

**HOME MANAGEMENT PRACTICES OF CHILDHOOD MALARIA
AMONG CAREGIVERS IN OJO MILITARY CANTONMENT,**

LAGOS: IMPLICATION FOR CHILD SURVIVAL

BY

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DEDICATION

This dissertation is dedicated, in evergreen memory, to late Godwin Unimke **AGOGO**, and to all the **GREGORYS'**: Scholastica, Elilejo, Ukezi, Ukongikwen and Agogo for their understanding and endurance.

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ABSTRACT

The global incidence of malaria is estimated at 110 million clinical cases and an annual mortality of about 1 million people. In Nigeria, malaria is highly endemic and children under 5 years old are particularly at risk of severe complications accounting for 30% and 41% of mortality and morbidity respectively. At the Abuja 2000 declaration on Roll Back Malaria, commitment to ensure that by 2005, at least 60% of those suffering from malaria have access to prompt, appropriate and affordable treatment within 24 hours of onset of symptoms was made. Home management was a major strategy identified to reach these goals and self medication in the home is a major treatment seeking behavior in the cantonment. The objective of the study, therefore, was to explore knowledge of anti-malaria drugs, dosages, ability to recognize, treat malaria and therefore the impact of home management practices by caregivers on child survival in the Military Cantonment, Ojo Lagos.

Both qualitative and quantitative data collection methods were used. Five Focus Group Discussions and 8 in-depth interviews were held with caregivers and key informants then, using systematic sampling design, blocks were selected from camp clusters and alternate households within the blocks were entered. Questionnaires were administered to four hundred caregivers, one per household, for the survey.

Respondents comprised of 221 (55.3%) mothers, 137 (34.3%) fathers, and most 322 (80.5%) were married with mean age 29 years (SD±15.17). Many 191 (47.9%) attended secondary school while 120(30.0%) had tertiary education and their mean monthly income was 14531.00 Naira (SD± 6459.8). High prevalence of malaria all year round caused by mosquitoes bite was indicated by 281(70.2%) respondents, 361(87.0%) believe it can kill and 312 (78.0%) perceived young children as most vulnerable to attack. Preventive practices are uncoordinated, including screening of windows and doors, awareness and use of ITNs is low. Home management practices of childhood malaria are high predicated on immediate treatment with medicines, mainly chloroquine 188(47.0%) and herbal preparations 32 (8.0%) available in the home. Only 149(37.2%) reported that the children became completely well on a first action prompting a second and third action in the home. Sharing of left over drugs and concurrent use with traditional herbs were common practices leading to low compliance to correct dosages. Knowledge of drug dosages was low in both tablets 33(8.25%), syrups 86(21.5%) and 316(79.0%) respondents were not aware of color-coded pre-packs of chloroquine. Home treatment was preferred because of high

costs 250(62.5%), unfriendly attitude of workers 195(48.8%) and long waiting time 194(48.5%) in the hospital so, only 122(30.5%) sought help there, yet no policy on home management of malaria is in place. Seventy-three respondents (18.3%) reported having lost a child under 5 years old in the household and half of these were perceived to be malaria related.

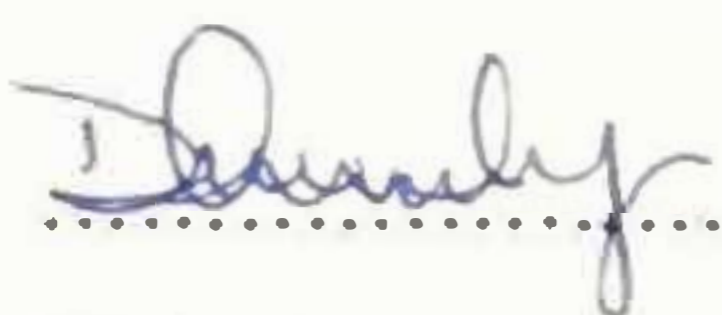
Based on the findings there is the need to create awareness for caregivers on the need for correct dosages of anti-malarial drugs, pre-packaged drugs and home visits to improve managing childhood malaria within the community.

KEY WORDS: Caregivers, home management, children under 5 years old, malaria drugs

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CERTIFICATION

I certify that **Agogo-Ukezi GREGORY** carried out this work in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Ibadan- Nigeria.



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OPERATIONAL DEFINITION OF TERMS

Cantonment: A camp for soldiers containing both living and operational quarters. A cantonment is a large barracks.

Medical Reception Station (MRS): A medical facility that takes care of the soldiers and their families located on the basis of one per battalion. The MRS is therefore equivalent to a primary health centre and has facilities for a few beds for patients on observation. The medical facility that should cater for a military cantonment is a medical centre

Mammy market: A market within a barracks that caters for the needs of the soldiers. The market was initially operated by wives or relations of the soldiers and usually will sell on credit to soldiers who normally pay on "pay day" i.e. the day soldiers received their pay and allowances. The mammy market in Ojo Military Cantonment is a full fledged market and is about the largest of such markets in any an army formation in Nigeria.

Unit: The unit is the smallest independent body in the Nigerian Army. The unit is usually a regiment, battalion or its equivalent commanded by a Commanding Officer.

Formation: A formation is a group of units usually commanded by one commander. There are many units and formations garrisoned in the Ojo military cantonment.

Magajiya: A magajiya is usually the wife of the most senior company or regimental sergeant major appointed to coordinate the activities of the wives of soldiers living in the barracks. They carry cleaned settle in the minor misunderstandings between soldiers' wives in the barracks and generally coordinate activities barracks.

Patent Medicine Vendor PMV: This is a person licensed to sell non prescription medicines also known as over- the- counter (OTC) medicines.

Chemist: a chemist is a person professionally trained in the art and science of preparing and dispensing medicines. He is usually a pharmacist.

RBM: Roll Back Malaria

WHO: World Health Organization

BASICS: Basic Support for Institutionalizing Child Survival

IMCI: Integrated Management of Childhood Illness

USAID: United States Agency for International Development

HBM: Health Belief Model

NCO: Non Commissioned Officer. Soldiers of the ranks corporals, sergeants and staff sergeants and warrant officer.

CHAPTER ONE

INTRODUCTION

Background of the Study

Malaria is a public health problem of epidemic dimension. The global incidence is estimated at 110 million clinical cases per year with a reservoir of parasitaemia in about 280 million people and a total annual mortality of about 1 million. Africa South of the Sahara accounts for 80% of the clinical cases, more than 90% of the parasite load and over 80% of the deaths. Thus, the world's problem of malaria seems to be concentrated in Africa. It is also estimated that malaria is responsible for about 40% of the febrile illnesses in children with a mortality of 5 per 1000 per year and a case fatality rate of 2-24% (Brinkman and Brinkman, 1991).

The disease is highly endemic in Nigeria and the entire population is exposed to it. All ages are susceptible but children under 5 years and pregnant women are particularly at risk of severe and complicated malaria. Available data indicate that malaria ranks consistently among the 5 most common causes of death for all ages and represents between 8-16% of child deaths. Specifically, malaria accounts for 30% and 41% of the under 5 mortality and morbidity respectively while the figures for the infants are 26% and 38% (NHMIS, 1999). In addition to this, malaria is the most common cause of morbidity as represented by substantial social costs due to school and work absenteeism and reduced economic productivity (Akpan, 1996).

Malaria control efforts commenced in Nigeria in the 1950s and until the 1970s vector control, residual insecticide spray and sanitary inspection were the main stay. Ekanem (1996) pointed out that these efforts had limited impact on the interruption of the transmission of malaria, because of growing resistance of the malaria parasite, *plasmodium falciparum*, to insecticides and to drugs for treatment. Also, there was as well failure to adopt an inter- sectoral approach taking into consideration the social and environmental factors that sustain the disease. As in most other tropical countries, malaria control efforts diminished in Nigeria from the mid 1970s, until the significant renewed efforts of the 1990s. This culminated in the "Roll Back Malaria", (RBM) summit by African Heads of States held in Abuja on April 25, 2000.

The summit brought together 44 heads of states, along with development partners, and adopted a coordinated global response driven by country priorities and leadership. The Abuja Declaration recognized all the devastating effects associated with malaria and resolved, as a goal, to initiate appropriate and sustainable action to strengthen the health

systems. One of the cardinal objectives was that by 2005, at least 60% of those suffering from malaria would have prompt access to and should be able to use correct affordable and appropriate medication within 24 hours of the onset of symptoms.

The goals of the Abuja declaration on RBM for the entire member states were summarized as follows:

- a. Promote community participation in joint ownership and control of RBM actions to enhance their sustainability.
- b. Make diagnosis and treatment of malaria available as far, peripherally, as possible including home management.
- c. Make appropriate treatments available to the poorest groups in the community.

Among the strategies to achieve the above is disease management. An integrated approach to the management of childhood illness (IMCI) is advocated. Specifically, it entails health education and communication to schools, workplaces, parents, especially young mothers and other caregivers, on the recognition of malaria, improve capacity for treatment at home and recognizing when to seek for assistance in the case of severe malaria.

These strategies seem to be available only on paper, as RBM does not seem to have emerged from the boardroom in many member states. The imminent threat of HIV/AIDS has conversely stimulated health education in combating the scourge. Incidentally, malaria, which constitutes a bigger health burden to the nation, has not enjoyed an equal amount of relative patronage in terms of health education. It seems, therefore, that malaria has come to be accepted or regarded as “our disease” and the import of its control has been lost both on the populace and on the technocrats (Adedokun 2002)

Anti-malarial therapy is usually based on clinical symptoms alone (usually fever). It is also possible that some children are treated for malaria when actually they have other conditions. This approach is acceptable if it ensures that a high proportion of children are treated promptly and appropriately for malaria.

Malaria control and therapy are thus fraught with problems possibly because of the magnitude of the disease; inadequate and inappropriate control measures. The treatment-seeking behavior of caregivers for the children or wards with childhood fever is usually predicated on cultural beliefs. Thus beliefs about causes and cure for the disease often influence the choice of a treatment option. (Bledsoe et al, 1985 , McCombie, 1996).

One of the six (6) elements of action to Roll Back Malaria is prompt and effective treatment of peoples' malaria illnesses. This can reduce malaria deaths by 50%, even more,

if treatment can be administered at home (RBM Fact Sheet, Nov. 1999). It is therefore important to build capacity at home by catalyzing behaviors that would lead to child survival practices at home.

Nearly 300 million people have malaria parasites in their blood and about 0.5-2million (mainly African Children) will die from this parasitic infection each year. Of the four human parasites only *P.falciparum* kills regularly. This parasite has developed resistance to nearly all available anti -malarial drugs, the most important of these being chloroquine, a cheap, simply administered and relatively well tolerated anti-malarial drug that has become the main stay of malarial treatment throughout the tropical world (White 1998).

Studies have shown that more than two-thirds of children who had fever were first treated at home before any medical facilities were consulted. These also revealed that the dosages of anti-malaria drugs given by the mothers for their children's fever were inappropriate and was associated with under dosing. Other studies also revealed that native herbs were the main treatment given at home. It is therefore important that mothers and other caregivers should be able to make early diagnosis of malaria, by early recognition of simple symptoms and the appropriate administering of anti-malaria drugs in the proper dosages. It is also important for these caregivers to adopt the attitude of the administration of anti-malaria drugs as against herbs some of which have doubtful efficacies (Greenwood et al, 1987, 1991; Dermin, et al 1989; Rueush et al 1995; Foster, 1995)

Resistance develops most rapidly when a population of parasite encounters sub-therapeutic concentration of anti malarial drug. This is a major problem with home management of malaria. Severe, chloroquine resistant malaria episodes are becoming more frequent.

Use of health centre as a first resort for malarial treatment has been shown to be low, occurring only in 20% of disease episodes (Dabis et al 1989). This suggests that a high proportion of malarial episodes are treated at home and self -medication is common. This often results in poor quality of care and indiscriminate treatment; the drugs used either being inappropriate, under dose or overdose (Bremen and Campbell, 1988).

Statement of Problem

The burden of malaria as a disease has been recognized with ineffective control strategies and poor facilities for treatment. Home management is therefore a viable option if caregivers are empowered to manage malaria at home with an appropriate drug in a correct dose and for the proper duration of time. The converse would mean that their action

could create more problems for the health system and therefore imply more morbidity and mortality from malaria.

In the past malaria control efforts were taken seriously within the barracks. Sanitation exercises were regular activities and it was compulsory for everyone to participate in them. Thus every where was kept clean, breeding grounds for mosquitoes were removed by clearing all pools of water and grasses were cut as closely as possible. There were also regular competitions for the cleanest quarters or barracks lines among the companies and units. At the household level, all family members were called out every Sunday morning for the Daraprim parade – the so called Sunday-Sunday medicine. The use of mosquito nets was high as these were issued free to soldiers routinely and old nets were exchanged for new ones when they became torn. These are no longer standard practices in the barracks.

The Ojo Military Cantonment environment is characterized by poor sanitation, lack of clean drinking water, open drainages and these are very conducive breeding grounds for mosquitoes. Children under 5 years old constitute an appreciable proportion of the population in the cantonment. There has not been any community based study in the cantonment on malaria neither is there any program for the home management of the disease. Also, attendance at the cantonment Medical Reception Station is observed to be low. Further, there are concerns that indiscriminate use of anti-malarial drugs by “illiterate caregivers” and uninformed household treatment seeking practices may lead to ineffective management, persistence of symptoms in the children thereby aggravating the disease burden.

Records at the medical reception station in the cantonment showed that there was a total attendance of 6628 (six thousand six hundred and twenty eight) patients at the station for the period Jan 2002 to Dec 2003. Out of these 45.45% were infants and children while 29.45% were under five years old, 19.67% of who were treated for malaria fever. In personal communication with the station medical staff it was revealed that many of these children were presented late at the station after they might have been given various medications at home and there was treatment failure. Indeed, for the same period records reveal that 20 cases of brought in dead (BID) were recorded out of which 9 (45%) were children who died of febrile convulsion and acute plasmodiasis.

This study is therefore intended to document the practices and behaviours adopted for the home management of childhood malaria by caregivers in the Military Cantonment, Ojo. It is believed that the application of the findings will build capacity for home based

management of simple malaria and strengthen health-seeking behaviour for severe and complicated malaria. This should contribute to child survival in the barracks in Nigeria and other developing countries.

Research Questions

This study intends to answer the following research questions:

1. How do caregivers perceive that their children are susceptible to childhood malaria and are they able to correctly recognize, adopt appropriate and adequate treatment practices in the home?
2. What are the anti-malarial drugs and the dosages commonly employed by caregivers for the management of malaria in children in the home?
3. Are there any household disease prevention strategies and how actively are these promoted in the home?
4. What are the factors that encourage, and how satisfactory is the home management of childhood malaria by caregivers in the home?

Objectives

Broad objective

To document home management practices for childhood malaria by caregivers in Ojo Military Cantonment, Lagos with a view to developing subsequent sustainable intervention strategies.

Specific Objectives are to:

1. Determine caregivers' perception of susceptibility, ability to recognize and treat childhood malaria fever in the home.
2. Determine what anti malarial drugs and the dosages being administered for the home management of childhood fever/malaria by caregivers in the home.
3. Determine if there are any household strategies to prevent the disease and how actively are these promoted.
4. Identify the factors that encourage home management practices in childhood fevers/ malaria and determine the extent to which this practice in the home is satisfactory.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter reviews literature on childhood fevers/malaria and the conceptual framework that serve as guide for the study. The review will cover related issues like the definition of malaria, self-treatment in general and home management of malaria, prevention of malaria, health seeking attitudes and practices by caregivers in the home, notions of susceptibility of children under 5 years old to malaria and cultural approaches to its treatment. The conceptual frameworks are presented relative to specific behaviours that are important and influence the home management of childhood fever/malaria.

General Overview

Malaria is one of the most important causes of death worldwide and 90% of these deaths are estimated to occur in sub-Saharan Africa. Estimates of the total mortality have ranged between 700,000 and 2.7 million deaths per year (Snow, Craig, Deichman and Marsh, 1999; Bremen 2001). There are indications that childhood mortality due to malaria has been rising in Africa in the last decade (Snow, Trape and Marsh, 2001). Malaria has re-emerged in some areas where it has been controlled (Nchinda, 1998; Sleight, Liu, Li *et al.* 1998) and epidemics have occurred in areas previously free of transmission (Lindsay and Martens, 1998). The burden of malaria is therefore rather increasing; for instance, there are about 140 countries or territories with about 36 percent of the world's population (about 2.2 billion people) that are regarded as living in high risk malaria areas (Trigg and Kondrachine, 1997).

In endemic areas, infants, neonates, young children and pregnant women are at highest risk of malaria and its complications (Steketee, Nahlen, Parise and Menendez, 2001). Children below the age of 5 years are highly vulnerable to malaria in Tropical Africa. Among older children malaria has been reported as a major cause of school absenteeism. Over one-third of secondary school children have been reported to have malaria in a single school term, with about half of them having up to two malaria attacks (WHO, 1996).

The danger posed by malaria to young children is febrile convulsions and death resulting from high temperature. Although a variety of extra-cranial infections also produce high temperature, which provoke seizures, malaria is the most common (Jolley, 1981; Famulusi and Sinette, 1971; Lesi and Adenuga, 1996; Thomas, Fagbenro-Beyioku and Bawa-Allah, 1998). The peak incidence of febrile convulsions occurs between the ages of 1 and 3 years, a stage of life when the patient is unable to take personal protection

for prevention. The onus lies, therefore, on caregivers to be able to recognize and treat malaria in order to ensure child survival.

Natural caregivers are defined as lay people to whom others turn for advice, emotional support and tangible aid (Brieger, 2002). They provide informal spontaneous assistance, which is so much part of everyday life that its value is often not recognized (Israel 1985). The term “caretaker” is also often used to refer to an individual who has primary responsibility for the care of a child. Often, it is the child’s mother, but could also be his or her father, grandparent, older sibling or any other member of the family or community (Murray, Adeyi, Fields *et al.* 1997).

Definition of Malaria

The clinical presentation of malaria is highly variable posing a lot of difficulties in the case definition. The Roll Back Malaria (RBM) Guidelines for Primary Health Care Workers in Nigeria specifies that malaria may be diagnosed if any one or more of these signs are present:

- a. Axillary temperature of 37.5°C or higher
- b. Anaemia (pallor of the mucus membranes or palms)
- c. The spleen and or liver may be enlarged.

The document mentions further that symptoms in addition to fever, including headache, back pain, chills, sweating, nausea, vomiting, diarrhea, respiratory symptoms, convulsion and delirium may be present (FOH/RBM, 2001). Efforts to develop a useful clinical definition of malaria that has a predictive value higher than fever alone have been mostly unsuccessful (Basset, Taylor, Bvirakare *et al.* 1991; Redd, Kazembe, Luby *et al.* 1996; Chandromohan, Jaffars and Greenwood, 2002).

In Uganda doctors classified 92% of children presenting with fever as having malaria, but only 64% tested positive (Lubanga, Norman, Ewbank and Karamangi, 1997). A high rate like this justifies presumptive treatment of fevers in children advocated by many authors (Spencer, Kaseje, Mosley *et al.* 1987; Greenwood, Bradley and Greenwood, 1987; Mennon, Joof, Rowan, *et al.* 1988). However, none of these authors have demonstrated a reduction in mortality through presumptive treatment. Also, among adults and in areas where malaria is less common, a policy calling for treatment of all fevers results in substantial over treatment (Nwanyanwu, Kumwenda and Kazembe, 1997).

Identification of deaths caused by malaria through verbal autopsy is less accurate than it is for other diseases and only 46% of cases were identified in one study (Snow, Armstrong, Forster *et al.* 1992). In many areas, there is no specific illness category that

approximates malaria. A common pattern is a single term that approximates 'fever' for example '*Omusujja*' among the Baganda of Uganda (Kengeya-Kayondo, Seely, Kayura *et al.* 1994). In some places, there are a number of different illness categories and malaria may be divided into different types for instance, in Calabar, Nigeria, the term *Utoeyin* refers to yellow eyes and is considered to include malaria. There is a variety of types of *Utoeyin* one of which is *Utoeyin Ekpo* (ghost malaria) that is associated with hallucinations or ghosts in dreams (Ezedinachi, Egwu Charles *et al.* 1996-7). Similarly in Ghana, among the Dangme, *asra* is used to denote fever while *asraku* refers to high fever (Agyepong and Manderson, 1994).

Another concept found among the Dangme of Ghana is *hiorwe* (sky illness), which was characterized by convulsions. Some related this to malaria while others attributed it to a number of other causes including evil spirits and witches flying in the sky (Ahorlu, Dunyo, Afari *et al.* 1997). This distinction is similar to the pattern found among the Swahili speaking tribes of Tanzania and Kenya, where *homa* is used to describe fever. Some people recognize a specific form of *homa* - *homa ya malaria* characterized by severe anemia and cerebral malaria and *degedege*, a term used to describe convulsions in young children, is usually considered to have a spiritual cause such as a bird or witch flying in the air (Mwenesi, Harpham and Snow 1995; Makemba *et al.* 1996; Winch *et al.* 1996; Tarimo *et al.* 1998; Oberlander and Elverdan, 2000). Similarly in Uganda, *eyabwe* has been described as a spiritual illness characterized by convulsion (Lubanga *et al.* 1997).

In an ethnographic study in Nsukka, Nigeria, Brieger, Nwankwo, Ezike *et al.* (1996) found out that malaria is characterized into as many as six types depending on severity and symptoms. In the study, *Eya/Iba* is regarded as mild or ordinary malaria caused by too much sun, too much work and mosquito bites, *Eya Ocho Nanya* is yellow or colored malaria which is more severe and is recognized by yellow eyes or urine. *Eya Nkpoku* is dry malaria caused by poor feeding and exposure to the sun while *Eya mmiri* is caused by poor feeding, exposure to the rain or cold and causes the victim to be bloated or increase in size. The study further recognizes *Oke-Eya* - strong malaria where causes include in addition to fever and headache, much thinking and much alcohol, which results in senseless talk. *Eya Mbaka Ise* shaking malaria is another type of fever believed to be caused by much thinking, much alcohol and drugs resulting in restlessness abnormal talk/ behavior and headache. In another study in Western Nigeria, three types of malaria were characterized; *Iba* ordinary malaria with fever chills, *Iba ponju*, yellow malaria with jaundice and *ako iba*, strong malaria with body aches (Brieger, 1994).

It is important to bear in mind that these characterizations may actually include other clinical diseases (e.g. yellow fever and dengue fever) as this may have influence on people's perception of the intent and effectiveness of control programmes and treatment regimes. In Nigeria malaria is halo-endemic. In a study by Ramakrishna, Brieger and Adeniyi (1989) it was found out that one of its major complications is febrile convulsion that affects nearly one third of preschool children at least once in their lifetime. They noted that perceptions among the local Yoruba people categorize malaria and convulsions as part of two different disease processes and those ideas about causation, severity and treatment are in many ways opposites of biomedical concepts. This means that caregivers may not perceive the danger of convulsion when the children suffer malaria and unfortunately the children themselves cannot be part of the decision-making process, which often involves potentially toxic treatment practices.

Illness categories, therefore, need to be properly differentiated as those related to symptoms of severe malaria but are not associated with malaria by lay people, may involve different treatment decisions. In Kenya the response to convulsions was more likely to involve a traditional healer and less likely to involve shop bought drugs (Molyneux, Murira and Snow, 2002). In Zambia, while many caregivers did associate convulsions with malaria fever, there was also an association with the supernatural and children with convulsion were very likely to receive traditional treatments (Baume, Helizer and Kachur 2000).

Individual variation in classification systems is very important but often overlooked. Not all members of a culture share the same understanding of disease categories. A study of traditional healers representing several different ethnic groups in Tanzania found that most differentiated between different types of malaria, which represented a more complex classification than has been reported for the lay population of the area. Four illnesses that corresponded to different types of malaria were found. *Malaria ya Kawanda* which corresponded to ordinary malaria, *malaria ya Kichwa* or Malaria of the head, which corresponded to cerebral malaria, *malaria ya tumbo* or malaria of the abdomen and *Ndegedege* which was associated with convulsion in children (Gessler, Msuya, Nkunya et al 1995).

Even when disease concepts that approximate or seem broad enough to include malaria exists, episodes of malaria may be classified as other illnesses for a variety of reasons for instance in Malawi, *Malungo* is considered equivalent to malaria, although it incorporates a broader range of conditions. However, when treatment with one-dosage regimen fails, the

illness episode may be redefined as another illness such as *Mauka*, which refers to female genital swellings that can affect a nursing infant (Kachur, 2000). Using the response to treatment, as a diagnostic tool is common among lay people as well as the practitioner (Nichter and Vuckovic 1994).

Treatment Seeking Behaviour

Cultural beliefs and some other factors have been found to play very important roles in the treatment seeking behaviours of individuals and caregivers. Beliefs about the causes and cure of disease often lead to the choice of treatment (McCombie, 1996). Many related but ill-defined terms are found in literature that refers to treatment seeking behaviour in sick-role situations. Self-treatment is often used in literature in reference to treatment outside health facilities. In some cases, home treatment is also used but often associated with traditional remedies. When it is described, self-treatment may involve a number of behaviours with very different potential impacts on an episode of disease (McCombie, 2002). These include home treatment such as cool baths, use of herbal remedies and purchase of drugs from a shop.

Self-treatment is extremely common in combating malaria attack. Self-care initiatives usually employ treatment modalities based on socio cultural beliefs (Adeniyi and Ramakrishna, 1984-5). In an article on medication use by children in Kenya, Geissler Nokes, Prince et al (2000) clearly define a distinction between self-treatment and home treatment. According to them, self-treatment refers to an individual treating himself without the direct involvement of another person, while home treatment occurs in the household when one member gives treatment to another. Self-treatment is any treatment that does not involve consulting a healthcare provider or traditional healer (McCombie, 2002). Thus a mother who visits a shop or pharmacy may be said to be self-treating. There are limitations to this definition because in some cases, visits to shops and pharmacies may involve advice seeking and consultation that is comparable to that received at health centers.

A number of studies on treatment seeking in general have shown high rates of self-treatment. The three factors that emerge repeatedly as related to self-treatment are time, costs and perception of severity (Gomes de Espirito Santo, Flouny and Cisse, 1998; Vuckovic 1999). In Ghana, 92% of the time spent on treatment seeking for fever was spent waiting in health facilities (Asenso-Okyere and Dzator, 1997). Self-treatment saves time and lowers the cost of treating an illness (Mugisha, Kouyate, Gbangou et al 2002) and is more common for illness episodes that are not considered severe. In Guatemala,

self-treatment was predicted by low severity and short duration of illness and not by the availability of household resources. The authors noted that there are several dimensions to severity (Weller, Ruebush and Klein, 1997).

While severity is virtually always mentioned as a factor related to choice of treatment, signs and symptoms related to the perception of severity need to be examined. In Kenya, a 12-month longitudinal study of illness was conducted in Machakos district, and illnesses were classified in terms of pain, discomfort and whether or not there was restriction of daily activities (Oranga and Nordberg 1995). Self Medication was more likely with slight pain or discomfort (43%) than with severe pain or discomfort (39%). People were asked about reasons for not going to a clinic, and the responses were very different depending on whether the illness was reported to include restriction of activities. For episodes that involved restriction of activities, 45% of reasons for not going to a clinic include distance, transport and costs versus only 28% of the cases that did not involve restriction. Conversely cases with no restriction were more likely to say that clinic care was unnecessary or ineffective or that the staff was rude (65% versus 45% for those with restriction). This suggests that distance and costs are more important limiting factors for serious illness and thus very important for treatment choices.

Illness Behaviour

Illness behaviour could be defined as actions people take when the symptoms of disease begin to appear (Kasl and Cobb, 1986). Various illness behaviours are possible when individuals are faced with the signs and symptoms of disease. Such behaviours range from symptoms recognition and illness diagnosis to help seeking processes, including the use of home care or treatment, traditional healing and to the choice, acquisition and use of different types of therapeutic regimens (Good, 1987; Green, 1985).

Home treatment for malaria was defined in a survey in Togo as any treatment with an anti-malaria drug that was not given during or after a visit to a health center. In the study 'health-center' was taken not only to include, conventional health centers but also dispensaries, maternity clinics, private doctors offices and hospitals (Demming, Gayibor, Murphy et al 1989). Home treatment for malaria fever is therefore slightly narrower than self-treatment because visits to cosmopolitan pharmacies and medicine stores are excluded and it is therefore based at the household level. In recent years, the cornerstone of malaria control in Africa has been early diagnosis and prompt treatment of cases to prevent mortality and reduce morbidity, especially in children (WHO, 1996). Home treatment seems to be a strategy that encourages low attendance at the health centers.

Many reasons have been advanced for the low attendance, including physical difficulty in reaching the health centers, scarcity of affordable drugs and the poor performance of health personnel (Foster, 1995; Ruebush, Kern, Campbell et al 1995). In these circumstances many people seek to resolve their health problems at the household level.

At the Household Level.

At this level treatment of malaria often combines herbs with over the counter (OTC) drugs and the administration of inadequate doses of chloroquine is widespread (WHO,1999). The knowledge of the recommended dose of chloroquine was poor everywhere in home treatment of malaria, deficient and not recommend in Columbia and Nicaragua (Kroeger, Meyer, Manchens et al 1996).

It was reported that about 43% of respondents attending clinics were given anti-malaria drugs and only 70% of these administered them correctly among the caregivers of children (Slutsker, Macheso, Slekete, 1994). Majority, 90% of mothers, gave some medicines before visiting the health center and of these, 76% gave modern drugs exclusively including anti-malaria, antipyretics, analgesics, antibiotics and other drugs. Among the orthodox drugs given 50 percent were anti-malarial out of which chloroquine is commonly used (Lubanga, et al, 1997).

The treatment of sick children at home is often carried out with the hope that this may obviate the need for hospital treatment, which is erroneously believed to be more expensive and time wasting. In a study carried out in Zaria, Nigeria the rate of home medication was shown to be 67.2% agreeing closely with the rate of 60.5% reported in Jos, another Nigerian city. (Audu and Ogala, 1997; Ighogboja, Angyo and Okechukwu, 1996). In a population based survey of diarrhea management at the household level in Suleja, Nigeria, Bamiayi, Maciak and Wambai (1994) reported the use of drugs at home in 53.5% of the patients further indicating the prevalence of the practice.

The importance to child survival of house hold administration of drugs, especially for malaria, lies in the fact that caregivers indiscriminately administer drugs to their children irrespective of the perceived cause and severity of fever (Ogundahunsi, 1998). Launching the 'Home Based Campaign for Malaria' in Ghana Kwaku Afriyie, Minister for Health, lamented that majority of malaria treatments in that country take place at the home or community yet only about 15% of them are correct and complete. (WHO/Ghana, 2002)

Home Management.

Home management is a broader concept than self treatment and home treatment. It involves the choice of a particular treatment resort for malaria among many resorts, traditional healers, orthodox medicine, (Drug sellers) and medicine shops to mention a few. Home management also could be determined by significant others within the household like parents, spouse relatives, friends and neighbors (Tharitong, Prasit and Manee, 1985; Fawole and Onadeko, 2001). Home management strategy is articulated by the following objectives:

- a. Ability to recognize the disease at home
- b. Knowledge of the cause(s) of the disease
- c. Appropriate choice of anti-malaria and dose compliance
- d. Preventive measures like use of nets on widows and beds, and
- e. Recognition of the signs of severity of disease in children and adequate referrals. (Murray et al, 1999).

These objectives are sound because studies have reported that the knowledge of etiology, symptoms and treatment of malaria is generally poor all over the world particularly in sub-Saharan Africa (Foster, 1995; OKonofua et al, 1992). Further, chemoprophylaxis and insecticide treated bed nets (ITN) use is not widely practiced throughout Africa. Among those with malaria who do seek treatment, there is often a delay of many days before presentation. (Foster, 1995; McCombie, 1996).

Prompt access to effective anti-malaria treatment is one of the major strategies for reducing the intolerable burden of malaria/childhood fevers. Prompt access means having treatment available as near the home as possible, either within the community or even inside the home itself. In Africa where the mortality burden of malaria is greatest, children can die before they reach the health services, so having treatment available near the home is a major strategy for this region. It is for this reason that Heads of State of African countries made a commitment, in April 2000 at Abuja, Nigeria, to ensure that at least 60% of those suffering from the illness have access to appropriate and affordable treatment within 24 hours of onset of symptoms (Marsh, Mutemi, Muturi et al, 1999; WHO/RBM, 2000).

Central to the home management of malaria is that people must be able to access effective treatment within 24 hours, take correct dose of anti-malarial drug, and comply fully with the treatment. The use of pre-packaged tablets in scaling up studies in the home management of malaria increased the number of children receiving treatment within 24

hours from 46% to 54.4% in Uganda (Nshakira et al, 2002) and from 67% to 89.6% in Nigeria (Okonkwo, 2001).

However, making the drug supply sustainable is one of the major challenges of the home management of malaria. Pre-packaged tablets have been shown to be better for ensuring compliance than anti-malarial syrups, which have been the main stay of anti-malarial treatment in children under 5 years in Africa. In Nigeria after the introduction of the intervention package, 26.7% of children received correct dosage, as opposed to 14.3% at baseline (Salako et al 2001; Okonkwo, 2001)

Malaria/Childhood Fevers.

Fever is the commonest symptom of childhood malaria in Nigeria. Even though fever maybe due to other causes such as acute respiratory tract infection (ARI), most fever is attributed to malaria in sub-Saharan Africa. Malaria and fever are often used interchangeably (Akpan, 1996). In endemic areas most cases of malaria are diagnosed on the presence of fever or a history of fever without laboratory confirmation of parasitaemia (Seboxa and Snow; 1997)

However, because of the considerable overlap in the signs and symptoms of malaria with several other childhood diseases, a diagnosis for a single illness may not be adequate or even inappropriate. WHO and UNICEF have responded to this challenge by developing the approach referred to as the "integrated management of childhood illness (IMCI). Findings from surveys of health workers performance and the management of the illness in the home suggest that this approach is likely to enhance disease management and to reduce childhood mortality significantly (WHO 1995). When first introduced by WHO and UNICEF in Tanzania 1995, the focus of IMCI was on improving the quality of care at the first level health facilities through introduction of standard treatment guidelines and training of health workers (Lambrechts, Bryce and Orinda, 1999).

In subsequent years IMCI evolved into a broader strategy consisting of three components (1) Improving the case management skills of health workers; (2) Improving the health systems support requirements for high quality care for children coming into health facilities or outreach sites (such as supply of essential drugs, vaccines etc and (3) Improving household practices related to child health, nutrition and development (WHO/CHD, 1997; Lambrechts 1999; Gove 1997; Lambrechts et al 1999).

The third component is relevant to this study as emphasis is on improving community and household practices. It is now referred to as household/community IMCI (HH/C IMCI). As an aid to planning of HH/C IMCI programmes, WHO and UNICEF developed

“The key family practices”. These include 16 key family practices, which based on scientific evidence and country experiences, are the backbone of the HH/C IMCI strategy.

The list of the practices or behavioral objectives is divided into four groups

- (1) Practices for mental growth and development
- (2) Practices for disease prevention;
- (3) Practices for appropriate home care and
- (4) Practices for seeking care.

A systematic review of the evidence for a list of “emphasis behaviours” that includes most of the family practices was conducted by the BASICS project 1997. These include:

- Use and maintain insecticide treated bed nets.
- Hand washing at appropriate times.
- Cover the child or wrap up with light cloth in bed.
- Give plenty of fluids or drink and if child is on the breast milk, must continue breast-feeding.
- Continue feeding the child who has malaria.
- Avoid giving local medications along with or without recommended drugs.
- Avoid the use of scarification marks, tattoos and local sacrifices. These are part of the misconceptions/cultural barriers that inhibit child survival and therefore should be discouraged

Prompts for Home Care in Malaria.

Fever in the child usually prompts action by caregivers in the home. A number of studies have found overall treatment of 90% or more for fever at home (Mwabu 1986, Neuvians et al 1988; Deming et al 1989; Louis et al 1992; Mwenesi et al 1995; Ndyomugenyi et al 1988; Molyneux et al 1999). In a survey in Uganda, fever was the symptom that had the highest treatment rate (74% versus 54% for diarrhea (Adome, Whyte and Handan 1996). A prospective study in Kenya found a rate of 78% (Ruebush et al. 1995), as did one in the Philippines (Espino and Manderson, 2000). Findings from a study in Nigeria however, show the presence of parasitaemia in a group of rural school children in an endemic area who did not have clinical malaria (Sowunmi, 1995). This finding seems to support an earlier one, which indicated that the threshold of pyrexia in the children would depend on the degree of immunity (among others) and that this may not be a reliable indicator of hyper parasitaemia (Sowunmi, Walker and Akindede, 1992).

Mild illness is more likely to be forgotten, especially if they were not treated. In addition, variation in the choice of terms to designate fever or malaria can result in different episodes of illness being recalled. A term that indicated high fever would generate recall of more severe cases, leading to apparently higher treatment rates. In Ethiopia, mothers reported that high fever; shivering vomiting and inability to feed were cues for action (Yeneneh, Gyorkos, Joseph et al 1993). In Kenya, the numbers of severe symptoms present were related to taking action (Ruebush et al 1995). However, in Uganda, perceived severity was more important than number in reaching a decision to seek care outside the home (Lubanga et al 1997).

Considerable concern centers on the treatment of severe malaria, especially in light of studies that have found that childhood convulsions are often not associated with malaria, and are sometimes classified as a supernatural disease more likely to be treated by traditional healers. In a study in Tanzania, 87% of women with children under 5 years said they would go to a health center if their child had convulsions while only 9% said they would go to a traditional healer. However, 76% believed injection in a child with high fever would precipitate convulsions or cause death, which might indicate why some might be reluctant to seek care in these facilities in these cases (Tarimo, Lwihula, Miryas et al 2000). This study was done among mothers who brought their children to a health facility and thus suffers from selection bias. Studies using clinic-based populations may seriously misrepresent the prevalence of beliefs and behaviours among the general population and can lead to spurious conclusions (Brown 1976). This bias can be serious especially if the belief is related to a decision to seek care form outside the home.

Socio Demographic Factors in Home Management of Malaria

Indirect evidence that age of the patient may be related to self-treatment and homecare comes from studies of health facility use. Three studies in Africa have found that younger children are more likely to be taken to a health facility (Kaseje, Spencer and Sempebwa, 1987; Slutsker, et al, 1994; Molyneux et al, 1999). Also, a study of mortality in Myamar found that delays in being taken to a hospital were more common for those older than 15 years (Ejov, Tun, Aung et al. 1999).

Educational level is consistently found to be associated with health behaviour, and treatment seeking in malaria is no exception. In Tanzania, higher educational level was associated with seeking care from a health care provider (Tarimo, Urassa and Msamanaga, 1998) and with higher knowledge about anti-malarials (Tarimo, Minjas and Bygbyerg,

2001). In a comparison of two communities in Accra, Ghana, the poorer community with lower educational levels was found to be more likely to engage in self-treatment (Biritwum and Welbeck 2000).

Brinkman and Brinkman (1991) noted that self-treatment rates were higher in urban areas, although they were increasing in rural areas. A study in eastern Kenya involved a comparison of rural and urban areas and showed that although the mothers differed greatly in a number of demographic variables including educational level, the response between both groups was to buy drugs from shops (Molyneux et al. 1999). Earlier studies in Ghana and Nigeria also did not show substantial difference in illness behaviour patterns between urban and rural areas (Gardiner, Biggar, Collins et al 1984; Odebiyi 1992). However, a later study in Ghana indicated that self-treatment with drugs at home was more common in urban areas (Agyepong and Manderson 1994). It is likely that when rural /urban differences in responding to illness are found, they reflect geographic access to services as well as educational and other socio economic differences in the populations.

Prior experiences with the disease are another factor that influences treatment choices. In Burkina Faso, the most common reason for self-care was confidence in treating the disease (Mungisha et al 2002). Past experience with malaria has also been related with higher rates of self-care in the Philippines (Espino and Manderson 2000) and Thailand (Hongivatana, Leerapen and Chaiteeranuwasr ,1985). The level of endemicity in a population is an important factor to consider in designing studies of self-care for malaria (Tanner and Vlassoff 1998.)

Use of Anti-malaria in the Home Management of Malaria.

In a study of health care seeking, for childhood illnesses, in three rural communities in Nigeria about a third to a half of the illness studied appeared to be treated with an anti-malarial drug (Salako, Brieger, Afolabi et al, 2001). Interestingly, this is similar to the proportion of the illnesses that are actually due to malaria, and it would be comforting to think that actual malaria cases were more likely to receive anti-malarial drugs. However, in the Philippines, only one of the 20 confirmed malaria cases was treated with an anti-malarial in spite of the reported high frequency of anti-malarial use for 'malaria' cases treated at home (Espino and Manderson 2000).

In Kenya, 37% of children tested for chloroquine in a community survey were positive and these children were more likely to be parasiteamic, suggesting that chloroquine was more likely to be used in cases of malaria (Verhoef, Hodgins, Eggette et al. 1999). The study also found out that fever was over reported and anti-malaria use under

reported. Similarly in a health facility study in Tanzania, virtually all of those who denied using chloroquine had detectable levels of the drug in their blood (Nsimba, Massele, Enskan et al. 2002). Another study using biochemical markers conducted in a hospital setting in Malawi suggested that prior treatment was both under reported and over reported in this setting (Nwanyanwu et al 1997). Self-reports can never achieve 100% validity, and simple forgetting and confusion about the names of drugs is likely to be important in both under-reporting and over-reporting.

There is some evidence that those who practice self-care in a home setting begin treatment earlier than those who seek care in the official sector. In Togo, 83% of all fever cases were treated with an anti-malarial at home and 97% begin treatment on the first day, while only 17% of those who were taken to the health centre were taken there on the first day (Demming et al 1989). Similarly in Kenya, 91% of children treated at home with an anti-malarial drug received it within the first two days of illness, while only 51% of children taken to a health care facility were taken in the first 2 days (Hamel, Odhacha, Roberts et al, 2001).

It is logical to expect that prompt treatment is more likely to occur where anti-malarial are available at home. In Nigeria, 56% of households surveyed had chloroquine in the medicine cabinet (Isah, Isah and Oojie, 1995), while 85% of households in Congo (Brazaville) had chloroquine and other anti-malarial (Carne, Koulengana, Nzambi et al. 1992.) In Dar- Es- Salaam, Tanzania 68% of men and 77% of women reported using home reserve of drugs from past illness for treatment during current illness episode (Mnyyika, Killewo and Kabalimu, 1995). In the Solomon Islands only 25% of respondents reported that they had chloroquine at home but this was obviously under reported as the drug was also observed in other households that had reported that they had none. Home stocks may have been under reported because it was evidence that treatments were not being finished (Dulhunty, Yohanes, Kourleoutor et al. 2000).

In one study in Kenya, 28% of those who treated fever used home stocks of medicine as the first treatment step. A quarter of treated cases reported a second treatment step in the home using home stock of anti-malarial drugs and up to 5 treatment steps were recorded in the study. Self-treatment including home stocks and shops fell from 85% of treatment in step one to 74% in step two, but rose again in a small percentage (7%) who took a third step (Ruebush et al, 1995). In a study in another region of Kenya, self-care rates were much lower and only 5% of initial treatment choices involved shops. However, this rose to 10% in the second step and 16% in the third step. Public health facilities were

the most important first step (74%), but declined to 13% in the third step (Munguti 1998). In a third study in Kenya, 83% began with self-treatment using pills (Nyamongo 2002). The variation evident in these results from these studies illustrates the importance of considering variation within a single country.

In a Ghanaian study, Agyepong and Manderson (1994) reported that the common pattern was to try medicines and go to a health facility if symptoms did not improve. The complexity of the treatment process is evident in their description.

“For example, 143 of 256 rural respondents undertook two first actions concurrently (self medicating with chloroquine and paracetamol, for instance) and 46 out of the 143 who took a second action, took a third one at the same time, such as having an enema and taking a combination of drugs” (Agyepong and Manderson 1994: 325).

Although many report a tendency to begin with self-treatment and progress to the use of health facilities, self-treatment clearly remains an important option at all stages of illness.

Dosage Patterns.

The widespread pattern of stopping medication when symptoms resolve is well known. Drugs may be saved for a future episode or given to family and friends. Reports of correct dosing vary widely, partially because of the variation in methodology, which ranges from asking someone to report the correct dose for the child (knowledge), to report of usage for a recent episode (recall) and to report of usage in general (hypothetical). Knowledge of the correct dose for a child is likely to be less accurate, since it varies by age and body weight. There is little information on the amount of medication taken or on how anti-malarias are combined with other drugs (McCombie 2002).

Knowledge of correct dosage was high (58%) in Kisii District, Kenya, especially with prepackaged brands (Nyamongo 1999). However, a ‘gap’ between knowledge and behaviour is illustrated by another study among Kenyan school children, which found that dosages of anti-malarial were typically inadequate, even though the correct dose was known (Brooker, Guyatt and Omumbo, 2000). Much lower rates of correct dosing were found in Malawi where people were asked about treatment for specific illness (Stutsker, Chitsulo, Macheso et al. 1994). A detailed study in Uganda involved observation and follow-up at three points in time, with comparisons of dosages prescribed and actually taken (Nshakira, Kristesen and Ssali, 2002) less than half of the dosages prescribed in health units (39%) and drug shops (28%) were accurate to begin with. Thirty-eight percent of caregivers administered what was prescribed, while 28% gave less and 30% gave more.

The end result was that only 28% received an appropriate dose, and overdosing was essentially as common as under dosing. Results from Mali (Thera, D'Alessandros and Thiero, 2000) and Congo (Carne et al. 1992) also suggest that overdosing may be almost as common as under-dosing.

Clearly, knowledge of correct doses is an important variable and correct dosages are unlikely to be given if they are not known. In many areas there are a wide variety of brand names and pill types that lead to confusion among consumers about whether the drugs are the same or not. Nyamongo (1999) noted that knowledge of the correct doses was associated with reading ability. This corresponds with the results of a study in Zimbabwe, where urban respondents were more likely than rural respondents to say they determined the dose of over-the-counter (OTC) medication by reading package instructions (80% versus 39%), while 48% of rural respondents say they did not know how to determine the dose (Stein et al. 1989).

The type of medicine used also appears to influence adherence to correct doses. In Kenya, under-dosing for children was more common when syrup was used rather than tablets (Hamel et al. 2001). In Ghana, a clinic-based study of children showed that adherence to correct dose was more frequent when prepackaged tablets were given rather than syrup. Variation in the devices used to measure syrup was partially responsible for these results (Ansah, Gyanpang, Agyepong et al. 2001). Pictorial guides for the correct dose of chloroquine are available but have not been very widely circulated.

Health Behaviour

Health seeking behaviour is preventive behaviour defined as "any activity undertaken by a person who believes himself to be healthy for the purpose of preventing disease or detecting the disease in an asymptomatic stage (Kasl and Cobb 1966). Health behaviour can therefore be described as actions people take to protect themselves from becoming ill. Efforts have been made through the ages to prevent and control malaria. Globally efforts were targeted at malaria eradication, but those failed. The current African initiative is the Roll Back Malaria (RBM) launched by Heads of States and Governments in Abuja, Nigeria April 25 2000. The approaches and activities of the RBM programme relevant to this study in disease management in the home are:

- Encourage and support community based programmes for early diagnoses, prompt and adequate treatment of malaria.

- Take appropriate measures to ensure that adequate treatment for severe malaria is available and affordable even for the poorest section of the community.
- Provide health education and communication to schools, work places, and parents, especially mothers and persons caring for young children on the recognition of malaria. Improve capacity for treatment in the home and recognizing when to seek assistance for severe cases.
- Sensitize the population and promote preventive measures such as house screening and other personal preventive measures.
- Support and encourage environmental measures taken by families and communities to reduce mosquito-breeding sites.
- Support and promote the use of malaria preventive measures such as chemoprophylaxis (WHO/Abuja Declaration on RBM, 2000).

Prior to this, the principal malarial control strategy recommended by the WHO Expert Committee on Malaria for countries where mortality rates for the disease are high and resources for vector control are scarce is the prompt treatment of all malaria patients with drugs. In countries where malaria is highly endemic, anti-malarial drug treatment cannot be based on microscopy (WHO 1986). Provision of treatment to such a large target group is, however, a major challenge, and in responding to it, it is important to know what role parents' play in treating febrile children and to decide what role(s) they should be encouraged to play.

Mothers and other caregivers are poor at recognizing malaria when in fact it is present. In a study by Lubanga et al, 1997 the sensitivity of mother's diagnosis of malaria was found to be 37% while 63% of the cases were misclassified as other conditions. A caregiver's ability to suspect malaria in the presence of fever has important implications for child survival in malaria endemic areas.

It has been very difficult to attain a high level of success in the prevention and control of malaria most especially in areas with a high level of transmission. This is attributable to a number of factors, some of which are poor organization of Malaria controls programs and financial constraints because of the expensive nature of the programmes no matter how cost effectively and efficiently they are carried out (Greenwood et al, 1987).

With respect to home design and practices, it has been noted that differences in house design and construction are important causes of variation in the incidence of malaria within a community (Schofield and White 1984). Practices like filling the eaves, gaps between the

wall and the roof, are recommended but are not popular because of restriction in air circulation (Lindsay and Snow 1988). The importance of overall house design in reducing the risk of malaria has been demonstrated by Gunawardena, Wickremasirighe, Muthuwata et al.(1998) in their study in Sri-Lanka. In the study, it was found that among those who live near the river, the risk of malaria was about four times higher among residents of a house of poor construction than among who live in houses with better-constructed walls and roofs. The authors calculated that the costs of upgrading all the low quality housing in the village would be covered in the cost of malaria treatment over a period of 7 years. This could form part of malaria control strategy in endemic areas.

Mosquito' deterrent is major strategy of malaria control. Smokes of various kinds to deter mosquitoes from entering a house and variation in the frequency with which these are used may contribute to the differences in the prevalence of malaria between different communities and households. Many different materials are used to produce aromatic smokes. In the Gambia, the mixture called '*Churai*' is burnt in specially constructed pots. Use of '*churai*' reduces the number of mosquitoes entering a room but has not been shown to reduce the incidence of malaria (Snow et al. 1987). However, a recent study in Sri-Lanka showed that the use of traditional fumigants is associated with the prevalence of malaria (van der Hoek, Konradesen, Dijkstra et al. 1998). In Malawi specific Mosquitoes control practices in the home were found to include 'burning of leaves' as the most frequent followed by spreading dung, fire in the house and burning of fire (Glik , Rubourdt Nwanyanwu et al. 1999).

In Many parts of the tropics use of natural products as a source of deterrent smoke has given way to the use of industrially produced mosquito coils. Originally, these contained natural, plant-derived pyrethroids but synthetic pyrethroids are now used more frequently as the active ingredients and some brands contain DDT. Several studies have shown that mosquito coils are effective in repelling mosquitoes (Charlwood and Jolley 1984; Bockarie et al. 1994) although are cheap, households may spend substantial sums of money in the aggregate, on malaria control measures of this kind. For example, recent studies in Dares Salaam, Tanzania have shown that average household expenditure on anti-mosquito measures is the region of US 2-3 dollars per month (Chavasse, Masamu, Kiama et al, 1999).

It has also now been convincingly demonstrated that the use of bed nets and curtains treated with insecticide reduces mortality and morbidity from malaria substantially, at least in the short term. Insecticide treated bed nets now provide residents of malaria endemic

areas with an effective means of protecting themselves against malaria that some can afford. The public health priority now is to find ways of making nets and insecticide as widely available as possible (Lengler, 1998, Lines 1996). In Ghana, findings from studies show that dwellings in the region afford inadequate protection from mosquitoes, this problem may be very difficult to solve because of the substantial amount of money involved in providing screened windows, doorways and ceilings. Bed nets are said to cost between 8,000 and 10,000 cedis (US 5.3-6.7 Dollars) each, a price considered too expensive. The factor militating against the use of bed nets is convenience as people sweat a lot when sleeping under the nets (Ahorlu et al. 1997).

From the above, it is obvious that the cost of bed nets is one of the limiting factors to its universal usage by households in Africa. Since cost is considered a major reason for its low utilization, policy makers, governments and other public spirited organizations, especially non-governmental organizations (NGOs) should consider more subsidies on part of the cost of bed nets to enable more families to invest in them.

Preventive sanitation is another aspect of malaria health behaviour. In a study in Malawi, Glik et al. (1999) included non-scaled items as clearing of bush; digging and covering latrines rubbish control and emptying stagnant water. It was found that socioeconomic status and malaria levels were most significant in the predication of preventive and sanitation behaviors. In a KAP study of malaria in an isolated community on the Atlantic coast of Lagos, Nigeria measures to reduce mosquito in around the house and environmental modification were taken in 14% and 42% of the households respectively. For successful preventive sanitation and control programs, the issue of human behaviour cannot be overemphasized. Commenting on the state of sanitation in Nigeria Tayo (2003) opined that:

“ I can hear mosquito singing and praising God for the Nigerian environment, which is a rich and great haven for them. Our cities are probably the dirtiest in the world.

In the days of old we had incinerators all over the cities and towns. They were not imported. They were made and built by our own local people. Inside these incinerators we dumped our refuse and the sanitary inspectors went around to burn them. Lagos for instance has been overtaken by garbage”

WHO suggests that strategies for prevention and control should have a solid research base for developing appropriate behavioral change, anti-malaria drugs and vaccines and for a better understanding of the pathogenesis, vector dynamics, epidemiology and socio-economics of the disease (WHO/RBM, 1998)

CONCEPTUAL FRAMEWORK

Two health educational models that help in explaining relationships between variables guide this study. The Pathway to Survival Model highlights the need to focus on a number of household behaviours in order to have an impact on infant and child morbidity and mortality. Basic Support for Institutionalizing Child Survival (BASICS) project, U.S. Center for Disease Control and Prevention (CDC) and the US Agency for International Development (USAID) developed this framework for the integrated management of childhood illnesses but could find application in the management of malaria fever by caregivers in the home. The second conceptual framework is the Health Belief Model, which suggest that people act to avoid health problems only when (1) they believe they are susceptible to the problem (2) they believe that the problem will have a real impact on their lives, and (3) they believe taking an action will outweigh the costs. This model also could explain caregivers' behaviour and practices in home management of childhood malaria in the home.

PATHWAY TO SURVIVAL

Pathway to survival, as a conceptual framework was conceived to assist with the development and monitoring of integrated child health programmes. This framework outlines the key steps from a child being well, first developing illness and then surviving the illness (Waldman et al.1996). A substantial component of the pathway takes place at the level of the home and community. In the home, the following key areas have an effect on the quality of health care provided to children and could form part of intervention strategy in the home management of childhood fevers/malaria:

a. **Prevention of illness in well children.**

A number of simple strategies have been demonstrated to prevent childhood illness. These include breast-feeding, appropriate complimentary feeding practices, basic hygiene practices like hand washing, and receiving a full dose of vaccine, to mention a few. With regards to childhood fevers/malaria, caregivers could ensure a barrier

between mosquitoes and the child by using insecticide treated bed nets, curtains and practicing preventive sanitation.

b. Recognition of illness when the child becomes ill. In order to manage a sick child, appropriately, caregivers must recognize when the child is sick. The focal point of the Roll Back malaria program has this approach to malaria case management which is to improve capacity for the recognition of illness and treatment in the home and where necessary for recognizing when to seek assistance for severe cases (RBM, Facts Sheet Nov. 1999.).

c. Seeking care from an appropriate provider outside the home. This model stipulates that caregivers must seek help from an appropriate health-care provider (who will provide quality care) before the child becomes severely sick and at a higher risk of death. Health workers must on the other hand provide quality care, including training caregivers on how to take medication and when to return for follow-up checks. Supervisory visits to the home by health workers would also help in building capacity for providing adequate care at home.

d. Providing quality care to sick children in the home. Caregivers must be able to correctly manage their own children in the home, whether they have sought care from health care providers or not. For example, caregivers should be able to correctly administer appropriate medications, in this case anti-malarial drugs, and oral re-hydration fluids and to give fluids and food appropriately both during and after illness (Murray et al. 1997).

WHO and UNICEF have adopted 16 key family practices or behavioral objectives, in their Household/community IMCI (HH/C IMCI) program to target behaviour by caregivers in the home. Under this program, caregivers should be able to make early diagnosis of malaria by simple recognition of early symptom (Akpan, 1996). Many studies have recognized early diagnosis and effective prompt treatment of childhood fevers with anti-malaria drugs as a strategy for reducing mortality and morbidity in children. Early and appropriate treatment of malaria detected in children by caretakers may prevent complications that arise as a result of persistence of symptoms and attainment of high parasitaemic levels (Dunyo et al. 2000).

Malaria is synonymous with fever, but is not the only childhood illness that presents as fever. An Overlap in the clinical presentation and treatment of malaria and other childhood illnesses has been demonstrated in many studies (WHO 1996; WHO, 1998). Data available from many developing countries now suggest that at least 70 percent of all childhood

mortality is the result of five major conditions: diarrhea diseases, acute lower respiratory tract infection (ARI), malnutrition, measles and malaria. The evidence suggests that children often have multiple conditions at the same time; managing just one of these conditions may not prevent death from other underlying conditions. In order to improve health of children in developing countries, programs need to focus on all five most common causes of mortality and morbidity many of which present as fever.

Most parents are frightened when their child develops a fever. It has been demonstrated that undue fear of fever among, even highly educated, caregivers is very common and has led to overly aggressive treatment. Preliminary data from Bolivia, for example, indicate that only 40% caretakers of sick children recognized that their children were ill, with 1 percent of these caretakers managing their children appropriately in the home (Aguilar-Liendo et al.1997). In order to improve both the prevention and management of childhood illnesses in the home, the behaviour of the caregivers and families responsible for young children must be changed.

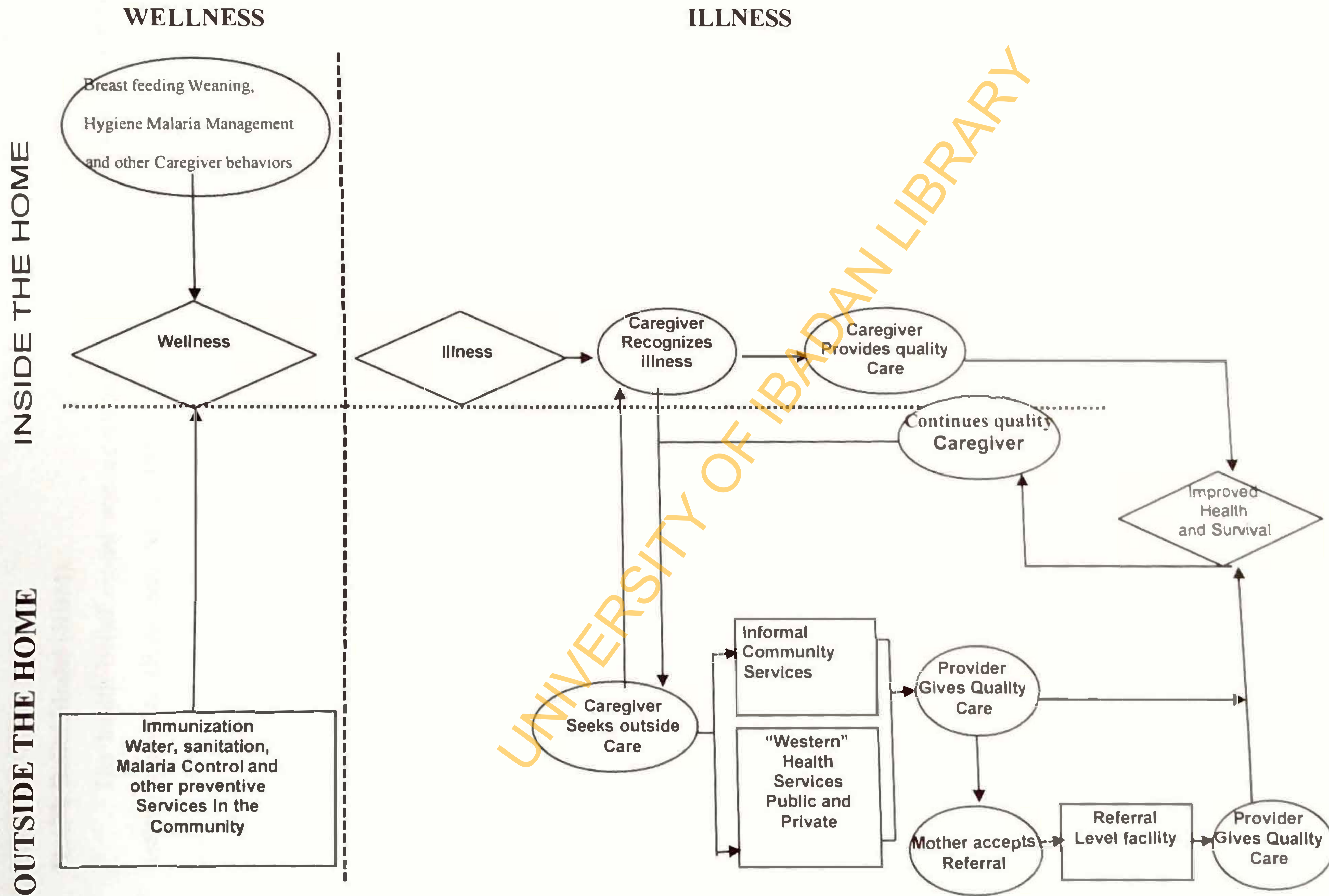
IMCI, an approach to child survival supported by USAID, UNICEF and the World Health Organisation focuses on treating the child rather than the illness and addressing all of the major causes of childhood mortality including malaria, respiratory infections, diarrhea diseases, vaccine preventable diseases and malnutrition. The approach emphasizes that when fever occurs it is important that it is quickly recognized and appropriate steps taken.

The pathway to survival model focuses on the caring skills for minor illnesses and the ability to recognize potentially life threatening conditions by caregivers in their own children in the home and the decision to seek help outside the home when necessary. At the level of the home the caregivers should be able to emphasize those practices that ensure the wellness of the child. Should the child become ill the caregiver the caregiver must be able to identify the illness, select the appropriate medication, the right dose and for the accurate duration to administer. These competencies should be able to reduce the chances of developing complications by the child and increase the chances for child survival. The caregiver should also be able to recognize signs of severity of the illness, when and where to seek care outside the home. The model is illustrated in Fig. 1.

In this study, information relating to household practices by caregivers in the home management of childhood illnesses in the study area will be documented. Attention will be paid to behaviors and practices that need to be emphasized in the training of caregivers to improve the home management of childhood illnesses for enhanced child survival.

Fig 1:

PATHWAY TO SURVIVAL MODEL APPLIED IN THE HOME MANAGEMENT OF CHILDHOOD MALARIA



Health Belief Model (HBM).

The health belief model was developed in the 1950s to explain preventive health behaviors (Ross and Mico, 1980). Initially the developers of the model incorporated a heavy component of the behaving individual's perception and motivation emphasizing current dynamics, believing that prior experiences exercise influence only if conditions remain the same. The model was revised to include general health behavior and motivation, and to distinguish illness behavior and sick-role behavior from health behavior (Janz and Becker, 1984).

Graeff, Elder and Booth (1993) explain that health related behavior is determined when individuals believe that they are susceptible to a particular health problem, regard the problem as serious, are convinced that treatment or preventive actions are effective, inexpensive and that there are reasons to take such health related actions. It follows that if an action requires much effort but does not seem important; the model predicts that people are not likely to carry out the action. Conversely, if an action seems meaningful and takes less effort, there is a much greater chance that people will do it (Marshall and Maiman, 1975). The key elements of the model are shown in figure 2.

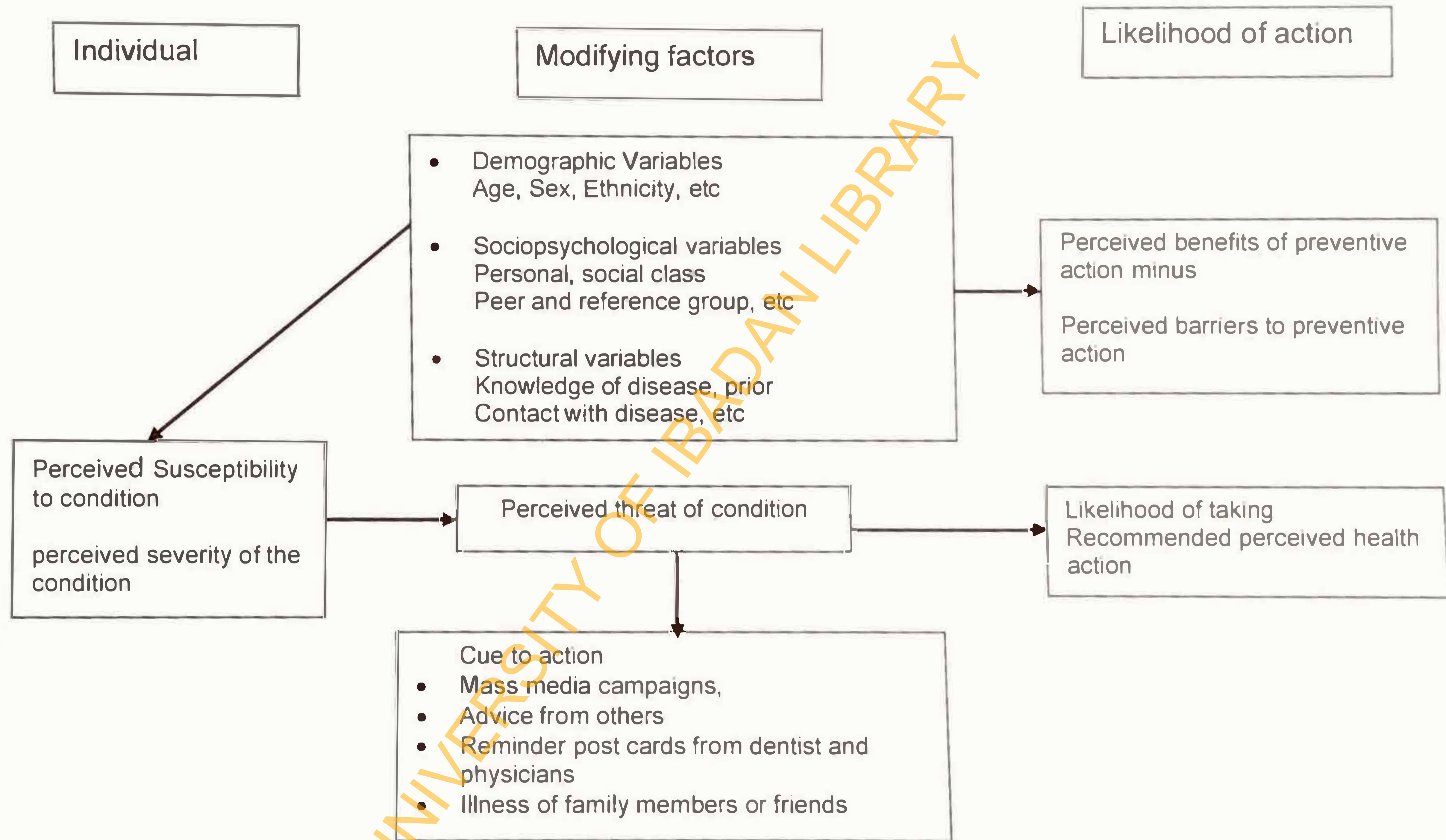
Malaria is perceived as everyday occurrence both in children and adults. The illness is so endemic in Nigeria that almost all caregivers would have a previous experience with the disease in both adults and children in the household. Community life in the cantonment would also suggest that there is a lot of information exchange about the disease. Many caregivers are aware that malaria and its complications could lead to mortality in children. It should, therefore be predicted that these caregivers would form positive attitudes that would lead to a high level of preventive and health seeking behaviour in the home. It is however difficult to define and measure accurately indicators of beliefs, feelings and perceptions on which health seeking is predicated.

Malaria prevention and treatment seeking by caregivers, is determined by their perceived seriousness of the illness in children less than five years old and susceptibility to harmful outcomes. Their decision to manage the situation in the home or seek help outside the home is as a result of assessment and the identification of benefits and constraints to prevention and treatment seeking. Cues for taking desired or recommended action are also predicated on the perceived threats of complications and severity of the illness.

The perception of malaria by caregivers and therefore the susceptibility of the children to adverse outcomes will be explored in this study. Emphasis shall be placed on the behaviour and practices by the caregivers in the home. The HBM applied in the study is as figure 3, Brieger (2002).

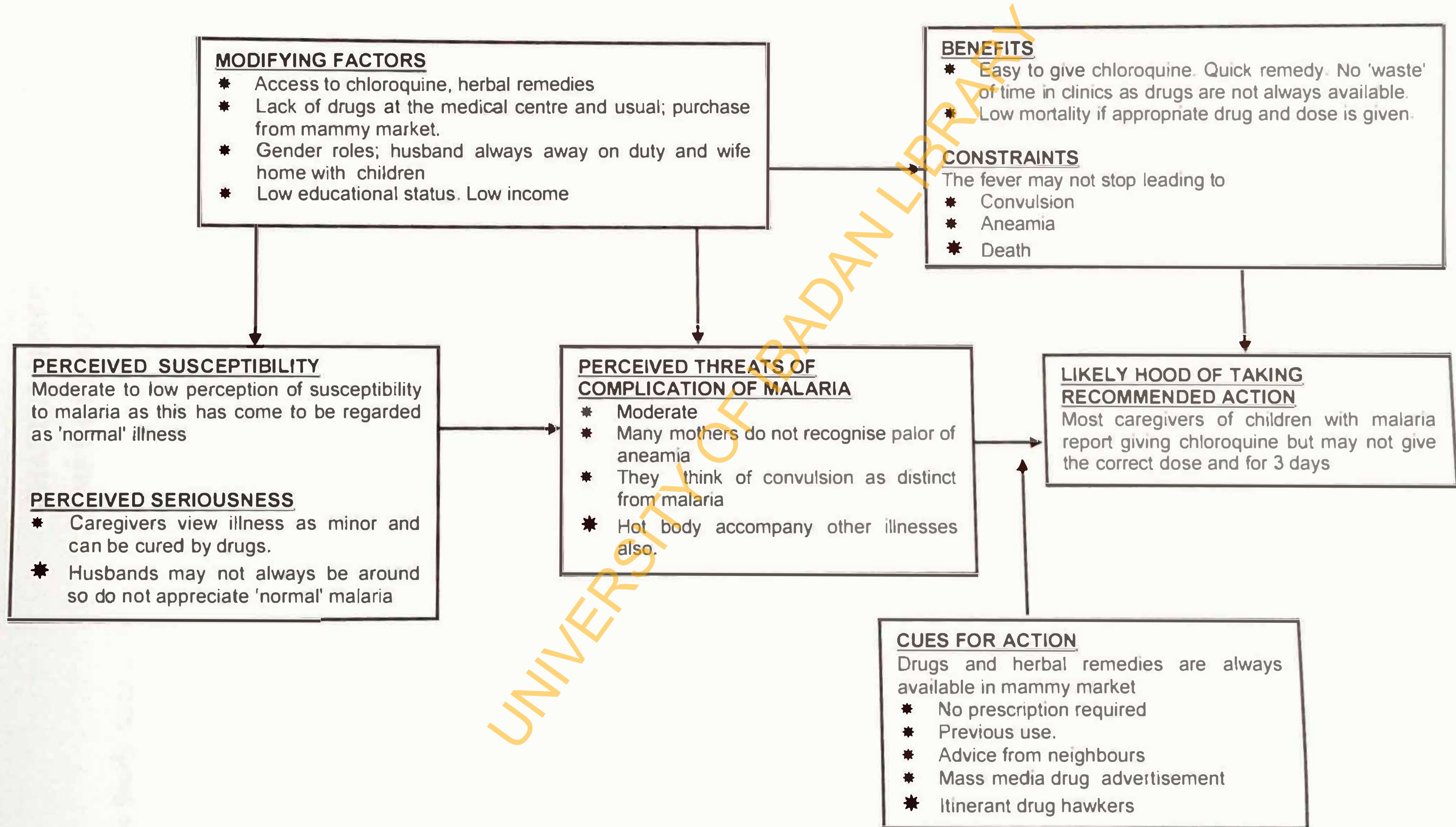
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Fig. 2: A HEALTH BELIEF MODEL



Source: Ross, A.S and Mico P.R (1980). Theory and Practice of Practice of Health Education

Fig. 3 THE HEALTH BELIEF MODEL APPLIED TO HOME TREATMENT OF MALARIA



Source: WR Brieger 2002: Change Process (Unpublished)

CHAPTER THREE

METHODOLOGY

The Study Area

Lagos was the administrative capital of Nigeria until the advent of Abuja. The city is also one of the business nerve centers of the country, with very busy air and seaports. It is one of the fastest growing cities in sub-Saharan Africa. As a result of a high growth rate and rapid urbanization the city is now replete with urban slums many of which pose public health problems. One of the major causes of morbidity in Lagos is inadequate water supply. Only 20% of households in Lagos urban area receive pipe borne water, street water vendor accounting for 37% while 30% of households have access only to yard wells (Stoveland and Bassey, 2000). The situation in the cantonment is the same today with household complimenting their source of water from shallow wells.

Another issue of public health concern is the intractable household waste management and unsanitary disposal of sewage. A survey carried out in Lagos and Kano found out that the proportion of households connected to a sewerage system was only 2-3% while less than 1 % of waste water in these cities is treated (FMW&H, 1996). These problems are enormous given that the population of the city, projected at a 2.9% growth rate from the 1991 National population census is about 7.9million.

Usually, soldiers live in barracks. A large barrack may be called a cantonment. The Military Cantonment, Ojo is one of the two such large barracks in Lagos, the other one being situated at Ikeja. In addition to these two large barracks, there are 8 smaller barracks in the Lagos area garrisoned under the 81 Division.

The Ojo Military Cantonment is situated along the Lagos /Badagry expressway about 12 kilometers from urban Lagos. Due to rapid urbanization, the cantonment is now surrounded by built up areas. However, it maintains a rural setting with living blocks far separated from each other in Camps with a lot of unused spaces in between. The Cantonment occupies an area of more than 20sq kilometers, and the living area is delineated into Camps, which are clusters of living blocks, as follows:

CAMP 1: Quarters for personnel of the Workshop, Ordinance Military Police, Intelligence, Supply and Transport and the Nigerian Army Engineers Regiment.

Camp 2: Quarters for soldiers of the 149 Mechanized Infantry Battalion and the Administration personnel of the Ministry of Defense.

Camp 3: Fin Niger Camp- mainly quarters for Physical Training and Nigerian Army Signal personnel.

Camp 4: Nigerian Army Medical Corps and the Artillery Regiment Quarters.

Officers Village- for married and single officers and civilian staff at the Command Secondary School

The buildings are in a variety of single bungalows for single and married officers, twin flats for warrant officers and senior non-commissioned officers, 6,10 and 12 blocks of flats each meant for a household. In all, there are about 150 blocks meant for 1500 households but the occupation rate, according to the Cantonment Office records, is usually about 94%. The Cantonment community is a miniature Nigeria with officers, soldiers and their families from almost all the ethnic groups in the country.

The social infrastructure in the Cantonment include one Medical Reception Station (MRS) which is a medical facility equivalent to a community health center with a few bed spaces mainly for observation of patients before being referred .A bigger medical center is being proposed. There is also a Mammy market where almost all items are sold including medications. It is the biggest of such facilities within any military formation in Nigeria. There are 3 units within the Cantonment that run a drug-revolving scheme as part of a welfare package for the officers and soldiers. These are 149 battalion, Nigerian Army Ordinance Corps (Training Branch), and the Nigerian Army Medical Corps (Training Branch). Other facilities include messes (recreational facilities for officers, warrant officers and soldiers), primary and secondary schools, a bank and a vocational training center.

Study Design

The study is an explorative household survey that seeks to document caregiver's home management practices and health seeking behaviors in caring for the children for childhood fevers/malaria in the home.

Study Population

Caregivers that reside in the study area were studied. These include mothers, fathers, grandmothers, and aunties. Other significant persons or groups in the study area like magajiyas (women coordinators), patent medicine vendors, traditional healers and health personnel were also interviewed. The respondents selected were those in the households who could recall, at least, one episode of febrile illness in the children aged 5

years or less, physically present in the home, in the last one month preceding the interview.

Method of Data Collection

Five focus group discussions (FGD) were conducted with a cross section of caregivers recruited at random from all the segments in the cantonment. Four of these were all female groups while one was all male. Four key informant interviews (KII) were also conducted with all the magajiyas in charge of the blocks. (These are women coordinators and opinion leaders who maintain the sanitation of the blocks by giving out portions and perform other leadership roles. Sometimes, they are called upon to settle quarrels and help in caring for the sick.) Issues of interest emanating from these discussions were addressed by arranging in-depth interviews with significant persons (also key informants) within the Cantonment. These included the medical personnel in charge of the medical reception station (MRS), chemists/ patent medicine vendors (PMV) in the mammy market, and sellers of traditional medicines, environmental health officer for the cantonment and the cantonment officer. Portable recorders were used during the FGD and other interviews after due permission was sought.

Research assistants were employed and trained on skills necessary for collection, verification and coding of responses accurately. Emphasis was placed, during their training on how to ask sensitive questions.

Instruments for Data Collection

An FGD guide was developed to guide discussions during the interviews with a cross section of the caregivers. Also an in-depth interview guide was prepared and used during interviews with the magajiyas, environmental sanitation officer, Medical Officer at the Medical Reception Station (MRS), patent medicine vendors (PMVs) and traditional medicine vendors in the cantonment. All the instruments for data collection were pre-tested before administration on the respondents. The FGD guide was discussed with the moderator and the recorder to remove ambiguous questions. The key informant interview (KII) and the in-dept interview (II) guides were also pre-tested among respondents with similar characteristics as the respondents within the cantonment

A questionnaire containing structured and semi-structured elements was designed, using information from the data collected during the FGDs, in-depth interviews and a thorough review of literature. The instrument was reviewed by discussing it with colleagues and with the supervisor.

The questionnaire was pre-tested for reliability among caregivers in Ikeja Military Cantonment, not selected for the study, where the occupants have the same demographic characteristics as in the study area. The outcome was used to modify the instrument by removing any ambiguous questions in the questionnaire. Twenty questionnaires were administered (in a proportion of 10 to soldiers, 5 to senior non-commissioned officers and 5 to officers' households) by 2 groups of 2 research assistants each who were monitored and supervised. The instruments were scored at the end of the exercise and the observations were paired and Spearman's rank correlation coefficient was calculated ($r = .573$). This was considered a strong positive correlation and a good measure of the degree of consistency of responses to the instrument.

Based on the preliminary remarks, questions and answers during the pretest, it became necessary to insert some questions into the instrument. These were required to build up to the next question or offer clarification. Also questions 14, 19 and 20 were not clear going by the answers received and have been modified and or reframed. Question 24 was split into 24 and 25 for better understanding while 2 questions relating to health seeking behavior, considered irrelevant, were dropped.

Sampling Procedure

A census of the households within the cantonment was carried out to determine the sampling frame for the study. This was done by physical enumeration to verify records obtained from the Cantonment Office. In order to allow for equal chances for caregivers in all the households to participate in the study, the blocks in the camp clusters as well as the starting households were randomly selected from the sampling frame, the list of accommodation blocks obtained from the cantonment office records. Households were then entered alternately.

In the household entered a child or children that met the criteria for the study were identified and the caregiver, who was at home at that time, interviewed using the structured questionnaire. In the case of more than one caregiver being present preference was given to the biological mother of the child or children identified. Where a household entered did not have at least one child with the inclusion criteria, the subsequent house was entered. This systematic sampling procedure was repeated in all the households for all the selected blocks and camps.

Sample Size

The sample size was estimated using the formula.

$$n = \frac{Z^2 P q}{d^2}$$

Where

n = sample size
 Z = a constant at 95% level of confidence (1.96)
 d = Desired precision (0.05)
 P = proportion (probability that there is at least one child under 5 years old in the household)

q = 1 - P

So

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2}$$

$$= 384.16$$

The sample size was rounded up to 400, to take care of attrition and non-response.

Validation and Reliability

The following measures were taken to validate the instruments for data collection and to ensure reliability.

- All the instruments designed for data collection were pre-tested before being administered on the respondents.
- The instruments were validated in the Department of Health Promotion and Education before and after the pretest, by being subjected to peer review to ensure that the questions included were not awkward and out of the scope of the study.
- To permit free self-expression by the respondents and contribute to the validity of the instrument the questionnaire provided for anonymity of the respondents.
- Appropriate training was conducted for the research assistants to ensure they had a common understanding of the instrument and the procedure prior to commencement of data collection.
- In order to reduce interviewers' bias and errors, the households were randomly selected using a sampling frame that contains the list of all the blocks and their respective room numbers within the cantonment.

Data Management and Analysis

Questionnaires were sorted daily and verified where necessary. Questionnaire with incomplete information were returned to the interviewer in order for him to pay a repeat visit. Data cleaning was, therefore, done manually and with the aid of the computer. The questionnaires were sorted out and coded serially. All identified errors were checked against the original Questionnaire and corrected accordingly.

Data was entered into the computer using the Epi-Info 2000 statistical software to produce distribution of the relevant variables. Percentages and chi-square distribution at 0.05 level of significance were used to test for association between determined factors.

The findings were summarized and presented in tables, charts and histograms for better understanding. Hard and electronic copies of the data were produced.

Approval for the Study

Approval for the study was sought and obtained from the General Officer Commanding 81 Division, Nigerian Army for approval. His approval was conveyed to the Cantonment Commander who then informed all the unit commanders in the cantonment of the exercise. A copy of the approval letter is attached as Appendix 1 to this report. Based on this approval temporary gate passes were issued to the research assistants to ensure their unhindered access to the cantonment and the camps.

Ethical Considerations

I was explained that all information obtained for the survey can only be used for research purpose and under no condition can this be divulged to a third person. Assistants were trained to be cautious, polite and exhibit empathy particularly during verbal autopsies.

Informed consent was sought from the caregiver(s) in the household before being interviewed, for instance some of the caregivers believed that the study was a commercial venture and demanded to be paid for participation. The research assistants were asked to explain the purpose of the survey and then request each respondent to indicate willingness to participate or decline.

Limitations

The limitations and constraints encountered during the study were:

- a. The cantonment inhabitants were not familiar with household

surveys. This posed a major difficulty in gaining entry into the households. However strategies such as communication with community leaders e.g. block NCOs and community participation by the “magajiyas and the commanders of units were used to overcome the constraint.

b. Difficulty in the assessment of knowledge attitudes and practices was very glaring in the study area because of multi-ethnicity but data collection process and the training of the research assistants tried to address this constraint.

c. Most of the soldiers’ wives were not willing to discuss their children without permission from their spouses. This constraint was minimized with creation of awareness about the survey and its objectives.

b.Limited funds were available for the study as it was not funded.

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CHAPTER FOUR

RESULTS

Introduction

The results are presented in 5 sections. Section A is the survey results comprising socio-demographic characteristics of the respondents while Section B presents data on the caregivers' knowledge and perception of childhood fever/malaria. Results on health seeking behavior and practices in the home are presented in section C. Section D presents data on illness behavior by caregivers while section E deals with knowledge of anti-malaria drugs and their dosage patterns employed in the home.

Section A: Socio – Demographic Data

A total of 400 respondents (one in each household) were interviewed. Results indicated that 1583 children were in the households surveyed and 658(41.6%) were under five years old. The number of children in the households ranged from 1 to 18 with a mean of 3.96(SD±2.29). The 400 respondents constituted 221(55.3) mothers, 137(34.3%) fathers, grandparents (5.5%) and other relations (5.0%). Most of the respondents 322(80.5%) were married, 24(6.0%) widowed, 6 (1.5%) divorced, 14 (3.5%) separated and 7 (1.8%) never married. With respect to sex of respondents, there were more females 250 (62.7%) compared to males 150(37.3%). (Table 1a)

Religious affiliation of respondents showed that 247 (61.8%) were Christians compared to Muslims 144 (36.0%). Traditionalists and those who did not indicate their religious leaning were very few amounting to only 9 (2.3%). With regards to age, many of the respondents 167 (41.5%) were in the 31 to 40 year age group and the least number of the respondents 7 (1.7%) were in the 60 to 70 year age group. The age of the respondents ranged from 14 to 70 years with a mean of 29 years (SD ± 15.17).

Educational level of the respondents showed that many 191(47.8%) attained the secondary level followed by 120 (30.0%) with tertiary education, 47 (11.8%) with primary education and only 33 (8.3%) had no formal education. On the income available to the respondents, majority of them 235 (58.8%) earned between N11, 000 to N20, 000 per month, followed by 84 (21.0%) who earn less than N10, 000 per month. It was revealed that the mean total income available from all sources to the respondents was N14, 531. 00. (SD±6549.8).

With regard to ethnicity many of the respondents were Yoruba 115 (28.8%) followed by both Hausa and Ibo 66 (16.5%) while the remaining 151 (37.8%) were of

various ethnic groups such as Ibibio, Idoma, Igala, Ishan, Ogoja, Tiv and Urhobo. Most of the respondents 229 (57.3%) have lived in the cantonment for a continuous period of more than 3years while only 14 (3.5%) have lived there for less than 6 months.(Table 1b).

FIG. 4: No of Children Under 5 Years Old in the Household

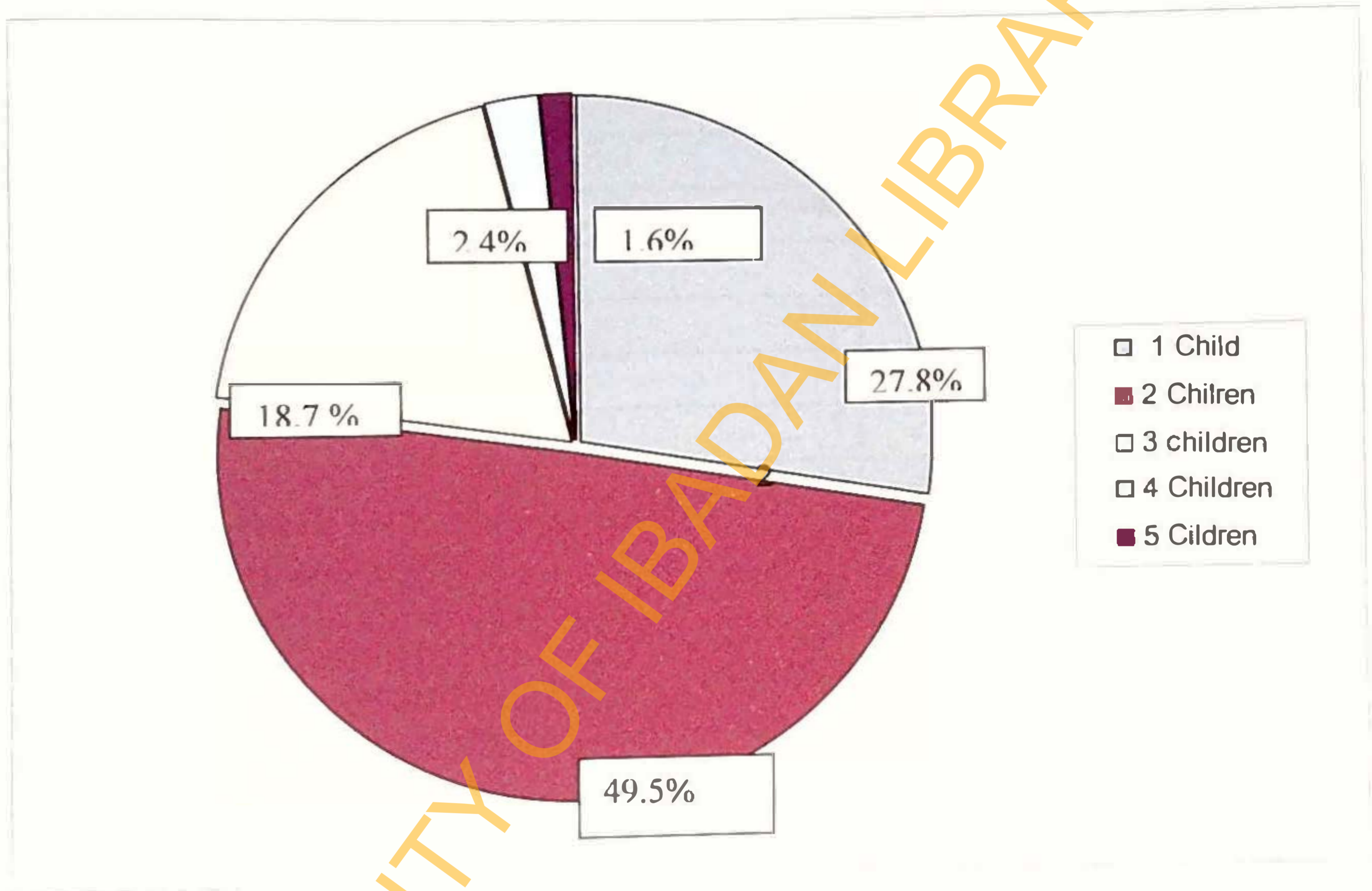


Table 1a: Socio-demographic Characteristics of Respondents
(Type of Respondents, Sex, Marital status Religion and Age)

CAREGIVER	<i>Number</i>	<i>Percent</i>
Father	137	34.3
Mother	221	55.3
Grandparent	22	5.5
Relation	20	5.0
Total	400	100
SEX		
Female	250	62.7
Male	150	37.3
Total	400	100
MARITAL STATUS		
Married	322	80.5
Widowed	24	6.0
Divorced	6	1.5
Separated	14	3.5
Never Married	7	1.8
Non response	27	6.8
Total	400	100
RELIGION		
Christian	247	61.8
Islam	144	36.0
Non response	5	1.3
Others	4	1.0
Total	400	100
AGE		
14 – 20	8	2.0
21 – 30	95	23.8
31 – 40	167	41.8
41 – 50	47	11.7
51 – 60	13	3.3
61 – 70	7	1.7
Non response	63	15.7
Total	400	100

Table 1b: Socio-demographic Characteristics (Level of Education, Ethnic Group, Period of Residence in the Cantonment, and Mean Total Income Group)

	<i>Number</i>	<i>Percent</i>
LEVEL OF EDUCATION		
No formal education	33	8.3
Primary education	47	11.8
Secondary education	191	47.8
Tertiary education	120	30.0
Others	9	2.3
Total	400	100
ETHNIC GROUP		
Hausa	66	16.5
Ibo	66	16.5
Yoruba	115	28.8
Others	151	37.8
Non response	2	0.5
Total	400	100
PERIOD OF RESIDENCE IN THE CANTONMENT		
Less than 6 months	14	3.5
6 months to 1 year	27	6.8
1 to 2 years	48	12.0
2 to 3 years	69	17.3
Above 3 years	229	57.3
Non response	13	3.3
Total	400	100
MEAN TOTAL INCOME GROUP		
	84	21
N1,000.00 – N10,000.00	235	58.8
N11,000.00 – N20,000.00	55	13.8
N21,000.00 – N30,000.00	5	1.2
N31,000.00 – N40,000.00	1	0.2
N41,000.00 – N50,000.00	20	5
Non response	400	100
Total		

Section B: Knowledge and Perception about Childhood Malaria by Caregivers

In mutually exclusive responses malaria and febrile illnesses were mentioned by 217(54.3%) respondents, followed by catarrh/cough 76(19.0%) and typhoid fever 57(14.3%) as the most common illnesses occurring in children under 5 years old in the cantonment. The results also indicated that diarrhea/dysentery and measles occur almost equally as common [50 (12.6%) and 48(12.0%) respectively]. About what causes malaria fever, the respondents indicated mosquito bites 281 (70.2%), filthy environment 74(18.5%), dirty water 15(3.8%), stress, too much walking in the sun 16 (4.0%) and poor food/feeding 10 (2.5%). (Fig: 5 Table: 2). Findings from the focus group discussions support the above results as many of the discussants mentioned mosquito bites as the sole cause of malaria. However, some other discussants said that dirty environment, walking in the sun and stress could predispose the children to malaria. Yet others believed that the presence of other febrile illnesses such as catarrh and cough, diarrhea and dysentery might only indicate that malaria was present or imminent.

The respondents mentioned fever 398 (99.5%) and headache 391 (97.7%) as the commonest symptoms of malaria. Convulsion was also mentioned 237(59.2%) as against the findings from the FGD where some discussants did not see the relationship between convulsion and malaria. It was a common notion that convulsion is triggered off by extremes of cold or heat in those children who already have it in their bodies, but the respondents did not, however, see it as a spiritual illness.

Most of the respondents 361 (87.0%) believed that malaria can kill and a slightly lower proportion (78.0%) perceive young children as the group of people that may most likely succumb to a malaria attack. Most of the respondents 323 (80.8%) and 361 (90.3%) respectively believe that malaria could lead to convulsion and anemia while 312 (78.0%) responded that other childhood illnesses could occur along with malaria. Catarrh and cough were indicated by 86 (21.5%) respondents as the most frequent illnesses that may occur along with malaria fever followed by measles 49 (12.3%) and convulsions 36(9.0%) which seems to contradict earlier responses that convulsion was a symptom of malaria and the notion in the FGD that it has no direct relationship with malaria (Table 3) It was also found out that the position of caregiver in the home was positively associated with the perception of susceptibility to malaria in children under 5 years old ($\chi^2=32.2, df=9, p = <.001$ Table 4).

Fig 5: Common Illnesses Listed by Respondents

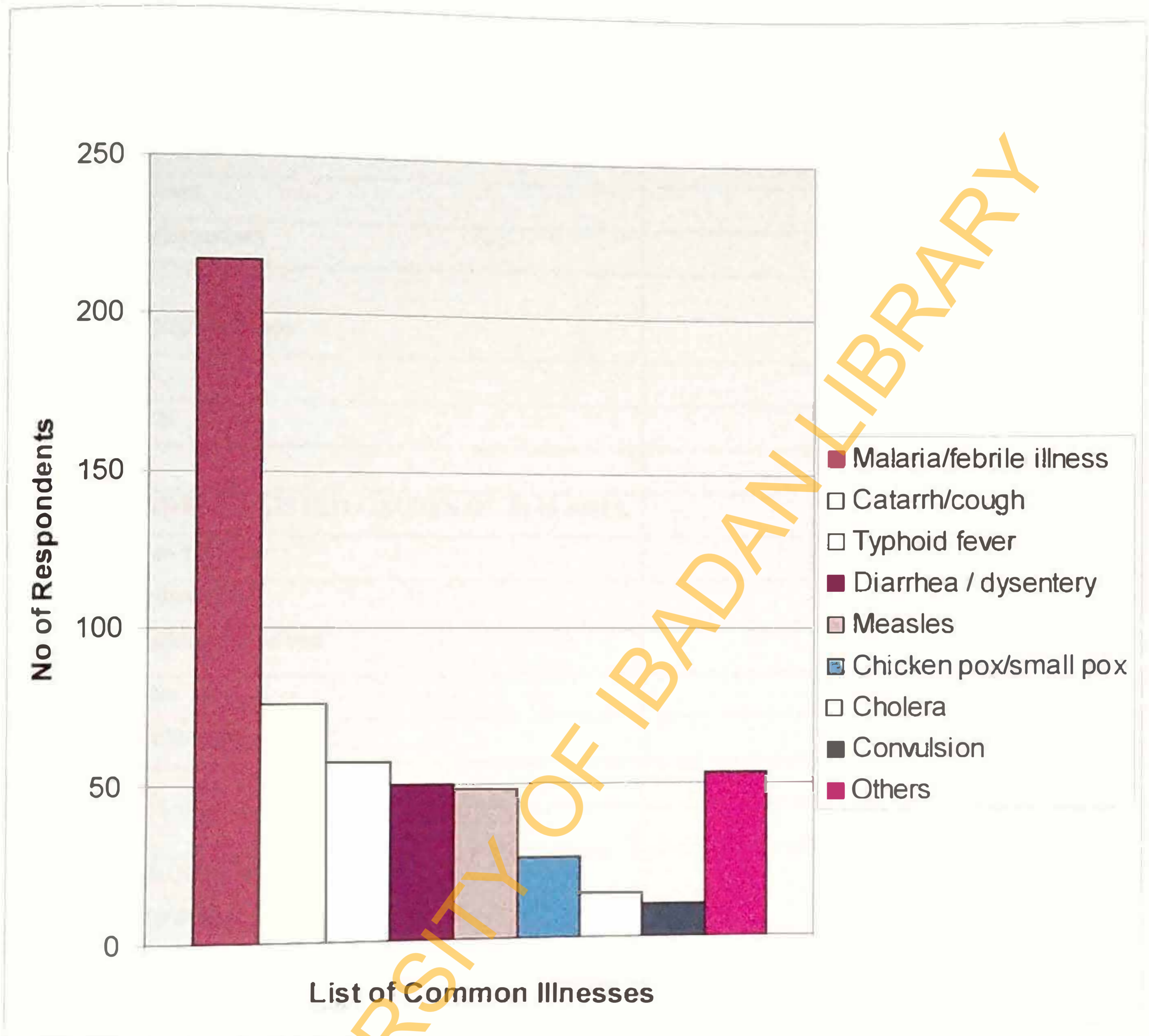


Table 2: Knowledge of Common Illnesses, Causes and Symptoms of Malaria by Respondents

COMMON ILLNESSES	<i>No of Respondents*</i>	<i>Percent</i>
Malaria/febrile illness	217	54.3
Catarrh/cough	76	19.0
Typhoid fever	57	14.3
Diarrhea / dysentery	50	12.6
Measles	48	12.0
Chicken pox/small pox	26	6.5
Cholera	14	3.5
Convulsion	11	2.8
Others	53	2.5
RESPONDENTS LISTED CAUSES OF MALARIA		
Mosquitoes bite	281	70.2
Filthy environment	74	18.5
Stress/Walking in the sun	16	4.0
Dirty Water	15	3.8
Poor food/feeding	10	2.5
Others	4	1.0
TOTAL	400	100
RESPONDENTS KNOWLEDGE OF SYMPTOMS OF MALARIA*		
Fever	398	99.5
Head ache	391	97.7
Malaise	247	61.7
Abdominal pains	119	29.7
Joint pains	300	75.0
Loss of appetite	367	91.7
Vomiting	331	82.7
Tiredness	342	85.5
Tiredness	237	59.2
Convulsion	268	67.0
Dizziness	268	67.0
Dizziness	165	41.3
Jaundice		

*Multiple Responses

Table 3: Respondents Perception of Severity, Complication of Malaria and their Knowledge of Illnesses that may occur along with it

CAN MALARIA KILL?	<i>No of Respondents</i>	<i>Percent</i>
Yes	348	87
No	52	13
Total	400	100
COMPLICATIONS OF MALARIA		
Convulsion	323	80,8
Anemia (shortage of blood)	361	90.3
CAN MALARIA OCCUR ALONG WITH OTHER CHILDHOOD ILLNESSES?		
Yes	312	78
No	88	22
Total	400	100
LIST OF ILLNESS THAT MAY OCCUR ALONG WITH MALARIA		
Catarrh/cough	86	21.5
Measles	49	12.2
Convulsion	36	9.0
Typhoid	31	7.8
Diarrhea / Dysentery	28	7.0
Headache	17	4.3
Cholera	13	3.2
Anaemia	12	3.0
Others**	8	2.0
Non response	120	30.0

*Multiple Responses

**Other Illnesses include boils, pneumonia and teething problems.

Table 4: Position of Caregiver with Perception of Susceptibility to Malaria by Young Children

Perception of Susceptibility to Malaria	Position			
	Father	Mother	Grandparent	Relations
Most likely (1)	124 (90.5)	163 (73.8)	12 (54.5)	16 (66.7)
More likely (2)	2 (1.5)	17 (7.7)	0 (0.0)	2 (8.3)
Least likely (3)	2 (1.5)	5 (2.3)	1 (4.5)	0 (0.0)
Non response (0)	6 (6.6)	36 (16.3)	9 (40.9)	5 (25.0)

(Chi-squared = 32.2, df = 9, $p < .001$)

Section C: Practices for Childhood Malaria Prevention in the Home

Most of the respondents 358 (89.5%) indicated that mosquitoes are a menace in the cantonment. Of these, 218 (54.5%) believed that the mosquitoes are more of a menace during the raining season while 144 (36.0%) feel the situation is the same all year round (Table 5). Responses with regard to the prevalence and menace of mosquitoes in the cantonment were marched (Table 6) and the result indicated the retention of the null hypothesis that mosquitoes are a menace in the cantonment all year round (*Chi square (kruskal-Wallis) = 7.1888, df = 6, p value = 0.001*). This is also corroborated by findings during the FGDs where all the discussants agree that mosquitoes are a source of concern in the cantonment because of high vegetation all year round and due to open drainages. The cantonment environmental officer in an in-depth interview said he was so concerned about the mosquitoes that he had to introduce a 2 –weekly sanitation exercise, which has made the place cleaner.

Regarding actions taken to reduce mosquito contact in the cantonment 139 (34.0%) ranked the provision of netting and screens for doors and windows as the primary action followed by the use of repellants (flit) 110 (27.5%) and smokes for example burning of coils 65 (16.3%). The use of insecticide treated bed nets (ITNs) was also rated as a preventive action by only 22 (5.5%) of the respondents. (Table 7) The result is validated by discussants at the FGD who agreed that the most common approach is to screen the doors and windows but that mosquitoes still find their way into the home, so it may have to be sprayed with insecticide repellants every night. The discussants said that they apply flit the room is not very effective because the children have to wait outside and may be bitten by mosquitoes during this time. Also many of the discussants agreed that preventive sanitation is a possible approach to reducing mosquito contact but its effect on the mosquitoes is not often very apparent during the raining season when the menace is greatest. The medical officer in charge at the Medical Reception Station (MRS) noted that children run around half clad up to 9pm in the cantonment so they stand the greater chance of mosquitoes contact.

Three hundred and twenty-five (81.2%) respondents agree that malaria can be prevented by the administration of medicines. As a result they maintain a stock of varied medicines in the home for prevention. When asked to list these drugs, chloroquine was mentioned by 183 (45.8%) respondents as the most common drug kept in the home for prevention of malaria in children followed by daraprim 59(14.8%), sulphadoxine/sulphalen pyrimethamine (Fansidar, Amalar, Maloxine etc) 45 (11.3%), and herbal preparations (Agbo) 28 (7.0%)(Table 8)

On drug preference, 103 (25.8%) respondents' preferred drugs to herbal preparation "agbo" while 31 (7.7%) preferred "ugbo" to drugs and 87 (21.7%) said it depends on the illness. One hundred and seventy-nine respondents (44.8%) did not respond to this question. This result is corroborated by findings from the FGD where some of the discussants said that herbal preparations are an essential first step in the prevention and treatment of fever in the children in the home. Also the in-depth interviews with traditional healers in the cantonment revealed a good patronage. They said that many of their customers come to them when "medical" medicine has failed or on discharge from hospital so that the "balance of the illness can be flushed out".

With regards to insecticide treated bed nets, many of the respondents 258(64.5%) have heard about them mostly from television 173 (43.3%) and radio 136 (34.0%). One hundred and eleven (27.8%) respondents say they have a "bed net" while 289(72.2%) do not have. Fifty-four (13.5%) rate the use of the net as highly convenient while 6 (1.5%) say the

nets are not convenient because they sweat a lot while sleeping in them. Non-availability 225 (53.6%) and costs 145 (34.4%) were the major reasons given for not having ITNs in the home. The results are consistent with findings from the FGDs and the in-depth interviews where it was revealed that many of the discussants and those interviewed were not aware of ITNs neither did they know where the nets were sold (Table 9). In table 10, awareness and possession of nets is shown to be low compared with awareness and lack of possession indicating no significant relation between them. (*Chi-square* =52.4, *df*=1 *p* < .001).

Table 5: Prevalence and Menace of Mosquitoes in the Cantonment.

PREVALENCE	<i>No of Respondents</i>	<i>Percent</i>
There are very many	358	89.5
There are not many	29	7.25
They are only found sometimes	13	3.25
There are none in this cantonment	0	0.0
Total	400	100
MENACE OF MOSQUITOES		
During raining season	218	54.2
During dry season	38	9.5
All year round	144	35.3
Total	400	100

Table 6: Menace against Prevalence of Mosquitoes in the Cantonment.

Menace	Prevalence				
	Very many	Not many	Found sometimes	None in the cantonment	Total
Raining season	205 (92.3%)	11 (5.0%)	6 (2.7%)	0 (0.0%)	222 (100%)
Dry season	20 (51.3%)	11 (28.2%)	8 (20.5%)	0 (0.0%)	39 (100%)
All year	135 97.1%	4 2.9%	0 (0.0%)	0 (0.0%)	139 (100%)
Total	360	26	14	0	400

(Chi square (kruskal-Wallis) = 7.1888, df = 6, p value = 0.001)

Table 7: Usual Actions to Prevent Mosquitoes Contact

Actions	Ranking response*						TOTAL
	1 Most used	2 More used	3 Frequently used	4 often used	5 Least used	0**	
Use of repellent (flit)	96 (24.0)	72 (18.0)	110 (27.5)	15 (3.8)	16 (4.0)	91 (22.8)	400 (100)
Keep surroundings clean	87 (21.8)	150 (37.5)	67 (16.8)	15 (3.8)	2 (0.5)	79 (19.8)	400 (100)
Use of insecticide bed nets	12 (3.0)	16 (4.0)	22 (5.5)	18 (4.5)	8 (2.0)	324 (81.0)	400 (100)
Smokes e.g. Burning of coils and Impregnated mats	21 (5.3)	34 (8.5)	65 (16.3)	31 (7.8)	5 (1.3)	244 (61.0)	400 (100)
Provide netting for Windows and doors	136 (34.0)	77 (19.3)	60 (15.0)	33 (8.3)	9 (2.3)	85 (21.3)	400 (100)

* Ranking Order is from most used (1) to least used (5).

FIG. 6: Listed Home Stock of Medicines for Prevention

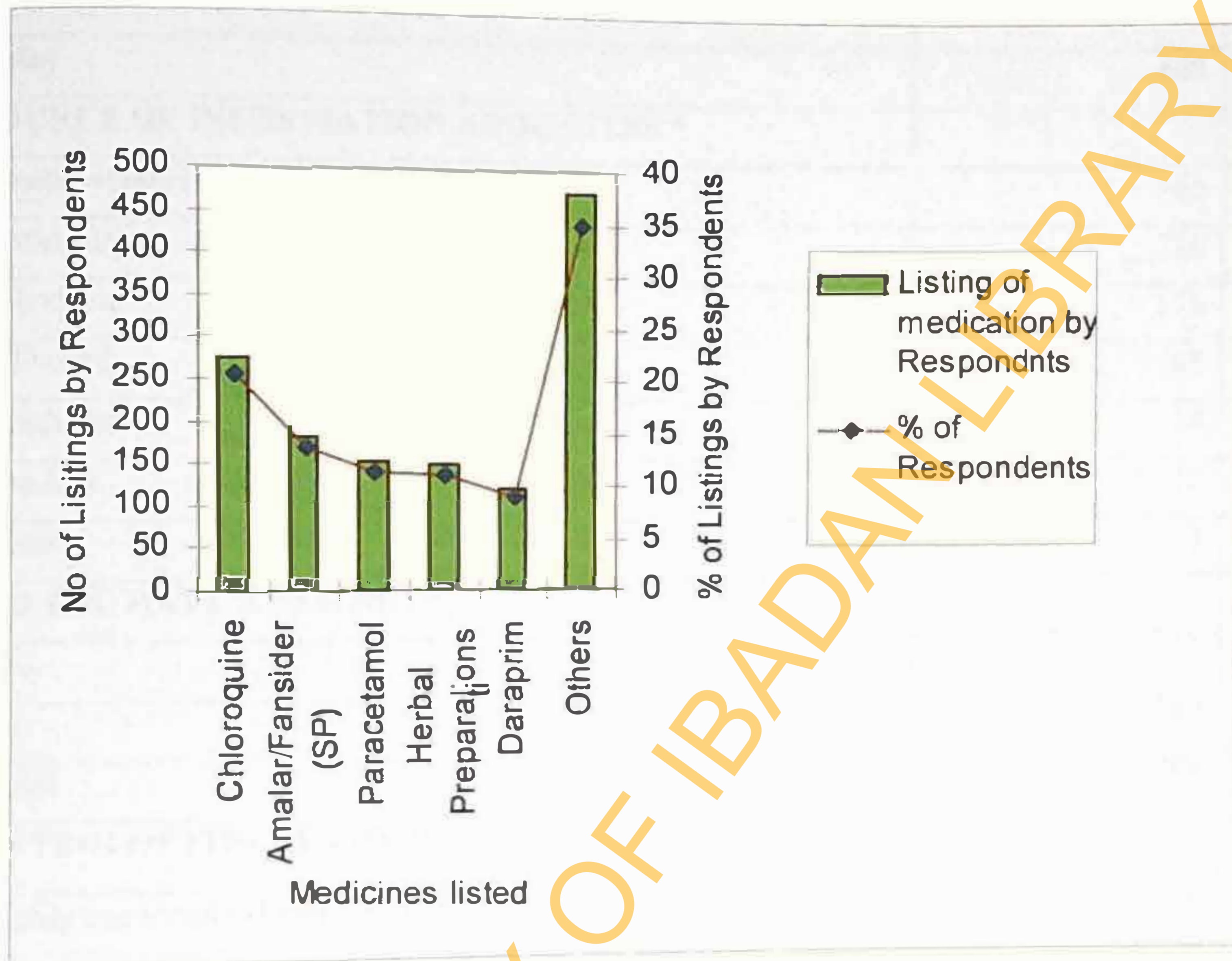


Table 8: Information, Rating and Ownership of Insecticide Treated Bed Nets (ITNs) by the Respondents

<i>Response</i>	<i>Number</i>	<i>Percent</i>
HAVE YOU HEARD OF ITNs?		
Yes	258	64.5
No	142	35.5
Total	400	100
SOURCE OF INFORMATION ABOUT ITNS *		
Health workers	65	16.3
Radio advert	136	34.0
Television	173	43.3
Billboards	67	16.7
Neighbors	34	8.5
Vendors	12	3.0
Others	3	0.6
DO YOU HAVE A BED NET?		
Yes	111	27.8
No	289	72.2
Total	400	100
RATING OF ITNs BY THE RESPONDENTS		
Highly convenient (I can not sleep without it)	54	13.5
Very convenient (I sleep easily in it)	32	8.0
Convenient (I manage to sleep in it)	24	6.0
Not convenient (I sweat a lot while sleeping in it)	6	1.5
Non response**	284	71
Total	400	100
REASONS FOR NOT HAVING ITNS		
ITNs are too costly	145	36.2
Not easily available	205	51.3
Not necessary since I have window net	31	7.7
ITNs are not culturally accepted	5	1.2
My child/children cannot sleep well under the nets	3	0.8
ITNs may be harmful to children who touch them	11	2.8
Total	400	100

*Multiple Responses

**Did not rate because they did not have a bed net

FIG. 7: Rating of Insecticide Treated Bed net by Respondent

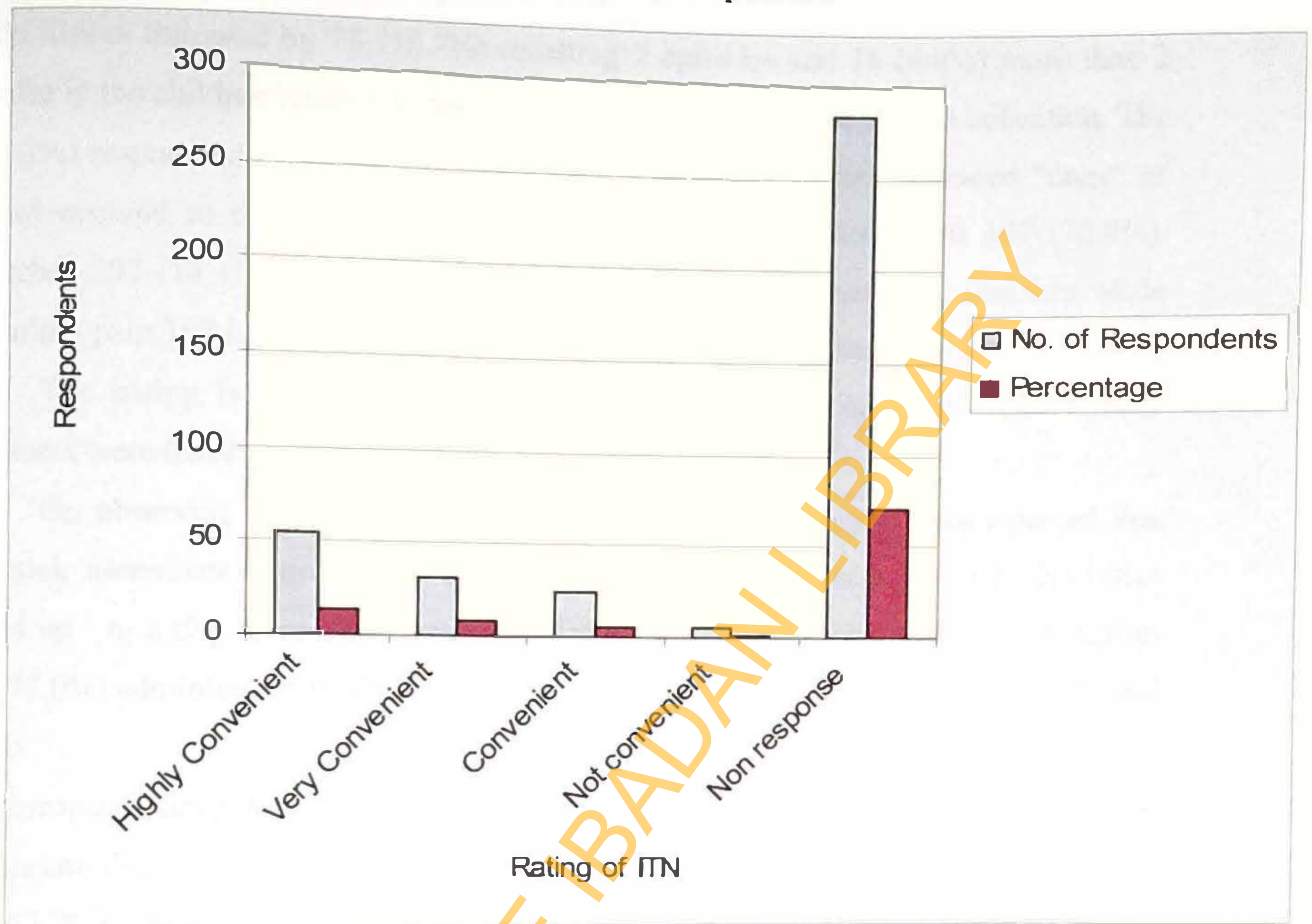


Table 9: Awareness and Possession of Bed nets

<i>Awareness</i>	<i>Possession</i>	
	<i>Yes</i>	<i>No</i>
Yes	109 (41.6)	153 (58.4)
No	7 (5.1)	131 (94.9)

Chi-square = 52.4, df = 1 p < .001

Section D: Treatment Practices during an Illness Episode by Caregivers in the Home

The results showed that 282(70.5%) respondents could recall at least one episode febrile illness followed by 75 (18.7%) recalling 2 episodes and 16 (4.0%) more than 2 episodes in the children under 5 years old in the one month preceding data collection. The 17 (4.3%) respondents who were not very sure of the period either indicated "none" or did not respond to the question. Fever 387(96.7%), catarrh and cough 307 (76.8%), headaches 297 (74.3%) were indicated as the most frequently occurring illnesses while abdominal pain 107 (26.7%), fast/difficult breathing 80 (20.0%) and convulsion occurred least. The listing is congruent with the answer to an earlier question where similar symptoms were listed for malaria. (Table 10)

On observing that the child was unwell, 234 (58.5%) respondents reported that they took immediate action while 63(15.8%) acted within a few hours and 52(13.0%) waited up to a day to confirm symptoms. Of the respondents who took the first action 308 (77.0%) administered medicines available in the home as against 19 (4.8%) who used herbs.

An appropriate drug was selected in 253 (82.1%) of all the drugs administered but the appropriate dosage was given only in 42 (13.6%) cases and for an appropriate duration 164 (53.2%). Decision as to what drug to use, dosage and duration was made by self in 245 (61.2%) cases, and on the advice of spouse in 87 (21.8%) cases. The outcome of this first action was that 149 (37.2%) got well completely while 218 (54.6%) did not. (Tables 11 and 12)

The respondents reported that a second action was taken in the home where the child did not recover fully from the first action or where the child got worse. In this case the most frequent action was to change to other drugs available 104 (26.0%) followed by those who continued with the former regimen 79 (19.7%) or wait to confirm more symptoms 27 (6.8%). The respondents reported that action was self advised 149 (60.6%) followed by spouse 62 (25.2%) and neighbors 28(11.4%). Childcare practices such as continuous feeding and fluid intake 256(64.0%), making the child comfortable 196 (49.0%) and temperature control by tepid sponging 177(44.3%) were reported to have been carried out in the home. Results of the second action indicated that 105 (48.2%) of the children got better while 68 (37.2%) got worse and there was no change in 45 (21.6%) of them (Table 13)

Many of the respondents reported that they sought help outside the home due to excessive vomiting 55(32.2%), advice from spouse or neighbor 40(23.4%) and severe

illness 25(14.6%). Preference for home treatment was due to cost of treatment at the medical centers 250(62.5%), unfriendly attitude of health care workers 195(48.8%) and long waiting time 194 (48.5%). The facilities often visited outside the home include the Medical Reception Station 251(62.7%) and private clinics outside the cantonment 69 (17.2%). Ten respondents indicated that they visited a herbal home (2.5%) while only one respondent (0.3%) mentioned the church. (Table 14)

Seventy-three respondents (18.3%) reported that they had lost an under 5 years old child in the household. Malaria and other childhood febrile illnesses combine to account for 37(50.7%) of the losses. Many other childhood illnesses were implicated but in 13 (17.8%) cases the reasons advanced could not be bio-medically explained. (Fig 10)

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Table 10: Signs and Symptoms that the Index Child was Unwell

SIGNS USED BY CAREGIVERS IN RECOGNISING THAT CHILD WAS UNWELL*	<i>Number</i>	<i>Percent</i>
Fever	353	88.3
Reduced activity	326	81.5
Reduced eating	313	78.3
Sleeplessness	162	40.5
Too much sleep	118	29.5
Vomiting	152	38.0
Diarrhea	96	24.0
SYMPTOMS OF THE ILLNESS RECALLED IN THE INDEX CHILD/CHILDREN *		
Fever	387	96.7
Head ache	297	74.3
Abdominal pains	107	26.7
Joint pains	161	40.3
Vomiting	243	60.7
Diarrhea	190	47.5
Cough/catarrh	307	76.8
Rigors/chills	205	51.3
Dizziness	158	39.5
Convulsions	154	38.5
Fast/difficult breathing	80	20.0

***Multiple Responses**

FIG. 8: Signs Used By Caregivers in Recognising that a Child Was Unwell

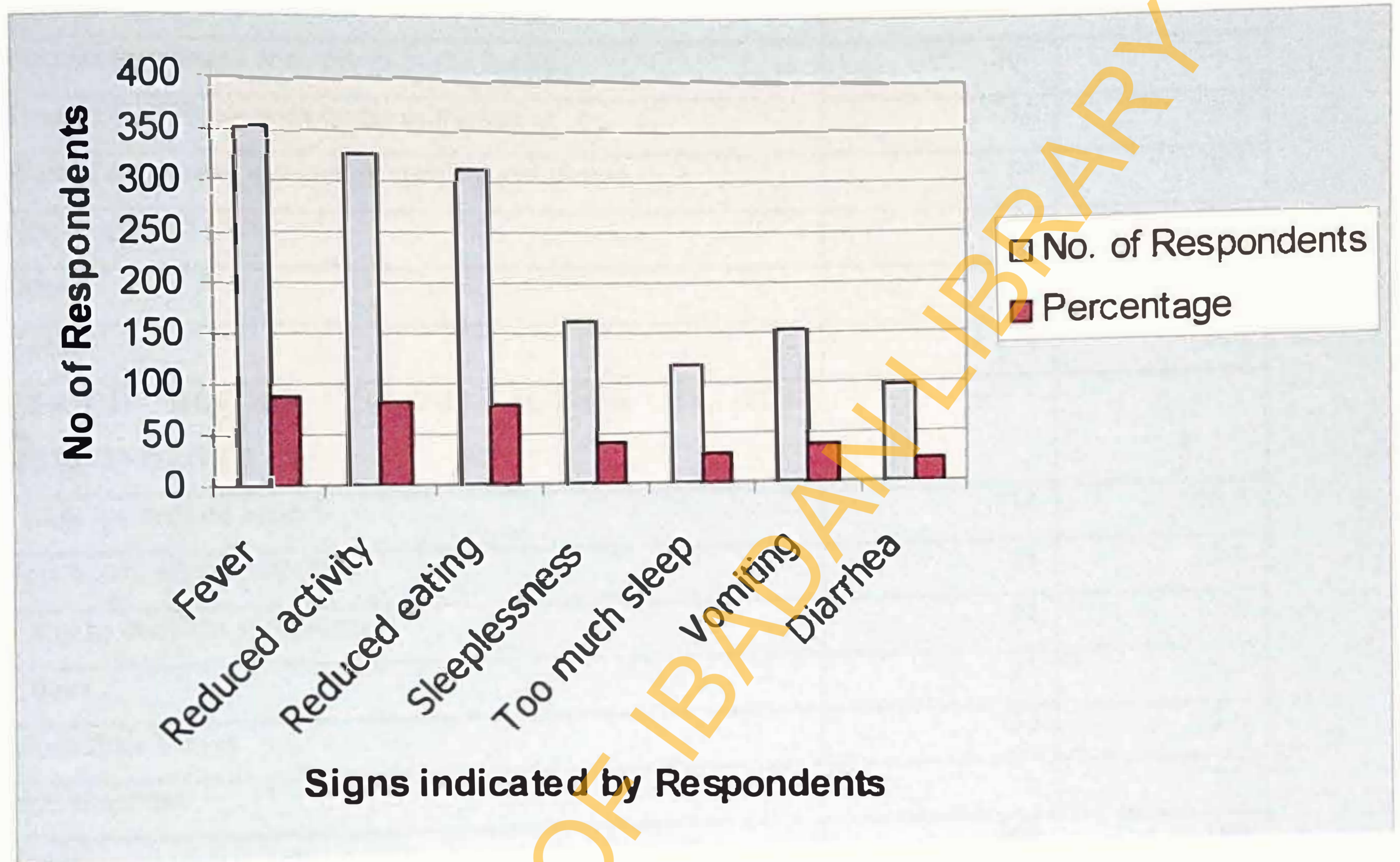


Table 11: Reported Practices in the Home to Manage Childhood Fevers/Malaria

ACTION BY CAREGIVER THE CHILD/CHILDREN BECAME UNWELL	Number	Percent
ACTION BY CAREGIVER WHEN THE CHILD/CHILDREN BECAME UNWELL	Number	Percent
Treated the illness with drugs in the house	308	77.0
Treated the illness with herbs in the house	19	4.8
Waited to be able to identify specific symptoms	34	8.5
Non response*	21	5.2
Others	18	4.5
Total	400	100
PERIOD BEFORE TAKING ACTION BY THE RESPONDENTS		
I took immediate action	234	58.5
Few hours after symptoms	63	15.8
1 day to confirm symptoms	52	13.0
2 days	25	6.2
More than 2 days	20	5.0
Non response	6	1.5
Total	400	100
WHO PROMPTED THE ACTION?		
Self	245	61.2
Spouse	87	21.8
Neighbor	18	4.5
Relation	10	2.5
Non response	40	10
Total	400	100
REPORTED OUTCOME OF THE INITIAL ACTION		
Went away completely	149	37.2
Went away and came back	218	54.5
Non response	9	2.3
Others (specify)	24	6.0
Total	400	100

* Did not take any action

FIG.9: Action by Caregivers on Observing a Child Being Unwell

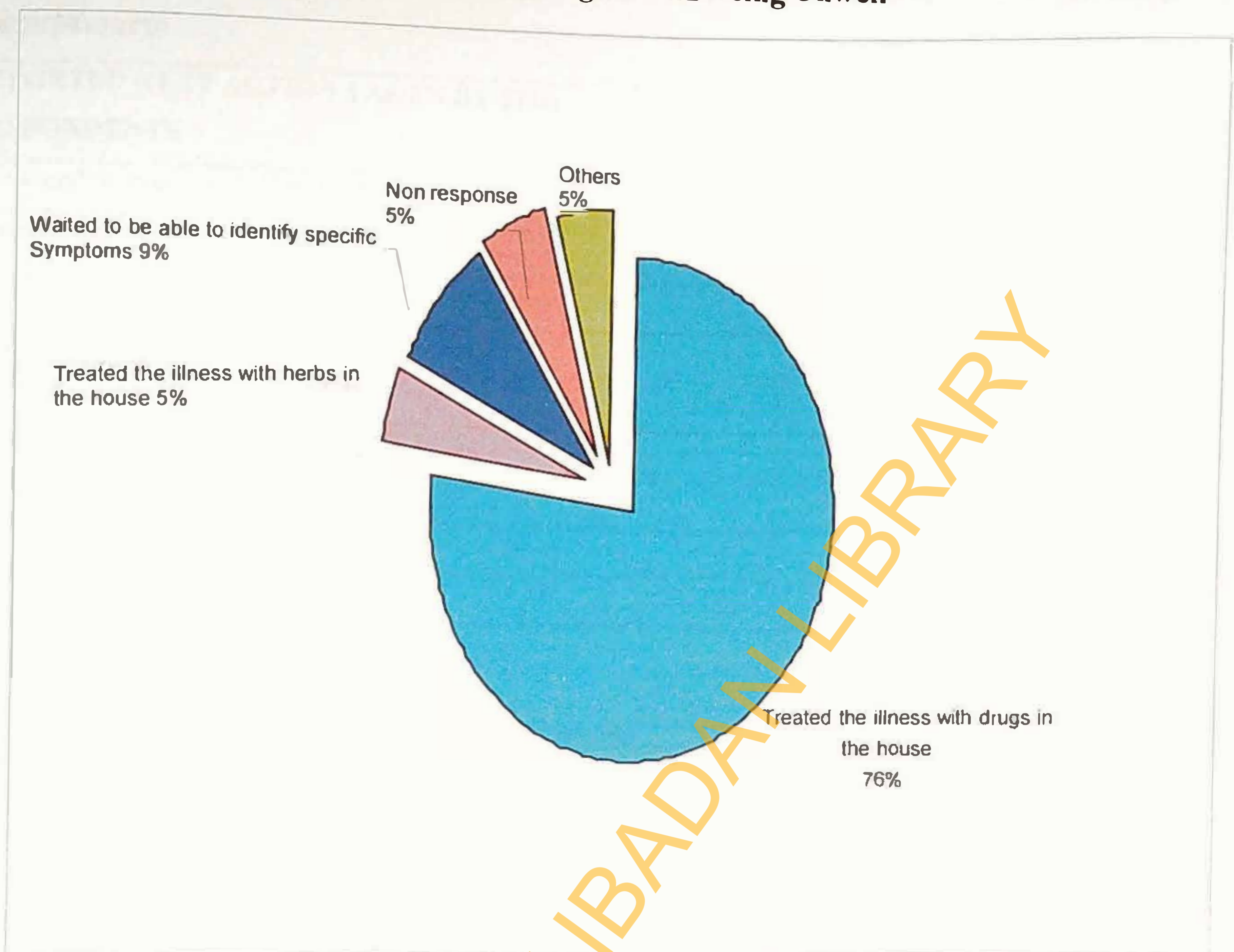


Table12: Appropriateness of Dosages and Duration of Administration of Drugs Used for those who took Second Action

<i>Variables</i>	<i>Dosage</i>	<i>Duration</i>
Correct Dose	79	83
Under Dose	33	16
Over Dose	26	6
Not stated	72	105
TOTAL	210	210

FIG.9: Action by Caregivers on Observing a Child Being Unwell

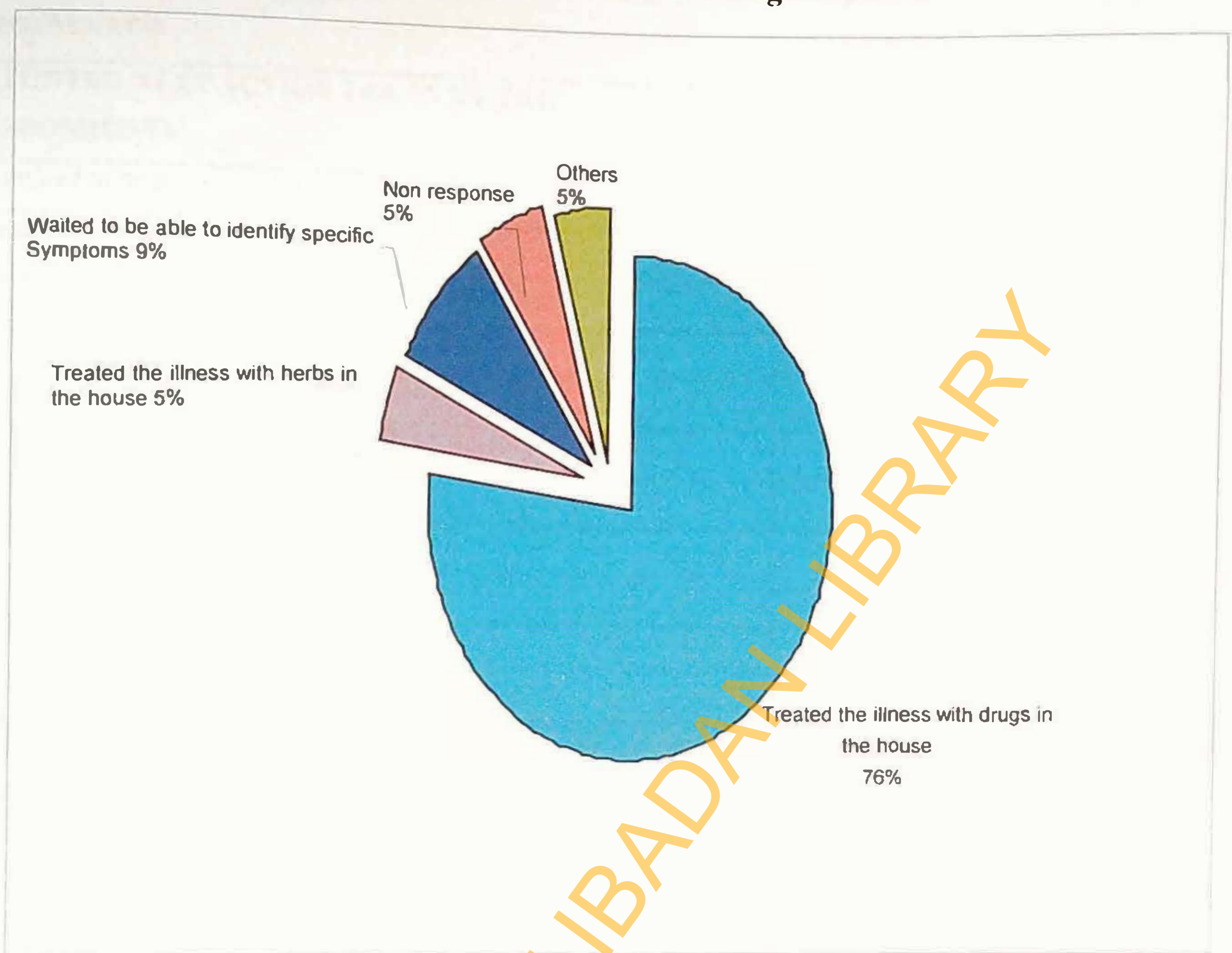


Table12: Appropriateness of Dosages and Duration of Administration of Drugs Used for those who took Second Action

<i>Variables</i>	<i>Dosage</i>	<i>Duration</i>
Correct Dose	79	83
Under Dose	33	16
Over Dose	26	6
Not stated	72	105
TOTAL	210	210

Table 13: Repeated Practices in the Home to Treat Episodes of Childhood fevers/Malaria

REPORTED NEXT ACTION TAKEN BY THE RESPONDENTS	<i>Number</i>	<i>Percent</i>
Continued to treat the child with the same drugs in the house	79	19.7
Changed the drugs to other drugs in the house	104	26.0
Waited to confirm if new symptoms would develop	27	6.8
Others (specify)	34	8.5
Did not take second Action**	156	39.0
WHO PROMPTED THE SECOND ACTION?		
Self	149	37.2
Spouse	62	15.5
Neighbor	28	7.0
Relation	7	1.8
Non response**	154	38.5
REPORTED OUTCOME OF THE SECOND ACTION		
Child got better	105	26.2
Child got even worse	68	17.4
There was no change	45	11.6
Non response**	179	44.8
REPORTED THIRD ACTION TAKEN BY THE RESPONDENTS		
I continued to administer the drugs in the home	14	3.5
I gave other drugs purchased from the patent medicine vendor/chemist	2	0.5
Took the child to the traditional healer	10	2.5
Took the child to the hospital	121	30.3
Non response***	253	63.3
REPORTED PRACTICES TO ENSURE CHILD GETS WELL		
Ensure continued feeding and increase fluids intake during illness	256	64.0
Make child as comfortable as possible by light clothing	196	49.0
Sponge the child regularly to reduce temperature	177	44.3
Clean mouth regularly if ulcers are present	35	8.8
Others (specify)	8	2.0

** Did not take the action

*** Did not take third Action

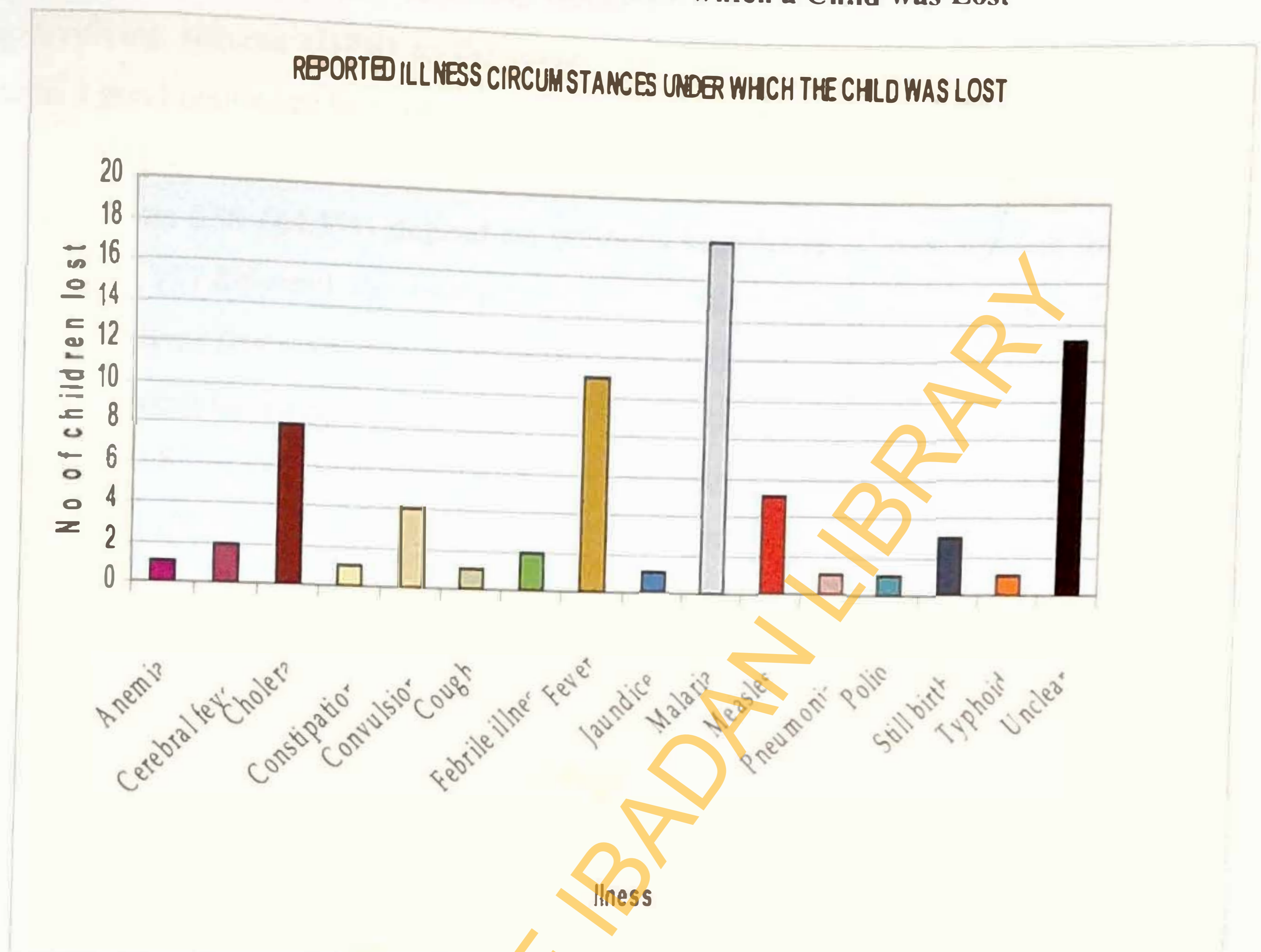
Table 14: Reasons, Problems faced, and Usual Facilities Visited while Seeking Help Outside the Home.

REPORTED REASONS FOR SEEKING HELP OUTSIDE THE HOME	<i>Number</i>	<i>Percent</i>
Child could not sit, stand or walk without support	25	14.6
Child could not take oral drugs and vomited more than three times in one day	55	32.2
There was no improvement in condition after a complete course for oral chloroquine	36	21.0
Advice from spouse/relation/neighbor	40	23.4
Illness was spiritual	13	7.6
Others (specify)	2	1.2
Total+	171	100
USUAL PROBLEMS FACED BY THE RESPONDENTS AT CENTERS OUTSIDE THE HOME*		
Cost of seeking treatment (drugs, transport etc)	250	62.5
Distance from the health center	135	33.7
Attitude of health providers in the health center	195	48.8
Long waiting period in the health center	194	48.5
Lack of drugs in the health center	177	44.3
FACILITIES USUALLY VISITED FOR HELP OUTSIDE THE HOME		
The medical reception station (MRS)	251	62.7
A private hospital outside the cantonment	69	17.2
A herbal home outside the cantonment	10	2.5
A church outside the cantonment	1	0.3
Non response	69	17.3
Total	400	100

*Multiple Responses

+Total Number who reported to have sought help outside the Home

FIG.10: Reported Illness Circumstances under which a Child was Lost



Section E: Knowledge of Anti-Malaria Drugs and Dosage Patterns in Home Management of Childhood Malaria

In mutually exclusive responses 188(47.0%) indicated that chloroquine based medicines, followed by analgesics 82(20.5%), sulphadoxine/sulphalene pyrimethamine 37(9.3%) and multivitamins 30(7.5%) are kept in the home by the respondents for treatment of childhood fevers/malaria. Herbal preparations are also reported to be stocked in 32 (8.0%) responses and halofantrine, a drug meant for clinical prescription only, is also reported 4(1.0%). On the source of these medicines 285 (71.3%) responses indicated that they were purchased from the 'chemist' shop, followed by the leftover from previous prescriptions 69(17.3%), purchase from patent medicine vendors 62 (15.5%) and 17 (4.3%) indicated that they purchase from itinerant medicine peddlers.

with the medical officer at the medical reception station indicated that most patients prefer to patronize the patent medicine vendors in the mammy market rather than the drug-revolving scheme (DRS) in the center. The patent medicine vendors interviewed agree to a good patronage because of flexible payment methods and lower costs.

With reference to knowledge about dosages, responses indicated that many of the respondents 258 (64.5%) depend on previous knowledge of prescriptions from the hospital, 151 (37.8%) read the instructions on the label of the drugs purchased while others seek advice from whoever is selling the drug to them.

Concerning dosages of chloroquine respondents reported more under dosages in syrups 185(42.85%) than in tablets 69(17.25%) while over dosages were reported more in tablets 41 (10.25%) than in syrups 34(8.5%). The reported knowledge of correct dosage in both cases was low, tablets 33(23.1%) and syrup 86 (28.2%). Most of the respondents 316 (79.0%) were not aware that chloroquine is now presented in pre-packs with a colour code (Table 15).

When asked about their awareness of the possible adverse effects that may accompany the administration of chloroquine to the child in the home 297(74.2%) indicated that they are aware, while 103 (25.8%) are not aware (Table 16). Asked to rank these side effects, the respondents indicated body itching 166 (41.55) followed by weakness 75 (18.8%), nausea 49 (12.3%) and vomiting 57 (14.3%) (Table 17). On actions usually taken at home in case of severe side effects, many mentioned the use of drugs like piriton/phenergan 172 (50.8%), administration of other things in the home such as palm oil, coconut water and cold water were also mentioned. Only 14 (4.1%) would stop the drug and 77(22.8%) would take the child to the hospital.

Table 15: Drugs kept at Home, reported Source and Knowledge of their Dosages

LIST OF DRUGS KEPT AT HOME FOR TREATMENT*	<i>Number</i>	<i>Percent</i>
Chloroquine base	188	47.0
Analgesics	82	20.5
sulphadoxine /sulphalene pyrimethamine	37	9.3
Herbal Preparation (Agbo)	32	8.0
Multivitamins	30	7.5
Piriton/phenegan	16	4.0
Daraprim	6	2.6
Halfan	5	1.2
Others (Amoxil. Ketrax etc)	4	1.0
REPORTED SOURCES OF DRUGS AT HOME TREATMENT		
Drugs were left over from previous prescriptions from the hospital	69	17.3
Bought them from the chemist store	285	71.3
Bought them from the patient medicine vendors (PMVs)	62	15.5
Bought them from itinerant drug peddlers	14	3.5
Others (specify)	17	4.3
REPORTED SOURCE OF KNOWLEDGE OF DRUG DOSAGES*		
I was told by a neighbor	15	3.8
I was advised by the drug seller	147	36.7
I used my previous knowledge of the doctor's prescription	258	64.5
I read the instruction on the packet of the drug	151	37.8

*Multiple Responses

Table 16: Awareness of Reactions and Side Effects of Chloroquine and Reported actions taken in the home.

AWARENESS THAT A CHILD MAY REACT TO CHLOROQUINE	<i>Number</i>	<i>Percent</i>
Yes	297	74.2
No	103	25.8
Total	400	100
ACTIONS TAKEN BY THE CAREGIVERS IN THE HOME IN CASE OF SIDE EFFECTS		
Use piriton /phenegan	172	50.8
Take child to hospital	77	22.8
Use red palm oil	30	8.8
Stop drug	14	4.1
Use coconut water	13	3.8
Use cold water	11	3.2
Others	21	6.2
Total	400	100
ARE YOU AWARE THAT CHLOROQUINE IS MADE IN COLOUR PRE PACKS?		
Yes	84	21.0
No	316	79.0
Total	400	100

Table 17: Side Effects to Chloroquine Ranked by Respondents

<i>Response</i>	<i>Ranking++</i>					<i>TOTAL</i>
	<i>1 Most frequent</i>	<i>2 More frequent</i>	<i>3 frequent</i>	<i>4 Least frequent</i>	<i>0*</i>	
Weakness	50 (12.5)	75 (18.8)	32 (8.0)	5 (1.3)	238 (59.5)	400 (100.0)
Nausea	9 (2.3)	41 (10.3)	49 (12.3)	20 (5.0)	281 (70.3)	400 (100.0)
Vomiting	26 (6.5)	40 (10.0)	41 (10.3)	57 (14.2)	236 (59.0)	400 (100.0)
Body itching	166 (41.5)	40 (10.0)	16 (4.0)	13 (3.3)	165 (41.3)	400 (100.0)

++ Ranking from most frequent (1) to the least frequent (4)

* did not indicate this item in their ranking

CHAPTER FIVE

DISCUSSION

Findings from the study are discussed under the following sub headings: demographic characteristics, knowledge and perception of the caregivers about childhood malaria, preventive health seeking practices and home management practices during an episode of malaria. Caregivers knowledge of anti-malaria drugs and dosages used in the home are also discussed along with the implications of the findings of the survey for health education.

Demographic Characteristics

The results of the study showed a high number of children in the households surveyed and 41.6% of these were under 5 years old. This is expected as it is a common notion that soldiers in Nigeria are indiscriminate in childbearing, although this has not been supported by any study. Also polygamy was reported in many of the households and some respondents indicated that the mothers of some of the resident children were living somewhere outside the cantonment. This is supported by the report from the National Demographic and Health Survey, NDHS, 1999 where about 26% of the currently married men in Nigeria are in polygamous unions.

Many of the respondents (41.5%) were in the age group 31 – 40 years with a mean of 29 years ($SD \pm 1.5$ 17). This is normal as soldiers are expected to be young and energetic and could also account for the high fertility seen in the cantonment. The 1.8% 'never married' were soldiers' daughters who were not yet married but had given birth to children at home. The implication of many children in the household is that a high number of malaria episodes in the children are expected hence the preference for home management practice which is generally regarded as less expensive than seeking help in formal health institutions outside the home.

The respondents comprised 62.7 % females compared to males 36.8%. This proportion could be due to the fact that they were the ones usually found at home. However, some of the women said they were not competent to discuss the health of their children and their husbands, who are more educated and control the family resources, were often out of the home when a child or children become sick. This could pose a challenge in home management of malaria and female caregivers should be targeted for health education.

Literacy level among the respondents was high as 47.9% attended secondary school, 30% had tertiary education, and only 8.0% had no formal education. The implication of a high literacy level is that the respondents are more likely to seek appropriate care for their sick children in the home and are able to recognize when to seek help outside. Literate caregivers are also more likely to adopt home management practices that will promote health at home and ensure that the child survives an illness episode when attacked. The finding is supported by studies in Tanzania where higher educational level was associated with health seeking (Tarimo et al, 1998) and with higher knowledge about anti-malarial drugs (Tarimo et al, 2001). High literacy level would therefore contribute to the ability of the caregivers to correctly recognize and treat malaria and therefore contribute substantially to reduced child mortality and morbidity through effective home management practices in the cantonment.

On the income available to the household, more than half of the respondents (58.8%) earned between 11,000 and 20,000 Naira per month from all sources with a mean of N14, 531(SD \pm 6549.8). This income may not be low given the Nigerian minimum wage, but in the case of multiple malaria attacks and other family commitments may not be adequate for the household. Inadequate income available to the household determines, to a large extent, care and treatment seeking practices by caregivers for their children, capacity to cope including their ability to care adequately for the children. Discussions during the FGD support this notion and revealed that it contributes to the sharing of left over medicines from previous child illness episodes which leads to non compliance with dosage regimen, thereby detracting from the benefits of prompt treatment of the child in the home.

In addition, financial constraint is perceived to be responsible for the high patronage enjoyed by the patent medicine vendors in the cantonment because of their ability to sell medicines on credit. The discussants in in-depth interviews said "fever is very frequent in children and this is a problem when the husband is away on posting outside the cantonment or when salaries are delayed." This agrees with a number of studies from Sub Saharan Africa which have shown that between 15% and 82% of the population choose to consult private medicine shops and informal providers for advice and assistance with treatment of childhood illness. In many of these studies, lack of access to the formal sector and the easy accessibility to the drug shops encourage self treatment with shop drugs (Deressa et al, 2003; McCombie 1996;). In the cantonment respondents complain of drugs being out of stock in the MRS or, where available, are

expensive compared to the PMVs. Patent medicine vendors therefore, play a vital role in home management practices for malaria and they should be empowered in relation to knowledge about child survival strategies, dosage of medicines and appropriate medication information to the caregivers.

The cantonment is a melting pot of almost all ethnic groups in the country where many of the respondents (28.8%) were Yoruba followed by Hausa and Igbo in the same proportion (16.5%) and the remaining 37.8% were Ibibio, Idoma, Igala, Ogoja, Tiv, and Urhobo etc. This wide ethnicity was reflected in the variety of ingredients mentioned as composition of the herbal preparations *agbo* used in the prevention and treatment of malaria in the home. In the FGD and in-depth interviews respondents classified malaria into ordinary malaria and yellow fever and were more likely to seek treatment for yellow fever. This did not support the expected wide typology of malaria and ethnic practices in the home management of childhood malaria in the cantonment. For instance, the Yoruba and the Igbo who consist about 45.3% of the households in the cantonment are reported to have at least three classifications of fever or malaria (Munguti, 1998).

Majority of the responses indicated that 61.8% were Christians compared to 36.0% Muslims, traditionalists and those who did not indicate their religious leanings were very few amounting to only 2.3%. The distribution seems normal and did not influence the care seeking attitude of the caregivers outside the home as only about 10% sought care in herbal homes, 1% in the church and no respondent mentioned the mosque.

Caregivers Knowledge and Perception about Childhood Malaria.

Malaria and other febrile illnesses were mentioned by many respondents (54.3%) as the most common illnesses occurring in children under 5 years old within the cantonment. This is supported by the magajiyas (women coordinators) who mentioned "malaria fever, typhoid fever, measles, chicken pox, diarrhea (cholera), convulsion and worm infestation" as the most common illnesses, in that order, in the under 5 years old children in the cantonment. In another in-depth interview, the medical doctor at MRS stated that in the children under 5 years old 90% of them seen daily suffer from malaria fever or its complications (personal communication). This finding agrees with Afolabi (2000) who found out in a study in an island in Lagos close to the study area that malaria is highly endemic and is the major cause of ill health and death. In the National Health Information Management System, NHIMS, 1999 malaria was reported to account for 30% mortality and 41% morbidity in children under 5 years old.

About what causes malaria, majority of respondents (70.2%) mentioned mosquito bite as the cause. Others causes indicated included filthy environment 18.5%, dirty water 3.8% and stress including walking in the sun 4.0%. Discussants at the FGDs supported these findings when most of them mentioned mosquito bite as the sole cause of malaria fever, although some of them added that other childhood illnesses could predispose the children to malaria. The idea that other causes additional to mosquito bite could cause malaria represent a gap in knowledge by caregivers that could be bridged by convincing health education targeted at raising their consciousness about malaria pathways. This is important because if the caregiver is convinced that the mosquito is the sole cause of malaria extra care would be taken by the caregiver to avoid the mosquito contact with the child. Findings from the study did not support any supernatural cause for malaria.

Common symptoms of malaria by majority of the respondents include headache (99.5%) and fever (97.7%). During the FGD, the discussants said that the presence of other childhood illnesses such as catarrh/cough, diarrhea and dysentery may not be symptoms of malaria but because they are always present caregivers should look out for them because their presence may indicate that malaria is present or imminent. Interview with magajiyas revealed, "Malaria is easy to recognize in children. The child often has hot body and may be 'shaking'. He may be having running stool and cough but the body must be hot and shaking". Other signs mentioned were yellowish urine, yellowish eyes, sleepiness or sleeplessness, dullness and frequent yawning. The respondents therefore seem generally well informed about the major symptoms of malaria, knowledge that corresponds with clinical case definition and medically accepted features of malaria especially in the children.

Most of the respondents 87.0% believe that malaria can kill, while 78.0% perceived young children as most likely to succumb to malaria attack so, fever in the child usually prompts immediate action by the caregivers in the home. This finding is supported by Nwabu, 1986 who found overall treatment rates of up to 90% at home prompted by fever. Perceived severity of malaria is another prompt for treatment at home. In this study it was found that there was a significant association between the position of caregiver in the home and the perception of susceptibility to malaria by young children. Mothers, as caregivers, more than fathers believe that their children are most likely to die from a malaria attack ($\chi^2 = 32.2$, $df = 9$, $P < .001$).

Majority of the respondents also believe that malaria could lead to convulsion 80.8% and anemia (90.3%). However, discussants at the FGD were sure that anemia

“short of blood” can result from malaria but were divided as to whether convulsion was as a result of malaria or an entirely different illness. As observed by Afolabi (2000) in his study, villagers perceive convulsions as a different disease entity, spiritual in origin and not responsive to orthodox medicine. In the cantonment however, many of the discussants believed that convulsion it is triggered off by high temperature in the children who already have it in their bodies. So they concluded that there could be no relationship between it and malaria; but they did not believe that convulsion is a spiritual illness. The traditional medicine dealers, (herbalists’ not native doctors), also supported this notion when they claimed that “convulsion is stronger than malaria because it is caused by high temperature which can lead to death. Convulsion is not caused by mosquito bite or bad food; it is already in the body in some children. There are two types of convulsions, one is related to high fever while in the other, the body may not necessarily be hot, but both of them are not caused by spirits”.

Convulsion is one of the danger signals of severe malaria and should prompt caregivers to seek care outside the home. This agrees with observations by Snow et al, (1992) in a study in Kenya and Akogun and John (2005) in Nigeria. Despite insisting that convulsion is not a spiritual illness, it was obvious that many caregivers lack a clear understanding as they believe that case of convulsion must first be stabilized with home remedies like coconut water before a visit to the health center if necessary. This is a major challenge that must be addressed by appropriate linkage between the formal health centre and the home in management of malaria and other febrile illnesses in the children at home should improve child survival. Therefore appropriate health education in this regard is necessary.

Most of the respondents (78.0%) are aware that other childhood illnesses could occur along with malaria; catarrh/cough (21.5%) being the most common followed by measles (12.3%) and convulsion (9.0%) so the discussants said that

“...it is safer to start the treatment of every episode of fever with anti-malaria drugs as malaria is always present”. This approach is supported by the WHO strategy of presumptive treatment of fever, in endemic areas, with an anti-malaria drug to reduce morbidity due to malaria. Greenwood et al, 1988 and Menon et al, 1990, have reported reduction in child mortality through presumptive treatment. Desirable as this approach is,

it will require a linkage between caregivers in the home and health care providers to fully implement by regular supervisory home visits.

Practices for Malaria Prevention in the Home

. Most of the respondents (89.0%) indicated that mosquitoes were a menace in the cantonment. This result is expected because of high vegetation, open drainages and pools of water in the cantonment all year round. The cantonment environmental officer indicated that efforts to reduce mosquito population include regular sanitation exercises, which seem to be yielding the desired fruits. The medical officer at the cantonment MRS observed that children run around half clad late into the night increasing their chances of being bitten by the mosquitoes.

Deliberate effort by caregivers to reduce mosquito contact with the children in the home were ranked and provision of screens and nettings for exit doors and windows was first (34.0%), followed by used of repellants (flit) (27.5%), smokes for example burning of coils in the home and bushes surrounding the home (16.3%) and the used of insecticide treated bed net (5.55%). The choice of screening exit doors and windows is expensive and feasible only in buildings with standard doors, windows and roofing. The buildings in the cantonment fit into this category. However, discussions during the FGDs indicated that this option is not very effective as the mosquitoes continue to gain access when the door is opened. Other discussants indicated that some mosquitoes enter through the mesh either when they are still small in size or where the mesh is damaged. Raising smokes, as a method of keeping away mosquitoes was observed, as not effective during the raining season as the vegetation is usually too green to burn and the process frequently disturbed by the rains. Burning coils within the home was noted to be more effective but often causes irritation, catarrh and cough in the children. It was therefore a consensus that a method effective in one household may not be of the same value in another and the methods are most effective when used in combination.

Many of the respondents (43.3%) have heard about insecticide treated bed nets, but only 27.8% of the respondents indicated that they have a 'bed net'. The findings suggest a high level of awareness of bed nets but low possession. This conflicts with discussants' view during the FGDs where they revealed not being aware of ITNs neither do they know where the nets were sold. It is therefore logical to conclude that despite explanation about ITNs, the respondents were referring to mosquito nets in general, not insecticide treated bed net, a perception traceable to the high culture of use of nets in the Nigerian Army. In deed, until recently, mosquito nets were issued to every soldier free

of charge. This also explains why awareness and possession of nets is shown to be low compared with awareness and lack of possession of the nets ($X^2 = 52.4$, $df = 1$, $p < 0.001$). Some respondents (36.2%) also indicated that ITNs are costly while more than half of the respondents say that ITNs are not available so, it can be concluded, safely, that the use of ITNs is much lower in the cantonment than indicated.

The issue of cost would not arise where the ITN is unavailable as observed by Ekanem (2003), who found that less than 1% of Nigerians use bed nets in urban areas and much less in rural communities. It has been demonstrated that between 25%-30% reduction in mortality, particularly in children and a reduction of up to 50% number of malaria episodes experienced by children in communities correctly using ITNS. Making ITNs available and affordable, therefore, should be a major strategy of a malaria reduction campaign in the cantonment.

Three hundred and twenty-five (81.2%) indicated that they practice routine administration of medicines in the home to prevent or reduce malaria attacks in the children and listed chloroquine (45.8%), daraprim (14.8%) Fansider/Amalar group (11.3%) and herbal preparations (Agbo) (7.0%) in their home dispensary. The practice of administration of drugs to children for the prevention is regarded as a promising option by WHO-UNICEF who is currently engaged in a joint project of intermittent preventive treatment in infants (IPTI). Project reports have indicated promising research findings from Tanzania where it has been demonstrated that a single dose of anti-malarial drug, sulphadoxine-pyrimethamine (SP) given to healthy infants at 2,3 and 9 months of age, at the time of expanded program on immunization (EPI) vaccination, reduce episodes of clinical malaria by 60% and episodes of anaemia by 50%, during the first year of life (Murphy and Breman, 2001; Schellenberg, Menedez, Kaligwa et al, 2001) The medical officer at the MRS did not support the idea of routine preventive administration of drugs to children, except those with sickle cell disease and those with lowered and or compromised immunity (personal communication).

Although there is a high level of knowledge about medicines in the cantonment, indiscriminate use of drugs and improper combination of herbal preparation with other medicines could lead to unsafe treatment outcomes with negative implication for child survival. There is the need therefore for health education about drugs and herbal preparation used for prevention of malaria in the home.

The low proportion of herbal preparation (Agbo) in the home stock of medicines for malaria prevention was not justified by the responses as to its preference. In the FGD

many discussants agreed that herbal preparations were an essential first step in the prevention and treatment of fever in the home. Also in the in-depth interview with traditional healers, they said many customers come to them when 'medical' medicine has failed or on discharge from the hospital so that the "*balance of the illness can be flushed out*". The implication of this is that many more respondents than indicated could administer herbal preparations depending on the situation and calls for appropriate health education for the caregivers and the traditional medicine vendors in the cantonment.

Treatment Practices in the Home Management of Malaria.

In the household interview 70.5% of the respondents were able to recall at least one episode of fever in any of their resident children under 5 years old in the one month period preceding data collection. This could be taken as a measure the severity of the illness episodes, as mild illness is likely to be forgotten particularly if not treated. The finding is supported by Kroeger, (1988) when he noted that differing recall period for fevers is consistent with the severity of syndromes. These symptoms of illness recalled were consistent with those listed for malaria fever and also suggested the high prevalence of malaria in children under 5 years old in the cantonment. .

On observing that the child had fever, most of the respondents acted within 24 hours to treat the child. This agrees with many other findings where most people affected by malaria do not attend general health care facilities and that caregivers are the major providers of antimalarial treatment. The tendency to provide home treatment has been observed in many studies (Deressa et al, 2003; Fawole and Onadeko, 2001 and Hamel et al, 2001). This action is also in line with one of the objectives of the Roll Back Malaria, RBM, which is to ensure that at least 60% of those suffering from malaria have access to prompt, appropriate and affordable treatment within 24 hours of onset of symptoms by having treatment available in the home or within the community. This enables us to suggest that home management practices by caregivers in the cantonment could enhance the promptness of antimalarial treatment and interrupt the progression of simple uncomplicated malaria to severe malaria reducing complications that may arise from the episode.

The results of the study confirm findings in many studies that the typical first response to malaria in the children is self treatment with antimalarials at home. Promptness of action is a major advantage of the treatment being available in the home. As Deming et al (1989) found in a study in Togo, 97% of parents who treated their febrile children with an anti malarial drug at home reported giving it on it on the first day of

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fever while in contrast, only 17% of the children suspected fever who were taken to a health center were said to have been seen on the first day of their fever. For this reason home management practices for childhood malaria should be encouraged and caregivers targeted for health education to improve the application in the cantonment.

Results indicated that the caregivers have high knowledge of the illness and the common anti-malarial drugs possibly due to high literacy level of the caregivers in the cantonment as many of the respondents administer drugs (77.0%) and herbs 19(4.8%) available in the home. Thus appropriate home management by caregivers therefore holds a positive implication for child survival.

However, a common behavior observed was to stop giving medication when symptoms were relieved and save tablets for future attacks or friends thus the availability of medicines in the home is not unusual also as most drugs could be bought without prescription in Nigeria. This notion was emphasized during the interviews. Unfortunately, out of all the cases where drugs were administered, an appropriate drug was selected in 82.2% cases but appropriate dosages were administered only in 13.6% cases and for an appropriate duration in 53.2% cases. In Kenya 18% of the households surveyed had antimalarials at home but none had a full course (Mwenesi, 1993). The disadvantage of unlimited access to antimalarial drugs, especially chloroquine, is the occurrence of resistance by *p. falciparum* which is already posing a problem in Nigeria today.

Decision as to what action to take, dosage and duration was made by self (caregivers) in as high as 61.2% of the cases. Although this result is expected given the high knowledge of drugs and malaria observed within the household, it did not support the qualitative findings, in which supportive roles were reported as normally played, by neighbors, relations and magajiyas (women coordinators) in the cantonment when a child becomes ill. Discussants and key informants indicated a wide spectrum of supportive activities from sharing of left over drugs to assisting to ensure that drugs are obtained on credit from the 'chemist' in the case that caregivers cannot afford to pay for the treatment. They also said they ensure the child is taken to the hospital in case of emergency and if the patient is referred to the hospital outside the cantonment, they arrange transportation and cash required. Also in case there is bereavement; they take turns to sit around with the bereaved to offer social support. Care and support could be appropriate media for strengthening home management practices for childhood fevers in the cantonment.

The outcome of the first reported action in the home was that only 37.2% of the children got well necessitating a second action where the child did not recover fully from

the first action or where he got worse. For the second action, correct dosage was administered in 79 out of 210 cases and the rest cases were under doses, overdoses or the doses were simply not stated. The 3 day course of chloroquine was not used in most cases mainly due to ignorance of the importance of a full dose. There was therefore no significant association between the doses and the duration of administration of the medicines ($\chi^2 = 24$, $df = 3$ $p < 0.001$). There was therefore need for a third action, a combination of actions in the home and outside it. This finding is in line with observation by Akogun and John (2005) that mothers went to the health centre as a third line of action. The outcome of these various actions in the home suggest a trial by error approach and tends to justify the previous notion of home management where "illiterate population" was said to be handling medicines. It is important therefore, to focus on caregivers to change their behavior on dosages and duration of the administration of drugs in the home.

These multiple activities suggest that drug availability in the home alone is not an effective tool to strengthen home based malaria treatment. A disadvantage of the above trial by error approach is lack of clinical evaluation of the child by trained health professionals leading to delayed appropriate treatment. A community based intervention used mother coordinators to provide home treatment of malaria that showed a 40% reduction in mortality in those aged 5 years and below (Kidane and Morrow, 2000). This approach should also be very useful in up scaling home management practices for malaria in the cantonment.

For those who sought help outside the home 30.25% indicated taking the child to the hospital while 2.5% went to the traditional healers. In one of the conceptual frameworks for this study, seeking care from an appropriate provider outside the home is a logical next step in child survival programs (Waldman et al, 1996). After taking 2 actions in the home, some of the respondents reported visiting the medical reception station (MRS) which is located within the cantonment in the case of severe and persistent illness which agrees with the observation that caregivers would go to the station only when home care has failed. This late presentation of the children is usually compounded by their having received various medications before being presented at the clinic. This trend is also noted by Ahorlu et al, 1997, who observed that "the earliest recognition of a febrile illness suspected to be malaria begins in the home where treatment is also initiated using home-prepared herbs and/or analgesics and usually inadequate doses of chloroquine. After the sickness has failed to respond to treatment in the home, recourse is made to the

formal health sector". Audu and Ogala, 1997 reported that as high as 67.2% of patients in a study in Zaria, Nigeria, have received one form of malaria medication or the other before visiting the clinic. Late presentation poses a potential threat to child survival and caregivers should be taught to recognize danger signals of malaria and when to seek help outside the home.

The proportion of those who visited the traditional healers seems to be under reported as in-depth interviews revealed that this group of providers enjoys a good patronage in the cantonment. Also most participants at the FGD said that said traditional remedies are an essential first step in home management of malaria. It is there fore possible that most remedies are prepared by the caregivers at home as most of them demonstrated high awareness of the ingredients used for these preparations. Another problem that became apparent from the interviews was that of combining medicines with herbal preparations. The doses of these preparations are not known and many of them are passed from one family to the other. Administration along with other drugs poses a threat of toxicity particularly to a child who is ill.

Seventy-three (18.3%) of the respondents reported that they had lost a child under 5 years old in the household, malaria and its complication combining to account for 50.7% of the cases. The losses may have been under reported as similar question during the FGD simply elicited the answer 'God forbid'. Reduction of deaths associated with malaria in children is the primary goal of malaria control programs in Africa but there have been no discussion about how these changes in mortality can be measured in view of many problems and constraints such as deaths not reported and even the real cause of such events. It is, therefore, important to streamline monitoring and evaluation particularly as it affects home management by caregivers.

The main reasons for preference of home management of febrile illness were given by respondents as high cost of treatment at the MRS and other medical centers (62.5%), unfriendly attitude of health care workers (48.8%) and long waiting time (48.5%). The higher cost is expected as the caregivers are not likely to be given the option of what drugs to purchase, higher quality of drugs and the token fee for admission. Late presentation of the child may result in adverse episodes. This experience, which appears common, has created a strain between the health personnel one accusing the other of negligence. The accusation of long waiting time is also expected as there are always many other patients to attend to. The perception of health care providers and public health institutions by caregivers as hostile change in order to improve the management of

malaria and other febrile illnesses in the home. The caregivers, who are responsible for young children, must be able to recognize when to seek help from outside the home so that the health of the child may not be unnecessarily threatened. This can be achieved by conducting health talks with caregivers in the cantonment during antenatal clinic with pregnant women and health education outreaches in the living blocks. Home visits to improve knowledge, malaria home management practices and therefore child survival should also be carried out on routine basis.

Knowledge of Anti-malarial Drugs and Dosage Patterns in the Home Management of Malaria.

Chloroquine based drugs top the list (40.0%) of the home stock of medicines for prevention and treatment of malaria. Analgesics (20.5%), sulphadoxine pyrimethamine SP (9.3%) and multivitamins (7.5%) and herbal preparations (8.0%) are reported to be stocked. Maintenance of a home stock of medicines is supported by discussions during the FGDs where the caregivers maintain that the medications come in handy when a child becomes unwell and there is no money to purchase drugs or to take the child to the clinic.

Regarding the source, 71.3% of the respondents indicated purchase from 'chemist shop' followed by the left over from previous prescriptions (17.3%), purchase from patent medicine vendors PMVs (15.5%) and (3.5%) respondents indicated that their source was the itinerant medicine peddlers. Since it was observed from the initial interviews and in-depth interview with the PMVs that there is no registered 'chemist' which is defined as a practice run by a registered pharmacist in the cantonment, what obtains in the cantonment are patent medicine vendors who are licensed to sell non prescription drugs known as over-the-counter, OTCs, who are patronized by caregivers because of lower prices and flexible payment terms. PMVs were observed to sell prescription drugs as well as other medicines, sometimes, of questionable source and quality. A study of PMVs by Oshiname and Brieger, (1992) showed that there were gaps in several areas of their knowledge, skill and possibly attitudes but revealed their usefulness particularly in the areas of drug availability. The PMVs could be an avenue for improving community knowledge about medications and strengthening the quality of the apparent prevalent home management practices in the cantonment.

Buying of medicines from itinerant vendors was also mentioned as a potential source of danger in the cantonment as the peddlers carry their wares in bottles; out of their original packs thus hiding the expiry dates which could unwittingly promote fake and counterfeit drugs. While the menace of itinerant drug trade is widespread in Nigeria,

it posed a particular danger to the cantonment community as the peddlers go as far into the living quarters as possible and entice their customers with cheap prices and there is thus the need for concerted efforts to check the practice.

Another reported common source of drugs in the cantonment is the left over from previous sickness episodes. The major reason for this practice could be associated with cost as caregivers are unwilling to discard uncompleted prescription drugs. However, there was also evidence of solidarity during an episode of child illness among caregivers in the cantonment as support systems to the caregiver during did not include only advice but also sharing of drugs left over from other children's treatment. Foster 1998, noted that drugs obtained at a cost considered higher are either hoarded for future use or sold to others for self medication.

It was observed that the caregiver discontinues the administration of medicines as soon as the child was seen to have improved in health and the balance kept against another episode in the child, another child or even to pass to a child in another household with similar symptoms. The act of sharing has been exploited for the development of home and community based management in Uganda and should find application in the cantonment too.

Among the important issues in home management of malaria in children under 5 years of age are knowledge about the drugs and appropriate doses to be used. The commonest source of knowledge of drugs in the cantonment is residual knowledge of previous prescription from the formal health sector (64.5%); reading of the label for instruction (37.8%), advice from the drug seller (36.7%) and neighbors (3.8%). The discussants at the FGD and interviews said that they have not been trained and no home visits paid to them. This is not unusual as Makubalo (1991) found that only about 25-27% caregivers in the two areas studied knew the correct dosage for children. In another study by Deming et al 1984, the main problem associated with parental administration of chloroquine in Togo was under dosage that was believed to be responsible for the drug resistance that developed. Clearly, correct knowledge of dosages of chloroquine was low and is gained by individual efforts of the caregivers, which sometimes may be counterproductive. A deliberate program targeting appropriate knowledge of anti malarial drugs by the caregivers should be undertaken as a part of malaria reduction program in the cantonment

Only 21.0% of the respondents and few patent medicine vendors were aware that chloroquine is now available in color-coded pre-packs and none of them were able to

mention the color code during the in-depth interview. The advantages of presentation of chloroquine and other anti-malarial in age-specific pre packs to home management of childhood malaria include correct dosage delivery, and improved drug compliance. The availability of pre-packed formulation of the relevant anti-malarial drugs(s) would also avoid the inconvenience of crushing tablets and insufficient or too much administration of liquids. The Disease Management component of RBM has the provision of prepackaged drugs by 2003 as one of its milestones/targets, but this target has not been achieved. Use of pre-packaged tablets of chloroquine in scaling up studies increased the number of children receiving treatment within 24 hours from 46% to 54.4% in Uganda and from 67% to 89.6% in Nigeria, (Yeboah-Antwi et al 2001; Salako et al, 2001). The availability in the cantonment of prepackaged drugs could be of assistance to the caregivers in their home management practices of childhood malaria.

Results of the study revealed that majority of the respondents (47.27%) were aware that a child may react to chloroquine. Many side effects were mentioned and body itching was ranked as the most common followed by weakness, nausea and vomiting and the respondents seem to be very aware as to how to ameliorate these side effects. The most common approach was the use of piriton/phenergan (40.8%), the use of miscellaneous items in the home like palm oil, coconut water, use of cold water, and taking the child to hospital (22.8%) where necessary. Only very few respondents indicated that they would stop further drug administration in case of severe drug reaction or severe side effect. These actions are in line with the guidelines for malaria control for primary health care workers, in Nigeria, which indicate that side effects to chloroquine are minimal at the recommended doses but dizziness, nausea, vomiting, diarrhea and itching may occur. The ability of caregivers to recognize side effects as distinct from normal illness progression and to ably manage them is a major challenge in home management. This can be improved by health education.

Implication for Health Education

The main findings from this study are that the prevalence of malaria is high in the cantonment all year round and preventive practices are uncoordinated and expensive. Awareness about ITNs is low and most respondents do not know where they are sold. Home management practices for childhood malaria are high predicated on home stock of drugs and herbs. In this study, two actions were taken in the home while a third combined home management and seeking help outside the home. Support systems within the cantonment include sharing of medications left over from previous illness episodes.

Patent medicine vendors are an important source of medicines and information within the cantonment. Correct knowledge of dosages of chloroquine and other antimalarials is low and there is no awareness of chloroquine prepacks which could improve correct dosage administration and compliance. Mortality due to malaria and its complications is also high within the cantonment.

The findings indicated that the caregivers are either unaware of the issue of fake drugs or did not attach much importance to it. This could be predicated on the erroneous belief that patent medicine vendors dare not peddle such drugs in the cantonment. However it is important to observe that even the vendors may not be aware of or recognize these fakes with the sophistication with which they are presented. Caregivers should be advised to suspect fakes in case of too cheap prices and non response by the children to the drugs. It is also important that caregivers should be educated on the issue of resistance of the parasite to drugs that could develop from under dosing as this was very apparent in the cantonment. New drug such as artemisinin was not mentioned during the group discussions possibly because it is still very expensive and not routinely stocked by the vendors. Caregivers should be counseled, during home visits, of the danger in the administration of prescription only drugs at home and advised to visit as soon the qualified person when symptoms seem not to be resolved by the routine medication.

Based on these findings health education, using appropriate strategies such as, training, social mobilization and public enlightenment should be embarked upon to improve home management of childhood malaria and linkages for seeking help outside the home by caregivers within the cantonment.

Training should be organized for caregivers in order to fill the observed gaps in knowledge and practices in malaria causation, signs and symptoms, and adequate treatment using correct dosages of and for the appropriate duration. The patent medicines vendors should be trained to improve their prescribing practices and knowledge in providing drug information to the customers. The magajiyas should also receive adequate training in malaria disease management in the home and in providing social support to the caregivers when the child has an episode of malaria.

There should be mobilization of the whole cantonment occupants to ensure community participation in the preventive sanitation in the cantonment. Groups, such as the magajiyas and patent medicine vendors should be mobilized to embrace community-based distribution of ITNs and pre-packaged anti-malarial drugs.

As a public enlightenment strategy health workers in the medical reception center (MRS) should deliver health talks to caregivers before the clinics. This could be applied to the malaria clinics, ante and postnatal and immunization clinics. During the health talks behavior change communication materials eg chloroquine dosage charts, prepackaged and co- packaged drugs could also be introduced. Behavior to be emphasized in the home for child survival could be highlighted. Similarly, there could be home visits by health workers as a part of a deliberate policy to improve linkages between the home and the formal health sector to improve referrals and, therefore child survival.

Recommendations

The following recommendations are made based on the results of the survey:

- Home management as a preferred approach to the treatment of malaria needs to be scaled up within the cantonment. This could be accomplished by supporting health education within the cantonment by the relevant authorities with the support of NGOs working on malaria.
- Caregivers should be targeted for training in order to fill the observed gaps in knowledge such as the perception of convulsions, recommended doses and duration of administration of chloroquine, management of side-effects and indications for seeking help outside the home. This is very important because the caregiver's ability to suspect malaria in the presence of fever has important implications for the child surviving the episode of malaria.
- Patent medicine dealers "chemists" are a helpful source of medicines and drug information in the cantonment. They should be targeted for training to provide this service and to discourage them from selling unwholesome medications.
- Traditional healers within the cantonment provide an essential service when they "flush out" the remnants of a malaria episode after the administration of drugs or where such drugs do not provide the required relief. They should be recognized and empowered by training for improved service
- The magajiyas (women coordinators) are a group that could be used to provide social support and to ensure community participation by

community-based distribution of pre-packaged anti-malarial drugs, ITNs etc. They should be sufficiently mobilized and trained for this assignment.

- The whole of the cantonment community should be mobilized for mosquito reduction activities. Against the current situation where only soldiers are called out for preventive sanitation as a drill or parade, every two weeks, the whole community should be involved with each camp assigned an area to keep clean and free of pools of water.
- To provide linkage between the home and the formal health sector, thereby improving home management of malaria, the staff at the medical reception station MRS, should be encouraged to hold malaria clinics. They should be able to hold health talks before each clinic and pay home visits as necessary.

Conclusion

The study was undertaken to document home management practices for childhood malaria in Ojo Military cantonment, Lagos. Findings from this study show that the respondents are generally well informed about malaria and its major symptoms. Most respondents believe that malaria can kill and there is a significant association between the position of caregiver in the home and the perception of susceptibility to malaria by young children. The prevalence of malaria is high in the cantonment all year round and preventive practices are uncoordinated and expensive. Efforts by caregivers to reduce mosquito contact with children in the home include screening of doors and windows, use of repellants (flit), burning of coils and bed nets. It was found that none of these practices is effective when used alone. Awareness about ITNs is low and most respondents do not know where they are sold.

Home management practices for childhood malaria are prompted by the presence of fever and are predicated on a home stock of medicines and herbs. Most respondents reported taking immediate action on observing fever in the child by giving an appropriate anti-malarial drug but in inappropriate dosages and for inappropriate duration. There was therefore no significant relationship between the doses and duration of administration of the drug. Correct knowledge of dosages of chloroquine and other anti malarial is low and there is no awareness of chloroquine pre-packs, which could improve correct dosage administration and compliance. Mortality due to malaria and its complications is also high within the cantonment. Support systems within the cantonment included sharing of

medications left over from previous illness episodes. The patent medicine vendor “chemist” was reported to be the main source of drugs within the cantonment and the main reasons for their patronage were low cost and flexible payment terms.

It is important to review the care-seeking behavior focusing particularly on attitudes, beliefs and practices that prevent caregivers from seeking proper medical care and the quality of care provided in the home as vital aspects of home management of childhood malaria.

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APPENDIX I

500/19/13



HEADQUARTERS

NIGERIAN ARMY MEDICAL CORPS/SCHOOL
P.M.B. 12019,
VICTORIA ISLAND,
LAGOS.

LAGOS 2611707, 2614263

Ref: UNMCS/253/03

UNIT (IP) ←

4 Jun 03

APPROVAL TO CONDUCT STUDY ON KNOWLEDGE
AND HOUSEHOLD PRACTICES IN THE HOME MANAGEMENT
OF MALARIA/CHILDHOOD FEVERS AMONG CAREGIVERS IN
C/O MILITARY CANTONMENT

References:

- A. UNMCS/500.3/TA dated 2 May 03.
- B. 81 DIV SIG DTP 2010503 May 03.

1. I am directed to convey approval to conduct above mentioned subject in C/o Military Cantonment vide Reference B.
2. Please treat and acknowledge receipt.

SE. OBEDE
Col
for Comdt

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REG-CLERK	<i>Abi</i>	<i>05/08/03</i>

Approval has been given, ~~per~~ inform the concerned and Col Greg accordingly.

[Signature]
Abi

cc
 Pass to Col Gregory as directed. *Abi* 05/08/03

6-03

Pl
 CI-SFMC/16C

01

APPENDIX II

FOCUS GROUP DISCUSSION GUIDE

Good morning. My name is Agogo U. Gregory of the department of Health Promotion and Education, University of Ibadan. The purpose of this discussion is to investigate the various home management practices adopted by caregivers in childhood fevers/malaria in the cantonment. We will want to find out what we usually do as persons taking care of children when they become sick particularly when we suspect it to be malaria. We request for your maximum co-operation by discussing freely about the disease. We want to assure you that the information you give us will be used for research purposes only and therefore will not hurt you in any way. Please permit us to record your contributions with the tape recorder so that we will not forget important things you will discuss with us.

Thank you.

1. Please can you tell us about the most common diseases in the cantonment? Probe for illnesses among:
 - a. Children
 - b. Adults'
 - c. Pregnant women.
2. What is malaria? Ask questions to determine their knowledge of the condition they refer to as "malaria". Probe for association between it and other febrile illnesses like:
 - a. Hot body
 - b. Stomach problems
 - c. Convulsions
 - d. Measles
 - e. Cough
3. For the illnesses mentioned e.g., fever and convulsions what are the specific causes?
4. What are the main things caregivers in the cantonment do to prevent malaria i.e. to keep the children from getting the illness at all?
5. What are the different ways caregivers take care of illness with fever? Probe to know:
 - a. What are the local forms of care at home?
 - b. How do they get drugs used in home care?
 - c. How and when do you visit indigenous headers and spiritualists?
 - d. Who are the prominent spiritual healers patronized by people in the cantonment?
 - e. Private Health providers?
6. Among the illness associated with hot body and with convulsion, what are the common forms of treatment? Probe for common drugs/ medicines for these illness

types, names knowledge of how drug works, costs, preferences, reasons for choices etc

7. What are the common problems caregivers have when their wards have a disease associated with fever in the home? Have you or anyone close to you ever lost a child because of illness associated with malaria?
8. Please could you share your experiences about help received or given in the case of children under 5 years with fever? How frequently does this occur?
9. When and how do you determine to seek help outside the home? What facility most frequently patronized, Medical Reception Station (MRS), patent medicine vendors, traditional healers churches etc Probe for support received or denied by spouses or neighbors etc
10. Can you please tell us about the situation concerning mosquitoes in the cantonment?
 - a. Problems caused by mosquitoes
 - b. Efforts to get rid of mosquitoes
11. What is the experience in the Cantonment with bed nets? Probe for types, source of nets, problems caused by nets, perception of nets, Whether or not bed nets are treated/impregnated with chemicals? Costs of nets etc.
12. Please give us your own suggestion on the best way childhood fever/malaria could be managed in the home. What practices do you think should be encouraged or discouraged and how?

Thank you, for your time

APPENDIX III

INDEPTH INTERVIEW GUIDE FOR KEY INFORMANTS:ENVIRONMENTAL HEALTH OFFICER

Good Morning Sir,

My name I work with the Department of Health Education and Promotion, Faculty of Public Health, University of Ibadan. This interview follows the focus group discussion with caregivers on home management practices of childhood malaria in the cantonment in which environmental sanitation was mentioned as being responsible for the large mosquitos' population in the cantonment.

We should be glad if you express your candid opinion on the subject as this will determine the success or otherwise of the study. Your opinion will be treated in confidence and will be used for research purpose only. Please permit me to use a tape recorder so that I will not forget or omit vital information you may give me.

1. What is your experience with environmental sanitation in the Cantonment? Probe for:
 - a. Organized effort to keep the cantonment clean
 - b. The steps taken to keep the cantonment free of breeding grounds for mosquitoes, by whom?
 - c. The level of individual and cantonment sanitation in general? What are the outcomes?
 - d. Is there any organised fumigation for the living areas, offices and messes?
2. What can you say about malaria prevalence in the cantonment? Probe for the number of reported cases, whether the illness is seasonal and the group in which it is more prevalent.
3. How often do you carry out health talks in the cantonment? Probe for:
 - a. Groups included in the health talk (if any) in the clinics, camps and living quarters (blocks).
 - b. Topics covered by these health talks, probe for specific topics such as Malaria and its prevention, diarrhea, chicken pox, measles etc.
4. What are the constraints in carrying out your functions? Probe for constraints in funding, manpower, and availability of chemicals
5. Please can you suggest in what ways the cantonment sanitation can be improved and what can be done to reduce the prevalence of malaria?

Thank you for your time.

INDEPTH INTERVIEW GUIDE FOR KEY INFORMANTS

CHEMISTS / PATENT MEDICINE VENDORS

Good Day Sir,

My name is I work with the Department of Health Education and Promotion, Faculty of Public Health, University of Ibadan. This interview is arranged after focus group discussions we have had with caregivers on home management practices of childhood malaria fever. It was revealed during the interviews that patent medicine vendors/chemists feature prominently in drugs supply and social support to caregivers during illness episodes.

We would, therefore appreciate your candid opinion on the subject, as this will enrich the study. Your opinion will be treated in confidence and used for research purpose only. Please permit me to use a tape recorder so that I will not forget or omit vital information you may give me.

1. For what illnesses do patients purchase drugs in the cantonment? Probe for the most common illnesses among children less than 5 years, older children, adults and pregnant woman
2. What do you think of drug purchase in the cantonment? Probe for whether the clients bring a prescription or just request for what they think they need. Do they request for complete dosages or just what they can afford?
3. What advice do you give to your clients with respect to drug use? Probe for adequate dosage and for a complete duration of treatment. What is normally the reaction to this advice?
4. What can you say about the knowledge of drugs by caregivers? Probe for appropriate drugs and adequate dosage for home management of malaria.
5. What is your experience with drugs for malaria? Probe for the drugs most frequently requested or bought, what are the main reasons for the preference? What drug combination (if any) is commonly requested? What are the cost and therapeutic advantages of each combination? What do you think about compliance to drugs prescribed or recommended?
6. What do you think about quality of drugs sold in the cantonment? Probe to know about the activities of itinerant drugs sellers. How prevalent are fake and counterfeit drugs? What should the cantonment authority do to reduce fake drugs and curb the activities drug hawkers?

7. Please suggest ways that drugs for malaria may be packaged and sold such that correct dosages are used by caregivers. Probe for the part drug manufacturers, government should play in this.

Thank you for your time.

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INDEPTH INTERVIEW GUIDE FOR KEY INFORMANTS:**TRADITIONAL MEDICINE VENDORS**

Good Morning Sir,

My name is AU Gregory. I am a student in the Department of Health Education and Promotion, Faculty of Public Health, University of Ibadan. This interview is arranged to confirm information on the management of childhood fevers / malaria in the cantonment advanced by caregivers during focus group discussions that were held.

I should be glad if you express your candid opinion on the subject; as this will determine the success or otherwise of the study. Your opinion will be treated in confidence and used for research purpose only. Please permit me to use a tape recorder so that I will not forget or omit vital information you may give me.

1. For what common illnesses in children do your customers request your medicines? Probe for how these are called both in English and the dialect.
2. What is/are the causes of fever in children? Probe for the causes of various types of fevers. Enquire specifically about malaria fever; causes, types, treatments.
3. Do you believe that malaria fever can be better treated in the home using roots, herbs and concoctions? Probe for the types or stages at which malaria is treated using traditional remedies.
4. Is there any component of your medicine not disclosed to your clients? Probe for divinations, incantations, rules and regulations taboos etc.

Thank you for your time.

INDEPTH INTERVIEW GUIDE FOR KEY INFORMANTS:MEDICAL RECEPTION STATION

Good Morning Sir,

My name is AU Gregory. I am a student in the Department of Health Education and Promotion, Faculty of Public Health, University of Ibadan. These are my research assistants. We are working on "Home management Practices of childhood fevers / malaria by caregivers in the cantonment" This interview is arranged to enable us confirm information we received during focus group discussion with the caregivers. We should be glad if you express your candid opinion on the subject, as this will determine the success or otherwise of the study. Your opinion will be treated in confidence and used for research purpose only. Please permit me to use a tape recorder so that I will not forget or omit vital information you may give me.

1. Please name the childhood diseases common in the cantonment?
.....
2. How frequent do you see patients with the diseases mentioned above?.....
3. What would you say about the prevalence of malaria in cantonment? Probe for prevalence among children, adults, and pregnant women.
.....
4. Please estimate the number of cases of malaria in the under -5 seen daily, weekly etc in the station?.....
5. What can you say about early presentation of the child at the station? Probe for the ability of the caregivers to recognize illness as malaria, administration of drugs, and outcome of visit to the station?
6. What are the common drugs usually administered by caregivers to treat malaria before coming to the clinic? Probe for appropriateness of drugs, adequacy of dosage employed sources of drugs and use, if any, of traditional tea / concoctions.....
7. What is your experience with malaria within the period of your tenure in the station? Probe for occurrence and frequency of severe malaria, convulsions, cerebral malaria, deaths due to malaria and drugs usually administered before child is brought to the station?

9. Are there any special programs to create awareness about how the malaria scourge can be prevented? Probe about chemo prophylaxis, ITNs/ ITMs (insecticide treated bed nets, insecticide treated materials) spraying, burning of bush etc.

Thank you for your time

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INDEPTH INTERVIEW GUIDE FOR KEY INFORMANTS:**MAGAJIAS**

Good Morning Madam,

My name is AU Gregory. I am a student in the Department of Health Education and Promotion, Faculty of Public Health, University of Ibadan. This interview is arranged to enable me collect baseline information on the management of childhood fevers / malaria in the cantonment.

I should be glad if you express your candid opinion on the subject; as this will determine the success or otherwise of the study. Your opinion will be treated in confidence and used for research purpose only. Please permit me to use a tape recorder so that I will not forget or omit vital information you may give me. Thank you.

1. Please name the childhood diseases common in the cantonment?
.....
2. Please rank the diseases mentioned above from the most common to the least common.....
3. What is/are the causes of malaria?
.....
4. How do you recognize malaria in children?
.....
5. What measures do you take to prevent mosquito bites?
6. What are your roles as women coordinator in the cantonment?
.....
7. What support roles are you often called upon to perform with relation Childhood illness?
8. In what ways do you think malaria is peculiar to other childhood fevers?.....
9. Have you received any formal training in childcare?
10. What is your opinion in home management of malaria by caregivers?
11. In what ways do you think home management of malaria can be improved In order to ensure enhanced child survival?

Thank you for your time

APPENDIX IV
QUESTIONNAIRE

Dear Respondent,

Good Day, Sir. My name isI work with AU Gregory who is a student in the Department of Health Promotion and Education, Faculty of Public Health, University of Ibadan. The questionnaire is designed to obtain data on the **“Home Management Practices of Childhood fevers/ Malaria among Caregivers in the Cantonment”**. The outcome of the study will be helpful in planning intervention programmes for improving home management/prevention of childhood fever/ malaria. Your open and sincere responses are very essential to the success of the study.

The information required is solely for research purpose and will be treated in strict confidence.

Are you willing to participate? 1. (Yes) 2. (No). If yes, thank you for your time

What is the total no of children in the family?.....

How many of these children are under five years old?..... (If nil, thank the respondent and discontinue the interview)

A. SOCIO-DEMOGRAPHIC DATA

Please tick [] against the appropriate option

1. What is your position, as a caregiver, in the family?
 1. Father () 2. Mother () 3. Grandparent () 4. Relation () 5. Others (specify).....
2. Sex
 1. Male () 2. Female ()
3. Religion
 1. Christian () 2. Islam () 3. Others (specify).....
4. Marital Status
 1. Married () 2. Widowed () 3. Divorced () 4. Separated ()
5. What is your Age? (Last Birthday)
6. What is highest level of Education you have attained?
 1. No formal Education () 2. Primary Education ()
 3. Secondary Education () 4. Tertiary Education ()
 5. Others (specify).....

7. What is your Ethnic group?
 1. Hausa () 2. Ibo () 3. Yoruba () 4. Others (specify).....
8. How long have you and your family resided in the cantonment?
 1. Less than 6 months () 2. 6 months to 1 year ()
 3. 1 to 2 years () 4. 2 to 3 years ()
 5. Above 3 years. ()
9. What is the average total income available to the family per month?
 ₦

B. KNOWLEDGE AND PERCEPTION ABOUT CHILDHOOD FEVERS/MALARIA

10. Mention the most common illnesses suffered by children less than 5 years old in the cantonment (start from the most common and list all you know).

1.	
2.	
3.	
4.	
5.	
6.	
7.	

11. Which of these sicknesses come with hot body/fever? (Please list starting from the most common).

1	
2	
3	
4	
5	

12. How do you know each of these illnesses listed? (describe)

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....

13. What causes malaria fever? (Start from the most common)

1	
2	
3	
4	
5	
6	

14. What are the symptoms of malaria? (Please tick in appropriate space provided)

Symptoms	Yes	No
Fever		
Headache		
Malaise		
Abdominal pains		
Joint Pains		
Loss of Appetite		
Vomiting		
Tiredness		
Convulsions		
Dizziness		
Jaundice		
Others (specify)		

15. Do you think malaria can kill?

1. Yes () 2. No ()

16. If yes, which of the following group of people do you think can die more easily from malaria attack? Please indicate (1) for the most likely (2) for the more likely and (3) for the least likely

1. Young children [] 2. Adult []
 3. Pregnant Women [] 4. Others (please rank. []

17. Do you believe malaria can cause: (select yes or no)

Convulsion. 1. Yes [] 2. No []

Anemia (shortage of blood) 1. Yes [] 2. No []

18. Do you know that malaria can affect children at the same time along with other childhood diseases?

1. Yes [] 2. No []

19. If yes, please list the common illnesses that commonly occur along with malaria and how to recognize them.

1..... 2.....
 3..... 4.....
 5..... 6.....

20. How do you refer to 'malaria' in your dialect/ language?.....

C. HEALTH SEEKING (PREVENTION) BEHAVIOUR AND PRACTICES IN THE HOME.

21. What is your experience with the mosquito in the cantonment?

1. There are very many [] 2. There are not many []
 3. They found sometimes [] 4. There are none. []

22. Mosquitoes are more likely to be a menace (please tick correct option)

1. During raining season [] 2. During Dry season []
 3. All year round. []

16. If yes, which of the following group of people do you think can die more easily from malaria attack? Please indicate (1) for the most likely (2) for the more likely and (3) for the least likely

1. Young children [] 2. Adult []
3. Pregnant Women [] 4. Others (please rank. []

17. Do you believe malaria can cause: (select yes or no)

Convulsion. 1. Yes [] 2. No []

Anemia (shortage of blood) 1. Yes [] 2. No []

18. Do you know that malaria can affect children at the same time along with other childhood diseases?

1. Yes [] 2. No []

19. If yes, please list the common illnesses that commonly occur along with malaria and how to recognize them.

1..... 2.....

3..... 4.....

5..... 6.....

20. How do you refer to 'malaria' in your dialect/ language?.....

C. HEALTH SEEKING (PREVENTION) BEHAVIOUR AND PRACTICES IN THE HOME.

21. What is your experience with the mosquito in the cantonment?

1. There are very many [] 2. There are not many []

3. They found sometimes [] 4. There are none. []

22. Mosquitoes are more likely to be a menace (please tick correct option)

1. During raining season [] 2. During Dry season []

3. All year round. []

23. What actions do you take to prevent mosquito contact with your family?

Action	Ranking.
Use of Repellant (flit)	
Keep the surroundings clean	
Use Insecticide Treated Bed nets	
Smokes e.g. burning of coils and impregnated mats.	
Provide Netting for windows and Doors	
No Action	
Others (specify)	

(Please rank 1,2,3,4,etc from most to least important)

24. Is malaria infection preventable by the administration of medicines?

1. Yes [] 2. No []

25. If yes, mention the common medicines used for malaria prevention.

1.....2.....3.....
4.....5.....6.....

26. If herbal preparations (Agbo) is mentioned as a prevention of malaria, above, please indicate the extent to which it is preferred for use in children.

1. Prefer it to drugs [] 2. Prefer drugs to it []
3. It depends on the illness []

27. Have you heard about insecticide treated Bed nets (ITNS)?

1. Yes [] 2. No []

28. If yes, what was your source of information?

1. Health workers [] 5. Neighbors []
2. Radio Advert [] 6. Vendors []
3. Television [] 7. Others (specify)
4. Billboards []

29. Do you have an insecticide Treated bed net?

1. Yes [] 2. No. []

30. If yes, how do you rate the ITN use?
1. Highly convenient (I can't sleep without it) []
 2. Very convenient (I sleep easily in it) []
 3. Convenient (I manage to sleep in it) []
 4. Not Convenient (I sweat a lot while sleeping in it). []
31. If no to question (28). Explain:
1. ITNs are too costly []
 2. Not easily available []
 3. Not necessary since I Have window net []
 4. ITNs are not culturally accepted. []
 5. My child/children cannot sleep well under the bed nets. []

D. ILLNESS BEHAVIOUR BY CAREGIVERS IN THE HOME

32. How many of the children under 5 years in your household became ill in the last one month?
1. None []
 2. One []
 3. Two []
 4. More than Two. []
33. What type of illness did the index child/children have? (Please prompt respondent to describe in detail, Tick as many of these symptoms if mentioned in the Narrative)

Symptoms	Present
Fever	
Headache	
Abdominal pains	
Joint Pains	
Vomiting	
Diarrhea	
Tiredness	
Rigors/chills	
Dizziness	
Convulsions	
Fast/difficulty breathing	

34. How did you recognize that the child/children were unwell?
1. Fever []
 2. Reduced activity []
 3. Reduced eating []
 4. Sleeplessness []
 5. Too much sleep []
 6. Vomiting []
 7. Diarrhea []
 8. Others (specify).....
35. What was the first action you took immediately you noticed this? (tick)
1. Treated the illness with drugs in the house []
 2. Treated the illness with herbs in the house []
 3. Waited to be able to identify specific symptoms []
 4. Others (specify)
36. If the action you took was to give drug(s). Indicate the drug(s) administered the dosage and the duration of administration.
- 1.....
 - 2.....
 - 3.....
37. What period elapsed before taking the above action?
1. I took immediate action []
 2. Few hours after symptoms []
 3. 1-day to confirm symptoms []
 4. 2-days []
 5. More than 2 days. []
38. Who prompted the action?
1. Self []
 2. Spouse []
 3. Neighbor []
 4. Relation []
39. What was the outcome of the action? Did the malaria go away completely or did it go away and come back?
1. Went away completely []
 2. Went away and came back []
 3. Others (specify).....
40. If it went away and came back, how long was the interval?
1. Less than one week []
 2. One week after []
 3. More than one week after []
41. What did you do immediately you noticed this?
1. Continued to treat the child with the same drugs in the house
 2. Changed the drugs to other drugs in the house
 3. Waited to confirm if new symptoms would develop

4. Others (specify).....
42. If you continued drug treatment, what drug and dosage did you use this second time?.....
43. Who decided on this second action?
1. Self [] 2. Spouse [] 3. Neighbor [] 4. Relation []
44. In addition to drug treatment what other actions do you take at home to ensure child recovers/survives the illness? (please tick)
1. Ensure continued feeding and increase fluids intake during illness
2. Make child as comfortable as possible by light clothing
3. Sponge the child regularly to reduce temperature
4. Clean mouth regularly if ulcers are present
5. Others please specify.....
45. What was the outcome of this second action?
1. Child got better 2. Child got even worse 3. There was no change
46. If the child got even worse or there was no response to treatment, what action did you take next?
1. I continued to administer the drugs in the home
2. I gave other drugs purchased from patent medicine vendor/chemist
3. Took the child to the traditional Healer
4. Took the child to the Hospital.
47. If a third action was outside the home, what prompted you seeking help outside the home?
1. Child could not sit stand or walk without support.
2. Child could not take oral drugs and vomited more than three times in one day.
3. There was no improvement in condition after a complete course of oral chloroquine.
4. Advice from spouse /relation/neighbor.
5. Illness was spiritual
6. Others (Specify).....
48. What are the main reasons for preferring home treatment? Please tick as applicable.
1. Cost of seeking treatment (drugs, transport etc.)
2. Distance from the health center
3. Attitude of health providers in the health center

- 4. Long waiting period in the health center
- 5. Lack of drugs in the health centers

49. What facility did you visit?

- 1. The Medical Reception station (MRS)
- 2. A private hospital outside the cantonment
- 3. A herbal home outside the cantonment
- 4. A church outside the cantonment

50. What problems do you encounter while seeking care outside the home?

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51. Have you ever lost any child in the family less than 5 years?

- 1. Yes []
- 2. No []

52. If yes, please describe the circumstance that led to this.....

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E. KNOWLEDGE OF ANTI-MALARIALS AND DOSAGE PATTERNS IN HOME TREATMENT OF MALARIA

53. Mention the most common drugs you have for malaria treatment at home

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____

54. How did you obtain the drugs?

- 1. Drugs were left over from previous prescriptions from the hospital
- 2. Bought them from the chemist store
- 3. Bought them from the patient Medicine Vendors (PMVs)
- 4. Bought them from itinerant drug peddlers
- 5. Other sources (specify).....

55. What dosage of chloroquine do you administer to a child less than 5 years?

- 1. Tablet.....
- 2. Syrup.....
- 3. Capsules.....

56. Are you aware that chloroquine tablets are made in different colours and packaged for the different age groups?

1. Yes [] 2. No. []

57. If yes, please indicate the colours available and the age groups for which they are meant.

Colour code	Age group
1.
2.
3.
4.

58. How did you determine the dosage to be administered to the child?
(Please select the option/s that apply)

1. I was told by a neighbor
2. I was advised by the drug seller
3. I used my previous knowledge of the doctor's prescription.
4. I read the instruction on the packet of the drug

59. Are you aware that the child may react to chloroquine by having side effects? 1.
Yes [] 2. No. []

60. Which of these side effects have you experienced in the index child?(please indicate the most common by writing 1,2,etc against the options below.

1. Weakness ()
2. Nausea ()
3. Vomiting. ()
4. Body itching ()
5. Others (specify).....

61. What action/s did you take in the home case of severe side effects?

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Thank you for your patience!