

**UNIVERSITY OF CAPE COAST**

**COMMUNITY PERCEPTIONS OF ARTESUNATE AMODIAQUINE  
FOR THE TREATMENT OF UNCOMPLICATED MALARIA IN  
ANAKYIN IN THE CAPE COAST METROPOLIS**

**BY**

**MARTIN AMPOFO**

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## DECLARATION

### Candidate's Declaration

I hereby declare that this dissertation is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:.....

Date:.....

Name: Martin Ampofo

### Supervisor's Declaration

We hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature:..... Date:.....

Name: Dr. Collins S. K. Ahorlu.

## ABSTRACT

The most important drawback to successful control of malaria is the development of resistance by *Plasmodium* species to commonly used antimalarial drugs. To enhance effective treatment, many African nations including Ghana changed its malaria treatment policy from monotherapy to combination treatment with Artesunate + Amodiaquine (AS+AQ). The policy specifies AS+AQ as the first line treatment for uncomplicated malaria. There has been public outcry due to the perceived side effects of the drug.

The study was carried out to assess community's perceptions of AS+AQ for the treatment of uncomplicated malaria. The study was carried out in Anakyin community in the Cape Coast Metropolis. Semi-structured questionnaires were used to assess views of the respondents on AS+AQ.

A quantitative descriptive design was employed using semi-structured interviews. Two hundred and sixty (260) people out of the total population of 860 were interviewed using Kirk scale.

Adherence to the three-day treatment regimen of AS+AQ was very high (81.5%) in this study and 60.4% of the respondents believed artesunate + amodiaquine is good.

Respondents were of the view that AS+AQ is efficacious in the treatment of uncomplicated malaria. However, the respondents reported some side effects (drowsiness and weakness).

Further, there is high awareness among the respondents of the new policy. It is however recommended that, there must be an intensive education to disabuse the minds of the general public on the perceived adverse effects of AS+AQ.

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## **DEDICATION**

To my wife, Zipporah and daughter Caryn for their support.

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## LIST OF ACRONYMS

ACT	Artemisinin Combination Therapies
AIDS	Acquired Immune Deficiency Syndrome
AS+AQ	Artesunate+Amodiaquine
CCDH	Cape Coast District Hospital
CQ	Chloroquine
GHS	Ghana Health Service
MOH	Ministry of Health
NMCP	National Malaria Control Programme
PV	Pharmacovigilance
SPSS	Statistical Product for Service Solutions
WHO	World Health Organization

## CHAPTER ONE

### INTRODUCTION

#### **Background to the study**

Malaria is an acute or chronic infection, of red blood cells caused by protozoa parasites of the genus Plasmodium: *P.Vivax*, *P.malariae*, *P.falciparum* and *P.ovale*. Malaria is one of the diseases which contributes significantly to morbidity and mortality in Africa. 90% of the estimated 300-500 million malaria cases per year worldwide occur in sub-Sahara Africa. There are least one million deaths attributed to malaria per year in Africa (WHO, 2002). Children are the main casualties from the disease. The vast majority of malaria death toll is especially among poor African children and most of them younger than 5 years old (WHO/UNICEF 2003).

The malaria burden faced by African countries continues to be a challenge for national governments. Increasing resistance to drugs and pesticides, the lack of capacity to implement programs effectively and low public education about malaria is only a few of the many complications that African governments must address to effectively combat malaria (Melanie et al., 2004).

Malaria is known to constitute 10% of the disease burden of Sub-Saharan Africa and accounts for about 25% of all deaths. Arguably, despite global, national and local initiatives, this situation is not improving quickly enough (Korenromp et al., 2003; Sachs, 2002; Sachs & Malaney, 2002), and

case rate may double over the next 20 years (Bremen, 2001). In terms of public health significance, malaria remains the most important disease in Ghana; it constitutes about 40% of all outpatient clinical cases and about the same proportion of childhood deaths (Ahmed, 1989). Malaria is a major cause of anaemia in children and pregnant women, low birth weight, premature birth and infant mortality in most African Countries. Malaria accounts for 25-35% of all out-patient visits, 20-45% of hospital admissions and 15-35% of hospital deaths, imposing a great burden on already fragile health care systems. The costs of malaria are also enormous when measured in economic terms. Countries with a high number of cases of malaria are among the very poorest in the world, and typically have very low rates of economic growth; many have experienced declines in living standards in the past thirty years (Korte & Fisher, 2004). In response to this pressing social problem, in April 2000, the African heads of state committed their governments that by the year 2005, 60% of malaria episodes will be appropriately treated within 24 hours of onset of symptom. A strong healthcare delivery system would ideally provide early reliable diagnosis and appropriate prompt effective treatment. However, in most malaria-endemic countries access to curative and diagnostic services is limited (WHO, 2004).

Malaria control in Ghana largely relies on early and prompt treatment of suspected cases with adequate drugs. This strategy was threatened by the emergence and rapid spread of *P. falciparum* resistance chloroquine. The situation has worsened since chloroquine (CQ) resistance was first reported in Ghana in the late 1980s (Neequaye, 1986). The increasing problem of anti-malarial drug resistance prompted the National Malaria Control Programme to

search for safe, good quality, affordable and acceptable anti-malarial drugs with the purpose of providing, among other benefits, long lasting clinical cure for individuals suffering from malaria thereby preventing progression of uncomplicated malaria to severe disease and death.

By 2003, parasitological responses to chloroquine were less than 50 per cent in some areas in the country (Koram, Abuaku, Duah & Quarshie, 2005).

### **The Policy Adoption**

Ghana had to follow the WHO (2001) recommendation to use combination therapies containing artemisinin derivatives as a country experiencing resistance to monotherapies in the treatment of falciparum malaria (Koram, 2003).

The choice of the combination adopted is based on characteristics including efficacy levels, compliance, route of administration, side effects, cost effectiveness, impact on local industry and key demographic variables such as the appropriateness for treating malaria in children under 5 years and in pregnancy. Ghana adopted and later implemented a new antimalarial policy effective from January 2005 with the objective to treat all malaria cases in all categories of the population in order to reduce morbidity and mortality especially in children under five and pregnant women.

The new policy chose Artesunate+Amodiaquine because it is an efficacious combination drug with low side effects, known worldwide for its high parasitic clearance and cure rate with adequate treatment duration. The combination is also safe for use in children and can also be used with caution

in pregnancy after the first trimester, comparatively less expensive to all other alternatives and compliance can be improved with unit-dose co-packaging. (Global Fund, 2004).

In November 2004, the Ghana Health Service (GHS) adopted the Artesunate-Amodiaquine Combination Therapy as the first line treatment in uncomplicated malaria, a decision which was informed by numerous studies both within and outside Ghana. These studies showed the drug to be of commendable efficacy. This decision is in line with the WHO (2001) recommendation that Artesunate Combination treatment would increase cure rates, reduce transmission and prolong the span of anti-malarial drugs.

A study funded by Gates Malaria Partnership and carried out in the Kintampo District of Ghana between July 2005 and 2006 showed that Artesunate+Amodiaquine was very efficacious and safe, producing a rapid clearance of malaria parasites and symptoms.

In further support of the efficacy and reliability of Artesunate+Amodiaquine Combination, a study was conducted by Neils Quashie et al. of the Noguchi Memorial Institute in 2005 into the comparative efficacy of Artesunate+Amodiaquine. These results just like the others confirmed the efficacy of the drug.

In addition, The University of Ghana Medical School undertook the responsibility to constantly monitor report of any adverse events through their Pharmacovigilance (PV) Centre. The policy implementation started in January, 2005 and since then, the PV Centre has endeavoured to follow reported adverse events and has contributed greatly to inform the implementation process.

### **Statement of the problem**

The use of Artesunate+Amodiaquine as the first-line treatment of malaria following the introduction of the new Anti-Malarial Drug Policy has generated a lot of anxiety and complaints among the public. At the launch of the new treatment policy, some clients experienced severe adverse reaction that were publicised. This created doubts in many providers and the general public about the combination.

Under the circumstances, the Ministry of Health was compelled to withdraw the 200mg and 600mg strengths of the drug combination and replaced it with 100mg and 270mg respectively. The Ghana Health Service (GHS) and the Ministry of Health, however, assured the public that Artesunate+Amodiaquine; the new drug for the treatment of uncomplicated malaria remained the national choice for the treatment of the disease despite the withdrawal of some combinations. In view of the circumstances that led to the withdrawal of the drug, some health practitioners and members of the public out of skepticism seem to have lost faith in Artesunate+Amodiaquine of any kind. This therefore makes it pertinent for further studies by way of sampling local perceptions of the drug.

### **Objectives of the study**

The general objective is to study local perceptions of Artesunate+Amodiaquine for the treatment of uncomplicated malaria.

The specific objectives are to:

1. Describe the general perception of Artesunate+Amodiaquine.
2. Assess the extent of public education on Artesunate+Amodiaquine.

3. Assess the extent at which people use Artesunate+Amodiaquine.
4. Give recommendations as regards the use of the combination therapy.

### **Research Questions**

1. What is the level of acceptance of Artesunate+Amodiaquine?
2. What factors influence people's choice of Artesunate+Amodiaquine?
3. What are the side-effects of Artesunate+Amodiaquine ?
4. How much information has the public received on Artesunate+Amodiaquine?

### **Significance of the study**

As a nation, it has not been easy addressing the manifold health challenges that have come our way through the years and with all our health records singling out malaria as the number one medical condition reported to our hospitals, choosing the right drug for treating malaria is an obligation and not an option. Notwithstanding numerous studies both inside and outside Ghana; studies, which showed Artesunate+Amodiaquine to be of commendable efficacy, perception that the drug is not good rages on. When this study is completed therefore, it is expected to address the problem of discontentment from a section of the public; complaints that may not have anything to do with the efficiency and safety of the policy but rather a communication gap, which in itself serves as an enough incentive for stakeholders to optimize their input and make the implementation, sustenance perfection of the new anti-malaria drug policy a reality.



## **Organisation of the Study**

The study is organized into five chapters. Chapter one which the introduction discusses issues like the background of the study, statement of the problem, objectives of the study, and the research questions. Chapter two reviews literature on malaria; including Drug resistance, Artemisinin Combination Therapies (ACTs), perceptions about the causes, transmission, prevention and treatment of malaria. It also looks at social theories explaining people's perception of a drug. Chapter focuses on the methodology of the study. The chapter also describes the study design, study site and population, sampling, sources of data collection procedure and data processing and analysis. Data collected for the study is analysed and discussed in chapter four. Finally, chapter five focuses on summary of the findings, conclusions and recommendations of the study.

## CHAPTER TWO

### LITERATURE REVIEW

#### Introduction

The origin of the name malaria, meaning ‘bad air’, stems from the Roman period in Italy when the Romans first associated the disease with the stench of swamps. Indeed, malaria is one of humankind’s oldest enemies (Desowitz, 1991). Malaria has been a scourge of humanity since antiquity and it remains so today. It has been over 100 years since the discovery that ‘the ague’—now commonly known as malaria—is caused by infection with the protozoan Plasmodia, which is transmitted between humans by the bite of the female Anopheles mosquito. There are various Plasmodia species but the most severe form of the disease is caused by *Plasmodium falciparum*.

#### Drug Resistance

One of the key challenges of malaria control in recent time has been the emergence of parasites resistant to chloroquine and mosquitoes resistant to insecticides. In 1961 Young and Moore reported for the first time chloroquine resistant *P. falciparum* in a patient from Colombia (Young & Moore, 1961). Since then strains of drug resistant *P. falciparum* have been reported in many areas (Draper, Hills, Kilimali & Brubaker, 1988—East Africa; Alvar, Puente & Blazquez, 1987— Equatorial Guinea; Raccurt, Le-Bras, Le-Bras, Beylot, Combe & Ripert, 1986—Cameroon; Van-der-Kaay, Overbosch, Stuiver

& Wismans, 1984–Central Africa). Apart from Western Sahara, Morocco, Algeria, Tunisia, Libya, Egypt, South Africa and Lesotho, all the other Africa countries have reported drug resistant *P. falciparum*. The whole of the Indian sub-continent and Southeast Asia, and South America (excluding Argentina, Chile, Paraguay, and Uruguay) have parasites resistant to chloroquine (Center for Disease Control, 1990). With 2.13 million cases reported, India accounted for at least 40% of the total number of cases reported to WHO excluding Africa in 1992 (WHO, 1994; 1997).

In Ghana chloroquine resistance was on the rise; in the early nineties a combined Chloroquine resistance of 45% was described in the coastal zones of Ghana (Landgraf et al. 1994). More recent studies report up to 57% resistance in the northern savannah zones and 37% combined RII/RIII resistance in the forest zones of Ghana (Ehrhardt, Mockenhaupt, Agana-Nsiire, Mathieu, Anemana, Stark, Otchwemah, & Bienzle, 2002; Driessen, van Kerkhoven, Schouwenberg, Bonsu, & Verhave, 2002). Despite the variations in the extent and degree of such resistance between endemic zones, the change of the first line drug in Ghana was inevitable.

In 1998, the National Malaria Control Programme (NMCP) in collaboration with Noguchi Memorial Institute for Medical Research (NMIMR) started a study centred at 6 district hospitals around the country to examine the responses of *P. falciparum* to chloroquine in the treatment of uncomplicated malaria and the results showed a resistance of the parasite to chloroquine. Treatment failure in this study using chloroquine of good quality was between 6% and 25% among the different demographic cohorts. This put Ghana's state between 'Alert Period' and 'Change Period' according to

suggested WHO Global response to Anti-malarial Drug Resistance four tier action framework. There was therefore a call for a review of the current policy to replace chloroquine as a first line drug for malaria treatment, introduce alternatives and review the treatment guidelines. A task force of experts of various aspects of malaria control, set up by the NMCP reviewed the evidence on efficacy of chloroquine in the treatment of malaria and chemoprophylaxis in pregnancy between October 2002 and January 2004 (Global Fund, 2004).

Elsewhere in Africa, chloroquine resistance increased the proportion of admissions to hospital and deaths from malaria by two-fold to four-fold. These links between drug resistance, treatment failure, and finally death are not controversial. The WHO concurs that chloroquine resistance was a “very likely” reason why childhood malaria deaths in Africa were increasing, and that chloroquine “has become useless in most malaria-endemic areas. The WHO further agrees that resistance to sulfadoxine-pyrimethamine, which was often the replacement for chloroquine, “was also widespread and its use too will soon have to be discontinued”. In Kenya, a decision 5 years ago (1998) to switch from chloroquine to sulfadoxine-pyrimethamine treatment is already faltering because sulfadoxine-pyrimethamine treatment failure quickly reached dangerous levels. The demise of chloroquine and sulfadoxine-pyrimethamine leave artemisinin-class combination therapies (ACT) as the best treatment option (WHO, 2000).

The main reason for treating malaria with combination therapy is the same as for AIDS, tuberculosis, and leprosy, in which it is the standard practice: patients given two (or more) robust and highly effective drugs are less likely to encounter drug resistance and treatment failure — which brings

both clinical and public-health benefits. These benefits have now been shown in a large meta-analysis of nearly 6000 patients, which shows that combining existing malaria drugs with an artemisinin both reduces patients' risk of treatment failure (by 75%), while lessening the pool of infectious parasites that transmit malaria to others. In studies done on nearly every continent ACT successfully treats 90% or more of patients. That level of success can probably be maintained for a very long time, since artemisinins have been used as Chinese traditional medicines for over 2000 years, with no observed resistance. ACT is now the preferred policy for WHO and the Roll Back Malaria campaign as a whole: Recently WHO has formulated a policy to make combination drug therapy the preferred first therapy for all malaria infections in areas where *P. falciparum* is the predominant infecting species of malaria. Combination therapy (CT) with formulations containing artemisinin compound (ACT) is the policy's recommendation.

### **Artemisinin Combinations Treatments (ACTs)**

The combination therapy (CT) concept is based on the synergistic potential of two or more drugs, to improve therapeutic efficacy and also delay the development of resistance to the individual components of the combination (Majori, 2004). The key goal of combining artesunate with an existing antimalarial medicine is to improve cure rates; delay emergence of resistance to component drugs and reduce parasite clearance time, (Barennes, Nagot, Valea, Koussoubé-Balima, Ouedraogo, Sanou, & Yé, 2004). By this, the combination could also reduce treatment failure and transmission potential

(Adjuik, Babiker, Garner, Olliaro, Taylor, & White, 2004). Though they are expensive, their advantages over monotherapy far outweigh the cost.

Artemisinin-based combination chemotherapies have been documented to consistently produce faster relief of clinical symptoms and parasite clearance in uncomplicated *falciparum* malaria than any other currently used antimalarial drug (Owusu-Agyei, Chandramohan, & Greenwood, 2005). However, the short half-lives of artemisinins result in frequent recrudescence infections when used alone and therefore, much interest lies on the choice of the combination partner drug.

In order to obtain the benefits of combination therapy and protect the component drugs, complete adherence to the full recommended dosing regimen is necessary. Long duration regimens, complete dosing schemes, high cost, poor understanding of how or why to adhere to recommended regimens and adverse reactions to treatment contribute to non-adherence. Perceptions of wellness can also affect adherence: if symptoms are relieved before a regimen is complete, treatment may be halted and the remaining drug may be saved for later use. Adherence to multiple day regimens of anti-malarial drugs is poor (Boland, 2000). Combination therapy may be more vulnerable if the strategy requires several drugs to be taken together (co-administration) as opposed to having the component drugs together in a single tablet (co-formulation). The goal of slowing down the development of resistance by using (CT) may be undermined by these economic and behavioural influences (Boland, 2000).

The National Malaria Control Programme (NMCP) after a thorough examination of available evidence and in consultation with stakeholders

recommended the use of Artesunate+Amodiaquine for the treatment of uncomplicated malaria in the country beginning January 1st, 2005. The new treatment was rolled out to the regions and districts during the first half of 2005. In September 2005, a programme to monitor the new treatment at sentinel sites across the country was instituted as a continuation of the studies used to obtain data on the failing efficacy of chloroquine. The primary objective was to determine the therapeutic efficacy of the Amodiaquine + Artesunate (AQ+AS) in the treatment of uncomplicated malaria in children less than 5 years and to set up a system of data collection on the efficacy of the new treatment drug to guide the NMCP in its continuous evaluation of treatment policy, (Koram, Abuaku, Duah, & Quashie, 2005)

### **Perceptions about the Aetiology and Transmission of Malaria**

Understanding people's perceptions of malaria, and the factors which influence these perceptions, must be a central part of mounting successful interventions to control malaria throughout the world (Ahorlu, Dunyo, Afari, Koram & Nkrumah, 1997; Bradley, 1991; Lipowsky, Kroeger & Vazquez, 1992). People in different societies hold a variety of beliefs about the cause and transmission of malaria that vary according to cultural, educational, and economic factors, and have direct consequences for both preventive and treatment-seeking behaviour as well as for activities to control malaria. But this puzzle cannot be viewed simplistically, since a solution to "misguided" perceptions, in terms of current public health knowledge, is not just a matter of providing "correct knowledge." As Espino and colleagues, (1997) have noted, "Improving or increasing knowledge does not necessarily result in changes in

perceptions or behaviour" (Espino, Manderson, Acuin, Domingo & Ventura, 1997). Indeed, behaviour is not just a consequence of knowledge and belief. Levels of alcoholism, community social and political divisions, or lack of control by women of household budgets, for example, are also significant determinants (Agyepong & Manderson, 1999; Winch, Makemba, Makame, Mfaume, & Lynch, 1997).

Attention to these perceptions is critical to public health efforts for at least three primary reasons. First, beliefs that differ from the scientific explanation about the cause and transmission of malaria may lead to inaction, a delay in seeking appropriate treatment, or ineffective action, all with serious consequences. These attitudes may also inhibit effective preventive measures (for example community participation). Second, people often hold various, seemingly contradictory, views about malaria at the same time (Espino et al., 1997).

Although they may concur with the scientific explanation of how transmission occurs, their preoccupation with why it occurs, for a particular person at a particular time, may be unique and at odds with orthodox public health knowledge. The explanation might be related to witchcraft or seen as the consequence of immoral or illegal actions, a logical conclusion as suggested by Helitzer-Allen, Kendall & Wirima (1993) was that, "the complex transmission of malaria lends itself to spiritual etiologies... mosquitoes are present most of the time, but fever is a periodic occurrence". As a result, both appropriate and what is scientifically considered irrelevant or ineffective preventive and "treatment" actions may be taken at the same time. If health personnel denigrate the apparently (to them) ineffective behaviours, such as



the wearing of an amulet, the unintended result may be to prejudice many against the appropriate use of the health services (Eisenberg & Kleinman, 1981; Paul, 1955; Polgar, 1963). Third, fevers and other severe and unstable varieties of symptoms, such as convulsions, are frequently not associated with malaria, obviating the need for treatment or preventive measures associated with these symptoms, which can have dire consequences for the sufferers (Mwenesi, Harpham & Snow, 1995).

### **Sensitivity in Communicating Malaria Prevention, Treatment and Control Measures**

In most countries in Africa, outsiders are faced with a real communication challenges since there may be multiple different terms for what could be referred to as malaria – or its different manifestations. These terms may also have a number of subcategories. An awareness of the use of a wide range of labels, related to the tremendous variability in symptoms (or clinical presentation of malaria), is highly significant for understanding people's perceptions and their prevention, treatment, and control behaviour. For example, Winch et al. (1996) write, "Cerebral malaria is commonly classified as a distinct condition attributable to supernatural forces. In this case the control of 'regular malaria' may not be seen as a priority as it is not perceived to be dangerous, while cerebral malaria, although perceived as dangerous, may not be seen as controllable through either vector control or chemotherapy"(Winch et al., 1996). It should also be noted that "local illness terms are in a constant state of flux, so that [cultural] 'rules' that make sense

now might be entirely inappropriate in a few years" (Winch et al., 1996 ; Gordon, 2000).

Even when perceptions about appropriate treatment and preventive actions may in general correspond with the scientific public health position, necessary actions may not be taken because it is often thought that people at certain stages of their lives, such as very young children or pregnant women, must be treated with special care (Gordon, 2000).

In some cases it is believed that young children should not be in contact with the "highly toxic" impregnated bed nets, and pregnant women should not ingest bitter substances such as chloroquine (Gordon, 2000). Researchers in Sudan reported that a large proportion of those studied believed that chloroquine may cause abortion (Elzubier, Ansari, Nour, & Bella, 1997). This conclusion was reached not only because of chloroquine's bitter taste and the association of bitter substances with traditional abortifacients, but because of the widespread use of an overdose of chloroquine for the specific purpose of bringing about abortion. A similar perception was found among inhabitants of the Pacific Coast of Guatemala where "people think that chloroquine causes abortion and breast milk to dry up" (Ruebush, Weller & Klein, 1992). A study in Malawi found that many women reported having been told by healthcare workers not to consume bitter substances during pregnancy. Yet, these same women reported receiving chloroquine, a very bitter medication, from antenatal clinics (Schultz, Steketee, Chitsulo, Macheso, Kazembe & Wirima, 1996). Thus, pregnant women are often given mixed messages, which can negatively affect compliance. From Sri Lanka it is learned that poor compliance with chemotherapy is a result of the common perception that side-

effects of chemotherapy are far more debilitating than the disease and uncertainty as to the validity of the 'cure'" (Jayawardene, 1993).

This is even more compelling for the use of prophylaxis for malaria prevention. Many link efficacy of drugs with toxicity and, as found in a study in Tanzania, where it was shown that "the greater the demonstrable effects of a 'dawa' (drug/medicine/treatment), the greater the potential for toxicity" (Winch et al., 1997). The effect of strong (toxic and effective) anti-malaria drugs was of particular concern to mothers of young children. A "strong" drug is good for getting rid of the sickness, but it may be too "strong" for certain age groups and people in particularly vulnerable conditions (i.e., pregnant women) (McCombie, 1996). Classification of foods, medicines, and diseases as either "hot" or "cold" (not necessarily in temperature) is also prevalent among people in malarial zones in Africa, as it is in Latin America and Asia. Following the belief that therapy is dependent on establishing a balance, if an anti-malarial preventive or therapeutic medicine is perceived as "hot," it will not be taken for the "hot" disease of malaria. In the Amazon region of Brazil, for example, Coimbra has noted that malaria is categorised as a "hot" disease and if popular ideas of health and disease are based on the belief that health depends on a proper balance between "hot" and "cold" elements, "it makes sense that people will not pay much attention to explanations relating mosquitoes and 'plasmodiums' to the transmission of malaria" (Coimbra, 1988).

Similarly, a study in Sri Lanka reported that people with malaria did take orthodox anti-malarial drugs, but expended a great deal of money on "cold" foods, following the belief "that both the disease and the modern anti-malarial drugs have a 'heating' effect, which should be neutralised by special

['cold'] foods” (Konradsen et al., 1997). Thus, in Sri Lanka, by far the most expensive part of malaria "treatment" was the purchase of these special, and locally necessary, foods. In other places, as reported from Ghana, for example, Agyepong noted that the common perception is that what is “good for one person is not necessarily good for another. Consideration should be given to the person as an individual and what suits him or her in choosing a particular therapy” (Agyepong, 1992). This notion may derive from the way people experience treatment by traditional healers, whose therapies may vary for individuals who show the same symptoms. People have grown to expect that therapy will be adjusted to the patient's personal characteristics, and that such things as the specific constitution and even character of a person will affect the treatment that is deemed appropriate. Factors such as the season and the phase of the moon, as well as the specific background of the individual and the social context, are also expected to influence appropriate therapy. An understanding of how people are treated by traditional healers and what they consider "appropriate treatment" in general may be crucial in providing guidance in how best to go about making changes to improve malaria prevention, treatment, and control (Agyepong, 1992).

### **How Misperceptions Inhibit Preventive and Treatment Actions**

Examples of perceptions people hold that may inhibit appropriate preventive and therapeutic actions abound. In Tanzania and Ghana it has been reported that malaria is considered as a result of excessive heat and overwork (Ahorlu et al., 1997; Gessler, Tanner, Chollet, Nkuya, & Heindrich, 1995; Winch et al., 1994). In Ghana, “malaria is perceived as an environmentally

related disease caused by excessive contact with external heat which upset the blood equilibrium” (Agyepong, 1992). In parts of Guatemala it is thought that malaria is caused by “bathing too frequently or by drinking un-boiled water” (Ruebush, Weller & Klein, 1992). And elsewhere in Guatemala malaria is thought to be derived from ‘exposure to cold or wet conditions; weakness or poor general health; problems related to hygiene; and poor eating habits or eating too much of the wrong foods” (Klein, Weller, Zeissig, Richards, & Reubush, 1995). Yet Guatemalans in these studies were quite knowledgeable about the role of mosquitoes in the transmission of malaria, although few knew how mosquitoes acquired their infections or understood the risk of having an untreated person in their midst” (Klein et al., 1995). A study from Uganda similarly found that poor diet and environmental conditions (as well as the bites of mosquitoes) were perceived to cause the disease (Kengeya-Kayondo et al., 1994). Examples of perceptions about malaria are reported in research from all over the globe. A study in the Philippines found “a general disbelief in the mosquito as a vector of malaria, and therefore doubts about the efficacy of bed nets” (Espino et al., 1997). This was also the case in a study from Tanzania, which reported that for those studied “there is no close association made between mosquitoes per se and malaria’ (Gessler et al., 1995; Van Geldermalsen & Munochiveyi, 1995).

Researchers in Ethiopia found that 77% of those studied ‘thought that malaria could not be prevented: this probably arises because of local ideas about its transmission” (Yeneneh, Joseph, Gyorkos, Pickering, Tedla, 1993). A study from Hainan, China, stated that though “people do not necessarily understand that mosquitoes are the vector of malaria,” unlike in the

Philippines, there was still a high use of bed nets (Tang, Manderson, Deng, Wu, Cai, Lan, Gu, & Wang, 1995). In The Gambia it is believed that close association with cattle, and, by extension, with nomadic pastoralists such as the Fula people, will cause malaria (Aikins, Pickering & Greenwood, 1994; Aikins, Pickering, Alonso, D'Alessandro, & Lindsay, 1993). Similarly, in Sri Lanka, while on the one hand “the bite of the mosquitoes is presented [in some folk poems] as more menacing than the life-threatening dangers from certain wild animals...., “strangely, on the other hand, “local peasants did not recognise any connection between fevers and mosquitoes and mosquitoes were not recognised as a disease vector” (Silva, 1991). These seemingly contradictory perceptions people can and do hold at the same time, complicating their compliance with drug regimens and preventive activities.

Links between malaria and supernatural forces are common. In The Gambia and in Kenya, malaria, especially in children, is often perceived as the result of the child being possessed by an evil spirit or devil (Aikins et al., 1994; Mwenesi, Harpham & Snow, 1995). A study from coastal Kenya also found that mothers did not make a connection between mosquitoes and malaria in their children, nor did they recognise many of the children's (convulsive) symptoms as related to malaria (Mwenesi et al., 1995). In some ways, convulsions in a child may quite "naturally" be seen as the child being possessed by a foreign force (devil or spirit) that is making the child's body twist and shake. It is also clear that while people recognise the symptoms of certain regular febrile illnesses such as malaria, the symptoms of cerebral malaria, which may be quite different and include convulsions, will not be related to malaria precisely because of its different and quite dramatic

presentation. In Tanzania, as in Kenya, convulsions (also known as ndege-ndege) in young children are not associated with malaria (which, of course, they usually are).

People believe that if a child with ndege-ndege is given an injection, he or she will surely die (Mwenesi, 1993). Thus, children with convulsions are usually taken to traditional healers but not to a health centre or hospital (Tarimo, Urassa & Msamanga, 1998; Winch et al., 1996). Because of this, an anti-malaria project in Bagamoyo District, Tanzania, recommended that "instead of criticising traditional healers, they should be incorporated into project activities, and some have served as members of village mosquito committees" (Winch et al., 1996). Similarly, for adults in this district in Tanzania, it was found that certain febrile illnesses that are especially common during the "cold" rainy seasons, and which cause severe fevers, were perceived to be caused by 'spirits, witchcraft and sorcery.' As a class, these illnesses are known as "fevers which do not accept hospital treatment" or "out-of-the-ordinary fevers" (Winch et al., 1994). However, other *homa ya malaria* (malaria fevers) are recognized as malaria and modern medicine is sought for their treatment (Winch et al., 1996). From Malawi we have learned that "A few people said that people die when they have malungo illnesses, because of an overdose of chloroquine" (Helitzer-Allen, Kendall & Wirima, 1993).

These differing and often conflicting perceptions, as delineated some time ago by Foster (1976), may stem from a dualistic etiological perception, common among many people who think about disease causation in either "naturalistic" or "personalistic" terms. The "personalistic" aetiological perception includes the belief that certain diseases may be caused by

purposeful intervention of an agent, which may be human, non-human, or supernatural. This way of perceiving disease causation sees the sick person as a victim, with no room for accident as an explanation. The researchers go on to state quite strongly that "The importance of 'nonscientific' and traditional theories of illness causation to malaria control should not be underestimated... since they summarise the communities' perception of the local epidemiology of malaria and their perception of risk" (Oaks et al., 1991). Based on knowledge of local realities, new ideas should be introduced in as harmonious ways as possible, allowing old perceptions to be amended and new perceptions to be adopted. An antagonistic approach, especially one which involves labeling people ignorant and unscientific peasants, has been found over and over again not to meet with much success, either in the short or long run. A formal recognition of differences and a negotiation of mutually agreeable solutions (through cultural "accommodations") should be employed and will help form the basis of successful malaria control efforts (Oaks et al., 1992).

### **The Acceptance and Use of Western Technology versus Local Methods in Malaria Treatment**

Just as health or treatment-seeking behaviour can be influenced by a variety of factors, including local beliefs about disease, access, costs, and attitudes toward health-care providers (both Western and traditional healers), sources of treatment for malaria are similarly affected. Treatment seeking for malaria also involves all the activities or modalities engaged by people to avert or treat the occurrences of malaria. Perceptions about the cause and appropriate methods to be used can play a large role in the type of treatment



chosen. Thus different etiological explanations for malaria can lead to different treatment methods. Treatment modalities can be separated into three different categories: 1) home or self-treatment, including both herbal/traditional treatment and pharmaceutical/antibiotic use; 2) traditional techniques; and 3) the official allopathic or "Western" medical sector, including hospitals, clinics, dispensaries, private practitioners, and village health workers (McCombie, 1996; Ahorlu et al., 1997). Multiple treatment – and polypharmacy practice – is common, both in the concurrent use of different types as well as in the sequential use of various sources of treatment. Studies have shown that traditional healers are less relevant in the treatments of malaria as people already knew how to prepare herbal remedies to treat it (Abyan & Osman, 1993; McCombie, 1996).

Especially for uncomplicated malaria, if the use of traditional medicine is preferred, it is usually prepared at home. Traditional healers are likely to be consulted for severe malaria especially in rural areas. Where for example, malaria is thought to be of supernatural origin, treatment is usually within the domain of traditional medicine. In Kenya, less than 1% of patients have consulted traditional healers before coming to the hospital (Snow et al., 1992). It is still important to note that many people still have faith in traditional healers and their medicine. Muela & Ribera (1998) report that traditional care is dominant in Tanzania up to 43% of household use traditional medicine for reasons such as accessibility, low cost, efficacy etc. (Adera, 2003). Moreover many cultures do not have an illness concept or general category that corresponds to the biomedical term malaria. In light of many difficulties in diagnosing of malaria case, it is important to study the local categories and

illness that correspond to malaria, since the concept of what is and what is not malaria can affect treatment seeking behavior (McCombie, 1996).

The official health sector includes hospitals, clinics, dispensaries, private practitioners, health centres and village health workers. This pattern of care usually follows the use of modern care. Savigny, Mayombana, Mwangeni, Masanja, Minhaj, Mkilindi, Mbuya, Kasale and Reid (2004) report that severe malaria is often treated with the use of modern health care in Tanzania as it accounts for up to 58.8% (both government and non-government providers). A study in Gambia also reports high use official health sector in the treatment of malaria (Clarke, Rowley, BÆgh, Walraven, & Lindsay, 2003). Self-treatment is the most prevalent of all the health seeking patterns. Most cases reported to the official health sector or traditional healers must have been treated with one medication or the other. In a classical review, Brinkmann and Brinkmann (1991) found the rate of self-treatment ranges from as low as 19% in Guinea to as high as 94% in rural Ghana.

Self-treatment includes both self-medication and what is called home treatment. The former involves treatment of self while the later involves treatment of a member of a household by another be a child or an adult. Self-treatment for malaria is usually the rule rather than exemption in African (Foster, 1995). Studies have revealed that self treatment is predicated on time, cost, low severity and short duration of illness (McCombie, 2002). Antimalarials are usually used in self-treatment. Mostly used is chloroquine (Verhoef et al., 1999). In Togo, 83% of all fever cases were treated with an antimalaria at home (McCombie, 2002) and In Dar es Salaam, Tanzania, 68%

of men and 77% of women reported using home reserve drugs for treatment in the past ( Mnyinka, Killewo & Kabalimu , 1995).

Individuals often use a combination of self-treatment, traditional medicines, and more than one clinic or health-care provider, what is known as a "hierarchy of resort" (McCombie, 1996). In a review of the literature of studies conducted throughout the world, McCombie found that there was a large range of variation in treatment-seeking patterns, with use of the official sector ranging from 10% to 99%, and resort to self-purchase of drugs ranging from 4% to 87%. Exclusive use of traditional healers and/or herbal treatments seems to be rare except in the most remote areas, while combining traditional remedies with "Western" methods is common. In a study of the sociomedical aspects of malaria control in Colombia, for example, researchers found that even though chloroquine was usually used, it was most often combined with plant remedies. This suggests both a long tradition of herbal treatment in this area and an acceptance, if only partial, of Western medicines (Lipowsky, Kroeger & Vazquez, 1992). Severity of illness may be related to this hierarchy of resort, with the use of multiple treatments: as one treatment fails and the illness worsen, people may take recourse in other, more drastic or costly means to alleviate it (McCombie, 1996).

When people employ a hierarchy of resort in seeking treatment for malaria, home treatment usually serves as the first line of defence. Although both allopathic medical services and those of traditional healers are used to prevent and treat symptoms of what is sometimes known to be malaria, most malaria patients are treated at home. In developing countries, constrained access to health care facilities reinforces the need to focus on local solutions in

the management of illnesses. A multi-country study by Susan Foster found that “self-treatment in Africa, especially in rural areas where about 75% of the population live, is the rule rather than the exception’ (Foster, 1995). Cost and convenience are obvious reasons for home treatment, especially in countries where “structural adjustment policies” are in place; yet perceptions also play a significant role. In terms of a hierarchy of resort, it is the perception of the majority of people in countries throughout the world that most illnesses should first be treated at home, and only when such treatment fails and the illness persists, or worsens, should other types of therapies be sought. The attitude of the health staff may be yet another reason for avoiding official health facilities for malaria treatment. When staff are brusque or condescending (due to ethical perceived class differences or other reasons), patients may not be comfortable asking questions to clarify dosage schedules or they may feel belittled. Indeed, the quality of interaction between staff and patient is often neglected in studies of health clinic attendance, even though this may be an important deterrent to facility use (Foster, 1995).

If it is perceived that health workers treat most patients rudely, that they do not have the appropriate drugs, or that the general quality of their services is inadequate, this will also influence a first preference for home treatment (Yeneneh et al., 1993).

Home treatment may, of course, result in incorrect or incomplete regimens or dosages, and it may also cause delays in taking a severely sick person to a health facility in a timely fashion (Fungladda, 1991; McCombie, 1996). Although a range of anti-malarial drugs are available in the market, the fact that many of those who "self-treat" purchase their medicaments from

poorly-informed shopkeepers and drug sellers is a significant reason for concern about misinformation on appropriate treatment (Massele et al., 1993). From a village setting in Sri Lanka it was learnt that "Malaria tablets circulated freely within the village, they were passed around according to need... Keeping a few tablets in stock was important, just in case, 'why should we take those tablets when we have no fever? Better store them for when we get sick?'" (Jayawardene, 1993). Indeed, this behaviour is found throughout the world and may be one of the leading reasons for drug resistance.

"Traditional malaria medication is based on the use of substances such as pepper, salty water, and bitter fruits, roots, and leaves and barks of certain trees. Most of these substances are ground into powder and boiled in water, to be taken as a drink, or added to food" (Vundule & Mharakurwa, 1996). The effectiveness of these substances is, of course, highly questionable. Nonetheless, a number of other traditional anti-malarial therapies have been found to have active ingredients effective against malaria. In a study of treatment-seeking behaviour among women in Uganda, researchers found that their subjects resorted to the use of local herbs first. Taking antibiotic tablets bought from local shops or left over from a prior illness was also quite common. A very small number of respondents reported going to a clinic/hospital as a first line of action, but there was general agreement that informal self-treatment was sought before pursuing formal care (Kengeya-Kayondo et al., 1994). Similarly, in a study of treatment-seeking behaviour for malaria in Somalia, researchers found that the first choice of treatment was use of local herbal remedies, the second line was irregular and unprescribed doses of

chloroquine, and the last resort was to visit a doctor or hospital (Abyan & Osman, 1993).

### **Other Factors Influencing Mode of Treatment**

In addition to consideration of the most appropriate treatment methods, there are various other ways by which people make decisions to seek care for specific stages of an illness. Social networks may play an important part. Indeed, many decisions about where to seek care are influenced by lay references. This may be especially true in Africa, where people may be affected by a network of kin, neighbours, and friends who constitute a "Treatment Management Group" (Janzen, 1978) and contribute to diagnosis and selection of treatment sources, both of which may have an impact on the course of treatment (Igun, 1987). Who makes the decision within the household, whether it is the mother or the father, may play an important role in which kind of treatment is sought, and this can vary by region, community, and even individual household. For example, in Ethiopia researchers found that treatment-seeking determinations were usually made jointly by both parents (Yeneneh et al., 1993).

In contrast, along the Kenyan Coast among the Mijikenda and Luo<sup>1</sup>, researchers found that the male head of household generally made decisions. Social roles played an important part in the decision-making process, especially ideas about who "owns" the child. This idea of "ownership" of children is an important consideration when studying treatment-seeking behaviour in patrilineal and matrilineal societies. Since the child belongs to the patrilineage, it is the male head that makes decisions. In the Kenyan study, the

male head of household (usually the husband) decided both about diagnosis as well as the type of treatment to be used. In the absence of a husband, male in-laws in the case of widowed women, and brothers or fathers in the case of unmarried women, made the determinations. A primary reason for this was to keep matters within the household and to protect the male head's position within it.

In the local belief system, malaria is sometimes thought to be caused by sorcery, which can be practiced by kin against kin. Illnesses are therefore kept hidden within the household until the local healer dispels the threat from other kin or performs the necessary counteractive measures (Mwenesi, 1994). Another important issue for malaria control efforts is who receives treatment, since children under age five are most at risk for severe malaria, and morbidity and mortality for this group is especially high due to low immunity (Massele et al., 1993). Local recognition that this group deserves special treatment is vital in decreasing morbidity and mortality and can be a challenge to health education. Some studies have shown that at the local level, this age group is often recognized as requiring special care. In a study of anti-malarial drug utilization by women in Ethiopia, researchers found that the under-five age group was identified as the most malaria-vulnerable and most in need of treatment. Severity of illness was seen as the primary determinant in seeking treatment (Yeneneh et al., 1993).

In a similar study of malaria treatment in Malawi, researchers found that clinic attendance was positively correlated with young age of the child, defined in this study as less than four years (Slutsker et al., 1994). Gender of the child is also a factor, as discrimination may result in better care for males

than for females. This was found to be the case in Malawi, where researchers learned that, among clinic attendees, male children were more likely to receive the correct dosage of chloroquine than were females (Slutsker et al., 1994). This could be gender discrimination by clinic workers or a more widespread gender bias across the entire culture. Outside the clinic, parents may be more inclined to bring male children to the clinic in the first place and within the clinic, health workers may give better treatment to male children. Pregnant women, especially if they are primigravida, are another group at high risk because of suppressed immunity during pregnancy (Okonofua, 1992).

For young pregnant women, however, cultural prejudices may play a role in barriers to treatment, especially if the women are unmarried. In a study among pregnant and non-pregnant adolescent girls in Nigeria, researchers found that premarital pregnancy was resented and associated with shame. Most parents hid their unmarried, pregnant daughters at home to avoid the humiliation, and the daughters themselves stated that they did not want to be seen in public because of the negative attitude toward premarital adolescent pregnancy. Thus many of these adolescents were more likely to practice self-medication for malaria, rather than using the village health facility (Okonofua, 1992). Another problem in treating pregnant women for malaria is the very common belief that chloroquine tablets can cause abortion and there is substantial evidence to suggest that excessive use of chloroquine can indeed precipitate abortion (Phillips-Howard et al., 1998; Phillips-Howard & Wood, 1996; Schultz et al., 1996). Few women in the Afgoi Women's Organisation in Somalia advocated use of chloroquine tablets for pregnant women (Abyan & Osman, 1993). In a study of malaria treatment practices among mothers in



Guinea, researchers found that lack of chloroquine usage was significantly associated among urban women with the belief that the pills would cause miscarriage. The fear pregnant women may have of losing their babies as a result of taking chloroquine far outweighs their concern about contracting malaria and they thus avoid use of the drug. This was not found among women in rural areas, however. The discrepancy may have been due to exposure to chloroquine and its use: those in rural areas may have had less exposure than urban women to the idea that chloroquine causes abortions and so was not as disinclined to its use during pregnancy (Glik, Ward, Gordon & Haba, 1989). It should be pointed out; however, that severe malaria during pregnancy can lead to fetal death (Alecrim, Espinosa & Alecrim, 2000; Phillips-Howard, 1999; Steketee, Wirima & Campbell, 1996).

### **Self-Treatment and Use of Anti-Malarial Drugs**

Self-treatment is the most common mode of action in malaria cases, especially in rural areas of Africa, where 75% of the cases of malaria occur (Foster, 1995). In a study of home treatment of febrile children in Togo, researchers found that 83% of children were treated with an anti-malarial drug at home, with chloroquine from a street market or vendor being the drug of choice which constitutes 94% (Deming et al., 1989). Similarly, Ryan (1995) found that in a Kom village of Cameroon, 83% of the illnesses were treated at home, with 22.5% of the 454 illness episodes seeking treatment outside the home. Kroeger (1983) reported that 80% of illnesses are managed within the household, further pointing to the importance of looking at the home as a major player in the management of health problems. In a review of the

treatment-seeking literature, McCombie (1996) also found that care of most malaria episodes begins with self-treatment, and that nearly half of all cases were treated solely with these methods. Despite the potential dangers of failed treatment due to chloroquine-resistant strains of malaria, chloroquine continues to be the most widely available and widely used drug in many areas of the world. But indiscriminate and partial chloroquine use may significantly contribute to the growth of resistant strains.

In most countries, the four main distribution or supply networks for drugs are the public sector; non-profit sector; the private commercial sector; and the private "unofficial" or "informal" sector. Many drugs are purchased in the private sector, which includes official "ethical pharmacies" as well as "unofficial" outlets like drugstores, general stores, market sellers, and street peddlers (Foster, 1991).

There are various reasons why people choose to patronise pharmacies, shops, and even illegal drug sellers in addition to and instead of health centres. First, and perhaps foremost, is the ease of purchasing drugs and obtaining "immediate" treatment. In a study in Maiduguri, Nigeria, the researchers found that immediate attention for both consultation and treatment was the single most important reason for patronizing retail pharmacies rather than health clinics (Igun, 1987). Another important factor was "availability of unadulterated drugs at all times," since the pharmacy was open during hours when the health clinics were closed (Igun, 1987). The inadequacies of the health delivery system in Nigeria were legion, including overcrowded outpatient clinics and wards, no availability of drugs due either to insufficient

resources or mismanagement of funds, and preferential treatment based upon "who you know."

In a similar study in Ethiopia, reasons for failing to complete a full course of treatment included unpleasant taste of the drug, "the drug was too strong," and subsidence of malaria symptoms, which made further use of the drug "unnecessary" (Yeneneh et al., 1993).

Since self-treatment is so common, it is likely to continue as the main resort for the majority of malaria cases in the future. In fact, were people in many developing countries to cease self-medicating and to seek care in health facilities, it would be disastrous, as most of these institutions would be unable to cope with the large influx of cases that would result. According to Foster (1995), 'patients are actually doing the health services a financial favour by self-medicating. Nevertheless, self-treatment of malaria entails many potential dangers. First, home treatment may result in delays in taking patients with severe malaria to health centres (Menon et al., 1988). Caretakers may wait until the condition resolves on its own or when the illness does not resolve and indeed worsens, it may be too late, as a delay of even a couple of days may prove deadly in cases of severe malaria.

In a study of treatment of childhood malaria among mothers on the Kenyan Coast, researchers found that mothers were treating their children with anti-malarials within 24 hours of the onset of illness. However, the average time lag between taking children to the hospital and the onset of illness was three days (Mwenesi, 1994). Second, if chloroquine is used first at home and then administered again at the clinic, there is a chance of overdosing if clinic staff is unaware that medication has been previously used. Third, the spread of

chloroquine-resistant malaria strains may be increased by indiscriminate and improper use of the drug (Mwenesi, 1994). Improper or inappropriate use of anti-malarial drugs is the result of a number of factors. Illiteracy may be a significant issue: people who are unable to read the instructions on or in the medicine packages may not understand the correct dosage (Mburu, Spencer & Kaseje, 1987). If health workers do not correctly explain how to use drugs, if the health workers themselves are misinformed, or if the medicine is bought at a shop where incorrect or little information is given, the potential for misuse is high (Djimde, Plowe, Diop, Dick, Welles & Doumbo, 1998). Under-dosing is the most common result (McCombie, 1996). In fact, anti-malarials are frequently shared among family members (Ruebush, Kern, Campbell & Oloo, 1995) and since the full course of treatment is usually not completed, tablets are saved for the next bout of illness (McCombie, 1996).

Failure to complete treatment is common, whether the drugs are bought from the unofficial sector or obtained from a health-care clinic (McCombie, 1996). In a study in Ethiopia, researchers found that mothers with more than two children were more likely to stop treatment after the symptoms went away, rather than completing the full course of anti-malarials, in order to save the remaining pills for the other children (Yeneneh et al., 1993). Another factor in under-dosing relates to the large numbers of people who purchase drugs from shops or illegal vendors who recommend the wrong amount (Djimde et al., 1998). In a study of the treatment of malaria in Dar es Salaam, Tanzania, researchers found that shopkeepers and drug sellers receive no formal education on the proper treatment of malaria. Since the people interviewed in the study did not have adequate knowledge about chloroquine

dosage (only 30% of patients and 20% of shoppers knew the correct dosage), the researchers concluded that the customers were not receiving adequate information from shops and drug sellers (Massele et al., 1993).

In Maiduguri, Nigeria, researchers learned that diagnosis and treatment of malaria was being handled by retail pharmacists, as well as by people who had no qualifications for working in the pharmacy and were licensed to sell only proprietary non-poisonous drugs (Igun, 1987). Researchers noted a similar activity in Saradidi, Kenya, where shopkeepers both supplied and prescribed drugs. With many people asking for advice about the proper dosage, shopkeepers influenced the amount of drugs taken (Mburu, Spencer & Kaseje, 1987; van der Geest, 1999). Even if people do visit health facilities, they may not necessarily receive the correct advice. A common problem associated with low-level health facilities is over prescription of too many different drugs. Health workers may overprescribe drugs to appear to be "good doctors," which may create confusion about which medication is really needed. Further, when patients reach the pharmacy they may ask again for help, this time from the worker at the counter, who in effect fulfills the prescribing role, even though sufficient knowledge to do so is lacking (Foster, 1991).

### **Traditional Treatment Methods and Healers**

Since traditional treatment methods and healers may often be the first line of treatment for malaria, it is important to understand how, why, and what kinds of traditional methods are used. This is particularly crucial since many control programmes in the past have ignored the ways that traditional medical

systems and local people deal with the disease (Lipowsky, Kroeger & Vazquez, 1992). Many cultures, especially in Africa, combine religion, sorcery, health, and interpersonal conflict into a unified system of belief and practice, making it necessary to consider all aspects of the social and economic environment in studying treatment-seeking behaviour for malaria (Gessler et al., 1995b).

The use of herbal remedies in the treatment of malaria is widespread. They are often an inexpensive alternative to Western antibiotics (Ruebush et al., 1995; Silva, 1991; Tona et al., 1999). In Somalia, the aetiological connection between malaria and the mosquito has probably been recognized for a long time, and as a consequence of the long historical interaction between local culture and malaria, Somalis have developed many of their own treatment practices, including consumption of "Khat" leaves (a mild drug-like substance), fresh camel milk, purgative herbs such as "Carmo" leaves, black river fish, reciting verses of the Quaran, and massaging ill people with a mixture of sesame oil and lemon juice (Abyan & Osman, 1993). Traditional healers may be consulted for a number of reasons - social, economic, therapeutic, and psychological.

In a review of treatment-seeking behaviour, McCombie (1996) found that, even if most people preferred self-treatment, traditional healers were most often consulted for cases of convulsions, splenomegaly, and anaemia, even if these symptoms were not associated with malaria. Indeed, traditional healers serve a variety of important roles. In a study of the use of traditional healers in the malaria volunteer programme in Thailand, villagers preferred the traditional healers, many of whom were actually "injection doctors,"

specializing in administering treatment via injections. Villagers felt more comfortable having their fingers pricked by someone with previous experience in handling needles, and they felt that they were more able to complain about their symptoms and receive a sympathetic response (Okanurak, Sornmani & Chitprarop, 1992). In a study in Ethiopia, researchers also found that traditional birth attendants are believed to understand women's and children's problems and consequently are more likely to have a better rapport with mothers. Including indigenous and/or other traditional specialists as volunteer malaria workers may increase access to anti-malaria drugs for some hard-to-reach mothers and children (Yeneneh et al., 1993).

Perceptions about the cause and appropriate methods to be used can play a large role in the type of treatment chosen. The absence of a true symptom complex, combined with variations in cultural perceptions and interpretations of symptoms, makes identification of malaria cases difficult. Indeed, the identification of malaria-like illnesses is highly variable. Diagnosis can be subsumed either under one large illness category or several illness terms can be used, based on the different manifestations of the illness (Igun, 1987). Thus, the variability of symptoms may lead to different treatment methods. For example, along the coast of Kenya researchers found that the use of traditional methods and healers depended on different clinical manifestations of the illness (Snow et al., 1992). In Tanzania, researchers also found that local residents made use of treatment methods based upon different types of patients (male, female, pregnant female, young child) and different presentations of the disease (Gessler et al., 1995a).

In a more serious and potentially deadly example, other researchers in Kenya reported that convulsions (an indication of severe cerebral malaria), while considered life-threatening, were attributed to supernatural causes and anti-malarial drugs and anti-pyretics were counter indicated when convulsions occurred, and were actually withheld or withdrawn from children having convulsions (Mwenesi, Harpham & Snow, 1995). This disease concept is also common in Tanzania, where it is considered dangerous for children with *ndege-ndege* (convulsions) to receive "Western" treatment. Different aetiological explanations for malaria can lead to different treatment methods. For example, where malaria is thought to be of supernatural origin, treatment is usually within the domain of traditional medicine. On the other hand, those illnesses thought to be due to natural causes can be cared for through more modern methods and treatment therapies. The two are often combined, sometimes simultaneously, especially in Africa (Igun, 1987). Moreover, many cultures do not have an illness concept or general category that corresponds to the biomedical term "malaria." In light of the many difficulties in diagnosing malaria cases, it is important to study local disease categories and illnesses that correspond to malaria, since the concept of what is and is not malaria can affect treatment-seeking behaviour (McCombie, 1996).

Among Mijikenda mothers in Kenya, malaria is perceived as a chronic disease, but not a particularly severe one. Since this explanation of malaria does not account for it becoming a severe condition convulsion, anaemia, and splenomegaly are not considered related to it and are thought to have their own ethno-etologies and treatments, not necessarily the same as those for malaria. Moreover, the type of treatment used for convulsions at hospital is not



consistent with traditional expectations; reason enough for mothers to avoid taking children with these symptoms to hospitals. Injections are the primary form of treatment in these instances, but it is these procedures that are believed by mothers to cause the death of children with convulsions at hospital. Perhaps most paediatric malaria deaths occur in hospital emergency wards because that is where children are brought when their illness is often too far advanced to respond to treatment. Unfortunately, these deaths only serve to reinforce the idea that children with convulsions who are brought to health clinics do not survive the treatment, especially the "strong" (or "hot" as it would be called elsewhere) injections, administered there (Mwenesi, 1994).

### **Use of Health-Care Facilities**

Considerable variations can be found in the use of the official health sector in the treatment of malaria. Part of this variability lies in cultural practices, but other barriers play a large role as well. Clinic attendance usually shows an urban versus rural differentiation. Even though malaria is usually most prevalent in rural areas, either because of difficulty of access to health facilities or because of the presence of more traditional methods, clinic attendance is usually lower. In a review of the literature, McCombie (1996) found that urban areas usually present lower rates of malaria, while at the same time showing higher rates of attendance at health facilities. Self-treatment, both with anti-malarial drugs and traditional remedies, was higher in rural areas due to differential access to health facilities, income levels, educational level, and prevalence of the disease.

McCombie also found that access to health facilities, severity of illness, and cost were the main impediments to health-centre use. Indeed, concern over cost of treatment is a primary reason for non-use of health clinics, as well as being a primary motivator for self-treatment, the main problem being ability, not willingness, to pay (Foster, 1991). Herbal treatment is practically free (Ahorlu et al., 1997), while certain allopathic anti-malarial can sometimes be purchased individually at shops, decreasing the cost of a single course of treatment. Visits to health centres, however, may entail additional and sometimes prohibitive costs, including travelling expenses and time lost from productive activities. Another significant concern is the timing of malaria, which often does not overlap with the "seasonality" of available income from agricultural-based economic activities. Seeking care at health clinics requires money. In many countries malaria appears during the rainy season, when cash reserves from the previous harvest are at their lowest. Thus those seeking care at this time of year are less able to afford it due to loss of time that would be used for productive activities as well as the low cash reserves (Foster, 1991). Commuting time to hospital or clinic can also be a serious concern.

The nonmonetary cost and inconvenience of attending health centres may be underestimated in studies of health-centre attendance (Snow et al., 1992). In a study of the use of shops in the treatment of malaria along the coast of Kenya, researchers found that mothers preferred to purchase drugs from over-the-counter stores close to home because the women did not have to go themselves and could send siblings of the sick child or other family members to buy medication while they stayed home and attended to their

household duties and other productive activities (Snow et al, 1992). The hours of service are yet another factor, since shops may be open and more convenient in emergencies that occur at times of the day when health facilities are closed (Mburu, Spencer & Kaseje, 1987).

Since malaria is a major problem in rural areas, the remote location of many villages can serve as a barrier to treatment. Quite simply, if caretakers cannot reach the facilities, they cannot use them. This was a major problem as well as a primary reason for the purchase of drugs from shops in the above-mentioned study in Kenya (Mburu, Spencer & Kaseje, 1987). Similarly, in a study of malaria treatment practices among mothers in Guinea, researchers found that rural mothers who lived farthest from health facilities were less likely to attend them and were tardier in administering medication to sick children than women who lived closer to health clinics (Glik et al, 1989). There are other, more subtle reasons responsible for the difficulties of treating malaria at rural health centres. Transportation is often arduous in remote areas, making timely delivery of supplies problematic. Preventing drug pilfering along the supply route and ensuring that most drugs reach their intended destinations is a concern as well. Finally, preventing deterioration of the drugs during transport can be formidable (Foster, 1991).

All of these problems with the supply and quality of drugs at rural health centres can negatively affect people's desires to seek treatment there. Other barriers to the use of health centres include the long waiting times common at many rural health facilities, as well as shortages of medicines. In a study of self-treatment in a rural area of western Kenya, researchers found that fewer than one in four people went to the rural health centre or to a hospital

during any stage of their illness, even though these facilities were free and readily accessible. Reasons included the long wait times at the clinics, the often brusque manner of the overworked staff (who frequently dealt with 50 to 60 patients in a morning), and the frequent shortages of drugs. Furthermore, there was concern and doubt about the effectiveness of the treatments (Ruebush et al., 1995). This was also found to be a problem in a similar study along the Kenyan Coast, where Sokoke mothers preferred to make a 40-kilometre journey to a district hospital in Kilifi District, rather than attending the government dispensary in the area that was much more accessible. They considered the "muzungu" (white) doctors in the malaria clinic to be more qualified, and they believed that they would receive better treatment, even though the rural dispensaries offered fee-free services, while the hospital in Kilifi District charged (Mwenesi, 1994).

### **Private and Public Sector Sources of Malaria Treatment**

The attitude of the health staff may be yet another reason for avoiding official health facilities. When staff are brusque or condescending (due to ethnic, perceived class differences or other reasons), patients may not be comfortable asking questions to clarify dosage schedules or they may feel belittled. Indeed, the quality of the interaction between health staff and patient is often neglected in studies of health-clinic attendance (Foster, 1995), even though this may be an important deterrent to facility use. In a study of childhood treatment of malaria along the Kenyan Coast, researchers found that 55% of mothers who were given medication for their children did not understand instructions and did not ask clinic staff for verification.

The reason they gave for their failure to make inquiries was that health-centre staff could be harsh and rude when asked too many questions (Mwenesi, 1994). Health staff may not carry out their proper roles, and may in fact engage in illegal sale of drugs because of poor salaries. This was found to be the case in a study in Ethiopia, where some of the health agents were found to be selling anti-malarial and other drugs illegally (Yeneneh et al., 1993). If malaria morbidity and mortality are to be reduced, treatment-seeking behaviour is one of the primary issues that must be addressed. Delays in seeking treatment at health centres, inappropriate or inadequate use of anti-malarial drugs, and the use of traditional herbal treatments and the roles that healers play in treatment all contribute to the high rates of malaria morbidity and mortality in developing countries. An understanding of the social and cultural motivating factors is essential to any malaria control effort, as is integrating a social-behavioural approach and the use of already existing literature on this subject into the design of malaria control programmes.

Literature reviewed above indicates dozens of books and hundreds of scientific articles published in the major professional journals documenting the nature and dynamics of malaria control. However, nearly all those reports focus solely on malaria treatment logical in biological terms excluding those shared experience and knowledge well-embedded in a local culture.

Arguably, despite the abundance of literature on malaria there is a lack of research on perception of Artesunate+Amodiaquine. There is therefore the need for further studies which will delve further into the aspect of perception. This study will then focus on local perception of Artesunate+Amodiaquine for the treatment of uncomplicated malaria.

### **Theoretical Perspective of the Study**

People's perceptions and meanings of social phenomena may be accounted for by cognitive theory while economic behaviours, choices of scale at preference may be explained by various economic models. It appears, however, that a transactionalist perspective will enable us to pull together the two stands of behavioural models to understand better people's perception of a drug. Transactionalism operates on the assumption of individual choice and social forms and is explained as cumulative results of current choices that people make as they interact. The choices made are rational to the extent that people choose such interactions as they consider in their best interest (Barth, 1959; 1996; Boissevain, 1974; Verrips, 1974). In examining rationality in the context of available choices, Sergent (1982), defines rationality as choosing the most effective means to reach a goal (or most preferred goal when a set of goals is involved) however that goal is defined. Therefore patients/caretakers weigh the advantages of buying the medicine over the counter versus getting it from the dispensary.

They consider the expenses involved and rationalize in economic terms their choice of treatment. Because the cost of drugs is lower when taken directly from the shops, as is evident from the quote above, one is likely to opt for drugs from the shop rather than to go to a government health care facility or to a private health care provider. Since they report that they get well after using the medicine there is really no reason why they should go to the health care providers for treatment unless they consider their condition as serious. They end up spending less money that way. It can be a frustrating exercise, sometimes futile, to try and get treatment at a public health care facility.

As several studies have now shown, however, transactions in the therapeutic processes which are essentially about medicines have strong symbolic overtones. Thus the acceptance of medicines makes sense only if we consider their therapeutic power in social and symbolic context.

The symbolic meaning of medicines has recently engaged the attention of medical anthropologists. Montagne (1988) argues that drug metaphors and symbols are quite pervasive in individual thinking, social discourse, and the cultural media. In very concrete terms, Nichter (1980) and Bledsoe and Goudbaud (1988) have found in India and Sierra Leone, respectively that among others, the colour of medicines influence their use to the extent that traditional notions of efficacy of medicines are colour based.

Usually, cognitive aspects of pharmaceuticals borders on the colour, size and taste of the medicine which influence its categorization and efficacy assessment. Yellow medicines are classified as anti-malarial because malaria induces yellowish urine. Red / Brown medicines are classified as blood-giving because of the colour of blood. The central argument of this study borders on acceptability and safety of Artesunate+ Amodiaquine. This may be influenced by people's belief and opinion of the drug.

Consequently, drug companies are leaving nothing to chance. The color and shape of the pills, and the names and imagery used to sell products are heavily researched and tested, much like the drugs themselves. Color has been elevated to a "powerhouse" status because it is the most fundamental part of a drug's personality. As is the case with all products – from computers to colas - purchasing decisions are not just based on what a product looks like (visual brand) but on the idea of the brand (its core brand value), how

customers feel about it (emotional brand). In other words, color has the unique ability to do all three simultaneously – to create emotional appeal, to communicate functional values and benefits (such as reliable pain relief), and to distinguish the brand from others. The effectiveness of any drug involves many factors not just the pharmacological ingredients. The hidden benefits of a drug are termed the ‘placebo effect’, but because many of these factors cannot be explained scientifically they are often dismissed as irrelevant. However, factors including the attributes of the drug itself (shape, colour, taste), relationship between the one dispensing the drug and the patient receiving it, the route of administration, the setting in which the drug is given and wider sociocultural beliefs surrounding the ingestion of medicines can all have a major influence on a drug’s efficacy (the British Journal of Nursing, Vol. 8, Iss. 9, 13 May 1999).

Like many other sociological perspectives, transactionalism, since its inception, has been subjected to massive criticism. The core of most of these is that the perspective assumes too much rationalism in human behaviour (Asad, 1972; Robben, 1994). This notwithstanding, it still has lingering merits, its attraction lies in the fact that it opens more layers for understanding human thought processes. In this regard, transactionalism should help to explain the multi-level self interests and choices that people have as they contend with ill-health.

In sum, then, the appeal of transactionalism is the promise it affords to investigate the perception of patients / consumers and this to a large extent goes beyond symbolism. It may help to explain in fuller manner people’s perception of a drug.



## CHAPTER THREE

### METHODOLOGY

#### Introduction

The purpose of this study was to examine the usage of Artesunate + Amodiaquine combination for the treatment of uncomplicated malaria and its perceived side effects in the Anakyin community of Cape Coast Metropolis. This chapter discusses the research methodology including the research design, population and sampling, data collection and data analysis.

#### Study Area

This study was conducted in April, 2008, in Anakyin, in the Cape Coast Metropolis of Ghana. The Cape Coast Metropolis is located in the coastal shrub vegetation zone and bounded on the south by the Gulf of Guinea, west by the Komenda / Edina / Eguafu / Abrem District, east by the Abura/Asebu/Kwamankese District and north by the Twifu/Hemang/Lower Denkyira District. The Municipality covers an area of 122 square kilometers and is the smallest district in the country. The district has a population of 118,106 with the female and male population of 60,741 and 57,367 respectively (National Population Census 2000). Although the larger female population reflects the national pattern, the phenomenon in this municipality may be attributed firstly to a higher male out-migration rate; and secondly, to the rapidly urbanizing nature of the Municipal area which encourages

economically active females to stay back and engage in small-scale economic activities. About 70% of the people are farmers. Currently, there are about 70 farming communities in and around the municipality. Fishing activities also take place in the Municipality; these activities are done on the sea, lagoons, ponds, rivers and streams. The sea is however the major source of fish, accounting for about 90% of the total catch. Along with this is a thriving fish-related industry encompassing fish mongering, distribution and sales.

The people of Cape Coast are part of a larger group of Fantes found in the central part of Southern Ghana. The Fantes are part of the Akan ethnic groups of Ghana. The language spoken by the people is Fante. Other Ethnic groups, mostly immigrants like the Ewes, Gas, Adas, Krobos, Nzemas, Twi-Speaking Akans, and others from the Northern Ghana reside in the Municipality as farmers, fishermen, traders, government workers, commercial drivers, and artisans, among others. The entire Municipality constitutes one traditional area with the ‘Oguaa Omanhen’ as the paramount chief. The matrilineal system of inheritance is practiced by the people. The extended family or clan, locally known as “ebusua” is the basis of the social structure of the people. The “odikro” or the Traditional ruler is the political head of a town or village. The main festival celebrated in the Municipality is the Oguaa Fetu Afahye, which is celebrated in the first Saturday of September every year and is watched by people from all walks of lives, both from far and near.

The Cape Coast Metropolitan Assembly is synonymous with a City District. This is because Cape Coast is the most populous settlement in the district with functions that make it the nerve centre of economic activity for both the district and the region. About 6% of settlements in the Municipal

Area including Cape Coast, Ekon and Nkanfoa and Kakomdo account for nearly 85% of the population of the entire district. Out of the 71 settlements in the Municipal area, 54 or 76% of them have population less than 1,000 persons and account for only 10% of the district's population. Thirty of the settlements (43%) have population less than 100 persons.

Anakyin has a population of about 860. The people in the community are predominantly food crop farmers and petty traders. Some are also fishermen. The community falls within the catchment area of Cape Coast Metropolitan Hospital (CCMH) and malaria tops diseases of public health importance in the community (CCMH, 2007).

### **Research Design**

A quantitative descriptive design was used to describe the general attitude to, and perception of, Artesunate + Amodiaquine. A descriptive study was chosen as it helps us to gain more information about characteristics within the particular field of study (Burns & Grove, 1993). It also allows us to provide a picture of situations as they naturally happen. Survey designs are concerned with gathering information from a segment of the population to describe things as they currently exist. Surveys allow the researcher identifies the variables of interest and ascertains the frequency of occurrence but this cannot be used to infer causality or the extent of the relationship between variables (Talbot, 1995). By adopting descriptive design, it was envisaged that the outcome of this study will give a detailed picture of the general perception on the drug of interest.

## Population and Sampling

The population (target population) for this study was the entire set of individuals in the Anakyin community. The accessible population is the portion of the target population that conforms to the designated criteria to which the researcher has reasonable access (Polit & Hungler, 1995; Burns & Grove, 1995; Burns & Grove, 1993). Anakyin has a population of about 860. The target population comprised both males and females aged 20 years and above living in the community. The respondents were selected as follows.

Two hundred and sixty (260) people out of the total population of 860 were interviewed. Kirk scale was used to select the sample size to prevent underestimation of respondents. Kirk's format uses a table of recommended Sample Sizes (n) for Population (N) with Finite Sizes. From the table, every population size you find out has its corresponding sample (Kirk, 1995).

The study site was divided into ten equal vicinities going by the landscape and the streets running through the area. This was done to ensure fair representativeness of the sample. That is, respondents in the sample were from all over the Anakyin community. On the average, each vicinity comprised seven houses. With simple random sampling technique five out of seven houses were selected from each vicinity for interviewing. The houses were identified by numbers. These numbers were written on pieces of paper and put in a bowl. After shuffling, five pieces of papers were picked and their corresponding house numbers were located for interviewing. A total number of 50 houses, with the average number of 13 inhabitants each, in Anakyin community were selected for interviewing. All the selected households had inhabitants who were 18 years and above. However, forty out of the 50

selected households had 5 inhabitants each aged 18 years and above, whereas the remaining ten households had 6 inhabitants each aged 18 years and above. Therefore a total number of 260 respondents were selected as the sample for the study. Respondents were asked to respond to a questionnaire which seeks information on: (i) demographic and socio-economic characteristics, (ii) number of children, (iii) religious affiliation, (iv) educational status, (v) cost of health care, and (vi) distance from home to the nearest health care facility, (vii) perception of Artesunate + Amodiaquine.

### **Data collection**

Semi-structured interviews were conducted with respondents. The use of interviews is useful in the study of sensitive topics as well as help to increase response rates (Parahoo, 1997). The interviewer conducted a face-to-face interview. In this type of interview, the interviewer traces and contacts the respondents where the respondent and the interviewer sit together see each other, observe each other's expressions and reactions to questions or answers (Kumekpor, 2002). In this case, the respondents will be interviewed by the researcher and the answers provided by respondents which will be written down verbatim.

In semi-structured interviews, all respondents are asked the same questions, but there is flexibility in the phrasing and order of the questions (Parahoo, 1997). The researcher is in control of the content and the purpose of the interview, with the opportunity to change the words but not the meaning of questions. It acknowledges that not every word has the same meaning to every respondent and not every respondent uses the same vocabulary.

The interview schedule was refined after administering it to a small group of people with characteristics similar to those of the intended respondents. This was done to ensure that the respondents understand the questions, that the format of the questions is suitable for the population and that the questions are relevant. It also helped us to test the length of the questionnaire and its structure to be sure that it affects responses and procedure for recording responses (Parahoo, 1997; Burns & Grove, 1993). Secondary data was obtained from Cape Coast Metropolitan Assembly and Cape Coast Metropolitan Hospital.

### **Data Analysis**

To ensure good quality data, all questions were manually checked in the field and all discrepancies sorted out before being submitted for data entry. All qualitative data were transcribed and typed into a computer using Microsoft word for windows. All semi-structured interviews were coded and analysed using Statistical Product for Service Solutions (Version 16 for Microsoft Windows). The study employed percentages, graphs and histograms to present findings.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### **Introduction**

This chapter focuses on the presentation, interpretation and discussion of the primary data. The chapter first presents data on demographic characteristics of respondents, followed by results pertinent to the study focus. The results are then discussed and conclusions are drawn.

#### **Demographic characteristics of respondents**

The following tables present data on demographic characteristics of the respondents.

**Table 1: Age of Respondents**

Age	Frequency	Percentage (%)
20-29	60	23.1
30-39	54	20.8
40-49	68	26.2
50-59	65	25.0
60-69	13	5.0
Total	260	100.0

Source: Fieldwork, 2009.

The Age of respondents ranged from 20 to 69 years. Respondents were fairly distributed across the age groups except the age group 60 – 69 years which constituted only five percent of the respondents (Table 1). Females constituted the majority (51.2%) of respondents.

**Table 2: Marital Status of respondents**

Marital Status	Frequency	Percentage (%)
Never Married	105	40.4
Married	127	48.8
Separated	5	1.9
Divorced	16	6.2
Widowed	7	2.7
Total	260	100.0

Source: Fieldwork, 2009.

Nearly half of the respondents (127(48.8%)) were married, while 40.4% were never married. Only seven (2.7%) of the respondents were widowed (Table 2). The following Table 3 looks at the occupation of the respondents.

**Table 3: Occupation of respondents**

Occupation	Frequency	Percentage
Pastor	2	0.8
Trader	102	39.2
Student	21	8.1
Beautician	21	8.1
Health worker	35	13.5
Security officer	14	5.4
Farmer	10	3.8
Carpenter	20	7.7



Teacher	29	11.2
Unemployed	6	2.3
Total	260	100.0

Source: Fieldwork, 2009.

Out of the 260 respondents interviewed approximately 40% were traders whereas 0.8% were pastors (Table 3). Six respondents were unemployed and 11.2% were teachers.

**Table 4: Educational level of respondents**

Characteristic	Frequency	Percentage (%)
None	4	1.5
Basic	58	22.3
Secondary	93	35.8
Vocational/technical	44	16.9
Tertiary	61	23.5
Total	260	100.0

Source: Fieldwork, 2009.

Table 4 presents the educational levels attained by respondents. Ninety-three (35.8%) were Senior High School leavers, while four respondents had no formal education. However, 58 respondents had some basic education, while as many as sixty-one respondents had tertiary education.

#### **Respondents' information about and usage of Artesunate +Amodiaquine**

As stated in the objectives of this study, respondents' information about Artesunate + Amodiaquine, and its usage among the respondents was investigated. The following tables present results in this regard.

**Table 5: How often respondents are diagnosed with malaria yearly by sex**

Variable	How often are you diagnosed of malaria in a year				Total
	Once	Twice	three times	4 times & more	
	N (%)	N (%)	N (%)	N (%)	
Male	10 (7.9)	58 (45.7)	41 (32.3)	18 (14.1)	127 (100)
Sex Female	9 (6.8)	36 (27.1)	65 (48.9)	23 (17.2)	133 (100)
Total	19 (7.3)	94 (36.2)	106 (40.7)	41 (15.8)	260 (100)

Source: Fieldwork, 2009.

Out of the 127 male respondents interviewed, only 10 (7.9%) were diagnosed with malaria at their various sources of treatment once in a year. Fifty-eight (45.7%) of the men were also diagnosed of malaria twice in a year. Approximately 49% of female respondents were diagnosed of malaria thrice a year, while only nine (6.8%) females were diagnosed of malaria once in a year. On the whole, more women (52%) were diagnosed with malaria than men (48%). On a whole however, 40.6% of the respondents were diagnosed of malaria thrice a year, while only 19 of the respondents were diagnosed once in a year.

**Table 6: Sources of malaria treatment**

Variables	Frequency	Percentage (%)
Hospital	198	76.4
Drug store	26	10.0
Traditional medicine	35	13.5
Total	259	100.0

Source: Fieldwork, 2009.

The majority (76%) of respondents usually seek treatment at the hospital whereas 14% resort to traditional healers. Only 10% usually visit the drug store when they have signs/symptoms of suspected malaria (Table 6). For instance, a woman reported that:

“Most of our people are poor. As a result, we have limited opportunity to visit private clinics, though we all know that they provide better and prompt treatment. Therefore, we choose to seek health care at the government hospital for the sake of getting the services free of charge or at a low cost” (A 49-year-old respondent).

Respondents were also asked of the type of anti-malarial drug they take when they get malaria. Their responses are reported in Table 6 below.

**Table 7: Type of anti-malarial taken**

Characteristic	Frequency	Percentage
Artesunate+amodiaquine	151	58.0
Alaxin	48	18.5
Chloroquine	20	7.7
Malafan	41	15.8

Total	260	100.0
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Source: Fieldwork, 2009.

Antimalarial drugs often taken by respondents varied. The majority (58%) of them often receives or takes Artesunate+Amodiaquine when they are diagnosed of or suspected to have malaria. However, only 20 respondents reported that they take chloroquine (Table 7).

**Table 8: Prescriber of Artesunate+Amodiaquine**

Characteristic	Frequency	Percentage (%)
Medical doctor	132	50.8
Pharmacist	36	13.8
Self	9	3.5
Medical assistant	83	32.9
Total	260	100.0

Source: Fieldwork, 2009.

It came to light that the majority (50.8%) of antimalaria drugs taken by respondents are usually prescribe by the Medical Doctors and Medical Assistants (32.9%). Self-medication (3.5%) using antimalarial drugs were found to be low among respondents (Table 8).

**Table 9: Source of information on Artesunate+Amodiaquine**

Characteristic	Frequency	Percentage (%)
Media	72	27.7

Public health personnel	154	59.2
Friends	19	7.3
Relatives	15	5.8
Total	260	100.0

Source: Fieldwork, 2009.

Respondents were asked how they got to know about artesunate + amodiaquine and various sources were mentioned. However, the majority (59.2%) reported that they usually receive information on the drugs from Public Health Personnel (Table 9).

When respondents were asked about the amount of information they had about Artesunate + Amodiaquine, (Most of them, 174 (66.9%) reported that they had scanty information about the drugs, while 86 (33.1%) said they have adequate information about the combination drug.

### **Respondents' perceptions about Artesunate + Amodiaquine**

The majority of respondents 211(81.2%) reported that they usually complete the full course of Artesunate + Amodiaquine when given, whereas 18.8% either have never been given the drugs or usually fail to complete the course. Table 9 displays adverse effects of Artesunate + Amodiaquine reported by the respondents.

**Table 10: Complaints of adverse effects of artesunate + amodiaquine**

Side Effect	Frequency	Percentage
Drowsiness	119	46
Weakness	126	48.5

No side effect	15	5.5
Total	260	100.0

Source: Fieldwork, 2009.

Respondents were asked whether they experienced some adverse effects after taking the drug and almost half of them (48.5%) reported feeling weak after taking the drug (Table 10). The following representative qualitative responses demonstrate how respondents feel about artesunate and amodiaquine (AS+AQ) combination therapy; “side effects due to AS+AQ are rare in occurrence. I have used the drug and think that it is a good drug without any side effects” (A 25-year old male respondent). A female respondent said, “I think that AS+AQ cures better than chloroquine and it is a good drug except that it has some minor side effects”. On the contrary, an elderly man said “a lot of people experience side-effects after taking AS+AQ. Some of these side effects are very severe and if really what people complain about is due to AS+AQ, then it is a problem (41- year old male reported).

**Table 11: Respondents’ opinion about Artesunate + Amodiaquine**

Rating	Frequency	Percentage
<b>General Opinion</b>		
Bad	6	2.3
Good	157	60.4
Very good	97	37.3
<b>Taste</b>		
Bitter/Sour	260	100.0
<b>Cost</b>		

Expensive	90	34.6
Affordable	170	65.4
Complexity of Schedule		
Easy to follow dosage	190	73.1
Difficulty to follow dosage	70	26.9

Source: Fieldwork, 2009.

The respondents were asked of their opinion about Artesunate + Amodiaquine and 60.4% of them believed the drug was good. However, all of the respondents reported that the drug was bitter/sour. On affordability, 170 (65.4%) respondents reported that the drug was affordable. Seventy (26.9%) of respondents believed that it is difficult to follow the dosage regimen of the drug (Table 11).

Respondents were also asked if they will encourage others to take Artesunate+ Amodiaquine. The study enquired from respondents whether they will encourage others to take artesunate + amodiaquine as a first line antimalarial drug. On the whole, 65.4% of the respondents reported that they will encourage others to take artesunate + amodiaquine as a good antimalarial drug. This position is represented in the following narrative by a 38-year old woman when she said “AS+AQ is a good drug and it cures my malaria when I use it, so I will happily recommend it for others”.

**Table 12: Educational level of respondents by agreement to use AS+AQ as first line antimalarial drug**

Variable	AS+AQ as first line antimalarial drug	Total	p-value
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		Do not agree N (%)	Agree N (%)	Strongly agree N (%)	N (%)	
Education level	None	1(25.0)	1(25.0)	2(50.0)	4 (100)	0.366
	Basic	7(12.3)	42(73.7)	8(14.0)	57(100)	
	Secondary	14(15.1)	61(65.5)	18(19.4)	93(100)	
	Vocational/ technical	5(11.4)	33(75.0)	6(13.6)	44(100)	
	Tertiary	10(16.4)	35(57.4)	16(26.2)	61(100)	
Total		37(14.3)	172(66.4)	50(19.3)	259(100)	

Source: Fieldwork, 2009.

The educational level of respondents was cross-tabulated against their endorsement of Artesunate+Amodiaquine as the first line antimalarial drug in the country. Out of the 93 secondary school leavers who formed the majority of respondents, 61(65.5%) agreed that Artesunate + Amodiaquine combination should be maintained as the first line antimalarial drug. Fourteen do not agree while 18 strongly agreed that the drug should remain the first line antimalarial drug. Also, the majority of those with tertiary education (35 out of 61) agreed that the drug should remain the first line anti-malarial drug. On the whole, the majority of respondents, 172 (66.4%) agreed that Artesunate + Amodiaquine should continue to be the first line antimalarial drug in the country (Table 12).

## Discussion



The evidence that has been examined suggests that understanding community perceptions about malaria can help in malaria prevention and control initiatives. The need to improve behaviour patterns and attitudes regarding malaria control must be based on sound understanding of the socio-cultural characteristics of the community under study.

In particular, the level of education was critical to compliance, as almost all the respondents who were able to complete the full course of AS+AQ have received some formal education. The degree of compliance by the tertiary and secondary level educated respondents was higher than the illiterates. This may be due to their ability to read and understand the instructions on the drug. Another reason for this may be that these people could easily comprehend the need to complete treatment. These findings point to the need for prescribers to spend more time to explain the need for patients to complete their drug schedules, especially to those who have education below secondary school level.

The use of modern antimalarial drugs over the traditional remedies was very high in this study and this findings contrast with findings from Somalia, where it was reported that local remedies were the first choice of treatment for malaria (Abyan & Osman, 1993).

### **Treatment and Care Seeking Behavior**

Treatment-seeking behaviour can be influenced by variety of factors, including local beliefs about disease, access and cost of drug, and attitudes of health-care providers (both Western and traditional healers). Findings indicated that Hospital treatment was the preferred choice for respondents in

this study and this may be due to the fact that Anakyin community is located close to the Cape Coast District Hospital, which offered easy accessibility. A study in the Gambia also reports high use of official health sector for the treatment of malaria (Clarke et al., 2003).

This result is a turnaround of Ryan's (1995) finding that stated that in a Kom village of Cameroon, 83 percent of illnesses were treated at home. Also, Weller, Ruebush & Klein (1997) have shown that only 10 percent of the population in Guatemala involved in their study reported seeing a physician or a nurse and concluded that it was not surprising that easy accessibility, absence of drug shops, and the severity of the disease predicted a higher use of the official health sector. Other studies identified accessibility as the predisposing factor to seeking help from the formal providers (Glik et al. 1989; Deressa, Ali & Enqusellassie, 2003).

### **Completion of full course of medication**

Findings from this study point to the need for a periodic evaluation of adherence to treatment regimen to identify difficulties of patients to adhere to treatment and thereby design interventions to improve adherence among target populations. Adherence to the three-day treatment regimen of AS+AQ was very high (81.5%) in this study. A similar study in southern Ghana using AS+AQ also demonstrated a high rate of adherence (81–97%) among caregivers (Ajayi, Browne, Bateganya, Yar, Happi, Falade, Gbotosho, Yusuf, Boateng, Mugittu, Cousens, Nanyunja & Pagnoni, 2008). These results suggest that high levels of adherence to AS+AQ can be achieved in rural

communities if an effective education programme on treatment regimen is in place.

### **Level of information about AS+AQ**

Adequate information and competent advice on drug use may lead to compliance. This study has shown a general high level of information on AS+AQ in the study community. Prescribed drugs are often administered in an in-correct way and poor prescription practices may stem from heavy workload and limited time for information provision (Ansah, Gyapong, Agyepong & Evans, 2001). To further improve adherence with treatment of prescribed drugs and with drugs bought in shops several approaches should be considered. These approaches may consist of training shop keepers, pre-packed drugs, and an enhanced information provision through better drug labeling or pictorial instructions or through training of mothers themselves (Kilian, Tindyebwa, Gulck, Byamukama, Rubaale, Kabagambe & Korte, 2003; Ansah, Gyapong, Agyepong & Evans, 2001; Sirima, Konate, Tiono, Convelbo & Cousens, 2003; Yeboah-Antwi, Gyapong, Asare, Barnish, Evans & Adjei, 2001a).

Drug stores dealers have an impact on the provision and quality of treatment. 10% of the study participants reported that drug dealers advised them on the dosage regime to be given. Meanwhile it is known that drug sellers themselves very often have a lack of knowledge on the correct administration of drugs. Wolf-Gould, Taylor, Horwitz & Barry (1991) found that only 43% of the chemists in rural Ghana knew the correct dose of the drugs they sell.

Results from this study suggest that the majority of respondents take AS+AQ when they have suspected malaria or diagnosed of malaria. This may be due to the fact that it is the most frequently prescribed antimalarial in public health centres after the drug policy change.

The proportion of respondents reported to have experienced side-effects following treatment with AS+AQ was relatively high. However, none of these side-effects were reported to be serious. Notwithstanding the reported side-effects, respondents generally perceive AS+AQ to be effective. This adds credence to the fact that the majority of respondents would encourage others to take AS+AQ when they have malaria and this should be welcoming news for the malaria control programme implementers.

The easy and convenient access of respondents to AS+AQ at reasonable costs and at no cost under the National Health Insurance Scheme and improvement in the state of health when treated with AS+AQ must have contributed in no small measure to the acceptability by the respondents.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Introduction

The purpose of this study was to assess perceptions of Artesunate+Amodiaquine in the Anakyin community of the Cape Coast Metropolis. In addition, the study examined the relationships between demographic, socio-cultural and behavioural aspects of malaria treatment. This chapter first gives the summary of the study and draws conclusions from the findings. Finally, recommendations are presented for the utilization of health authorities and for further related research efforts.

#### Summary

Malaria is a leading cause of death in Sub-Saharan Africa. Ghana changed its malaria treatment policy from chloroquine to Artesunate + Amodiaquine (AS+AQ) as first line drug in 2005. This study seeks to assess community's perceptions of AS+AQ after phasing out chloroquine which was very popular antimalaria. Although AS+AQ was perceived to be safe and efficacious with minimal reports of adverse event by the community, there is still the need for sensitization and educational campaigns especially in the rural communities for the policy to ensure its success.

## Conclusions

Based on the research questions and findings of the study, the following conclusions are drawn:

The perception among respondents irrespective of educational level was that Artesunate + Amodiaquine combination should be maintained as the first line anti-malarial drug. Further, educational level of respondents was not associated with adherence. Approximately, 66% of respondents agreed that Artesunate + Amodiaquine should continue to be the first line antimalarial drug in the country.

There is high awareness among the respondents of the new policy. Health workers were reported as the primary source of respondents' information. As a result, 59.2% of respondents reported that Public Health Personnel are their source of information. This indicates that Health Workers influence people's choice of Artesunate+Amodiaquine in the community. Hence, appropriate information is essential for people to make appropriate decisions about taking medicine.

The majority of respondents (76.4%) have sought treatment for malaria outside home from modern health care services. Easy access to the health facility and affordable cost of AS+AQ might have been the major disposing factors to seek malaria treatment outside home. This implies that Anakyin community has come to recognize the meaning of modern health care than the traditional one.

In spite of the public outcry and the negative perceptions about AS+AQ, the findings from this study showed that AS+AQ is widely used in Anakyin community. Thus, AS+AQ was perceived to be very effective and

efficacious. This study discovered that 58% of the respondents receive or take AS+AQ for the treatment of uncomplicated malaria.

### **Recommendations**

Based on the findings of the study and the conclusions, recommendations are made to health authorities and for further research.

#### **To the Ministry of Health/ Ghana Health Service:**

Malaria is a serious health issue in sub-Saharan Africa and Ghana is no exception. Therefore, all hands must be on deck to work towards its eradication. This requires the crucial roles of health workers (pharmacists, physicians, nurses, local chemists, and other health workers).

1. The health authorities should train health workers on the behavioural aspect of malaria drug use so that they could understand their clients better to be able to provide relevant information to them, especially on appropriate drug use and side effects
2. Concerted efforts should be put in place by the National Malaria Control Programme within the Ministry of Health to properly educate the general public on rational practices of using artesunate + amodiaquine in order to prolong its life span.
3. The success of a new antimalarial policy requires a countrywide monitoring and reporting of side effects, so that a mechanism may be put in place to address any misgiving and fears that people may have about the medication. Continuing education to health workers and clients is necessary for consistent adherence to a new policy.

4. Health staff should be encouraged and endowed with logistics to document any reported adverse events of medicines especially on AS+AQ to inform decision making.

District Health Management Teams should constantly monitor the effects of different doses of drugs against expected therapeutic effects.

Further, studies aimed at evaluating and monitoring the impact of treatment with these combination therapies on resistance development are therefore, warranted.

5. To ensure greater involvement of the private sector in the control of malaria, the sector should appoint voluntary national and regional private sector co-coordinators to constantly co-ordinate sector malaria control activities for the sector.

#### **Recommendations for further studies**

1. A similar study should be conducted on Parents' perception of Artesunate+Amodiaquine for the treatment of uncomplicated malaria in children. The study should essentially, focus on drug-associated side effects and children's recovery for the combination therapies compared with previous experience with monotherapy.

2. Studies aimed at evaluating and monitoring the impact of treatment with Artemisinin Combination Therapy regimens on resistance development are therefore, warranted.



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**APPENDIX**

**M.A Dissertation**

**Questionnaire**

**Section A**

**Socio-demographic background**

1. Sex                                      Male [ 1 ]                                      Female [ 2 ]
  
2. How old are you.....
  
3. Marital Status  
  
Single [1]                                      Married [2]                                      Separated [3]  
Cohabiting [4]                                      Divorced [5]                                      Widowed [6]
  
4. Ethnic background  
  
Ga/Adangbe [1]                                      Ewe [2]                                      Mole/Dagbon [3]  
Guan [4 ]                                      Akan [5]                                      [6] others,  
(specify).....
  
5. What is your occupation? .....
  
  
6. What is your level of education?  
.....

**Section B**

7. Have you ever been diagnosed with malaria? a) Yes      b) No

8. How often are you diagnosed with malaria in a year? a) Once  
b) twice c) three times d) more than 4 times.
9. Where do you seek treatment when you perceive you have malaria?  
a) Hospital b) drug store c) traditional medicine  
d) others.....
10. What medication do you take when you have malaria? a) Artesunate  
+ Amodiaquine b) Alaxin c) Chloroquine d) other  
.....
11. Have you taken Artesunate + Amodiaquine before? a) Yes b) No
12. If no, what are your reasons?  
.....
13. How did you get to know about Artesunate + Amodiaquine?  
Through the a) media b) public health personnel c) friends d)  
relatives e) other .....
14. Who prescribes your medicine at your source of treatment? a)  
Medical doctor b) pharmacist c) self d) medical assistant e)  
other .....
15. Do you have adequate information on the use of Artesunate  
+ Amodiaquine? a) scanty b) relatively adequate c) adequate
16. Does the prescriber educate you on how to take the medication?  
a) Yes b) No

17. Do you complete the full course of medication as prescribed?

a)Yes b) No

18. Do you observe or experience any side effects when you take the medication? a)Yes b)No

19. If yes, what are the side effects?

.....

20. Notwithstanding the side effects, how do you rate the medication?

a) Bad b) good with reservations c) very good

21. How does the drug taste?

a) Bitter b)sour

22. How affordable is the drug?

a) Expensive b) affordable

23. Would you advise people to patronize the medicine if well-prescribed? a)Yes b)No

24. Do you agree that Artesunate + Amodiaquine is good enough to be used as a first line anti-malarial? a) Do not agree b) agree c) strongly agree