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UNIVERSITY OF CAPE TOWN

Public responses to policy changes in 1st-line treatment for uncomplicated for malaria in Kenya and the potential influence of policy communication in the uptake of malaria drugs

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DECLARATION

This dissertation is my own original work and has never been presented to any other institution or organisation for examination or otherwise.

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ABBREVIATIONS

ACT- Artemisinin Combination Therapy

AL- Artemether-Lumefantrine

AQ- Amodiaquine

AS- Artesunate

CQ- Chloroquine

DFID- Department for International Development

DHMT- District Health Management Team

GFATM- Global Fund to fight AIDS, Tuberculosis and Malaria

IEC- Information Education and Communication

MOH- Ministry of Health

MOP- Malaria Operational Plan

SP- Sulfadoxine-Pyremethermine

TOT- Training of Trainers

USAID- United States Agency for International Development

WHO- World Health Organisation

1. CHAPTER ONE: INTRODUCTION

1.1 Background

About 2.4 billion people worldwide are at risk of malaria, most of them in developing countries. Although countries have had mixed results in malaria control, the World Health Organisation (WHO) malaria report of 2008, observed that the decade 1997 – 2006 has seen significant reduction in malaria burden by at least 50% in 22 WHO region countries in the Americas, the South- East Asia and Western Pacific regions(WHO, 2008). The reduction has been due to multiple malaria control policies including use of Insecticide Treated Nets (ITNs) and use of Artemisinin-based Combination Therapies (ACT) as 1st-line treatment for uncomplicated malaria. In Africa, only four countries (Eritrea, Rwanda, Sao Tome and Principe, and Zanzibar (part of Tanzania) have convincing evidence of a reduction in malaria burden by up to 50% during the same decade (1997 – 2006) (WHO, 2008). Although Kenya has not experienced a 50% overall reduction in malaria burden, case studies have provided evidence of declines in morbidity and mortality (Noor et al., 2009, Okiro et al., 2009, Snow et al., 2009). The paediatric hospitalization for malaria in 17 hospitals across Kenya, for instance, reported a reduction of up to 49% (Okiro et al., 2009).

The need to sustain gains in the fight against malaria has seen Kenya and many countries in Africa changing 1st line treatment policy for uncomplicated malaria from sulfadoxine-pyremethamine (SP) to the more potent ACTs. Around 2001/2002 resistance to SP was common-place. The WHO reacted by strongly urging countries that intended to change their malaria treatment policies to adopt the ACTs as the best option for the treatment of uncomplicated malaria (Amin et al., 2007, WHO, 2008).

Kenya changed from SP to ACT in 2004, marking the second policy change for 1st-line drugs in the country since independence 46 years ago. The first change in the malaria treatment policy involved a move from chloroquine (CQ) to SP in 1998. Each change in the 1st-line treatment policies for uncomplicated malaria involved revision of malaria treatment guidelines. The type of ACT used in Kenya is Artemether-Lumefantrine (AL) that trades by the name Coartem. The actual roll-out for AL began in late 2006 (Amin et al., 2007). The regimen for AL involves two doses per day for three days with an eight to 12 hour-break between each dose. Instructions to health workers on how and when to administer AL were documented in the new treatment guidelines for malaria. SP on the other hand, had only three tablets for adults, all taken in one dose.

The United States Agency for International Development (USAID) noted that changing and implementing drug policies are complex and fraught with challenges at every level. The challenges range from stakeholders' interests, local and international bureaucracy (USAID, 2005), to the potential resistance from the intended beneficiaries. In Kenya, despite the change from SP to AL, much remains to be done in malaria control. The task ahead does involve sustaining the declining malaria burden while also ensuring proper take-up of AL. Uptake of AL in Kenya is said to be below expectations (Wasunna et al., 2008). The uptake of health interventions can be improved with the involvement of the community (Muga and Jenkins, 2008). The involvement of the community is important because people tend to have negative perceptions about drug policy changes. These perceptions are driven significantly by illiteracy, misinformation and cultural beliefs (Williams et al., 1999, Lettenmaier, 2003, Nsimba, 2006b). Involving the community is an attempt to change the negative

perceptions. This explains why communication strategies become an integral part of a drug policy change. Passing the right information through appropriate communication channels helps to influence community perceptions and treatment seeking behaviour and has a positive impact on the implementation of the policy (Hausmann-Muela et al., 2003, Lettenmaier, 2003). What the public believes about the (treatment) policy change and why the policies change can influence treatment seeking behaviour. The behaviour can also be influenced by the perceived effects of the change and people's perceptions about the effectiveness of the new treatment policy (Muga and Jenkins, 2008). Ideally, a change in policy in 1st-line treatment should be followed by corresponding changes in certain aspects of treatment seeking and hence the desired uptake of the new policy. The results of the change are likely to depend on how effectively the policy change is communicated and understood by the public. In Kenya, the Information, Education and Communication (IEC) strategies accompanying change of 1st-line treatment policy from SP to AL involved multi-media approaches but it is not clear whether the communication that was directed at the public achieved the desired objectives.

1.2 Problem Statement

The problems of non-adherence to recommended malaria dosage and the use of ineffective malaria drugs is most common in poor rural areas (Attaran et al., 2004). These are key catalysts in development of drug resistance. Although changing 1st-line drugs for uncomplicated malaria in response to resistance is scientifically appropriate, it is not clear whether the public usually is adequately prepared for the changes, whether it (the public) understands the purpose and reason for drug policy changes, and whether the changes themselves influence use of the drugs. The introduction of

new drug policies requires effective communication strategies to forestall resistance from the community (Lettenmaier, 2003). These strategies are meant to ensure the public is informed of the change and to educate people on the need to adapt to the recommended drugs (Lettenmaier, 2003). However, it is not clear the extent to which communication strategies do influence public perceptions, expectations and use of recommended drugs. For these reasons, it is necessary to investigate community responses to drug policy changes and how the responses influence uptake of 1st-line treatment for uncomplicated malaria drugs, in this case, AL.

1.3 Research Questions

The study addresses two main questions: (i) How do rural communities perceive policy changes on 1st line drugs for uncomplicated malaria in Kenya? (ii) How are the perceptions influenced by policy communication strategies?

Specifically, this study sought to answer the following questions:

1. What do communities understand about the policy changes on 1st-line drugs for uncomplicated malaria in Kenya?
2. What is the potential influence of communication strategies for the policy change on the community experiences?
3. What implications does the study have for future drug policy changes and communication strategies?

1.4 Aims and Objectives

1.4.1 Aim

The study aims to contribute to malaria control efforts by analysing gaps in policy communication at the community level and making suggestions on future strategies in policy communication.

1.4.2 General Objective

To explore community perceptions of policy changes on 1st-line drugs for uncomplicated malaria in Kenya and the potential influence of communication strategies on use of recommended drugs.

1.4.3 Specific objectives

1. To explore community understanding of successive policy changes on 1st-line drugs for uncomplicated malaria in Kenya;
2. To evaluate the potential role of communication strategies in 1st-line drug policy changes in influencing community responses to these changes;
3. To propose alternative means to improve future policy communication strategies.

1.5 Justification

This study intends to give new insights into community perceptions on policy changes in 1st-line treatment for uncomplicated malaria in Kenya and the contributions of such perceptions on the uptake of recommended malaria drugs. It also intends to promote effective communication and implementation of malaria treatment policies and highlight public concerns about drug policy changes, and finally, add to the literature on malaria control and contribute to policy debates from a community perspective.

1.6 Outline of remaining chapters

Chapter Two reviews relevant literature; Chapter Three presents the methods of the study; Chapter Four has findings that are grouped into relevant sub-headings, and Chapter Five has analysis and discussions of study findings. The same chapter also concludes the study and gives recommendations in line with the findings. The literature review identifies studies that support the topic under consideration, apart from identifying the gaps that this study sought to fill. As there are no studies that have specifically looked at community perceptions about drug policy changes, a wide range of material was used covering health seeking behaviour, perceptions of health interventions especially drugs, and policy communication. The methodology chapter gives details on how the study progressed; for example, justification of methods, how data were collected and analysed, and the rigour of the study. Chapter Four presents the overall outcomes of the study as well as explaining the reasons for the outcomes. Chapter 5 presents an analysis and discussions of the findings in relation to the existing literature in the field. The chapter concludes with key points and draws out recommendations from the experiences gathered in order to strengthen future communication on policy changes for 1st-line drugs for uncomplicated malaria.

2. CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This review is based on a systematic search for published and unpublished literature relevant to the study, using various strategies including PubMed search, Google search and Google scholar search, as well as sourcing literature from web-pages for internationally reputable institutions such as the WHO and Institute for Development Studies (IDS), United Kingdom. Apart from perceptions on new drugs and other health interventions such as immunisation, few studies have paid attention to what the public understands of policy changes on 1st-line treatment for uncomplicated malaria. As such there is limited explicit literature addressing the topic under study. As a result, the review had to use various phrases to locate literature that was closely related to the subject under study.

The following key phrases were used to search for relevant literature: *'policy change communication'*; *'folk beliefs treatment seeking'*; *'community perceptions drug policy changes'* *'malaria policy'*; *'challenges drug policy change'*; *'community drugs policy'*; *health policy implementation*; *policy AND communication*. A phrase such as *'folk beliefs treatment seeking'* was selected because treatment seeking behaviour has a direct influence on people's reactions to a policy change that introduces a new drug into the health system. A new drug is supposed to alter some aspects of treatment seeking. *'Policy change communication'* was selected on the basis that new policies need to be communicated to the wider public and the effectiveness of the communication could empower the public with the information that they need to address their perceptions over new policies and new drugs. Others were chosen

because they were likely to come up with literature that bordered on community views over a range of health-related interventions that could have been relevant to the study. Literature that was identified included peer reviewed journal articles, books, theses, unpublished literature reviews and conference/workshop presentations. All the accruing documents were examined and those regarded as relevant to the study were taken for review. Materials were excluded on the basis that, first, they were not related to responses to policy changes of any nature, and second, they were not relevant to communication in health or health education. Given the material finally reviewed, this chapter is structured under three broad sub-headings: (i) Treatment seeking behaviour, (ii) Public perceptions on health interventions and (iii) Role of communication in malaria drug policy changes.

2.2 Treatment seeking behaviour

Policy changes that seek to introduce new drugs into the health system to replace ineffective ones need to consider people's treatment seeking behaviours because the behaviours may influence acceptance of new interventions (Mwenesi et al., 1995, Hausmann-Muela et al., 2003). A successful drug policy change should significantly alter treatment seeking behaviour to enhance uptake of newly introduced drugs. Considerable success could be registered in this regard with provision of adequate information through the right channels for the public (Hausmann-Muela et al., 2003). Established behaviours are difficult to change because people tend to go for drugs that they are familiar with rather than use the newly recommended ones (Mwenesi et al., 1995, Attaran et al., 2004, Wasunna et al., 2008).

Cultural beliefs and attitudes are also likely to underpin resistance to new changes in treatment and limit uptake of new drugs (Mwenesi et al., 1995, Eriksen et al., 2005). Various cultures have varied interpretations of the causes and treatment of illnesses (Mwenesi et al., 1995, Eriksen et al., 2005). Malaria, for example, presents with a variety of symptoms and is subject to various interpretations across cultures. In some cultures, malaria is caused by evil spirits that can only be treated by traditional healers. In other cultures, it is caused by hot sun and cold water (McCombie, 2002). These meanings of disease influence the timing and type of treatment sought. Accordingly, understanding people's views on malaria, its causes and the available treatment choices is important if successful policy changes are to be realised (McCombie, 2002, Mbonye et al., 2006b). Implementation of health policies depends on how compatible the policies are with the public's concepts regarding specific health problems (Muga and Jenkins, 2008). The use of bed-nets typifies the problems of compatibility between a health policy and the public. Despite their efficacy against malaria infection, the use of mosquito nets remains quite low in some places (Chuma et al., 2010). A useful explanation to this trend would be people's perceptions about the dangers of malaria, attitudes and cultural aversion to use of nets (Lettenmaier, 2003, Alaii et al., 2003b).

In some cases, in defining a disease category, a patient's characteristics and social situation are considered more than signs and symptoms (McCombie, 1996). For instance, joint-aches may not be immediately recognised as a symptom for malaria, but it may be associated with carrying heavy loads or hard work. This delays treatment seeking mainly because there is neither specific symptom category for malaria nor homogeneity in interpretations of symptoms across cultures (McCombie,

1996). Sometimes the characterisation of disease is dictated by cultural interpretations of illness whereby certain symptoms trigger specific actions regardless of the nature of illness and its appropriate treatment (Hausmann-Muela et al., 2003). The authors give an example of the cultural concept of *degedege* in Tanzania, whose symptoms include convulsions. The convulsions, to most people without biomedical knowledge, should be treated traditionally. Among people with biomedical knowledge, traditional treatment is often taken alongside modern methods where *degedege* applies (Hausmann-Muela et al., 2003). In some other cultures, the perception of severity of an illness is often associated with use of the official sector (Mbonye et al., 2006b, Mbonye et al., 2006a, Mbonye et al., 2006c). But the community definitions of severity are not always the same as health worker's definitions. Therefore, seriously ill cases may not be immediately taken to health facilities and vice-versa. Other factors that may affect treatment seeking are health system-based. For example, in the sub-Saharan Africa 40% of fevers are attributable to malaria, and in health facilities where diagnostic kits are lacking the main strategy to control morbidity and mortality is presumptive treatment (McCombie, 2002, Mbonye et al., 2006b, Mbonye et al., 2006a, Mbonye et al., 2006c). The success of this kind of approach to treatment depends a lot on the behaviour of patients and care-takers especially with regards to drug adherence (McCombie, 2002).

Treatment seeking behaviour for malaria may be grouped into three categories: self-treatment, the formal health sector and use of traditional medicines and healers (Mwenesi et al., 1995, McCombie, 1996, Mbonye et al., 2006c). Each of these categories may be used exclusively but they are also often used successively; one after the other depending on severity of illness and outcome of treatment. Many patients try

one option after another as illness progresses (Mbonye et al., 2006b). For those who opt for self-treatment at home, it is not always clear what kind of drugs they use and the dosage consumed, and these have implications on drug resistance (McCombie, 2002). Most of the drugs bought from retail shops for self-treatment are either ineffective anti-malarials or none at all (Ruebush et al., 1995, McCombie, 2002, Mbonye et al., 2006c, Mushi et al., 2008). Inappropriate use of drugs could lead to fatal outcomes or may involve alternative costly treatment from worsening illness that should have been avoided. Such poor approaches to malaria treatment often lead to drug resistance (Attaran et al., 2004). Fatal outcomes or worsening cases of malaria are not only the result of use of ineffective drugs, but also people's attitudes towards particular drugs and delays in seeking treatment (Mwenesi et al., 1995). The delay may be caused by high cost of medicine, travel or time lost from work as well as difficulty in accessing the formal sector (Mwenesi et al., 1995, McCombie, 2002, Attaran et al., 2004)

While there are a wide variety of malaria drugs in both formal and informal sectors, there are concerns that the drugs are often used inappropriately, especially in the informal sector (Attaran et al., 2004). The incorrect use of drugs is mainly associated with lack of appropriate knowledge and information on the right dosage. The most affected by the inappropriate use of drugs from the informal sector are the hard-to-reach rural populations. People often buy ineffective drugs from shops even if there are better anti-malarials at formal health facilities that are either free or at a much lower cost compared to what is paid for at the shops. The reasons for this kind of behaviour include distance to facilities, personal preference for drugs from the shops, distrust of health workers and lack of information (Lettenmaier, 2003, Mubyazi et al.,

2005, Mushi et al., 2008). The other major reason responsible for consumption of drugs from the informal sector is drug shortages at health facilities (McCombie, 2002, Mubyazi et al., 2005, Rutebemberwa et al., 2009).

About 70 to 80% of malaria cases are treated outside the formal health system (McCombie, 2002). In Kenya, less than 50% of drugs bought from shops are effective anti-malarials (McCombie, 2002). To address problems associated with self-treatment, small-scale community-based drug dispensing policies were initiated in Kenya under the essential drugs package. The initiatives attempted to reduce impact of malaria by promoting community distribution of chloroquine. One such initiative was carried out in Saradidi, a Kenyan village, where drug distribution points were established at strategic places like markets and people made aware of them. Although the initiative changed the source of treatment, it had no impact on mortality, a factor associated with high resistance to CQ at the time (McCombie, 1996).

The misuse of pharmaceuticals has aggravated the problem of drug resistance (Attaran et al., 2004) and this has necessitated changes in 1st-line treatment for uncomplicated malaria in endemic countries. Even though countries change policies on the 1st-line treatment for uncomplicated malaria on account of drug resistance, people continue to use outdated drugs like Chloroquine (CQ) and SP. This could be linked to lack of knowledge and information among users (Mushi et al., 2008). The lack of knowledge and information encompasses many aspects of treatment seeking including the perception that CQ and SP are still efficacious and the perception that a bitter or high cost drug is more effective than others (Rutebemberwa et al., 2009). Other reasons that drive consumption of non-recommended drugs include packaging, perceptions

over side-effects and use of the drug over-time (Rutebemberwa et al., 2009). CQ owed its popularity to low cost, safety and easy availability from kiosks, shops and drug stores (McCombie, 2002, Mubyazi et al., 2005). However, continued availability of these mostly ineffective drugs is a result of flawed policies pursued by the WHO and the Global Fund for HIV/AIDS, Tuberculosis and Malaria (GFATM) (Attaran et al., 2004).

The medicines in the informal sector is highly heterogeneous, but there are concerns over the quality of treatment and drugs (Bosman and Mendis, 2007). Kenya for instance, has about 218 brands of registered anti-malarial products. These keep the market confusing and supports continued consumption of non-recommended brands including artemisinin monotherapies (Bosman and Mendis, 2007). The availability of many types of malaria drugs in the market may be good for individual preferences because of the tendency to prefer one drug over another, but the diversity is only good as long as the drugs are effective (Bosman and Mendis, 2007). The fact that there are many ineffective anti-malarials being consumed by an unknowing public is exploitative to the consumers who have to spend scarce resources on products that cannot cure them. It is the responsibility of the government to maintain quality in the market. The Kenya government has made a commitment to withdraw marketing authorisation for artemisinin monotherapies (Bloland et al., 2000), but there are no follow-up studies on progress made so far.

2.3 Public perceptions about health interventions

What the public understands with a health intervention may influence how people respond to it. In cases where negative perceptions about an intervention exist, the

chances of successful implementation and uptake are often limited. Bed-nets for example, have sometimes met considerable resistance, especially in rural areas, because of negative perceptions that communities have about them (McCombie, 2002, Alaii et al., 2003a, Alaii et al., 2003b). The fact that community resistance lingers long after Insecticide Treated Nets (ITNs) were introduced may have contributed to the reported low usage of ITNs (Gilson L, 2008.). This means any policies that introduce mass distribution of bed-nets where negative community sentiments against ITNs persist, may not make significant progress in malaria control.

Health worker perceptions about an intervention do not always influence the responses of beneficiaries towards the intervention. This has been shown in a study of perceptions of health workers about use of AL in four Kenyan districts (Wasunna et al., 2008). The study indicated that health workers had positive views of AL although the use of the drug among the beneficiaries remains below average (Wasunna et al., 2008). The subject of health worker attitudes regarding an intervention and how beneficiaries respond to the intervention based on health worker attitudes has not been fully documented. Health worker practices such as dispensing AQ or SP instead of AL, if influenced by negative perceptions of AL at all, may directly influence how the larger community would view and respond to AL.

In many cases, rumours and misconceptions about changes in drug policies may affect uptake of recommended drugs (Lettenmaier, 2003). The rumours and misconceptions may include issues such as new drugs being part of feasibility test on human beings or that new drugs may be too strong or weak in treatment (Williams et al., 1999).

Perceptions about a new drug could also reflect on how beneficiaries and implementers view treatment policy changes. There is scant literature in this regard.

A key issue from the literature is that user perceptions should be compatible with the intentions of a new health intervention if successful implementation is to be realised (Muga and Jenkins, 2008). It means that treatment policies, which are meant to ensure better treatment of malaria and hence contribute to disease control, should be known to the beneficiaries. Contradicting views of the beneficiaries can make implementation of the new policy difficult. Even with the commitment of health workers and the funders, a new policy will be difficult to implement if it is unacceptable to the public (Muga and Jenkins, 2008). Malaria control is primarily a community issue (Ghosh et al., 2006) but most often policy beneficiaries feel that they have no role in malaria control, more-so when they are left out of the policies that are geared towards control of the disease (Opiyo et al., 2007). When people are excluded from drug policy changes during implementation, they will most likely be unaware of the policy goals or intentions. Such situations may give room for the community to create their own conceptions about newly introduced drugs because their concerns may not have been addressed during implementation (Hausmann-Muela et al., 2003).

Some studies have already documented how the public responded to the introduction of new drugs into the health system (Williams et al., 1999). The responses may result from cultural concepts of malaria causation and treatment, lack of biomedical knowledge and poor knowledge of the new drug. In Zambia, community concerns about the change from CQ to SP were about efficacy of SP because it had fewer tablets compared to CQ that had 10 tablets (Williams et al., 1999). In Uganda a bitter or sweet taste was used as a measure of drug efficacy by beneficiaries (Rutebemberwa

et al., 2009). A bitter anti-malarial was viewed by the community as more effective than a sweet one. Such concerns may in turn generate distrust or lack of confidence in health care provision (Williams et al., 1999, Gilson, 2007), particularly in cases where a new treatment policy replaces a bitter drug with one that is not.

Health systems that are not culturally sensitive have contributed to misconceptions about new drugs (Gilson, 2007). Such are health systems that fail to account for the local concepts of disease and what influences treatment seeking behaviour. Culturally inappropriate health systems may create communication barriers between patients and providers leading to poor information provision and mistrust of health care providers (Gilson, 2007, Mwisongo, 2007). Sometimes the reluctance to change to a new treatment policy can result from usage of specific drugs over time and misinformation (Rutebemberwa et al., 2009). With the introduction of SP into the Tanzanian health system, beneficiaries associated SP with an experiment that the government was carrying out on the public (Eriksen et al., 2005). Responses to a new treatment policy that are informed by local culture, ignorance or inadequate information are sometimes negative and could limit successful implementation of the new policy. The introduction of SP in Tanzania made communities to believe that SP posed some health problems to users including possibilities of miscarriage and death, growth of a large baby that could pose problems during delivery and making patients weak because of its perceived strength (Eriksen et al., 2005, Mbonye et al., 2006b).

In some cases, it is the medical prerequisites on the use of a drug that discourages patients from using it. For example, when patients were advised by health workers to take SP with fluids as part of the treatment guidelines, the patients concluded that the

drug must be too strong (Mbonye et al., 2006b). Such a perception can have a direct negative influence on the uptake of a new treatment policy yet it is avoidable if health workers take time to explain to patients why SP needed to be taken with fluids. Hence, poor communication between providers and patients can inadvertently and directly act as a barrier to use of new interventions (Mbonye et al., 2006b). The need to use fluids also had cost implications that posed more barriers to the use of SP. Other barriers to the use of new treatment interventions have been linked to poor market regulation that has failed to curb proliferation of the largely ineffective anti-malarials (Mbonye et al., 2006b, Bosman and Mendis, 2007). The cheap and widespread availability of the ineffective anti-malarials encourages self-treatment instead of seeking effective treatment from formal health facilities.

A large number of people, especially in the rural areas, continue to use old drugs because of their doubts about efficacy of new drugs and the fear that new drugs could be dangerous (Nsimba, 2006a). Many of these negative observations are informed by illiteracy and misinformation (Nsimba, 2006a). In other contexts, persistent use of drugs increases the possibility that they will be viewed positively among community members (Eriksen et al., 2005, Rutebemberwa et al., 2009). For instance, chloroquine was perceived as the best drug whose efficacy was not in doubt (McCombie, 2002, Nsimba, 2006a). This contributes to persistent demand for non-efficacious drugs even after treatment policies have changed.

Not all public perceptions are always negative. Positive views by communities over health interventions are defined from cultural understandings and associations and can facilitate policy implementation. For example, in a study in Tanzania, the white colour

of SP tablets were perceived to be for making the mother and unborn child healthy, particularly to protect them from malaria (Eriksen et al., 2005). Community receptivity to immunisation policies in West Africa also revealed immunisation was viewed positively as giving strength to children by introducing a powerful substance into the blood to protect against illnesses (Leach and Fairhead, 2008). This logic is applied to all forms of diseases and not only that against which a child is immunised. The strength goes beyond the limits of the individual person immunised to encompass whole communities and regions (Leach and Fairhead, 2008). Hence, the desire for strength and power by a community may drive demand for immunisation. These local social and cultural perspectives need to be understood in order to address challenges that come with implementation of health policies (Leach and Fairhead, 2008).

To address misconceptions among beneficiaries against a new treatment policy, various strategies should be employed that are aimed at behaviour change (Malik et al., 2006). Such strategies should involve well researched evidence, proper communication, donor support, national and regional approaches and a better understanding of the political system (Williams et al., 1999, Malik et al., 2006). The input of beneficiaries, particularly their perceptions of the new policy, should then be considered as equally important. Also important to policy implementation is the context; for instance, where there are too many anti-malarials, attitudes emanating from ease of access may hinder uptake of new drug policies (Williams et al., 1999, Malik et al., 2006) because of public familiarity with the old drug (Eriksen et al., 2005).

To ensure successful implementation and avoid resistance from beneficiaries, a policy that introduces new drugs into the health system would require mobilisation of all key

actors. Key actors should be involved in policy making and implementation (Walt and Gilson, 1994). The key actors in health policy making may include public agencies, the private market sector, consumers, regulatory agencies, the scientific community and politicians, who interact to influence policy implementation (Williams and Jones, 2004). Importantly, policy implementation needs to take account of the views and expectations of beneficiaries as well as other actors (Gilson and Erasmus, 2006). The common top-down approach to policy implementation rarely considers the ways in which actors at the 'bottom', such as front line health workers and beneficiaries, always influence policy implementation success (Gilson and Erasmus, 2006). As a result, drug policy changes may face resistance from beneficiaries during implementation, because community misunderstandings about the new policy may not have been adequately addressed.

2.4 Role of communication in policy change

The WHO recognizes equitable and universal access to health information as vital in strategies aimed at reducing global inequities in health and in achieving the health-related Millennium Development Goals (Godlee et al., 2004). Achieving the goal of Universal access to essential health-care information by 2015 would be essential in enhancing health outcomes. The problem with low- and middle-income countries is lack of access to health information, which is a major hindrance to knowledge-based health care (Godlee et al., 2004). Although access to information is necessary, it alone cannot change behaviours and practices. Other factors also need to be considered including use of information, awareness of what is available, relevance of available information to people's needs, availability of time and incentives to utilize

information, and interpretation skills to understand the health messages being passed (Godlee et al., 2004).

The strategies used to pass health information should consider a community's preferred channels of information delivery as this increases access to the messages being passed (Eng et al., 1998, Kreuter and McClure, 2004, Claasen-Veldsman and Snyman, 2005). To improve access to information, two dimensions should be considered: physical access ensures that information is available and within reach. Semantic/linguistic access is the ability of the audience to understand the meaning of the message (Claasen-Veldsman and Snyman, 2005, Eng et al., 1998, Kreuter and McClure, 2004). Increasing access to information should use linguistic strategies that provide health information in the dominant or local languages of the target audiences. These strategies make health communication campaigns, programs, and materials readily available to the intended beneficiaries (Kreuter and McClure, 2004). Language being fundamental to effective communication, renders linguistic accessibility as the most basic in terms of cultural sensitivity (Kreuter and McClure, 2004). Affordability of information sources is also considered as an important aspect of access to health information (Emmanuel, undated). Improved access to appropriate health information impacts positively on the quality of health care, apart from supporting public health goals (Eng et al., 1998). Availability of health information is a public health good, which forms part of a chain of factors with influence on the adoption of healthy behaviours and disease prevention (Eng et al., 1998).

The medium through which information is passed determines effectiveness of communication. This requires that the audience, the message and the medium be in harmony (Claasen-Veldsman and Snyman, 2005). Populations in rural areas across

most of Africa are characterised by poor access to health information and low literacy yet a lot of information has pro-literacy bias (Claasen-Veldsman and Snyman, 2005). A print medium for a low literacy audience, for example, is ineffective in as much as information passed through the radio for an audience without access to the equipment. African cultures are essentially oral, wherein information is processed through an “interactive social processes” (Claasen-Veldsman and Snyman, 2005 :1). Policy makers need to pay attention to such social and cultural biases before rolling out communication strategies for health policy changes.

When communication strategies are employed as part of the policy change process, then it should involve evidential approaches (Kreuter and McClure, 2004). Such an approach augments the perceived relevance of a health problem to the target group by presenting evidence of the impact of the health problem on the targeted population (Kreuter and McClure, 2004). Provision of information is a crucial ingredient in any policy change (Hausmann-Muela et al., 2003, Lettenmaier, 2003, Mulligan et al., 2006). Necessary information needs to be carried through appropriate communication strategies in order to change perceptions, attitudes or social norms that might limit the impact of new health interventions and policy implementation (Hausmann-Muela et al., 2003). Because policies that aim to introduce new drugs into the health system are often met with resistance from the community (Hausmann-Muela et al., 2003), there is need to give full information and education about the new policy to the beneficiaries in order to convince them of its merits (Hausmann-Muela et al., 2003, Lettenmaier, 2003, Mulligan et al., 2006). There is no current literature on how communication strategies have influenced malaria control in Kenya.

Key information on an illness has the potential to change people's knowledge and behaviour and investment in communication infrastructure can improve people's health status (Mozumder and Marathe, 2007). The authors add that poor investment in IEC infrastructure is thus to blame for the inefficiency in primary health care systems in rural areas of developing countries. Poor health education and information are often manifested in misconceptions of disease causation and cure (Mwenesi et al., 1995, Eriksen et al., 2005). In light of these misconceptions, health information, education and communication can be used to transform people's ways of thinking and to increase their level of knowledge about illnesses and health interventions (Mozumder and Marathe, 2007, Emmanuel, undated). Information, Education and Communication (IEC) strategies should be tailored to different audiences, based on recognition and understanding of differences between target groups in their needs and concerns (Kreuter and McClure, 2004).

IEC materials are considered the first step in a communication strategy targeting health care beneficiaries. Although many countries across Africa have invested in IEC materials during policy changes in malaria drugs, few have endeavoured to evaluate the impact of these strategies at the community level. There is also dearth of literature on the extent to which communication strategies can influence malaria treatment outcomes. Existing literature suggests that well-developed communication strategies not only help in increasing awareness of the policy change but also improve acceptance and compliance with drug regimens such as ACTs (Lettenmaier, 2003, Mozumder and Marathe, 2007). Acceptance and compliance with new drugs form part of health education, which is important in disease control. This area has not received sufficient emphasis in malaria control programmes and the result has been poor

community acceptance and involvement in malaria control interventions (Ghosh et al., 2006).

A number of channels can be used to pass health information, but in many rural communities, communication strategies that involve radio and interpersonal interactions are the best options to reach this part of the population (Eriksen et al., 2005, Mozumder and Marathe, 2007). The interpersonal interaction helps community members in identifying symptoms and in mobilising resources for treatment (Mozumder and Marathe, 2007). Information passed between community members, if well communicated and accompanied by collective decision-making, improves outcomes of home-based treatment (Mozumder and Marathe, 2007). Oral communication is one of the best methods for communicating with people in rural areas in the sub-Saharan Africa because of the oral nature of African cultures (Claasen-Veldsman and Snyman, 2005). Information orally delivered by health experts is more appealing than one that is delivered by any other person because expert sources are generally regarded by the community as most credible (Kreuter and McClure, 2004). Oral interpersonal communication would be more beneficial to women than men because women usually prefer to meet the information providers rather than listening to the radio (Emmanuel, undated). The best option to reach all audiences is the use of multiple information delivery channels (Eriksen et al., 2005), meaning that using one method of information delivery may alienate other groups of people.

Above all, the radio remains the cheapest and most widespread source of information in most parts of Africa (Eriksen et al., 2005). Information presented through this

medium is taken seriously (Eriksen et al., 2005) and this influences user-perceptions and attitudes (Mwisongo, 2007). During the drug policy change from CQ to SP in Tanzania, for example, information from the government about the policy change was passed to the public at the time when the media was already presenting negative information about SP (Eriksen et al., 2005, Mwisongo, 2007). The official communication about SP might have added to the confusion because the public was already receiving information through radios and newspapers about the possible negative effects of SP. Simultaneously, the government used the same media to pass information about the benefits of the drug and the need to change from CQ to SP. Such contradictory messages about drug policy change may have led to confusion among policy beneficiaries thereby making them form divided opinions about the drug policy change (Mwisongo, 2007). The media may therefore, play both positive and negative roles during policy change, which in turn, could lead to success or failure of a policy.

Communication strategies for drug policy changes often involve training of key implementation staff and multi-media communication using a number of languages that are relevant to recipients. Mulligan and others give a description of the Tanzania communication strategy during the switch from CQ to SP. The communication strategy involved training of regional medical representatives who later trained District Health Management Teams (DHMTs) (Mulligan et al., 2006). These in turn trained at least one health worker from each of the selected districts. Training involved primary prescribers: clinicians, pharmacists, clinical officers and nurses. Only 23 of the 114 districts got the initial training with centralised funding from the National Malaria Control Programme. The rest of the districts were to be trained from

their own decentralised budgets (Mulligan et al., 2006). Whether this difference could have compromised quality of training has not been documented. To pass messages to the public, Tanzania hired communication experts to design messages that were pretested before being aired to the rest of the population (Mulligan et al., 2006). The pretesting may have been crucial in gauging potential impact of the IECs before the final roll-out. But there are no documentations about the impact of the pre-test or of the final roll-out.

In Sudan, multimedia strategies were employed during the change from SP to ACTs. Their manner of passing information to the public was not a one-off event, instead it was periodic, with breaks allowing people to digest information already provided before more information was given. For example, radio broadcasts consisted of four messages per day for two weeks, then a week-long break before resumption of broadcasts (Malik et al., 2006).

The Zambian policy change to ACT was similar to Tanzania's in the initial stages but the change had the additional goal of strengthening the performance of the key health sector support functions such as supply and procurement, drug regulation, communication and health management information systems (Steketee et al., 2008). All the countries documented here had an incrementalist model of policy change with training of key health sector personnel taking place in stages during policy implementation. There are also elements of rigour in the policy making process especially in the Tanzanian case where debates involving the general public, researchers, traders, pharmaceutical industry and health workers began even before a replacement for the outgoing drug was suggested. What is not clear is the impact of

the different approaches (Kenyan, Zambian, Tanzanian and Sudanese) to implementing communication strategies.

2.5 Summary

There is little published literature on how the public perceives policy changes on 1st-line drugs for uncomplicated malaria. There is also little literature about how communities respond to new drugs when one drug replaces another in a new policy, or about how people's attitudes influence acceptability and compliance with new drugs. However, it is known that public perceptions do affect treatment-seeking behaviour. Some of these perceptions are influenced by cultural interpretations of disease. The interpretations determine what kind of treatment is sought whenever a household experiences illness. Many households resort to self-treatment where drugs are brought from the informal sector. Quite often, drugs bought from the informal sector are inappropriately used. Misuse of pharmaceuticals leads to drug resistance, a scenario that calls for changes in 1st-line treatment for uncomplicated malaria. The consequent implementation of the changes needs to consider all key actors. It is particularly important to provide full information about the policy change to the public in order to forestall rumours and misconceptions that could become barriers to drug use. The provision of information to the public is meant to change negative perceptions, attitudes and social norms. It may involve multi-media approaches aimed at maximising the reach of information in order to minimise distortions of the policy change and enable smooth implementation drug policies.

3. CHAPTER THREE: METHODOLOGY

3.1 Study Site

3.1.1 Choice of Study Site

This study was conducted in a newly created administrative area called Kinango district that was initially part of the larger Kwale district in the Coast province of Kenya. The district was chosen because; firstly, this remote district is typical of many rural settings in Kenya, thus it was interesting to investigate the population's understanding of drug policy changes and how they receive communication about these changes from their disadvantaged position. Secondly, the researcher has prior experience of working in the district. This made the logistical challenges of the research easier to address than would have been possible in another setting.

3.1.2 Position and population

Kinango district is located in south-east Kenya on the border with Tanzania. Being a new district, it does not have updated demographic data and what is presented here is drawn from the larger Kwale district. In terms of physical accessibility, the road network is poor and unpaved and often people get cut-off by heavy rains. The largest ethnic group in Kinango district is the Duruma, one of the nine sub-tribes of the Mijikenda ethnic group. The socio-cultural institutions of the inhabitants of the larger Kwale district rotate around an elaborate system of government controlled by elders (gerontocracy). The district is also semi-arid and characterised by high poverty levels and poor communication networks including telephone coverage. The MOH indicates that the coastal region faces high malaria transmission patterns similar in intensity to the lake region in western Kenya. Very high transmission intensity areas have mean

values of *P. falciparum* parasite prevalence of about 40%. Kinango district also has comparably low coverage of insecticide-treated bed-nets (MOH-Kenya, 2009).

3.2 Study Design and Study Population

This was an exploratory qualitative study focused on different categories of the population including adult members of the community especially young parents and community opinion leaders. Other key respondents were health care providers at primary facility level and health care managers based at the local district hospital. The choice of a qualitative design was driven by the need to better understand people's thoughts and perceptions about policy changes on 1st-line treatment for uncomplicated malaria because little was known about the subject, and such information is, in the first instance, better gathered through in-depth qualitative approaches rather than more structured survey tools. Qualitative methods are appropriate in situations where one needs to first identify the variables that might later, in this case, in another study, be tested quantitatively (Hoepfl, 1997).

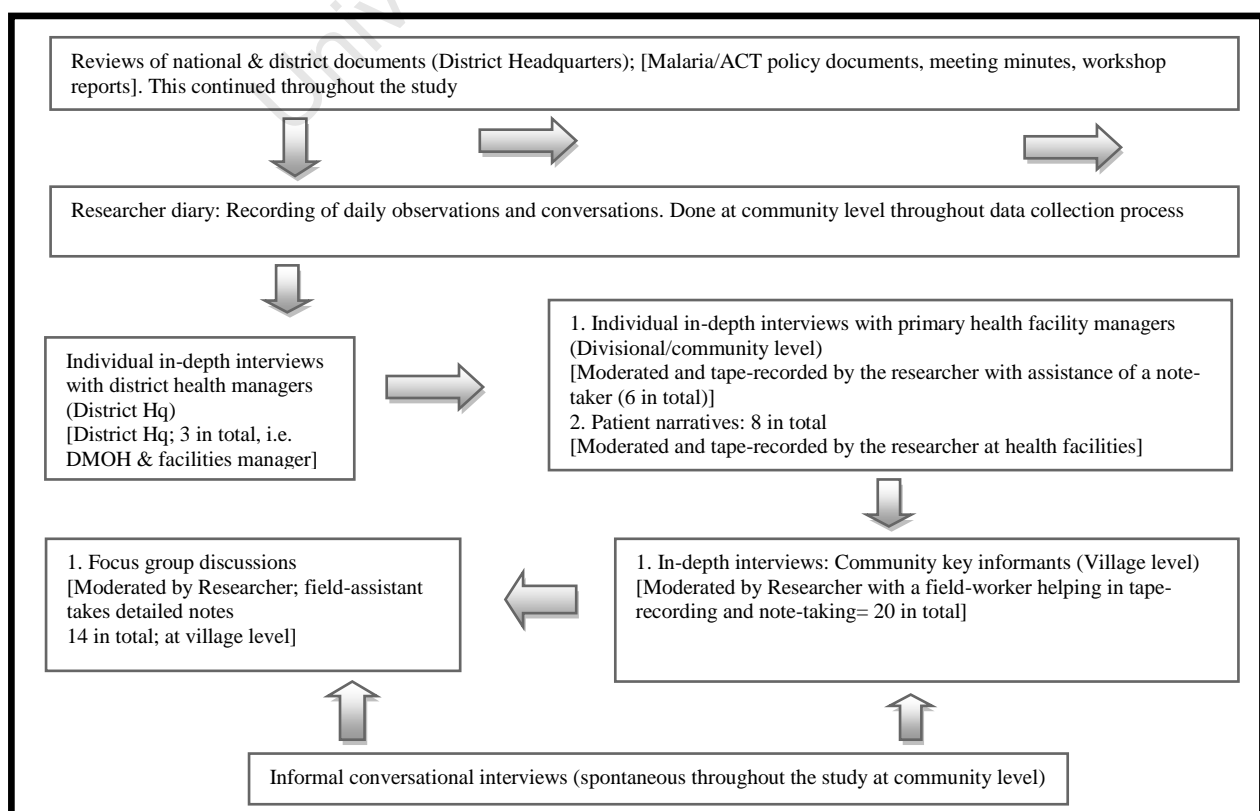
3.3 Sampling Strategy and Data Collection Methods

The district has four administrative zones called divisions, namely: Kinango, Samburu, Ndavaya and Kasemeni divisions. A convenience sample of three divisions was selected for the study. The three were chosen on the basis of the following: (i) the district is socially and culturally homogenous because it is dominated by one ethnic group, one language and the socio-economic status is dominated by widespread poverty. (ii) Two divisions that were farthest from the district headquarters were regarded as more remote and were chosen for the study because of their perceived

disadvantage in terms of communication and access to care. (iii) One of the two divisions closer to the district headquarters was chosen to allow comparison between areas that were more remote and those closer to an urban centre. A cluster of two villages per division was randomly selected to bring the total to six villages for the study. Data were collected up to a point of redundancy. Sample size determination in qualitative studies is not fixed so the number of subjects required for the study is identified as the study progresses, with new informants being included because new information emerges or with no increase in informants because explanations stop emerging from the data being collected (Marshall, 1996).

The initial number of FGDs was meant to be 12 but this was increased to 14 to just to confirm that the FGDs had reached a point of data redundancy. There were 29 in-depth interviews. These methods were used alongside document reviews and observations that were documented in the researcher diary. Figure 1 presents the tools used in data collection.

Figure.1: Summary of data sources and collection methods



Data were collected for two months starting mid-January and ending in mid-March 2009. A field assistant with prior training in data collection helped in translation, pilot testing tools and data collection. The training of the field assistant was done by the KEMRI-Wellcome Trust Research Programme. The main language of communication was Kiswahili and in a few cases, the local language was used. Both the researcher and the field assistant are fluent in English and Kiswahili. The field assistant is also a native speaker of the local language. The researcher and field assistant translated study tools in three languages: from English to Kiswahili and the local Duruma language. Accuracy of the translations were confirmed by the researcher and the field assistant and through back-translations, and pilot testing where some questions were asked in both Kiswahili and the local (Duruma) language to check their accuracy.

3.4 Justification for Data Collection Methods

3.4.1. Document Reviews (n=6)

Document reviews were necessary to ensure familiarity with content of policy documents and discussions, and to feedback on policy implementation process. Such familiarity helps to contrast what is on paper and the specific actions taken, besides assisting in polishing interview questions for health managers. The documents were selected with the assistance of one of the district health managers. The documents included the national health policy document, malaria control policy, the AL training manual and minutes of meetings at the district level among the District Health Management Team (DHMT) members. After all the relevant documents were reviewed, comparisons were made between issues arising from each document reviewed, reflecting policy intent, and experience of policy implementation. These, apart from being used to review questions for in-depth interviews with district health

managers as well as facility managers, also formed part of the data that were analysed. The reviews provided a background to policy change communication and implementation and helped clarify what was envisaged in the policy change and actual implementation at the community level. Document reviews were important in guiding purposive sampling and also familiarised the researcher with content and context of the study (Mack et al., 2005, CDC, 2009).

3.4.2 Researcher Diary

Diaries are important in highlighting thoughts and reflections and to “triangulate research on information behaviour” (Hyldegard, 2009 :7). Diaries improve rigour in qualitative research (Clayton and Thorne, 2000). A researcher diary was kept throughout the study period. The diary permitted constant reflection on the researcher’s experiences as well as helping in identifying emerging thoughts about issues and ideas that were followed up in subsequent interviews. The researcher constantly referred to diary notes during data analysis so as to compare what was observed with what was said during the process of data collection hence contributing to reliability and validity of data. Part of the observations included population groups at health facilities, who said what in FGDs and with what intensity, and the social circumstances and their relationships with the findings.

3.5.3 Individual In-depth Interviews (n=29)

The use of individual in-depth interviews to collect exploratory qualitative data is recommended (Lofland and Lofland, 1995, Patton, 2002). This method emphasises verbal communication and are efficient in discovering underlying attitudes and motivations towards an intervention or situation (Lofland and Lofland, 1995). The goal is to elicit rich, detailed material that can be used in analysis. In-depth interviews

are good in collecting data on sensitive topics, experiences, feelings, knowledge, thoughts, expectations and perceived changes, following an intervention (Patton, 2002, Mack et al., 2005).

Individual in-depth interviews were conducted with three categories of respondents. These included three members of the DHMT, six health workers from six primary health facilities and 17 community leaders and three mothers just from the dispensary (n=29). DHMT top officials were purposively selected given their administrative roles that included over-seeing policy implementation day-to-day running of the district health services. They provided information on the general malaria situation in the district, their role in policy communication and implementation, and influences over uptake of drugs.

In-depth interviews with primary health facility managers were required because they were in charge of health service provision at the local level and feed back to district health managers on all health matters at community level. Besides, they constituted the lowest link between the community and the DHMT. A convenient sample of two facilities per division was chosen and in-charges were interviewed. This made a total of six facilities for the study and six in-charges. The facilities were chosen at the divisional level because health facilities are not available in every village. All interviews with health managers/workers were conducted in their respective offices.

The researcher took brief notes while the field-worker was required to take detailed notes as well as operate the recorder. The primary facility health workers provided information on the malaria situation at the local level, their own role in policy

implementation, policy communication strategies, barriers and facilitators to policy changes/implementation at the local level, perceived community response to policy changes, attitudes to recommended drug and general uptake of malaria drugs.

A total of 20 key informants at the community level were also purposively selected from among the six sampled villages. These participants were chosen based on their presumed knowledge of local culture, administrative issues, and health and malaria treatment. In this regard, they were most likely to have been actively involved in, or experienced first-hand, key events such as policy change communication. Those interviewed included the following: 17 community leaders including four local chiefs, eight village level leaders and five women group leaders. There were also three mothers (n=20). As custodians of community culture and leadership, the views of these leaders were necessary as culture plays a role in the community interpretation of disease and treatment seeking. Besides, they were likely to have had experience with the earlier 1st-line drug, CQ. The mothers were selected because they had just taken their children to the formal health sector and had first-hand information about malaria treatment.

The researcher acted as interviewer in the key informant interviews while the field assistant managed the recorder. The field assistant also took detailed notes during the interviews. The participants provided information on their experience with malaria, types of health provision available in the community, their views on available malaria drugs. Other areas of questioning included their responses to recent malaria drug changes and why such responses; whether the community got any communication about recent drug policy changes, what form of communication, who was reached,

and from whom/what sources; usefulness of the communication, and what reactions to it. Each interview session lasted about 45 minutes. All community key informant interviews were conducted at the respective homes while the chiefs were interviewed at their offices.

3.4.4 Patient Narratives (n=8)

Narratives reveal qualities of individual or group experiences in a way that other forms of research cannot (Connelly and Clandinin, 1990). Narratives also provide descriptive knowledge that is understood in context (Richmond, 2002). Narratives seek to collect data to describe lives, and are a method to find the voice of the participant in a particular time, place or setting (Richmond, 2002). This was important for the study as it also sought to understand individual experiences with drug policy changes in given contexts.

Patients for the narratives were chosen purposively from the nearest three of the six health facilities that were visited. The argument behind the choice was that the study area is culturally and socially homogeneous and so did not require a large number of narratives from many health facilities. Two narratives were conducted from the first facility, four from the second and two narratives from the last facility. Patients were first asked to narrate the story of their illnesses and use of the formal health care and thereafter probed on their choice of drugs, their perceptions on available drugs and how they received communication about health services in general and malaria drugs in particular. The narratives elicited real life experiences when seeking treatment, experiences with various drugs, the shocks of policy change and communication received about the new policies. Eight narratives were conducted and included in the

analysis, but only one edited version was illustrated here, partly to act as an example and partly to minimize the size of the thesis.

3.4.5 Informal Conversational Interviews (n=11)

Informal conversation with participants has advantages in that the participants are in their natural settings and are not subjected to paper-work and consent procedures. Informal conversational interviews are advantageous because the interviews are highly individualised and relevant to the individual (Patton, 2002). Thus, they are likely to produce information or insights that the interviewer could not have anticipated.

Informal conversational interviews were done conveniently with individuals or groups like youths at social places and around schools and markets, at chiefs' meetings, a funeral and relief food distribution points. These spontaneous conversations continued throughout the study and were conducted by the researcher with ordinary adult men and women, both young and elderly. There was no tape-recording or note-taking during the informal interviews, instead the researcher after the conversations, immediately noted down outcomes to ensure no important data were lost. The interviews provided additional information on experiences with various malaria drugs, perceptions on policy changes on 1st-line treatment for uncomplicated malaria and sources of information on government and facility matters. These were conducted spontaneously until there was data saturation. Six informal conversational interviews were conducted with individuals and five with groups.

3.4.6 Focus Group Discussions (FGDs) (n=14)

Focus group discussions are appropriate in qualitative studies because they encourage verbal communication and are efficient in discovering underlying attitudes and motivations towards an intervention or situation data is recommended (Lofland and Lofland, 1995, Patton, 2002). FGDs were the last to be conducted at each village because they acted as debating arena for issues emerging from the interviews as well as being an avenue for debates on issues relevant to the study. FGDs normally ensure free flow of information and allow agreements and disagreements (Mack et al., 2005).

The FGD participants were selected purposively with the help of community leaders. Among male participants, most were household heads with at least a child aged 10 years and below and must have lived in the village in the past one year. Female participants came from similarly young households. Young households were chosen because they are likely to have had experiences with the latest policy changes on malaria drugs because of their young children who are vulnerable to malaria infection. Male and female participants were interviewed separately. Each FGD included a minimum of ten and a maximum of 12 ordinary community members. Topics discussed included the following: views on recent malaria drug policy changes; what responses to the changes and why; communication about recent drug policy changes; what sort of communication, who got the communication, from what sources; usefulness of the communication, and what reactions to the communication. Also explored were what influences choice of health care and views over new drugs.

When residents of socially and culturally homogeneous areas are interviewed about their attitudes, experiences and beliefs, there is usually a large measure of agreements in answers (Ruebush et al., 1995). In-depth information from a small sample is

important when the respondents are information rich (Patton, 2002). Consequently, a large sample of participants was not necessary for the study so as to secure high reliability and validity in data. A maximum of two FGDs per village- one with men and one with women- were conducted. Two more FGDs- one each with men and women- were conducted to ascertain data saturation. All FGDs were tape-recorded. The researcher moderated the discussions while a field-worker took detailed notes. FGDs were conducted at communally agreed central points including schools, churches and chiefs' compounds.

3.5 Data management

All interviews and discussions were tape-recorded except for informal conversations. Field notes from observations and informal interviews were kept in an envelope and locked in a drawer. Tape recorded interviews were downloaded into a password-secured computer in the custody of the researcher.

3.6 Ethical issues

Ethical approval was obtained from the University of Cape Town Ethical Review committee and the Kenya Medical Research Institute (KEMRI) Ethical Review Board. The purpose and methods of the study were explained to all study participants in line with ethical requirements. Informed written consent was obtained before the interviews or discussions begun and participants were given copies of information sheets about the study to retain for future reference. All participants studied were competent adults in their ability to make informed consent. Consent forms, question guides were either in Kiswahili or local language. A notification to conduct the study

was given to local health care managers, local authorities including village elders and chiefs of respective locations who acted as points of entry into the community. All participants were assured of confidentiality. It was also explained to the participants that the benefits of this study could not be immediate and if any would be communal rather than individual. The study involved no invasive procedures and caused no pain to participants. The only drawback was that participants might have felt inconvenienced with time and questions that they might have regarded as personal. Results of the study would be communicated soon after the study is examined and approved. The dissemination plan included the proposal of a journal paper for a wider literate audience and policy makers and through brief notes containing key findings for the district health workers and managers. Public meetings were proposed for the rest of the community to give feedback on the findings.

3.7 Data processing and analysis

All interviews were audio-recorded, transcribed and then translated into English. Transcriptions were made by the researcher and field assistant. Any discrepancies from the transcriptions were resolved by re-listening to the recordings. Interviews with the district health managers and health workers were conducted in English. All transcriptions were processed electronically. Coding and analysis were performed manually by the researcher by developing a matrix for emerging categories and themes. The themes and categories centred on phrases, incidents and behaviour during interviews, discussions, and observations. Unusual statements were also considered as a basis for analytical categories. Data from each theme or category were identified and analysed using constant comparison (Thorne, 2000). Each item was compared with the rest of the data to establish analytical categories. For example, individual key

informant interviews with health personnel at district and divisional levels, and community members were separately compared and contrasted with each other to identify patterns, consensus, differences, variations or contradictions and weighing the relative importance of information. Comparisons and contrasting were also made between female and male respondents, within groups and between villages. Concepts and themes thus identified were compared with those from FGDs. Field notes and review notes were explored for content and contrasted with themes and concepts from FGDs and key informant interviews. Analysis of narrative focused on how ideas and behaviours were sequenced, the perceptive differences in the narratives and how these have worked to influence receptivity to policy changes in malaria drugs.

The analytical categories were then explained and interpreted in line with the research objectives and the themes developed from the data (Malterud, 2001). Preliminary analysis was presented before the Social and Behavioral Research team at KEMRI-Wellcome Trust Research Programme. Feedback from the team was incorporated in the final analysis. The data were also subjected to iterative methods where sets of concepts from various data sources were examined, constructs developed and compared with each other. The researcher noted his role in producing certain classes of knowledge, how and why certain conclusions were arrived at, and how the results function to shape community responses to changes in 1st line treatment for malaria.

3.8 Validity and Reliability

To ensure rigour in the research process, the following precautions were taken as suggested by (Olshansky, 2006, Golafshani, 2003), regarding validity and reliability in qualitative studies:

- i) Constant reviews of question guides in line with research objectives,
- ii) Comprehensive recording of data using audio-tapes and detailed transcription involving two individuals. The transcriptions were compared for consistency and any discrepancies were resolved by listening to the recordings together.
- iii) Triangulation involved three approaches: across data sources (district health managers, primary health facility staff, community key informants including cultural leaders, leaders of local authorities, women group leaders, and ordinary members considered to have better information about malaria drug policy changes; ordinary adults including parents of young children, youths and the elderly); across data collection methods (in-depth interviews, FGDs, informal interviews, narratives, observations and document reviews) and across analytical methods (constant comparisons, reflexive analysis, iterative methods and peer reviews). Familiarity of the researcher with the study population made participants feel at ease and this most likely increased level of trust between the researcher and participants. Mutual trust was important for successful recruitment and the quality and flow of information from the participants. The researcher also became very familiar with the context that was built into the analysis and interpretation of the findings.

3.9 Limitations of the Study

The study was only in only one district. While rural communities are similar in many ways, cultural differences between settings may limit the application of the findings culturally and socially different settings. Limitation in scope was also registered in the fact that the study is purely qualitative and so misses the strength that would have come with a mixed methodology.

4. CHAPTER FOUR: FINDINGS

4.1 Introduction

The data presented here are drawn from document reviews, views and experiences of ordinary members of the community, primary health facilities, health managers and diary records. The first part of this chapter provides an overview of the policy change strategy including the context and processes of the change. The second part presents findings on the overall outcomes of the policy change in the study district. The third section presents factors that explain these outcomes.

4.2 Overview of the policy change from SP to AL

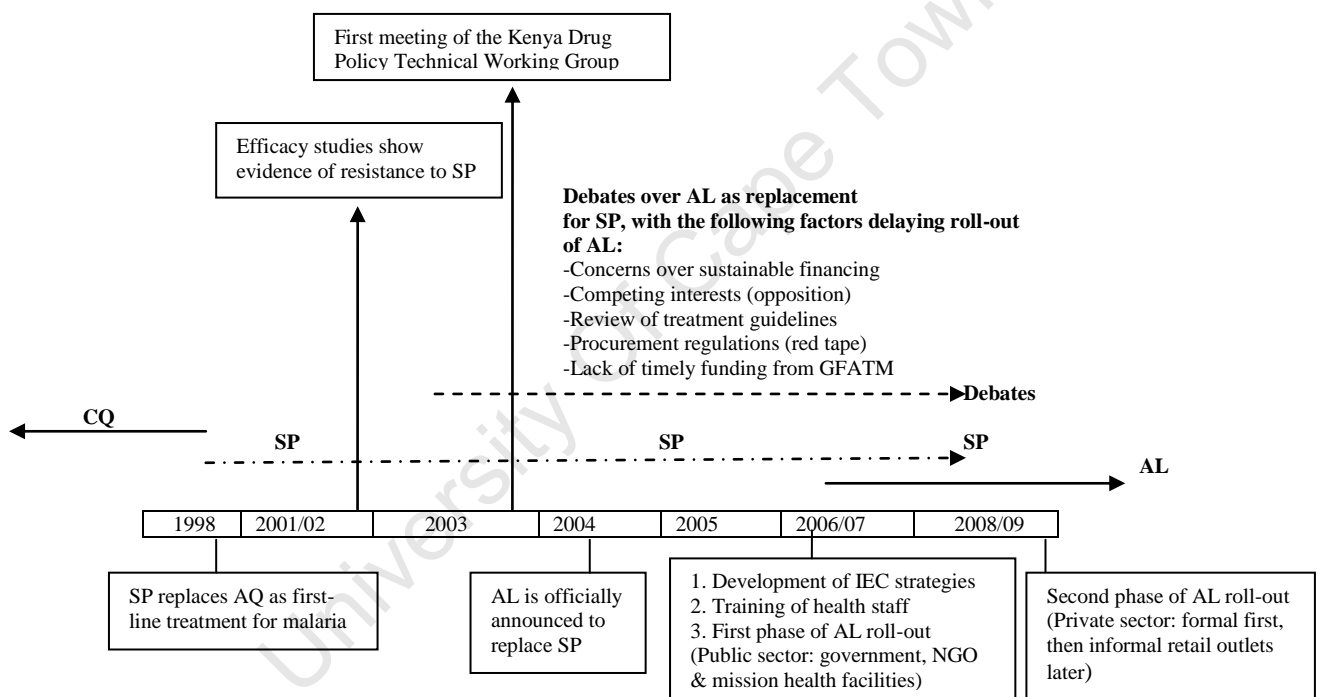
The date of the official policy change to AL was 2004 although the drug only reached health facilities in the study district 32 months later in 2006. This was according to a member of the DHMT. Apparently, the delay affected the whole country and this was confirmed from secondary data sources (Amin et al., 2007). It was due to the following reasons: concerns over sustainable financing for AL, competing national and international interests, procurement regulations and lack of timely funding from the Global Fund to fight HIV/AIDS, Tuberculosis and Malaria (DHMT minutes 1 & 2, Kangwana et al., 2009). The arrival of AL also did not displace earlier antimalarials, CQ and SP. A spot-check by the researcher confirmed the presence of these drugs in most health facilities in the district and in most of the local shops. SP is recommended as 1st-line treatment for pregnant women, a factor that ensures its continued supply to health facilities.

As early as 2001, various studies in Kenya had indicated that the SP treatment failure rate was over 25%, a threshold used as the bench-mark in determining drug policy change in Kenya (MOH-Kenya, 2006). Treatment failure is defined as the “failure of a drug to achieve the desired therapeutic response after the initiation of therapy” (MOH-Kenya, 2006 :4). It can result from many sources including: poor adherence to treatment, unusual pharmacokinetic properties in an individual, drug resistance or wrong diagnosis hence wrong treatment (MOH-Kenya, 2006). At the end of 2003, the Kenyan Drug Policy Technical Working Group held its first meeting to review data on SP and AQ sensitivity and think about alternative 1st-line treatment for uncomplicated malaria (MOH-Kenya, 2006). Among the alternatives considered were AL and AQ-AS (AS= artesunate) in line with the WHO demands for countries to avoid using monotherapies in order to preserve the life of artemisinins (Amin et al., 2007). The choice between the two was complicated due to the lack of efficacy studies and unclarity about who to undertake and who to fund such studies (Amin et al., 2007). In 2004, at the intervention of the WHO, regional and international evidence on efficacy was used to push for the policy change.

Apart from widespread resistance to SP, the decision to select AL was because it was the only co-formulated ACT that had passed rigorous international regulatory scrutiny (WHO, 2008). Therefore, AL was the only ACT purchasable by countries that needed to change 1st-line treatment policy to an ACT. Drugs can be administered with artemisinins, for example, AQ + AS but for ease of use for outpatients, an ACT regimen needs to be co-formulated, that is, the various drugs must all be formulated in the same tablet (Laxminarayan and Gelband, 2009). The official announcement about the choice was made in April 2004. Funds secured from the Global Fund for

HIV/Aids, TB and Malaria (GFATM) enabled initial roll out of AL in two phases. The first phase (2006/2007) involved free distribution of AL to the public sector facilities including: government, mission and NGO health facilities. The 2008/2009 phase involved, first the formal private sector followed by retail non-formal sector, but there was still no AL in the informal sector at the close of 2009. The phased roll out was an attempt to win public trust over the safety of the new drug (Amin et al., 2007). Figure 2 presents a graphical representation of the policy change process.

Figure 2: An illustration of events leading to the change of first-line treatment policy from SP to AL



At the time of the official announcement of AL as the replacement for SP, a conference was held in Nairobi for 13 Francophone countries that had adopted AQ-AS as first line drug for uncomplicated malaria (Amin et al., 2007). The conference, on its conclusion, sent conflicting messages to the Kenyan public because its resolutions appeared to endorse AQ-AS as the recommended 1st-line treatment for uncomplicated malaria (Amin et al., 2007). It was unclear why a Francophone

conference was held in Kenya, an Anglophone, if not for external forces opposed to adoption of AL at the expense of AQ-AS. Adding to the confusion, the Pharmaceutical Society of Kenya (PSK), representing a national grouping of pharmacists and mostly private pharmaceutical firms, opposed the move to AL and questioned the legitimacy of the switch from SP (Amin et al., 2007). Their opposition to the change to AL was not based on any scientific evidence but on the grounds of transparency in the choice of AL.

The PSK draws some of its membership from the health personnel and its influence may partly explain why some district health managers and primary facility providers still expressed mild opposition to AL at the time of the study. One of the managers said: *“We keep asking why AL and not any other ACT? This question has not been answered and sometimes you come to believe that the change to AL was facilitated by some reasons other than health concerns ... may be someone just wanted to make money.”* Two DHMT members and three primary health workers questioned why AL was selected when it was obvious that it had a more difficult regimen compared to other alternatives. But in opposition to this view, documents used during training, which the researcher reviewed at the district hospital, clarified that at the time AL was being considered to replace SP, it was the only co-formulated ACT and therefore had no other competing ACT. It could have been this consideration that was not communicated to some health workers/managers in the district.

The sub-committees enlisted by the Department of Malaria Control (DOMC) to recommend best methods to implement the AL policy took 23 months to review treatment guidelines (MOH-Kenya, 2006). The final version of the guidelines was

only available in the first quarter of 2006 (MOH-Kenya, 2006). Approximately 8500 copies of the guidelines were distributed to health workers across the country through the DHMT and during in-service training for health workers and health managers (MOH-Kenya, 2006). These copies were too few considering that the training also involved the private sector.

The new treatment guidelines emphasised careful assessment of fever and use of AL. It targeted health staff in Kenya's general and specialist hospitals and health centres, and meant for both pre-service and in-service training of doctors, clinical officers, nurses, pharmacists and pharmacy technicians, and laboratory workers involved in diagnosing and managing malaria (MOH-Kenya, 2006). The emphasis on assessing cause of fever before treating with AL was meant to reduce the chances of resistance by reserving AL for patients who are truly malaria positive, wise use of limited resources, and to treat patients for the disease they had (MOH-Kenya, 2006). The new guidelines proposed parasitological diagnosis for all adults and children above the age of five and presumptive treatment for children under-five years of age in areas with high transmission rates. Use of Rapid Diagnostic Tests (RDT) was recommended for all age groups in low risk areas. However, across the country only 34% of health centres in the periphery have microscopy and less than 7% have RDTs (MOH-Kenya, 2009). There were no RDTs in all the primary health facilities visited during the study.

Compared to CQ or SP, AL involves a more complex dosage. An adult dose for CQ had 10 tablets taken within three days. The first dose involved four tablets followed about eight hours later with a second dose of two tablets. The third and fourth doses

consisting of two tablets each were taken on the second and third days respectively (4 – 2 – 2 – 2 pattern). An adult SP dose only involved three tablets taken at one time. AL has a three-day dose regime for all patients and with a larger number of tablets. Those aged 14 years plus and weighing 34kg and above, have a dosing pattern involving four tablets after every eight to 12 hours for three days, giving a total of 24 tablets. Table 1 represents the recommended AL dose schedule for all ages:

Table 1: Dosing schedule for artemether-lumefantrine (AL)

No. of tablets recommended at approximate timing (hours) of dosing (each tablet contains 20mg A and 120mg L)

Body weight	0hr	8hrs	24hrs	36hrs	48hrs	60hrs
5–14kg (<3y)	1	1	1	1	1	1
15–24kg (4–8 y)	2	2	2	2	2	2
25–34kg (9–14 y)	3	3	3	3	3	3
>34 kg (>14 y)	4	4	4	4	4	4

The regimen may be simplified as follows: The second dose on the first day should be given anytime between 8 and 12 h after the first dose. Dosage on the second and third days is twice a day (morning and evening).

(Source: MOH, 2006)

The training manual indicated that training for policy implementation was undertaken through a three-tier system cascading down from the national level to the provinces and districts. It involved 405 Training of Trainers (TOTs) nationwide (Figure 3). Two national level trainings were conducted for provincial medical officers (PMOs), representatives from major private hospitals, representatives from NGOs and religious groups as well as professional bodies (Amin et al., 2007). Provincial training in June 2006 involved members of the DHMTs and senior district health staff. District training took place two months later and included primary health facility staff (nurses, public health officers, clinical officers, lab technicians and pharmacists). The minutes of DHMT meetings, available at the study district, stated that the training for health workers involved a three-day workshop for approximately 30 participants per training

course and was facilitated by the DHMT. The training did not include clinical practice- guidelines developed to help health care professionals and patients make decisions about screening, prevention, or treatment of a specific health condition. The training targeted 60% of key health workers and was meant to be completed before roll-out of AL (Amin et al., 2007). It is not clear how or whether the 60% target was accomplished. Interviews with the DHMT revealed that delays in disbursement of funds from GFATM meant that AL was distributed before some health personnel were trained. Altogether, about 9000 health workers from government, mission and NGO health facilities were targeted for training countrywide, but this objective was most likely not achieved due to delays in disbursement of funds from donors (MOH-Kenya, 2006). It was not immediately clear how many health workers were actually trained.

The training manuals were silent over what was expected of the health workers/managers in terms of directly linking with the larger community in order to pass relevant information about the policy change. As stated by a member of the DHMT: *“...nothing happened from the district headquarters to educate the community about the switch from SP to AL, specifically because there were no resources allocated for the same purpose....”* The training itself, had conflicting messages: first, health workers were required to confirm parasitic diagnosis before prescribing AL even though many primary facilities did not receive any diagnostic test kits. With this contradiction, some of the health workers interviewed reported that they did not know what to do with AL. This influenced some of them to continue administering SP and AQ. All DHMT members confirmed in separate interviews that many primary health facilities in the district waited for the diagnostic kits in vain. The

minutes indicated that some health workers were confused whether or not AQ was still in use.

The IEC materials employed to effect the change from SP to AL involved multi-media approaches using various languages: English, Kiswahili and vernacular languages. The strategy included 10 spots for the print-media, 481 television spots, 3064 for vernacular radio stations, community road shows, 0.1million posters and 0.5million brochures. The campaign lasted three months ending in the last quarter of 2006 and targeted 60% of primary care-givers (Amin et al., 2007). Most of the primary caregivers are usually women. The IEC materials were developed in April 2006 but it was not clear when they were implemented though the implementation ended in last quarter of 2006.

4.3 Overall outcome of the policy communication strategy

4.3.1 Knowledge of the policy change

The interviews and discussions at the community level revealed that although there was a general awareness of AL as drug found at public health facilities, there was minimal knowledge about it as the officially recommended 1st-line treatment for uncomplicated malaria. In all the FGDs and informal interviews conducted at the village level, only two women knew AL by name and recognised it as the current 1st-line treatment for uncomplicated malaria. One of the women was a leader of a trading group and the other was a leader in a local community-based organisation. The same women were the only ones who had accurate knowledge about why malaria drug policies change. Asked how they got health information, they mentioned that they had post-primary education and could read well. They also interacted with people who had

better education than theirs and had access to information by virtue of their residence close to a semi-urban centre. One of them said: *“By virtue of literacy, I can listen to the radio or read posters and know exactly what is going on in the health front. We also read newspapers.”*

Among the key informants, only four women and two men had accurate information about drug changes and AL, symbolising the minimal impact of the policy change communication strategy. A statement from a narrative given by a female patient best exemplifies the failure in policy communication: *“I have no information concerning any new drugs for malaria and I am not aware of any changes in drugs but if indeed there are changes in drugs then the new drugs are not yet around here.”* This patient had AL tablets issued by the dispensary and she did not know what drugs they were or what they treated. On how the drugs had changed, the responses were varied in all the interviews and FGDs. Some participants mentioned that drugs have changed from CQ to AQ while others believed that drugs changed from CQ to SP or some popular painkillers like *maramoja* and *panadol*. The actual changes in 1st-line treatment for uncomplicated malaria occurred from CQ to SP to AL.

Finally, a few respondents suggested that the policy changes were specific to health needs of particular groups. In one FGD, individuals supportive of this view felt that the changes in drug policies did not affect the whole country or everyone in a locality since only those who could not find appropriate drugs from the shops were affected by subsequent drug changes. A female participant said: *“It [policy change] is not for everyone. People who cannot be cured by the drugs we know are the ones affected by the change. So we will continue with the drugs we have known all along until they*

cannot cure us anymore.” A similar view was also expressed by three key informant interviews in two neighbouring villages as well as in one FGD with men.

4.3.2 Perceptions about why drug change

There were varied views from the study participants on why malaria drugs often change. The most widely shared view coming from virtually every interview and discussion across the district including health workers and managers was that the policy changes are motivated by profit. Although misplaced, participants from all the villages pointed out that the government allows one company after another to make money through the change of policies. A middle-aged man in one FGD gave the following response: *“I think CQ is no longer available because the company associated with it had made a lot of money so the government thought it was time to give another company chance to make money. That explains why we have a different kind of drugs for malaria.”* This view was apparent in all FGDs for both women and men as well as in 17 out of 20 key informant interviews in the villages. Two out of the three DHMT members, and four out of six primary health facility workers also shared a similar view. Apart from health workers and managers, most study participants also singled out supportive treatment with antipyretics as serving no purpose other than enhancing profitability of companies supplying the drugs. One of the mothers had this to say: *“We only take what we feel is right with the illness, not all the other drugs that we are given so that someone somewhere can make money.”*

Eight FGDs and seven informal interviews also revealed that participants believed that the policy changes were necessitated by the desire of the government to test the effectiveness of new drugs. This was a particular view expressed in FGDs and more

remote villages, and much less strongly among key informants at the community level and in less remote villages. This may indicate some social differentiation between key informants and peri-urban dwellers on the one hand, and more remote inhabitants.

Discussions about policy changes being driven by profit motives also included the concern that facilities charged fees for malaria treatment rather than providing it free of charge. Study participants viewed the contradiction between the government policy on free malaria treatment and the informal or under-the-counter charges as an attempt by the government to sell its own drugs. A community leader commented thus: *“When a government advertises its own drugs to poor people like us and says they are free when they are not, it shows you that there is something wrong with it. Can anything good come from such a government?”* This was a view expressed especially in more remote villages, which included the majority of participants in 11 FGDs and a few in-depth interviews and one informal interview.

Asked about whose responsibility it was to change drug policies, all in-depth interviews and the majority of the participants in all FGD and informal interviews acknowledged that the government is responsible for changing policies on malaria drugs. At the same time, most FGD participants were of the view that the policy changes have not contributed to better treatment for malaria. In 12 FGDs and nine informal interviews, therefore, most participants saw the policy changes as an indication of bad practice by the government. One female participant reasoned thus: *“The change of drugs is very bad because when we are already used to one type of drug then one day we are given a new one whose name we do not know. This makes treatment difficult because we do not know which drug to use anymore....”*

Finally, very few middle-aged men in one FGD thought that drugs alternate across seasons. They stated that they were waiting for the return of the CQ season: *“We do not know that drugs have changed, but we know there are seasons for malaria drugs and it is now the season for malara-tab (AQ) and others. When the CQ season returns, we will have no problems over which drug to use in malaria treatment.”*

4.3.3 Perceptions about AL vis-à-vis other drugs

Community respondents' views about AL in comparison to other antimalarials revolved around two sets of issues: the safety of AL and its effectiveness. Concerns about AL's safety were identified from 14 in-depth interviews in four villages, nine FGDs and seven informal interviews. More men than women maintained that AL was harmful. Older individuals in their 50s and 60s were also concerned about the dangers posed by the change of drugs to AL. To emphasise their point, a male key informant said: *“.... When taking the new drugs, we ask ourselves many questions: ‘where are they from and why cannot we be given the ones that we know? What harm can they cause to us?’ This makes us afraid.... We use the drugs but inwardly we ask ourselves why they are different drugs from the ones we used before and whether they are good at treating malaria...”* There were no differences in opinion between villages in the peri-urban and more remote areas about AL as a harmful drug. Others saw AL as harmful because it was not recommended for expectant women [malaria treatment guidelines in Kenya require treatment of expectant women with SP (MOH-Kenya, 2006)]. A young male participant said: *“Recently, I asked my wife why she was given fewer drugs than those given to everyone who goes to the dispensary and she told me that the other drug [AL] cannot be given to pregnant women. That confirms the new drug is harmful.”*

In terms of the effectiveness of AL, only 6 out of the 20 key informant interviews at the community level thought that AL was better than its predecessor, SP. Some viewed AL as a strong drug that was effective in treating strong malaria. A young woman in an FGD said: *“We visit dispensaries when we have strong malaria that cannot be treated with drugs from the shops.”* Those who held that AL was weak considered it as effective only in treating weak malaria. Strong malaria, according to the respondents, presents with vomiting, shivering and loss of appetite, and the patient cannot work at all. Weak malaria on the other hand, presents mild headache, weak joints but the patient is able to go about their businesses.

Three more specific issues were raised by the community in the discussion of AL’s effectiveness: the number of tablets, recommendations for its use, and the fact that it was only one type of antimalarial issued at the dispensary.

First, the fact that an AL dosage involves many tablets (24 for adults) was interpreted by some community members as a sign of its weakness. This was captured in the following statement from an FGD with a group of women: *“We heard that the malaria drugs that we keep using are not good any more... but the new one is not good either, because there are 24 tablets to complete a dose instead of just a few. Why are the tablets so many if it is a good drug?”* In another FGD, a question was posed to men regarding whether SP, which had only three tablets, was better than CQ with ten tablets. One of the responses, which captured the mood in the discussion, was as follows: *“For us CQ was the best drug for malaria and we are yet to be told why it is no longer available.”*

Second, two sets of recommendations were misunderstood by the community and so could have affected utilization of AL. Although made for sound scientific reasons, the recommendation that patients should take the initial dose of AL at the health facilities under the supervision of health workers and that the drug should be taken with (fatty food) was not clearly communicated to patients. As such, AL was often considered as less useful than CO by members of the community. A key informant gave the following statement: *“If this new drug is good then why are we being forced to take it at the dispensary? Why should a drug be imposed on us if we do not want it? Why can’t we be given the ones that we want... (CQ)?”* In two FGDs, a minority of both male and female participants observed that AL can only alleviate symptoms of malaria or temporarily cure the disease. One male participant in an FGD said: *“If malaria infection occurs two months after taking these many drugs, I cannot go back to the dispensary to be given the same drugs... instead I use herbs as an alternative.”* A female FGD participant, in support of this view, said the following: *“....at one time I suffered from malaria and got many drugs from the dispensary. Before one month had passed I had a similar problem and when I went back to the dispensary I was given the same drugs...the very drugs that failed to treat me....”* In summary, one young woman said of what some of them do with AL tablets: *“...we simply take them [drugs] home and keep them... then we try another dispensary... and if it is the same drugs, some of us go to the private clinic for injections....”* The requirement that AL should be taken with food also had cost implications for households. For poor households, this could mean delay in commencing treatment even when drugs are already available. A woman in an informal interview said: *“Only last week my son had malaria and when he came back from the dispensary he refused to take drugs*

because he was told by the health worker not to, unless he has eaten. It forced me to ask my neighbour for some mangoes so that he could start taking drugs.”

Third, some study participants were concerned that AL was ineffective because it was the only antimalarial consistently issued at the dispensary to malaria patients when there were different types of malaria that required different types of drugs. A female FGD participant said: “...one type of drug cannot be used to treat everyone because people could be suffering from different types of malaria. I suggest that each type of malaria should have its own drug....” According to most respondents, the shops therefore, offered a better alternative than the dispensary because of the repertoire of malaria drugs available. A man participating in an informal interview said: “...the shops are better because there are a variety of drugs for different types of malaria.” Not everyone agreed that drugs from the shops are better than the dispensary’s; instead the drugs were recognised as ineffective by some participants. A female key informant stated: “At the shops one can spend all the money one has on drugs that do not work. It is drugs like.... which should be replaced because they do not work.”

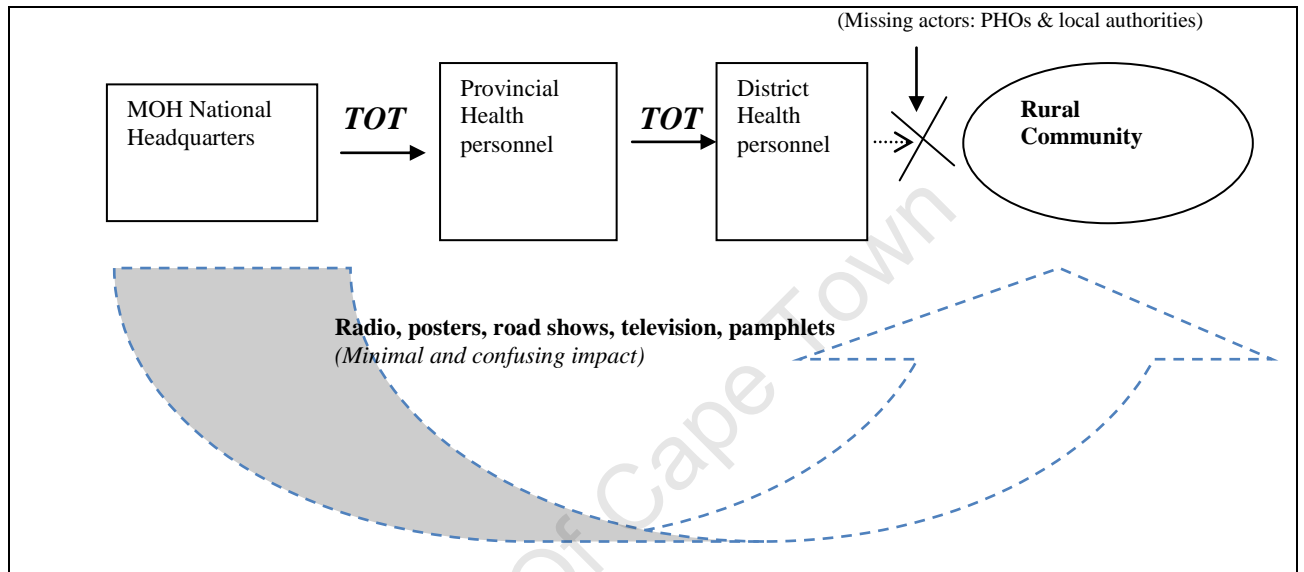
4.4 Factors influencing community perceptions about the policy changes

4.4.1 Choice of communication channels and failure to involve some key actors

Apart from the IEC strategy involving print and electronic media, no other means of communication was used by the health ministry to pass information about the policy change to the population. There was also no assessment to ascertain the effectiveness of the IEC strategies. In essence, the communication approach used by the ministry directly passed information from the national headquarters to the villages using

various media, especially the radio for those in rural areas. There was generally a weak link between the policy implementers and the beneficiaries because, according to the district health managers, the public health officers and local authorities were not involved in the policy communication (Figure 3).

Figure 3: AL policy communication from the national headquarters to the community



The reliance on the media alone to pass health information was not enough because the channels used were not entirely accessible to many in the community. From the in-depth interviews and FGDs, the main sources of health information for the community at the time of the study included radio, health workers and socio-economic networks like farming groups. Others were shopkeepers and posters (Figure 4). The preferred sources of health information that were mentioned randomly in FGDs and in-depth interviews included public health officers (PHOs), local authorities, teachers and the radio (Figure 5).

All study participants at the community level were asked to specify who, between men and women, were likely to have better access to each of the information sources

identified. There were general agreements in the following: men would benefit more from information passed through radios, posters outside health facility settings, and shopkeepers. Said one male participant: *“Most of our women here cannot read or write and the best way to give them health information is through our local leaders.”* As a result of illiteracy, also confirmed by a health worker, health information posted on health facilities made no sense for many women as stated by one of the female participants: *“...all we see are graphics and pictures and sometimes we think they are decoration in the dispensary.”* Women were mentioned by study participants to have better access to health information if such information is passed through local socio-economic groups and health workers. To confirm this point, one woman in an FGD said: *“We have no radios and quite often our only sources of information are either the health workers or colleagues in women groups.”* The radio was seen as unsuitable for women who were the primary target audience for the policy change. Most women listened to radios at the convenience of their husbands. This was reflected in the following quote from a male FGD participant: *“When I am away, I keep the radio off to preserve batteries ... and I alone can switch it on....”*

In all FGDs and interviews, there was emphasis on interpersonal communication, and this was expressed in the following statement by one young male participant said: *“We are yet to see someone coming to us to tell us that ‘the name of the best malaria drug is (this), and here it is’. Until that happens, we will continue suffering from malaria.”* A key informant added the following statement: *“...if we have the assurance from an ‘expert’ that the dispensary drug [AL] is the best in curing malaria then we would not mind about the number of tablets.”* The PHOs were particularly singled out as the best means of passing health information to the

community. The success of PHOs and local leaders in passing health information was reflected in HIV/AIDS campaigns that were largely driven by three actors: public health officers, local authorities and head teachers. The results were impressive as reported in the FGDs. Study participants expressed good knowledge on the causes of HIV/AIDS, transmission mechanisms and prevention methods. They also understood the need for an early diagnosis and knew where to get help in case one turned out positive. These actors who lead in HIV/AIDS campaigns were never involved in the malaria policy communication.

The shopkeeper, as a source of health information, was said by study participants to favour men. Men tended to seek treatment from the informal sector while women seemed to prefer the formal sector. In all the health facilities visited, there was a much larger presence of women than men. In one of the facilities there was only one adult man and several women. Focus group discussions showed that men often use informal sector drugs and herbs. Female participants added another dimension to the discussions: that men controlled most resources in the household and often decided what type of treatment is sought and where. A young woman said: *“Sometimes I may fall sick and I feel that the right place to seek treatment is the dispensary but since I am not the one with money, I have to buy local drugs as my husband demands.”*

Figure 4: Current health information sources identified by the community

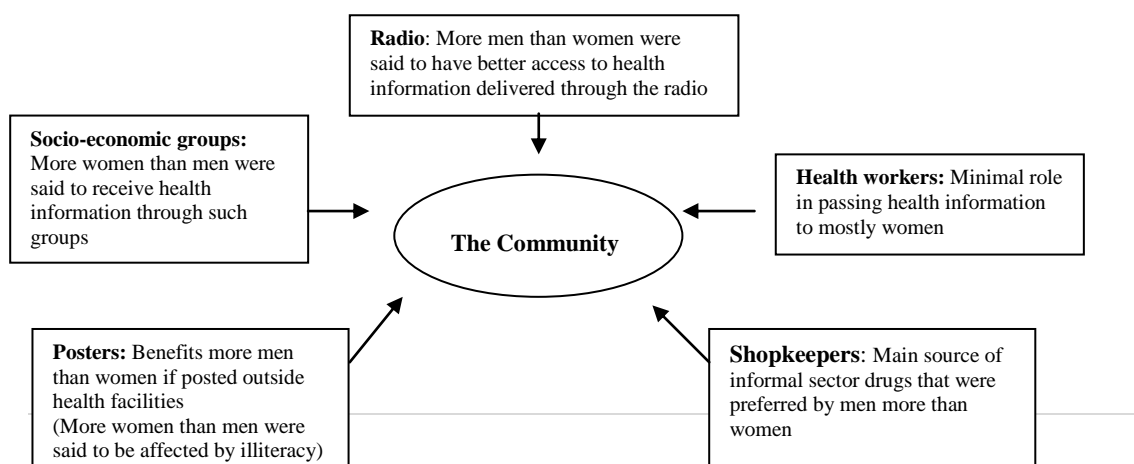
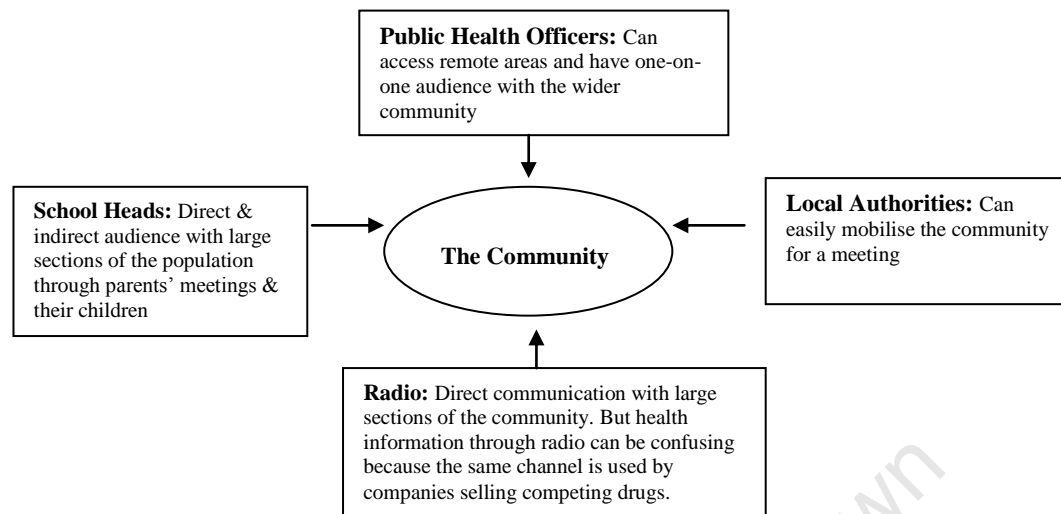


Figure 5: The community's preferred channels of health communication



4.4.2 The role of the DHMT

The district health managers said that their expectation overall, was to ensure the success of policy implementation and, more specifically, to train all key primary health workers within the district concerning the policy change. The new treatment guidelines outlined that all health workers involved in drug dispensing, as well as public health officers, were to be trained during the policy shift. However, only in-charges of primary health facilities in the district were trained. Interviews with in-charges in six primary health facilities revealed that not all of them were trained. The main reason given by the DHMT for scaling down training to include only in-charges was that the budget from the line-ministry catered for a three-day training workshop for about 30 participants. Asked why some in-charges remained untrained, the health managers explained that a few cases might have been out of station during the training. This was confirmed by one of the in-charges who missed the training because he was on leave.

In trying to perform their roles, the DHMT members cited the challenge of a lack of support from the national headquarters to accomplish their objectives. Apart from being forced by circumstances to scale down training, there were also no resources allocated for the DHMT to organise community outreach programmes to inform the public about the policy change to AL, for example. One member made the following remark: *“The launch of AL was done through the media and many health workers also got information about the change from the media...”* The health managers reckoned that a better response to AL could have been ensured if the public was properly mobilised and prepared for the change of drugs. This, they argued, could have been achieved through the involvement of public health officers, all key health workers at primary health facilities and the local authorities. The involvement of these groups was necessary because they were the closest to the community and would have easily passed information about the change of drugs.

According to a DHMT member, poor or no training for health workers could explain why health workers ignored malaria treatment guidelines. One DHMT member gave the example of guidelines for administering a loading dose for quinine. Health workers only got the information about the loading dose from the ministry headquarters on notice-boards and were not conversant with the instructions. Those who were unclear about expectations of the *loading* dose were told by the health ministry headquarters through their superiors to use the methods that they were familiar with. As a member of the DHMT put it, *“...the casual handling of important information could have affected the move from SP to AL in that health workers, who were not trained during the switch from SP to AL, continue to do what they think is best.”* This partly explained why some health workers continued to administer drugs

like SP and AQ that were no longer recommended. [A loading dose, in *Wikipedia 2007* refers to an initial higher dose of a drug that may be given at the beginning of a course of treatment before dropping down to a lower maintenance dose].

4.4.3 Health provider roles, behaviour and practices during the policy change

Primary health workers influenced the outcome of the policy in various ways: they were unclear about their roles in the policy change, had poor communication with patients and were accused of corruption by the community. They also dispensed inappropriate drugs and delegated duties to unqualified support staff.

All six health workers interviewed were unclear about what was expected of them during the policy change. Apart from attending the training, the health workers believed that they did not have other roles to play in the policy change process. Although they were intended to train their junior staff such as nursing assistants, only one reported fulfilling this role and the training reportedly lasted just ten minutes. Asked if they made an effort to pass messages to their patients about the policy change, one gave the following response: “...*We do not have enough time to treat and engage several patients in lengthy conversations let alone the larger community....*” Asked if they usually advised their patients on such issues as adherence, one health worker had this to say: “*My work is about giving treatment not issues of adherence. Besides I have never considered it important to engage the community on such issues as change of drugs, but now I see the point.*” The lack of dialogue between health workers and patients was also manifested in the fact that some patients left facilities not knowing which of the drugs they had were anti-malarials. A young mother stated: “*The problem is that we have several types of drugs from the dispensary but health*

workers are not clear about what each of them treats.” The lack of communication was most likely responsible for some patients referring to AL as paracetamols (Narrative in Box 1). Asked what they thought of the treatment they had received, one patient affirmed that she would not take the tablets, and two others said that they would not finish the dose. This explains how lack of dialogue between providers and patients could have contributed to poor uptake of AL.

Box 1: Narrative of Patient A (Female)

I had a very bad headache so I bought panadol (paracetamols) from the shop. The third day of using these drugs saw my headache worsen and I bought more panadol but the headache did not go away. Then I decided to go the hospital at Kinango because I realised I was going to use a lot of money without getting better. At the hospital, I explained to the health worker my condition then he wrote a note and instructed me to take it to the pharmacist. I have no formal education so I could not understand what was on the note. When I reached the pharmacist, I was given the same panadol that I had bought from the shops. The only difference was that those from the dispensary were packed in fours. Then I remembered what I heard from friends that malaria drugs had been changed and there are better drugs at the dispensary. I never asked for the better drugs but accepted the panadols all the same. I took four tablets each time and when I finished them I was still sick. So I just waited to see what else I could do. After about a week, I had recovered though not fully.... But that was only temporary because I am here with the same problem about 3 weeks later. If it takes a week before I recover then I know what to do: I will neither buy drugs from the shops nor come to the dispensary for treatment because I believe the drugs do not do well with my body....

Furthermore, there were indications that some patients who tried to open dialogue with health workers were treated rudely. One young woman said: *“I wanted to know why I was given [malaria] drugs different from the ones I have known all along but the nurse asked me whether I had come to the dispensary to be treated or to know what drugs I am taking....”* There were some efforts to educate patients in two out of the six facilities visited, but education days were not regular because, as clarified by a health worker, they depended on the number of patients who reported for treatment early in the morning. When a large number of patients presented early in the morning, health workers considered it an opportunity to impart some health knowledge before

commencing treatment. However, some patients interviewed at the facilities claimed that the topics addressed were mostly irrelevant to their health needs because they were tailored to suit expectant and nursing mothers. This was confirmed by a health worker who explained that: *“Most of the topics addressed are mainly preventive and more relevant to expectant and nursing mothers than other patients.”* But there were also other patients who benefitted from the education programmes as stated by one young woman: *“Sometimes health workers teach us about illness and what drugs are available to treat them. We find this very important since the information comes to us without us asking for it....”*

One of the issues raised with concern by study participants in the villages was that of informal and under-the-counter charges in primary health facilities. Interviews with community members and patients at health facilities raised issues bordering on conflict of interest and corruption. Some health workers were alleged to engage in private business within public health facilities. A young man said: *“Yes, the health worker will show you two types of drugs.... He would say, ‘These drugs belong to the government, and these other ones are mine. Mine are the best because they are stronger; so you choose which ones you want.’ His drugs are better but more expensive....”* A young woman in one of the FGDs added that: *“The health worker makes a lot of money during weekends because he refers all sick people to visit him at his house for treatment and he charges a lot of money.”* The rest of the FGD supported her statement. Interviewees and FGD participants in four of the six villages also claimed that patients who lacked money to pay for the informal charges were given incomplete doses. This was done to ensure that the patient did not default payment because they had to return with more money for the remainder of the dose,

but this did not always happen. To emphasise this point, one male FGD participant remarked: *“If the health worker gives us part of the dose because we do not have enough money and asks us to return for the other half when we have got money, can anyone go back to the dispensary to pay for the remaining dose when one already feels ok with the first dose?”*

Other health worker practices that might hinder uptake of AL were related to the use of SP, a drug that two of the health workers considered as still effective. One primary health worker said the following in relation to SP: *“SP is one of the best malaria drugs I have ever come across- fast acting and very easy regime, and sometimes we have to wonder why the replacement occurred too soon.”* Asked why they continue dispensing SP despite the change to AL, health workers cited shortage of AL, so they administered SP to stop patients from using drugs from the shops. A health worker had this to say: *“We cannot leave the patient untreated because if we do, they will use painkillers or ineffective anti-malarials from the local shops and that will eventually lead to severe malaria....”* The suggestion that SP and AQ are effective could mean that the health workers received poor training during the switch to AL, given the widespread knowledge that both are now ineffective. This was substantiated by the fact that even after the training, some health workers were still in doubt about what exactly they should tell patients regarding the correct dose schedule for AL. One health worker expressed her doubts in the following statement: *“...we simply tell them to take drugs everyday at 9am and at 9pm. I do not know if we are doing the right thing....”* Other reasons mentioned by health workers for administering SP included their perception that some patients are too poor to buy AL from private pharmacies when the dispensary runs out of the drug and that some patients prefer SP or AQ.

There was also a rush by health workers to get rid of AL stocks that were supplied when close to the expiry dates. In order to avoid wastage occasioned by expiry, some health workers issued AL to cases that should have been treated with non-antimalarials. A health manager commented: *“Often AL supplied to health facilities have short shelf-life and the health workers struggle to give them out in the shortest time possible to beat the expiry date. This has led to their haphazard use including being given to patients who should be treated with antibiotics or painkillers....”* The administration of this drug unnecessarily may have led to complaints of ‘overtreatment’ by the community. Overtreatment, to the community, meant that patients were being given unnecessary drugs and some of them said they never finished their doses.

At least two health workers delegated part or all their duties to Community Health Workers (CHW), who were also expected to advise patients on drug dosages. The CHWs were neither trained on the new malaria treatment guidelines nor had any formal medical training. These attributes could make critical health information about adherence and the need to change policies unavailable to patients.

4.4.4 Inaccurate information and resistance from the community

A clear and widespread finding, which could have had an effect in the uptake of AL, was the confusion created by the different advertisements about different drugs over the radio. This led to poor knowledge about drug changes in general and AL in particular. This was expressed by a young man in the following statement: *“...the dispensary gave my wife what it said were the newest malaria drugs but the shopkeeper also has the latest drugs different from the dispensary’s...this is*

confusing.” Whereas there is limited information about the recommended anti-malarial, the expectation among community members was that the ‘latest’ drug should be the same at the shops and at the dispensary. Confusion arose on the realisation that the ‘latest’ malaria drugs from the dispensary are different from the ‘latest’ in the shops.

The study participants also expressed dissatisfaction with presumptive treatment, which they claimed, was of poor quality. For example, in an FGD, a young mother said, “...*he [health worker] just looks at the baby and prescribes treatment. How does he know what anyone is suffering from without tests?*” Others in at least six FGDs claimed that they avoided the dispensary and instead delayed treatment to travel to the hospital where they were assured of the tests. The majority of study participants also said that they would adhere to their medication if they were tested and told exactly what they were suffering from. With presumptive treatment, study participants feared that they were not being given the right medication for their illnesses.

Community culture also played a role in the evident poor reception to AL. Culture was manifest in the use of traditional methods of cure as well as in the use of familiar drugs. In the study area, the use of herbs to treat malaria or any other illness is a well-established cultural practice that a policy change per se may not change. A middle-aged man reported that: “*This [herbs] was the medicine of our grandparents and fathers, it served them well, so I do not see why we should not use it to treat malaria. Even ‘experts’ are using these herbs these days...*” Men, as custodians of the community culture, showed more preference for the use of herbs than women. Most men attributed their recovery from malaria to the use of herbs while women tended to

give more credence to conventional medicine. Nevertheless, a section of women also observed that herbs could enhance quick recovery when used alongside dispensary drugs. A young mother said: *“Often we go to the dispensary but when we come home we feel like something is missing... that treatment is incomplete unless we use herbs alongside dispensary medicine....We cannot explain it.”* Part of the reason why this happens is the belief in witchcraft as a cause of illness that is often treated with rituals involving herbs. But most women in the FGDs admitted that herbs often fail to treat malaria and that they used herbs only when there was no money or when the facility was closed. Herbs were also a cost-saving strategy: *“We do not like to use the herbs but sometimes we have no alternative other than get herbs to treat adults and older children just in case they work and money that could have been spent in drugs is used to buy food for all household members.”*

Herbs alone were not the only aspect of community culture that could have limited take-up of the new policy. There were also drugs such as CQ and SP that had been domesticated and seemingly curtailed use of AL, as explained by one man in an FGD: *“...I prefer the older drugs. I do not like the new drug because of many tablets and the fact that patients who use it never recover. ...I think there should be a warning on the [AL] package that it may not cure malaria the same way it is done to warn smokers against cigarette consumption.”* Domestication of a drug means full acceptance of a drug that forms part of a community’s material and treatment culture.

4.4.5 Successful drug advertisements from the private sector

Interview and FGD data appeared to show a positive relationship between the level of knowledge about a drug and the length of time it was advertised or stayed in the market. For example, the high level of knowledge about CQ was most likely the result

of its long stay in the market for over four decades. Drugs such as *panadol* and *maramoja* were also better known because they have had sustained advertisement over a long time. Moreover, private drug companies advertised their products through the same communication channels used by AL adverts. This added to the confusion in the community over which drug to use because the advertisements for competing drugs stretched much longer and over-shadowed communication about AL.

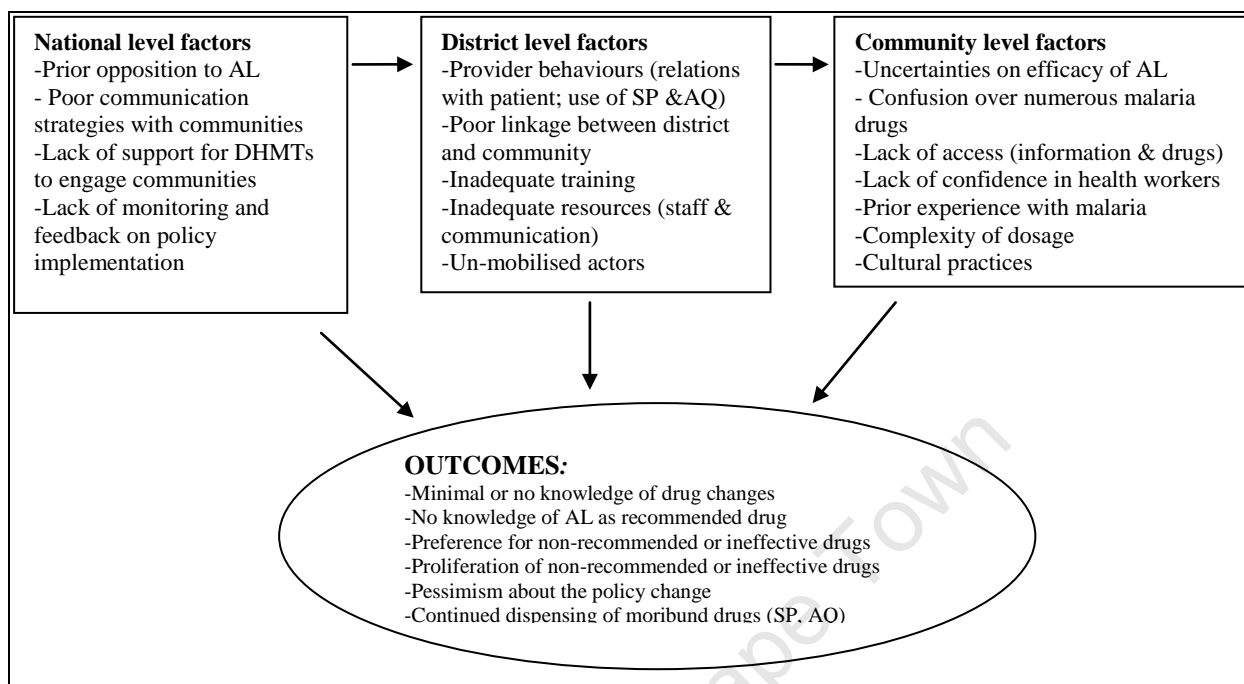
The other problem identified from study participants was that the manner in which companies advertised their drugs did not consider the literacy skills and culture of the population. Words, which had several meanings for the community, were not clarified in the advertisements. This left community members guessing what the messages meant in terms of treatment for malaria. For example, the Swahili word ‘homa’ refers to different types of ailments among members of the community under study. There are ‘*homa ya malaria*’ (malaria infection), ‘*homa ya mafua*’ (colds and flu) and ‘*homa ya tumbo*’ (abdominal discomfort). But the messages passed during advertisements about medicine for *homa* left the public uninformed about which ‘homa’ was being identified. In the end, a drug which should be used for alleviating symptoms from colds or flu, was also used in treating malaria. Following the confusion, a health worker had this to say: *“In this community, the word ‘homa’ means different illnesses including common cold, stomach upset and malaria. Unless these are clarified in the advertisement for drugs, the locals will continue using painkillers in treating malaria....”*

4.4.6 Summary

The change of malaria treatment policy from SP to AL in Kenya was protracted and difficult. This was mainly because powerful internal and external players/actors with

vested interests either distrusted the government on the policy change to AL or feared that the replacement of SP would deny them business opportunities. After the policy change was given a go-ahead by the government, difficulties were then experienced during implementation because beneficiaries were not adequately mobilised and informed about the change of malaria treatment policy. The DHMT lacked resources with which to pass information about the policy change to the entire district. Health managers and providers, as implementers of the new treatment policy, also had misgivings about the change to AL partly because they had limited knowledge about the choice of AL over other ACTs or were likely influenced by the PSK. Part of the problem for the poor outcomes in the policy change was the failure of the communication strategy to involve multiple channels, in addition to the media. Secondly, actors like PHOs and local authorities who could have been crucial to the policy change were uninvolved. Health workers also did not fully play their roles as expected in explaining to patients about the drug change from SP to AL and advising them to change to AL and the need for adherence. Besides, some of the health workers continued dispensing SP, which added to the confusion of the public regarding the drugs in use. The confusion also came because of competing advertisements from private drug companies. Figure 7 summarises the key weaknesses of policy communication during the change of treatment policy from SP to AL identified during this study.

Figure 7: Factors highlighting problems in policy communication in changing 1st-line treatment for uncomplicated malaria



5. CHAPTER FIVE: DISCUSSION AND RECOMMENDATIONS

5.1 Introduction

This chapter reflects on the findings presented in chapter four and compares them with wider literature on policy and communication in terms of the following: impact of communication strategies, treatment seeking behavior, perception about health interventions, access to health information, role of health workers in policy implementation and community relations with the government. The chapter ends by giving recommendations about best approaches in implementing policy changes in 1st-line treatment for uncomplicated malaria.

5.2 Discussion of implementation experiences

The discussion in this section is categorised into sub-headings reflecting major areas of finding in this study.

a. Communication strategies

The communication strategies adopted during the policy change to AL were meant to accomplish two objectives. The first was to educate the public about the need to change from using SP and other ineffective antimalarials to accept the use of AL. Secondly, to help dispel any misconceptions about AL. However, the findings suggest that these objectives were largely unmet owing to inherent weaknesses in the design and implementation of the strategies used. There was substantial failure in the health worker training, yet changing treatment seeking behaviour, including encouraging the use of new drugs, requires strong communication strategies (Hausmann-Muela et al.,

2003, Lettenmaier, 2003). Effective communication would have created awareness about AL and its benefits as well as inspiring confidence of patients in health workers and facilitating take-up of the drug. In contrast, inadequate policy communication can be a barrier to successful policy implementation as suggested by the findings. A recent study in Uganda about the use of drugs and perceived efficacy also observed that use of drugs is driven by the amount of information coming to policy beneficiaries over a period of time (Rutebemberwa et al., 2009). The delivery of health information should involve multiple methods (Eriksen et al., 2005) because reliance on a single tool to engage the public over a short duration did not seem to achieve the desired results in Kenya. These need to be supported by prolonged public engagement during health policy changes as people may slowly pick up new health interventions because of the existence of a grace period of information processing (Alaii et al., 2003b).

The central role of the community to the success of new drug policies has been emphasised by a number of authors (Williams et al., 1999, Hausmann-Muela et al., 2003, Muga and Jenkins, 2008). However, the poor engagement with the community during the policy change, as demonstrated in the findings, suggest that the change to AL was substantially driven by drug efficacy considerations. Although the community expressed discomfort with AL and the changes in malaria drugs generally, it would be premature to conclude that there was an aversion to the use of AL as an anti-malarial. On the contrary, there were indications from interview and FGD data that uptake of AL would improve if there were concerted efforts to inform the public about the drug with the hope that adequate and accurate information would increase demand. But it is

not always true that demand for an intervention always transforms into its utilisation (Alaii et al., 2003a)

b. Perceptions about AL

The findings suggest that user perceptions create the difference between demand and utilisation of an intervention, as positive perceptions encourage uptake and use of an intervention and vice-versa. The noted perceptions about AL were partly driven by the fear that when one got infected with ‘strong’ malaria as a result of using ‘strong’ drugs against ‘weak’ malaria, then one might not get cured. The categorisation of new drugs as either weak or strong by the community bears some similarities as well as slight differences with findings from other settings. The study community labelled AL as either weak or strong depending on how it was taken, who took it or who did not, and the number of tablets. In Tanzania, SP was considered as strong based on its side effects and the fewer number of tablets (Nsimba, 2006a). In Uganda, people had misconceptions about SP during its inception (Mbonye et al., 2006b). Similarly, in a study about community reactions to ITNs, people were reluctant to use ITNs because they feared that the chemicals in ITNs would affect their fertility (Alaii et al., 2003b). Generally, any negative views can lead to a community’s reluctance to accept new health policies while positive views, as reported in west Africa about immunisation, can facilitate uptake of new policies (Leach and Fairhead, 2008).

c. Culture and uptake of AL

The study community’s reluctance to adapt to new health interventions was influenced by factors beyond poor provision of information and local perceptions, and, specifically, by culturally entrenched treatment seeking behaviour. People tend to

get used to drugs about which they have had information for a long time (Rutebemberwa et al., 2009). The feeling was that people in the study district were reluctant to move away from the use of familiar drugs with which they felt 'safe', especially in a context where there was scarcity of information to help in the transition from older acculturated drugs to new ones. Wider experiences indicate that treatment behaviours are difficult to change (Mwenesi et al., 1995, Kreuter and McClure, 2004, Rutebemberwa et al., 2009), which partly explains why there was a lot of information from study participants throughout the study district about CQ being the best drug for malaria. The drug, which lasted many years as the 1st-line treatment for uncomplicated malaria in most of the Sub-Saharan Africa, had to be withdrawn from the market to stop its consumption long after it developed parasite resistance.

There were also wider cultural influences in the uptake of AL in the study site. The cultural and resource dominance of men ensured their decisions regarding when, where and how malaria was treated. Their preference for informal sector drugs was negated by women's preference for the formal health sector. The majority at formal health facilities are usually women, a factor attributable to higher disease rates among women and children, and women's preference for formal sector treatment (McCombie, 1996). Thus getting effective treatment to the community went beyond availability of resources within a household to include who, between a husband and wife, controlled resources.

The dominant belief in witchcraft among the Duruma people (MOH-Kenya, 2006) was a cultural dimension that could have influenced poor reception to AL. The belief in witchcraft makes the Mijikenda to keep *finjo*, a kind of medicine kept by qualified

medicine-men to ward off potential harm to a household (MOH-Kenya, 2001). Many of the study participants reported using herbs alongside modern drugs from the dispensary to treat illnesses. The use of both conventional and traditional methods of treatment indicates the uncertainty that many members of the community have over the exact cause of illness. Illness, in the community understanding, may be caused by pathogens or by witchcraft, but both often have similar symptom presentations. Severe malaria presenting as convulsion, for instance, is often regarded as the result of evil spirits (Hausmann-Muela et al., 2003). Such beliefs were found important in relation to acceptance of new policies in particular and in treatment seeking generally. These cultural influences on treatment seeking and illness outcomes have been documented by a number of authors (Mwenesi et al., 1995, Alaii et al., 2003a, Alaii et al., 2003b, Hausmann-Muela et al., 2003, Kreuter and McClure, 2004) .

d. Treatment seeking from the informal sector

The informal sector in Kenya was observed to offer a large pool of drugs, whose continued use seemed to limit uptake of AL. The influx results from a free market economy. The failure by the government to implement strict regulation in the drug market and develop a phase-out plan for non-recommended antimalarials is also to blame. The convenience of the informal sector fuels widespread self-treatment for malaria, particularly among adults, a tendency that is motivated by the notion that malaria in adults poses limited threat (Mbonye et al., 2006b). Self-treatment also results from lack of confidence in new drugs (McCombie, 2002), a fact that was spotlighted in this study through community attitudes and perceptions about AL. The reported low uptake of AL (Wasunna et al., 2008) means that malaria patients continue to use combinations of mostly ineffective drugs bought from local

shopkeepers. This leads to inappropriate use of pharmaceuticals and raises concerns over cost implications for the buyer, side effects and development of drug resistant parasites (McCombie, 2002, Attaran et al., 2004, Bosman and Mendis, 2007). Besides, patients who fail to recover from using the ineffective drugs often have to meet higher costs for treatment that may be beyond the reach of poor households.

The availability and use of the informal sector drugs also caused confusion to the public, especially whenever new drugs were released into the sector and the shopkeepers made it known to potential buyers of the presence of the 'latest' antimalarial. For lack of accurate information, the study community could not understand the difference between the shopkeeper's 'latest' drug and the 'new' one at the dispensary. This was particularly made difficult by advertisements of the informal sector drugs through the radio in a language that implied that the drugs were effective against malaria. Moreover, AL was not an over-the-counter drug at the time of the study, and could only be accessed through public health facilities. By confining AL to the formal public sector where the minority seek treatment, it was unrealistic for most people to suddenly change treatment seeking from the informal sector to the poorly accessed public sector.

The malaria treatment guidelines indicated that AL was supplied only to public health facilities until 2009, when it was supposed to be released to the formal private sector and finally to the informal sector, as well (MOH-Kenya, 2006). This was expected to be at a reduced cost following a 95% subsidy by the Affordable Medicines Facility-malaria (AMF-m) initiative (Laxminarayan and Gelband, 2009). The strategy was expected to crowd out all other ineffective anti-malarials in the market including

artemisinin monotherapies. The problem at the time of this study was that most people did not know that AL was the officially recommended and most effective 1st-line treatment for uncomplicated malaria. Besides, widespread use of ACT to presumptively treat fevers in the retail sector would create unnecessary drug pressure for resistance in Kenya (Noor et al., 2009, Snow et al., 2009).

e. Access to health information

The main channels (radio and posters) that were used to pass information about the policy change at the community level did not entirely benefit women. Study participants said that most radios were owned by men and some health workers pointed out that men were generally more literate than women in the study district and therefore had better access to posters that were used as an alternative AL communication channel. This symbolised poor investment in IEC that often led to inefficiency in the delivery of care in the primary health services (Mozumder and Marathe, 2007). To achieve good results, health communication should endeavour to meet the preferences of the target group in order to increase access to information (Kreuter and McClure, 2004). The access factors to be considered when passing health information include linguistic and physical access (Eng et al., 1998, Kreuter and McClure, 2004, Claasen-Veldsman and Snyman, 2005) as well as affordability (Emmanuel, undated). Information passed through channels requiring literacy, for instance, generally have little effect on a largely illiterate community. Also, communication through television or mobile telephones when the target audience have no access to such gadgets or cannot afford them is equally ineffective. A better approach to communication about AL should have considered oral and interpersonal

methods, with the former being in recognition of the oral nature of African cultures (Kreuter and McClure, 2004).

g. Health providers

The oral and interpersonal approach to health communication would have been enhanced if health workers engaged their patients in dialogue about the policy change. Information about change of drugs, reasons for the change, the need to adapt to the change as well as the importance of adhering to the dosage, should ideally, have come from health workers. The community regarded health workers as health experts and health information from experts is better received than that from ordinary persons (Kreuter and McClure, 2004). Basic health information was necessary to avoid the scenario where, among other things, the community interpreted policy change as a means of profiteering. Furthermore, failure to explain to patients the need for adherence most likely compounded the problem of patients not completing drug doses because AL presented with a much more complex dosage than SP.

Health outcomes depend a lot on the discussion between a patient and a doctor (Roter and Hall, 1989, Gilson, 2007). Unfortunately, there is ample literature (Inui and Carter, 1985, Roter and Hall, 1989, Roter and Hall, 1991, Moore et al., 2000, Gilson, 2007) to support claims of negative relationships that patients have with health workers. The findings suggested that health workers failed to recognise and utilise their power to pass health knowledge to their patients and the community at large. Such omissions existed despite the fact that positive provider communication behaviours are positively related to patients' perceptions of providers' competence (Moore et al., 2000). The question of power-relations between health workers and

patients, especially in remote settings, were such that the provider expected patients to do as told without questions. The only communications that seemed to exist were top-down instructions given by health workers to patients. Such top-down instructions are akin to an authoritarian relationship between providers and patients, something, which has been attributed to socialisation within similarly authoritarian settings (Gilson, 2007).

Other important aspects of provider behaviour which had a negative impact on the outcomes of policy communication, included administration of SP instead of AL, the perception that SP is effective, delegating work to unqualified staff and informal charges and/or corruption allegations. The continued issuance of SP and AQ at health facilities might have convinced patients that the drugs were still viable for malaria treatment. The two drugs are easily available in local shops and sick people or care-takers probably found it convenient and cost-saving to purchase the drugs at the shops rather than take time to visit a health facility for the same drugs. Health workers also administered SP because of AL stock-outs and because some patients preferred the other antimalarials (Wasunna et al., 2008, Kangwana et al., 2009). Although the perception of health workers regarding the superiority of AL was never in doubt, some of them believed that it had a very complex dosage pattern and imposed a high cost on patients. In the absence of AL, the concern for costs also made health workers to administer SP in the belief that a very poor person would not be able to purchase AL even when prescribed.

Organisation of health care delivery and gaps in the system also contributed to poor uptake of AL. In the first instance, although not directly the problem of providers, the

findings suggested that the provision of presumptive treatment in most primary health facilities in Kenya undermined patient confidence in health workers' ability to offer quality treatment. To avoid such negative patient behaviour, the providers should have explained the reason for presumptive treatment to the patients. A study in Tanzania also showed that patients preferred being tested and that testing inspired confidence in the diagnosis of their illnesses (Mwisongo, 2007). Erosion of confidence in providers' ability to treat also resulted from the delegation to unqualified staff of medical duties. This may not be entirely odd given the severe staff shortages in many rural health facilities in Kenya and the usually large numbers of patients who must be served in just a few hours. Staff shortages can run to about 50% in facilities in rural areas (Adano, 2008, MOH-Kenya, 2009). There were also the strong allegations of corruption against health workers. Although *under-the-counter* charges are a feature in many health facilities in low and middle income countries (McIntyre et al., 2009), they often cast any health intervention effort in a negative light, and so generate strong mistrust of government health care initiatives.

h. Distrust in government initiatives

Mistrust of the introduction of AL was felt nationally when the initiative to move from SP to AL was opposed by the Pharmaceutical Society of Kenya (Amin et al., 2007). The PSK draws some of its membership from medical professionals who, as members of PSK were thought to oppose the change to AL. On the other hand, as members in health care management, they were supposed to ensure successful policy implementation. These conflicting roles could have compromised the policy change. The community also viewed the change from SP with suspicion believing that it was not done with the best interests of the public in mind. Although the suspicions were

unfounded, the wider socio-economic and political context appears to have shaped public attitudes to this government initiative. The study was undertaken during serious famine as observed in the study district and amidst local and international reports of grand corruption in the government (Wrong, 2009). An environment of mistrust generally makes it difficult to successfully implement health interventions because the intended beneficiaries are not receptive (Muga and Jenkins, 2008).

5.3 Conclusion

This study suggests that the change of 1st line treatment for uncomplicated malaria from SP to AL in Kenya was compromised by design and implementation problems in the accompanying policy communication strategies. In the study district there was very limited knowledge of AL and of the policy change. The findings suggest that the population in the district would value an effective malaria drug but did not yet understand AL to be that drug at the time of the study. This understanding gap not only reflects policy communication failures but also a wider lack of confidence in the broader health system. In societies like Kenya where pluralistic practices of health seeking are common, information passed through appropriate channels of communication becomes vital to changing practices, perceptions and behaviours so as to improve utilisation of new drugs among groups and individuals. In sensitive matters like change of drugs, it is necessary to have consistency in messages passed to the public through multiple channels. The channels used should emphasise interpersonal and oral communication to avoid the confusions that act as barriers to acceptance and use of new treatment policies. Interpersonal communication enables active engagement with the source of the information and also avoids the confusion that was apparent when the media, which also advertised competing products against

AL, was used. With the change from SP to AL, the communication strategies were expected raise to awareness and usage of AL but this was not the case because the use of the print and electronic media alone was limited in scope and in terms of access to health information. The result has been a rural public struggling to find a better drug to treat malaria, often moving from one drug to the next, and back and forth between modern and traditional methods, or a mixture of all these, in a trial and error fashion. This kind of behaviour symbolises the uncertainties about drugs that communities face in their quest to find reprieve from malaria. As things stand, it is far from clear that prompt and effective malaria treatment will be achieved soon especially in remote rural communities where malaria is still managed at home, in large measure using traditional methods and ineffective drugs. What is encouraging is that there is no evidence of rejection of the AL intervention altogether but there are important community concerns that remain unaddressed and are affecting use of AL.

5.4 Recommendations

The recommendations presented here are derived from the findings of the study and are discussed in line with the recommendations of the United States Agency for International Development (USAID), Strategic Objective 5 that gives an implementation framework for changing treatment policy to ACTs. The document provides “guidance to countries on the actions that need to be taken when considering changing national policies for the first-line treatment for malaria to an ACT consistent with WHO recommendations as well as implementing the change,” (USAID, 2005 :1). The framework for implementation has 3 components, namely: Technical, Operational, and Monitoring and Evaluation. Where possible, the study recommendations have been supported by referenced evidence from other studies.

The technical component deals with matters related to three essential areas of ACT policy, namely: registration of ACTs in the country and changing its treatment policy. The other is to determine whether regulations on prescribing, dispensing, distribution and sale of ACTs in the country are consistent with the adopted policy. In detail, these include revision of drug regulation, review of the Essential Medicines List (EML), review and dissemination of treatment guidelines, training and supervision of health workers consistent with the new guidelines and IEC targeting the community. Operational considerations address the development of a phase-out plan for removing non-recommended drugs from the health system. Monitoring and Evaluation involves plans to track implementation progress and performance with respect to defined goals and objectives, how performance will be monitored and sources of information for monitoring implementation. Table 3 is a summary of key recommendations:

Table 3: A summary of some key recommendations

Problem	Recommended solution
1. Problems with provider attitudes and practices (a) Unfamiliarity with dispensing AL (b) Continued use of SP (c) Poor provider-patient relations	1. Emphasis on training health workers on technical and communication skills by the MOH 2. Supervision of peripheral facilities at district level by the DHMT 3. An all inclusive training for all key staff including public health officers
2. Presence of other anti-malarials and unclear messages over efficacy of AL	1. Development of a phase-out programme by the MOH and relevant arms of the government 2. Elaborate public education including interpersonal communication and media, peer education to be conducted by the MOH through PHOs at village level. 3. Clear and culturally sensitive IEC language should developed in consultation with policy makers, health workers and the community
3. Lack of access to information and drugs in public facilities	1. Design health information materials with physical access (availability), semantic access (literacy) and affordability in mind. 2. Use of localised drug delivery mechanisms such as community health workers
4. Loss of confidence in health workers because of presumptive treatment	1. The MOH to supply RDTs to primary facilities 2. Health workers at community level should educate the public on the need for presumptive treatment
5. Poorly implemented communication strategy	1. Need for impact assessment of IECs by independent evaluators 2. Monitoring and evaluation component in the policy change process should be factored in by policy makers

Technical Considerations

Although this study did not directly examine the regulations governing ACT use in Kenya, it provides clear evidence of problems in the implementation of the established guidelines and in the practice of prescribing, dispensing, distribution and sale of ACTs.

The first problem involves training and supervision of health workers during policy change. Adequate training for health workers is required to equip them with the necessary skills regarding the new treatment policy. Although the Kenyan government endeavoured to train health workers during the change to AL, the study findings suggested that some health workers in the study district felt the training was inadequate because the time allocated was too short to enable trainees to get to grips with the complexities of the new treatment guidelines. Perhaps as a result, the findings provided information that, whatever training was actually received, either did not cover all relevant issues or was not translated into practice. Training should, for example, emphasise that health workers should not dispense SP or AQ to any patient who presents with malaria fever. In addition, training for drug policy changes must not only involve equipping health workers with treatment skills but also skills for communicating with patients, because communication is an important component in treatment and adherence. Engaging health workers in policy communication should also include encouraging them to pass key messages concerning the policy change to their patients as well as encouraging patients to raise any concerns or questions and where possible, communicate with the larger community.

Training can also be supplemented by supervision of health workers. Supervision of health workers and appraisals with feedback are effective ways to improve health worker performance in terms of adherence to the new malaria treatment guidelines (Rowe et al., 2005). The findings here also suggest that supervision and audits could be supported with in-service training or refresher courses to keep health workers abreast of new developments or areas that need to be strengthened during the policy implementation. Health workers are likely to forget some of the things on which they have been trained (USAID, 2005).

Finally, participation in training should be thought through carefully, as these findings show that key staff who interact with the larger community were not trained. Future trainings should involve consultation with health managers at the district level to help in identifying key staff for training for the policy change instead of using top-down approaches. The top-down approaches may lack appropriate information regarding the most strategic personnel to be trained during treatment policy changes. There should also be consistency in the messages passed in the training guidelines. For instance, the training guidelines were clear that public health officers (PHOs) were to be trained on the policy change. But at the same time, the guidelines emphasised that those to be trained were personnel directly involved with dispensing medicine, which excludes PHOs. This inconsistency may have led health managers to leave out PHOs who could have been an excellent link with the wider community.

Operational considerations

In Kenya, malaria control continues to be a vertically controlled programme under the Department of Malaria Control (DOMC) in the health ministry. This gives the

ministry a central steering role in developing strategies that would ensure that health policies are successfully implemented. A key problem in the take-up of AL by the public is the confusion created by several anti-malarials in the market whose sales and further confusion are facilitated by the media and the ministry has a central role to play in regulating circulation of these drugs. It is difficult to ban these drugs as it raises several complexities (USAID, 2005) because manufacturers are likely to seek legal redress. There is also the potential for job losses which may translate into some levels of social unrest. This means that a phase-out programme should be developed that would include rescheduling some of the drugs to a prescription only. This, according to (USAID, 2005) should reduce their demand over time. Part of the phase-out plan should include a process to monitor the language used by drug advertisers to ensure that they do not confuse and lead the public into consuming ineffective malaria drugs. And non-malaria drugs that are often mistaken for anti-malarials by the public should be clearly labelled on the packages that they do not cure malaria and a caveat after their advertisements to that effect.

In addition, future drug policy changes require an elaborate public education programme designed with community concerns and practices in mind. The findings suggest that in phasing out one drug and introducing a new one, interpersonal communication alongside IEC materials can be used to establish a conducive environment for policy implementation at the community level. This can be achieved by engaging, for example, PHOs, the local authority and women groups in advocacy for the new policy. Simultaneously, outreach programmes involving peer educators from social groups such as youth groups and women groups should be encouraged to pass information about AL, the need for adherence and effective treatment for

malaria. A study about role of IEC on HIV/AIDS control has shown that critical information can be passed through booklets, radio and word of mouth as well as audio-visuals (Aggleton et al., 2005).

It is also important that the language involved in the IEC should be clear and culturally sensitive because words used in advertisements that have many meanings in local culture are most often misunderstood when used without further clarification. Given the experience in the study site as discussed here, all forms and strategies of communication with the public should focus on the following priority areas:

- Clarify to the community about policy directives on free treatment for malaria so that people are empowered to demand for their rights.
- Clarify about drug changes, that is, why the changes have occurred, a change from which drug to which drug, and emphasise the need to adhere to the dosage, and why presumptive treatment sometimes result in issuance of various types of drugs.
- Enlighten the public about the difference between the recommended drugs and drugs at the shops.
- Encourage prompt and effective treatment at the earliest onset of illness.

Another important finding to note in relation to policy communication is that there were particular problems in accessing information relating to the change in treatment policy especially among the primary care-takers, that is, the women, who were the main target population with the IEC strategies. Access to health information should be designed along the lines of physical and semantic access, and affordability (Claasen-Veldsman and Snyman, 2005, Eng et al., 1998, Kreuter and McClure, 2004), so that

all categories of the population can be reached with key messages. Women were particularly disadvantaged by the IEC materials because they are less likely than men to own radios, they control less resources and form the bulk of illiterate members of society. They are, therefore, better off accessing health information through interpersonal means.

The last strategies suggested by these findings to support the phase out of one drug and use of a new one focus on the need to improve malaria treatment in the public sector specifically (Yeung et al., 2008). Only the public sector spreads across the country. To improve access to it, one option would be to use localised drug delivery mechanisms such as Community Health Workers (CHWs) specifically trained to dispense AL in order to address problems of access to effective health services related to availability of moribund antimalarials at local shops, distance to facilities, long queues and opening hours at rural health facilities. The findings show that there are CHWs already administering AL to patients in remote dispensaries and in the absence of the nurse in-charge, are often left to run the facility on their own. Cases like this can be studied and built on to ensure that quality standards are not compromised especially now that AL would be soon available to informal drug vendors according to the treatment guidelines. Trained CHWs would be accessible at all time and may significantly reduce buying drugs from untrained shopkeepers who may be more after profits rather than ensuring that a patient gets the correct dosage of the recommended anti-malarial. Shopkeeper training programmes may also be undertaken to improve AL coverage and adherence. Improved access to effective drugs could also help in phasing out fake and ineffective drugs that have limited the impact of policy change.

The findings suggest that patients probably prefer to be diagnosed through tests before treatment instead of being treated presumptively, because the approach makes patients lose confidence in health workers (Mwisongo, 2007). Loss of confidence in health workers is a barrier to policy communication and lowers uptake of AL since patients are not sure whether they have been given the right drugs for their illnesses. The supply of Rapid Diagnostic Test (RDT) kits to primary health facilities might address this problem, but would require an initial study on the feasibility and sustainability of the approach.

The WHO confirms that parasite-based diagnosis can guarantee appropriate use of AL and save costs. RDTs are cost-effective in most parts of Africa (Rolland et al., 2006, Shillcutt et al., 2008) and even at a high prevalence levels of 90%, parasitic diagnosis with RDT is likely to cost somewhat more than the presumptive approach (Rolland et al., 2006). However, the cost-effectiveness may also depend on the trust and confidence that the provider and the patient have on the results (Williams et al., 2008). Apart from RDTs, there should be a reduction on pill-count to eliminate complaints over the number of tablets and increase adherence.

In any communication strategy, it is important that appropriate steps are taken at an early stage to give the public confidence in the drug of choice for the treatment of uncomplicated malaria, such as AL. In doing so, the role of cultural practices and the influence of global interests in the use of AL should be noted in the design of communication strategies. Conservative cultures do not always accept changes very quickly. Effective change in behaviour would require sustained flow of information to the community through appropriate and culturally sensitive channels, as suggested by

(Kreuter and McClure, 2004). The subsequent change of behaviour would recognise and use AL as the appropriate anti-malarial for uncomplicated illness.

Monitoring and Evaluation

The IEC strategy was rolled out without impact assessment and did not empower the public with information about the new treatment policy. In addition, it was clear that not all health workers acknowledged the wisdom behind the change of treatment policy to AL and singled out the inconvenience of the drug's complex dosage as a key factor. The IEC strategies cannot be implemented in a vacuum but should have clearly set and achievable goals and a mechanism for impact assessment (Aggleton et al., 2005). The impact assessment report should use feedback from the community to redesign IEC materials and approaches.

With a monitoring and evaluation component in the policy change, it could have been possible, for example, to pick out negative health worker perceptions on AL and provide feedback for further training interventions. Health worker performance in terms of adherence to treatment guidelines for AL could be audited through malaria patients who may be asked basic questions on what kind of drugs they have been given, the dosing schedule and how important it is to the patients to adhere to the dosage. These are some of the problem issues at the community level that have contributed to low use of AL in the study area. Because community awareness about the new treatment policy is significantly poor, monitoring and evaluation could have been used to track AL policy implementation progress at the community level by assessing the level of community awareness and use of the new treatment policy, and then using the findings to redesign communication strategies with the public.

Future policy communication, in order to benefit the community, should pay significant attention to training for health personnel. The training should aim at not only equip health staff with treatment skills but also train them in how best to open dialogue with their patients. Training should also be supported with adequate supervision of health personnel to facilitate adherence to policy guidelines alongside a viable phase-out programme to limit impact of un-recommended drugs in the health system. The language used in communicating with the community should be unambiguous and culturally sensitive. Broader IEC strategies should be undertaken simultaneously with interpersonal communication to improve access to health information. All these efforts should have a mechanism for monitoring and evaluation of policy implementation.

Finally, further research is required with quantitative methodologies to ascertain the level of awareness about first-line drug for uncomplicated malaria, knowledge of AL and drug utilisation patterns at a national scale. Also required at the national level is research on the communication strategies that will be most effective in reaching and changing the perceptions of people living in remote areas.

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APPENDICES

Appendix A: QUESTION GUIDES

A. In-depth interviews: District and primary health managers

1. What factors influence malaria control in the district?
2. How has the switch from SP to ACT influenced malaria control in the district?
3. What are the health workers views of ACT? To what extent has the public accepted ACTs?
4. How successful is the move from SP to ACT in the district?
5. What could be the possible role of health service managers/health workers in influencing the public to accept recommended drugs?
6. How was the public engaged during the change from SP to ACT? What communication channels were used? Who was involved? Who was targeted?
7. How have the communication channels influenced use of ACT in the community?

B. Patient narratives

1. Are you aware of what you are suffering from?
2. Tell me about your illness: how it started; what you feel caused it; the kinds of treatment options you have taken; and why?
3. When you suffer from malaria, what drugs do you usually use? Do you have a specific preference? Why?
4. Why do some people use different drugs to treat malaria?
5. Are you aware of any recent changes in malaria drugs? How important is this change of drugs to you?
6. How did you find out about the new malaria drug? How important was this information to you? How has it influenced your choice of malaria drugs?
7. Do you consult anyone before using any malaria drugs? Who? Why?

C. In-depth interviews (community KI)

1. How would you describe the malaria situation in the village?
2. Where do malaria patients seek treatment? Why in these places?
3. What kinds of malaria drugs are used in the community? Why so many drugs?
4. Who, in your opinion, decides which malaria drugs to use? Why?

5. Why do malaria drugs change from time to time? How are these changes important to you?
6. What are your views about the changes in malaria drugs?
7. Were these changes communicated to the community? How? Who was involved? Who was targeted?
8. What was the importance of the communication? How has the communication influenced people's choices of malaria drugs and/or treatment?
9. What was the role of community leaders in communicating these changes?
10. How do people in the village get information about drugs?

D. Focus group discussions

1. Where do you treat malaria in the village? What influences choice of these treatment sources?
2. Where do you get drugs for treating malaria? Why do you choose these sources?
3. There seems to be so many malaria drugs available within your community. Do you have any ideas why this is so?
4. Who, in your opinion, decides which malaria drugs to use? Why?
5. Why do malaria drugs change from time to time? How are these changes important to the community?
6. How have recent changes in malaria drugs influenced people's choices of treatment?
7. Were these changes communicated to the community? How did you receive information about these changes? Who was involved in passing information? To whom?
8. What do you think would be the importance of communicating to the public about change of malaria drugs?
9. What would you like to know about the new drug?
10. How do you feel now that the malaria drugs have been changed and you are not even aware of it?
11. How do people in the village get information about drugs?
12. What role can your community play in malaria control?

Appendix B:

INFORMATION SHEET

Study Title: **Community responses to malaria drug policy changes and the potential influence of communication strategies in the uptake of malaria drugs in Kenya**

What is the University of Cape Town?

The University of Cape Town is a public institution of higher learning which, among other things, carries out health research. The kind of research that we intend to carry out is different from treatment as it does not involve drugs.

The purpose of the study

The purpose of our study is to understand what people have responded to malaria drug policy changes and how their responses have been influenced by communication strategies for the policy change. As you may know, there may be a change of malaria drug but people may not know the reasons for the change or may not know that there has been a change of malaria drugs. We are trying to know what people understand of these policy changes and how they receive communication about the changes.

Voluntary participation

You may choose to take part in the study or not, but we would strongly encourage your participation because it is only through your responses that those responsible for health can best know how to deliver better services to you. However, there is no harm in choosing not to participate. Those taking part in the study and would like to withdraw can do so any time in the course of the study. We are neither paying any money nor supplying drugs to participants.

Confidentiality and anonymity

No one other than the researchers and our supervisors will have access to the information we will get from you. Besides, our research records are stored in a locked safe and in computers which are password protected. Our final report will not have any names such that those participating will remain anonymous to everyone reading the report.

Benefits and Risks

There may not be direct benefits to all individual participants, but there may be future benefits to entire communities if recommendations of the final report are adopted. Overall, your opinions will help in identifying problem areas in health care delivery.

The risks for involvement in the study are very minimal as it does not involve any invasive procedures such as drawing blood. However, as a participant, you may be inconvenienced because we will take some of your time (about 30 minutes); besides, we will be asking you some questions that you may feel are personal.

Who sanctioned research?

The research has been authorized by the University of Cape Town Ethics Committee. These bodies have scrutinized the study and confirmed that it is necessary, safe and will be carried out as required by ethical guidelines.

Any questions...?

You can ask any member of the research team questions that you might have (PI Tel. (+254) (0)722-779-456. Further questions about the study maybe directed to the Health Economics Unit, University of Cape Town, Anzio Rd, Observatory 7925; Cape Town, South Africa. Tel.: +27 406-8152

In case you need further clarification from the University of Cape Town, feel free to contact the Ethical committee Chair: **Prof. Mack Blockman**. Tel. .

CONSENT FORM

Study Title: **Community responses to malaria drug policy changes and the potential influence of communication strategies in the uptake of malaria drugs in Kenya**

I, _____, have had the research explained to me (or have read through the consent information sheet). I have understood all that has been read and had my questions answered satisfactorily. I understand that I can withdraw from the study at any stage and my withdrawal will not affect health benefits due to me.

Please tick one where relevant and delete appropriately:

Yes No **I agree/ don't agree to take part in this research**

[If the potential participant says 'No', then terminate the consent process here]

Participant's signature: _____ **Date** _____

Participant's name: _____ **Time** _____
(Capital letters only)

I certify that I have followed all the necessary ethical procedures as stipulated in the study for obtaining informed consent.

Investigator's signature: _____ **Date** _____

Investigator's name : _____ **Time** _____
(Capital letters only)

For participants who cannot read or write:

I (declare) that information on the intended research has been satisfactorily explained to me and I gave my consent freely based on the explanations given to me regarding the research.

Thumbprint of the participant as named above if they are illiterate:

Witness' signature: _____ **Date** _____

Witness' name: _____ **Time** _____
(Capital letters only)

[A witness should be anyone not involved in the study and has not participated in obtaining informed consent].

THE PARTICIPANT SHOULD NOW BE GIVEN A SIGNED COPY TO KEEP; THANK PARTICIPANT FOR HIS/HER TIME

List of documents reviewed (n=6)

1. Minutes of DHMT meetings (n=3)
 - a. Preparations for the launch of training workshop for primary facility health workers
 - b. Report on progress of training of primary facility health workers
 - c. Feedback from in-charges at dispensaries and health centers regarding the new treatment policy
2. MOH-Kenya (2009) *Health care financing policy and strategy: Systems change for universal coverage*. Government of Kenya.
3. MOH-Kenya (2006) *National guidelines for the diagnosis, treatment and prevention of malaria for health workers in Kenya*. Government of Kenya
4. Amin AA, Zurovac D, Kangwana BB, Greenfield J, Otieno DN, et al. (2007) The challenges of changing national malaria drug policy to artemisinin-based combinations in Kenya. *Malar J* 6: 72.

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