such was the case then more emphasis should be put on education to the patient and ensuring that the dosage was taken in a right way and the dose completed.

Policy Implication

This study looked at factors that affect adherence of health workers on malaria treatment policy since Public-sector health workers have received training on malaria treatment and better practices on treatment policy than their counterparts in private and not-for-profit sectors (FBO). Changes in treatment policy should be accompanied by subsequent implementation activities, which should involve all sector players. The assumption that health workers will follow the guidelines on paper is merely a guess and therefore there is need for frequent sensitization through education, information and communication. Furthermore, monitoring and evaluation for the achievements and failures of the policy changes and subsequent re-planning for better results is compulsory. This will increase rational use of anti-malarials and reduce parasitic resistance to recommended drug.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSION

The study findings show that the availability of ALU in public and private health facilities is high relative to other antimalarials treatment. Generally, ALU has been accepted by the public health workers, considering that majority have received training, knowledgeable and perceive the use of ALU in a positive way. However such is not the case in the private and FBO health facilities where the availability of varieties antimalarial drugs are stocked and making the implementation of the policy difficult. However other factors than prescribing and dispensing practice may play important role in health workers' practices and acceptance of treatment policy. Such things as experience acquired through observation of clinical response to treatment, having a range of available treatment choices and patients' characteristics may have more influence in clinical practices. The need for close monitoring of implementation of treatment policies is emphasized including assessment of training and sensitization needs for different health worker cadres and private health facilities, particularly early in the change process.

6.2 RECOMMENDATIONS

Based on these findings several recommendations are proposed**.**

6.2.1: Recommendation for practice

- Constant supervision should be done to ensure that the policy continues to be effectively implemented.
- Capacity building should be further strengthened to the health workers in the private health facilities and other cadres especially the nursing cadre and the pharmaceutical staffs.
- Due to complexity of the dosage regimen more emphasis should be put on education to patients regarding the correct instructions on the use of the drug; every dispensing of the drug should be accompanied with an illustrated dosing instructions to assist in better understanding of the drug.

6.2.2: Recommendation for future research.

- Further studies should be done in the communities to see whether ALU is being used as it is supposed to be and that patients are complying to the dosage regimen to ensure that maximum efficacy of the drug is achieved and to delay the development of drug resistance.

- Since the study was conducted in rural setting rather than urban setting, more studies should be conducted in urban areas so as to get the real picture in that type of scenario.

REFERENCES

Ahmmed, M., and Yousif, M., (2004), 10(4/5):566-572.Impact of the national protocol for malaria treatment on prescribing patterns in Gezira State, Sudan. Eastern Mediterrean Health Journal.

Abbas,B.(2006), 1(2):117-121.Prescribing and dispensing practice for malaria at dispensary level, White Nile State, Sudan. Sudanese Journal of Public Health.

Alba, S., Hetzel, M., Goodman, C., Dillip, A., Liana, J., Mshinda, H., and Lengeler, C., (2010), 9(1):164. Improvements in access to malaria treatment in Tanzania after switch to artemisinin combination therapy and the introduction of accredited drug dispensing outlets - a provider perspective. Malaria Journal.

Ashley, EA., Stepniewska, K., Lindergardh, N., Annerberg, A., Khan, A., Brockman, A., Singhasuivanon, P., White, N., and Nosten, F., (2007),12(2):195–206. How much fat is necessary to optimize lumefantrine oral bioavailability? Tropical Medicine and International Health.

Kachur, S., Khatib, R., Kaizer, E., Fox,S., Abdulla, S., Bloland, P., (2004), 71(6):715-722. Adherence to antimalarial combination therapy with Sulfadoxine-Pyrimethamine and Artesunate in rural Tanzania. Journal of Tropical Medicine and Hygiene.

Kielman,A., Janursk,K., and Annet, H.,(1995).Assessing district health needs service and system: Protocols for Rapid Data Collection and Analysis.

Ministry of Health and Social Welfare, Tanzania (2006). National Guidelines for Malaria Diagnosis and Treatment. Malaria control series 11.

Ministry of Health and Social Welfare, Tanzania (2010). National Malaria Control Programme-medium Term Malaria Strategic Plan 2008-2013.

Minzi, M., and Haule, F.,(2008), 5:117–121. Poor knowledge on new malaria treatment guidelines among drug dispensers in private pharmacies in Tanzania: The

need for involving the private sector in policy preparations. East Africa Journal of Public Health.

Mugoyela, V., and Minzi, O., (2011), 4:89–95. Implementation of artemether-lumefantrine treatment policy for malaria at health facilities in Tanzania. Risk Management Health Policy.

Mujinja, P.,(2008), 39. Consumer rights and Non governmental action in medicines markets: Knowledge, risk and trust in Rural Tanzania. IKD working paper no.39

Nsimba, S. (2006), 2(5):1746-4269. How Sulfadoxine-Pyrimethamine(SP) was perceived in some rural communities after phasing out Chloroquine (CQ)as a first line drug for uncomplicated malaria in Tanzania: lessons to learn towards moving from monotherapy to fixed combination therapy. Journal of Ethnobiol Ethnomedicine.

Rajakaruna, R., Weerasinghe, M., Amerasinghe, P., and Konradsen, F., (2006),43:58-65. The role of private drug vendors as malaria treatment providers in selected malaria endemic areas of Srilanka. Journal of Vector Borne Disease

Simba, D., and Kakoko, D., (2012), 14:2. Access to subsidized srtemether-lumefentrine from the private sector among febrile children in rural setting in Kilosa, Tanzania. Tanzania Journal of Health Research.

Skarbinski, J., Ouma, O., Causer, M., Kariuki, K., Barnwell, W., Alaii, A., Macedo de Oliveira, A., Zurovac, D., Larson, A., Snow, W., Rowe, K., Laserson, F., Akhwale, A., Slutsker, L., and Hamel, J., (2009), 80:919-926. Effect of malaria rapid diagnostic tests on the management of uncomplicated malaria with artemether-lumefantrine in Kenya: A cluster randomized trial. Journal of Tropical Medicine and Hygiene.

Watsierah, C., Onyango, R., Ombaka, J., Abong'o, B., and Ouma, C., (2012) 11:436. Provider knowledge of treatment policy and dosing regimen with arthmether-lumefantrine and quinine in malaria-endemic areas of Western Kenya. Malaria Journal.

Wasunna, B., Zurovac, D., Goodman, A., and Snow, W., (2008), 7:29. Why don't health workers prescribe ACT? A qualitative study of factors affecting the prescription of artemether-lumefantrine. Malaria Journal.

World Health Organization, Geneva (2010). World malaria Report.

Zurovac, D., Rowe, K., Ochola, A., Noor, M., Midia, B., Snow, W., (2004), 33:1080-1091 Predictors of the quality of health worker treatment practices for uncomplicated malaria at government health facilities in Kenya. International Journal of Epidemiology,

Zurovac, D., Ndhlovu, M., Rowe, K., Hamer, H., Thea, M., Snow, W., (2005) 331:734-7. Treatment of paediatric malaria during a period of drug transition to artemether-lumefantrine in Zambia: cross-sectional study. Bio Medical Journal.

Zurovac, D., Ndhlovu, M., Sipilanyambe, N., Chanda, P., Hamer, H., Simon, L., Snow, W., (2007) , 6:31. Paediatric malaria case-management with artemether-lumefantrine in Zambia: a repeat cross-sectional study. Malaria Journal.

APPENDIX I: INFORMED CONSENT FORM

MUHIMBILI UNIVESITY COLLEGE OF HEALTH SCIENCE

DIRECTORATE OF RESEARCH AND PUBLICATION, MUHAS

ID-NO | | | | | | | | | |

Consent to participate in study.

Greeting! My name is Joyce Massawe. I am a student of Master of Health Policy and Management at Muhimbili University of Health and Allied Sciences doing research on Assessment of factors that affect adherence of Health workers to malaria treatment policy in Singida Rural District.

Purpose of the study

The purpose of the study is to assess health workers' knowledge and practice on adherence to malaria treatment policy.

What participation Involves

If you agree to join the study you will be required to answer a series of question in the questionnaire pertaining to the malaria treatment policy.

Confidentiality

Confidentiality will be reassured through anonymity by the use of identification numbers; also only authorized person shall have access to the collected data.

Risks

We do not expect you to come to any harm because of participating in this study.

Right to Withdraw

Taking part in this study is completely your choice. If you choose not to participate in the study no penalty will be imposed on you. You can stop participate this study at any time, even if you have already given your consent.

Benefits

If you agree to participant in this study there may be no direct benefit to you, however, the information you provide will help to identify any problems associated with the implementation of the new malaria treatment policy and help the at any time, even if you have already given your consent.

Who to contact

If you ever have questions about this study, you should contact the study Supervisor Prof. P.F. Mujinja or the Principal Investigator Joyce Massawe of Muhimbili University of Health and Allied Sciences, P.O. Box 65001, Dar es Salaam. If you ever have question about your right as a participant, you call Prof. Mainen J. Moshi, Chairman of the University Research and Publication Committee, P. O .Box 65001, Dar es Salaam Tel: 2150302-6,2152489.

Signature:

Do you agree?

Participant agrees …… Participant does NOT agree……..

I _____have read the contents in this form. I agree to participant in this study.

Signature of participant _____

Signature of witness (if participant cannot read) _____

Signature of research assistant _____

Date of signed consent_____

APPENDIX 2: FOMU YA RIDHAA

CHUO KIKUU CHA SAYANSI ZA TIBA MUHIMBILI

MKURUNGEZI WA UTAFITI NA UCHAPISHAJI, MUCHS

Namba ya utambulisho | | | | | | | | | |

Ridhaa ya kushiriki kwenye utafiti

Salaam! Jina langu ni Joyce Massawe, ambae ni mwanafunzi wa shahada ya uzamili wa sera za afya na usimamizi katika chuo kikuu cha muhimbili, ninafanya utafiti juu ya uelewa na utekelezaji wa wafanyakazi wa afya wa kutumia dawa za mseto (Alu) kwa ajili ya matibabu ya malaria ya kawaida katika wilaya ya Singida Vijijini,mkoani Singida.

Madhumuni ya utafiti

Madhumuni ya utafiti huu ni kuangalia kama wafanyakazi wa afya wanafuata sera ya tiba ya malaria.

Nini kinahitajika kwa ushiriki

Kama utakubali kushiriki katika utafiti huu utatakiwa kujibu maswali katika dodoso ilioandaliwa juu ya sera mpya ya tiba ya malaria.

Usiri

Taarifa zote zitakazokusanywa zitakua ni siri na hakuna mtu yoyote atakaeambiwa ulichosema. Wale tu wanaohusika na utafiti huu ndio wataruhusiwa kuziona.

Hatari

Hutegemewi kupata madhara yoyote kwa kushiriki kwako katika utafiti huu**.**

Uhalali wa kujitoa.

Kushiriki kwenye utafiti huu ni kwa hiari. Kama ukichagua kutoshiriki kwenye utafiti huu hakuna adhabu yoyote utakayopewa. Unaweza kuacha kushiriki katika utafiti huu kwa muda wowote hata kama ulishakubali kushiriki

Faida

Hakuna faida ya moja kwa moja kwako kwa kushiriki kwenye utafiti huu. Lakini taarifa utakazotoa zitasaidia kujua kama kuna matatizo yoyote katika utekelezaji wa sera mpya ya tiba ya malaria na kusaidia watekelezaji kurekebisha tiba ya malaria.

Nani wa kuwasiliana naye.

Kama una swali lolote kuhusu utafiti huu wasiliana na mtafiti mkuu Pof. P.F. Mujinja au mtafiti msaidizi Joyce Massawe wa chuo kikuu cha sayansi ya tiba Muhimbili S.L.P. 65001 Dar es Salaam.

Kama una swali lolote kuhusu stahili zako kama mshiriki unaweza kumpigia **Prof. Mainen J. Moshi** mwenyekiti wa chuo wa kamati ya utafiti na uchapishaji S.L.P 65001 Dar es Salaam simu numba 2150302-6.

Unakubali?
Mshiriki amekubali.....…mshiriki hajakubali ……..

Mimi ……. Nimesoma maelezo ya fomu hii. Nakubali kushiriki kwenye utafiti huu.

Sahihi ya mshiriki …….**.....**……..

Sahihiya shahidi (kama mshiriki hawezi kusoma) ……

Sahihi ya mtafiti msaidizi …….**.....**……

Tarehe ya kusainiwa kwa ridhaa …….**.....**…….

APPENDIX 3: Questionnaire (English version)

QUESTIONNAIRE FOR THE HEALTH WORKERS

Tick the appropriate choice in the box provided

Demographic information

Questionnaire number _____

a) Date of interview _____

1) Type of health facility

1=Private

2= Government [ ]

3= FBO

4= NGO

2) Level of facility

1 = Dispensary

2 = Health Centre [ ]

3 = Hospital

3) Cadre of the respondent

1 = Clinicians

2 = Nursing personnel [ ]

3 = Pharmaceutical personnel

4) Type of qualification

1= Medical officer with specialty
2= Medical officer
3= Assistant medical officer
4= Clinical officer
5= Assistant clinical officer
6= Nursing officer [ ]
7= Nurse midwife
8= Public Health nurse B

9= Nurse Assistant
10= Pharmacist
11= Pharmaceutical technician
12= Pharmaceutical assistant
13=Others

5) Sex

1= Male
2= Female

6) Age

1= 20 – 30 [ ]

2= 31 – 40 [ ]

3=41 -50 [ ]

4=51 -60 [ ]

5= zaidi ya miaka 61 [ ]

7) Working experience .....

Questionnaire based on malaria treatment guideline

8. Do you know that the national guideline for malaria treatment and diagnosis has changed?

1= Yes [ ]

2= No

2. If Yes then since when?

1= less than a year ago

2= a year ago

3= more than two years ago [ ]

4= don't know.

9. Did you receive any training regarding the malaria treatment policy?

1= Yes

2= No [ ]

If yes, How _____

Questions to assess knowledge (NO.10 TO NO.14)

10. What is the1st line drug according to the Malaria guidelines in the treatment of uncomplicated malaria? _____

11. What is 2nd line drug according to the malaria guideline in the treatment of uncomplicated malaria?_____

12. What criterion would you use to determine the correct dosage for the 1st line drug in the treatment in adult / children?_____

13. What are the common side effects associated with 1st line drug in the treatment of uncomplicated malaria according to the guideline? *Mention*

_____

14. What is the dosage regimen (timing intervals) for the 1st line drug in the treatment of uncomplicated malaria?_____

15. In what type of patients it is not recommended? *Mention* _____

_____

16. Do you have the malaria treatment and diagnosis guideline in your facility?

1= Yes

2= No

17. What type of antimalarials do you have to treat uncomplicated malaria in your facility? (*you can tick more than one option*)

1= Artemether – lumefantrine (ALu)	[ ]
2= quinine	[ ]
3= Amodiaquine	[ ]
4= SP	[ ]
5= CQ	[ ]
6= Artemisinin monotherapies	[ ]
7= others _____	

18. Is your facility implementing the malaria treatment policy?

1= yes

2= No [ ]

3. If No why? _____

19. Do you have access to the malaria guidelines when you want to refer or use it?

1= Yes

2= No [ ]

20. If yes, then how often do you refer or use it?

1= always

2= most times [ ]

3= sometimes

4= never

21. What is your first option in treating a patient with uncomplicated malaria?

1= Artemether – Lumefantrine (Alu)

2= quinine

3= Amodiaquine [ ]

4= SP

5= CQ

6= Arteminisinins injection

7=others _____.

22. If the patient was prescribed the first line drug for uncomplicated malaria and did not respond what antimalarial would you suggest and give as alternative?

1= Artemether – Lumefantrine (Alu)

2= quinine

3= Others [ ]

23. If the patient was prescribed the first line drug for the treatment of uncomplicated malaria and he/she insisted on being given any other drug rather than the first line drugs what would you do?

24. What is your opinion regarding the 1st line drug recommended in the guideline for treatment of uncomplicated malaria?_____

END OF INTERVIEW

THANKYOU FOR YOUR KIND PARTICIPATION

APPENDIX 4:

A: QUESTIONNAIRE FOR EXITING PATIENTS AT THE DISPENSING SECTION TREATED FOR MALARIA

Tick the appropriate choices

1.Questionnaire no: _____

2. Date of interview _____

3. Type of health facility

1= Private

2= Public

3= Faith based organization (FBO) [ ]

4= NGO ____

4. Level of facility

1= dispensary

2= health center [ ]

3= hospital

5. Have you treated for malaria?

1= Yes [ ]

2= No

6. What medication have you given for treatment of malaria?

_____

If given ALu, then proceed with the following questions.

7. Have you given instructions on how to use the medication

1=Yes

2=No [ ]

8. If yes, how were you asked to take it? (how many and timing interval)

_____

9. Were you given any other instructions to follow when taking the drugs?

1= Yes [ ]

2= No

10. If yes what were the other special instructions given to you?

_____

_____

11. Were you informed of any side effects of the medication?

1= Yes

2= No [ ]

12. If yes then what side effect were you told about?

_____

_____

13. Did you take your first dose here at the facility under supervision?

1= Yes [ ]

2=No

END OF INTEWRVIEW
THANKYOU FOR YOUR KIND PARTICIPATION

B: Examination of the treatment cards/ records bearing the diagnosis and the treatment.

Age: _____

Body weight:_____

History recorded:_____

Diagnosis done:_____

Result of diagnosis:_____

Other records;

Headache	[ ]
Joint pains	[ ]
Malaise	[ ]
Vomiting	[ ]
Diarrhoea	[ ]
Poor appetite	[ ]
Body weakness	[ ]
Chest pain	[ ]
Pallor	[ ]

d. Type of the antimalarial drug_____

e .Dose of the antimalarial drug_____

APPENDIX 5:

CHECKLIST

Put the appropriate number in the box provided.

a) Identification number _____

b) Date of interview_____

c) Type of health facility

1= Private

2= Government [ ]

3= FBO

4= NGO

5= Others _____

d) Level of facility

1= Dispensary [ ]

2= Health center

3= Hospital

IN THE DISPENSING SECTION (Tick in the appropriate boxes)

1. Presence of antimalarials

a). 1st line with

i). All the pre packed (weigh based) blister [ ]

ii). Some of the pre packed (weigh based) [ ]

iii). Some blisters with missing tablets [ ]

iv). Single pack with 24 tablets [ ]

b). 2nd line _____

c).others _____

2. Ask if amount lasts until the next supply and procurement

Yes [ ]

No [ ]

OTHERS

3. Availability of national guidelines for malaria diagnosis and treatment in the facility

Yes [ ]

No [ ]

4. Availability of other IEC materials on the malaria chemotherapy in the facility

Yes [ ]

No [ ]

THE END

APPENDIX 6

DODOSO KWA AJILI YA WAFANYAKAZI WA AFYA

Weka alama ya vema kwenye majibu yanayostahili katika masanduku uliopewa.

A: Taarifa muhimu za kijamii.

1) Namba ya dodoso _____

2) Tarehe ya mahojiano _____

3) Aina ya kituo cha afya

1= cha binafsi cha faida

2 = cha serikali [ ]

3 = cha binafsi bila faida

4 = mengineyo

4) Ngazi ya kituo cha afya

1= Zahanati

2 = Kituo cha afya [ ]

3 = Hospitali

5) Kada ya msailiwa

1=Mganga

2= muuguzi [ ]

3= mfamasia

6) Umri wa msailiwa miaka:(andika numba)

1= 20 – 30 [ ]

2= 31 – 40 [ ]

3=41 -50 [ ]

4=51 -60 [ ]

5= zaidi ya miaka 61 [ ]

7) Jinsia

1= mke [ ]

2= mme [ ]

8) Mafunzo ya ujuzi ulio nao:

1= Daktari bingwa

2= Daktari

3= Daktari msaidizi

4= Tabibu

5= Tabibu msaidizi

6= Muuguzi

7= Muuguzi mkunga [ ]

8= Muuguzi wa jamii

9= Muuguzi msaidizi

10= Mfamasia

11= Fundi sanifu madawa

12= Fundi sanifu msaidizi

9) Miaka ambayo umefanya kazi _____

B: Maswali yanayohusu mwongozo wa tiba ya malaria

1.Hivi una habari kuwa mwongozo wa tiba ya malaria ya kimataifa umebadilika?

1= Ndio

2= Hapana [ ]

2. Kama ndio, je ulibadilika lini?

1= chini ya mwaka mmoja

2= zaidi ya mwaka mmoja

3= sijui

3. Je uliwahi kupata mafunzo yoyote juu ya sera mpya ya tiba ya malaria?

1= Ndio [ ]

2= Hapana [ ]

4. Kama ndio je kwa njia gani?_____

5. Je unafahamu dawa ya kwanza katika matibabu ya malaria ya kawaida ilioainishwa katika mwongozo mpya wa tiba ya malaria?

1= Ndio

2=Hapana

Taja_____

6. Je unafahamu dawa ya pili katika matibabu ya malaria ya kawaida ilioainishwa katika mwongozo mpya wa tiba ya malaria?

1=Ndio

2=Hapana

Taja _____

7. Je ni vigezo gani utatumia kutafsiri dozi sahihi ya dawa kwa wakubwa na watoto?

_____

8. . Je hii dawa ya kwanza inatakiwa kutumika vipi? (masaa) kwa mgonjwa wa malaria ya
kawaida?_____

9. Je kuna madhara gani yanaweza kusababababishwa na dawa hii ya kwanza inayotumika kutibu malaria ya kawaida?

_____

10 Je wagonjwa gani hawatakiwi kupewa dawa iliyoidhinishwa katika mwongozo wa tiba ya malaria?

Taja _____

11. Je unao mwongozo wa tiba na uchunguzi wa malaria katika kituo hiki?

1= Ndio [ ]

2= Hapana [ ]

12. Je kuna dawa gani za malaria ambazo zinatumika kutibu malaria ya kawaida katika kituo hiki? (*unaweza kujibu zaidi ya moja*)

1= dawa ya mseto (Alu) [ ]

2= quinine [ ]

3= Amodiaquine [ ]

4= SP [ ]

5= CQ [ ]

6= Sindano za artemisini [ ]

7= Nyinginezo

_____

13 .Je kituo hiki cha tiba kinatekeleza mwongozo wa tiba ya malaria ya kawaida?

1= Ndio [ ]

2= Hapana

14 .Kama hapana kwa nini?_____

15. Je ukitaka unaweza kuupata huu mwongozo mpya na kuutumia?

1= Ndio [ ]

2= Hapana

16. Kama ndio, je mwongozo huu unautumia wakati gani?

1 = kila mara

2 = mara nyingi [ ]

3 = wakati mwingine

4 = sijatumia.

17. Lipi ni chaguo lako la kwanza kutibu mgonjwa wa malaria ya kawaida?

1= dawa ya mseto (ALU

2= quinine

3= amodiaquine [ ]

4= SP

5= CQ

6= Dawa za jamii ya artemisini

7= Nyinginezo

18. Kama mgonjwa aliandikiwa dawa hii ya kutibu malaria ya kawaida na hakupona je ungeshauri apewe dawa gani mbadala?

_____

_____

19. Kama mgonjwa akaandikiwa dawa hii ya kwanza ya kutibu malaria ya kawaida na akasisitiza apewe dawa nyingine mbadala, je unafanya nini?

_____

20 Je una maoni gani kuhusu dawa ya kwanza ilioidhinishwa na muongozo wa tiba ya malaria ya kawaida?

_____

MWISHO WA USAILI

ASANTE KWA USHIRIKIANO WAKO

APPENDIX 7:

A: DODOSO KWA AJILI YA MGONJWA ATOKAE SEHEMU YA KUCHUKULIA DAWA

Weka alama ya vema kwa majibu yanayostahili katika masanduku uliopewa.

1.Tarehe ya mahojiano _____

2.Namba ya dodoso _____

3.Aina ya kituo cha afya

1= cha binafsi cha faida

2= cha serikali [ ]

3= cha binafsi bila faida

4= cha dini.

4. Ngazi ya kituo cha Afya

1= Zahanati

2= Kituo cha afya [ ]

3= Hospitali

5. Je umetibiwa kwa ajili ya malaria?

1= ndio [ ]

2= hapana

6. Kama ndio je ulipewa dawa gani kwa ajili ya tiba ya malaria?

_____

Kama amepewa Alu endelea na maswali yafuatayo

*7.*Je mtoaji dawa alikupa maelekezo yoyote juu ya matumizi ya hizi dawa?

1= Ndio [ ]

2= Hapana

8. Kama ndio. Uliambaiwa umeze hizo dawa (mara ngapi na masaa ya kumeza)?

_____

9. Je ulipewa masharti mengine yoyote ya kufuata wakati wa kutumia hizo dawa?

1= Ndio [ ]

2= Hapana

10. Kama ndio ulipewa masharti gani?

_____

11. Je uliambiwa madhara yoyote yanayoweza kusababishwa na hizo dawa?

1= Ndio [ ]

2= Hapana

12. Kama ndio, zitaje.

_____

13. Je dozi yako ya kwanza uliimeza mbele ya mtoa huduma wa afya?

1= Ndio [ ]

2= Hapana

MWISHO WA USAILI

ASANTE KWA USHIRIKIANO WAKO

B: Utafiti katika kadi ya mgonjwa au daftari zilizoandikwa matibabu.

1) Umri _____

2) Uzito wa mgonjwa _____

3) Vipimo vilivyofanyika_____

4) Majibu ya vipimo_____

5) Historia iliorekodiwa (weka alama ya vema kwenye sanduku uliopewa)

a) Joto la mwili wa mgonjwa kama limerekodiwa [ ]

b) Dalili za kuumwa viungo [ ]

c) Uchovu [ ]

d) Dalili za kutapika [ ]

e) Dalili za kuharisha [ ]

f) Dalili za kutokuwa na hamu ya kula [ ]

g) Dalili za udhaifu wa mwili [ ]

h) Maumivu ya kichwa [ ]

i) Dalili za upungufu wa damu zimeangaliwa [ ]

4. Aina ya dawa ya malaria_____

5. Dozi ya dawa ya malaria_____

APPENDIX 8:

ORODHA ANGALIZI

Weka namba inayostahili katika sanduku

a) Namba ya utambulisho _____

b) Tarehe ya mahojiano _____

c) Aina ya kituo cha afya

1= cha binafsi cha faida

2= cha serikali [ ]

3= cha binfsi bila faida

4= mengineyo

d) Ngazi ya kituo cha afya

1= Zahanati

2= kituo cha afya [ ]

3= Hospitali

Kitengo cha madawa (*weka alama ya vema kwenye kisanduku***)**

Upatikanaji wa dawa za malaria

1. Dawa ngazi ya kwanza

a) Packet zote kulingana na uzito [ ]

b) Baadhi ya paketi kulingana na uzito [ ]

c) Baadhi ya paketi ambazo dawa zimeondolewa [ ]

d) Paketi yenye vidonge 24 [ ]

2. Dawa ngazi ya pili [ ]

3. Dawa aina nyingineza malaria zilizopo_____

4. Je kiasi kilichopo kinatosheleza kwa kipindi kilichobaki hadi uingizaji mwingine wa dawa?

Ndio [ ] Hapana [ ]

5. Kuwepo kwa muongozo wa tiba na uchunguzi wa Malaria

Ndio [ ] Hapana [ ]

6. Kuwepo kwa vipeperushi kuhusu tiba mpya ya malaria

Ndio [ ] Hapana [ ]

MWISHO