HEALTH WORKERS' ADHERENCE TO THE NEW MALARIA TREATMENT POLICY IN SONGEA URBAN, TANZANIA

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH IN THE UNIVERSITY OF DAR ES SALAAM

2002.

CERTIFICATION

The undersigned certify that he has read and do recommend for acceptance by the University of Dar es Salaam a dissertation titled **"HEALTH WORKERS' ADHERENCE TO THE NEW MALARIA TREATMENT POLICY IN SONGEA URBAN DISTRICT, TANZANIA"** as a partial fulfilment of the requirements for the degree of Master of Public Health.

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Signature.....

Date: 26th Sept. 2002

DECLARATION

I, Daniel Aron Malekela, hereby declare that this dissertation is my original work, and that neither the whole nor parts of the dissertation have ever been submitted for a diploma or degree in any other University.

Candidate's signature:.....

Date: 26th SEPTEMBER, 2002.

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DEDICATION

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ABSTRACT

Tanzania made a policy change to replace chloroquine with sulfadoxine – pyrimethamine (SP) since August, 2001. However, the long experience (> 50 years) with chloroquine coupled with its anti-inflammatory and antipyretic effects that are lacking in SP might potentially make SP less readily acceptable by both prescribers and patients hence compromising adherence to the new policy. The study assessed health worker adherence to the new policy focussing on health workers awareness on the new antimalarial drug policy, knowledge on contra-indications, indications, potential side effects of the antimalarial drugs and necessary precautions, as well as their perceptions and practices regarding the new policy. A descriptive cross-sectional survey was conducted in Songea Urban District using structured open-ended questionnaire interviews supplemented with participant observations in public and private health facilities.

Awareness of the new policy was 95.2%, knowledge on 1st line drug 91.4%, 2nd line 53.3% and 3rd line 63.8%. Knowledge on SP indications and contra-indications was significantly high (91.4%). SP was perceived to be not as effective as chloroquine in clinical response (53.3% versus 46.7%). Amodiaquine was less preferred and was mentioned at a frequency of 42.9% as the perceived second line drug.

Quinine was significantly preferred than amodiaquine in the treatment of non-response to SP, both from interviews and prescriptions.

The findings show that there was an erratic adherence to the new malaria treatment policy, and clearly there is a gap between the knowledge of the health workers on the new policy and their practices. Therefore information, education and communication (IEC) messages should address identified knowledge and practice gaps and be accompanied with behavioural change communication (BCC) strategies.

There is a need to ensure a strict adherence to the indications for quinine use by inducing health workers to be familiar with amodiaquine as an alternative drug to non-response or contraindications to SP, and as a second line drug.

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CHAPTER 1

1.1 INTRODUCTION

Effective chemotherapy remains the most feasible malaria control strategy in holoendemic areas and would likely remain so for the foreseeable future. Thus, the objectives of malaria control in sub-Saharan Africa have been to prevent and reduce mortality and morbidity through prompt effective treatment on demand (WHO, 2000a). The worsening problems of resistance to chloroquine (Wernsdorfer, 1994), and the limited number of available and affordable alternative drugs in the peripheral health care levels, coupled with poor referral infrastructures, have made it difficult to achieve optimal case management of malaria consequently leading to increased morbidity and mortality (Trape et al, 1998). This highlights the importance of routine monitoring of the efficacy and effectiveness of national antimalarial drug policies as well as prompt and appropriate diagnosis of treatment failures that should receive alternative treatment (WHO, 2000a). The increase in childhood morbidity and mortality conceivably attributed to the escalating *Plasmodium falciparum* resistance to chloroquine (CQ) (Trape et al, 1998) has made endemic countries of Africa such as Kenya, Malawi, Botswana and South Africa to change policy to the fixed combination of sulfadoxine and pyrimethamine (SP) (White et al.1999a). However, the use of any antimalarial drug is influenced by socio-behavioural factors such as familiarity with the drug and the perceived efficacy (Le Grand et al, 1999).

1.1.1 PROBLEM STATEMENT

Plasmodium falciparum resistance to chloroquine in Tanzania increased over the last two decades surpassing the upper threshold (≥ 25%) for replacement (WHO, 1996), hence being a major constraint to child health care in Tanzania as reflected by the increase in child morbidity and mortality (MOH, 1999). The worsening problems of chloroquine resistance and the unavailability of alternative antimalarial drugs in the 1st level health facilities coupled with the poor referral infrastructures have gave a new impetus to the Ministry of Health to review malaria treatment policy and a change of policy from chloroquine to sulfadoxine-pyrimethamine that was planned since 1998 had been effected (MOH, 2000a). However, the long experience with chloroquine (50 years) coupled with its endogenous ability to lower fever (antipyretic effects) and reduce bodily aches (anti-inflammatory properties), characteristics that are lacking in sulfadoxine-pyrimethamine (Warrell, 1993), can lead to a slow symptoms relief after sulfadoxine-pyrimethamine therapy. This could conceivably make providers and clients to maintain the notion that sulfadoxine-pyrimethamine (SP) is not effective and resort to other alternative drugs or even continue using chloroquine thus limiting the potential public health benefits of the policy change. The fact that chloroquine was being given in three doses spaced over three days while SP is given as a single dose, might conceivably make providers and clients to maintain the notion that sulfadoxine-pyrimethamine is rather too strong (especially for children) or too weak (Tarimo et al, 2001) and resort to other alternative drugs or even continue using chloroquine. Although a policy change to

sulfadoxine-pyrimethamine is envisaged to show public health benefits in terms of a reduction in mortality and morbidity due to malaria, this can only be achieved if there is a consistent adherence to the new policy. Adherence to the new policy by providers and clients rests on their perceptions and knowledge of the new policy and reasons for the policy change (MOH, 2000a).

1.1.2 THE STUDY QUESTIONS

The research seeks to address questions such as: are the health workers in Songea urban district aware of the policy change and knowledgeable on the new malaria treatment policy in terms of indications and contraindications of 1st, 2nd and 3rd line antimalarial drugs, potential side effects and the necessary precautions to take? How do the health workers perceive the new policy? What are the current health workers' practices regarding antimalarial drugs use for the treatment of uncomplicated and severe/complicated malaria under the new policy?

1.1.3 THE STUDY RATIONALE

The rationale of this study was therefore to assess the major determinants of adherence to the new malaria treatment policy by health workers. The information obtained shall enable policy makers to develop supportive information, communication and educational (IEC) messages, accompanied by behavioural change communication

strategies to change practices and therefore adherence to the new policy. The study area is holoendemic for malaria (Kilama & Kihamia 1991) and hospital data show that in 1999/2000 malaria contributed to about 60% of the outpatient and 65.6% of inpatient attendances, and was responsible for 44.0% of all deaths, being the leading cause of hospital deaths. It is part of Tanzania mainland where the new malaria policy is being implemented.

1.2 BROAD OBJECTIVE

The overall objective of the study was:

To assess health workers' adherence to the new malaria treatment policy in Songea urban district, Tanzania

1.2.1 Specific objectives

1. To assess health workers' awareness on the policy change.
2. To assess knowledge on the antimalarial drugs in each line of choice, their indications, side effects and contraindications.
3. To describe health workers' perceptions on the antimalarial drugs in each line of choice according to the new policy.

4. To describe the current health workers' prescribing / dispensing practices for antimalarial drugs in each line of choice for the management of uncomplicated and severe /complicated malaria according to the new policy.

1.3.0 LITERATURE REVIEW

The spread of drug resistant strains of malaria parasites (Payne, 1987) has made the prophylaxis and treatment of malaria increasingly difficulty, particularly with chloroquine (CQ), and has increased the severity and complexity of what was already an enormous public health problem. The resistance of *Plasmodium falciparum* to antimalarial drugs remains the most important parasite factor in sub Saharan Africa, where 90% of all malaria cases in the world occur and causing about one million deaths of African children (Wernsdorfer, 1994; WHO, 1995). Chloroquine was introduced in the 1950s for use in large-scale distribution in treatment programmes as part of the worldwide malaria eradication campaign, but within 2 - 3 decades, resistance appeared in South America and South East Asia as well as in Africa (Wernsdorfer, 1991). In Tanzania, Chloroquine resistance was first demonstrated in 1982 and has increased since then (Kilama & Kihamia, 1991). Following the wide spread of chloroquine resistance, Fansidar, a fixed combination of sulfadoxine-pyrimethamine (SP), was introduced for large-scale use in South East Asia in the 1970s (Wernsdofer, 1991). Fansidar was introduced in Africa as a 2nd line drug in the 1980s, but to date endemic countries of Africa such as Kenya, Malawi, Botswana and South Africa have adopted sulfadoxine-pyrimethamine as the 1st line drug (White et al, 1999a). This highlights the importance of routine monitoring of efficacy and effectiveness of the national antimalarial drug policy and a timely change of policy so as avert morbidity and mortality due to malaria (WHO, 2000a).

1.3.1 Formulation of antimalarial drugs policy and when to change

The National antimalarial drug policy is the set of recommendations and regulations concerning antimalarial drugs and their utilization in a country. It is part of the National Drug policy and of the National Malaria Control Policy (WHO, 1994) and in line with the overall National Health Policy (WHO, 2000b). This policy is continuously evaluated, reviewed and updated whenever appropriate by the National malaria control programme (MOH, 2001). There are no well-defined criteria for determining the level of clinical or parasitological failure with the current therapy at which a first line should be replaced (WHO, 2000b). However the primary indicator for changing antimalarial treatment policy is a high level of treatment failure with the currently used antimalarial drug. Conditions that signal a need for a re-evaluation of the policy and later decision to change is based on a range of factors including the prevalence and geographical distribution of documented treatment failures, the impact of treatment failures on mortality and severe morbidity, provider and user or user dissatisfaction and the political-economic context and the availability of acceptable and affordable alternatives (WHO, 2000b). Since treatment failure rate remains the cardinal parameter, then it is recommended that the cut off level of treatment failure be 25% of cases (WHO, 2000b; Kitua, 1999), counting both early and late treatment failures (WHO, 1998).

1.3.2 Purpose for the development of a national antimalarial drugs policy

The primary purpose of developing a national antimalarial drugs policy is to ensure prompt, effective and safe treatment of malaria through the selection of optimal regimens for different clinical situations, and to provide effective protection of special groups at high risk such as children and pregnant women through presumptive intermittent therapy. The term effective treatment might be meaningful in different epidemiological contexts as follows (WHO, 2000b): -

1. Clinical remission i.e. clearance of signs and symptoms
2. Clinical cure i.e. clinical remission plus prevention of clinical recrudescence, i.e. no reappearance of signs or symptoms in 14 days following the end of treatment. The above two applies in areas of intense transmission of malaria where high population immunity is expected. Infected adults are often asymptomatic and clinical cure can be achieved without parasitological cure.
3. Parasitological cure (radical cure), i.e. elimination of all parasites from the body, applies in areas of low transmission of malaria. In these areas low population immunity is expected and therefore asymptomatic infections are rare among adults and clinical cure can rarely be achieved without parasitological cure.

The role of antimalarial drug policy is to efficiently use the available resource to maximize the reduction in morbidity and mortality due to malaria, and thus in Tanzania, the purpose of antimalarial drug policy has been (MOH, 2001):

1. To provide rapid and long lasting clinical cure.
2. To reduce morbidity including malaria related anaemia.
3. To halt progression of uncomplicated malaria into severe and potentially fatal disease.
4. To reduce the impact of placental malarial infection and maternal malaria associated anaemia through chemoprophylaxis or intermittent therapy.
5. To minimize the chance and rate of development of drug resistance.

1.3.3 Essential components of a national antimalarial drugs policy

A list of antimalarial drugs registered for use in the country is required (WHO, 1994). This should include their specifications and identification of those classified as essential drugs. Guidelines for treatment and prophylaxis with recommended antimalarial drugs need to include information on indications for use, drug regimens and dosages, and the routes of administration. They need to specify side effects associated with each drug and define risk groups for whom the drugs are contraindicated. Guidelines must include diagnostic criteria, which often vary with the capabilities of the different levels of the health service. Guidance on treatment outside the formal health services should also be included.

The recommended treatments will vary according to (WHO, 1994):

1. Characteristics of the disease: guidelines should include treatments for uncomplicated malaria as well as for severe and complicated malaria.
2. Response to treatment of the individual patient: The first line may fail so that the policy should specify the second line treatment to be used in such cases. In certain situations, it may be necessary to specify a third line treatment for uncomplicated malaria.
3. Pregnancy: malaria in pregnancy is serious risk and requires very effective treatment with the lowest possible risk of clinical failure. It may, therefore, require a first line treatment that is different from the one used in the general population.

Rational use of antimalarial drugs therefore, depends on the knowledge, attitudes, beliefs and practices of health workers and patients as well, regarding the specific antimalarial drug. Educational strategies for both groups are essential, but frequently neglected or inappropriate (WHO, 2001). In the case of health workers, there is often a focus on the transfer of narrow, time limited pharmacological knowledge, rather than on the development of lifetime prescribing skills and the ability to assess drug information critically (WHO, 2001). However, although in-service training on the new malaria treatment policy have the potential to improve malaria treatment practices, a recent study showed that this is not always the case and quite often there is a discrepancy between knowledge and the practice of health workers (Ofori-Adjei et al, 1996; Rowe et al,

2000a) indicating that other factors would potentially influence health workers' adherence to the new policy.

At policy level, a number of factors such as efficacy and half-life, acceptability and adherence to treatment, effectiveness, quality, adverse effects, cost effectiveness and affordability have influence on the selection of 1st line antimalarial drugs. However, acceptability and adherence to the policy by health workers and patients are pertinent to the success of the policy. Acceptability and adherence to the policy by health workers and patients are influenced by both behavioural and economic factors which in turn are determined by: the duration of treatment and daily doses, the speed of clinical response (fever resolution), adverse effects, presentation (taste, colour, size of tablet or volume of syrup), reputation (experience) of the drug, cost and packaging as well as appropriate information, education and communication (IEC) messages and behavioural change communication (BCC) strategies (WHO, 2000a). In Malawi, the first country in sub-Saharan Africa to replace chloroquine with sulfadoxine-pyrimethamine in 1993, following countrywide information, education and communication messages and behavioural change communication strategies, there was a successful policy implementation for more than 5 years now (Nwanyanu, 2000).

One potential adverse effect of sulfadoxine-pyrimethamine is hypersensitivity to the sulfonamide component i.e Sulfadoxine which may cause systemic vasculitis, erythema multiforme (Stevens-Johnson syndrome) or toxic epidermal necrolysis (Warrell, 1993)

that can be fatal, particularly in the background of human immunodeficiency virus / acquired immunodeficiency syndrome (HIV/AIDS) (Raviglione et al., 1988). Severe cutaneous adverse reactions (SCARs) due to sulfadoxine-pyrimethamine were more common in Europe and North America (associated with prophylactic use) than developing countries where sulfadoxine-pyrimethamine is therapeutically used as a single dose, the risk of severe cutaneous adverse reactions being 40 times higher in prophylactic than single dose therapeutic use (Sturchler et al., 1993). Although the risk of severe cutaneous adverse reactions seems to be low in developing countries, widespread use of sulfadoxine-pyrimethamine as the 1st line drug in self-medications and presumptive prescriptions may conceivably mimic prophylactic use subsequently increasing the risk of severe cutaneous adverse reactions, particularly in the background of human immunodeficiency virus / acquired immunodeficiency syndrome that is also a major health problem in sub-Saharan Africa.

CHAPTER 2

2.0 METHODOLOGY

2.1 The study area

The study was carried out in Songea Urban district, Ruvuma region, part of the Tanzania mainland where the new malaria treatment policy is being implemented nationally. The study area was selected for convenience as the principal investigator (PI) works in the regional hospital that is located in the study area. The district is among the five administrative districts namely Mbinga, Songea Rural, Namtumbo and Tunduru in Ruvuma region that is located in the Southern part of the country. The Songea Urban district has 2 divisions, 13 wards and 184 hamlets and an area of 394 square km (RHMT, 1997). The population of the district (an extrapolation of 1988 census) is 121,376 with an annual growth of 3.4% (RHMT, 1999/2000).

The district is comprised of mixed tribes as is the characteristics of many towns in Tanzania, but the main tribes are Ngoni, Ndendeule, Yao, Matengo, Nyasa and Bena. Agriculture and small-scale business are the main activities. Food crops being grown are maize, Paddy, Sweet Potatoes, and Beans/ Legumes; while Tobacco and Coffee is being grown at a small scale in the outskirts of the town. The rain pattern is that of monomodal, beginning in November and ends in May. Rainfall range between 800 –

1200 mm. coupled with favourable temperatures (20^0 C – 25^0 C daytime temperature) form favourable breeding sites for malaria vectors, with a typical perennial transmission and holoendemicity (RHMT, 1999/2000). According to the Regional Health Management Team (RHMT) – Annual Health Report of 1999/2000), Songea Urban district has 1 hospital (the regional hospital), 1 health centre and 15 dispensaries (8 being public and 7 by private) that are manned by 171 workers out of different cadres (clinicians, nurses, pharmaceutical and laboratory staffs).

2.2 The study design and population

A descriptive cross-sectional survey of health workers was carried out in public and private health facilities in Songea Urban district from May to June 2002. The health workers included clinicians / prescribers (medical officers, assistant medical officers, clinical officers and assistant clinical officers), nurses (nursing officers to nurse assistants), pharmacy (pharmacist, pharmaceutical technician and pharmaceutical auxiliary/assistant) and laboratory (laboratory technologist and laboratory assistant/auxiliaries) staffs. A total of 105 out of 171 health workers in the district were recruited from 13 out of 17 health facilities (RHMT – Annual health report – Ruvuma 1999/2000). This was complemented by an exit review of 105 treatment cards/ books of patients attending to the health facilities during the survey.

2.3 Selection of the study sample

A purposeful sampling procedure (sampling for convenience) was adopted so as to obtain a manageable sample. A total of 105 out of 171 health workers in the district were recruited from 13 out of 17 health facilities (RHMT – Annual health report – Ruvuma 1999/2000). This was complemented by an exit review of 105 treatment cards/ books of patients attending to the health facilities during the survey. The district hospital and the public health centre were included in the study. Using a lottery method, dispensaries were randomly selected using two sampling frames i.e. public and private dispensaries to obtain 5 (out of 7) public and 6 (out of 8) private dispensaries included in the survey. Health workers on duty for outpatient services were recruited into the study. At the hospital health workers on an afternoon shift were also recruited.

2.4 Definition of terms

Health worker

In this study the term health worker referrers to those who in one way or another are usually consulted by or may advise patients for different ill health conditions including malaria disease. Such health workers include; doctors, clinical officers and assistant clinical officers (who are sometimes grouped as prescribers), nurses, pharmacists, pharmaceutical technicians, pharmaceutical auxiliaries, laboratory technologists and

laboratory assistants. All these health workers categories are seen as "clinicians in the "eyes" of many people in the study area set up".

Perception

The individual feelings/notions concerning the subject matter, which an individual is knowledgeable about and has experienced, and usually influences individual decision and actions; as well as influencing others depending on the position he/she occupies in the society.

The new national malaria treatment policy

Is the set of recommendations and regulations concerning antimalarial drugs and their utilization in a country. In Tanzania the new policy has replaced chloroquine with sulfadoxine-pyrimethamine (SP) as the 1st line drug for the treatment of uncomplicated malaria. Amodiaquine is the second line drug for the treatment of uncomplicated malaria where SP has shown failure or is contraindicated. Quinine is the third line drug for severe malaria and for treatment of multi-drug resistant malaria.

Uncomplicated malaria

This refers to when the patient is infected with *Plasmodium falciparum* and presents with the features such as: fever, headache, joint pains, malaise, vomiting or diarrhoea, chest pain, poor appetite and body weakness. Normally a patient can take oral medications and does not need admission.

Severe malaria

This refers to when a patient is infected with *Plasmodium falciparum* and presents with one or more the following clinical signs and symptoms such as convulsions, unarousable coma, and prostration. Others are severe anaemia, change of behaviour or acute confusional state, oliguria or acute renal failure and circulatory collapse. Patients may also present with jaundice, bleeding tendencies and passing dark brown urine (haemoglobinuria). This requires appropriate emergency measures to be initiated and the patient needs hospitalization (i.e. a medical emergency), especially in pregnant women, infants and children; as a delay in provision of appropriate management, may lead to serious complications and even death.

2.5 Data collection

The data was collected using a structured interview by questionnaires with open-ended questions. The questionnaire was pre-tested so as ensure consistency and clarity. The interview concerned knowledge on the commonly used antimalarial drugs, focusing on their indications, contraindications and associated side effects as well as awareness of the new malaria treatment policy and perceptions on the efficacy of sulfadoxine-pyrimethamine (SP) versus chloroquine (CQ). The interview also concerned perceptions on amodiaquine (AM) as the 2nd line drug and quinine (QN) as the 3rd line drug with regard to their indications, contraindications and associated side effects.

The study also explored intramuscular quinine (QN) use before referral, problems associated with intramuscular quinine use and precautions. This was complemented with an exit review of treatment cards / books of patients attending outpatient services for malaria so as to validate health workers knowledge and perceptions on the new malaria treatment policy in terms of their actual practices of prescribing and dispensing antimalarial drugs. A physical inspection was carried out at the studied health facilities so as to assess the commonly stocked antimalarial drugs in accordance to the new policy. The principal investigator (PI) actively participated in data collection and supervision of the research assistant for quality assurance.

2.6 Data management and analysis

On each day, the collected data were cleaned and validated so as to ensure consistency. At the end of the fieldwork, the open-ended questions were coded and the data were entered into the SPSS version 10.1 statistical package. Explorative analysis was carried out to assess health workers knowledge and perceptions, and therefore adherence to the new malaria treatment policy. Wherever specific events were reported more than once, the denominator (number of events) may be different from the total number of health workers studied. Proportions were compared by the Chi-square test provided in the EPI table calculator. Because of the paucity of data, association of the respondent's cadre with knowledge and perceptions on the new malaria treatment policy was limited to clinicians / prescribers and nurses only, using the Chi-square test provided in the EPI table calculator. Significance was set at the 0.05 levels.

2.7 Ethical clearance

The Muhimbili University College of Health Sciences (MUCHS) ethical committee provided the ethical clearance and permission to carry out the study was sought from the district local authority. The purpose of the study was clearly explained to the health workers and informed consent sought before the interviews. Likewise, the purpose of the study was clearly explained to patients / care givers exiting from the dispensing area and informed consent sought before the review of the treatment cards / books.

2.8 Study limitations

Interviewing health workers during ordinary working hours (especially in the morning up to noon) can cause inconveniences to both health workers and patients, and would therefore compromise cooperation from the health workers. Therefore in morning hours the principal investigator (PI) was reviewing medical cards/treatment books of patients and health workers interview commenced in the afternoon.

The presence of a PI who is also a staff at the Regional Hospital, would conceivably make the health workers in Songea Urban district to develop the fear that their information on policy implementation would be revealed to the Regional authorities, and even affecting in reporting their true and correct assessment of the situation regarding the new policy and drug change from chloroquine to SP and therefore compromise their cooperation. However, the health workers were assured that whatever information they provide would remain confidential and their names and that of the respective health facilities shall not be revealed. Following a clear introduction of the purpose of the study and ethical observation by the research team, maximum cooperation was obtained.

CHAPTER 3

3.0 RESULTS

3.1 Socio-demographic characteristics of the study population

A total of 105-health workers out of 171 (61.4%) from 13 out of 17 (76.5%) health facilities in Songea Urban district were studied. The studied health facilities included 1 hospital and 1 health centre (public) and 11 dispensaries (5 public and 6 private). Thus, public health facilities formed 41.2%, and privately owned formed 35.3%. Of the studied health workers 64 (61.0%) were females (mean age: 38.4 ± 1.0) and 41 (39.0%) males (mean age: 43.8 ± 1.5). A total of 105 out patient's medical cards or treatment books of patients exiting from dispensing areas were reviewed.

A significantly high percentage of the health workers (62.8%) had secondary education (P-Value < 0.001) (Table 1)

Table 1: Distribution of the studied health workers by level of education (N=105)

Attribute	Number	Percentage (%)
Primary education std. I - VIII	39	37.1
Secondary education forms I - IV	60	57.1
Secondary education forms V - VI	6	5.7

The majority of the studied health workers (84.8%) consisted of clinical and nursing staffs (Table 2).

Table 2: Distribution of the studied health workers by cadre (N=105)

Attribute	Number	Percentage (%)
Clinical staff	43	41.0
Nursing staff	46	43.8
Pharmacy staff	4	3.8
Laboratory staff	12	11.4

The majority of the studied health workers (84.8%) were trained as clinicians (prescribers) and nurses (Table 3).

Table 3: Distribution of the studied health workers by type of training (N=105)

Training	Number	Percentage (%)
Medical officer and assistant medical officers	11	10.5
Clinical and assistant clinical officers	32	30.5
Nursing	46	43.8
Technician	12	11.4
Pharmacy staff	4	3.8

3.2 Awareness, knowledge, perception and practices regarding the 1st line antimalarial drug.

In a multiple response analysis of events (N = 351); sulfadoxine-pyrimethamine (SP), amodiaquine, and quinine were mentioned at a frequency of 29.1%, 23.4% and 29.1% respectively as the reported commonly used antimalarial drugs while SP was the most frequently prescribed drug followed by quinine and amodiaquine. (Table 4)

Table 4: Frequency of the reported commonly used antimalarial drugs (N = 351) and observed frequency of prescribed antimalarial drugs (N = 117) at the studied health facilities.

Antimalarial drug	Reported frequency		Observed frequency	
	No.	Percentage (%)	No	percentage (%)
Chloroquine	46	13.1	1	0.9
SP (Metakelfin/Fansidar)	102	29.1	68	58.1
Amodiaquine	82	23.4	13	11.1
Quinine	102	29.1	35	29.9
Halofantrine	9	2.6	0	0.0
Artemisinin derivatives	10	2.8	0	0.0

Chloroquine was mentioned at a frequency of 13.1%. A significantly high percentage of the health workers (60.0%) held the perception that chloroquine was still efficacious as a 1st line drug (P-value = 0.002). A highly significant percentage of the health workers (76.2%) reported continued use of chloroquine even after policy change (P value < 0.001)

In a multiple response analysis of events (Table 5); significantly more nurses than clinicians reported a continued use of chloroquine (P-value < 0.001).

Table 5: Reported frequency of the commonly used antimalarial drugs by clinician and nurse cadres

	Cadre		
Antimalarial drug	**Clinicians**	**Nurses**	**P - value**
	N° (%)	**N° (%)**	
Chloroquine (n=39)	11(28.2)	28(71.8)	< 0.001
Sulfadoxine / pyrimethamine (n=87)	41(47.1)	46(52.9)	> 0.05
Amodiaquine (n=58)	33(56.9)	25(43.1)	> 0.05
Quinine (n=87)	42(48.3)	45(51.7)	> 0.05

In a multiple response analysis of events (N = 146) (Table 6); quinine was highly significantly mentioned most frequently (61.1%) as the perceived alternative antimalarial drug for the replacement of chloroquine (P-value < 0.001)

Table 6: Frequency of the perceived alternative antimalarial drug for the replacement of chloroquine (N=146)

Antimalarial drug	No	Percentage (%)
SP (sulfadoxine/pyrimethamine)	35	24.0
Amodiaquine	11	7.5
Quinine	90	61.6
Halofantrine	4	2.7
Artemisinin derivatives	4	2.7
Undecided/don't know	2	1.4

The majority of the heath workers (95.2%) were knowledgeable on the new policy for malaria case management. Although the majority (81.9%) reported that they started using the new policy as soon as it was launched, paradoxically a highly significant percentage of the health worker (76.2%) reported continued used of chloroquine even after policy change (P-value < 0.001). In a multiple response analysis of events (Table 7); the responses on perceived chloroquine efficacy, last chloroquine use and alternative

antimalarial drugs to chloroquine were not significantly different among clinicians and nurses (P-value > 0.05).

Table 7: Perceived chloroquine efficacy, last chloroquine use and alternative drugs to chloroquine in relation to cadre (Clinicians, n = 43, Nurses, n = 46).

	Cadre		
Variable	**Clinicians**	**Nurses**	**P - value**
	N^{o} (%)	**N^{o} (%)**	
Perceived chloroquine			
Still efficacious	24(55.8)	26(56.5)	> 0.05
No longer efficacious	18(44.2)	20(43.5)	> 0.05
Last chloroquine use			
Before policy change	9(20.9)	14(30.4)	> 0.05
Before and after policy change	34(79.1)	32(69.6)	> 0.05
Alternative to chloroquine			
Quinine	36(46.7)	41(53.3)	> 0.05
SP	16(53.3)	14(46.7)	> 0.05
Amodiaquine	7(70.0)	3(30.0)	> 0.05

Although not statistically significant (P-value > 0.5), a high percentage of the health workers (53.3%) held the perception that clinical response to sulfadoxine-pyrimethamine (SP) therapy is not good. Among health workers reporting good clinical responses to SP therapy, the perceived reasons for good clinical response were: single dosage schedule (36.7%) and high efficacy (61.2%). Among health workers reporting lack of good clinical response to SP, the perceived reasons for lack of good clinical response were that SP does not kill malaria parasites fast (44.6%), is not well known and has a lot of side effects hence no trust (38.1%), as well as not lowering fever fast (8.6%) thus being not as strong as chloroquine (2.9%) in the clinical remission of malaria. In a multiple response analysis of events (N = 113) (Table 8); compared to amodiaquine (36.3%), quinine was highly significantly most frequently reported (56.6%) as the perceived alternative treatment option for non-response to SP (P-value = 0.002).

Table 8: Frequency of perceived alternative treatment options for non-response to SP (N=113)

Alternative Antimalarial drug	No	Percentage (%)
Amodiaquine	41	36.3
Quinine	64	56.6
Artemisinin derivatives	6	5.3
Don't know	2	1.8

The majority (91.4%) of the health workers mentioned sulfadoxine-pyrimethamine (SP) as the 1st line drug, while a few mentioned quinine (6.7%) and amodiaquine (1.9%). A highly significant percentage of the health workers (65.7%) reported a previous history of problems with SP therapy (P-value < 0.001). Among health workers reporting a previous history of side effects due to SP (Table 9), allergic skin reactions including mild cutaneous (42.9%) and severe muco-cutaneous reactions (32.7%) were significantly mentioned as the most frequent side effects (P-value < 0.001).

Table 9: Frequency of reported side effects due to sulfadoxine-pyrimethamine (SP) (N=98).

Problems	No	Percentage (%)
Mild cutaneous reactions	42	42.9
Severe muco-cutaneous reactions (Stevens Johnson syndrome)	32	32.7
Gastro-intestinal disturbances	3	3.0
Other (severe headache)	19	19.4
Kernicterus in new born	2	2.0

In a multiple response analysis of events (N = 204) (Table 10); allergy to any drug or specifically sulphonamides including sulfadoxine-pyrimethamine (SP) (61.8%) was highly significantly reported as the most frequently known contraindication to SP therapy (P-value < 0.001).

Table 10: Frequency of known SP contraindications (N=204) as reported by the studied health workers

Contraindication	No	Percentage (%)
Allergy to any drug (oral or parental)	51	25.0
Allergy to sulphonamides or specifically to SP	75	36.8
Late pregnancy (more than 36 weeks of gestation) and new born	56	27.4
Others (severe vomiting kidney disease severe illness, SP treatment failure early pregnancy)	13	6.4
Don't know/not sure	9	4.4

Although not significant (P = 0.06), quinine was the most frequently reported (54.1%) alternative therapy for patients who react to SP, followed by amodiaquine (42.0%). The majority (90.5%) of the health workers held the perception that sulfadoxine-pyrimethamine (SP) is not as rapid in fever clearance as chloroquine. Among health workers who perceived that SP is slow in fever clearance (n = 98), the perceived reasons for slow fever clearance were that SP is a slow acting drug (55.1%) and lacked antipyretic effects (24.5%). (Table 11):

Table 11: The perceived reasons for slow fever clearance by SP (N=98)

Attribute	No	Percentage (%)
Slow acting	54	55.1
No antipyretic effects	24	24.5
Not as 'strong' as chloroquine	2	2.0
Too 'strong' (causes fever to rise)	3	3.1
Don't know/not sure	15	15.3

A significantly high percentage (57.1%) of the health workers held the perception that SP is not as rapid in parasites clearance as chloroquine. The perceived rate of fever clearance by SP and the ascribed reasons for slowness in fever clearance were not significantly different among clinicians and nurses (P-value > 0.05) (Table 12).

Table 12: The perceived rate of fever clearance by SP and the ascribed reasons for slowness in fever clearance according to cadre (Clinicians, n = 43, Nurses, n = 46).

Variable	Cadre		
	Clinicians N° (%)	Nurses N° (%)	P - value
Rate of fever clearance			
Slow	40(93.0)	44(95.7)	> 0.05
Fast	3(7.0)	2(4.4)	> 0.05
Reasons for slowness in fever clearance			
Slow acting/takes long time to clear fever	22(51.6)	26(56.5)	> 0.05
No antipyretic effects	11(48.4)	10(43.5)	> 0.05

A significantly higher percentage of clinicians /prescribers than nurses reported past experiences with sulfadoxine-pyrimethamine (SP) side effects, commonly cutaneous & muco-cutaneous reactions (P-value < 0.05) (Table 13). There was no significant difference in other attributes of the different variables between the two cadres (P-value > 0.05).

Table 13: Effectiveness of sulfadoxine-pyrimethamine (SP) versus chloroquine (CQ), perceived reasons against SP, its associated side effects and alternative to non-response to SP in relation to cadre (Clinicians, n = 43, Nurses, n = 46).

Variable	Cadre		P - value
	Clinicians N° (%)	Nurses N° (%)	
SP effectiveness versus CQ			
SP effective than CQ	19(44.2)	24(47.8)	> 0.05
SP not as effective as CQ	24(55.8)	22(52.2)	> 0.05
Reasons against SP			
Does not clear fever fast	8(18.6)	6(13.0)	> 0.05
Does not clear parasites fast	15(34.8)	12(26.1)	> 0.05
History of SP side effects			
Yes	34(79.1)	24(52.3)	< 0.05
No	9(20.9)	22(47.7)	> 0.05
Reported SP side effects			
Cutaneous /muco-cutaneous reactions.	27(62.8)	13(28.3)	< 0.05
Headaches	11(25.6)	11(23.9)	> 0.05
Alternative to non responses to SP			
Amodiaquine	23(53.5)	18(39.1)	> 0.05
Quinine	22(51.2)	30(65.2)	> 0.05

Only about 50% (52/105) of the health workers reported counselling patients for follow up after sulfadoxine-pyrimethamine (SP) therapy and of these 27/52 (51.9%) counselled patients to come for follow up from day 8-14 after SP therapy.

In a multiple response analysis of events (N = 235) (Table14); the antimalarial drugs commonly used for pregnant mothers included SP (36.2%), amodiaquine (28.0%), quinine (21.3%) and chloroquine (11.9%).

Table 14: Frequency of commonly used antimalarial drugs (N=235) for pregnant mothers.

Antimalarial drugs	Number	Percentage (%)
SP (sulfadoxine or sulfalene/pyrimethamine)	85	36.2
Amodiaquine	66	28.0
Chloroquine	28	11.9
Quinine	50	21.3
Other (don't know/not sure)	6	2.6

A highly significant percentage (60.4%) of the health workers was knowledgeable on the correct gestation period for sulfadoxine-pyrimethamine (SP) use in pregnancy. (P = 0.005). A high percentage (68.6%) of the health workers was knowledgeable on the correct antimalarial drugs for neonates and infants (up to 2 months). Although not

statistically significant, (P-value > 0.05), a relatively higher percentage of nurses than clinicians (65.2% versus 51.2%) seemed to be more knowledgeable on correct gestation period for sulfadoxine-pyrimethamine (SP) use in pregnancy than clinicians. (Table 15)

Table 15: Knowledge on correct SP use in pregnancy and neonates (and children up to 2 months) in relation to cadre (Clinicians, n = 43, Nurses, n = 46).

	Cadre		
Variable	**Clinicians**	**Nurses**	**P - value**
	N° (%)	**N° (%)**	
Correct gestation for SP use			
Knowledgeable	22(51.2)	30(65.2)	> 0.05
Not knowledgeable	14(32.6)	12(26.1)	> 0.05
SP use in neonates and infants up to 2 months			
Knowledgeable	30(69.8)	34(73.9)	> 0.05
Not knowledgeable	13(30.2)	12(26.1)	> 0.05

3.3 Perception and knowledge on the 2nd line antimalarial drug.

The perceived 2nd line drugs were: amodiaquine (53.3%) and quinine (42.9%). Reporting amodiaquine as a 2nd line drug was not significantly different from reporting

quinine (P value = 0.13). The most commonly reported indications for amodiaquine use were treatment failure (43.6%) and reaction to sulfadoxine-pyrimethamine (SP) (35.0%). Reaction or resistance to amodiaquine as the known contraindications to amodiaquine were reported at a frequency of 33.0%, other contraindications (vomiting, low blood pressure and liver diseases) constituted 27.5% while 39.5% did not know or were not sure. The perceived 2nd line drug and knowledge on the indications for amodiaquine were not significantly different between the two cadres (Table 16).

Table 16: Perceived 2nd line drug and the knowledge on the indications for amodiaquine according to cadre (Clinicians, n = 43, Nurses, n = 46)

	Cadre		
Variable	**Clinicians**	**Nurses**	**P - value**
	N° (%)	**N° (%)**	
2nd line drug			
Amodiaquine	28(65.1)	23(50.0)	> 0.05
Quinine	14(32.6)	21(45.6)	> 0.05
Indication for amodiaquine			
Knowledgeable	33(76.7)	35(76.9)	> 0.05
Not knowledgeable	10(23.3)	11(23.9)	> 0.05

3.4 Knowledge on the 3rd line antimalarial drug, problems associated with intramuscular quinine and the necessary precautions for intra-muscular quinine preparation.

A highly significant percentage (63.8%) of the health workers reported quinine as the 3rd line drug for malaria case management (P-value < 0.001) (Table 17).

Table 17: Frequency of the reported antimalarials commonly used as 3rd line drugs as reported by the health workers (N = 105)

Antimalarial	Number	Percentage (%)
Quinine	67	63.8
Halfan	2	1.9
Arinate (artemisinin derivative)	3	2.9
Others (amodiaquine, chloroquine)	27	25.7
Don't know/not sure	6	5.7

A highly significant percentage (75.2%) of the health workers reported a history of problems with intramuscular quinine (P-value < 0.001). Abscesses were perceived as the most common problem with intramuscular quinine being mentioned at a frequency of 60.3%, followed by paraparesis (33.6%). The other perceived problems included hypoglycaemia (4.3%) as well as severe pain and swelling at injection site (1.7%). The

Table 18: Knowledge on quinine (QN) use as 3rd line antimalarial, problems associated with intramuscular use, precautions and knowledge on proper dilution according to cadre (Clinicians, n = 43, Nurses, n = 46)

Variable	Cadre		
	Clinicians N° (%)	Nurses N° (%)	P - value
Knowledge on quinine (QN) as 3rd line drug			
Knowledgeable	32(74.4)	31(67.4)	> 0.05
Not knowledgeable	11(25.6)	15(32.6)	> 0.05
History of problem with i/m QN			
Yes	34(79.1)	35(70.9)	> 0.05
No	9(20.9)	11(29.1)	> 0.05
Knowledge on the problem associated with i/m QN			
Knowledgeable	34(79.1)	31(67.4)	> 0.05
Not knowledgeable	9(20.9)	15(32.6)	> 0.05
Precaution for i/m QN preparation			
Proper dilution	28(65.1)	26(56.5)	> 0.05
Others (aseptic technique)	15(34.9)	20(43.5)	> 0.05
Knowledge on dilution for i/m QN			
Knowledgeable	28(65.1)	26(56.5)	> 0.05
Not knowledgeable	15(34.9)	16(34.8)	> 0.05

i/m = intramuscular

A high percentage (68.9%) of the health workers would give antipyretics (58.6%) or set intravenous drip (10.3%) as the pre-referral treatment for patients with malaria who need referral. A highly significant low percentage (20.7%) of the health workers would give a start dose of quinine (P-value < 0.001).

CHAPTER 4

4.0 DISCUSSION

Although a policy change to an effective drug that halts the progression of uncomplicated disease into severe disease is the most feasible strategy of malaria control in endemic areas, public health benefits (reduction in mortality and morbidity) can only be achieved if there is acceptance and consistent adherence to the new policy both at the public and private health facilities as well as the community (MOH, 2000a). This study investigated health workers adherence to the new malaria treatment policy at public and private health facilities in the holoendemic Songea Urban district. The study focused on health workers' awareness on the policy change, perceptions and knowledge on the indications and contraindications of antimalarial drugs in each line, as well as antimalarial drugs prescription and dispensing practices under the new policy.

According to the new policy, sulfadoxine-pyrimethamine (SP) should be the 1st line drug, while amodiaquine and quinine are the 2nd and 3rd line drugs respectively. Although our findings show that the three drugs are commonly used for malaria treatment in accordance to the policy, paradoxically chloroquine was still in use. Thus, a highly significant percentage of the health workers reported continued use of chloroquine even after policy change because chloroquine was significantly perceived to be still efficacious as a 1st line drug as noted here that one health worker lamented to the

principal investigator that the her family was still using chloroquine and is efficacious. This finding implies that a number of health workers especially nurses would continue advising patients to use chloroquine as a 1st line drug hence the envisaged public health benefits in terms of morbidity and mortality reduction would conceivably not be realized as chloroquine is no longer effective (Trape, 1998).

Before the new policy, health workers held the perception that quinine is the alternative drug for the replacement of chloroquine indicating that although sulfadoxine-pyrimethamine was the 2nd line drug, it was less known hence not commonly preferred by the health workers. Similar observations were made in the holoendemic Kibaha district whereby prescribers at district hospital, health centres and dispensaries most frequently preferred to use quinine for suspected or proven cases of chloroquine failure (Tarimo et al, 2001). Thus, although the majority of the health workers were knowledgeable on the policy and reported using the policy as soon as it was out, a significantly high percentage of the health workers reported continued use of chloroquine as the 1st line drug.

A number of factors might potentially limit the acceptance of sulfadoxine-pyrimethamine as a 1st line drug. The long experience (50 years) with chloroquine coupled with the anti-inflammatory and antipyretic effects that are lacking in sulfadoxine-pyrimethamine (Warrell, 1993) might make sulfadoxine-pyrimethamine less readily acceptable therefore compromising adherence to the new policy. Biomedically

the objective measure of antimalarial drug efficacy is the clinical and parasitological response. However for individuals, families and communities, the objective measure of efficacy rests on collective social influences such as long history of using the drug and individual experiences with the drug in terms of treatment successes or failures. Thus, though not statistically significant, a high percentage (53.3%) of the health workers held the perception that clinical response to sulfadoxine-pyrimethamine (SP) is not good because SP is perceived as slow acting (55.1%) in terms of parasite clearance and that it has no antipyretic effects (24.5%). However a recent study showed that in the absence of resistance, sulfadoxine-pyrimethamine is a rapid schizontocidal drug (Tarimo et al, 2002).

In the absence of adequate counselling on the alternative measures for fever control after SP therapy, may compromise the acceptance of SP by both patients and the prescribers, as persistence of fever for the first three days might be perceived as a sign of medication (treatment) failure. Thus in one health facility, compared to adults, majority of the children given SP (to be taken at home) remained sick and positive for malaria parasites indicating that perhaps parents / guardians might have been reluctant to give sulfadoxine-pyrimethamine to the children as it is perceived to be too strong for children (Tarimo et al, 2001). Adoption of the directly observed therapy strategy may conceivably help to overcome this problem. Although the policy stipulates that amodiaquine is the alternative drug for none response to SP therapy in uncomplicated malaria, quinine was most frequently reported as the perceived alternative treatment

option (56.6% versus 36.3%), clearly indicating preference to quinine as previously shown (Tarimo et al 2001). Although the policy states that amodiaquine should be used for patients who react to SP, the study shows that quinine is the most preferred as the alternative drug for patients who react to SP indicating that there is a need to induce familiarity with amodiaquine (Legrand et al 1999).

In this study cutaneous and muco cutaneous reaction were the most commonly reported SP side effects and at the time of the study there was one patient with Stevens Johnson syndrome at the district hospital. This adverse effect is due to hypersensitivity to the sulfonamide component i.e. Sulfadoxine (Warrell, 1993) that can be fatal, particularly in the background of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) (Raviglione *et al*, 1988). Severe cutaneous adverse reactions (SCARs) due to sulfadoxine-pyrimethamine (SP) are commonly associated with prophylactic than therapeutic SP use, the risk of severe cutaneous adverse reactions being 40 times higher in prophylactic than single dose therapeutic use (Sturchler *et al*, 1993). Although the risk of severe cutaneous adverse reactions seem to be low in developing countries (WHO, 2000a), widespread use of SP as the 1st line drug in self-medications and intermittent presumptive treatments may conceivably mimic prophylactic use subsequently increasing the risk of severe cutaneous adverse reactions; particularly in the background of HIV/AIDS that is also a major health problem in sub-Saharan Africa, including Tanzania. Clearly this has the potential to negatively influence acceptance and therefore adherence to the new policy by patients and health

workers as well. Although headaches featured as an important side effect of SP, this is most probably due to the lack of anti-inflammatory properties in SP (Rolo, 1971; Warrell, 1993).

According to the new policy, the known contra-indications to sulfadoxine-pyrimethamine (SP) are history of sulfonamide hypersensitivity, premature babies and children aged one week to two months and during the last month of pregnancy (i.e from the 36th week) In this study allergy to any drug and/or specifically sulphonamides including SP was highly significantly mentioned as the most frequently known contra-indications to SP. It is therefore important for health workers to elicit any history of allergy/ reaction, particularly drug allergy /reaction before prescribing SP in view of the serious concerns raised by the public regarding SP side effects. Likewise, policy makers should react promptly when serious concerns are raised by the public, especially when there are misconceptions as it occurred in the press recently when it was reported that "the combination of Sulfadoxine and Pyrimethamine (SP) which has been chosen as the first line treatment for malaria in the country, causes side effects in as many as 70% per cent of patients". (The Guardian, July 26th, 2002). Generally, reporting of adverse side effects associated with SP in Tanzania is still very low; for example, in 2001, only 13 cases of Stevens Johnson syndrome were reported in Tanzania mainland emphasizing the need for a countrywide assessment of the problem (Pharmacy Board – pers com 2002).

Follow up of patients after sulfadoxine-pyrimethamine (SP) is important for the early detection of treatment failures, however in this study only about 50% of the health workers reported counselling patients for follow up after SP therapy. According to the new policy follow up after SP treatment should be on the fourth day, but in this study health workers counselled patients to come for follow up from day 8-14, meaning that early treatment failures would not be detected. This is conceivably due to the notion that SP is long acting and that the right time to review the patients would be after day 7 onwards. Although SP is easy to administer (single dose treatment), the absence of antipyretic effects makes the clinical response to be slow (WHO, 2000b) hence the need for appropriate counselling for follow up by all cadres of health workers as any cadre (prescribers, nurses, pharmacy staff and laboratory staff) can be consulted both in the community and facility levels. Thus training on the new policy should cut across all cadres of health workers.

Generally sulfadoxine-pyrimethamine (SP) is well tolerated, can be used in pregnancy (except the last month of pregnancy i.e. from the 36th week) and lactating mothers whose children are above 2 months of age (MOH, 2000b; WHO, 2000b). The policy advocates use of SP in uncomplicated malaria up to 36 weeks of pregnancy (and there after oral quinine) and injectable quinine in premature babies and children up to two months. The study shows that SP, amodiaquine and quinine, as well as chloroquine are used in varied proportions during pregnancy indicating a lack of strict adherence to the new policy. A highly significant percentage of the health workers reported quinine use for neonates and

children up to two months of age. Knowledge on sulfadoxine-pyrimethamine (SP) use in pregnancy and quinine use in premature babies and children aged one week to two months of age was therefore high.

Although the policy states that amodiaquine is the 2nd line drug, in this study amodiaquine and quinine were mentioned at a similar frequency as 2nd line drugs, clearly indicating that there is no consistency in adherence to the new policy. In one health facility amodiaquine was not even found in their drug store at the time of study, and the explanation given was that "our clients don't like this drug due to its side effects which make them more "sick" and therefore we don't stock it". It is a common observation however, that there is a discrepancy between knowledge and practice (Ofori-Adjei et al, 1996; Rowe et al, 2000), indicating the need for combined information, education and communication (IEC) messages and behavioural change communication (BCC) strategies. The reported indications for amodiaquine use were consistent with the policy but observations show that amodiaquine use is fairly limited.

Regarding 3rd line drug, a highly significant percentage of the health workers reported quinine as the 3rd line drug as stated in the policy. Surprisingly, amodiaquine and chloroquine were also mentioned as the 3rd line drugs indicating a potential for the mismanagement of severe malaria. The injectable form of quinine is supposed to be available up to the dispensary level. Thus, patients with severe malaria who need referral to the next level receive a first dose of intra-muscular quinine before referral. However,

the study shows that a highly significant low percentage of health workers (20.7%) would give a start dose of intra-muscular quinine pre-referral. As stated in the new policy (MOH, 2000b), a highly significant percentage of health workers reported a history of problems with intra-muscular quinine, mostly sterile abscesses. For the avoidance of sterile abscesses, precaution on dilution is important but the study shows that less than 50% of the health workers knew the precaution for intra-muscular quinine preparation. Although a high percentage of the health workers (58.1%) knew the correct dilution of quinine for intra-muscular use surprisingly most of them wrongly associate abscesses with aseptic techniques rather than precautions on correct dilutions.

The findings of this study, however, have some limitations. Changes in prescribing and dispensing practices during the study cannot be ruled out as the presence of the research team at the health facilities can influence, albeit temporarily, the health workers to change their practices. The study would give a more representative picture of the new malaria treatment policy in Songea Urban district if clients (consumers) were studied as well; however, because of time constraints this was not possible. Perceptions and knowledge, and therefore adherence to new policy may conceivably vary between public and private dispensaries, and likewise with the type of "professional" training, however the paucity of data did not permit a valid assessment of adherence to the new policy in relation to the two variables. The fact that only one out of three public hospitals was studied, while none of the 6 private hospitals were included makes the findings not

applicable to the whole Ruvuma region as ownership normally influences antimalarial drugs utilization pattern.

CHAPTER 5

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The study generally shows an erratic adherence to the new malaria treatment policy and clearly there is a gap between the knowledge of the health workers and their practice. One year after the policy change, chloroquine is still in use and is perceived to be still efficacious, even for pregnant mothers. Before policy change, sulfadoxine-pyrimethamine (SP) was a less preferred antimalarial drug to be used as an alternative treatment to chloroquine failures, but even after policy change a significantly high percentage of health workers reported continued use of chloroquine as the 1st line drug although they were aware of the policy change.

The majority of the health workers held the perception that clinical response to sulfadoxine-pyrimethamine (SP) is not good because of slow parasites clearance and lack of antipyretic effects. This has lead to the general preference to quinine, hence most health workers prefer to use quinine as an alternative to non-response or contraindication to SP and as a 2nd line drug before and after policy change. Most health workers were knowledgeable on the indications and contraindications of SP and were specifically aware of the severe cutaneous adverse reactions due to SP (a potentially fatal side

effect). However patient counselling after SP therapy was generally low, and when done, it is from day 8-14. There is the potential for the mismanagement of patients with severe malaria who need referral as less than a quarter of the health workers would give a pre-referral dose of intra-muscular quinine.

5.2 RECOMMENDATIONS

Pertinent information, education and communication (IEC) messages and behaviour change communication (BCC) strategies should focus on the fact that chloroquine can no longer be used as it is no longer effective, and that chloroquine should completely be phased out so as to induce a consistent use of sulfadoxine-pyrimethamine (SP) as a 1st line drug.

There is the need to reverse the notion that SP is slow acting as in the absence of resistance SP is fast acting and that regular fever control measures either by tepid sponging or use of antipyretic drugs (e.g. paracetamol) would eventually clear fever. There is the need to ensure a strict adherence to the indications for quinine use by inducing health workers to be familiar with amodiaquine as an alternative to non-response or contraindication to SP and as a 2nd line drug. In view of the public outcry on the severe cutaneous adverse reactions due to SP, emphasis should be to elicit history of allergy to sulfa drugs before prescribing SP. Patients should also be counselled to

promptly report for adverse effects. Counselling should also be done on fever control and follow up on the 4th day post SP treatment

The referral infrastructure for patients with severe malaria needs to be strengthened, in particular to ensure such patients get the pre-referral intra-muscular quinine and that for the avoidance of sterile abscesses, proper dilution should be re-enforced.

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