Social and Economic Research Project Reports *No. 13*

Mothers' Definition and Treatment of Childhood Malaria on the Kenyan Coast

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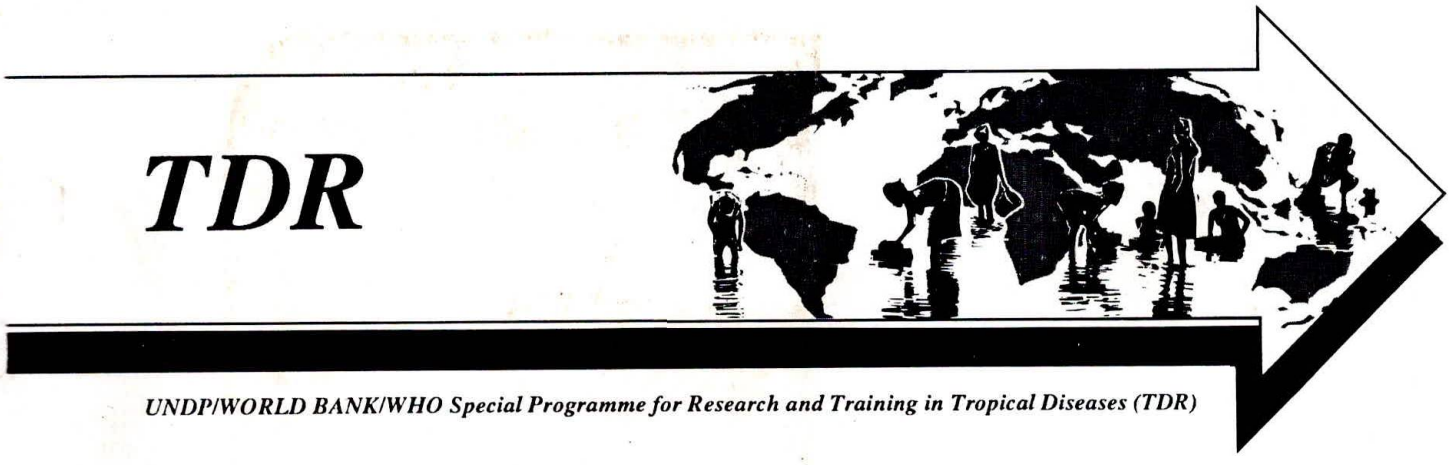

TDR

UNDP/WORLD BANK/WHO Special Programme for Research and Training in Tropical Diseases (TDR)

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TDR/SER/PRS/13

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(June 1993)

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Foreword

The UNDP/WORLD BANK/WHO Special Programme for Research and Training in Tropical Diseases (TDR) is a globally coordinated effort to bring the resources of modern science to bear on the control of major tropical diseases: malaria, schistosomiasis, filariasis (including onchocerciasis), the trypanosomiases (both African sleeping sickness and the American form, Chagas' disease), the leishmaniases and leprosy. The Programme has two interdependent objectives:

- To develop new methods of preventing, diagnosing and treating selected tropical diseases, methods that would be applicable, acceptable and affordable by developing countries, require minimal skills or supervision and be readily integrated into the health services of these countries;

- To strengthen -- through training in biomedical and social sciences and through support to institutions -- the capability of developing countries to undertake the research required to develop these new disease control technologies.

The *Social and Economic Research Project Reports* series represents a communication venture undertaken by TDR's Social and Economic Research (SER) component. This series was launched in 1987 to facilitate and increase communication among social scientists and researchers in related disciplines carrying out research on social and economic aspects of tropical diseases and to disseminate social and economic research results to disease control personnel and government officials concerned with improving the effectiveness of tropical disease control.

Research reports published in this series are final reports of projects funded by TDR and usually include more material than ordinarily published in peer review journal articles. TDR considers this material to be valuable both for investigators involved in the study of social and economic aspects of tropical diseases and for professionals involved in training programmes in the social sciences, economics and public health. The series should acquaint those working on similar problems with approaches undertaken by others, in order to test new approaches in different settings, and should provide useful information to personnel in disease control programmes and related agencies.

Although SER, as of 1 January 1994, was integrated into an Applied Field Research (AFR) component of the TDR Programme, the AFR Steering Committee considers that the series deserves to be continued so that results of the social and economic research in TDR will continue to be disseminated.

In the interests of rapid dissemination of social and economic research findings, much of the supporting material, e.g., tabulated data, has not been included in the present report. This material is, however, available upon request to interested researchers. All requests for such material, citing in full the number, title and author(s) of the *SER Project Report*, should be addressed to: Dr C. Vlassoff, Secretary, Manager, Gender and Tropical Diseases Task Force, TDR, World Health Organization, 1211 Geneva 27, Switzerland.

Tore Godal, Director

Special Programme for Research
and Training in Tropical Diseases
TDR

PREFACE

This report is based on research undertaken for doctoral work by Dr. Halima Mwenesi, supported by TDR's Research Strengthening Group. This project is an example of a truly worthwhile investment from TDR's perspective, not only because it resulted in a successful PhD but also because the research itself produced extremely interesting and useful results.

A major contribution of the report is that it demonstrates women's clear knowledge and understanding of malaria in the study area. The distinctions made by mothers between signs of fever and signs of convulsions and the way in which they treat them are particularly insightful and instructive. The study provides a closer view of people's perceptions, knowledge and behaviour at the community level than is available to medical personnel in health facility settings, or to researchers using traditional survey instruments. Through her insights and recommendations, Dr. Mwenesi has provided an opening for the development of future research and interventions.

Carol Vlassoff
Manager
Gender and Tropical Diseases Task Force
Special Programme for Research and Training in Tropical Diseases (TDR)

Mothers' Definition and Treatment of Childhood Malaria on the Kenyan Coast

Final Report of a project supported by the TDR Social and Economic Research Component

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June, 1993

Acknowledgements

The research described in this report is a modest venture of an inexperienced social science student who set out to learn more about social aspects of health and disease, with a bias towards tropical diseases, specifically, malaria.

In my quest to understand human behaviour in relation to health and illness, I have interacted with several people who have been a source of encouragement and from whom I have learned a great deal. Some of these people deserve to be mentioned: Dr. Patricia Rosenfield of the Carnegie Foundation of New York (formerly of TDR), and Prof. S. Migot-Adholla of the World Bank (formally chairman, sociology department, University of Nairobi) encouraged my interest in tropical diseases research, and my studies in social science and medicine. I thank Dr. Carol Vlassoff and the entire Tropical Disease Research and Social and Economic Research (TDR/SER) Committee for supporting my PhD training programme as a Principal Investigator.

I am also grateful to the numerous colleagues and friends who have contributed to and encouraged me through the course of my studies. Special and sincere appreciation goes to my supervisor, Dr. Trudy Harpham, an untiring source of inspiration, who has encouraged and guided me through the rigours of scientific enquiry throughout the entire study period. Many thanks to Dr. P.R. Kenya and Dr. Kevin Marsh for giving me the resolve to embark on the project, and Dr. R.W. Snow, who unwaveringly offered me invaluable advice and time since the commencement of the study. The help obtained from Dr. Dayo Forster on data management is sincerely acknowledged.

I am grateful for the financial support I received from the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR/SER). Secondly, I thank Dr. D. Koech, Director, Kenya Medical Research Institute for allowing me time off to further my studies; and all members and colleagues of the Health Policy Unit, at the London School of Hygiene and Tropical Medicine. Others I wish to mention are the Head of Unit, Dr. N. Peshu and all colleagues at the KEMRI Unit, Kilifi; the field workers and all the support staff from Kilifi and the Medical Research Centre (MRC), Nairobi.

My deepest appreciation goes to all the people in Kilifi, especially the mothers, without whose cooperation this undertaking would not have been possible. Thanks are also extended to the administrators of the Kilifi district hospital, Ngerenya dispensary and the private clinics in Kilifi town.

After several trials and errors at producing a proposal, progress reports, financial reports, managing a team of ten field workers, (and a young family) I have finally produced a thesis for a doctoral degree; the last three years have not been in vain.

Halima Abdullah Mwenesi
Principal Investigator
June, 1993

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EXECUTIVE SUMMARY

Presumptive treatment of clinical malaria by health personnel, village health workers (VHWs) or mothers is currently the mainstay of malaria control in Africa. Surprisingly, little is known about the management of malaria and its complications in the home. This study examines mothers' definitions of malaria, recognition of complications associated with malaria, the use of proprietary drugs and decision-making dynamics in the health seeking process.

The research was carried out in Kilifi district, situated on the Kenyan coast, an area holoendemic for malaria. Complementary data collection methods (quantitative, qualitative and non-participatory observation) were used to explore the four main objectives of the study:

1. To determine whether the different communities under study perceived malaria as a major health problem and how they translated this perception into action.
2. To determine whether overt complications of childhood malaria were recognised and how they were managed.
3. To determine decision-making dynamics and the significance of family and other social networks in the health seeking process.
4. To determine the extent and reasons for use of proprietary treatments for malaria in the context of other traditional and modern therapeutic measures.

A total of 1408 respondents, drawn from three different settings; a) peri-urban, b) rural, and c) a slum settlement, were included in the study.

The main findings of the study were:

1. Mothers have limited knowledge of childhood malaria as a biomedical disease, but have a clear and precise biocultural definition of the disease.
2. The biocultural definition of childhood malaria does not recognise biomedical definitions of complications of malaria, but provides separate explanatory models for these conditions.
3. Decision-making for health care is the prerogative of males.
4. Use of proprietary treatments for malaria is partly a function of the biocultural definition and the easy availability of over-the-counter (OTC) drugs. More importantly, mothers are treating their children promptly, albeit not effectively.

This study contributes to the understanding of psychosocial processes that generate and mediate viable management of childhood malaria at the household and community levels. Recommendations are made which call for the re-assessment of the image of malaria that is portrayed to populations in malarious areas and the promotion of health education in malaria control. It is hoped that the findings can be linked to malaria programmes in the study area and as pointers to control programmes elsewhere - thus contributing to policies for malaria control and health promotion.

INTRODUCTION

Statement of the problem

Presumptive treatment of clinical malaria is currently the mainstay of malaria control in Africa. This has been in response to the failure of conventional malaria control efforts. Recently, there have been trials of community-based presumptive treatment services delivered by Village Health Workers (VHWs), in line with the implementation of primary health care (PHC) (WHO/UNICEF, 1978). VHWs are a cadre of health personnel perceived to be more accessible and acceptable to members of their communities. They are expected to improve overall coverage and equity of services by increasing service use especially by disadvantaged individuals and households (Berman 1984). Recent studies however, indicate that community-based chemotherapy strategies in Africa are yet to help reduce morbidity and mortality from malaria (Walt, 1988; Slutsker, Breman and Campbell 1988; Hoffman, Masbar, Hussein et al. 1984; Spencer, Kaseje, Sempebwa et al. 1987; Greenwood and Bradley 1988; Menon 1991).

Little is known about the management of malaria and its complications in the home. This study did not investigate the reasons for failure or success of PHC in malaria control. Rather, it aimed at highlighting some issues that may mediate viable management of childhood malaria at the household level. The position taken in this study is that the general axiom about health and illness in a culture mediates upon information on mothers'/carers'/guardians' (hereinafter referred to as mothers) definition of childhood malaria; their perceptions of the seriousness of the disease; their response to its different presentations; the time-lag between onset of illness and remedial action; the case for self-medication, available services and the decision-making dynamics involved in the choice of care. This is important in formulating useful criteria for malaria control programmes.

Justification for the project

The behaviour of humans has not been given an equal position with the other factors in the malaria equation. Arguments such as:

> Malaria control activities ... depend on the prevailing epidemiology of the disease, on the efficacy of technological methods, on the structure of health services, on the logistic and financial capability of each country and, last but not least, on the national commitment (The Lancet 1983: 963);

or the contention by Ruebush, Breman, Kalser et al. (1986), that the practical realities of controlling malaria through PHC are the need for a thorough understanding of malaria epidemiology as well as the recent call by Okelo (1990) that "malaria control strategies of the future should focus on a wide variety of areas such as schizonticidal drugs to replace chloroquine, insecticides, and vaccines..." (p: 293) illustrate the neglect of human behaviour in current thought.

However, as Oaks, Mitchell, Pearson et al. (1991) put it:

> human behaviour and social organisation - one side of malaria's host-vector-parasite triangle- are clearly vital determinants for the success of control programmes. Unfortunately, we do not know enough about how humans respond to malaria to be able to build strong multidisciplinary control programmes (p: 258).

Bradley (1991) concludes, "no one method will on its own control malaria, but a combination of skills and methods, because there is not an either/or choice". He says: "... when the insights of anthropology and education fully permeate the way in which environmental control is implemented and are not just added on as afterthoughts ... then real progress in control can be made" (Bradley 1991:28).

These were the challenges of this social science study. It sought to fill the gap between the epidemiology and the social aspects of malaria control, by trying to explain the meaning and values of some socio-cultural and behavioural factors that may affect household and community based efforts for malaria control. There is a dearth of such studies which could help us understand not only why programmes fail or succeed, but also how to sustain successful ones.

Background to the study

This project was carried out parallel to a hospital based case-control study on severe malaria in children. Several issues emerged from the early phases of the case-control study:

a) Severe disease presented from the study area frequently even though entomological challenge was low (i.e few mosquitoes but a lot of severe disease).

b) Mothers were frequently administering antimalarial (AM) drugs and other over-the-counter drugs (OTC) to their children before presenting to hospital.

c) Convulsions were a common feature of severe malaria compared to other serious febrile illnesses.

d) Severe malaria appeared to be geographically clustered with some areas generating more cases than others.

e) Reported use of traditional healers (THs) for the treatment of malaria was low.

This study was conducted to explain the specific behaviours highlighted above.

Project Objectives

The initial objectives of the study approved in May 1989 were:

> i) To assess the degree to which the basic understanding of the illness "malaria" and treatment practises vary between mothers of children taken to health centres with malaria and mothers in the general community.
>
> ii) To assess the extent to which the incidence of clinical episodes of malaria in children aged 0-9 years treated at a health centre are representative of the incidence of clinical episodes of malaria actively detected in the community.

In August 1989, the objectives were revised after lengthy discussions, between the investigator and the field advisor Dr. R. Snow, on the issues arising from the case-control study. The first objective was found to be more involved than originally anticipated and the second objective to require a more indepth prospective surveillance of fevers than feasible in the available time. Subsequently, the second objective was dropped and the first one amended and expanded.

The amended objectives of the study were:

> i) To determine whether the different communities under study perceived malaria as a major health problem and how they translated this perception into action.
>
> ii) To determine whether overt complications of childhood malaria were recognised and how they were managed.
>
> iii) To determine decision-making dynamics and the significance of family and other social networks in the health-seeking process.
>
> iv) To determine the extent and reasons for use of proprietary treatments for malaria in the context of other traditional and modern therapeutic measures.

THE SETTING OF THE STUDY: KILIFI DISTRICT

Kilifi is one of the six districts in the Coast Province of Kenya, an area holoendemic for malaria. It measures about 12,523 km^2 (KDDP, 1989) and is divided into five administrative divisions with its headquarters in Kilifi town. The district's population in 1991 was 711,838, with an average density of 57 persons per km^2 (CBS, 1991). Kilifi experiences two rainy seasons. Temperatures and humidity are generally high all year, with daily means averaging a minimum of 22^0 Celsius and a maximum of $30\text{-}34^0$ Celsius. This type of climate, coupled with a large expanse of water, swamps and forests, favours continuous breeding of mosquitoes and development of parasites.

Kilifi district has three hospitals: two government-run hospitals at Kilifi and Malindi towns, a mission hospital at Kaloleni, six government-run health centres and thirty-four dispensaries. The disease pattern in Kilifi shows a preponderance of preventable diseases as the major causes of morbidity and mortality in both children and adults. Further, it is estimated that one in three children in Kilifi is malnourished (Thompson, 1990) and educational levels in the district, especially among women, are among the lowest in Kenya. However, malaria is seen as the major factor contributing to the under-development of the area (Ewbank, Henin and Kekovole 1986). Blacker, Mukiza-Gapere, Kibet et al. (1987) state the determinants of differential mortality in coastal Kenya thus:

> ...coastal districts show most of the correlates of high mortality particularly **Kilifi**... These districts are highly malarious, have high rates of stunting and wasting, are relatively poorly provided with HFs; their women are badly educated and the lack of progress in female education correlates with lack of progress in the decrease of child mortality. Only on the score of piped water do they come out reasonably well (: 9)

Earlier work in Kenya correlating malaria endemicity, maternal education, malnutrition, health facility (HF) accessibility and access to clean water, estimated child mortality rates for Kilifi to be 212 /1000 live births (PSRI 1982). More recent statistics show that malaria is by far the major single cause of death in hospitalised children and malaria specific mortality in Kilifi are at approximately 6/1000 per year (Snow pers.comm. 1992). The vector responsible for malaria in this area is the A.gambie s.l which accounts for over 90% of infections (Mbogo, pers. comm. 1992).

Study sites

Three sites, all within the case-control study area, were chosen for the study. **Kilifi town** is a peri-urban, relatively affluent setting with a population of 11,700 people at the 1989 census (CBS, 1991). It covers an area of six km^2, with a population density of >800 per km^2. The town hosts the district's headquarters and has a heterogenous population, engaged in different occupations. The only major industry in Kilifi town is the cashew nut factory. The town is reasonably well supplied with transport services. Kilifi district hospital (KDH), at the town centre, provides out-patient and in-patient services. There were three private clinics in the town.

Mtondia is a densely populated slum situated about 15 km from Kilifi town. It is inhabited by a squatter community of the Luo, a Nilotic group which migrated to the area from the Lake basin region of Western Kenya. They are mainly quarry diggers but also engage in fishing for their subsistence. The population in 1989 was estimated at 1000 people. The area has one private HF and has access to clean piped water at a fee.

Sokoke is a remote rural settlement scheme about 40 km from Kilifi town. In the early seventies, families were settled in the area by the government on twelve acres of land each. Transport services are intermittent and almost non-existent during the rainy season. The population was estimated to be 6,563 people in 1989. The people are typically rural, subsistence farmers and predominantly Giriama. There is one dispensary

and people have access to clean piped water at a fee, although water points are few and far between.

These areas were purposively, not randomly, selected. As alluded to earlier, there were differences in the recruitment of cases from some parts of the study area designated for the case-control study. Preliminary results (Snow, pers. comm. 1989) of the case-control study gave the following indications:

Sokoke: The **rural** area 40 km away and with poor accessibility to Kilifi District Hospital (KDH) had surprisingly large numbers of children recruited into the case-control study during 1989. **Kilifi town:** The **peri-urban** area within easy reach of KDH had proportionately fewer children recruited into the case-control study in 1989, despite having an apparently large number of under five year olds. **Mtondia:** The **slum settlement** community about 15 kms away, with fairly adequate accessibility to KDH, also had few children recruited into the case-control study in 1989.

Study population

Seven of the nine **Mijikenda peoples**: the Giriama, Jibana, Chonyi, Rabai, Kambe, Kauma and Ribe are in Kilifi district. The Giriama are the largest group making up 90% of the total district population. The Mijikenda family system is patriarchal and mostly polygamous. They believe in natural and supernatural causation of illness and practice sorcery. As a corollary, different types of healers, diviners, sorcerers and 'witch-finders' who formally define the causes of personal and social misfortune and even death are central to the lives of the people (Thompson, 1990; Parkin, 1991; Mwenesi, 1993). For a detailed description of the population, see Mwenesi (1993).

The Luo belong to the Nilotic ethnic group that occupies the Lake Basin region of Western Kenya, Nyanza Province. They have the highest rate of out-migration of able-bodied Luo men in the country (Alila, 1978), hence the Mtondia Luo settlement. The family system is also patriarchal and mostly polygamous (Parkin, 1978) and they also believe in natural and supernatural causation of illnesses and practice sorcery (Whisson, 1964; Mwenesi, 1993). Different healers deal with different diseases and misfortunes.

The region from which the Luo community migrated resembles Kilifi district in terms of disease distribution, high child and infant mortality rates, low socio-economic levels, education levels and the available infrastructure (GK/UNICEF, 1989; 1990).

METHODOLOGY

Theoretical framework and research methods

The cultural-ecology theoretical perspective, which views the interaction between people and their micro-environments (ecological, economic and cultural) as determinants of health problems in relation to local cultural definitions and expectations together with and the social construction approach which emphasises the cognitive and interactional processes involved in the management of disease were used as the overall conceptual frameworks for data analysis (Stanton, Black, Engle et al 1992). Both these perspectives

acknowledge the differences between biomedical and biocultural knowledge and practices, as opposed to approaches that explain behaviour in terms of biomedical rationality.

Complementary methods of data collection were used to explore the four main objectives of the study. Several workers (Jick, 1983; Rubinstein 1984; Glik, Parker, Mulingande et al. 1987; Heggenhougen and Clements 1987; Mechanic 1989; Steckler et al. 1992; Yach 1992) have argued that combining different methodological approaches is important for social research intended to provide information upon which interventions can be designed. This study required both qualitative and quantitative data to accomplish the proposed objectives. The methods used were:

i) quantitative survey research methods where structured interview questionnaires were used to collect quantitative data.

ii) qualitative methods where the ethnographic approach of using unstructured in-depth interviews and non-participatory observation methods were used.

Development of research tools

All draft questionnaires were prepared in London. In Kilifi, ethnographic inquiries were made and the drafts were discussed informally with colleagues and some residents. The aim of this exercise was to identify and understand any traditional terms and concepts used to describe disease and illness in the different study areas. Finally, six questionnaires and an in-depth interview schedule were developed and pre-tested. The pilot study assisted in refining the questions and establishing codes for most possible responses. During the pre-tests, it was decided to use a tape-recorder and to develop a drug collage. The questionnaires were translated into Kiswahili, Kigiriama and Dholuo; then translated back into English to identify any idiosyncrasies in the interpretations. They were, however, administered in the languages in which the respondents were most conversant. The investigator could follow conversations in both Kigiriama and Dholuo. A detailed field manual which doubled as a codebook, was developed. It explained to the field worker why and how each question was to be asked and recorded.

Meetings with relevant administrative authorities were held, where they were briefed on the purpose of the study. Ten local school-leavers were recruited. They spoke the local Mijikenda languages and Kiswahili (the national language) fluently. No Dholuo-speaking field workers were recruited - none presented themselves for recruitment. They were suspicious of the motives of the research because of their squatter status. However, it had been established during the pilot study that most Luo people could speak Kiswahili. It was decided to use "on the spot" interpreters if the need arose. The field workers were trained for two weeks on general aspects of field procedures.

Mapping and enumeration of household retail outlets and health facilities

Households were mapped and enumerated to facilitate easy tracing of the respondents and subsequent follow ups and to devise an accurate sampling frame. Enumeration of

retail outlets (ROs) and health facilities (HFs) facilitated recruitment of the self-selected group of mothers who resort to these facilities for the treatment of their children. Enumeration of ROs was also necessary for the recruitment of proprietors who stocked and sold antimalarial (AM) and other over-the-counter (OTC) drugs.

Smith and Morrow (1991) recommend that definitions of "households" be made explicit for any studies using them as units of analysis. The diversity of household types (Mwenesi, 1993) necessitated the development of an operational definition of the term. A household was defined at two levels. The first level involved the physical and geographical identification of a home and the second level was created to fit in with the study design. Social-anthropological parameters were incorporated, to create a "household unit" that included all members with influence upon one another's decision-making processes, which would transcend the geographical identification. Using the outlined definition of households, sketch-maps of the study areas were made since no current maps of the areas were available. Also mapped were all ROs that sold OTC drugs both within the study areas and within a one kilometre radius of their outskirts.

The census

The de jure system (Smith and Morrow, 1991) was used to conduct a census, which was necessary in order to provide precise demographic profiles of each area and to provide a comprehensive sampling frame for further surveys (Mwenesi, 1993).

A household roster was developed and used. Each individual was given an identity number. Other information gathered through the roster was the name of the household head, the respondent's name, his/her relationship to the household head and others in the household, gender, month or year of birth, ethnic or tribal group, whether present or absent at the time of enumeration, and the "kid" code which was used to identify women who had or were guardian to children under nine years of age. Age estimations for the study population were made by use of a historical and local events calendar.

All mothers and female guardians of children under nine years of age were included in the study. Similarly, all retail outlet proprietors (ROPs) who stocked OTC drugs from the mapped areas were included. The sample was large because analysis involved comparisons of people possessing multiple, interrelated characteristics so that meaningful conclusions could be arrived at from the data collected from sub-groups of the sample i.e. mothers re-interviewed at HFs and at ROs.

The mothers' survey

The mothers' survey gathered data on respondents' knowledge, beliefs and behaviour towards malaria and associated complications as well as their demographic and socio-economic characteristics. A questionnaire was administered to all available study area mothers. The mothers' survey questionnaire was developed to include only questions relevant to the objectives of the study and to determine how questions were to be formulated, especially the important question on the local definition of malaria. These questions were tried out during the pilot study:

a) Tell me the types of fever you know.
b) What do you do when your child has fever?
c) What disease name would you give the following symptoms?
fever + vomiting + headache?
d) What is malaria?

Important points came to light. The four questions were inadequate for the study objectives. The first question produced an array of febrile illnesses which were difficult to interpret. Mothers recognized fever and had terms to describe several types including malaria and other conditions that present with pyrexia. This question's advantage over the others was that it drew malaria as one type of fever.

Question (b) assumes that malaria is synonymous with fever and does not consider other types of fevers. Although it has been used to elicit answers for malaria by several workers, for example: Dabis, Breman, Roisin et al. (1989) and Glik, Parker, Mulingande et al. (1989), in Guinea; and Deming, Gayibor, Murphy et al. (1989), in Togo, it was unsuitable for this study. The position of this study is that the answers to this question may be misleading if different types of fevers are perceived to have different aetiologies by a given community.

Question (c) was not useful either. For most of the mothers, symptoms were perceived as disease entities in their own right. Fever, vomiting and headache were three distinct illnesses.

The fourth question (d), which is the straight forward approach used in Kenya by Abdullah (1985) and Ongore, Kamunvi, Knight et al. (1989) was not understood by most mothers, except those who had secondary school level of education and Luo mothers who all distinguished other febrile illnesses from the condition they referred to as malaria, even when they did not describe malaria correctly. Clearly, the direct question of 'what is malaria' can only be asked of respondents with some amount of schooling or where malaria control efforts have been carried out over a long period of time.

The preceding discussion illustrates difficulties involved in questioning people about a complex disease like malaria, which has no specific symptoms and mimics many other conditions. Neither malaria nor fever can be investigated as individual disease categories, especially in areas of low literacy, as fever is one of the many symptoms used to denote the disease of malaria. Consequently, the study concentrated on mothers' perceptions of severe childhood malaria. It was hoped that identifying manifestations of severe malaria perceived by mothers to be serious, would enhance the case for malaria drug intervention.

Clinically, manifestations and complications of P.falciparum are numerous and varied. They include cerebral malaria, anaemia, repeated generalised convulsions (Warrell, Molyneux and Beales 1990) and splenomegaly (Greenwood 1987). Convulsions, anaemia and splenomegaly were chosen and included in the study. These were chosen because (a) all the three study communities had local names for them indicating that they were

recognised, (b) they have fairly overt signs (convulsions and anaemia) and (c) they were of interest to the case-control study. Preliminary results of the case-control study showed that more than 50% of the children diagnosed as having severe malaria had a history of convulsions and were anaemic (Snow, in press). Cerebral malaria was not included in the study because it was not mentioned in relation to children at all during the pilot study.

Modules of symptoms and conditions including malaria as a disease category were included in the questionnaires, as was the generic term homa which covers a range of febrile conditions, convulsions, anaemia and splenomegaly. To be questioned about any of the five conditions, a mother would have had to mention it as a childhood illness that presents with high fever. The field workers were instructed to use the literal transliteration of fever - "hot body" - which had the same meaning in the three languages used for interviews. These criteria removed the preconceived assumption inherent in many studies that communities living in malarious areas define malaria biomedically (Abdullah 1985; Ongore, Kamunvi, Knight et al. 1989; Deming, Gayibor, Murphy et al. 1989; Dabis, Breman, Roisin et al. 1989; Glik, Parker, Mulingande et al. 1989) and ensured that respondents knew or were aware of the illness about which they were answering questions.

The final questionnaire had four sections. (1) background information of the respondent such as education, marital status, religion, occupation of self or partner and parity. (2) illness modules, the core of the questionnaire which addressed mothers' definitions and reactions to malaria and its complications. Sections (3) and (4) addressed health consultation behaviour, decision-making dynamics and socio-economic variables. To introduce some amount of flexibility in the interview, all the illness modules allowed for interviewer prompting after the respondent had exhausted spontaneous information.

All questions were closed and pre-coded. A manual and an aide memoire, as well as a collage of all the drugs in the ROs was prepared and used with the questionnaire. The collage was used to ascertain whether mothers could identify any OTC drugs they mentioned. All households that had a mother/s and a child or children under nine years were included in the study. The interviews (15-20 minutes) were conducted in the respondents' homes.

The health facility users' survey

The HF users' survey, conducted after the mothers' survey, aimed at validating data relating to service use and monitoring patterns of health-seeking behaviour (HSB) during a self-diagnosed episode of malaria. It had been proposed to interview only those mothers who had brought a child suspected of malaria or any of its complications to a HF. The pilot study revealed that very few mothers would be recruited at HFs if that inclusion criterion was retained. The proposal was dropped and all mothers from the study areas presenting at a HF during the survey were interviewed regardless of the child's illness. This did not compromise the objectives of the study and enhanced information on general HSB for children.

The questionnaire covered matters on accessibility, decision-making for choice of service, duration of illness, management at the household level and an assessment of the concordance between mothers' and health workers diagnosis of a childs' illness. Management of malaria at the HF was noted, and mothers' understanding of prescription descriptions was assessed. The last section of the questionnaire assessed mothers' abilities to follow treatment regimens, and the multiple use of services. This was administered to the mothers three days later in their homes. They were not forewarned about the follow-ups.

Every Monday, Tuesday, Thursday and Friday between eight a.m. and six p.m., one field worker was stationed at each of the six HFs in the area except for the KDH which was manned by three field workers. Starting at the out-patients department or reception areas, any adult female accompanying a child/children to the HF was approached. If it was established that the adult woman was from the study area, had been interviewed during the mothers' survey, and had brought the child because she suspected that she/he was ill, the questionnaire was administered. If on the other hand the female caregiver had only brought the child to the "Well Baby Clinic" for routine procedures, the interview included only part one of the questionnaire and was terminated with no follow-up.

The identified mother was then followed along the queue at the HF. After her child was seen, the field worker recorded the treatment prescribed and followed her to the pharmacy. Here, drugs given were recorded and duration and regimen of treatment noted; by counting the number of tablets and measuring the amount of syrup given in centimetres against the bottle used. This was used only as an estimation. The mother was then asked to repeat the instructions given to her about the medication and the answer was recorded.

Wednesdays and Saturdays were follow-up days. Mothers were re-interviewed in their homes about how they had administered the medications to the child, including the measure they had used for giving syrups, whether any other person had shared the child's drugs, whether they had given any other treatment since being seen at the HF and the reasons for doing so. Tablets were re-counted and syrups re-measured. The interview lasted about ten to fifteen minutes.

The retail outlet users' survey

The RO users' survey, like the HF survey, aimed to validate some of the data collected in the mothers' survey, and to gather information on actions taken for self-medication during a current self-diagnosed episode of malaria or its complications. The survey also aimed at gathering information on the extent and reasons for use of OTC drugs for treatment.

The questionnaire was adapted from the HF questionnaire. It had two sections. The first section sought information on health consultations, the current illness for which the drugs were being purchased, history of previous treatment and the type and combination of drugs that were purchased. The mother was asked about the mode of transport, time and money spent for the journey to the RO. Section two sought information on any other

treatment the mother might have given to the child since purchasing the drugs, and the rationale.

For four days in a week field workers were stationed at ROs from opening to closing time. Any adult female who purchased any drugs, was from the study areas, had been interviewed during the mothers' survey and was purchasing the drugs for her child/children was included in the survey. Section one of the RO user' questionnaire was administered to the mother at the RO. The mothers were re-interviewed at their homes on the third day to find out whether they had replenished the drugs, whether they had used other types of treatment, and the reasons for using other treatments. They were not forewarned about the follow-up. The interview lasted five to ten minutes. It had been intended that any persons purchasing drugs at ROs be questioned, just in case a mother in the study had sent someone to the RO. It proved difficult because most of the proxies (especially children) knew neither the names of the mothers nor the names of heads of households (necessary for follow-up). Secondly, it was not practical to follow each of these proxies back to their homes because the RO sentinels would be broken. Thus only mothers who actually purchased drugs themselves were interviewed.

The retail outlet proprietors' survey

The aims of the ROPs' survey was to find out their knowledge, attitudes and practices (KAP) on malaria and the extent of the use of OTC drugs on malaria in the communities. The questionnaire for this survey had three sections. The first section dealt with demographic information: age, gender, education, religion and ethnicity. This information was included because biographic information collected during the census was only for ROPs within the study area. Even for those from within the study areas, available information was only on age, gender and ethnicity. The second section dealt with the type of drugs stocked, and the quantities sold. The final section dealt with KAP of ROPs in relation to malaria, and their knowledge of correct dosages of the different AM drugs in stock.

This survey was conducted by the investigator. All 64 ROPs already identified as stockists of OTC drugs were included in the study. The person behind the counter of the RO at the time of the visit was interviewed only if they were the usual store-keepers. Stand-ins were not interviewed.

The drugs in homes survey

A small survey was conducted to validate and verify some of the information collected from ROPs, on available drugs in households. By use of random numbers, 390 households were picked from the three study areas. The adult person who was found in the household at the time of the visit was interviewed. This small survey also aimed at assessing the quantities of chloroquine and other AM drugs consumed by the use of proxy indicators: quantities of AM drugs sold, dispensed or available in households (Horgerzeil, 1985).

The ethnomedical survey

This approach was firstly used to gather preliminary data to help in development of questionnaires and secondly, for collection of data on beliefs and perceptions surrounding matters of health and disease. The questions focused on disease aetiology, treatment and prevention. The reasons for questioning the people about disease in general (without focusing on malaria) was to locate the place of malaria in the disease profile of the people. This strategy also provided information on priority health problems in the area, reasons for use and non-use of services and the people's perception of the cause of the very high infant and child mortality rates in the area. Suggestions for remedies for the perceived problems were also obtained.

Key informants were chosen through purposive and snow-ball sampling methods. The first few informants were picked because they were perceived by other people in the community to know the information required. The subsequent informants were suggested by those already chosen. In-depth informal interviews (Khan and Manderson, 1992) were conducted. The data were gathered by the investigator and the interviews took place in the homes of the key informants. Kiswahili was the language used and when necessary, an interpreter was used. There was no fixed duration but the interviews took between 60-90 minutes. Only one person was interviewed at a session. The discussions were recorded on tape and notes taken when necessary (Mwenesi, 1993).

The data were transcribed and indexed under several categories determined after sorting the pilot study data. These were: priority health problems in the areas, diseases perceived to be prevalent in the areas, their aetiology, symptomatology, treatment, prevention, perceived causes of mortality in children, reasons for use of different health services, and their ideas on the solutions for the perceived health problems.

Non-participatory observation

Structured and unstructured observations were made parallel to the survey and ethnographic interviews. The mothers' questionnaire included questions that required the field worker to observe indicators for socio-economic status assessment, among others. Observations on domestic, social and occupational activities as well as environmental factors that expose people to the problems of malaria, were made by the investigator. These observations sought to supplement, validate and verify data from the other approaches. For instance, data were gathered from chance observations of certain activities and factors that had not been addressed by either the surveys or in-depth interviews. These included house types, sanitation and cultural activities that enhance man-mosquito contact (Mwenesi, 1993).

Fieldwork supervision and data analysis

The fieldwork was conducted between April 1990 and December 1990, and was finalised between December 1991 and January 1992. Field workers were briefed every day on what was required of them for each phase. Personal checks were made at each point of the fieldwork to ensure that field workers understood and followed instructions, and their

work was verified by re-interviewing five percent of households already interviewed by each of them. Recall checks on reported refusals and on reported unsuccessful contacts were also routinely made. No significant interviewer/interviewee problems were encountered.

Editing and preparing data for analysis was done simultaneously with data collection. Data processing facilities and senior scientists who were valuable resource persons "on site" at the KEMRI unit Kilifi enabled this. Each questionnaire was checked for consistency errors and completeness at the earliest and when necessary re-visits were done. After coding, data was entered twice by independent data entry clerks using the Dbase IV programme and was cleaned and analysed using the EPI-INFO programme.

Ethnomedical data were transcribed according to relevant categories. The information was used as the background for the analysis of the quantitative data and the basis for understanding the study population's thinking on matters of health and illness and specifically their definition of malaria.

RESULTS

Overall, 894/1,120 mothers were identified as eligible respondents were interviewed. Of these, 883 mothers were successfully interviewed as 11 questionnaires were incomplete; a response rate of 99%. Table 1 summarises findings on socio-demographic characteristics of the mothers included in the mothers' survey.

Table 1: Socio-demographic characteristics of mothers (N=883)

VARIABLE	ATTRIBUTE	FREQUENCY (%)
Residency	Kilifi town Mtondia Sokoke	352 (40%) 224 (25%) 307 (35%)
Ethnicity	Mijikenda Luo Other	608 (69%) 152 (17%) 123 (14%)
Age group	10-34 = Young 35-59 = Middle age 60+ = Old	633 (76%) 245 (28%) 5 (6%)
Religion	Christian Traditional Muslim	353 (40%) 280 (32%) 250 (28%)
Marital status	Married Partnered Un-partnered	716 (81%) 13 (4%) 154 (15%)
Education	None Primary Secondary/Tertiary Other	445 (50%) 304 (34%) 97 (12%) 37 (4%)
Occupation	None/Housewife Service/Pros Labourers/Farmers	776 (88%) 89 (10%) 18 (2%)

Percentages for attributes with >1 answer are >100.

Definition and management of childhood malaria in Kilifi

The Mijikenda and the Luo peoples in Kilifi district explain illness as part of misfortunes of being human. Like any calamities, illnesses can happen naturally "when so God wishes" or when there is disharmony in the elements which include, wind, heat and food. They can also happen as a result of witchcraft or sorcery and the "evil eye", or one can bring illness on oneself or one's progeny by neglect of taboos and other ancestral or religious obligations.

Some of the illnesses attributed to the (cold or 'evil') wind are all febrile illnesses including malaria, homa, colds, aches and pains, convulsions and splenomegaly. Heat was reportedly responsible for tsango or mshipa which could refer to conditions like

strangulated hernia, hydrocele and non-specific lower abdominal pains in men and women. Food was implicated for diabetes and hydrocele. All the mentioned illnesses are seen to be inevitable and unavoidable because they result from natural processes which are beyond mans' control. Illnesses that were attributed to negligence of taboos and obligations included a childhood folk illness referred to as chirwa or kirwa in Mijikenda and chira in Dholuo. Clinically, it presents with symptoms of marasmus or severe protein energy malnutrition (PEM).

The childhood illnesses frequently mentioned either spontaneously or on prompting as presenting with high fever in order of magnitude were: homa (90%), malaria (83%), convulsions (56%), splenomegaly (24%) and anaemia (20%). Mention of fever was associated with higher education levels and the younger age groups. It is important to note that 150 (17%) mothers did not mention malaria as a childhood illness.

The Mijikenda had no vernacular name for malaria. They defined the illness as one of the many manifestations of a condition known locally as homa. This concept refers to a febrile condition that has symptoms ranging from mild to severe headache, influenza, fever and general malaise. Four different types of homa were identified: non-specific homa (feeling unwell), homa ya mafua (flu or common cold), homa ya matumbo (typhoid fever) and homa ya ripeho (a febrile condition accompanied by chills). The concept of homa was also used to refer to fever especially in the context of "fever rising" or joto mwilini literally "hot body". This literal meaning of fever was used to establish if there was a vernacular description or understanding of malaria.

The Luo referred to malaria as 'meleria' and perceived it as a disease entity on its own, distinct from other febrile conditions such as athung'a (flu or common cold). When asked if they knew of a disease called malaria, most Luo informants answered in the affirmative, while most Mijikenda key informants answered in the negative. The probable explanation is that malaria control efforts have been going on almost continuously for the last 50 years in Nyanza Province (GK/UNICEF 1989), the home area of the Luo, thus raising their awareness.

In most instances the Mijikenda informants, talked about malaria in terms of what they "hear" about it. Answers to questions about malaria were punctuated by "I don't know" or "I'm not sure about the answer" but "they say" or "you people say...". The "they" and "you" referred to health workers or the media. The disease was perceived to be among the five top priority health problems in the area, but not the major one. Several respondents alluded to an advertisement over the radio for one AM/OTC drug which says: "malaria kills. Each year it kills millions of people". This advertisement does not say, however, where exactly the "millions" are "killed". Thus most of the informants thought that malaria must be a general problem in Kenya.

Mothers' beliefs and behaviour in relation to childhood malaria

A summary of principle results pertaining to mothers' knowledge, beliefs and management of malaria are presented in table 2.

Table 2: Mijikenda and Luo mothers' knowledge, beliefs and management of childhood malaria (n=733)

VARIABLES	QUANTITATIVE RESULTS	SIGNIFICANT ASSOCIATIONS ($P<=0.05$)[1]	QUALITATIVE COMMENTS
Aetiology	56% 'mosquitoes' 35% 'D.K' 9% 'God/weather changes'	Mention of mosquitoes was associated with residency in Kilifi Town, age <35 years and higher education levels.	Weather changes, especially sudden changes from hot or cold and being rained on were implicated.
Symptoms and age-specificity	75% 'fever' 53% 'vomiting' 42% 'chills' 42% 'general malaise'	N.S	Headache was mentioned in relation to adults. Age-specificity was not recognised.
Recognition of complications associated with malaria	16% 'convulsions' 4% 'anaemia' 2% 'splenomegaly'	N.S	Complications viewed as illnesses in their own right and not associated with malaria.
Communicability and transmission	47% 'communicable': of these: 10% 'correct' 22% 'droplets and sharing bedding and utensils' 36% 'cold entering the body' and 32% 'D.K'	Knowledge that malaria is communicable was associated with residency in Kilifi Town and "higher" education levels.	Other febrile illnesses such as flu may have given credence to the contact explanatory model.
Preventability and prevention	53% 'preventable': of these: 23% 'correct' 48% 'keep warm/dry' 25% 'D.K' 2% 'prophylaxis'	Knowledge of preventability and prevention modes was associated with residence in Kilifi Town, age <35 years and "higher" education levels.	As for other febrile illnesses, no specific modes of prevention were mentioned for malaria.

Cont. VARIABLES	QUANTITATIVE RESULTS	SIGNIFICANT ASSOCIATIONS	QUALITATIVE COMMENTS
Anti-mosquito measures used	65% 'currently used' Of these: 53% 'insecticides' 15% 'bed-nets' 11% 'local repellents' 21% 'cover-up when sleeping and close windows early'	Use of anti-mosquito measures generally and bed nets specifically was associated with residency in Kilifi Town and "higher" education levels.	Anti-mosquito measures are not used for the purpose of preventing malaria but to decrease the nuisance of bites.
Management of childhood malaria and malaria-like illness within households.	16% reported child malaria currently or in last 2 weeks. Of these: 59% gave OTC drugs. Of these: 49% 'AM drugs' and 51% 'other medication'	Reporting malaria in a child was associated with "higher" education levels, so was self-medication with other drugs especially antibiotics.	Self-medication with OTC analgesics and AM drugs is rampant. A local febrifuge for all febrile conditions is available and emetics and purgatives are used.
Recognition of OTC drugs	70% mentioned OTC/AM drugs. Of these: 56% could not identify them on the drug collage provided.	Recognition of OTC drugs was strongly associated with "higher" education levels.	Mothers rely on ROPs when purchasing OTC drugs that they know by brand names only.

Footnote: The independent variables tested for associations included residency, ethnicity, age, religion, marital status and education. N.A = Testing for association not applicable and N.S = no significant association found. D.K = Don't Know. OTC = over-the-counter. AM = Antimalarial. OTC/AM = over-the-counter antimalarial. The sum of certain percentages are >100 because some questions had >1 answer.

Management of childhood malaria at home

Beliefs on the aetiology of illnesses invariably dictate the type of therapy and thus healers to be consulted. The reported **first-line treatment** for childhood malaria was **OTC drugs** from ROs. One hundred and seven (91%) out of 118 mothers who diagnosed their child as having malaria currently or in the two weeks prior to the survey **did something about it.** Twenty-nine percent reported to have given antimalarial drugs, 30% gave antipyretics and other medications including antibiotics, 25% said they took child to health facility, while 9% gave no treatment and 7% gave a home remedy. Residency, age and education were associated with correct knowledge of malaria.

The following explanation from a mother who was an informant illustrates a typical reaction to childhood malaria or any other febrile illness.

> If I suspect my child is unwell; for example the child may be restless, have no appetite and not happy, I observe him more closely. I wait and see for a day or two if the restlessness will go away. If the child continues to be restless and cries or has hot body, I look for any children's tablets or medicine in the house and give the child. If there is none and I have some cash then I get some aspirin or cafenol^{R} and give the child. The child will get better if the illness is malaria or flu [homa la mafua]. If the child does not get better or develops cough, I have to find a way of getting to the hospital. If on the other hand the child develops nyago, I do what I can in the house and then rush the child to the traditional healer (Mwenesi 1993: 157).

A typical and casual reaction where the mother portrays experiential wisdom in child rearing (Mwenesi, 1993). She was observant and discerning in monitoring her child's illnesses, she is aware of and knows by name which OTC drugs to use and also portrays some knowledge of differential diagnosis, based on the prognosis of each symptom or initial diagnosis. The selected therapy and the lapse between onset of illness and remedial action seems to depend on the perceived aetiology, prognosis of the illness and its perceived seriousness. Note the informant's casual observance on malaria, while "...nyago..." (convulsions) is treated as an emergency. Note that the mother does not allude to consulting anyone about the child's condition.

The traditional home therapy commonly used for malaria and malaria-like illness in Kilifi is a herbal febrifuge prepared from the "neem" tree (azaderachta indica), locally referred to as muarobaini [literally, 'the herb that can cure forty diseases'], mkilifi and mzerekta. However, only one percent of mothers reported to use it for childhood malaria.

Malaria transmission as shown on Table 2 was not understood. Although 15% of households reportedly used bed-nets, people were generally indifferent towards mosquitoes. Nevertheless, all the respondents conceded that mosquitoes were a major nuisance in the area. For them, malaria control was not related to mosquito control but the availability of adequate curative services. In general people were dissatisfied with the health system, especially in relation to drug availability and "user fees" after 27 years of free services.

Convulsions (fits)

A total of 498/883 (56%) mothers mentioned convulsions as a childhood illness that presents with fever. Table 3 summarises their knowledge, beliefs and management of convulsions at the household level.

Table 3: A summary of mothers' knowledge, beliefs and management of convulsions in children (n=498)

VARIABLES	QUANTITATIVE RESULTS	SIGNIFICANT ASSOCIATIONS (P< =0.05)	QUALITATIVE COMMENTS
Aetiology, symptoms and susceptibility	47% 'D.K.' 28% 'fever' 15% 'malaria' 8% 'spirits' 2% 'worms in head' Symptoms and age-specificity well recognised.	Knowledge that malaria could cause convulsions associated with age <35 years and higher education levels.	An inevitable childhood illness. Almost a 'folk' illness for the Mijikenda people.
Transmission, communicability and prevention	20% 'preventable'. Of these: 43% 'avoidance of vectors'; 19% 'charms/amulets' 38% 'D.K.'	Knowledge of correct prevention associated with age >35 and higher education levels.	Not understood but explained as corollaries of aetiological beliefs.
Management of cases at the household level	5/12 'OTC drugs' 5/12 'traditional therapy' 2/12 'no treatment'	N.S	Management starts at home, then traditional therapy is sought. Allopathic therapy is contraindicated and no specific OTC drugs for convulsions.
Footnote: Independent variables tested for associations included residency, ethnicity, age, religion, marital status and education. N.A = Testing for association not applicable and N.S = no significant association found. D.K= Don't know.			

Both the Mijikenda and the Luo have local names for childhood febrile convulsions. They recognise them as a **serious** childhood illness. The Mijikenda refer to the condition variously as nyago, dege, nyuni and nyama wa dzulu. They also call it ukongo wa kitoto, literally meaning 'the childhood illness'. The Luo call it oriere. The Mijikenda attributed the cause of convulsions to a figurative 'animal or bird' which gets into a child by frightening the victim thus inducing the fits. **Luo** informants attributed the cause of convulsions to intestinal worms somehow finding their way into the head. No explanation was elicited as to how the worms got into the head.

Most of informants could describe convulsions in a child. Twenty-eight percent (N=498) of mothers gave fever as a symptom of convulsions. However, they could not clearly discern the link between fever and convulsions. Fits were perceived to be neither communicable nor preventable. The **Mijikenda** first-line treatment for fits was reported to be sponging with the mother's or any other close female relative's urine. The child is then taken to a traditional healer, always a man. Treatment consists of herbal preparations for drinking and bathing. Smoke from different herbs or elephant dung (kufukiza) and charms/amulets called hirizi or vuje may be used. They are supposed to decrease the virulence of the nyama and not necessarily to prevent further attacks. Strict rules are attached to the management of convulsions both at the healers and at the household (Mwenesi 1993). The different options for the treatment of febrile convulsions must be exhausted before a child is taken to a HF, where it is believed the chances of dying as a result of mishandling are high. Especially dreaded is the prospect of a child being injected, which they believe could kill the child instantaneously (Mwenesi 1993).

Luo treatment of fits also commences at the household. Certain roots are dried and crushed and then the child is made to sniff the powder to induce sneezing, to get the worms out of the head. Most mothers know these roots and they treat their children themselves. A visit to a HF on account of a child fitting is a last resort. One thing to note however is that many of the Luo informants thought that febrile convulsions were more common on the coast than in their home area in Western Kenya.

Anaemia

Anaemia was mentioned by only 174 (20%) of all the mothers interviewed. It was not perceived as a priority disease. Residency in Kilifi town and "higher" education levels were associated with the answer. However, the condition was well known in the communities. The local names for the condition are: safura which literally means 'the swollen or puffy' in Mijikenda and rembe orumo which literally means 'blood is finished' in Dholuo. The local name in Dholuo suggests that the Luo did not recognise anaemia in their cultural disease profile because they have literally transliterated the medical explanation to lay people that one has anaemia when they have insufficient blood in their bodies.

Although everyone could get anaemia, children under five years were perceived to be more susceptible because they tend to eat soil and spoilt foods which are believed to be the causes of the condition. Transmission and communicability was not understood but mothers believed that anaemia in children could be prevented, unless it was caused by sorcery. Prevention measures mentioned were corollaries of perceived causes. Anaemia was not perceived to be a life threatening illness. Only seven mothers reported anaemia in their children, currently or in the past two weeks prior to the survey and none of them had presented her child at a HF or had given a home remedy. Anti-helminths were mentioned by 8% of the mothers, no other OTC drugs were indicated for the treatment of anaemia.

Splenomegaly

A total of 216/883 (24%) mothers mentioned splenomegaly as a childhood illness that presents with fever. The response was associated with the younger age-group and schooling. A large percentage of these mothers (72%) included **fever** as a major **symptom** of splenomegaly. However, most of the mothers (71%) could not describe an enlarged spleen. Both communities recognised splenomegaly and had local names for it: luwengu in Mijikenda and ima in Dholuo. Ingested soil could solidify in the stomach causing splenomegaly. Worms could also form a mass which presents as an enlarged spleen.

The **first-line treatment** for this condition is OTC anti-helminths and laxatives. Certain herbs with laxative properties referred to as msahala are also used to induce diarrhoea which is perceived to be a wash out for the worms and the soil. Traditional treatment is sought if the condition persists. The initial diagnosis changes from 'soil mass' and 'worms mass' to 'bad blood mass'. Bad blood refers to the swelling which is perceived to be coagulated blood which has to be sucked out. The usual treatment is scarification of the swelling followed by 'letting' out the blood by suction, followed by rubbing poultices into the cuts (Mwenesi, 1993). A HF is a last resort. Three mothers who reported splenomegaly in their children in the two weeks preceding the survey reported to have given their children antipyretics and one had taken the child to a HF.

Mothers' health seeking behaviour (HSB) for malaria

Mothers' use of health facilities

Sixty-nine mothers were re-interviewed at health facilities. The socio-demographic profile of these mothers was not different from mothers who were not re-interviewed. Fifty-three of these, whose children were ill were interviewed in detail about their child's current illness and the whole process of care seeking. Cough was the illness most likely to present at a health facility (50%) and only one mother diagnosed her child's illness as malaria prior to coming to the health facility. The average number of days between onset of illness and health facility visit was three days. Some of the reasons given for the three days lapse (62%) in order of magnitude were: perception that illness was mild, partner being absent, other important matters to attend to and lack of someone to mind the ill child's siblings. These were categorised as "predisposing" factors. The remaining 38% gave their reasons as lack of money for transport, having given the child OTC drugs and having taken child to a traditional healer and were categorised as "enabling" factors. No "health systems" factors were given. At the facilities, 55% of mothers who received antimalarial drugs did not follow instructions on how to dispense the medication and none asked for clarification for fear of the health workers.

Mother's use of retail outlets

An inventory of medications available in 64/200 retail outlets in the study areas yielded 150 types of drugs: 19 (13%) types of antimalarial drugs, 27 (18%) types of analgesics and antipyretics, the rest were gastrointestinal (23%) and respiratory drugs (13%). The remaining 33% were a host of preparations including antibiotics (3%). Results from the drugs in homes survey showed that 67% of households had purchased drugs in the past

two days before the survey and 44% had drugs at the time of the survey. Of these, 41% had antimalarial drugs in varying quantities.

Eighteen mothers were re-interviewed at retail outlets. The type of retail outlet used depended on distance and availability of required medication. Fourteen out of 18 mothers purchased drugs for homa, with symptoms ranging from general febrile conditions, anorexia, crying and restlessness to cough. Most mothers purchased the drugs within one day of noticing the symptoms or behaviour changes and thus acted promptly to administer presumptive treatment. The most popular choice of medications was combinations of analgesics (10/18 mothers), followed by analgesics together with antimalarial drugs (4/14), while the remaining four purchased other drugs. Mothers based the combination of drugs on what each was supposed to treat and on their brand names. However, although 70% (N=883) mentioned OTC drugs that they thought could cure malaria, 56% of them could not identify the medications from a drug collage provided.

The treatment seeking pattern that emerged from this data was that mothers took remedial action for their child's illness as soon as possible. They first gave any medication available within the household. They repeated the treatment with medication from the ROs, which was repeated if necessary. They only went to HFs when, in consultation with a significant other, the mother thought it was necessary.

Retail outlet proprietors' knowledge of malaria and its medications

Almost all (91%) ROPs thought malaria was a **serious** illness but they did not recognise **age specificity**. Seventeen percent (N=58) of these thought malaria was not preventable and all those (83%) who thought it was **preventable** mentioned **prophylaxis as the best preventive measure**, in keeping with their vocation of selling drugs. They routinely offered **advice** to mothers who purchased drugs for children. The **best drugs** for the treatment of malaria were reported to be chloroquine-based AM drugs, of which one brand was so popular that one ROP remarked that "it sells like aspirin". However, 24 (38%) of them **did not know the correct dosages** of the drugs, and only 2 (3%) of them indicated that their customers bought correct dosages of AM drugs.

Antimalarial drugs available in retail outlets and homes

Of 19 types of AM drugs recorded from ROs, 14 were chloroquine phosphate-based drugs, all being sold without control under different brand names. Most had "catchy" names and were vigorously advertised in all media including large posters strategically billed on RO walls and often doors. The remainder were aminoquinolines including amodiaquine (Camoquine^{R}) (recommended for chemotherapy only) and proguanil hydrochloride (Paludrine^{R}) (recommended for prophylaxis only), and second-line drugs, intended for treatment failures due to parasite drug resistance to ingredients such as quinine, examples of these are: sulphadoxine+pyrimethamine (Fansidar^{R}) and sulfalene+pyrimethamine (Metakelfin^{R}). The second-line AM drugs should be used under the direction of a qualified person but they were readily available over the counter.

One hundred and seventy (44%) out of 390 households had drugs at the time of the interview. Of these, 70/170 (41%) had AM drugs. Four of the households had second-line drugs and 66 had different brand names of chloroquine phosphate-based AM drugs. None of the households had a full course of any of the AM drugs in their possession. The respondents reported that they buy AM drugs only when in need and what was found in the house was a recent purchase. Twenty-two percent had purchased the drugs in the last 48 hours before the survey. The majority of households that had any type of drugs were in Kilifi town. One hundred and twenty households had no drugs at the time of the visit but they reported to have purchased some type of drug in the last 48 hours. Of these, 90 (75%) had evidence of purchase in form of drug wrappings. This implies that a total of 260 (67%), households had purchased drugs between one and two days prior to the survey. The analysis did not include medications recorded as having been obtained from HFs. The data indicates a high level of self-medication in the community. Qualitative information indicated that low utilisation of HFs and high use of ROs was directly a result of the introduction of user fees at HFs.

DECISION-MAKING DYNAMICS IN HEALTH SEEKING BEHAVIOUR

The Mijikenda and Luo people have a well defined social structure in which everyone knows their place. It was surprising that almost all mothers, 880/883, regardless of marital status, age and education level reportedly sought advice before taking an ill child to a health facility, while another 386 (42%) sought advice for retail outlet use, (responses to a retrospective hypothetical situation). Results obtained from mothers at both health facilities and retail outlets during a current illness episode on consulting behaviour were in concordance with the results from a hypothetical situation. The consultations involved family members. Husbands were consulted more frequently (63%). Fifty percent of all mothers interviewed consulted because it was expected of them and 50% consulted only when they perceived an illness to be serious or they did not understand its nature.

Other male members of households and in their absence senior females were also consulted. The reasons advanced were that illnesses, whatever their nature, were a matter of life and death and a second opinion on the likely cause of a child's illness was necessary. Further, having to seek advice for a child's illness not only acts as a check for 'bad behaviour', especially on the part of women among the Mijikenda, and men among the Luo, but, according to the informants, hastens the child's chances of being treated quickly and effectively without wasting time and sometimes money at HFs, especially for illnesses involving sexual transgressions. Financial considerations were not cited as reasons for consulting a significant other.

DISCUSSION

The discussion of the results includes qualitative and quantitative data. The findings are discussed and their implications for malaria control spelled out.

Table 4 summaries the major findings of the study.

Table 4: Summary of major findings

MAIN OBJECTIVES	SUB-STUDY	MAJOR FINDING(S)
1. Determine how the communities under study define and perceive childhood malaria and how they translate this perception into action.	- Mothers' survey. - Ethnomedical survey. - HF and RO users' surveys - ROPs survey.	1. They have **limited knowledge** of childhood malaria as a biomedical pathology and react to it from a biocultural framework. 2. The **image of malaria** presented by health workers and the media to populations living in malaria endemic areas has been based on **presentations of the illness in non-immune or semi-immune populations** and may be the major barrier in malaria control in this areas. 3. The time-tested **simplistic mosquito-malaria link** presented to people by malaria workers of all cadres: **no mosquitoes no malaria** may be another obstacle in malaria control.
2. Determine whether certain complications of malaria in children are recognised and their management.	- Mothers' survey. - Ethnomedical survey.	1. Mothers in Kilifi do not recognise convulsions, anaemia and splenomegaly as **complications of malaria** in children, but as illness entities in themselves. 2. **Antimalarials** are not thought to be appropriate for their management and are therefore **withheld or withdrawn** from children suffering from these conditions.
3. Assess decision-making dynamics and the significance of family and other social networks in the health seeking process.	- Mothers' survey. - Ethnomedical survey. - HF and RO users' surveys.	1. Mothers **rarely make decisions** on health matters related to their children. The male head of a household **almost exclusively decides** what therapy is to be used when a member of the household is taken ill.
4. Determine the extent and reasons for use of proprietary drugs for malaria in children in the context of multiple therapeutic systems.	- Mothers' survey. - Ethnomedical survey. - RO users', ROPs and drugs in homes surveys.	1. Mothers are **promptly treating** their children for malaria like illness. 2. ROs are **extensively used** as sources of health care; not as alternatives to HFs but as the **first tier of care** for 'mundane' illnesses. 3. The **range of types and formulations** of OTC drugs including antimalarials **is bewildering to both users and proprietors**. They know little or nothing about them and use or sell them inappropriately.

A biocultural definition of malaria

Most mothers in Kilifi, especially the Mijikenda, have limited knowledge of childhood malaria as a biomedical disease, its cause, prevention and treatment. They define it as a mild self-limiting illness likely to cause death. Their ethnoetiological explanations leaned more on thermal and climatic theories, where sudden body temperature changes from hot to cold or vice-versa, or sudden weather changes, compromised the body's ability to resist febrile illnesses like malaria. Ramakrishna and Brieger (1987) in Nigeria mention that mothers also believed that malaria was a temporary illness caused by excessive heat. The Kilifi mothers' explanatory model did not extend to other imbalances such as hot-cold foods and other humoral features. The thermal definition as used by Mayall (1986) who reported similar results from mothers in England when studying common colds is therefore preferred. Jackson (1985) in Liberia and Bledsoe and Goubauld (1985) in Sierra Leone reported similar findings.
These ethnoetiological factors associated with malaria are natural processes, 'acts of God', which individuals perceive to be beyond their control. The only precautionary measures against malaria in Kilifi are common sense practices that are a corollary of the ethnoetiologies such as avoiding extreme temperatures, excessive wetness and weather changes. Except among a few mothers with some schooling who use sporadic antimosquito measures in Kilifi town there are no conscious efforts made to avoid mosquitoes as a malaria prevention effort; since they were not associated with malaria.

The only other studies known to the investigator that have systematically investigated mothers' definition of childhood malaria are by Jackson (1985) in Liberia and Glik, Parker, Mulingande et al. 1987, Glik, Gordon, Warden, et al. 1988). In contrast with findings in this study, Jackson (1985) reported that mothers in Liberia defined malaria as a serious illness which they were apprehensive about and therefore regularly gave their children some local prophylactic teas. In both studies however, malaria was cited as the fifth major health problem in Liberia and on the Kenyan Coast. The contrast in definition and perception may be explained by a probable difference in the amount of exposure the communities have had to information about malaria, since ethnoetiologies for malaria are similar in both countries. The difficulty of Mijikenda mothers to recognise childhood malaria is largely a result of the explanatory model for febrile illnesses which is imbued in their culture. The generic term homa, which covers a wide range of febrile conditions may denote malaria, but the fact that mothers differentiate between typhoid and influenza would make that assumption incorrect. Luo mothers on the other hand differentiate malaria from other febrile illnesses because they do not posses a generic term for febrile illnesses in their taxonomy of illnesses. Spencer, Kseje, Sempebwa et al. (1987) came to the same conclusion while working in Nyanza, the home are of the Luo. Most malaria control programmes in Kenya for the last 50 years have been carried out in the area.

Kilifi mothers had fairly good knowledge of symptoms that present in mild malaria. This knowledge may have been acquired through contact with health workers where exhibited symptoms may be diagnosed as malaria, from media messages which describe symptoms for conditions that their brand medications can treat or from learning at school, from friends and relations. Similar results were reported by Jackson (1985), Spencer et al. (1987), Ejizie, Ezedinachi, Usanga et al. (1991) and Rooth and Bjorkman (1992).

The findings illustrate that Kilifi mothers would clearly not react to childhood malaria from a biomedical premise, but from a biocultural "explanatory" position. According to Kleinman (1980) and Young (1987), "explanatory models" are generated by individuals within their cultural background. The models contain knowledge about the kinds of illnesses, what to expect about the onset of the symptoms, courses of the illness episodes and the appropriate treatment. The explanatory models illuminate our understanding as to why people react in certain ways to a given illness.

These findings imply that health information for malaria should include these divergent explanatory models and also appreciate the context within which they are formulated. That may be the only way to make them acceptable to the people. The most important point emanating from the findings, however, is the indication that health promoters of all persuasions have been using an incorrect premise in health education for malaria. It is argued here that mothers in Kilifi may not have biomedical knowledge or even a local name for malaria, but they have the correct perception of malaria, as a chronic disease, gained through empirical observation and experience. It is not surprising that mothers and key informants described malaria as the disease they "hear about" from "you people" (health workers and the media). The disease that is presented to them is consistent with the presentation observed in non-immune and semi-immune patients: acute, serious and almost always fatal if not promptly treated at a HF. This illness is alien to them because being in an endemic area they identify with a self-limiting illness, that is chronic and debilitating. They do not experience the malaria that is portrayed to them. Any health information strategy in an area like Kilifi that fails to appreciate peoples' perception and definition of the illness is bound to fail.

The explanatory model for malaria presents to Kilifi mothers an illness that is not serious and which one need not be apprehensive about because they may have no control over it, since it is firmly placed in the realms of natural processes - fate and God. Blaxter (1990) argues that if ill-health is seen largely as "self-inflicted" then education, persuasion and an emphasis on self-responsibility will work as policy. But, if it is perceived to be principally outside the individual's control, then social policy issues are paramount. In the case of malaria in Kilifi, the issues would relate to availability of medication and the persistence on raising awareness, especially the recognition of a malaria episode and the link between malaria and mosquitoes.

"Cultural blindness"? - The mosquito - malaria link

Fonaroff, (1968) argued that peoples' cultures are to blame for the perceptual difficulty of linking mosquitoes to malaria by most populations living in malarious areas. While working in Trinidad, he noted that East Indian ethnic groups who presumably knew about mosquitoes and malaria, preferred to live near marshy land where they could cultivate their highly valued food - rice. These cultural preferences reportedly put these groups at a greater risk of malaria infection relative to other ethnic groups on the Islands.

Three decades later, one wonders about whose "culture is blind", that of the people in malarious areas or that of malaria workers? This study and most other social science studies (for example: Abdullah 1985; Ongore et al. 1989; Jackson 1985; Hongvivatana,

Leerapan and Chaiteeranuwatsiri 1985; Silva 1991; Agyepong 1992; Lipowsky, Kroeger and Vasquez 1992) attest to the fact that mosquitoes are not perceived to be linked to malaria, especially by people who have had little or no schooling. The question is, why has this perceptual difficulty persisted through almost the whole period that malaria has been an issue?

It could be that the simplistic messages that were given to the people about how to prevent malaria, which may have seemed reasonable then, have contributed to the problem of the malaria-mosquito link. People in malarious areas were given the mistaken impression that eradication of malaria would be brought about by the eradication of mosquitoes. The belief was based on earlier ideas that: "...the disappearance of malaria related directly to the disappearance of anophelines" (Fonaroff, 1968: 538).

People were (and are still) taught that malaria control would be achieved through environmental manipulation, especially by clearing bushes and vegetation and draining of stagnant waters to destroy mosquito breeding sites. The fact that there can be mosquitoes without malaria ('anophelism without malaria') is not made clear to them. The messages were simple for simple societies, but they were also ambiguous. It may be that the malariologists of the 1920s did not know as much as is now known about the bionomics of different types of mosquitoes and their breeding habits. However, there is evidence to show that as early as 1940s, some of the procedures advocated such as clearing vegetation, were found to be useless (Hackett, Russell, Scharff et al. 1938; Ribbands 1946).

Empirically it is difficult for people to visualise any method that would have an impact on mosquito densities and thus they perceive most 'simple' measures against mosquitoes as a waste of time. While working in Kisumu, Western Kenya, Millman (1967) found that villagers refused to clear vegetation for malaria control purposes, because they needed fodder for their animals. Abdullah (1985) reports that 87% of her respondents also in Kisumu, claimed to clear vegetation as a malaria control measure. However when asked whether the measure was effective, only five percent of them answered in the affirmative. Malaria workers of all cadres must clear the confusion through properly formulated health education messages if the "cultural blindness" is to be rectified.

Does malaria have any complications?

The explanatory model for malaria in Kilifi does not provide for the illness becoming severe and therefore causing other illnesses. As such, convulsions, anaemia and splenomegaly were not perceived as complications of malaria but as specific illnesses with different ethnoetiologies and in the case of convulsions, sophisticated management procedures. The three conditions did not even fall into the same explanatory models.

Convulsions are perceived as a serious childhood condition, non-communicable and unavoidable. The condition must have been encountered frequently in the area because it has acquired a 'folk illness' status known by different names but commonly called nyago. It has a supernatural ethnoetiology where spirits are implicated. Nevertheless, convulsions are treated as emergencies. Similar results have been reported by Boerma, (1989) for South Coast Mijikenda and Coreil (1983) for Haitians. In contrast, Jackson

(1985) reports that Liberian mothers linked convulsions to malaria, but it was found that convulsions as a reported symptom overpredicted evidence of malaria and may have reflected the high prevalence of neonatal tetanus in the study area.

Biocultural definitions of anaemia were not as entrenched or as elaborate as beliefs on convulsions. Among the Mijikenda, anaemia could be caused by natural processes such as eating soil (dirt) and spoilt food, which results in helminthiasis or by sorcery. Heredity, where a mother passes on the pica syndrome to her child in utero was also implicated. The Luo on the other hand had no biocultural explanatory model about the condition but explained anaemia as lack of blood - the lay explanation of low haemoglobin levels. It was not viewed as a life-threatening illness and could be prevented by avoiding the implicated aetiological factors or protection against sorcery. The explanatory model for splenomegaly, as for anaemia, was not elaborate. The condition was attributed to natural processes which included eating soil and helminthiasis. It could also result from unknown aetiologies which manifest as "bad blood" in the 'painful swelling'. It was not viewed as a life-threatening illness.

Mothers did not mention cerebral malaria, which presents as delirium or coma. This confirms the observation by Greenwood (1991) that in Kilifi, anaemia is responsible for more malaria related deaths in children than cerebral malaria. Jackson (1985) reports similar findings in Liberia. It has been reported that cerebral malaria and severe anaemia are responsible for most deaths from malaria in tropical Africa (Greenwood 1991), but Rooth and Bjorkman (1992) concluded that perhaps cerebral malaria in children is uncommon in malaria endemic areas.

It is important at this point to comment on the link between good prognosis of malaria infection and bile in vomitus. Mothers believed that malaria was exacerbated by bile excretions. If the bile was vomited, the patient was perceived to be recovering. This has not been mentioned anywhere else in the social science literature on malaria or even in the literature on the pathophysiology of malaria where not much on the bile factor was found. Gastrointestinal dysfunction is discussed in relation to nausea and vomiting, especially in hyperpyrexia (White and Ho, 1992) and only in cerebral malaria is the colour of the vomitus described, especially where there is involvement of other organs in the gut.

Morbidity and mortality from childhood malaria

The objective was not to measure the rates but to determine the extent to which childhood morbidity and mortality was attributed to childhood malaria. Recall bias is appreciated for this result. Of 733 mothers, only 16% reported malaria in their children in the two weeks prior to the survey and only 1.3% reported to have ever lost a child due to malaria. The figures for anaemia and splenomegaly were 4% (n=174) for morbidity and no mortality, 1.3% (n=216) and no mortality, respectively. These conditions were perceived as non life-threatening.

Findings on morbidity and mortality from convulsions may reflect the true situation because the nature of the illness reduces recall bias significantly. Twelve (2.4%) out of 498 mothers reported convulsions in their children in the two weeks prior to the survey.

This would translate to about half of all the children having one attack of convulsions annually; indicating substantial cases of severe illness in the community. Five percent of the mothers reported to have ever lost a child due to convulsions. Convulsions, therefore, were implicated for more deaths than all the other conditions put together, while malaria was implicated for more morbidity than all the other conditions.

The findings on ethnoetiological explanatory models for complications associated with malaria and the perception that these conditions are not life-threatening (except convulsions) have several implications for malaria control. Firstly, any health intervention that assumes their link with malaria but neglects these psychosocial factors would be misplaced. Secondly, none of the conditions is revered enough to act as a proxy for malaria during health intervention programmes.

Who makes decisions for childrens' health care?

Health care especially for children begins at the household level. It is assumed that mothers as their carers have the prerogative of making health care decisions for their children. This assumption, which has directed past health interventions for malaria, presupposes the existence of a situation of choices, with mothers and significant others bidding for their preferences, within the context of equal say in households (Rogler, 1989). However, the Kilifi study suggests that this is not always the case. Decision-making processes for health care in different types of households and settings depends generally on the social structure and particularly on who "owns" the child: an important consideration in patrilineal and matrilineal societies.

Clear social roles delineate who makes what decisions. Among the Mijikenda and Luo, women may make decisions regarding what their family meal will comprise of but they had no mandate to make decisions for their husband's children or even themselves. This applied to partnered or un-partnered mothers. The decisions for health care lay exclusively with the male head of the household (especially the husband), who not only decided the final diagnosis of an illness, but also the therapy to be used. Male in-laws in the case of married and widowed women, fathers and brothers in the case of unmarried women, also hold the mandate to make health decisions.

Similar findings were reported by Janzen (1978). Zairian mothers and even female heads of households did not make decisions on health matters for either themselves or their children. However, unlike in Kilifi, matriarchal kinsmen made health decisions in Zaire. In Tanzania, McCauley, West and Lynch (1992) reported that although mothers were responsible for the care of their ill children, they sought permission from their husbands before utilising a health facility or traditional healer. In contrast, Glik et al. (1987) while working in Rwanda, reported that mothers generally made decisions on child health matters independently.

Generally in Kilifi, consultations for health care matters rarely went beyond the immediate household. This was especially so for illnesses that had any moral ethnoetiologies implicated or were suspected to result from sorcery. The element of social control implied by 'folk' illnesses such as chirwa, which presents as PEM, and which these communities believe can only be treated traditionally is a case in point.

Keeping matters within the household protects the household male head's positions. Finally, sorcery may be practised by kin against kin. Thus, matters of illness remained within immediate households until other kin even in next door households had been cleared by a muganga.

The implications of these findings on malaria control is that any interventions for malaria that are targeted at women as child carers are bound to have little impact. This is best summed up by McCauley et al. (1992) based upon their experience in Tanzania. They report:

> Although the mothers were responsible for both water use and the health and cleanliness of their children,...the decision to change behaviour [to control trachoma in children] had to be sanctioned by the husband in the household and the community as a whole (: 817).

Mothers' diagnostic abilities

The study findings demonstrated that mothers, regardless of their socio-economic and socio-demographic characteristics make the first diagnosis of illness in their children by defining and interpreting bodily and behavioural changes. It has been argued that health and illness constitute a continuum but the point at which one becomes the other is often vague (Lieban, 1992). The mechanisms by which Kilifi mothers conclude that certain bodily and behavioural changes are illness are not explicitly laid out by the results of the study. However, the findings suggest that a mothers' decision to confer the sick-role to a child and to subsequently do nothing or seek treatment is a function of various factors. In the case of malaria, they include the mothers' experiential knowledge (determined by familiarity with the illness, as a result of an ecology conducive to malaria); based on its definition (derived from their nosology and explanatory model of malaria and/or contact with biomedical information on malaria), and the social structure which determines household decision making dynamics. All these factors together constitute the functional biocultural definition of malaria; what Sevilla-Casas (1992) refers to as subjective perception and evaluation of risk. Other factors relate to the availability of other sources of care and the adequacy of health facilities.

This study did not detect any belief-conflicts on the part of mothers or significant others in choice of treatment for mild malaria. The type of therapy selected and the lapse between onset of illness and remedial action taken seems to depend on the perceived aetiology, prognosis of the illness and its perceived seriousness. As one mother reiterated when referring to convulsions in children: "...We know what we can treat ourselves and what you can treat for us". The explanatory model for malaria in Kilifi provided mothers with precise courses of actions to take for malaria-like illness.

A conclusion by a mother who notices and decides something is the matter with her child seems to culminate into two pathways (1) deals with behaviour or bodily changes ('symptoms') she views as precursors to illness by observing for a few days or administering self-medication, either OTC drugs or home therapies; and (2) deals with

the 'symptoms' as concomitant with an illness and may observe, administer self-medication or, depending on the prognosis of the 'symptoms', seek care immediately, based on the ethnoetiology of the disease.

All the factors discussed above are psychosocial processes which have not been seriously investigated as literature on use and non-use of services shows (see Gilson, 1988). This study demonstrated that they are important in health-seeking behaviour, but as Foster (1976) concluded, economic and social costs are equally important.

Treatment selection

In Kilifi, mothers used ROs as the first tier in the hierarchy of care sources, for symptoms perceived to be mild, mundane or those conditions that respond rapidly to modern chemotherapy. OTC drugs were viewed to be efficacious and their use was very high. The mothers were not only aware of, but also knew by name, some OTC drugs that they believed "cured" childhood malaria. Fifty-nine percent reported to routinely treat their children for malaria with OTC drugs from ROs. However there is cause for concern because the study showed that 56% of these mothers could not visually identify the drugs they mentioned. They depended on advice from ROPs, notwithstanding their low knowledge of correct dosages. The most serious cause of concern however, is the saturation of OTC drugs in Kilifi. Out of a total of 150 types of drugs and other preparations, there were 19 types of antimalarial drugs, both first-line and second-line drugs. Of these, 14 types were chloroquine based, all being sold under different brand names and very vigorously promoted through the media. The findings of this study reinforce results from previous studies on availability of excessive proprietary drugs in the markets (Maitai et al. 1981; Raynal 1985; Van de Geest and Whyte 1989; Logan 1988; Kasilo, Nhachi and Mutangadura 1991); especially antimalarial drugs (Maitai et al. 1981; Olatunde 1981; Van der Geest 1987; 1988; Foster 1991a; 1991b).

An important finding in this study however, was the fact that mothers were treating their children promptly, within 24 hours of onset of illness; although the time lag between onset of illness and taking a child to a health facility was 3 days. What is not happening however, is the correct recognition of true episodes of malaria. Further, mothers not only used inappropriate drugs for what they define as malaria, but they also gave incorrect doses. Similar findings were reported by Dabis et al. (1989); Deming et al. (1989) and Makubalo (1991). Whereas the prompt treatment at the household level may protect children with mild malaria from advancing to severe forms, delay in seeking proper care for malaria may have serious neurological consequences (Brewster, Kwiatkowski and White (1990) and could lead to death in less than 24 hours (Greenwood, Greenwood, Bradley et al. 1987; Taylor and Molyneaux 1988).

In areas where use of health facilities is high and medication can only be obtained from health facilities, children are not treated promptly. Glik et al. (1987; 1988). The reasons for this trend in Ivory Coast are not clear but in Rwanda it was due to a colonial statute which had outlawed keeping drugs in households and therefore self-medication. Though the laws were defunct at the time of the study, the habit was embedded in peoples' treatment-seeking behaviour.

Retail outlet proprietors

ROPs cooperated in the research but they felt that they could not take it upon themselves to give advice if not asked, or to question any one purchasing drugs from their concerns, about what the drugs were for, or why they bought incorrect doses. Firstly, it would not be in their interest to pry into peoples' illnesses since it was not expected of a ROP - they are not health workers. Secondly, OTC drugs in themselves were not commodities with a good margin of profit, but their being available attracted other business. ROPs were only fulfilling a need and thus it was, they felt, upon the government to control the manufacture and pricing of OTC drugs, which are not on price control. ROPs price them according to the procurement price from dealers. This sentiment was also expressed by key informants who felt that the malaria problem in the area could only be dealt with by the government "ensuring that HFs were well stocked with antimalarial drugs" and "lowering and regulating the prices of proprietary drugs". The Luo of Karateng in Kisumu district expressed the same sentiments, that only the government could solve the malaria problem by "bringing the best medicines to hospitals and shops" (Abdullah 1985: 83). This scenario presents a situation where ROPs may not be keen to be involved in malaria control strategies.

The neem tree, Azaderachta indica, was commonly used as a home therapy for malaria, but specifically for convulsions. Management of convulsions at hospitals kept mothers away because it is not in concordance with the biocultural explanatory expectations of how therapy should be administered. Injections and other invasive procedures are perceived to be the cause of the childrens' deaths and not the illness itself. This may explain the observation that most paediatric deaths associated with malaria occur in emergency wards of hospitals. In Zaire, Greenberg, Ntumbazondo, Ntula et al. (1989) reported that 62% of 1323 paediatric deaths occurred in the emergency ward prior to admission. The children are brought in as emergencies and few survive because the illness is too advanced. Their deaths only help to reinforce the belief that children who are taken to health facilities with convulsions do not survive - and the vicious cycle continues.

The neem tree is used for the same purpose in same purpose in Ghana (Abbiw, 1990; Agyepong, 1992). The medicinal and insecticidal properties of this plant have been and are continuously being investigated with regard to its efficacy as an antimalarial and as a vector control (Reuben and Rao 1991; Nkunya 1992). The conclusion so far is that its antimalarially active limonoids are in very small amounts and thus the therapeutic effects claimed by patients may be due to other factors, such as the recently established anti-inflammatory and immunomodulating activities (Nkunya 1992). Thus when introducing health intervention programmes, this herbal remedy belief should not be discouraged, neither should it be vigorously promoted. Its insecticidal properties are also encouraging and its products are used widely in rice paddies in India and other countries of South East Asia (Reuben and Rao 1991).

The use of HFs for the treatment of malaria was low. What is usually referred to as 'delay' in bringing a child to a hospital is in fact the period that a mother has to make complex decisions, in real life situations where as Blaxter (1981) puts it, issues may not be discrete, roles may conflict and priorities have to be assigned in accordance with an

individuals' value systems. Thus although mothers did not present their ill children to HFs on the first day of symptoms, at home they were not ignored either. Further, when their differential diagnosis had to change either because the child did not respond to the treatment being given at home or from a traditional healer; or the condition was perceived as getting worse, then mothers did bring their children to a HF.

It has been suggested that purchasing OTC drugs incurs relatively large out-of-pocket health expenditure especially on poor people (Melrose 1982; Coreil 1983; Ugalde and Homedes 1988). However, on the whole, self-medication for Kilifi mothers was cheaper than a HF visit. A single visit to a HF would cost a mother between Ksh.20-30 (£0.30-0.55), depending on whether there were laboratory investigations or not. The hospital journey may also include transport money which for the respondents ranged between Ksh. 10-25 (£0.20-0.50) and may also include money for other incidentals such as lunch. If no transport funds were available, a mother in Sokoke for example would have to be well enough herself to make the 40 kilometre journey with a child strapped on her back, while a mother in Mtondia would have a 15 kilometre journey to make. A correct course of an antimalarial for a child (syrup or tablets) would cost the mother between Ksh.5-10 (£0.10-0.20). The user fee charge at HFs therefore increased the need for self-medication.

It must be pointed out however, that mothers had their own preferences in choice of what HF to use. For example, mothers from Sokoke preferred to make the 40 kilometre journey to Kilifi district hospital, by-passing the government dispensary in the area, which was more easily accessible to them. They did so in the hope that they would be "examined by more qualified doctors", especially the "muzungu (white) doctors in the 'malaria clinic'". The issue of by-passing HFs on account of drug shortages, always cited in literature on utilisation of services did not arise in Sokoke at the time of the survey because the drugs ration had recently arrived and therefore there was no drug shortage. Further, no user fees are charged at dispensaries and yet Sokoke mothers still went to Kilifi district hospital where a fee was levied. Gilson (1992) observed in Tanzania that mothers by-passed the nearest facility to go to one perceived as better. In the Gambia, mothers complained they lacked money to pay for drugs from VHWs yet they subsequently payed more at HFs (Menon 1991). This may explain why mothers do not use services even when proximity is not an issue, and charges are minimal or non-existent.

It was suggested that mothers are using antimalarial drugs inappropriately and that they do not get proper advice from ROPs. The study also found that it was not only OTC drugs that were used in this manner, that even medication prescribed in HFs was used irrationally. This is partly because no clear instructions were given to the mothers by the health workers or because they (mothers) used the wrong measures when giving the medication to the children at home. Fifty-five percent of mothers whose children were given medication did not understand instructions and they did not ask for clarification. They explained that they did not ask for clarification because health workers can be harsh when asked too many questions, an observation also made by Nyazema, Chavunduka, Dzimwasha et al. (1991) in Zimbabwe.

The positive finding made at HFs and in the study area in general was the fact that injections were neither a preferred mode of treatment for malaria in HFs nor was there a belief among the people that injections were the best treatment, hence the lack of the culture of 'quack injectionists' in the area. This is in contrast to findings from Guinea by Dabis et al. (1989), and Ejezie et al. (1991) in Nigeria, who reported excessive use of injections for malaria in their studies. Dangers of this procedure are well documented (Warrell et al. 1991).

METHODOLOGICAL ASSESSMENT

Integration of methodologies

This study seeks to contribute to the development of health communication information for malaria control, specifically, childhood malaria, through appropriate and prompt presumptive treatment of fever and malaria-like illness. While acknowledging the debate about whether it is possible or even desirable to combine research methodologies (Werner and Schoepfle 1987; Buchanan 1992) and the promotion of triangulation of methods (Mechanic 1989; Steckler, McLeroy, Goodman et al. 1992; Yach 1992); the latter position was adopted for this research. It views quantitative and qualitative methodologies as complementary and assumes that weaknesses in either would be compensated by the other. Integration of data collection methodologies provided a broader understanding of both the context and factors that influence mothers' definition and treatment of childhood malaria.

The triangulation technique allowed for coverage of a large study population (1408) in which 1348 respondents were interviewed through structured interviews and enabled the in-depth interviewing of 60 respondents concurrently. Observations of any phenomena of interest to the study were also made parallel to the other methodologies. Through quantitative methods and their sampling procedures the study investigated knowledge, beliefs and behavioural differentials as determined by socio-demographic and socioeconomic variables. Qualitative methods were used to investigate intensely the basis of the knowledge, beliefs and behaviour. Hence, it was possible to obtain the general feelings and attitudes of the mothers towards childhood malaria, and to measure the strength of the feelings and factors influencing them.

For example, quantitative results (table 2) at a glance showed that 56% of mothers knew the cause of malaria to be mosquitoes, the majority knew the symptoms, 47% understood communicability and 53% thought malaria was preventable. More impressive is the finding that 65% of the mothers currently used anti-mosquito measures. The results also indicated that education levels had a great influence on what mothers knew about malaria. However, further data presented in the same table 2 demonstrate that the figures do not auger well for childhood malaria control. Overall, only 10% of the mothers had correct (biomedical) knowledge of malaria, of the remaining 90%, some of the mothers had beliefs that were a mixture of biomedical and biocultural beliefs while the majority had only biocultural beliefs.

It was through qualitative methods however, that one could clearly determine the basis of the beliefs and behaviours. Malaria is viewed in the same light as other febrile

illnesses that are inevitable, not serious and self-limiting but with the possibility of being severe and could perchance cause death. Like other febrile illnesses, childhood malaria was attributed to weather or temperature changes, which Mayall (1986) refers to as thermal theories. While working among mothers of different social classes in Britain (an inner city area of North London), Mayall found that mothers believed that colds were caused by effects of temperature changes, or of extremes in temperature. Like in Kilifi, it was mothers in low socio-economic groups who invariably also had relatively low levels of education who subscribed to these thermal theories. HSB for childhood malaria, especially with regard to therapy choice would not have been clearly understood if only quantitative data was used. The fact that the male head of household is almost exclusively the sole decision-maker in the choice of therapy for children and mothers would have been difficult to elucidate.

It was also through qualitative methods that beliefs on complications associated with malaria were fully discerned. For example, the quantitative data showed that only 16% of mothers recognise convulsions as a childhood illness that presents with fever. On prompting (which is arguably more a qualitative technique than a quantitative one), the figure rose to 56%. Further, quantitative data indicated that only 8% of mothers believed convulsions had a spiritual origin and only 19% reported use of charms and amulets to prevent the illness. The interpretation of the quantitative data would arrive at the conclusion that mothers in Kilifi do not recognise convulsions as a childhood illness. This would be far from the truth. Qualitative findings have demonstrated that almost all mothers not only know the condition but know what to do in the event that their child has an attack. The condition has the same status as other 'folk' illnesses like chirwa, included into the larger cognitive classification of illnesses specific to children. Similar results are illustrated for anaemia and splenomegaly. Further, ethnoetiological beliefs and the very elaborate management procedures would have been completely missed if integration of methodologies was not employed.

Another example of information that could have been missed if the data collection methods were not integrated was the dissatisfaction with and non-use of HFs because of user fees. Twenty-two out of 53 mothers explained the three day time lag between onset of illness in their children and seeking care from HFs as being due to "predisposing" factors such as the perception that illness was mild, partner being absent, other important matters to attend to and lack of someone to mind the ill child's siblings while others (11/53) cited "enabling" factors such as lack of money for transport, having given the child OTC drugs and having taken the child to a traditional healer. No "health systems" factors such as accessibility, lack of user fees, waiting time at facilities or problems with health workers were explicitly cited, although they may be implied in the factors mentioned above. The mothers may have said nothing about user fees and accessibility being a hindrance because they were already at HFs when they were interviewed, but it came out very clearly during the in-depth interviews that most mothers chose not to go to HFs, unless it was absolutely necessary, because it was beyond their means. It was more unlikely for people to come to HFs especially when they thought the illness may involve laboratory tests which would have to be paid for in addition to the consultation charge and then be given "only chloroquine".

The complementarity of the methods thus allowed for clarification and wider interpretation of the data. Results based on these data would be far more useful as a basis for intervention strategies because all possible aspects of maternal reaction to childhood malaria were explored. The triangulation approach has great potential for areas where communities are much more at ease talking than responding to questions in mono-syllables. However it is necessary to point out that while no undue disadvantages of using triangulation were encountered, there were a few problems that were experienced in the analysis of the data, especially with regard to deciding the cut off point (by quantification) for categorisation of themes in content analysis. Because methodological integration is still not fully entrenched and in essence is still "currently being attempted and struggled with..." (Steckler et al. 1992: 6), there are few "how to" documents for reference. Nevertheless, with more investigators using the methodology, the tools should become better (see entire issue Hlth. Educ. Q. 19(1) 1992), and health communication planning, implementation and evaluation might have more positive results than hitherto.

Limitations: scheduled and unexpected

Firstly, although the study aimed at focusing on mothers' definition and treatment of childhood malaria, it was deemed necessary to confine mothers to answering questions about childhood illnesses that present with fever. This was intentionally done to focus on childhood malaria and some of its complications. However, key informants and ROPs could discuss any childhood illnesses without restrictions. The questions put to the key informants and ROPs were in effect a community diagnosis of childhood health priorities, without overwhelming mothers with too many questions, while also verifying their responses against the illness taxonomy obtained from the key informants and ROPs.

Secondly, although the HF users' and RO users' sub-studies elicited important information about who uses these services, the data could not be used to determine usage levels in the communities because only a self-selected group of mothers already included in the mothers' survey were re-interviewed in these sub-studies. The criterion proposed for inclusion into the HF users' survey was 'mother accompanying an ill-child to the facility, with a self-diagnosis of malaria'. However, it became apparent that few mothers indeed would be included in the study because malaria was not often self-diagnosed. Only one out of 53 mothers re-interviewed at a HF (in the space of four weeks) diagnosed her child as suffering from malaria before coming to the HF. Similar results were reported by Rooth and Bjorkman (1992), who while working in Rufiji, Tanzania, an area almost similar endemicity to Kilifi, found that only two out of 164 mothers (in the space of six months) mentioned malaria as a possible diagnosis before bringing the child to the HF.

Thus the criterion was abandoned and all mothers bringing an ill child to the HF, who had been previously interviewed in the mothers' survey, were included in the study. This ensured that those mothers whose children would be diagnosed as having malaria by a health worker would also be re-interviewed. This did not compromise the results.

Similarly, the inclusion criterion for RO users' survey had to be modified. It had been decided that mothers and 'others' purchasing OTC drugs on behalf of mothers be interviewed at ROs if they purchased drugs for children. However, the field-workers proved to be too few for the survey to facilitate follow-up of those 'others'. It was imperative that the mother herself be interviewed especially because of the questions on decision-making processes involved in the use of the services. This in effect made it difficult to recruit all users; consequently, sub-samples were small and generalisation of the findings difficult. However, the RO users' results are intended for use in intervention programmes in Kilifi, making the issue of the small sample and thus generalisability less critical (Basch 1987; Ramakrishna and Brieger 1987). As Ramakrishna and Brieger (1987) argue, "...in-depth research cannot be generalised to a larger population. But this is not the aim of the research. The results are intended to be valid for the local situation, an essential for PHC planning...[the need is to] generalise not the particular results...but the process by which the results were obtained" (Ramakrishna and Brieger 1987: 173). The methods used in this study can therefore be replicated in other areas.

Thirdly, it is recognised that SES of a household may influence maternal behaviour in relation to malaria. However, the study did not adequately measure the SES position of the households. This would require information on household structures, information on direct and indirect income generators, land tenure and other indicators. It was hoped that occupation of the head of household, household possessions and house quality would give an estimation of SES, but these markers only reinforced the expected differences between the three areas - peri-urban, rural and slum settlement. It was thus not fully used in the data analysis.

Overall, no major contradictions came through the findings because of triangulation of methods. Any differences noted may be explained by the nature of the research question or the nature of questionnaire interviews. For example, many more key informants than mothers linked fever to convulsions, and most mothers played down the need to consult someone for health decision matters. As Gilson (1992) concludes with regard to integration of methodology, " contradictions... could be traced back to the structured nature of questionnaire interviews...particularly closed questions..."(:196).

IMPLICATIONS AND FUTURE RESEARCH NEEDS

The study has described the biocultural definition of childhood malaria and how decisions are made as to whether, and how to react to the illness within the existing health care sources. These psychosocial processes may hinder or facilitate appropriate management of malaria at the household level. The study has also identified other factors that may militate against malaria control, namely: (a) the image of malaria depicted to populations in malarious areas, (b) the simplistic depiction of the malaria-mosquito link and (c) the excessive availability of over-the-counter antimalarials and other drugs. The implications of these findings for malaria control are presented and recommendations are made for consideration in future malaria control policies.

The key findings and recommendations emanating from this study are summarised in table 5. The findings are discussed in detail in Mwenesi (1993).

Table 5: Issues on malaria control that need to be addressed or improved upon

ISSUE	SITUATION	RECOMMENDED ACTION
KAP on malaria, mosquitoes and its complications	Limited knowledge	1. Health education messages should aim at depicting malaria as it is experienced in holoendemic areas - chronic and debilitating. 2. Difficult as it may be the mosquitoes and malaria link should be made clear to people. 3.The fact that malaria can progress to serious complications should be carefully included into malaria messages.
Decision-making roles	Clear and not flexible	1. Whole populations including men must be targeted in HE for malaria.
Availability and use of OTC drugs	Excessive	1. Closer control of licensing procedures, promotion, distribution and selling of OTC drugs. 2. Reduce the number of brand names on the market. 3. Control drugs at HFs to minimize prescription drugs finding their way into ROs. 4. Educate the public and especially ROPs on the need to use/sell correct and relevant medication and the dangers of misuse of OTC drugs. 5. Enforce drug regulation laws.
Use of health facilities	Low	1. Explain to the public why 'user fees' are an unavoidable part of future health services and the hope that they will improve quality of care. 2. Health workers should improve their communication skills especially on the need to complete courses of malaria medication.
Traditional healers	Strong[1]	1. Identify, forge and promote links with them.

Kenya is in the process of formulating a long over-due malaria control policy. Lessons to be learned from the findings of this study are that the issue of malaria is not a straight forward one. The policy should be informed by Kenyan and other experiences. For Kenya, community orientation for CBHC exists, as indicated by the fact that such programmes have covered more than half of the 41 administrative areas (districts) in the

[1] Traditional healers are frequently used in Kilifi although not for malaria. Convulsions, anaemia & splenomegaly are treated by traditional healers making them part of the general sources of care.

12 years since CBHC commenced in the country (Maneno and Mwanzia 1991), like the oft cited Saradidi (Kaseje and Sempebwa 1989), Chogoria (Deboer and McNeil 1989) and Kibwezi (Johnson, Kisubi, Mbugua et al. 1989) projects. Whatever programmes or strategies are to be used to implement the malaria policy (PHC, selective PHC or the Bamako Initiative), the implementation has to be thought out carefully. Lessons should be learned from earlier malaria control policies which have not been successful (Bradley 1991).

While there are clouds over the prospects of 'Health for All by the Year 2000' particularly as a result of structural adjustments programmes (SAP) in the developing world (Stone 1992; Woelk 1992; Rathwell 1992), CBHC is still perceived to be a viable strategy for providing health care for the majority of the people (Garner and Walt, forthcoming). However, certain health care strategies currently being promoted need re-assessment, both nationally and internationally. For example, why are findings of social science studies not taken up seriously; and why is health education not being given the due attention it deserves if informed change is to be achieved where necessary?

The fact that most CBHC projects do not base their programmes on results of needs assessment was alluded to earlier. The reason for this state of affairs has been expounded by Stone (1992), which she sums up as the contradiction inherent in CBHC (PHC) as a policy:

> it is supposed to foster community participation and wherever possible assist local communities define their own health needs, and initiate ways of meeting them. At the same time PHC has already set its own parameters around both the needs of the people and the range of possible means of meeting them (: 411).

The implication is that often, well-meaning programmes like the strategy of prompt presumptive treatment of malaria through VHWs are rendered ineffective. This is because even when a community diagnosis is done in an area, there is a bias towards current strategies, already decided upon. Stone (1992) describes a hypothetical situation where 'well meaning' health planners may assume that even if local communities are more interested in curative care they will still be responsive to health education. For example, mothers in Kilifi asked for subsidies on OTC drugs which to them are the strategy that they feel can tackle the malaria problem. They were promptly treating their children albeit inappropriately. They did not link mosquitoes to malaria or malaria-like illness. Any intervention programme introduced must convince these mothers why malaria is a major problem and not malnutrition for example. They may not be keen to be taught by VHWs, what they already know and do - prompt treatment of feverish symptoms - and if it also includes anti-mosquito measures they would have to be fully convinced of their role in the aetiology of malaria.

The relevance of new technologies must be made clear to the people through whichever CBHC medium is used (PHC, selective PHC, or BI). Recently, the call for use of bed nets has gained momentum and because the BI strategy is seen to lend itself well to the promotion of bed net use, it is the medium used. However, it is not clear how this 'new' technology will be implemented and sustained in areas of deprivation like Kilifi where

user fees for the preferred curative services are already a problem. This raises doubts as to the viability of impregnated bed nets as a measure for malaria control in Kilifi.

Health education is not the panacea for the problems encountered in malaria control efforts, but it could be a strong catalyst in bringing about informed change. It should however be based on the premise that the perceptions that people hold are diverse and may offer opportunities as well obstacles to change. As was demonstrated by the findings of this study, peoples' beliefs form part of a valued framework which helps them cope with their day to day health problems. Such beliefs are not open to simple correction (Williams and Wood 1986).

Health education, acquired through schooling or community education prepares an individual's base for behaviour change, that may facilitate 'healthy' decision-making. Maternal education especially has been shown to have a strong impact on child health (Cleland and van Ginneken 1988; Rasmussen 1989). On average, each one-year increment corresponds with a seven to nine percent decline in under five year olds' mortality. Further, education is found to exercise the strongest influence in early childhood (Cleland and van Ginneken 1988), which corresponds with the critical age-group that is most at risk of malaria infection. Thus although they may not be the decision-makers for health care matters, they would be better off informed.

However, factors that affect child health cannot be tackled only through individual behaviour change. Those whose behaviours are targeted, be they mothers or whole communities, must be empowered to enable them to change their behaviour by addressing the other problems that put them in the situation they find themselves, such as unfavourable micro-environments in ecological and socio-economic terms as well as concomitant structural inequalities. In other words the cycle of deprivation should be broken (Zaidi 1988), by realising that economic powerlessness of most people who suffer from malaria is real.

For example in Kilifi, while tackling the problem of childhood malaria through health education, there would also be need to address the causes of the rampant malnutrition, issues of housing and sanitation and the low levels of education amongst women. Malaria is but one of the many problems that face the community. The reality though, is that resources required to address these issues are limited. Dialogue with the community should allow for the most urgent to be tackled.

Health education in general should equip populations with awareness of the benefits and dangers inherent in self-medication with OTC drugs. However, the Kenya government which already has in its statutes laws like the Pharmacies and Poisons Act, which is chapter 244 of the Laws of Kenya to regulate the production, licensing, distribution, promotion, pricing and sale of this widely used source of care should enforce the law and probably re-assess it.

The chain of distribution of OTC drugs which include antimalarial drugs and analgesics is long - manufacturer --> wholesaler --> retailer. Pricing of OTC drugs works on a supply and demand basis - it is not controlled. Consequently, the further in the interior a retailer is, the more difficult it is to police the sale of expired drugs or prescription only

drugs, including antibiotics such as chloramphenicol and tetracycline, found in ROs in Kilifi. But, regulations must be enforced.

In Kilifi the number of drugs and formulations available over the counter is bewildering. Even more unacceptable, is the availability of the same generic drug in many different brand names. There were **19 types** of antimalarial drugs. Of these, 14 types were chloroquine-based. **Twenty-seven** types of analgesics and antipyretics, based on aspirin, paracetamol and codeine, singly or in combination, were also being marketed under different brand names. Drugs sold in informal outlets account for 35% of all drugs distributed in Kenya (Foster 1990). The Kenya government may not individually be able to change the generic/patent names regulations, but most of the OTC drugs are manufactured locally. Through strict licensing and advertising regulations, it may be possible to reduce the number of drugs available and to ensure that promotional materials are reasonable.

At present, it is estimated that only 20% of the population is effectively covered by services (Mwabu and Mwangi, 1986) and approximately half the population has no access to public health services (Dahlgren, 1991). It is obvious then that other sources of care will be used. Self-medication will continue to be practised, but unacceptable risks that go with it should be checked and minimized. The wrongly held belief that 'a pill exists for every ill' (Laing, 1990) should be a focus for health education.

In the recent past, the call has been for the serious consideration of social aspects in tropical disease control. There is enough information that has been generated in this field to justify a serious focus on health education, one of the most important aspects of CBHC. While certain social sciences have recently gained momentum in the field of health and medicine, especially in improving the methodologies employed in gathering and disseminating data, there has been no corresponding acceleration in the field of health education, which would enable the input of anthropological and sociological efforts to be implemented and evaluated.
The greatest need is to develop convincing and persuasive communication materials to reverse the effect of old teachings of past decades on malaria and the mosquito to populations that are mostly illiterate and posses strongly held alternative explanations - a tabula rasa situation does not exist. Commensurate with the promotion of health education, will probably be the training of a new cadre of personnel who will receive proper training in health education - not the three to four days training handed out to VHWs to teach about a complex disease like malaria. Health educators should rise to the occasion.

The essential drugs programme policy (WHO 1988a; 1988b), that addresses the issue of drug selection, procurement, tendering and distribution to health facilities could profitably be extended to retail outlets. This informal sector will continue to provide a health service so urgent positive action is imperative. Generic name use for drugs is a contentious issue for commercial drug companies, but there is evidence that their use is possible (Mamdani and Walker 1985). The World Health Organisation (WHO) and the newly formed International Network for the Rational Use of Drugs (INRUD) (Ross 1992), should seriously consider the possibility of an essential drugs list for ROs, akin to

the essential drugs list for HFs. It could be a useful tool for guiding countries about what should be sold over-the-counter. This appears to fit well into the primary objective of INRUD, which is to identify through a coordinated set of country studies, a set of effective interventions to recommend as policy options for the promotion of rational drug use. An essential drugs list for retail outlets is long over-due. This could be prescribed under existing drug regulation statutes.

Malariologists, entomologists, social scientists and health educators must urgently come together to formulate health education messages and strategies that will get the message of malaria across to populations in malarious areas. Instead of workers in different countries working in isolation, trials of the different types of strategies could be conducted in comparable areas of these countries to find out the most feasible ones. For example, the feasibility of different channels such as the radio, television, street theatre or public meetings could be examined.

Research issues arising from this study are:

a) There is evidence that severe malaria when not fatal results in some serious consequences. For example, repeated generalised convulsions have been implicated in the aetiology of secondary epilepsy (Bahemuka, 1981; Matuja, 1989). In their study of severely ill children, Brewster et al. (1990) reported that 25% of those presenting with cerebral malaria ended up with major neurological handicaps. It would be important to determine the prevalence of these neurological problems in malarious communities. If their rates are high and people perceive them as priority health problems, and if their link to malaria can be established, they could be used as proxies for malaria in HE interventions for malaria. This would be an indirect way of tackling the malaria menace.

b) The magnitude of OTC drug-related iatrogenesis such as aspirin and paracetamol poisoning should be investigated. This would require a multi-disciplinary approach where social science methods would be used to elicit drug use histories of suspected cases, epidemiological methods to map out incidence and prevalence rates in the community and biomedical and clinical methods. Hard data would be needed to convince authorities of the need to be strict about licensing, manufacture, distribution and sale of the drugs.

c) Since traditional healers and retail outlet proprietors are part of the health service sources in Kilifi, possibilities of incorporating them into malaria intervention efforts should be explored.

The battle against malaria will continue. The serious effort and enthusiasm being put in the search for new insecticides, new drugs and the eagerly awaited vaccine, must also be put into health education and communication sciences. This suggests that all those working in malaria are a necessary part of the equation. Ignorance on the part of health care providers and recipients must be fought through continuing education for the former and health education for the latter. 'All for Health' should be the guiding motto for 'Health for All'.

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Abbreviations

AM	-	Antimalarial Drugs
BI	-	Bamako Initiative
CBHC	-	Community-based Health Care
CDC	-	Centres for Disease Control, Atlanta, USA
CHW	-	Community Health Worker
HE	-	Health Education
HF	-	Health Facility
HP	-	Health Promotion
HSB	-	Health Seeking Behaviour
INRUD	-	International Network for the Rational Use of Drugs
KAP	-	Knowledge, Attitudes and Practices
KDH	-	Kilifi District Hospital
KEMRI	-	Kenya Medical Research Institute
OTC	-	Over-the-counter (drugs)
PEM	-	Protein Energy Malnutrition
PHC	-	Primary Health Care
RO	-	Retail Outlet
ROP	-	Retail Outlet Proprietor
SES	-	Social Economic Status
SAP	-	Structural Adjustment Programme
TH	-	Traditional Healer
VHW	-	Village Health Worker
WHO	-	World Health Organisation