SOCIAL ASPECTS OF MALARIA CONTROL: A K A P STUDY AMONG THE LUO OF KARATENG, KISUMU DISTRICT.

BY

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DECLARATION

This Thesis is my Original Work and has not been Presented for a degree in any other University.

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This Thesis has been Submitted for examination with our approval as University Supervisors.

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FOR

MY FATHER, MY MOTHER

AND

MY SON

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ABSTRACT

The aim of the study is to explore the influence of socio-cultural factors, namely knowledge, attitudes and practices (KAP) upon the effectiveness or ineffectiveness of malaria control. Since all malaria control measures affect man directly even when directed at either the mosquito or the parasite, it is suggested that socio-cultural factors constitute a significant sociological phenomenon, so far neglected by malariologists and social scientists. It is posited that malaria control measures and programmes can only be successful if biological factors i.e., the mosquito, and medical factors i.e., the parasite are considered together with socio-cultural factors. i.e. man.

A peoples' culture, hence their health behaviour and levels of empirical knowledge are seen to be crucial to the success of malaria control. Low levels of scientific education implies an adherence to traditions and culture. A cultural - definition of a disease like malaria in terms of its cause will determine how people classify it. The classification further determines their beliefs about the disease (knowledge), their reaction to it and weight of its seriousness (attitudes), the type of treatment and healer to be consulted, and how to prevent it (practices).

It is assumed that this cultural - definition and its concomitant results will determine how people will react to modern control measures. Because of these definitions people may not comprehend control methods aimed at malaria because

they are derived from scientific knowledge, which they do not posses. Indigenous control methods if any, are based on empirical knowledge and are therefore in correlation with peoples beliefs about causation. This empirical knowledge can be affected by exposure to other knowledge i.e. formal education (scientific).

An argument is further made that the process of changing health behaviour towards malaria to facilitate understanding and thereby positive attitudes toward malaria control may be achieved through health education. But it is also suggested that this health education cannot be effective if only one syllabus or approach is developed for all peoples. Thus generalizations about patterns of malaria control must be understood within the context of specific cultures, and their levels of scientific knowledge.

Data were obtained through standardized questionnaires, among Iay Luo people of Karateng sublocation, Kisumu District, Western Kenya in order to elicit lay and not specialized K A P information. This was supplemented by data obtained through non-participant observation of practices relevant to all aspects of malaria. A total of 200 respondents - males and females were interviewed. Being an exploratory study, only descriptive research methods were employed. The analysis was based on the data from questionnaires and non-participant observations, and interpretation/on the basis of a health Belief Model. / is

The findings of the data support the expectations about low levels of empirical knowledge and cultural definitions on malaria control. They also support the argument that education significantly affects acceptance or rejection of control programmes; and suggest how some of the current control measures could be improved. The data do not suggest the rejection of the contention that socio-cultural factors have hitherto been neglected at the expense of effective malaria control.

CHAPTER ONE

INTRODUCTION

Basically, the chapter highlights issues relevant to Malaria as a disease. These include the distribution of malaria the nature of the disease, its effects and attempts to control it. The chapter also deals with the objectives and justifications for a sociological study of malaria.

Malaria has existed in the humid low-lying areas of the Coastal plains and around the shores of Lake Victoria from time immemorial. In the highlands of Kenya, malaria was virtually absent as far as can be ascertained, but gradually outbreaks started to be reported in the early 1920s (Roberts 1974). According to Roberts, the spread was probably carried out by soldiers returning from the first World War. It is now an accepted fact that some of the reasons behind the spread of Malaria into hitherto 'malaria free areas' has been due to the rapid increase in population growth and its mobility, due to improved infra-stractures and urbanization. Also, an increase in irrigation schemes and other development projects like fish farming and Water Conservation Schemes have facilitated the spread of malaria. Other factors include the lack of awareness of the seriousness of malaria among the people and the lack of effective control methods against the disease.

Today, malaria is endemic, that is, it is present all year-round, in most parts of Kenya, with the degree of endemicity varying geographically and ecologically. Thus in Kenya areas can be classified as either being holoendemic, hyperendemic,

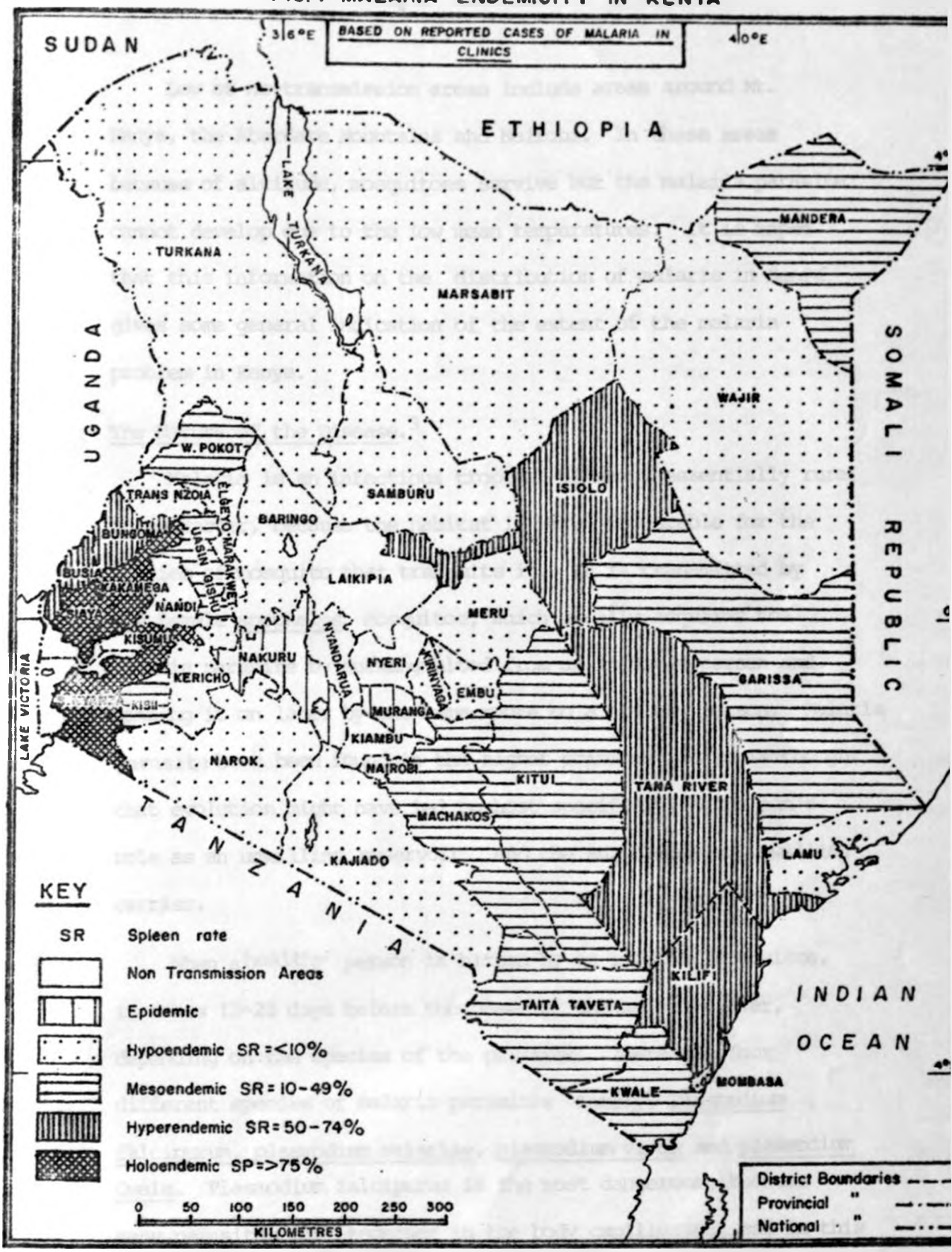
epidemic and low or non-transmission areas, according to the level of endemicity. Endemicity refers to the degree of natural malaria transmission within an area. The degree of endemicity is measured by the rate of spleen enlargement in children between the ages of 2-9 years (Roberts 1974).

In the holoendemic areas (see figure 1) the spleen enlargement rate is 75% and over. These areas include the coastal belt and parts of Taveta in Coast Province, and the Kano Plains in Nyanza Province. In the hyperendemic areas the spleen enlargement rate is 50 - 74%. These areas cover Western Province and the Shimba Hills of Coast Province. Mesoendemic areas are characterized by a spleen enlargement rate of between 10 - 49%. The areas involved are Machakos, Kitui and Embu in Eastern Province; Lower Kiambu and Kirinyaga in Central Province and Pokot and Baringo in the Rift Valley Province.

Hypoendemic areas have a spleen enlargement rate of less than 10%. They include Isiolo and Marsabit districts in Eastern Province; Garissa in North Eastern Province; Masailand, Kericho and Nandi in the Rift Valley.

Epidemic malaria is variable and occurs in the highlands especially after high rainfall and also in the drier areas whenever exceptionally high rainfalls are recorded. Areas that experience epidemic malaria include those areas mentioned under hypoendemic areas.

FIG. I MALARIA ENDEMICITY IN KENYA



Source: Population Research Institute

University of Nairobi

Low or no-transmission areas include areas around Mt. Kenya, the Aberdare Mountains and Nairobi. In these areas because of altitude, mosquitoes survive but the malaria parasite cannot develop due to the low mean temperatures. It is hoped that this information on the distribution of malaria in Kenya gives some general indication of the extent of the malaria problem in Kenya.

The Nature of the Disease.[3]

Malaria is an infectious tropical disease, essentially rural in character, because the habitat is very favourable for the species of mosquito that transmits it. It is transmitted by the female anopheles mosquitoe, which usually acquires the malaria parasite by sucking blood from an infected person and passing it on later by the same route to a healthy person. Malaria parasite have been found in the higher primates and it is thought that evolution might have led to host specificity hence man's role as an unwilling reservoir and the An. Gambie an unwilling carrier.

When a healthy person is bitten by an infected mosquitoe, it takes 12-28 days before the onset of the malaria fever, depending on the species of the parasite. There are four different species of malaria parasites namely, Plasmodium falcipurum, plasmodium malariae, plasmodium vivax and plasmodium Ovale. Plasmodium falcipurum is the most dangerous, because many parasites clot together in the body capillaries, and in this way block oxygen and blood supply to vital body organs. It is the most common type of malaria infection in Kenya (Eshuis and Manschot 1978).

Malaria presents clinically as fever, shaking chills, rapidly rising temperatures, headache, joint pains vomiting and general malaise. The fever appears intermittently. After an interval free of fever, the cycle is repeated either daily or every third day, depending on the causative parasite.

Malaria may be diagnosed in several ways. These include clinical diagnosis, where presenting symptoms suggest malaria, therapeutic diagnosis, where patients' compalints respond to malaria tratment and laboratory diagnosis, where malaria parasites are seen in a blood stain after tests have been done. The laboratory diagnosis is the surest way of making diagnosis but it is not practical in highly malarious areas because of lack of facilities.

Treatment of a malaria attack is achieved by giving the patient four chloroquine tablets at the start of treatment, followed by two tablets six hours later, and then for the next three days, two tablets daily, which makes a total of twelve tablets, for good management of an attack (Eshuis and Manschot 1978). This is so even for chronic patients. Only patients with complications for example vomiting are given chloroquin intramuscularly by injection.

In cases where the patient for some reason cannot swallow the tablets because he is either unconscious or is vomiting so much that tablets can not be absorbed, a chloroquine injection can be administered intramuscularly . However, the injection is used only if it is the only way because it can

be very dangerous to life. It has been reported to lead to acute cardiac arrest especially in children, cause abscesses and contrary to popular belief it is absorbed in the body much more slowly than tablets.

When a malaria attack is not treated fast enough, or when drugs are not taken as prescribed it can lead to very serious complications and eventually death. Some of the complications are anaemia, where the parasites attack and break the red blood cells, and cerebral malaria, where the parasites block or reduce oxygen supply to the brain. It presents as acute mental confusion . The parasites also atttack other vital organs like the liver and kidneys by obstructing capillaries within the organs thereby cutting the blood supply to these areas with at times fatal results. It can also interfere with the bowels, leading to severe diarrhoea and death as a result of severe dehydration. Malaria is also known to cause still births, miscarriages, and recently demographers have linked malaria to infertility and subfertility (Koyugi 1984).

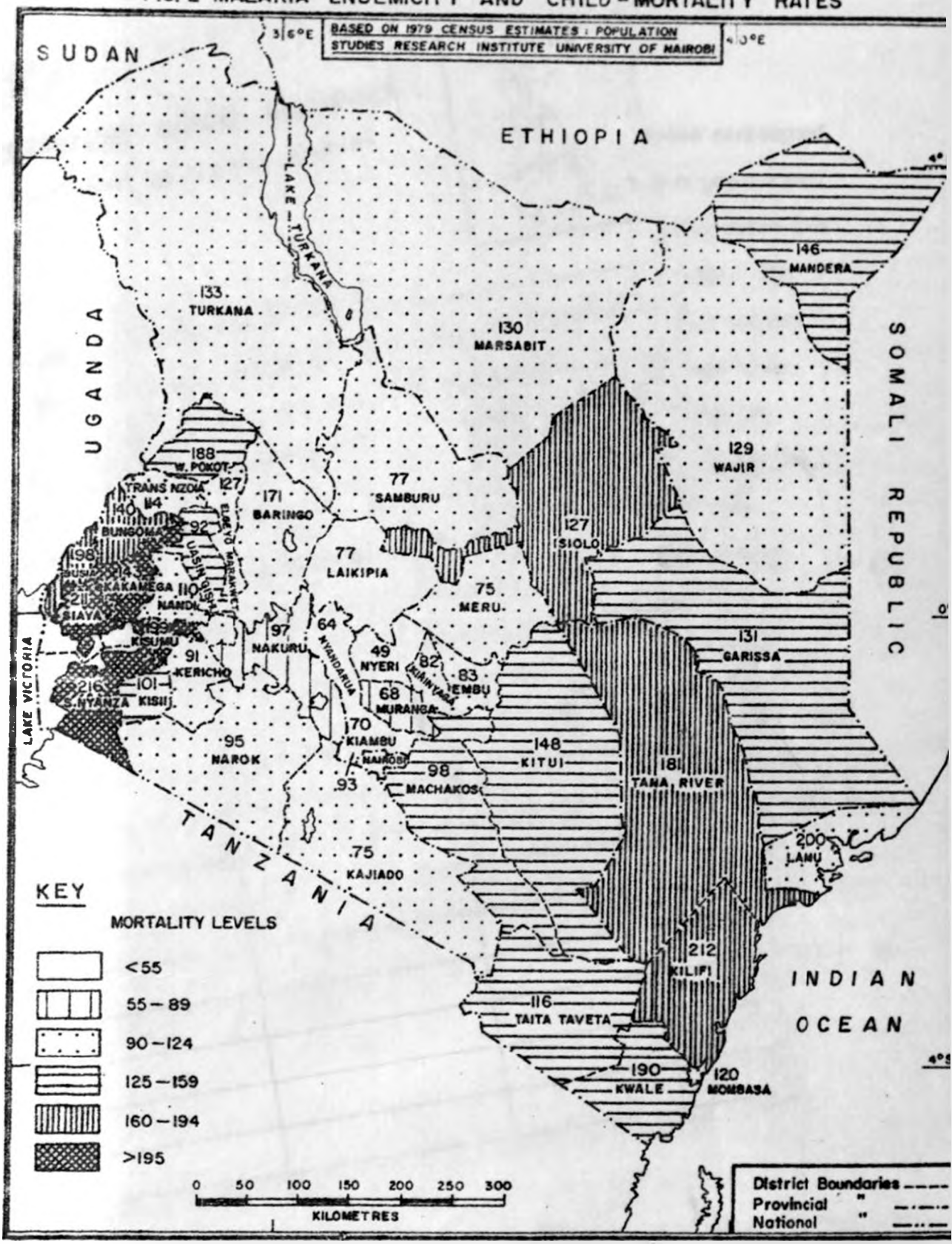
Those at the highest risk of death from malaria are infants and children under the age of 14 years, pregnant women and people from non-malarious areas. These groups have no immunity against malaria, which is only acquired very slowly and through continuous exposure to infection.

Social Effects of Malaria

Malaria has many deleterious effects. These will be discussed in relation to mortality and morbidity rates attributed to malaria. According to the Websters' International Dictionary mortality refers to the rate of deaths in a specified group or community; and morbidity refers to the rate of illness in a group or community.

In Kenya, studies have shown that mortality rates due to malaria are indeed high (Henin et al 1979, Koyugi 1984), and it has even been reported that malaria is the principal determinant of death in Kenya. According to a world bank report this is the case even after the effects of other factors such as levels of education,urbanization and medical facilities are controlled (World Bank 1980). Between 1968 and 1975, malaria ranked third as a cause of death among inpatients in Kenya's hospitals; and it accounted for 5 per cent of the total deaths in Kenya, in 1974. These happen to be the latest statistics in the 1982 Ministry of health report. Child mortality rates are also very high in holoendemic and hyperendemic areas (100-200 per thousand) compared to mesoendemic and non-malaria transmission areas where the rates range from 50 -100 per thousand (see fig.2). It is also in these highly malarious areas where expectations of life at birth are quite low and paradoxically where fertility rates are very high (Kenya population census, 1979).

FIG. 2 MALARIA ENDEMICITY AND CHILD-MORTALITY RATES



Source: Population Research Institute

University of Nairobi

It has been observed that high mortality rates correspond with high birthrates and hence the problems of high population. It has been noted that in areas where child mortality rates are high the fertility rates of mothers are also very high. The explanation for this phenomenon is that traditionally mothers have to replace each child that dies with another, and also that in areas where modern family planning methods are not used, traditional ones like breastfeeding are defeated by the frequent infant deaths. While a mother is lactating the chances of conceiving are very minimal but become high when breastfeeding is stopped.

When malaria does not kill it debilitates, causing the sufferer to be very vulnerable to other diseases and infections. In 1980, it was ranked second after acute respiratory diseases, in the ten leading morbidity conditions in Kenya, with an annual rate of 34 per cent. Looking at specific provinces, Nyanza had the highest annual rate of 69 percent followed by the Coast with an annual rate of 59 per cent (see table 1.1.)

TABLE 1:1

MORBIDITY DUE TO MALARIA IN KENYA, 1980

RANK	PROVINCE	ENDEMICITY CLASSIFICATION	ANNUAL RATE % PER 100,000
1	Nyanza	holoendemic	69,956
2	Coast	holoendemic	59,808
3	Western	hyperendemic	54,078
4	Rift Valley	hypoendemic	31,111
5	Eastern	mesoendemic	30,339
6	Central	hypoendemic	18,029
7	North Eastern	hypoendemic	11,999
8	Nairobi	low-transmission	Figures not available
	Kenya		34,086

Source: Adopted from Koech, D. (1984).

COMMENTARY

High mortality and morbidity rates contribute to low levels of both social and economic development of not only individual families but of the whole nation. Sick people who are not productive become a liability to the nation since the nation has to spend a substantial portion of its resources on them, through free medical services and man--hours lost in labour, while getting nothing in return. The fact that malaria is essentially a rural disease in character means that it affects the agricultural worker more profoundly than the urban worker.

This directly affects food production which is a very important sector of the nation building. Also, ill-health impairs the ability to learn (Koyugi 1984). This affects the school going population more and has serious implications for the future adults of this nation.

Allowing for hospital records biases, diagnostic inaccuracies and inflated figures it is reasonable to assume that the statistics of the effects of malaria presented here sufficiently illustrate the magnitude of the malaria problem.

Conventional Malaria Control Methods

Malaria can be prevented by several methods such as chemoprophylaxis, meaning taking drugs to protect oneself from malaria infections and personal protection. People in malarious areas or those travelling to malarious areas are advised to take anti-malaria drugs to prevent infections, at two chloroquine tablets weekly. However, the drug prophylaxis of malaria does not provide full immunity, especially if proper doses are not taken.

Personal protection from mosquito bites is also vital in preventing malaria. This is achieved by the use of insect repellents, bed nets protective clothing and screening of all ventilation in houses and dwellings.

Vector control is achieved by altering the environment so that it is unfavourable to the breeding of mosquitoes e.g. clearing of bushes around homes and draining of swamps, using of toxic substances like DDT and fenitrothion for adult, and mosquitoe larvae; and using other living organisms, such as introducing larvae-eating fish into breeding grounds that cannot be done away with such as irrigation water, dams and canals.

Malaria Control in Kenya

Malaria control is one of the major Public Health issues facing the country. In August 1984, malaria control or lack of it in the Coast Province (and in Kenya generally) drew the attention of the President. He was concerned that Officers of the Public Health Department within the Ministry of Health were not executing their functions of preventing or otherwise dealing with malaria as was required of them by law.[1]

The importance of the control of communicable diseases such as malaria was long recognized by the colonial government when in September 1921 the Public Health Act was enacted. This Act has continued in operation as chapter 242 of the Laws of Kenya. Under the Act, Public Health Officers are required to combat communicable diseases by various methods through the medical department of the government and local authorities. Part XII of the Act which addresses itself to the prevention and destruction of mosquitoes also requires everybody t participate in the excercise of preventing and

destroying mosquitoes. For example, owners and occupiers of dwellings and other premises are required to ensure their yards are kept free of any containers likely to retain water, ensure that their compounds are not overgrown with grass, that wells and pits are covered, cesspits are screened and that gutters are perforated where required. Penal sanctions are attached to these obligations. However, the provisions of the Act rely on their enforcement by the public health authorities.

Owing to the seriousness of malaria, it was singled out from the other communicable diseases when in July 1929 the Malaria Prevention Act was enacted. This Act was enacted to enable Public Health authorities deal even better with the disease. This piece of legislation has continued with little or no amendment as an Act of the Parliament of Independent Kenya as Chapter 246 of the Laws of Kenya. Under the Act,health authorities, that is the Ministry of Health and the various municipal councils are empowered to construct and maintain drainage systems and to take any action for the removal of water from any land under their jurisdiction in order to destroy all breeding areas of mosquitoes. Destruction of mosquitoe breeding grounds is seen in the Act as the best measure for malaria control.

The existance of the two Acts in the Laws of Kenya since the 1920's indicates the seriousness with which malaria is viewed by the legislature. However, this seriousness seems not to have been translated by the implementing agencies.

For example one would have expected a National Malaria Control Programme (Mbaabu 1982), as an implementation measure sooner than 1982 when it was formulated. This was done in response to the request by the World Health Organization Africa Region (WHO/AR 1980) that member states formulate new malaria control strategies.

The Conventional malaria control strategies that are used in Kenya include:

Vector Control:

For vector control, four main methods are used which include,

i) Residual indoor spraying which is carried out in urban and peri-urabn areas especially at Malindi in the Coast Province. The same method was used during the World Health Organisation research on malaria in Kisumu in 1972 (WHO/ACRU II 1972).

ii) Larviciding, which is widely carried out in urban and peri-urban areas, irrigation and settlement schemes. The measure is aimed at reducing mosquitoe larvae by use of chemicals and used oils on breeding grounds (Roberts 1974).

iii) Permanent anti-malaria works which include construction of drains concrete channels, filling up of depressions and excavations are carried out in both rural and urban areas. For example swamps have been filled up in Siaya and permanent drains have been constructed in the Kisumu municipality (Mbaabu 1982).

iv) Larvivorous fish,which feed on the mosquitoe larvae are/have been carried out in the Coast Province, in Lamu and Kilifi areas (Mbaabu 1982).

All the above measures are aimed at reducing mosquitoes.

Parasite Control

i) Chemoprophylaxis or administering drugs for protection against malaria by use of chloroquine which is the drug of choice for the treatment of malaria is carried out in all irrigation schemes in Kenya such as Ahero and Kano, Nyanza Province; Mwea Tebere and Masinga, Eastern Province, Marigat and Perkerra Rift Valley and Shimba Hills, Ramisi,Hola and Bura in Coast Province. In adidition, drug administration is carried out in Kisumu and Mombasa Municipalities on pre-primary children who recieve chloroquine fortnightly.

ii) Chemotherapy or administration of drugs for treatment is carried out in most health institutions where chloroquine is supposed to be readily available. Also widely available are shop patent drugs such as malariaquine and Nivaquine which can be obtained from any shop anywhere in the country. These drugs are advertised through different media such as the radio and the press.

All these malaria control methods have been carried out in Kenya from as early as 1946. They have been and are still carried out as government projects through public health programming, where target populations are neither consulted nor involved in their planning or operations (Mburu

1983). Also the programmes are carried out more in urban areas like Mombasa and Kisumu because they are tourist resorts, (Mbaabu 1982) yet malaria seems to be essentially a rural and not an urban problem (Grammicia 1981).

On further examination of the control measures carried out in Kenya, it becomes obvious that they have been concentrating on malaria as a disease, the mosquitoe and the parasite. Man, his culture and behaviours, has been totally ignored in the fight against malaria.

These methods have been found by malariologists (WHO/AR 1980) to be unsatisfactory not only because of the costs involved in their formulations and operations, but also, their excessive focus on the mosquitoe and the parasite. Moreover, mosquitoes are reported to be steadily becoming resistant to known insecticides and the parasites to the current drug of choice, chloroquine (Mcgregor 1976; Wernsdorfer et al 1980; Noguer et al 1978; Chin 1979; Spencer a,b,c, 1983). The dissillusionment with current malaria control strategies are further increased by the steady upsurge of the disease and lack of a vaccine that can be used against malaria, now or in the near future.It has therefore become not only desirable but necessary to look for alternative or complementary approaches to the problem of malaria.

There is a general recognition in malariology that at least for the time being malaria control methods must include man and his behaviour (Dunn 1979). As such, together with the biomedical researchers that must of necessity continue, man's

socio-cultural patterns, behaviours and responses to specific malaria control measures must be researched into. This will enable malariologists to improve on the methods and implementers to find better channels for introducing the programmes to different communities.

Some of the sociocultural factors that have been identified as possible contributers to the inneffectiveness of malaria control programmes are enumerated below.

The first factor that may contribute to the innefectiveness of conventional malaria control programmes is a people's culture. There are some cultural traditions which determine the prevalence and steady transmission of malaria. For example in agro-cultures clearance of forests and newland, which normally offer an inhospitable environment for the malaria vector (Anopheles mosquitoe) , leads to open swamps, trenches and ditches, which are good breeding grounds for Anopheles mosquitoes. Also, concentrated, populations in settlements close to mosquitoe breeding grounds perpetuate the malaria-mosquitoe cycle, because the closeness of houses is favourable for the limited flight range of the Anopheles mosquitoe. Types of houses or shelter, especially in relation to openings and ventilation, and even normal activities such as fishing, drawing water, staying out-of-doors at certain hours and even the mode of dress, does influence the prevalence of malaria and invariably, its control.

A second possible factor is the cultural-definition of malaria. Different communities view malaria differently, depending on how they perceive its cause, their traditional mode of treatment and prevention. When their cultural definition differs from the scientific theory of malaria, they do not understand the subsequent control methods. This is especially so when their own traditional methods have seemingly worked for them. Also the way the control programmes are introduced to the communities that is, governments plan, and execute the programmes without any consultation with the people inevitably makes the people view malaria as a problem of the government and not their own.

The third possible factor is the type of populations that suffer from endemic malaria. They are mostly rural populations with low levels of education, poor housing, hygiene and general environmental conditions. They are traditional and adhere closely to their cultures. Accesibility to these populations is often difficult and medical services and facilities available to them are very scarce (Grammiccia,1981).

Fourthly, malaria is said to be a part of a socioeconomic complex and people have difficulty singling it out as a priority (Grammiccia 1981). In endemic areas, malaria with its undramatic effects can easily be accepted as an inevitable part of the lives of people living in those areas. It may well be recognized as a disease but could be taken for granted because of its very nature (as a result of immunity, adults in endemic

areas suffer only rare bouts of fever which are seen to be of no consequence) while other diseases such as elephantiasis, leprosy and skin infections which are not necessarily fatal but more dramatic may be accorded top priority. Other needs such as water and food, basic necessities for life may hold first priority. Consequently, people who have lived with malaria for a long time may become apathetic towards it and invariably towards its control. Lastly, the nature of the disease itself has been identified (Grammicia 1981) as a contributor to the innefectiveness of malaria control. For people to be motivated to undertake and sustain measures against malaria, they need to understand the disease, how it is spread, how it is manifested in the population and how it can be controlled. However, the cause and effect relationship of the various elements in malaria control are difficult to grasp for many people, because of the complexity of its manifestation. Consider for example some of the typical features of the disease:

a) Many mosquitoe bites may not result in malaria but a few bites may produce a severe attack depending on the species of the parasite.

b) Drugs may cure a person of malaria but after some time that same person may suffer from further attacks because of relapses or new infections.

c) A person may make the effort of protecting himself from malaria and his neighbour may not, yet he might catch malaria and his neighbour may not due to the factor of immunity.

Using the factors as guidelines, a study was designed that aimed at exploring the influences of sociocultural factors on the success or failure of malaria control programmes in a Kenyan community. No such study has been carried out in Kenya.

The objectives of the study were:

a) To investigate the respondents knowledge and beliefs regarding the causation, transmission, symptoms treatment and prevention of malaria.

b) To assess their attitudes on the disease, the mosquitoe and existing control measures; and

c) to observe and analyse the cultural practices or behaviours that relate to the transmission, treatment, prevention and control of malaria.

d) To make recommendations towards greater effectiveness of malaria control programmes, especially on how the effects of the social factors could be minimized.

The objectives are highly relevant to the goals of the WHO(1978) Declaration of Alma-Ata which states in part that "by the year 2000 health care should be available to all including the methods of preventing locally endemic diseases." They are also in keeping with the National Malaria Control strategy plan which states in part that ".....prevalence should be reduced using all available control methods " (Mbaabu 1982).

NOTES FOR CHAPTER ONE

1. See "Eradicate Mosquitoes Ministry Ordered", Kenya Times, Wednesday August 29th 1984.

2. Also, "Its total war on mosquitoes"; Kenya Times, Tuesday September 11th 1984.

3. In everyday language, 'disease', 'illness' and 'sickness' are interchangeable, but for the purpose of this paper they had to be distinguished clearly since they could be very confusing. There are very many definitions of disease but most of them are ambiguous. For this paper, the biological definition was prefered and adopted i.e. - "one organism invades another with predictable, negatively valued outcome for the host, or there is a breakdown in the anatomical structure of an organism".

   May (1961) defined disease even further so as to specifically fit in vector-borne and other communicable diseases. He defined disease as a multiple phenomenon brought about by the convergence of "pathogens" and "geogens". He went further to separate these factors into smaller categories, classifying agents, vectors, intermediate hosts, reservoirs and man as the pathogens. Matching diseases with the number of factors responsible for each, he developed a taxonomic scale on which malaria is categorized as a three factor complex initiated and maintained by the interaction of man, some female anophelines and plasmodiom.

   Therefore, malaria, was taken as a disease from a biological point of v' and not a as an "illness" which refers to a subjectively defined state of an individual regardless of the presence of or absence of a disease; or "sickness" which is a social designation, a status occupied by people who are socially defined as being ill or as having a disease.

CHAPTER II

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

In this chapter, relevant literature on the social aspects of malaria will be reviewed, However, systematic studies on traditional beliefs about malaria, traditional therapy, prevention and in general those cultural, social and psychological factors that might enhance or restrict efforts for its control is very limited, although incidental observations are scattered in the available literature.

Literautre on malaria control indicates that control of the disease has been based on the modern medicine premise which classifies disease in terms of single universal categories (Lieban 1977). Thus a recognized disease retains its identity wherever it occurs, regardless of the cultural context. It is identified, diagnosed, treated and prevented in the same way and by the use of the same drugs everywhere. The vector-parasite approach to malaria control supposes that everybody in a malarious area views malaria scientifically, in terms of causation, transmission, treatment and prevention, regardless of factors like culture, levels of education and religious affiliations, among others.

However, different peoples look at malaria differently. They do not even link mosquitoes to the malaria fever. Fonaroff (1968) argues that a simple, mosquitoes - malaria cause and effect relationship is a difficult perceptual problem. He observed that in many parts of the world, cultural blindness creates

conditions in which mosquitoes and malaria are kept apart perceptually and empirically.

For example, among the Aborigines of the marginal lands of Australia, ceremonies are performed which are supposed to appease the gods to increase the numbers of mosquitoes and flies. Mosquitoes and flies are known to be a nuisance by the people and especially, the biting habit of mosquitoes, but they are not associated with any diseases. Instead, these insects are associated with the rainy season which is of paramount importance to these people of marginal lands. Hence, they believe that the larger the numbers of mosquitoes and flies the longer the wetter the rainy season will be (Vallier, 1977). This perceptual problem is enhanced by the very nature of the disease, and some characteristics of the kinds of populations that suffer from it.

Malaria being essentially a rural disease, it follows that those who suffer from it most are rural people. These are people who are said to have particularistic values and who operate not only on precedents and previous experiences but also on obvious cause - effect relationships (Mbithi 1974, Grammiccia, 1981). However, because of the nature of the disease, the cause and effect relationship of the various elements in malaria control becomes difficult to grasp for rural people, because they are not always obvious.

Also, it has been argued that because the impact of malaria is often not dramatic(does not cause instant death or body disfiguration), people in endemic areas disregard infection and often do not even seek treatment. Prothero (1965) argues,

> "------- Malaria is scarcely even recognised as a disease. Mosquitoes may be regarded as a curse not because of their being malaria vectors, but because of their unpleasant biting habits. Endemic malaria is insidious in the way it manifests itself and it is frequently difficult to convince those who are affected by it of the need to control the disease or eradicate it altogether (Prothero, 1965: 5).

Another condition that makes people underate malaria and invariably its control measures in endemic areas is poverty (Hughes et al 1970). These people do not understand why malaria should be selected for elimination rather than poverty and hunger, which affect them, more acutely and continuosly than malaria (Gramiccia 1981). Gramiccia further argues that the multiplicity of afflictions from which the people suffer takes away a big part of the motivation they might have for controlling malaria.

Several studies have proved that people have their own views and beliefs about malaria and its control measures which seem to determine the success or failure of traditional malaria control programmes. (Dhillon and Kar 1965; Nyamwaya 1982; MacCormark 1983) . These views are based on disease classifications of indigenous medical systems which are not universal, but are confined within cultural boundaries (Lieban 1977). Specific cultural idioms determine the classifications of disease, the cause, the weight of their seriousness, the type of treatment required and the healer to be consulted (Mead 1966). For example, it has been reported that the Orissa Community in India, believed that malaria was caused by climatic factors. They argued that when a person was rained on, his body temperature would suddenly drop and this would result in fever, which comes with a chill and shivering (Dhillon et al 1965). In this community malaria was seen as a mild - self limiting disease,for which no treatment was required. Neither mosquitoes nor sick persons were considered to be carriers of malaria.

These findings were in keeping with Foster's (1976) observation that non-western medical systems possessed two categories of disease causation: personalistic and naturalistic. Correlated with the personalistic category is the belief that diseases are due to the active purposeful intervention of an agent who may be human that is, witch or sorcerer; non-human, that is,ghost, spirit or ancestor or a deity. Diseases under

this category include the uncommon conditions which members of a community cannot comprehend, such as conditions that lead to deliriums malignant growths and elephantiasis (Foster,1976).

Under the naturalistic category, diseases are believed to stem from such natural forces or conditions as cold, heat winds and dampness. These diseases include everyday complaints such as fever, the common cold, diseases of children, the aged and expectant mothers.

In both categories personalistic and naturalistic, no mention is made of any disease that are known to stem from agents such as vectors, direct body contact, feacal contamination of soil, food or water, or contact with animals or their products. This implies that in most non-western medical systems germs and parasites and their relationship to man and diseases are virtually unknown.

As such it is no wonder that some communities are not able to comprehend control methods used for malaria because they are based on the germ theory, which differs from the social theory. In the same study of the Orissa Community (Dhillon and Kar 1965), it was reported that several of the control measures did not make sense to the villagers. They did not see the link between mosquitoes and malaria and therefore they did not understand why their homes had to be sprayed with a chemical they detested only to get rid of mosquitoes, which they only viewed as annoying and not harmful to health. The community gave several reasons for their dislike

of DDT. They detested the spray not only because of its smell, but also because the spray disfigured their clean decorated walls. House plastering in the community was not only practiced for aesthetic reasons, but was also associated with deeply-held religious beliefs. Thus after the spraying team had done its job, the yillagers would plaster, the walls again to cover 'ugly' trails of spray that remained on the walls. Other reasons given for not liking DDT were; inconvinience and time wastage in preparation for spraying, and the fact that it did not have any obvious results. The dislike for DDT was so strong that those who accepted it only did so to avoid prosecutions.

The idea of taking preventive drugs against malaria has also met with the same difficulties as DDT, especially, in the communities that do not posses any concept of disease prevention in their medical systems. The Orissa Community (Dhillon et al 1965) could not understand how a tablet would prevent natural forces such as rain, wind or cold weather from causing a disease like malaria and as such they totally refused to take prophylactic drugs for malaria.

In contrast to this Orissa community, the Pokot of Kenya have been reported to view prevention of diseases like malaria positively (Nyamwaya 1982). This is because their cultural idiom possesses a concept of disease prevention, by taking herbs or drugs. According to Nyamwaya, the Pokot believe in prophylaxis so much that periodically a head of household prepares and

dispenses to each member of the family a mixture of herbs in a session called Ighat, to guard against diseases. On the same note they accept vaccinations because they regard it as a form of ighat.

Although the Pokot study did not clearly indicate how the Pokot thought their form of prophylactic measure prevented them from getting diseases, including, malaria, the findings imply that measures to prevent malaria by use of drugs would be accepted by the Pokot not because they understand how the drugs work or because they know the scientific theory of disease, but because the idea of preventing diseases is inherent in their traditional medical system.

Control of malaria by use of treatment or chemotherapy has met with success in some areas but has also met with some failures in others. Among the Orissa Community (Dhillon et al 1965), the villagers willingly accepted chloroquine for treatment when this drug was available in the health centres and christian mission medical facilities which they visited as a last resort. However the study does not tell us at what point the villagers would go to the hospitals, or whether they reported any side effects from the drugs or even whether they took the drugs as prescribed. These questions are important because it has been reported that communities have willingly accepted chloroquine for treatment, only to reject it later because of various side effects associated with it (MacComarck 1983). In a study carried out in one rural district of Tanzania it was reported that people were refusing to continue swallowing

chloroquine tablets not only because of their bitter qualities and the large number that one had to swallow at one time, but also because they were associated with side effects such as vomiting and itching (MacComarck 1983). In Kenya studies are even indicating that the efficacy of chloroquine has become questionable, since resistant malaria parasite strains have been reported in various areas (Wernsdorfer et al, 1980, Spencer et al, a,b,c, 1983).

However, not all people find the bitter quality of chloroquine unpalatable. For example to the Pokot, this quality is an added asset for the drug. Among them chloroquine is regarded very highly as a cure for malaria. They believe bitter medicines are more effective in treating disease (Nyamwaya 1982). For the same reason the Pokot (like many other communities) prefer injections to tablets or other oral medicines. The pain affected by the injection is regarded to cause instant cure. Nevertheless, the study is limiting as it does not report on any side effects associated with chloroquine among the group.

Bush clearing and draining of stagnant waters around homes as measures of malaria control have not been very successful, especially among cultures that rear livestock. It has been reported that in Botswana, where malaria is a major problem, people refused to clear bushes and grass around their compounds because these were vital for their livestock (Ministry of health Report,Gaberone 1979). The same has been reported of the Luo

(Millman 1967).

He reported that the Luo could not clear bushes and grass around their homesteads and in between their homesteads and open ground reserved for communal pasture because that is where they grazed their cattle in the mornings and evenings. The stagnant waters and swamps near living compounds are also used for the purposes of watering animals and in areas with inadequate water supplies, as sources of water for domestic use (Gramiccia 1981).

The few studies that have been conducted on traditional beliefs about malaria and some of its control measures have been limited in one way or another. The knowledge, attitude and practice study by Dhillon and Kar (1965) addressed itself to only one method of malaria control, that is residual indoor spraying. It did not address itself to other measures of control such as taking of prophylactic drugs, clearing of bush around homes and all the other measures of malaria control. As such one is not sure whether indoor spraying was the only method that failed in Orissa, or the others too.

The study by MacCormarck et al (1983) also addressed itself only to the reasons of refusal to swallow chloroquine tablets among a Tanzanian community. It would also have been more illuminating if all control measures that the people were aware of, were looked into. The study by Nyamwaya was anthropological and as such it addressed itself to the Pokot

beliefs about all diseases and not specifically malaria, hence the scarce information. Nevertheless, although not in a systematic way, the studies succeded in demonstrating how man can hinder control efforts through no machinations of his own but his own cultural legacy. The studies also demonstrated how useful it is to understand what people recognize as malaria as distinct from other diseases, its cause,and what they expect in the way of treatment and prevention from their own resources as well as from modern medicine.

In this study the same approach used by Dhillon (1965) was used, but emphasis was laid not only on the traditional beliefs, but also on all methods of malaria control that the respondents were aware of. Also unlike in Nyamwaya's study (1982) the study dealt specifically with malaria.The need to understand peoples knowledge, attitudes and practices in relation to all aspects of malaria control is not merely of academic interest, but can be seen as relevant to questions of social policy and the efficacy of the state in providing malaria control in all endemic areas.

Theoretical Framework

Various theoretical formulations have been advanced to explain health behaviour (Kirscht 1974; Becker, 1979; Rosenstock, 1974 a,b,c,; Kasl et al, 1966, a, b,). For this dissertation, the Health Belief Model (HBM) was adopted as the frame of reference because it seemed to explain best health behaviour

towards malaria, and also because it has received the widest theoretical and research attention albeit not in tropical diseases. The model was formulated by Kasl et al (1966).

In this model, health behaviour is perceived as

> "any activity undertaken by a person believing himself to be healthy for the purposes of preventing disease or detecting it in an asymptomatic stage" (Kasl et al 1966: 246)

In relation to malaria, activities taken as health behaviour include taking of antimalaria drugs (prophylaxis) and personal protection from mosquito bites either by the use of protective clothing, insect repellents, bed nets and screening of all ventilation in houses and dwellings. It also includes measures like clearing of bush around homes, draining stagnant water around homes and using of insecticides to destroy mosquito breeding grounds.

The health belief model also includes illness and sick-role behaviour, where according to Kasl et al, illness behaviour includes,

> "any activity undertaken by a person who feels ill, to define the state of his health and to discover suitable remedy"(ibid)

while sick-role behaviour is seen to include,

> "any activity undertaken by those who consider

themselves ill, for the
purpose of getting well."(ibid.).

In relation to malaria illness and sickrole behaviour are seen as situations where one defines oneself as having malaria, or having it diagnosed by someone else then acts appropriately by either going for treatment or adminsitering self-treatment, by taking drugs as prescribed.

According to the HBM an individual's engagement in a particular kind of health, illness or sickrole behaviour depends on two conditions, namely, the perceived amount of threat and the attractiveness or value of the behaviour. The amount of threat further depends on three other factors, namely

a) the importance of health matters to the individual and his level of knowledge

b) the perceived susceptibility and vulnerability to the disease in question, and,

c) the perceived seriousness of the disease.

This means that for a person to define his illness as malaria and thus either goes for treatment or participates in its prevention, the person has to know about malaria as a disease, its cause, its seriousness and its being a threat to life, before he makes such a move. However, according to the HBM, the choice of action taken to prevent oneself depends not only on whether the person knows them, but also on,-

a) the perceived probability that the actions will lead to desirable preventive or ameliorative results

b) and, the unpleasantness or 'cost' of taking or not taking such action.

As such a person will only take anti-malaria drugs if he thinks they will prevent him from developing malaria, or take the drugs for treatment if he thinks they will cure him. However, socially and individually determined beliefs about the efficacy of the alternative measures against malaria such as the fact that preventive drugs do not offer full immunity, side effects such as vomiting and itching associated with the drugs and the fact that mosquitoes are difficult to eliminate completely may become barriers to these methods. Other factors that may influence an individual's decision to take a health, illness or sickrole action are perceived barriers such as unavailability of drugs either in health centres, hospitals or shops, lack of money to purchase the drugs , insecticides,screens, nets and lack of alternative land for grazing their livestock, if they clear bushes around their homes. Besides, time that would be used for the clearing exercise is spent on more seemingly urgent things, such as searching for food and other basic necessities of life.

Critical incidents such as death from malaria in a family or states of mental confusion resulting from malaria may serve as cues or triggers to sensitize people on the seriousness of malaria. But, many people are not aware that all these complications of malaria can lead to death. Often malaria is viewed only as fever, headache and joint pains (Dhillon & Kar 1965), and if a person dies from a complication, death will not be seen to have resulted from malaria, but the complication itself. For example a person will be said to have died from kidney failure or severe diarrhoea, without linking these diseases to malaria.

It seems from the Health Belief Model that malaria control measures including treatment and prevention can only be successful if the persons involved know about the disease, its treatment and prevention; and perceive it as a serious disease which is a threat to their lives. Besides, the measures have to be perceived by the persons as favourable not only because they lead to actual cure and prevention but also because they are available, simple, and convenient to carry out.

With the above views a knowledge attitudes and practice study (KAP) was undertaken among the Luo of Karateng, Western Kenya. The study primarily undertook to establish whether socio-cultural and behavioural factors are important in the planning and implementation of malaria control programmes.

Traditional beliefs about malaria and mosquitoes and the way the people reacted to them were taken as the socio-cultural and behavioural factors which would have some influence on the overall success of malaria control programmes. Specifically, the study looked at; the knowledge of the people of Karateng on malaria, its cause, mode of transmission, symptoms treatment and prevention; their attitudes towards and beliefs on malaria, the mosquitoe and existing control measures; and finally, their practices in relation to transmission, treatment and prevention of malaria.

CHAPTER III

THE SETTING AND METHODOLOGY

Any of the many areas in Kenya under highly malarious zones could have been appropriate for selection as the study site for this research. However, certain questions could only be answered under special conditions. These conditions were that the site should have or should have had malaria control measures, carried out in the area. For a long time the Lake Basin has been a focus for many water related diseases like malaria, schistosomiasis , trypasonomiasis and cholera. Consequently, many control programmes albeit trial ones have been carried out in the region. Based on that fact,plus practical operational and financial considerations, an area in the region was chosen for the social study of malaria.

Area of Study

The area of field research was Karateng sublocation, Kisumu West Location, Maseno division, Kisumu District in Nyanza Province. The sublocation was established in 1968 following the subdivision of Kisumu district into locations and sublocations.

Population and Occupation

At the time of study (May-August 1983) Karateng had a population of 5,400 inhabitants (2,487 males and 2,913 females), living in an area of approximately 18 sq. km., with a density of about 292 persons per sq.km. (Kenya census 1979). The inhabitants of the area are the Nilotic Luo.

The main occupation of the inhabitants is peasant farming. They grow subsistence food crops like maize, cassava, groundnuts, millet, sorghum and other pulses. These foods are supplimented by fresh or dried fish which is readily available in the local markets. Animal husbandry at a large scale is non existent and there are no industries in the sublocation.

Settlement and Housing.

Basically, the Luo traditional settlement is non-villagized.[1] The smallest functioning unit is the circular or rectangular compound or homestead, containing the main house/hut belonging to the head of the homestead[2] and his wife (in a monogamous setting). Where there are grown up sons, their households[3] are also in the homestead and are arranged according to traditional specification. In a polygamous setting there are different households for the different wives. All these households are flanked by grain stores and a cattle 'boma' where applicable. Most of the houses/huts had thatch roofs, mud walls and earthen floors.

The area was chosen for various reasons, namely;

a) Geographyic conditions

The area lies on the equator at 1,200m above sea level in the down-warped Lake Basin of Western Kenya. It lies at the head of the Nyanza Gulf of Lake Victoria. The lowlands around the lake receive an annual rainfall of between 1061 and 1270 milimetres especially along the foot

hills of Maragoli Hills, with the long rains coming between March - June and the short rains coming between October - November.

Karateng sublocation itself lies in the star grass zone, one of the three ecological zones into which Kisumu District is divided (Alila 1978). This zone receives the highest rainfall in Kisumu District. Humidity in the area can reach 47 per cent and the mean annual temperature varies between 30^{o} - 34^{o} centigrade (Ominde, 1971). Like in other depressed areas around the lake shore, Karateng sublocation which is 20 km West of Kisumu town has its fair share of swamplands, found mainly along the Awach river and its tributaries. This river serves the whole sublocation with its water supply .

The above climatic and physical conditions of the area makes it very favourable for the breeding of mosquitoes. The Anopheles Gambiae and Anopheles Funestus, two species of the anopheles mosquitoe, which are the main agents for the transmission of malaria in Kenya abound in the area (Odhiambo 1980). These mosquitoes require a lot of sun or very lightly shaded water collection, exposed to sunlight. Specifically the Anopheles gambiae prefers clear water swamps, weedy banks of streams and rivers, lake shores and margins of ponds. A humid climate coupled with high mean temperatures favour continuous breeding of these mosquitoes and in turn a continuous development of the parasites.

b) Accessibility

Karateng is accessible to transport both public and private and thus it was easy to commute from the Kisumu town everyday without problems. This was very important especially because the study had to be conducted within three months.

c) Past Research

Quite a number of biomedical trial[4] control programmes have been carried out in Kisumu district and thus it was deemed proper to carry out the social science research in the same area. One objective of the study was to find out peoples attitudes toward control programmes and this could only be done in an area where there has been control programmes or where they currently exist.

Furthermore an initial pilot study[5] in the area revealed that the community was familiar with research work. Periodic small surveys are carried out by the staff of the Rural Health Training Centre situated in the sublocation. This fact facilitated easy entry into the community.

The study was conducted during May-August 1983. The period was chosen because it was a rainy season. Mosquitoes are known to be abundant during the rainy season and therefore malaria attacks are presumably many too. It makes more sense to interview people on a disease while it is prevalent, than to get them to remember or guess at symptoms or its manifestation, after a period of time; especially a disease

like malaria which has no lasting (evidently visible) effects.

METHODOLOGY

Survey design

The purpose of the study was to collect information on how the people of Karateng responded to the problem of malaria, and how that response could affect the success of any control programmes intended for or already being carried out in the area. Being largely an exploratory and descriptive study, the formulation of specific hypothesis for formal testing was not envisaged. However, a broad working proposition was advanced, from which formal hypotheses were later generated. The proposition behind this study was that community based control of malaria to be successful was dependent on what people knew about malaria, indigenous beliefs about the disease and their attitude towards control measures. The target group that provided this information included both men and women who were eighteen years and over. However, the unit of sampling was the household and not the individual.

Sampling

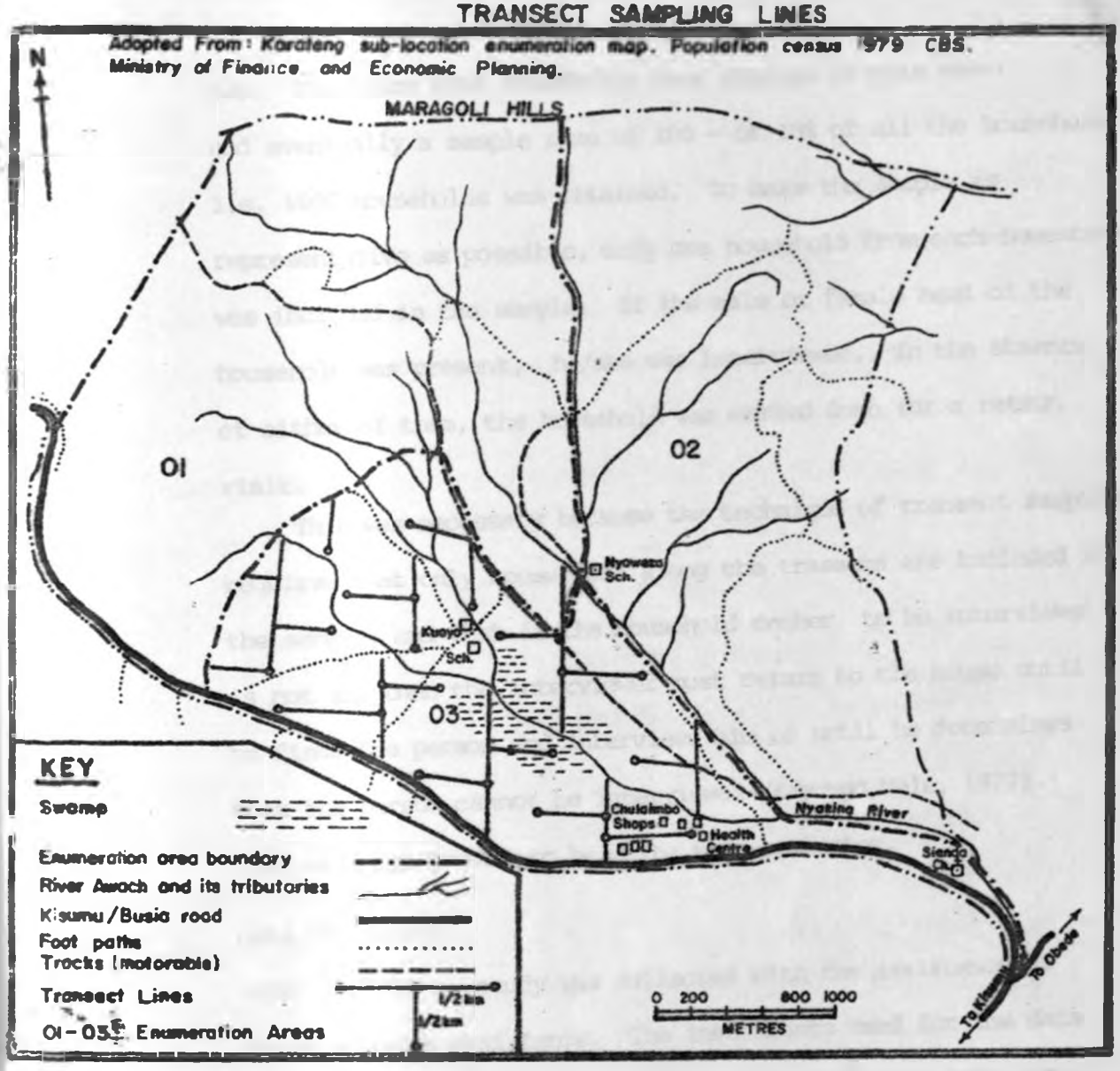
The population of Karateng sublocation was taken to be homogeneous with respect to this research. Thus probability sampling, specifically transect sampling was employed. This technique was preferred because Karateng had a fairly dense population - 292 persons per square kilometer (Kenya census 1979) and also because there were no listings of households available to provide a base for a sampling frame. Nevertheless, it was estimated that in 1979, Karateng had a total of 1,090

households (Kenya census 1979). Formulating a listing was considered impractical due to operational and financial constraints.

Area sampling rests on the assumption (if not always correct) that people live somewhere and everyone as such has an opportunity to fall into the sample. Transect area sampling involves the delineation of transects or artificial lines on a map of the research area, at regular intervals, then sampling along the transects. The constant distance from one transect to the next makes the choice of respondents non-purposive thus eliminating any bias (Mbithi and Barnes 1975). The transects are drawn using natural or man-made features such as roads, rivers, foot hills and ridges as beginning points. The same features can be designated to serve as outer boundaries for the research site.

Enumeration areas used during the 1979 Kenya National Census were used as the first stage of the sampling. Karateng had three enumeration areas, roughly the same size, but with unknown population sizes in each. Using natural and man-made boundaries as baselines, perpendicular transects at regular intervals of about ½ km were made in each enumeration area, designated as area one, area two and area three (see Fig. 3). Then every household on either side of the transect was interviewed. The initial target was about 67 households in each enumeration area but during the survey it was noted that enumeration area one was slightly more populous than the other

FIG. 3 KARATENG SUB-LOCATION SHOWING ENUMERATION AREAS AND TRANSECT SAMPLING LINES



two. Therefore more households were visited in this area; and eventually a sample size of 200 - or 18% of all the households i.e. 1090 households was obtained. To make the sample as representative as possible, only one household from each homestead was included in the sample. If the male or female head of the household was present, he/she was interviewed. In the absence of either of them, the household was marked down for a retrun visit.

This was necessary because the technique of transect sampling requires that only households along the trasects are included in the sample, and that if the household member to be interviewed is not in, then the interviewer must return to the house until he finds the person and interviews him or until he determines that the person cannot be interviewed (Kayongo Male, 1977). This exercise proved to be quite time consuming.

Data Collection

Data for the study was collected with the assistance of three research assistants. The instruments used for the data collection were a standardized questionnaire[6] with both 'open -ended' and 'closed-end' questions, and non-participant observation. The questionnaire was standardized to ensure that the questions were presented with exactly the same wordings and same order to all respondents. The 'open-ended' questions were designed to permit free responses from the respondents, without providing or suggesting any structure for the replies. The research assistants were instructed to encourage the

respondents to talk freely and fully in response to these questions and to make verbatim recordings of the replies.

With the 'closed' questions the responses of the respondents were limited to stated alternatives. The alternatives were simply Yes or No for some questions, other questions were for indicating various degrees of 'agreeing' or 'disagreeing' with certain statements; and yet others consisted of a series of replies of which the respondent picked one as being closest to his/her idea of what was being asked.

The questionnaire had first been written in the English language, but during a pilot survey when it was pretested it was found necessary to have it translated into the local language Dholuo. This was done to minimize the risk of each assistant asking questions according to his own interpretation, as had become apparent during the pilot survey. The assistants who were second year University under-graduates were thoroughly trained by the investigator after the pretesting of the questionnaire. They all spoke the local language and were locals of the research area.

During the translating excercise, no questions were dropped but a few were changed. The questionnaire was translated back into English and found to be acceptable. However, it was administered in Dholuo.

Parallel to the interviews was non-participant observation of domestic, social and occupational activities of the people

in relation to the problem of malaria as a whole, that is transmission, man-mosquitoe contact, prevention and control. The excercise was intended to gather supplementatry data that would either verify, qualify or help in the interpretation of the findings obtained through the questionnaire. The assistants were guided by an observation guide[7] as to what to pay attention to, while the principal investigator tried to observe every other relevant activity that related to the research.

Even with the problem of heavily relying on the respondents' verbal responses and the problem of social distance between interviewers and respondents (which makes respondents give answers which they think the interviewer wants to hear) it is hoped the verbal responses for this research were valid.

The responses to the questionnaire and observation guide were later coded and punched onto the 80 column data sheet cards by the investigator, and run through the computer. The primary analysis of the data in the following chapter attempts to utilize as much of the data as possible.

Procedures for Data Analysis

Cross-tabulations were computed and 'Chi-squares' (χ^2) worked out where necessary to find out the relationships of the variables utilised in the analysis.

Problems Encountered.

There was no problem with the administration and the people too were very cooperative. However, they complained about the length of the questionnaire which would take one and half hours to complete. There was no cause of refusal to answer any of the questions although the questions indicating various degrees of 'agreeing' or 'disagreeing' were problematic. Many of the respondents preferred to either agree or disagree, instead of strongly agree or 'strongly disagree'; and would only mention the latter after probing.

The chief problem however, was that the respondents seemed to be a little sceptical about the whole research excercise. They were asking questions like: "What difference will your research make from the others?" and "Why does the government send you here and we see no results?" Apparently, during the WHO/ACRU trials of 1972 some notable malaria control had been achieved. But after the research was over, those concerned left the area without any follow up activities. According to the respondents, soon after the departure of the research team there were many more mosquitoes and the problem of malaria became even worse. This might be because during the control period the people in the area lost some of their immunity to malaria thus making them very vulnerable. This demonstrates a case where overexposure of a population to research activities might be detrimental for further research, especially research conducted for its own sake.

Operational Definitions

Operational definitions of variables, terms and concepts used in the study was carried out to enable the reader understand fully the level of measurements. The independent variable in this study was knowledge which determines the other two, attitudes and practices.

Knowledge:

This was defined as the ability of a respondent to posses an understanding of how malaria is caused, how it is spread, how symptoms present, how it is treated and prevented in relation to scientific facts about it. If a respondent's understanding of malaria causation differed from the scientific one, the person was taken not to know.

Attitudes:

These were defined as the feelings that a respondent had on malaria as a disease, especially in terms of its seriousness, curability and preventability. These feelings were measured on Likert Scale questions, which had different levels of 'agreeing' or 'disagreeing' with a given statement on malaria. For example:

"In this area malaria is the most serious disease,"

Do you,

A. Strongly Agree

B. Agree

C. Not sure

D. Disagree

E. Strongly disagree.

During a pilot survey in the study area, it was observed that the respondents possesed only three levels of either 'agreeing', 'disagree' or 'not being sure'. Therefore A and B above were combined and given a weight of three. D and E were given a weight of two and C was given a weight of one. There were two questions that were positive for malaria control and three which were negative. If a respondent had a score of 6 for the positive questions and 6 for the negative, he was deemed to posses favourable attitudes toward malaria control. If he had a score of 4 for the positive and a score of 9 for the negative, he was seen to possess unfavourable attitudes toward malaria control. A score of 5 for all the questions was taken to mean that the respondent was hostile i.e was not telling the truth. Only two such hostile respondents were interviewed.

Practices:

Practices were defined as any actions committed or omitted by the respondent in relation to malaria transmission, prevention and treatment. These included any actions that would minimize or totally prevent the onset of the disease, any actions that would enhance the onset of malaria or breeding of mosquitoes , any actions taken to treat the disease and also any actions that maximize man-mosquito contact.

The explanatory independent variables including age, education and religion were defined as follows-:

Age:

This refers to the number of years lived since the birth of a respondent at the time of the interview. For older people who could not remember when they were born, they were told to mention any important event that coincided with their birth such as a world war or famine, which were used to estimate their ages. It was measured as a categorical variable with dummy categories of nine years each i.e. 18-27, 28-37, 38-47, 48-57 and 58 years and over.

Education:

This refers to the highest level of education attained by a respondent. The education variable was measured at interval level, with dummy categories such as none /, primary 1-4, primary 5-8, secondary 1-4, secondary 5-6 and college.

Literacy;

Literacy was measured at 3 levels. The respondents who could read and write in either of the three languages, Luo, Kiswahili and English were seen as literate and those who could neither read nor write in any of the languages were seen as illiterate. Those who could only read and write in Luo alone were refered to as semi-literate for purposes of analysis.

Religion:

In this dissertation, religion was used to refer to a respondents denominational affiliation, at the time of interview. The usual categorization of religion into protestants, catholics, Muslim or other was not seen as practical because the 'Other' category would have encompassed more than ten different

denominations, some of which were important for analysis singly.

Causation;

This was used to refer to the mosquitoe-malaria link, where a mosquitoe bite precedes the onset of malaria.

Transmission;

Was used to refer to the mechanism of an infected mosquitoe passing on malaria parasites from one person to another.

Control;

In this dissertation, control of malaria was taken as both treatment and prevention of malaria as such,

Treatment,

Was viewed as control because when cases are treated with effective drugs against the malaria parasite, then fewer parasites are available to spread to other persons.

Prevention,

Was defined as both interrupting transmission and protecting individuals. Destruction of mosquito breeding grounds and using insecticides to kill mosquitoes and their larvae was seen to control malaria by interrupting transmission and taking of drugs to prevent infection, personal protection with nets and use of repellents was also seen as malaria control. The term prophylaxis is commonly used in reference to drug taking to prevent infection. The term has also been used in the dissertation, with the same meaning.

Symptoms

This is the perceptible change in the body or its functions indicating the presence of a disease. In relation to malaria, these are the signs or manifestations of changes in the body indicating malaria.

Culture

Was defined as a people's way of life, encompassing their beliefs values, axioms and assumptions; which guide their conduct and definition of reality.

FOOTNOTES FOR CHAPTER III

1. A village is a unit of compact settlement varying in size but usually smaller than a town. The house/huts are usually close together. It can constitute different families from different clans or from the same clan. Non-villagized indicates that the Luo Settlement is not a compact unit of settlement. (Intergrated rural survey 1967-69)

2. A homestead is a compound or enclosure that constitutes the home and land (not always) of a family. It usually has more than one household (adopted from Webster dictionary).

3. A household is defined as a person or group of persons who normally or habitually eat and/or sleep together whether or not they are related by blood or marriage, by sharing a dwelling, their living expenses, gardens or shambas and granary or foodstore. (Intergrated rural survey 1967-69).

4. Several trial control programmes are and have been carried out in Kisumu District. For example, see Health Report for 1979. Ministry of Health, Kenya 1982. See Also the Monthly Reports WHO-ACRU II (Anopheles Control Research Unit II) 1972.

5. A pilot survey was carried out between January 15th- 30th, 1983. This was done in order to pretest the questionnaire for purposes of translating it into the local language, Dholuo. See under methodology, in this same cahpter, data collection.

6. See Appendix

7. See Appendix.

CHAPTER IV

RESEARCH FINDINGS

In the first section of this chapter, the characteristics of the respondents are described, and in the second section their knowledge attitudes and practices in relation to all aspects of malaria are reported. Lastly, cross-tabulations of some variables are presented. Several frequency tables are presented in this chapter. In all these tables, percentages are shown as the figures in parenthesis.

Section One: Basic Data

Age

The age distribution of the respondents showed that the area had fairly young people. Majority were aged between 18-27 years with a mean age of 37.5 years. Very few were over 58 years (Table 4.1)

Age Distribution By Area.

Table 4.1

Sample Area \ Age	18-27 no.%	28-37 no.%	38-47 no.%	48-57 no.%	57-58 no.%	Total no.%
Area one	19(27.6)	15(21.7)	17(24.6)	14(20.3)	4(5.8)	69(100)
Area two	24(37.0)	12(18.5)	7(10.7)	15(23.0)	7(10.8)	65(100
Area Three	28(42.4)	13(19.8)	7(10.6)	4(6.0)	14(21.2)	66(100)
Total	71(35.5)	40(20.0)	31(15.5)	33(16.5)	25(12.5)	200(100)

Education of those who had had formal education, 27 per cent had attained only eight years of primary education. Fourty point five per cent of the respondents had no formal education at all

(Table 4.2).

Table 4.2

Educational Levels Attained By Area.

Sample Area \ Ed.	None	Primary 1 -4	Primary 5-8	Secondary 1 - 4	Seconday 5 - 6	Total no. %
Area One	29(42.02)	15(21.73)	13(18.84)	8(11.59)	4(5.79)	69 (100)
Area Two	21(32.30)	14(21.53)	22(33.84)	8(12.30)	0(0.00)	65(100)
Area three	31(46.96)	10(15.15)	19(28.78)	6(9.09)	0(0.00)	66(100)
Total	81(40.5)	39(19.5)	54(27.0)	22(11.0)	4(2.0)	200(100)

Literacy

The level of literacy was measured by the ability to read and write one language. Fourty per cent of the respondents could read and write in either Kiswahili, English or the local language Dholuo, and 60 per cent could neither read nor write in any of the three languages.

Occupation.

Majority of the respondents were peasant farmers, that is 78 per cent. They engaged in subsistence farming of cassava, millet maize and groundnuts. Eleven per cent were professionals working, in the three primary schools, the health centre and in Maseno Urban Centre. The rest were semi-skilled and unskilled workers who engaged in small-shop businesses and pot-making. There were no industries in the area, or any large-scale farming.

Religion

In matters of religion, the sample of 200 yielded twelve different christian, denominational affiliations. However, only six denominations were used for analysis because the

other six denominations had an average of two followers each and as such were put into one category 'other'[1] (Table 4.3). The most remarkable thing about religion is that the 4.5 per cent Legio Maria followers said they did not believe in any medicine, but believed in faith-healing.

Table 4.3

Religious Denominational Affiliation by Area

Religious Denomination \ Area	SAMPLE AREAS Area One		Area two		Area Three		Total	
	No.	%	no.	%	no.	%	no.	%
Anglican	21	(30.43)	25	(38.45)	15	(22.72)	61	(30.5
Church of Christ	17	(24.63)	22	(33.84)	14	(21.21)	53	(26.5)
Catholic	7	(10.14)	6	(9.23)	19	(28.78)	32	(16.0)
Pentecost	9	(13.04)	1	(1.53)	5	(7.57)	15	(7.5)
Israel	7	(10.14)	3	(4.61)	5	(7.57)	15	(7.5)
Legio Maria	1	(1.44)	3	(4.61)	5	(7.57)	9	(4.5)
Other*	7	(10.14)	5	(7.69)	3	(4.54)	15	(7.5)
Total	69	(100.0)	65	(100.0)	66	(100.0)	200	(100)

The table shows that the Anglican church had the largest following in the area 30.5 per cent followed by the church of christ in Africa, with 26.5 per cent.

Sex.

Majority that is / , 74 per cent of the respondents were female; while 26 per cent male. The distribution of females was almost uniform in the three sample areas but there were relatively

more males in area one than in the other two areas (Table 4.4)

Table 4.4

Sex Distribution By Area

Sample Area	Sex MALE		FEMALE		TOTAL	
	no.	%	no.	%	no.	%
Area One	21	(30.4)	48	(69.6)	69	(100)
Area Two	15	(23.1)	50	(76.9)	65	(100)
Area Three	16	(24.0)	50	(76.0)	66	(100)
Total	52	(26.0)	148	(74.0)	200	(100)

Section Two: Knowledge on Malaria

The survey showed that everybody in the sample had an idea about malaria as a disease. There were nine 'local' terms used to denote malaria, but only two were significant. These two terms were 'Midhusu' or fever mentioned by 45 per cent of the respondents and 'malaria', which is actually malaria in 'Dholuo pronounciation,' mentioned by 17 per cent of the respondents. The other seven terms were actually, names of symptoms associated with malaria, such as 'Wich-bar', which is headache in Dholuo, 'Sambua' or convulsions and 'Homa' or the common cold.

Seventy-two per cent of the respondents claimed they could identify malaria, an ability acquired through observation and

experience, while 22 per cent claimed to have been taught how to identify malaria by their parents. Only a few had learned from school or other sources. When asked to mention the symptoms of malaria, both those who had learned how to identify it informally i.e. from observation and parents and those who had learned formally, i.e. from schools and health centre gave the right symptoms (Table 4.5).

Table 4.5

Malaria Symptoms identification and how learned.

Identification Ability Acquired through \ Symptoms	Fever		Chills & Shivering		Vomiting bile		Total	
	no.	%	no.	%	no.	%	no.	%
Observation	130	(65.0)	11	(5.5)	4	(2.0)	145	(72)
Parents	32	(16.0)	12	(6.0)	1	(0.5)	45	(22)
School	3	(1.5)	1	(0.5)	0	-	4	(2)
Health Centre	5	(2.5)	1	(0.5)	0	-	6	(4)
Total	170	(85.0)	25	(12.5)	5	(2.5)	200	(100)

Fifty per cent of the respondents believed that the symptoms were the same for everybody, and also that everybody was susceptible to the disease, but more so, children and pregnant mothers. They explained that pregnant women and children were weak hence the higher susceptibility. The remaining 45 per cent were not sure. However, all the respondents reported that malaria was intensified during and after the rainy season, between May and August.

Knowledge about Causation.

Knowledge of malaria causation among the respondents was minimal. The general feeling was that malaria was caused by cold entering the body especially after being rained on. Several respondents mentioned the chewing of maize-stalk, and 24 per cent said they did not know the cause. Only 35.5 per cent mentioned the mosquitoe (Table 4.6).

Table 4.6

Knowledge of Malaria
Causation and Transmission.

Transmission \ Cause	Mosquitoe	Rain & Cold weather	Maize Stalk	Dont know	Total
Infected Mosquito	14 (7.0)	-	-	-	14 (7.0)
Lowered body Temperature	-	96 (48)	-	-	96 (48.0)
Sugar in maize Stalk juice	-	-	9 (4.5)	-	9 (4.5)
Don't know	-	-	-	81 (40.5)	81 (40.5)
Totals	14 (7.0)	96 (48)	9 (4.5)	81 (40.5)	200 (100)

The respondents parralled their ideas of malaria causation to the mode of transmission. As such 48 per cent claimed that cold weather and rain lowered body temperatures to below normal and that way a person got malaria. The 9 per cent who claimed malaria was caused by chewing of maize stalk and very young maize claimed malaria was transmitted by the sugar in the maize stalk / juice which somehow lowered the body temperatures leading to malaria. Amongst the 24 per cent who said they did not know the cause of malaria were 4.5 per cent Legio Maria followers who claimed God was the cause of the disease.

Knowledge about Control: Treatment and Prevention.

Reaction to Malaria attack and Reason. Table 4.7

Reason \ Reaction	Nothing	Go to Hospital	Self-Medication	Total
Malaria clears by itself/God	92 (46)	-	-	92 (46)
Treatment is effective	-	90 (45)	8 (4)	98 (49)
Availability of drugs	-	6 (3)	4 (2)	10 (5)
Totals	92 (46)	96 (48)	12 (6)	200 (100)

For treatment (Table 4.7) 48 per cent claimed they went to hospital when they susptected malaria, because they believed hospital treatment was effective against malaria and drugs were available there. Fourty-six per cent including 4.5 per cent of Legio

Maria did nothing about an attack because it usually cleared by itself or by God's will, Four per cent performed self-medication with shop-patent drugs because they were effective and 2 per cent took any drugs they came across which they thought would get them better. When asked whether malaria was a difficult disease to treat, 51 per cent thought it was, 43 per cent saw it as a self limiting disease very easy to treat and 6 per cent said they were not sure.

Table 4.8

Mode of Treatment preference and Reason.

Treatment preference / Reason	Injection	Tablets	Both	Either	Neither	Total
Enters blood Stream faster/ tablets cause side effects	93(46.5)	-	-	-	-	93(46.5)
Fear Injection	-	34(17)	-	-	-	34(17)
Doctors know best treatment	-	-	-	38(19)		38(19)
One alone does not work	-	-	26(13)	-	-	26(13)
God's will	-	-	-	-	9(4.5)	9(4.5)
Total	93(46.5)	34(17)	26(13)	38(19)	9(4.5)	200(100

On treatment for malaria (Table 4.8) 46.5 per cent prefered injections which they believed entered the blood stream faster thus causing faster recovery and also because they experienced side effects such as vomiting and body irritation after taking anti-malaria tablets. Seventeen per cent preferred tablets specifically because they feared the prick of injections or tablets 19 per cent could have either of the two, injections or tablets because they felt the doctor ('Laktar') knew what medication was best for them. However, 13 per cent of the respondents would only accept treatment if they were given both the tablets and injection simultanenously. They felt each on its own would not led to cure. The 4.5 per cent Legio Maria's would take neither the tablets nor injection since they did not go to hospital anyway, but would offer prayers which they believed would lead to a cure.

For those who reported to take tablets, 70 per cent said that they stopped taking the tablets when an attack cleared, even before finishing the given dosage. The reasons given for not finishing the dosages were that the drugs were bitter and one took too many at once. Twenty per cent reported that after the first day of the dosage they took the tablets when they remembered and 10 per cent reported to take the drugs until they finished them as prescribed by the doctor.

For prevention, the answers were a correlative of the respondents belief on malaria causation. Those who mentioned cold weather and rain said that keeping warm and avoiding to be

rained on was the best guard against malaria. Those who claimed malaria was caused by chewing of maizestalk said this should be avoided and 7 per cent of those (71 respondents) who mentioned mosquitoes said the mosquitoes should be destroyed to prevent malaria.

On how to destroy mosquitoes, 60 per cent talked of clearing bushes and breeding grounds such as stagnant waters around their homes, 10 per cent reported to use insecticides and mosquito . . coils and another 10 per cent said they used a certain plant of the Lantana Camara species locally known as 'Nyalo Biro,' or cowdung to smoke mosquitoes from their houses. The remaining 20 per cent, including the 4.5 Legio Maria followers, said that trying to fight mosquitoes was a waste of time.

For personal protection against mosquitoe bites only 5 per cent of the respondents reported to use bed -netting. Ten per cent used insecticides. None of the respondents mentioned the use of insect repellents. Also none of the respondents had an idea of indoor residual spraying as means of destroying mosquitoes, although 20 per cent of them mentioned that spraying of stagnant waters with a certain chemical would kill mosquitoes. They must have been refering to larvicides.

When asked whether they took any drugs when not unwell to protect themselves from catching malaria (prophylaxis), 120 respondents, that is 60 per cent, reported to use prophylactic drugs. Fifteen per cent took no prophylaxis because anti-malaria drugs caused them to vomit and itch and 5 per cent

did not because one got sick anyway.

Table 4.9

Prophylaxis as a preventive measure and drugs taken.

Prophylaxis / Drug taken	Proper Prophylaxis	Improper Prophylaxis	No Prophylaxis	Total
Malariaquine Nivaquine Chloroquine	25 (12.5)	-	-	25 (12.5)
Asprin Cafe nol Aspro	-	95(47.5)	-	95(47.5)
No reason for Drugs when well	-	-	40(20)	40 (20)
Anti malaria Drugs cause itching/ vomitting	-	-	30(15)	30 (15)
One gets sick anyway	-	-	10(5)	10 (5)
Total	25 (12.5)	95(47.5)	80(40)	200(100)

Twenty per cent saw no reason for taking drugs while not ill (Table 4.9).

Attitudes Towards Malaria As a Disease.

Majority of the respondents, that is 65 per cent, reported that malaria was not communicable. Twenty-eight per cent claimed it was communicable, but they mentioned incorrect channels of transmission, such as droplets, sharing of utensils and beddings and through eating of contaminated foods, while only 7 per cent reported that it was communicated through mosquitoes.

Seventy seven per cent of the respondents believed that malaria was the most severe of the diseases prevalent in the area because it was believed to cause other diseases such as epilepsy, menengitis and mental illness. The remaining 23 per cent believed cholera was the most serious disease in the area in terms of fatality. None of the respondents saw malaria as a killer disease. Fifty five of the respondents said that trying to fight malaria was a waste of time and that it was never going to be contained. On the Likert Scale questions, 48 per cent scored a total of thirteen and 1 per cent scored a total of five, for the five questions. (see operational definitions pg.48).

Attitudes Towards Mosquitoes.

Mosquitoes were reported by the respondents to be annoying insects because they kept people awake at night and also because they caused spots on the body and itching. This was reported by 65 per cent of the respondents. The remaining 35 per cent said mosquitoes were dangerous because their bites led to malaria.

Attitudes Towards Control Programmes.

The 36 per cent respondents who believed that malaria could be controlled , said that only the government had ways of doing it. They said that the government ought to provide drugs, destroy breeding grounds and generally raise the living standards of the people if malaria was to be controlled. The remaining 9 per cent placed the responsibility of dealing with malaria on the people themselves.

Observed Practices in Relation to Malaria.

Most of the homesteads visited had thatch huts with mud walls and uncemented floors, (that is 63 per cent) while 22 per cent had corrugated iron sheet roofs, mud walls and uncemented floors, 12.5 per cent had corrugated iron sheet roofs, semi-permanent walls, that is, mud encased in cement and uncemented floors; 2 per cent had corrugated iron sheet roofs, semi-permanent walls and cemented floors and the remaining half per cent had tiled roofs, stone walls and cemented floors. A striking point about the houses was that quite a large number, that is 25 per cent, had no windows (Table 4.10).

Table 4.10

Type of House
by Window type

Type of house / Window Roof, Wall & floor	No Windows no. %	Wooden Windows no. %	Glass Window no. %	Total no. %
Thatch, roof Mud wall, uncemented	38 (19.0)	88 (44.0)	- -	126(63.0)
Corrugated mud uncemented	3 (1.5)	41 (20.5)	- -	44(22.0)
Corrugated Semi permanent uncemented	- -	25 (12.5)	- -	25 (12.5)
Corrugated semi permanent cemented	- -	3 (1.5)	1 (0.5)	4(2.0)
Tile Stone Cemented	- -	- -	1 (0.5	1 (0.5)
Total	41 (20.5)	157 (78.5)	2 (1.0)	200(100)

However, all the houses had large eaves 30 - 40 centimetres wide. These eaves were not meant to compensate for windows, since even those houses that had windows also had large eaves. Out of the one hundred and fifty seven houses, which had wooden windows, 80 per cent of them had no screening of any type, 14 per cent had wire mesh and 6 per cent had polythene sheeting. Only 2.5 per cent of all the houses had wire mesh screening for the

eaves. The average number of rooms in a house was two while the average number of persons occupying a house was five.

Eighty -seven per cent of the homes visited reported to obtain their water supply from the river, a chore that was carried out by women and children of both sexes. At the water points, it was observed that the women concentrated on temporary water collections along the river or streams, where the water was not very fast flowing. In addition to drawing water, for home use, bathing, washing of clothes and utensils was also done at the water points. Most often mothers would be accompanied by their infants and children either to be bathed or because there would be nobody to leave them behind with, at home. These children would usually be very scantily clothed and sometimes would have no clothes at all.

Pit latrines found in 87 per cent of the homes visited were ill-kept, without pit-covers or even doors. The latrines were usually constructed at a corner of the homestead and were used by all the members of the homestead. The remaining 13 per cent of the homes visited had no latrines. People from these households said they relieved themselves either in nearby bushes or in their shambas.

In 95 per cent of the homesteads visited, there was bush and tall grass in and around them. In only 5 per cent of the homesteads was the bush and grass in the compounds trimmed down.

During the survey, there was no government or other agency sponsored malaria control programme in the area. Infact, the only control programme that 32 per cent of the respondents could remember about was the 1972 World Health Organization, Anopheles Control Programme trials. They could not remember their reactions to the control measures because it was a long time ago, but they did remember that malaria attacks were lessened during that period.

The only form of control measure observed was the lecturing of patients at the Rural Health Training Centre situated in the area, every morning before they (patients) were attended. The lectures would be on various diseases prevalent in the area and invariably malaria would also feature as one of the diseases. There were also three occasions during the survey period when some health education on malaria was carried out in barazas (public meetings) by community health workers attached to the rural health centre in the area. The respondents reported that the forum was used often to inform people on various health issues including malaria, but the health education sessions became frequent when there was an epidemic or outbreak of a disease such as cholera.

Those respondents who owned radios, that is 45.5 per cent of the sample population, were further exposed to the advertisements on how to prevent and treat malaria, by taking shop patent anti-malaria drugs from one company or other. There were also advertisements on the daily papers for the 40 per cent literate respondents to further inform them how to prevent and treat malaria.

Section Three: Cross-tabulations.

Although the study was not designed to test any specific hypotheses, cross-tabulations on some of the variables led to the formulation of some null hypotheses (H_o) which were subsequently tested for significance, with the use of the χ^2 (chi-square) test. The formula used for the χ^2 was $\chi^2 = \frac{(fo - fe)^2}{fe}$

The degree of freedom was computed by the formula

$$df = (r - 1)(c-1)$$

In all the tables, the χ^2 test has been applied at 0.05 level of significance.

When the study was designed, it was assumed that the people of Karateng sublocation were homogeneous in terms of their knowledge, attitudes and practices in relation to malaria. However, since the sublocation was divided into three areas for purposes of sampling (fig.3) it was found necessary to find out the significance of the assumption (Table 4:11). The H_o was: Residential area[2] does not affect knowledge[3]

Residential area by Knowledge. Table 4.11

Area / Knowledge	Area 0 1	Area 0 2	Area 0 3	Totals
Those who had knowledge	2 5	2 4	2 2	7 1
Those who had no knowledge	4 4	4 1	4 4	129
Totals	69	6 5	6 6	200

df = 2

$\chi^2_{cal} = 0.295$

$\chi^2_{95} = 5.99$

Significance level 0.05

It was also found necessary to find out who knew more about malaria, the younger or the older respondents[4] (Table 4.12). The H_o was: Age does not affect knowledge.

Table 4.12

Age by Knowledge

Age / Knowledge	Young 18 - 27	Old 28 and over	Totals
Had knowledge	61	10	71
Had no knowledge	10	119	129
Totals	71	129	200

df = 1

$\chi^2_{cal} = 63.13$

$\chi^2_{.95} = 3.84$

Significance level 0.05.

Education, which is seen as a very important variable in this study was cross-tabulated with several other variables to find out if it had any influence on them (Table 4.13 to 4.18). The H_o for table 4.13 was: Age does not affect education, designed to test who were more educated[5] than the others, the younger or the older respondents.

Table 4.13

Age by Education

Education \ Age	Young 18 - 27	Old 28 & Over	Totals
Educated	4 5	3 9	8 4
Uneducated	2 6	9 0	1 1 6
Totals	7 1	1 2 9	2 0 0

$df = 1$

$\chi^2_{cal} = 21.49$

$\chi^2_{.95} = 3.84$

Significance level 0.05

A cross - tabulation was also computed to find out whether education had any influence on knowledge. The H_o was: Education does not affect knowledge (Table 4.14).

Table 4.14

Education by knowledge

level attained / Knowledge	None	Primary 1 - 4	Primary 5 - 8	Secondary 1 & over	Totals
Had knowledge	8	17	20	26	71
Had no knowledge	64	27	33	5	129
Totals	72	44	53	31	200

$df = 3$

$\chi^2_{cal} = 50.58$

$\chi^2_{.95} = 7.81$

Significance level 0.05.

It was also necessary to find out who practised prophylactic[6] measures against malaria, the educated or the uneducated (Table 4.15) and of those who practice it, who practiced it properly[7], the educated or uneducated. (Table 4.16). The H_o for table 4.14 was: Education does not affect knowledge of prophylactic measure.

Table 4.15

Education by Knowledge of Prophylaxis

Education / Knowledge	Educated	Uneducated	Totals
Knew and practiced	69	51	120
Knew and did not practice	10	12	22
Did not know and did not practice	5	53	58
Totals	84	116	200

$df = 2$

$\chi^2_{cal} = 38.02$

$\chi^2_{.95} = 5.99$

Significance level 0.05

The next H_o was:Education does not influence the use of proper prophylaxis (table 4.16)

Table 4.16

Education by proper practice of prophylaxis

education / Practiced	Educated	Uneducated	Totals
Proper prophylaxis	20	5	25
Improper prophylaxis	49	46	95
Totals	69	51	120

$df = 1$

$\chi^2_{cal} = 6.52$

$\chi^2_{.95} = 3.84$

Significance level 0.05

When the categorization of levels of education were changed (table 4.17, and the same H_o as above retained the results became clearer.

Table 4.17

Education Level by Proper Practice of Prophylaxis

Levels attained / Practiced	None	Primary 1 - 8	Secondary 1 and over	Totals
Proper Prophylaxis	2	2	21	25
Improper Prophylaxis	30	58	7	95
Totals	32	60	28	120

df = 2

χ^2_{cal} = 71.89

$\chi^2_{.95}$ = 5.99

Significance level 0.05

Education was further cross-tabulated with prefered mode of treatment (table 4.18).[8] The H_o was: Education does not affect the preference of mode of treatment.

Table 4.18

Education by preferred mode of treatment

Education level / Prefered Treatment	None	Primary 1 - 4	Secondary 1 and over	Totals
Injection	25	50	18	93
Tablets	14	14	6	34
Both	12	9	5	26
Either	16	21	1	38
Neither/but prayer	5	3	1	9
Totals	72	93	31	200

df = 8

χ^2_{cal} = 12.54

$\chi^2_{.95}$ = 15.5

Significance level 0.05.

The results of all the tables in this chapter are analysed and interpreted in the next chapter.

FOOT NOTES FOR CHAPTER 4

1. The category 'other' in table 4.3 represents the denominations which have very few followers among the respondents. They were,

Seventh Day Adventists	-	1
Nomia Luo Church	-	4
Wach Nyasaye Church	-	3
Roho Musalaba	-	3
Mennonite Church	-	2
Ephraim Church	-	2

2. Residential area refers to each of the three enumeration areas used for sampling (fig. 3 chapt. 3).

3. Knowledge refers to the ability to answer correctly questions on causation transmission, prevention and treatment. For purposes of analysis even those who knew the cause, prevention and treatment but did not know the mode of transmission were put with those with knowledge, to avoid having very few people in the frequency cells as required for statistical analysis.

4. For purposes of analysis, in this study any person from 18-27 was said to be young and anybody over 27 was seen as old.

5. The category of 'uneducated' in table 4.13 includes those who had attained no education at all and those with only primary 1 - 4 level. Four years of education were seen as hardly enough for one to retain the ability to read and write, to be educated. Those with 5 years and over were seen to be educated.

6. Prophylatic measure against malaria is the taking of antimalaria drugs on a regular basis to prevent malaria.

7. Proper prophylaxis implies that the person was not only aware of taking preventive drugs to prevent malaria but also took the correct ones such as malaraquin or Nivaquin. Improper prophylaxis implies that the respondent was aware of the measure but took the wrong drugs such as asprin, cafenol, and Aspro.

8. Table 4.18 has cells with frequencies of less than 5. The classifications could not be combined further than already done, hence the statistical results should be viewed in that light. For this table the conceptual differences were more important.

CHAPTER FIVE

INTERPRETATIONS OF FINDINGS AND THEIR IMPLICATIONS ON MALARIA POLICY

The study set out to primarily investigate the knowledge of the Karateng community on malaria, its cause, mode of transmission, symptoms treatment and prevention; assess their attitudes on the disease, the mosquitoe and existing control measures; and to examine their practices in relation to the ptoblem of malaria. This analysis is based on the findings relating to each of the objectives, and their implications on on-going or intended malaria control policies.

Knowledge: Causation, Transmission and symptoms

The findings on causation indicate that all the respondents were aware of malaria as a disease and could identify it by one symptom or other, (Table 4.5), confirming the observation that people become relatively familiar with obvious symptoms of a disease after long exposures to it (Mechanic 1968). Majority knew neither the cause nor the mode of transmission of the disease (table 4.6). Only fourteen out of two-hundred respondents knew malaria was caused and transmitted by the mosquitoe. It is interesting to note that among the causes mentioned such as, rain and cold weather and chewing of maize-stalk, there was no mention of witchcraft or other insects as causes of malaria. The respondents may have avoided mentioning witchcraft for fear of being reproached, but it could also have been because the community views malaria as a natural disease caused by natural elements and has no idea of disease

Causation and therefore transmission through vectors in its traditional medical system (Forster 1976). These findings corroborated with the findings of Dhillon and Kar (1965) in a study among the Orissa of India, who also believed malaria was a natural disease, caused only by climatic factors-rain and cold weather. They also confirmed the argument by Fonaroff(1968) that a simple mosquitoe malaria cause and effect relationship is a difficult perceptual problem. The only difference between the Karateng community and Orissa Community is that in Karateng maize-stalk juice was also associated with malaria.

In both Karateng and Orissa (Dhillon, and Kar 1965) the people related malaria to the rainy season, implying that they had become familiar with its pattern of occurance, due to long exposures to it. It is also important to point out that the beliefs linking malaria to the rainy season were not illogical or far fetched, in view of the type of population propounding them. The data on basic findings indicated that Karateng is a rural area, with typical rural area characteristics. The people are peasants and traditional, with low incomes,[1] low levels of education,poor housing, inadequate water supplies and poor general environmental conditions.

As such the Karateng community would also comprehend events on a cause-effect basis, by which rural people perceive most events (Fonaroff 1968, Mbithi 1974, Grammiccia 1981). It is a fact that during and after the rainy season, conditions are very favourable for the breeding of mosquitoes and hence there are

frequent malaria attacks.

The season also results in cold weather which is associated with shivers, chills and fever, the identified symptoms of malaria. It is also during this season when there is young maize growing on the shambas. Children especially like to chew the young maize-stalk whose juice is quite palatable. The maize plant holds water at the point where the blades attach to the stalk and this can offer good breeding pockets for the anopheles mosquitoe. It is probably during the picking of the stalks that the children get bitten by mosquitoes and hence catch malaria. All these observations have comprehensible cause and effect relationships and it would be up to those charged with the duty of informing such people about malaria, to offer them comprehensible examples, which they can follow.

Knowledge: Treatment and Prevention.

The findings on persons reactions to a malaria attack yielded interesting results. An almost equal number of respondents reported to either do nothing about an attack or go to hospital, 46 percent and 48 per cent respectively (Table 4.7). Those who did nothing about an attack believed malaria cleared by itself, and therefore needed no treatment. The same findings were reported by Dhillon & Kar (1965) about the Orissa people who saw malaria as a self-limiting diseases that needed no treatment. This is another logical observation on the part of these rural uneducated populations. It is a fact that malaria fever is periodic. Depending on the species of the

causative parasite, the fever can clear for 3-4 days before a relapse, even without treatment, especially for people in endemic areas who have some degrees of immunity. It must be this characteristic of the disease that caused the people to think each fever free period signified the end of an attack. With such a large number of people not going for treatment, the malaria cycle cannot be broken even if other control methods are used, because the reservoir of infections is forever present. Those who reported that they went to hospital or practice self-medication said they did so because they knew the anti-malaria drugs from both the hospital and the shops were effective They must have proved through experience, which is a very important element of rural perceptions of events (Mbithi 1974) that they felt better after treatment.

There was a difference however, as to the type of treatment prefered by any person who went to hospital for treatment of malaria. The fact that in reality people do not have a choice for mode of treatment was appreciated by the researcher, but the question was important for assessing how effective control through treatment was, and how it could be made better. It has been observed lately that treatment of malaria through medical facilities or self-medication is probably one of the most immediately applicable ways of reducing morbidity and mortality from malaria (Molineaux et al 1980). In Karateng almost half of the respondents (table 4.8) prefered injections to tablets. They all reported to experience side effects

such as body irritation and vomiting after taking the anti-malaria drugs. They also complained that the drugs were too bitter and one had to swallow too many at once, while only one injection was all that was needed to feel better. MacCormark and Lwihula (1983) also reported that in a Tanzanian community there was refusal by members to swallow chloroquine tablets for the same reasons of side effects. It is clear that these people did not know how dangerous the chloroquine injection was and that it was given only to specific malaria patients. This implies that a large number of those who prefered injections but were given tablets at the health facilities would not take them. This would only lead to drug wastage and hence shortages in the health facilities.

Of those who reported to prefer tablets only 10 per cent said they took the drugs as prescribed by the doctors. The rest stopped taking them when an attack cleared and others forgot to take the drugs after the first day. They also complained that the drugs were very bitter and that one took too many of them at once. There is no reason to doubt that even those who reported to prefer either or both the tablets and injections did not follow the prescribed drug regimen for four days. Moreover many of the respondents did not own watches - only 36 per cent did and thus it would be very difficult for them to estimate six hourly and twenty four hourly doses for chloroquine. No traditional treatment for malaria was mentioned.[2] This implies that the treatment of malaria had no rival traditional treatment to compete with and that with increased awareness on the part

of the people they would take modern treatment seriously.

Ideas on prevention were a correllative of each respondent's idea of malaria causation and transmission. For example, those who believed malaria was caused by being rained on said to prevent malaria they would avoid being rained on, and those who incriminated the maize-stalk said it should not be chewed. Hence very few of the respondents, that is, 35.5 per cent only knew that destruction of mosquitoes would prevent malaria. Nevertheless, 80 per cent of the respondents knew ways of destroying the mosquitoes not for the purposes of preventing or controlling malaria, but for purposes of reducing the mosquitoe nuisance. The methods they knew of were clearing of bush and grass around their homes, covering pits with stagnant waters and the use of insecticides, in the form of sprays or burning coils. Five per cent reported to use bed nets. None of the respondents was aware of residual indoor spraying, but some 20 per cent had seen the use of larvicides. This implies that in this area there has been no systematic malaria control measures and therefore the people are only aware of some and not all the mosquitoe control methods. Two additional methods of dealing with the mosquitoes were reported, smoking them either with cowdung smoke or with smoke from the Lantana Camara[3] species of plants, locally known as 'Nyalo Biro.' The respondents said these methods were good at keeping mosquitoes out of their homes cheaply. The Orissa Community also reported to use cowdung smoke to keep mosquitoes out of their homes (Dhillon and Kar 1965). It might

be advisable to find out the chemical components of both the plant and cowdung to find out if there is any credibility on their efficacy as mosquitocides.

Another form of malaria prevention which is a very important measure of control is the practice of chemo- prophylaxis which means taking of anti-malaria drugs once weekly to prevent oneself from developing malaria. One half of the sample population was aware of the measure, but only 12.5 per cent practised it properly (Table 4.9). The rest either took the wrong drugs or did not practise prophylaxis at all. Those who took wrong drugs took shop patent drugs designed for pain relieving only. It is the contention here that those who took these other drugs were not doing it with the aim of preventing malaria, but took them with the aim of alleviating some already felt discomfort, headache or unspecified pain. Those who did not practice prophylatic measures said they did not see any reasons of taking drugs when not sick or unwell, and because one developed malaria , even after taking preventive drugs.

After investigating what the Karateng community knew about malaria, their attitudes toward it were assessed.

Attitudes toward malaria as a disease and the Mosquito .

Among the sample population, malaria was not perceived as a killer disease. They said they had never heard or seen a person die directly as a result of malaria. This observation on their part is a result of the nature of the disease and the

characteristic of the rural people (Prothero, 1965). Malaria does not lead to immediate death, but causes death through complications (Chapter 2) thus breaking the cause-effect chain of thought (Grammicia 1981, Fonaroff 1968). As such death is seen to have been caused by the complication such as heart-failure but not from malaria which is not perceived to have been able to cause the complication in the first place. Malaria is perceived as a very strong common cold, hence severe and bothersome. They believed that everybody was susceptible to it but children and pregnant women were more prone because they were weak. Generally the people had become apathetic towards it because of the frequency of its occurence.

The respondents viewed mosquitoes as a nuisance but unharmful to health. They were not believed to cause any disease, apart from the itchy spots they left on the skin, which subsequently disappeared after a few days. As such 50 per cent of the respondents believed trying to fight mosquitoes was a waste of time. Dhillon & Kar (1965) reported the same attitudes among the Orissa Community who viewed malaria as a minor fever and mosquitoes as nothing than nuisances.

Attitudes toward Control Programmes.

The only control measure that the respondents had positive attitudes toward was treatment. At least 50 per cent saw the measure as effective. This is the only measure in which the cause-effect relationship is obvious in all measures against malaria.

The other measures which were viewed to focus on insects (mosquitoes) which were of no consequence to the lives of the people were not popular.

On the question of control programmes, the respondents felt that malaria was the government's problem and only the government would solve it by bringing the best drugs to the hospitals and raising the living standards of the people. Only 9 percent of the sample population thought that people themselves should bear the responsibility of malaria control, while 91 per cent felt that the government should be responsible. These findings verify the contention that introducing malaria control programmes to a community without consulting or involving them at all stages of the planning and implementing them makes people view malaria as a problem for the government and not their own.

Observed Practices.

The data on knowledge and attitudes indicate that the Luo culture did not have provisions of protecting oneself from mosquitoes. Hence, man-mosquitoe contact was observed to be very high in Karateng. The area being generally swampy (chapter 3) and abundant with Anopheles mosquitoes (Odhiambo 1980) it would take incredible efforts to avoid man-mosquitoe contact, hence malaria.

The house style preference either because of economic or cultural reasons provided an expedient arrangement for the Anopheles mosquitoe. Most of the houses (table 4.10) had thatch roofs which offer good hiding and resting places for

the Anopheles mosquitoe, which is anthropophilic and endomophilic, that is,it bites man and then rests indoors. It was not only the thatch roofs that favoured the mosquitoes, but also the large unscreened 30-40 centimetre wide eaves which were observed in all the houses. The eaves were considered necessary for indoor air circulation especially during the dry season when temperatures in the Lake Basin region can exceed 27^{o} centigrade (87^{o}f.). In the houses that had no windows (table 4.10) the eaves also served as windows. These eaves offered good exit and entry points for the Anopheles mosquitoe which is reported to enter houses in large numbers (Blackie 1947). The use of insecticides in houses with these type of unscreened openings would be too expensive even for the few who would afford, because it would require large amounts of spray to saturate circulating air and thus kill any mosquitoes.

Day to day activities such as drawing water, washing clothes and bathing in the river also exposed the respondents and especially women and children to further mosquitoe bites. The respondents got their water supply from the rivers, and they would concentrate on the river or stream banks where water does not flow very fast. It is in temporary water collections along grassy banks where the Anopheles Funestus ,the other causative agent for malaria in Kenya, breeds. As such the women and children were more exposed to their bites and consquently, malaria.

The number of pit latrines observed in the area was commendable. Eighty-seven per cent of the homes visited had pit latrines. However, most of them were health liabilities rather than health assets. They were ill-kempt, without pit covers and some did not even have doors, Their conditions possed health hazards especially from fly-transmitted diseases such as cholera and diarrhoea; and also from filariasis (elephantisis) which is caused by the Culex Pipiens mosquitoes, which breed in the pits (Surtees, 1970). Those without latrines polluted the environment even more by relieving themselves every where. During the rainy season feaces finds its way into rivers, streams and wells, leading to feacal contamination of water. This obviously leads to other health problems related to poor sanitation, since the respondents rely on the stream and river water for domestic use. The presence of these other disease organisms only aggravate further the health problems in the area, besides malaria.

Despite the fact that 87 per cent of the respondents had claimed to destroy mosquitoes by clearing bush around their homes,only five per cent had actually done it. Ninety-five per cent of the homesteads visited were observed to have either bush or tall grass in and around them. When asked why they did not clear the bush yet they knew that it would keep away mosquitoes, they explained that the bush was used for grazing their animals. There was no communal land for grazing like in the old days. Millman (1967) had been given the same reasons for not clearing land near the homesteads, and in Botswana, people gave the same reason of pasture for not clearing bush. The discrepancy between th

who reported to clear bush and those who actually did it indicates that sometimes respondents tell an investigator what they think he/she wants to hear and not the truth, but it also shows the logic of an economic activity overriding a health activity.

During the survey it was noted that no organized malaria control programme has been conducted in the area since 1972, during the World Health Organization Anopheles Control Programme trials. However, at least during the survey period, there were attempts to educate wananchi on various diseases including malaria. The health education lectures were carried out at the Rural Health Training Centre and in local barazas (Public Meetings). Both these forums and the method of delivering the lectures were questionable. At the health centres the patients were lectured to every morning on various diseases, their causes and means of prevention before being attended to. One really wonders whether these people listen when they have more crucial personal reasons for being at the health centre. It is also obvious that the information reached very few people, that is only those who attend the health centre. Also, people do not visit the health centre every-day and therefore pick up only some information in an on-going series of lectures. Moreover, those who go late would only pick up some and not all they need to know. This came to light during the survey when respondents showed marked confusion on the transmission of malaria, cholera and tuberculosis.

At the local barazas (public meetings) which were usually called and headed by chiefs, people were lectured on various issues including diseases. However, chief's baraza are associated with orders from the government, which are not to be questioned. People cannot react to what they are being told neither can they question nor voice their feelings on what is being asked of them. Consequently, whatever they hear at the barazas, they possibly leave it there.

It has also been observed that it is men who attend barazas in large numbers in the rural areas (Rogo, 1977). This is despite the fact that in most rural areas like Karateng (table 4.4) there are more females than males due to out-labour migration, of able bodied males. Subsequently much of the information about diseases is heard by men who usually do not impart the knowledge so gained to their wives, yet matters of health lie squarely on them.

Those who owned radios and those who were literate were further exposed to half-information through advertisements. The messages on both the press and the media assumed that everybody knows what malaria is. Over the radio the advertisement would tell the listener that only four tablets of a given shop patent anti-malaria such as malaraquin would cure and prevent them from catching malaria. The advertisement did not tell the listener about the continuation dose, although it would advise him/her to see a doctor if pain persisted. On the press the advertisement asked the reader to make one day

a week a prophylactic day by taking an antimalaria regularly, which would make them not worry about having malaria. It also reminded the reader that malaria is the commonest tropical disease and that every year millions of people died from it. Nevetheless the advertisement did not tell the reader how many of the tablets to swallow but gave false assurance that after swallowing the tablets the reader would be immune from malaria.

The information on the advertisements was not enough to provoke interest on malaria, because even the statistics used were not realistic to the reader or the listener. Giving Kenyan death statistics on malaria might have a better impact, than general world malaria statistics. Also it is better not to take any anti-malaria drugs and thus build natural immunity than to take anti-malaria drugs wrongly, thus creating resistance complications.

All the findings were uniform for the whole sublocation, despite the fact that for sampling purposes the area was subdivided into three enumeration areas. (table 4.11). The χ^2 results did not prove any significant difference between the areas and thus the H_o (null hypothesis) that area did not affect knowledge was accepted. Therefore one could tentatively agree that the people of the whole sublocation were homogeneous in terms of their knowledge, attitudes and practices towards malaria, and as such would accept or reject control programmes uniformly. It also implies that an identified approach to malaria control would work for the whole area.

The χ^2 results (table 4.12) of 63.13 at a significant level of 0.05 indicates that probably age affects knowledge significantly. In normal circumstances, the older a person is the more knowledgeable he supposedly is. However, in relation to knowledge on malaria, the reverse was noted. The younger persons seemed to know more about malaria than the older people probably due to the effect of formal education. As such the null hypothesis that age does not affect knowledge was rejected. Therefore health education in the field should be targeted at the older people, and in institutions of formal education it should be continued and improved, if it exists.

This contention was further strengthened by the χ^2 results of tables 4:13 to 4:17, when education was cross-tabulated with various variables. The assumption that probably younger people knew more about malaria because of formal education was confirmed by the χ^2 results of (table 4:13) 21.49, at 0.5 level of significance. The table indicates that among the respondents, the younger people were relatively more educated than the older people, hence more knowledgeable on malaria, which requires certain levels of scientific understanding. Hence the null hypothesis that education does not affect knowledge was rejected. Knoweledge was actually shown to be significantly influenced by education (table 4.14) with χ^2 results of 50.58 at 0.05 level of significance. Education was also shown to significantly affect not only the knowledge of prophylaxix against malaria (table 4.15) with χ^2 results of 38.02 at 0.05 level of significance, but also significantly affected the proper use of the measure (tables 4.16 and 4.17, with χ^2 results of 6.52 and 71.89 respectively,

both at 0.05 levels of significance.

Formal education seemed to have significant effects on knowledge of malaria, which would in turn affect acceptance or rejection of control measures against it. One important thing that education seemed to have no advantage over was prefered mode of treatment (table 4.18). Malaria treatment is probably the most important control measure for the moment. This is because people usually go to hospital or self-medicate themselves when feeling ill to affect cure. In essence if everybody who suspected he had malaria was treated for it, the infection reservoir would be depleted slowly but surely , thereby reducing morbidity and mortality from malaria.This would then imply that mosquitoes may have only few parasites to transmit, and that way control may be affected. However, the prefered mode of treatment by different people is not conducive to reaching this desirable stage in malaria control. The most practical form of treatment is by anti-malaria tablets, but many people (not only in Karateng) believe that the best cure is affected by injections. Antimalaria injections are very dangerous that they are only given to certain patients. This implies that many people are not satisfied with the treatment which they get for malaria and as such, the infection reservoir may not be depleted in the near future. The χ^2 results of 12.54 at a significance level of 0.05 indicates that education does not affect the prefered mode of treatment (table 4.18), with just as many uneducated as educated people prefering injections to tablets.

Summary of findings and the Health Belief Model.

The Health Belief Model (HBM) is used in this section to explain why control measures currently in use in Karateng have not been successful, and how even the intended ones will not be successful if certain behavioural and policy changes are not met. In the HBM, health behaviour is perceived as any activities undertaken by a person for the purposes of preventing disease or detecting it in an asymptomatic stage, and illness and sickrole behaviour are perceived as activities undertaken by ill persons to discover suitable remedy and after discovering it undertake another activity for the purpose of getting well (Kasl et al 1966).

In relation to malaria, activities taken as health behaviour include taking of anti-malaria drugs (prophylaxis) and personal protection from mosquito bites either by use of protective clothing, insecticides repellents, bed nets and screening of all house ventilations or clearing of bush, draining stagnant waters and using larvicides near dwellings. Illness and sickrole behaviour in relation to malaria are both seen as a situation where one diagnoses oneself as having malaria or having it diagnosed by someone else acts appropriately by either going for treatment or administering self-treatment on oneself.

The HBM posits that an individuals' engagement in a particular kind of health, illness or sickrole behaviour depends on two conditions, the perceived amount of threat and the attractiveness or value of the behaviour. The amount of threat

further depends on three other factors; what the individual knows about the disease, the perceived susceptibility to the disease and the perceived seriousness of the disease (seriousness measured by fatality). This means that for an individual to react to malaria, he has to know about it as a disease and its consequences, in order to view it as a threat to his life. In Karateng, the people did not know about malaria although they were aware of it.[4] They perceived themselves to be susceptible to it, but it was not perceived as a serious disease or a threat to life. However the few who knew about malaria took action against it and even some of those who perceived themselves to be susceptible to it also took some action.

According to the HBM, the choice of action taken by an individual did not only depend on whether he knew them, but it also depended on the perceived probability that the actions would lead to desirable preventive or ameliorative results; the unpleasantness or cost of taking or not taking such action and the simplicity and convenience of carrying out the action. The fact that one half of the sample population reported to either administer self-medication or go to hospital when they suspected they had malaria and the other half did nothing about it clarifies the point. Those who did something believed hospital treatment or self-treatment would lead to desirable ameliorative results while those who did nothing had negative perceptions about treatment or could not afford it. Other preventive measures like prophylaxix were unpopular not only

because of the unpleasantness of a swallowing the bitter drugs but also because their efficacy was questionable. Measures aimed specifically at the mosquitoes were also unpopular because for one, people did not believe it is the mosquitoe that caused malaria and two, all of them entailed either use of money, use of time or rendering the peoples' animals pastureless. For example a person would need money to purchase, insecticides, repellents, screens and nets. They would have to use time (man-hours) to clear bush, fill stagnant water pools around their homes and in the process deny their livestock pasture land, and all these, only to kill an insect they perceived as harmless.

In summary, malaria control measures have not been and cannot be successful in Karateng because,

1. The people do not know about the cause, mode of transmission, treatment and prevention of malaria.
2. Their attitudes towards malaria, and the mosquito are not conducive to successful malaria control.
3. Their social and cultural practices are also not conducive to successful malaria control.
4. Their educational levels and economic status are not conducive to malaria control.

For malaria control to succeed in Karateng (and any other rural area), these four factors have to be addressed before embarking on malaria control.

FOOTNOTES FOR CHAPTER FIVE

1. Income was measured by education, occupation, type of house style, number of livestock, and ownership of gadgets like radios, bicycles, watches and clocks and also measured from any other reported source of income either from a relative working elsewhere or any other source.

2. However, during informal conversations with some elders in the area, the researcher was told that Guava leaves are boiled in water and the herbal tea resulting is given to malaria patients in order that they vomit bile which is believed to be a symptom of malaria, thus affecting cure

3. Lantana Camara belongs to the family Verbenaceae. It is a shrub that reaches a height of 3-4 mts. and is widely spread in the area especially in waste land.

4. They were aware of a disease called malaria but did not know its cause in terms of scientific knowledge (see operational definitions).

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

The aim of this study was not only to find out how socio-cultural factors namely knowledge, attitudes and practices of the Karateng community contributed to the ineffectiveness of malaria control programmes. One of its other major objects was to make suggestions as to how problems emanating from these factors would be minimized.

The findings of the study suggest that besides economic and biological factors, (see chapter 1) socio-cultural factors have also contributed to the ineffectiveness of malaria control measures and inevitably, the ineffectiveness of malaria control programmes.

Different (people's) cultures classify diseases in terms of their cause, the weight of their seriousness, the type of treatment required and the healer to be consulted (Mead 1966), and decisions are arrived at through experience and empirical knowledge. This is unlike in modern medicine where diseases are classified in single universal categories (Lieban 1977), and decisions arrived at through rigorous scientific knowledge.

The Luo of Karateng classify malaria as a mild but bothersome, naturally caused disease, which does not even have specific traditional modes of treatment. It is not among the diseases like cholera, which they consider serious, because they do not believe it can lead to death. They go for treatment not because of the seriousness of the disease, but to affect cure

for the discomfort of pain or illness and also because the health centre is close to them.

With this type of population a complex operation like malaria control which requires understanding of an equally complex biological system, (see chapter 1), continuous efforts and strict personal and communal discipline is unlikely to succeed. Socio-cultural factors make it difficult for these people to comprehend either why malaria is made a priority disease by the government, or control measures which are derived from scientific knowledge and are geared towards the elimination of what they believe are harmless insects- mosquitoes. Moreover, all the measures entail either economic or time costs, two very important issues for most rural people.

It must be admitted that socio-cultural factors have not been given adequate attention either in the planning or implementing of malaria control prgrammes. In particular, attention has not been paid to understanding what peoples' attitudes are towards malaria control and ways of changing these attitudes. It is the contention here that health education aimed at a change in health, illness and sickrole behaviour towards malaria will achieve the results most desired in the control of malaria, a reduction in morbidity and mortality, resulting from this scourge. This would not only alleviate suffering among populations, but would contribute to the development of the nation. Sick people are a liability, healthy people are an asset.

Recommendations - How can it be done?

Change in health, illness and sickrole behaviour towards malaria can be achieved through health education, an important component of primary health care.[1] The findings of the study indicated that education had very significant influence on knowledge and hence positive attitudes toward malaria and its control. Health education entails teaching people about prevailing health problems and the methods of preventing and controlling it (WHO, 1978). Its objectives are, to promote or reinforce existing healthful behaviour of individuals and thus a whole community, to change behaviour which has negative affects upon the health status of the people and to develop among the people a sense of responsibility for their own health.

Health education on malaria should aim especially at making people understand the seriousness of the disease and its cause, thereby changing their attitudes toward the disease and the mosquito. They should also be made aware of how some of their normal daily activities such as bathing and washing in the rivers lead to malaria. Because those are activities that they must perform, they should be advised to take water to their homes to avoid the river banks where there are more mosquitoes. Cultural factors like house style preference can be addressed after people have understood the link between malaria and mosquitoes. For economic reasons, screening of ventilation by the use of wiremesh is not practical, but people could be persuaded to decrease the width of the eaves or do

away with them completely and have only windows or small ventilators for air ciculation.

At this juncture it suffices to point out that culture should not be viewed as the major culprit in the ineffectiveness of malaria control. Erasmus (1961) argues that even uneducated and illiterate people are not bound to their cultures and beliefs like puppets. When they are given opportunity to measure the advantages of new knowledge and new alternatives, they act to maximize their expectations. It is up to the health providers to demonstrate the efficacy of malaria control programmes, to maximize their acceptance.

How health education can achieve this and especially in rural areas will depend not only on the approach,contents and teaching techniques, but will also depend on consistency and dedication on the part of all concerned.

It is suggested that health education on malaria for rural areas should be designed in a manner suited to peasant psychology and behaviours. Peasants find it difficult to understand long discourses and sophisticated techniques, but are receptive to ideas presented in form of folklore scenes, popular songs and poems, which are close to the realities of their daily lives (Cau 1981). This argument implies that control programme approaches must be specific to each malarious area,especially on cultural issues. As such, before a control programme is launched in an area, a baseline study on socio-cultural factors

must be conducted to find out what people know about malaria in that area, their cultural and religious beliefs about malaria and where they place it in their list of priorities. This would enable those concerned to formulate appropriate health education techniques. Without a sound knowledge and understanding of socio-cultural factors towards malaria, a health educator can neither communicate with the people nor can he/she persuade them to change.

As an example, the Luo of Karateng might be more receptive to the idea on malaria causation if the educator uses their own belief 'rainy weather causes malaria' as a base for explaining how rainyweather actually creates favourable conditions for mosquitoes to breed, and therefore there are many mosquitoes during the rainy weather which cause malaria. Although the cause-effect relationship in various elements of the malaria chain are difficult to demonstrate, through continuous efforts on the part of health educators, the mosquito-malaria link may be understood by the people.

The only phase at which cause effect can be demonstrated in malaria is between taking anti-malaria drugs and suppressing malaria. People should be encouraged to take the drugs as prescribed and this will demonstrate to them the cause-effect relationship. They should also have inculcated in them why tablets against malaria are better, despite side effects associated with them, which are less dangerous than the side effects from injections. This point should be taken seriously

because at the moment, malaria control through drugs despite the growing problem of resistance,is a very important measure of reducing morbidity and mortality. In fact if malariologists would develop a cheap 'coated' antimalaria drug available to everybody, and combine the dosage so that the number a person has to swallow at once is lessened, control of malaria by chemotherapy might succeed where other measures have not.

The venues for health education should be thought out carefully. It was demonstrated in the findings of this study that health centres and barazas (public meetings) are not good forums because people are not able to exchange ideas or react to what they are being told. Health education through the media and the press is only informative to people with certain levels of education, and at times it is vague and misleading. It is suggested that during the baseline study of an area before introducing a control programme, women groups and church organizations should be identified and attendance rates determined to assess whether they can be used as forums for health education. Women's groups especially should be paid more attention to, because they comprise the larger proportion of the population in rural areas and because they have been found in many countries "to constitute a natural mechanism for community based action" (Royston 1985:15) which is very important for community based malaria control. These women's groups have also been identified as "compelling forces of change" (Mahler 1985:3) and are "ideal for primary health care activites " (Royston 1985:15).

It has also been postulated that "education of women greatly changes the traditional balance of familial relationships, with profound effects on health care-" (Bhatia 1985:14). Therefore targeting on women might achieve better results. The responsibility of health in their families and hence the whole community lies on them. It is they who must teach good health behaviour to their children, who must create a clean environment, who must ensure that children are taken to the health centres, and this way ensure that the children learn health, illness or sickrole behaviour on malaria based on scientific knowledge.

It is also suggested that health education especially on diseases like malaria be made compulsory from primary schools, when children are more receptive to new ideas. Properly taught, the knowledge might be retained for a long time.

However, all these suggestions can only be achieved through firm government policies on both education and health. The elimination of illiteracy is undoubtedly one of the essential conditions for raising the living standards of a population and promoting health education. But, malaria control does not depend only on education and health sectors of the nation but also on housing, good communication and agriculture, which must all coordinate to achieve the desired end. This implies that malaria control should be part of community development and not an isolated venture. Availability of basic necessities of life such as food, water and good

houses would leave people with time to deal with malaria, as it has been argued that poverty increases apathy towards the disease (Gramiccia 1981).

For the government to achieve its aim of providing health for all Kenyans by the year 2000, it should take the problem of malaria in the country seriously. It should define an adequate health policy for that purpose besides those in the Laws of Kenya[2] which would only be appropriate for urban areas, and those in the successive development plans.[3] It should also allocate an appropriate portion of the National budget on malaria control. Health education should be considered seriously by the formulators of the National Control Programme, than had hitherto been done.

It is the contention of the author that community based malaria control can be achieved through the combination of a clear legislation, health education and all the other methods of malaria control. The enormous costs of such a venture are appreciated, but the gains in saving human life and suffering offsets fiscal losses.

FOOTNOTES FOR CHAPTER SIX

1. Primary health care
   - includes at least: education concerning prevailing health problems and the methods of preventing and controlling them; promotion of food supply and proper nutrition;an adequate supply of safe water and basic sanitation; maternal and child health care including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; and provision of essential drugs;
   - involves, in addition to the health sector, all related sectors and aspects of national and community development, in particular agriculture, animal husbandry, food, industry, education, housing, public works, communications and other sectors; and demands the coordinated efforts of all those sectors.
     - From the Declaration of Alma-Ata, made at the International Conference on Primary Health Care held at Alma-Ata, USSR, September 1978. A WHO Paper

2. See Laws of Kenya, chapter 242, Public Health Act 1921 and Chapter 246, Malaria Prevention Act 1929.

3. See Kenya Development Plans 1969 - 1988 chapters on Health.

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APPENDIX

SOCIAL ASPECTS OF MALARIA

A K. A. P. STUDY AMONG THE LUO OF KARATENG KISUMU DISTRICT

Q U E S T I O N N A I R E

INSTRUCTIONS FOR ASSISTANT

These instructions explain questions and how the answers are to be recorded. Read the instructions with the questionnaire in hand.

All answers are to be carefully recorded in BIRO

1. Make an X on the response given.

e.g. A. Head (female) = 1

B. Head (Male) = 2

C. Wife = 3

D. Daughter X = 4

I

Do not enter anything in the boxes. The Coder is responsible for them.

Write the numerical answers in the space provided

EXAMPLE: The respondent says his/her age is 40 enter 4 0 years.

When a question has "other (Specify_____) as a possible response and you must use it, print the response on the line and mark it with an X.

Never Use abbreviation when writing response.

Every question requires a response; there are no blanks. If a question is left blank it is assumed that the interviewer neglected to ask it or if asked, forgot to record the response.

If a question (a) does not apply for the respondent please enter N A very clearly which means "Not Applicable" but never leave it blank; and jump to the next question.

Print the exact response of the respondent and not your own.

The open ended questions give the respondent a chance to freely express themselves. Please do not rush them or put words in their mouths.

GREETINGS: We are visiting residents of Karateng Sub-Location and talking with them about a disease which is prevalent in this area. We are only interested in the opinion of the people here in general, therefore we are not recording the names of those we have talked with. I would be grateful if you can spare some time to answer these few questions.

Name of interviewer_____

Date_____

Respondent Number _____

Enumeration Area _____

Biographical Information

1. Sex of respondent (do not ask) Male 1 _____

   Female 2 _____

2. What is your relationship to head of household.

   A. Head (male) 1
   B. Head (Female) 2
   C. Wife 3
   D. Daughter 4
   E. Father 5
   F. Son 6
   G. Mother 7
   H. Other 8
   I. None 9

3. How old are you, (Probe)_____

   (completed) years)

4. What is your religious denomination?

   _____

   _____

5. a) Can you read and write in any language?

   Yes 1
   No 2

   b) (If Yes) Which language(s)

   A. Dhobu Yes 1
   No 2

B. Kiswahili Yes 1

No 2

C. English Yes 1

No 2

D. Other Yes 1

No 2

6. What level of formal schooling did you attain?

A. None 0

B. Primary 1-4 1

C. Primary 5-8 2

D. Secondary 1 - 4 3

E. Secondary 5 - 6 4

F. College 5

G. University 6

H. Other Specify_____) 7
(Years)

7. What is your major occupation?

_____

_____

_____

8. Who else in this household has a major occupation?

A. Boys 15 - 19 Yes 1

No 2

B. Girls 15 - 19 Yes 1

No 1

C. Men 20-49 Yes 1

No 2

D. Women 20-49 Yes 1

No 2

E. Men 50 years & Over Yes 1

No 2

F. Women 50 years & Over Yes 1

No 2

9. What are their occupations

A. Boys _____

_____

B. Girls _____

_____

C. Men 20 - 49 _____

_____

D. Women 20-49 _____

_____

E. Men, 50 & Over _____

_____

Household Characteristics.

10. How many people altogether live in your household?

_____

11. How many of them are

A. Male children under 5 years _____

B. Female children under 5 yeas _____

C. Boys 5 - 14 years _____

D. Girls 5 - 14 years _____

E. Boys 15 - 19 years _____

F. Girls 15 - 19 years _____

G. Women 20 - 49 years _____

H. Men 50 & Over _____

I. Women 50 & Over _____

Respondents knowledge about malaria

12. What is the local name(s) for Malaria"

_____

_____

13. What are the major symptoms (signs) for malaria?

(Do not read answers Tick as mentioned by rank)

A. Fever Yes 1

No 2

B. Vomitting Yes 1

No 2

C. Chills & shivering

Yes 1

No 2

D. Joint pains Yes 1

No 2

E. Other_____ Yes 1

No 2

14. a) Are the Signs the same for (children and adults) everybody? Yes 1

No 2

b) (If No) Please explain. _____

_____

_____

15. What brings Malaria? _____

_____

_____

16. How does one get it? _____

_____

_____

17. Where are you more likely to 'get' Malaria?

A. In the Shamba Yes 1

No 2

B. In the house Yes 1

No 2

C. In another village Yes 1

No 2

D. I don't know Yes 1

No 2

E. Other (Specify)_____ Yes 1

No 2

18. During which months is there more malaria in this area?

A. January	01
B. February	02
C. March	03
D. April	04
E. May	05
F. June	06
G. July	07
H. August	08
I. September	09
J. October	10
K. November	11
L. December	12

19. During which months is there no malaria in this area?

A. January	01
B. February	02
C. March	03
D. April	04
E. May	05
F. June	06
G. July	07
H. August	08
I. September	09
J. October	10
K. November	11
L. December	12
M. None	

20. What is it that makes malaria disappear during those months? _____

_____

_____

21. a) Who is most susceptible to malaria? (do not read answers Rank as mentioned)

A.	Babies	1-12 months	Yes	1
			No	2
B.	Children	1-2 years	Yes	1
			No	2
C.	Children	3-12years	Yes	1
			No	2
D.	Adolescents	13 -18 years	Yes	1
			No	2
E.	Men	19-49 years	Yes	1
			No	2
F.	Women	19-49 years	Yes	1
			No	2
G.	Men, 50 & Over		Yes	1
			No	2
H.	Women 50 & Over		Yes	1
			No	2
I	Every body		Yes	1
			No	2

b) Why? _____

_____

22 a) Do pregnant women 'get' malaria more often than those who are not pregnant?

Yes 1

No 2

b) (If yes) Why?_____

_____

_____

c) (If No) Why? _____

_____

_____

23. a) Do your visitors 'get' malaria when they come to visit you? Yes 1

No 2

b) Where do the visitors come from?

_____

_____

_____

c) Why do the visitors catch it?

_____

_____

_____

24. a) If a person 'gets' malaria, can he pass it on to someone else?

Yes 1

No 2

b) (If Yes) How _____

_____

_____

c) (If No) Why? _____

_____

_____

25 a) Can Malaria lead to any other disease or diseases? Yes 1

No 2

b) (If Yes) which disease(s)?

_____

_____

_____

26 a) Is there a person in this household who cannot or does not 'get' malaria? Yes 1

No 2

b) (If Yes) who is the person? _____

_____

c) What is her/his age? _____

_____

d) Why can't malaria attack him/her?

_____

_____

_____

27. a) Is there more malaria now than ten years ago?

Yes 1

No 2

b) (If Yes) Why? _____

_____

_____

C) (If No) Why? _____

_____

_____

28. a) Have you had any information on how to identify malaria?

Yes 1

No 2

b) (If Yes) When? _____

_____

c) (If No) Why? _____

_____

d) Who gave you the information ?

_____

_____

e) Where was the information given?

A. In the home 1

B. In a Baraza 2

C. In the health Centre 3

D. In school 4

E. In church 5

F. Other, Specify_____ 6

_____

Practice with respect to malaria

29. a) When did you last have malaria _____

_____

b) How did you know it was malaria? _____

_____

c) Where did you contact it? _____

_____

_____

d) What did you do to treat it? _____

_____

_____

e) Was the treatment effective? _____

Yes 1

No 2

f) (If No) What was the problem?

_____

_____

_____

30. a) Is there a child under 5 years old in this house?

Yes 1

No 2

b) When did he/She last have malaria?

_____

c) How did you know it _____

was malaria? _____

d) Where did the child contact it?

_____

_____

e) What did you do to treat it?

_____

_____

f) Was the treatment effective?

Yes 1

No 2

g) (If No) What was the problem?

_____

_____

_____

31. a) Is there a pregnant mother in this household?

Yes 1

No 2

b) When did she last have malaria?

_____

_____

c) How did you know it was malaria?

_____

_____

_____

d) Where did she contact it?

_____

_____

_____

e) What did she do to treat it?

_____

_____

_____

f) Was the treatment effective?

Yes 1

No 2

g) (If No) What was the problem?

_____

_____

_____

Practice with respect to malaria

32. a) Can malaria be prevented?

Yes 1

No 2

b) (If Yes) how? _____

_____

_____

c) (If No) how? _____

_____

_____

33. a) When you are not actually suffering from malaria, do you take any tablets to prevent yourself from catching it? Yes 1

No 2

b) (If Yes) which one(s)?

_____

_____

c) (If No) Why? _____

_____

_____

34. Where do you get tablets from?

A. Hospital 1

B. Health Centre 2

C. Village helper 3

D. Duka 4

E. Other (Specify_____)

35. a) Is there any other form of prevention from malaria?

Yes 1

No 2

Don't know 3

b) Give examples _____

_____

_____

36. a) When you actually have malaria and you go to the hospital, do you prefer tablets or injections for treatment?

Tablets 1 Neither 5

Injection 2

Both 3

Either 4

bi) If tablets, Why? _____

_____

_____

b ii) Do you take the tablets as the doctor asked, until they are all finished?

_____

_____

_____

C) If Injection, Why? _____

_____

_____

d) If both, Why? _____

_____

_____

e) If Either, Why? _____

_____

_____

f) If Neither, Why? _____

_____

_____

37. How do you keep mosquitoes away from your home?

1. _____
2. _____
3. _____
4. _____

38. a) Do you think discarded empty tins, pots etc. lead to the increase of mosquitoes?

Yes 1

No 2

b) If Yes, How? _____

_____

_____

c) If No, Why? _____

_____

_____

39. a) Are there any government projects in this area to help prevent malaria. Yes 1

No 2

Don't know 3

b) If Yes, which projects are they?

_____

_____

_____

40. a) What do they do? _____

_____

_____

b) How effective are the methods?

A. Very effective 1

B. Effective 2

C. Not effective 3

D. Don't know 4

Attitudes on Malaria

41. a) "In this area, malaria is the most serious disease."

Do you A. Strongly agree 1

B. Agree 2

C. Not sure 3

D. Disagree 4

E. Strongly disagree 5

F. Don't know 6

b) If it is not the most serious one, which one/s is/are

1. _____

2. _____

3. _____

4. _____

42. a) When a person has malaria "he should be taken to the hospital immediately." Do you

A. Strongly Agree 4

B. Agree 3

C. Not sure 2

D. Disagree 1

E. Strongly Disagree 0

F. Don't know 9

b) Why? _____

_____

_____

43. a) When a person has malaria "he should be taken to a medicineman? Do you

A. Strongly agree 4

B. Agree 3

C. Not sure 2

D. Disagree 1

E. Strongly Disagree 0

F. Don't know 9

b) Why? _____

_____

_____

44. a) When a person has malaria, "he should be given tablets from the duka," Do you:

A. Strongly agree 4

B. Agree 3

C. Not sure 2

D. Disagree 1

E. Strongly disagree 0

F. Don't know 9

b) Why? _____

_____

_____

45. a) When a person has malaria, "he should be given any medicine in the house."

A.	Strongly agree	4
B.	Agree	3
C.	Not sure	2
D.	Disagree	1
E.	Strongly disagree	0
F.	Don't know	9

b) Why? _____

_____

_____

46. a) Can malaria kill?

Yes	1
No	2

b) (If Yes) For whom is it especially Fatal.

A.	Babies	Yes	1
		No	2
B.	Children	Yes	1
		No	2
C.	Adolescents	Yes	1
		No	2
D.	Men	Yes	1
		No	2
E.	Women	Yes	1
		No	2

F. Pregnant Women Yes 1

No 2

G. Old People Yes 1

No 2

47. a) Does malaria keep you from work?

Yes 1

No 2

b) (If Yes) Give details _____

_____

_____

c) (If No) Give details _____

_____

_____

48. a) Did the school age child in this household miss school last week? Yes 1

No 2

Not Applicable 3

b) (If Yes)What was the disease? _____

_____

49. a) Are there any taboos that if broken can lead to malaria? Yes 1

No 2

Don't know 3

b) (If Yes) give details _____

_____

50. a) Is malaria a difficult disease to treat?

Yes 1

No 2

Don't know 3

b) (If Yes) Give details_____

_____

_____

c) (If No) Give details_____

_____

_____

51. a) Is the mosquito a dangerous insect?

Yes 1

No 2

Don't know 3

b) (If Yes) Give details_____

_____

_____

52. What disease/s do you get from mosquito bites?

1. _____

2. _____

3. _____

53. a) "Mosquito cause elephantiasis." Do you:

A.	Strongly agree	4
B.	Agree	3
C.	Not sure	2
D.	Disagree	1
E.	Strongly Disagree	0
F.	Don't know	9

b) (If No) What do you think causes it?

_____

_____

_____

54. What can you do to prevent mosquito from biting you?

_____

_____

_____

55. a) Has God called any member of this household lately?

Yes	1
No	2

b) Do you know what was the cause of the death?

_____

_____

_____

c) (If Malaria is given as a cause, ask)

how did you know it was malaria?

_____

_____

_____

56. Do you have any suggestions as what should be done about the malaria problem in the future?

_____

_____

_____

INCOME INDEX

57. Who owns the house?

A. Owned by Family 1

B. Rented by family 2

C. Company leased 3

D. Other (Specify_____) 4

58. Where does the family get water for drinking and cooking from?

A. Well 1

B. River 2

C. Public water outside house 3

D. Running inside house 4

E. Other (Specify__)5

59. a) Do you have a toilet?

Yes 1

No 2

b) (If Yes) where is it located in relation to the house? _____

_____

_____

c) (If No) where do they relieve themselves?

_____

_____

_____

d) What type is the toilet?

A. Flush toilet 1

B. Pit Latrine 2

C. Other (Specify_____) 3

60. What supplies the family with light. (Expect more than one answer)

A. Firewood 1

B. Tyre strips 2

C. 'Mkebe' lamp 3

D. Hurricane lamp 4

E. Pressure lamp 5

F. Gas lamp 6

G. Electricity 7

61. a) Do you own a watch? Yes 1
No 2

b) Do you own a Clock? Yes 1
No 2

c) Do you own a bicycle? Yes 1
No 2

d) Do you own a motorcycle? Yes 1
No 2

e) Do you own a car? Yes 1
No 2

f) Do you own a Radio? Yes 1
No 2

g) Do you own a television? Yes 1
No 2

62. How far is the house from the main Road?

_____

_____

63. How far is the house from the hospital?

_____

_____

64. How far is the house from the dispensary?

_____

_____

THANK YOU VERY MUCH FOR YOUR COOPERATION.

INTERVIEWERS OBSERVATION GUIDE

WEALTH INDEX:

1. What is the house made of:

a) Walls

A. Mud 1

B. Bricks 2

C. Blocks 3

D. Stones 4

E. Other 5

Specify

.....

b) Roof

A. Thatch 1

B. Tin(Madebe) 2

C. Corrugated iron sheets 3

D. Tiles 4

E. Other (Specify___) 5

c) Floor

A. Cement 1

B. Wood 2

C. Earth 3

D. Other (Specify___) 4

d) Windows

A. Glass 1

B. Wood 2

C. Wire 3

D. Iron 4

E. No. windows 5

2. How many rooms are there in the house?

3. What is the condition of the compound close to the house?

Bush 1

Grassy 2

Well kept 3

4. Are the windows of the house or huts screened with

A. Nothing 1

B. Wire Mesh 2

C. Polythene Sheeting 3

D. Any other, specify 4

;.....

E. No Windows 0

5. Are there discarded tines, pots, or any other containers close to the home?

Yes 1

No 2

Cannot tell 3

6. Are there any pools, streams or water holes close to the home? Specify.

Yes	1
No	2
Cannot tell	3

.....

.....

.....

7. Are there any domestic animals in the house e.g. chickens/ goats?

Yes	1
No	2

8. Are there any livestock in the compound?

Yes	1
No	2

9. Are there any fishponds close to the house?

Yes	1
No	2