

A STUDY TO DETERMINE THE KNOWLEDGE AND
INCIDENCE OF MALARIA AMONG PREGNANT MOTHERS AT
MBERESHI RURAL HEALTH CENTRE, KAWAMBWA DISTRICT

BY

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THE UNIVERSITY OF ZAMBIA

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ZRTN: LUSAKA 1998

ZRN: KITWE 1994

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LIST OF ABBREVIATIONS

CBoH	-	Central Board of Health
CSO	-	Central Statistics Office
GFATM	-	Global Fund to fight AIDS, Tuberculosis and Malaria
IPT	-	Intermittent Presumptive Treatment
ITG	-	Integrated Technical Guideline for Frontline Health workers
ITNs	-	Insecticide Treated Nets
MoH	-	Ministry of Health
NMCC	-	National Malaria Control Centre
RBM	-	Roll Back Malaria
UNDP	-	United Nations Development Programme
UNICEF	-	United Nations Children's Emergency Fund
UNZA	-	University of Zambia
UTH	-	University Teaching Hospital
WHO	-	World Health Organization
ZDHS	-	Zambia Demographic Health Survey

DECLARATION

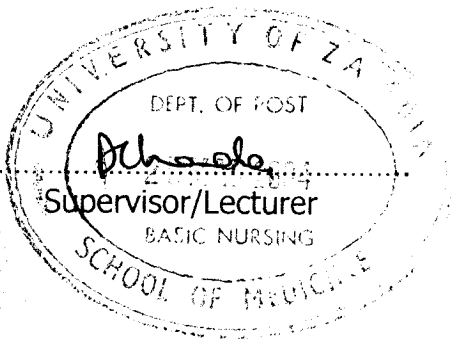
I Hezron Kanswata Chilefu, hereby declare that the work presented in this study is entirely of my own independent investigations. The study is the only one of this kind and it is not being submitted for the award of any other degree other than the Bachelor of Science in Nursing Degree at The University of Zambia.

Signed:
Student

Date: 11/03/04


Signed:
Supervisor/Lecturer

Date: 25/03/04



STATEMENT

I hereby certify that this study is entirely the result of my own independent efforts and investigations. I have clearly indicated in the text and the references the various persons and sources to which I am highly indebted

Signed: 
Student

Date: 11/03/04

DEDICATION

I passionately dedicate this study to my wife Mercy Kanswata, my sons; Calvin and Hezron Jr. and other family members whose devotion, patience, and forbearance were a constant source of my support and encouragement.

ABSTRACT

The aim of the study was to determine the knowledge and incidence of malaria among pregnant mothers.

Most of the literature revealed that malaria is a public health problem. It is on an increase in tropical countries especially the sub-Saharan Africa where the warm and humid climate favours the breeding of anopheles mosquitoes on the pools of stagnant water. Due to the increase in malaria cases, a concerted effort is being made by governments and non-governmental organizations to eradicate it.

A non-experimental descriptive design was used. The study was conducted at Mbereshi Rural Health Centre, Kawambwa District. The study sample comprised 50 respondents. A systematic sampling method was used for the selection of mothers. Data was collected by the use of a structured interview schedule in order to accommodate subjects that cannot write or read. The duration for data collection was four (4) weeks from the first week through to the 4th week of September, 2003. The data collected was then analyzed manually and findings were presented in cross tabulations and frequency tables.

After the analysis of data, the findings revealed that the pregnant mothers had knowledge on malaria but at different levels despite the fact that the majority (80%) had only primary school education. The majority of the mothers who were

more knowledgeable on malaria fell in the age group ranging from 15 years to 29 years.

The study findings also established that despite the high level of knowledge on malaria among women, the incidence of malaria in pregnancy was still high (52%). It was also established that despite the bed nets being sold at a subsidized price which is affordable to them by using their family income, only 50% of the mothers used the bed nets.

With the findings revealed in the study;

- There is need for a wide scale research to be done on the same topic using a wider sample representative of the population so that findings can be generalized.
- There is need for health workers to take each encounter with antenatal mothers as an opportunity to discuss malaria and its impacts on pregnancy.
- Since the majority of the mothers seemed to have good knowledge on malaria, but the incidence still seems to be high, there is need to emphasize to the mothers to put the knowledge they have into effect so as to combat malaria effectively.
- There is need to teach the mothers on the new regime of malaria treatment so that their knowledge on anti-malarial drugs can be up dated.
- There is need to teach the mothers on the new regime of malaria treatment so that their knowledge on anti-malarial drugs can be up dated.

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND

Zambia is a landlocked country covering an area of 752,614 square kilometers and consisting of about 2.5 percent of the area of Africa. It shares borders with the Democratic Republic of Congo (DRC) and Tanzania in the north; Malawi and Mozambique in the east; Zimbabwe and Botswana in the south; Namibia in the southwest and Angola in the west. Administratively the country is divided into nine provinces.

Zambia lies in the southern tropics between 8 and 18 degrees south latitude and between 20 and 35 degrees east longitude. It looks like a huge butterfly sprawling over the central African plateau, with an average attitude of 1,127 meters above sea level. The mountainous areas are found chiefly along the border with Tanzania and Malawi where the land rises to 2,000 metres above sea level. The broad depressions at the edges of the plateau form lakes Tanganyika, Mweru and Bangweulu in the north, the Luangwa river in the east and the Kafue basin and the alluvial of the Zambezi forms Zambia's southern border with Zimbabwe. Among the other major rivers in the country are the Kafue, Luangwa and Luapula.

Zambia has a tropical climate and vegetation. There are three distinct seasons; the warm-wet season stretching from November through to April, a

cool dry winter season from May to August with the mean temperature varying between 14 and 30 degrees centigrade and a hot dry season during September and October with mean day time temperatures rising to between 29 and 32 degrees centigrade in the north and northwest and 35 degrees centigrade over most of western Zambia. The Copperbelt, Northwestern, Northern and Luapula Provinces receive the highest precipitation, with the annual average ranging from 1,100 millimeter to over 1,400mm. There is a systematic decrease in rainfall towards the south and east, with an average ranging between 600 millimeters to 1,100 millimeters. The typical vegetation cover is woodland savanna with a mixture of various types of trees, tall grass, herbs and other woodlands which are mainly of the deciduous type usually found on the main plateau. These are also found in other areas, especially the successful maize-farming areas of Southern and Lusaka Provinces. Forests are found in Northwestern and Northern Provinces. Grasslands occur mainly in the seasonal flood plains of Western Province and the Kafue and Bangweulu Swamps. Zambia has a mixed economy consisting of a modern and urban-oriented sector confined to the line of rail and a rural agriculture sector, (Demographic Health Survey (DHS), 1996:1-2).

Kawambwa is one of the districts found in the Luapula Province and it lies 240 km north of Mansa the Provincial Headquarters. The district shares boundaries with the Democratic Republic of Congo in the west, Nchelenge district in the north, Mwense district in the south, Mporokoso district in the northeast and Luwingu district in the east.

Kawambwa district covers an area of 19,303 square kilometers and it accounts for 38% of the total area of the Luapula Province. It has two geographical features, the plateau in the east and the Luapula Valley in the west where Mbereshi rural health centre is located. The Luapula Valley is swampy and has a lot of pools of water which are potential sites for the breeding of mosquitoes which cause malaria.

The population of the district as stated by Central Statistical Office (CSO), 2000 was 103,760. Out of the total population of the district, Mbereshi rural health centre catchment area caters for 6,416. Fishing and subsistence farming are the major sources of income for the residents who are not in formal employment in the area. (Chansa,1997).

1.1.1 MALARIA

Malaria is by far the world's most important tropical parasitic disease, and kills more people than any other communicable diseases except tuberculosis. In many developing countries, and Africa especially, malaria exacts an enormous toll on lives, in medical costs, and in days of labour lost. The causative agents in humans are four species of plasmodium protozoa (single-celled parasites) – *plasmodium falciparum*, *plasmodium vivax*, *plasmodium ovale* and *plasmodium malariae*. Of these *plasmodium falciparum* accounts for the majority of infections and is the most lethal. Malaria is a curable disease if promptly diagnosed and adequately treated, (World Health Organization-WHO, 1998).

According to WHO (1998) malaria is endemic in a total of 101 countries and territories: 45 countries in WHO's African region, 21 in WHO's American region, 4 in WHO's European region, 14 in WHO's Eastern Mediterranean region, 8 in WHO's Southeast region, and 9 in WHO's Western Pacific region.

Malaria remains one of the most serious public health problems in tropical Africa, causing very high morbidity and mortality. In endemic areas, malaria is responsible for about 30-50% of fever cases, about 30% of all outpatient consultations and 10-15% of hospital admissions. In epidemic prone areas malaria regularly produces severe out breaks/epidemics with high morbidity and mortality in all age groups (WHO, 2000).

Malaria blights families, communities and countries. Most victims are children under five who die because they lack simple preventive measures, such as bednets, drugs and diagnostic tools. Often they do not receive treatment in time to save their lives (WHO, 2000). Malaria is also particularly dangerous during pregnancy. It causes severe anaemia, and is a major factor contributing to maternal deaths in malaria endemic regions. Pregnant mothers who have malaria and are HIV positive are more likely to pass on their HIV status to their unborn children (WHO, 1998).

1.2 STATEMENT OF THE PROBLEM

From time in memorial, malaria has been endemic in all of Zambia and is the leading cause of morbidity and mortality. It is the most common cause of outpatient attendances and hospital admissions in all age groups.

Malaria infection during pregnancy is a major public health problem in tropical and subtropical regions throughout the world. In most endemic areas of Africa, pregnant women are the main adult risk group for malaria. The main burden of malaria infection during pregnancy results from infection with *plasmodium falciparum*.

In areas of high and moderate malaria transmission, the principle impact of malaria infection is malaria-related anaemia in the mothers and the presence of parasites in the placenta. The resulting impairment of fetal nutrition contributes to low birth weight and is a leading cause of poorer infant survival and development.

According to statistics obtained from University Teaching Hospital (UTH) as shown in Table 1 below, malaria cases are on an increase.

TABLE 1: MALARIA STATISTICS AT UTH (2000-2001)

year	malaria general	in	malaria pregnancy	in	total	% of malaria in pregnancy out of the total malaria cases
2000	7,877		585		8,462	6.9%
2001	8,386		698		9,084	7.6%

Source: UTH Medical Records

Malaria in pregnancy seem to be on an increase. In the year 2000 it was calculated at 6.9%. It increased to 7.6% in the year 2001. The difference between the two years shows an increase that needs attention to reverse the situation so as to reduce the incidence rate.

Despite the toll that malaria exacts on pregnant mothers and their infants this was until recently a relatively neglected problem, with less than 5% of pregnant women having access to effective interventions. During the past decade, however potentially more effective strategies for prevention and control of malaria in pregnancy have been developed.

For many years WHO recommended that pregnant women in malaria endemic areas should receive an initial antimalarial treatment dose on their first contact with antenatal services, followed by weekly chemoprophylaxis of which in most African countries chloroquine has been the drug of choice. However, the emergence and spread of chloroquine resistant falciparum malaria, poor patient compliance with multiple doses, and a high incidence of chloroquine-induced pruritis have limited the effectiveness of the chemoprophylaxis and hence the implementation of intermittent presumptive treatment (IPT) policy. This policy emphasizes on the use of a single dose of antimalarial drug. In 2000, the WHO Expert Committee on malaria recommended that IPT with an effective, preferably one-dose made available as a routine part of antenatal care to women in their first and second pregnancies in highly endemic areas. At present, sulfadoxine-pyrimethamine (sp)- given as a therapeutic dose – is the single dose antimalarial with the best overall effectiveness for prevention of malaria in pregnancy in areas of high transmission and low resistance to sp. Insecticide –treated nets (ITNs) have also been recommended by WHO. If used during pregnancy in areas of

moderate malaria transmission, ITNs reduce the overall risk of morbidity and mortality among pregnancy women and their infants, (WHO, 2003).

According to the World Bank Report on malaria, 2001 the most cost-effective interventions against malaria today are rapid diagnosis and effective treatment, the use of ITNs, prophylaxis for at risk pregnant women and epidemic preparedness. This is actually a new development from the traditional method of spraying used in the past that has since proved to be costly.

1.3 FACTORS CONTRIBUTING TO / INFLUENCING THE PROBLEM

These factors can be classified into three categories; disease related factors, service related factors and social – cultural /economic factors.

1.3.1 Disease Related Factors

- **Chronic illness such as tuberculosis and immunosuppression) and HIV/AIDS:** These conditions lower the immunity of a pregnant mother, hence exposing her to a high chance of being infected with malaria. This in turn can increase the incidence of malaria in pregnancy.
- **Sickle cell disease:** In this disease the original shapes of red blood cells are distorted, hence predisposes the pregnant mother to severe malaria.

- **Antimalarial drug resistance:** When resistance to antimalarials develops, it becomes difficult to treat malaria in a pregnant mother.
- **Exposure to mosquitoes:** When a pregnant mother is over exposed to mosquitoes that cause malaria, she becomes reinfected and prone to severe type of malaria which may be difficult to treat. This also leads to the increase in the incidence of malaria.

1.3.2 Service Factors

- **Non-availability of antimalarial drugs:** This also leads to an increase in incidence of malaria because the drugs are not accessible.
- **Health staff shortage:** Because of inadequate manpower, there is inadequate monitoring of activities implemented to reduce malaria. On the other hand, the shortage of staff results into poor health education leading to inadequate information on malaria among pregnant mothers.
- **Distance:** Long distance from the health centre lead to absenteeism at antenatal clinic, thus resulting in pregnant mothers missing prophylactic treatment and not getting adequate information on malaria. This also predisposes them to malaria.

1.3.3 Social-Cultural and Socioeconomic Factors

- **Poverty, illiteracy and ignorance** results or leads to the inability to prevent malaria. Some people are unable to afford items like ITNs to

protect them from malaria. While due to illiteracy and ignorance, they do not realize the importance of preventing malaria.

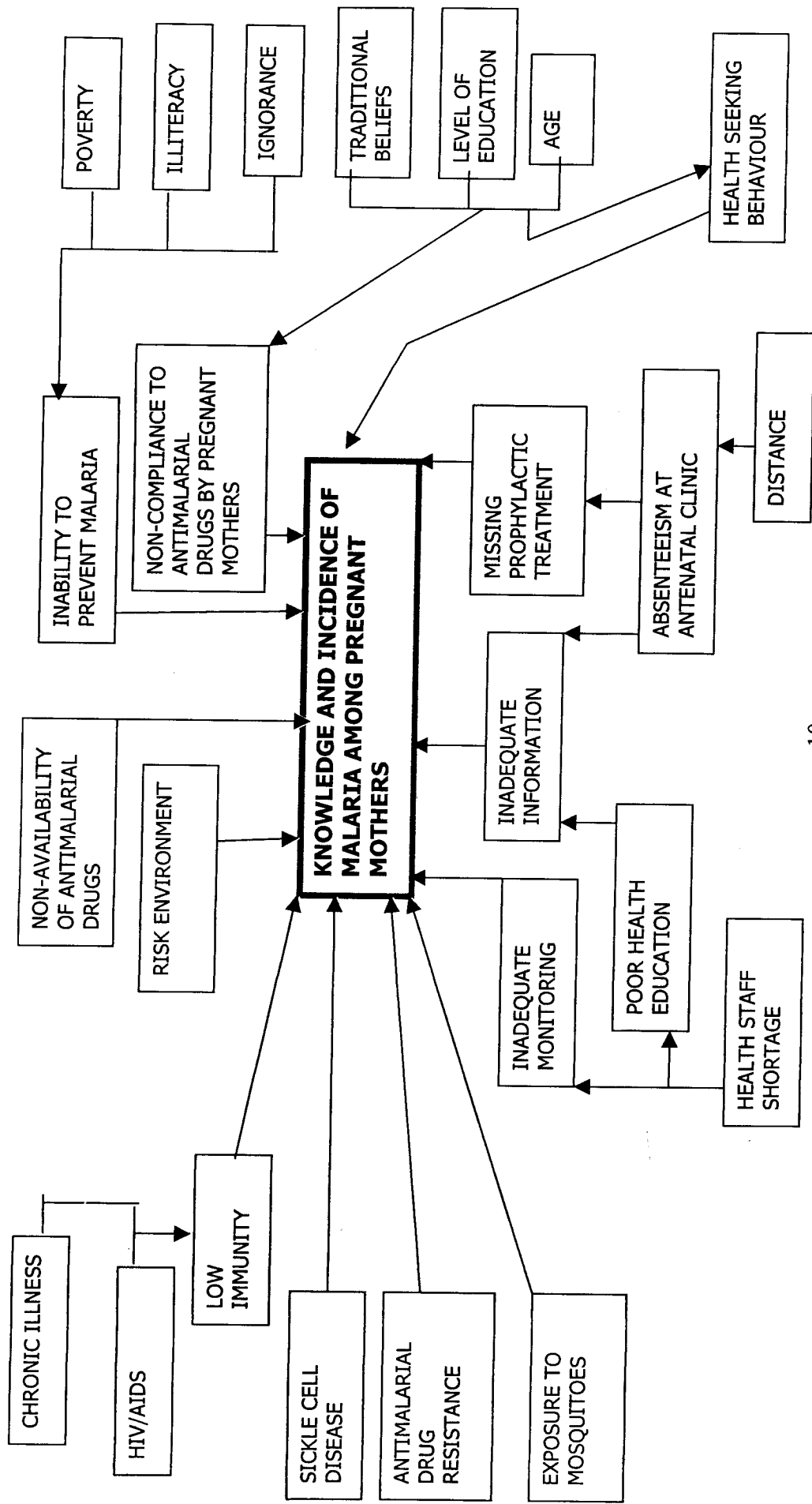
- **Traditional beliefs, level of education and age of pregnant mother:** This influence the health seeking behaviour negatively and it also leads to the non-compliance to antimalarial drugs by pregnant mothers. This leads to an increase in malaria cases.

1.3 DIAGRAM OF PROBLEM ANALYSIS

DISEASE - RELATED FACTORS

SERVICE FACTORS

SOCIO-CULTURAL AND SOCIO- ECONOMIC FACTOR



1.5 JUSTIFICATION

Malaria among pregnant mothers in Zambia is on an increase despite having in place a Roll Back Malaria Programme which was started in 1999 by the Ministry of Health/Central Board of Health in an effort to fight malaria through distribution of insecticide treated nets, health education and community participation in the prevention and control of malaria.

According to UTH Medical Records, statistics show that there was an increase in malaria among pregnant mothers from 6.9% in the year 2000 to 7.6% in the year 2001 (see Table 1). This could be related to the knowledge of malaria among the mothers. Otherwise it raises a need to find out why the incidence is increasing despite the programme that has been put in place to fight malaria.

According to a study done in Lusaka by Mushinda, T. E. 1999, it reveals that 52% of pregnant mothers had knowledge on malaria and about 48% of them had no knowledge. Since the Roll Back malaria programme started in this same year, this study is necessary as a follow up so as to determine whether or not the 48% of ignorant mothers has been reduced. It will evaluate the impact of the Roll Back Malaria programme as to whether it is a success or not.

Therefore the study will aim at finding out whether or not:

- The incidence of malaria among pregnant mothers is on an increase or is under control.

- Pregnant mothers have adequate knowledge about malaria.
- Pregnant mothers take measures to prevent and control the infection.
- The government and the non-governmental organizations are taking measures to control malaria.

The findings and recommendations of this study can be used by the relevant authorities such as the government and non-governmental organizations to intensify the fight against malaria which is already in progress.

1.6 OBJECTIVES

1.6.1 GENERAL OBJECTIVE

To determine the knowledge and incidence of malaria among pregnant mothers.

1.6.2 SPECIFIC OBJECTIVES

- 1.6.2.1** To determine the knowledge that pregnant mothers have on malaria;
- 1.6.2.2** To determine measures being taken by pregnant mothers to prevent malaria;
- 1.6.2.3** To determine the incidence of malaria among pregnant mothers;
- 1.6.2.4** To make recommendations from the research findings to relevant authorities for further action.

1.7 HYPOTHESIS

The lower the level of knowledge on malaria, the higher the incidence of malaria among pregnant mothers.

1.8 OPERATIONAL DEFINITIONS

- 1.8.1 **Knowledge:** Being able to explain something on malaria.
- 1.8.2 **Malaria:** A febrile condition caused by a mosquito bite.
- 1.8.3 **Incidence:** The occurrence of disease (malaria) among pregnant mothers.
- 1.8.4 **Pregnant Mother:** Woman who is expected to give birth to a baby.

TABLE 2: VARIABLES AND CUT OFF POINTS

VARIABLE	CUT OFF POINTS	INDICATORS	QUESTION NUMBER
KNOWLEDGE	Low	Response to knowledge questions with scores 0-3	12 – 24
	Medium	Response to knowledge questions with scores 4-7.	12 – 24
	High	Response to knowledge questions with scores 8-10.	12- 24

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

Malaria is a significant public health problem, threatening the lives and affecting the development of over 2.2 billion people over 100 countries, about 40% of the world's population. It is estimated that the incidence of malaria may be in the order of 300 million to 500 million clinical cases each year. Malaria seriously impairs the health of children under five years of age and pregnant women, causing a vast number of deaths (WHO, 2000).

During pregnancy, malaria is associated with maternal illness and severe anaemia. Malaria also contributes to low birth weight among the newborn infants – one of the leading risk factors for infant mortality. Malaria in pregnant women can also result in miscarriages, premature birth or stillbirth.

2.2 GLOBAL PERSPECTIVE

Malaria infection during pregnancy is a major public health problem in tropical and subtropical regions throughout the world. In most endemic areas of the world, pregnant women are the main adult risk group for malaria. Malaria during pregnancy has been most widely evaluated in Africa south of the Sahara where 90% of the global malaria burden occurs. Malaria is also a threat in parts of Asia, Latin America the Middle East, Eastern Europe and the Pacific.

The burden of malaria infection during pregnancy is caused chiefly by *plasmodium falciparum*, the most common malaria species in Africa. Every year at least 30 million pregnancies occur among women in malarious areas of Africa. This population of pregnant women is at a high risk of developing malaria because pregnancy itself increases a woman's risk of contracting malaria illness by 4 times and also doubles her risk of death. (UNICEF/WHO, 2000).

In an effort to curb the scourge of malaria which is on an increase, a global initiative of Roll Back Malaria (RBM) programme was launched in 1998 with a declared objective of halving the global burden of malaria by the year 2010. Its founding partners, United Nations Development Plan (UNDP), United Nations Children's Emergency Fund (UNICEF), World Health Organization (WHO) and World Bank – agreed to share their expertise and resources in a concerted effort to tackle malaria worldwide with a particular focus on Africa. Since the launch of RBM programme, international spending on malaria has more than trebled to a current figure of US\$ 200 million a year. Comprehensive strategic plan to tackle malaria have been developed in more than 30 endemic African countries and significant additional resources secured to implement these plans from the new Global Fund to fight AIDS, tuberculosis and malaria (GFATM). (UNICEF and WHO, 2003).

2.3 REGIONAL PERSPECTIVE

Africa lies in the tropical region with a warm, humid climate where pools of water constitute perfect breeding grounds for the anopheles mosquitoes. This leads to Africa having a high incidence of malaria, especially in the Sub-Saharan region where 90% of the cases occur. Pregnant women together with young children are especially vulnerable to malaria. Women are four times more likely to get sick, and twice as likely to die from malaria if they are pregnant. (WHO, 1998). " Pregnant women are twice as attractive to malarial mosquitoes as non-pregnant women, according to research reported from Gambia. Women were asked to sleep alone under a bednet and the number of mosquitoes caught in their homes each night was recorded. Twice as many mosquitoes were caught in the homes of those who were pregnant. Researchers put the increased attractiveness of the pregnant women down to three factors: the greater proportion of carbon dioxide in their exhaled breath, their slightly higher body temperature, and the fact that they left their nets more often during the night to urinate". (Africa Health, 2002).

According to the Report on Africa Malaria Day by WHO (2003) it is stated that at least 300 million people suffer from acute malaria each year. Nine out of ten cases occur in Africa south of the Sahara. Malaria is a major impediment to health and development in Africa. It causes death, reduces the productivity of agriculture, affects tourism and external investment. More than one million people die from the disease every year and about half a billion others are affected in other ways. The costs of malaria control and

treatment drain African's economies. Endemic countries have to use scarce hard currency on drugs, nets and insecticides. Malaria endemic countries are among the world's impoverished.

According to the report by the Medical Research Council, South Africa, 2003, the direct and indirect costs of malaria in Africa are estimated to exceed US\$ 2 billion per year. Malaria slows the economic growth in African countries by an estimated 1.3% each year. According to UNICEF, the average cost for each nation in Africa to implement malaria control programmes is estimated to be at least US\$ 300,000 a year. This accounts to about six United States cents (\$0.6) per person for a country of 5 million people.

2.4 NATIONAL PERSPECTIVE

Malaria is a major public health problem in Zambia. It is the leading cause of morbidity and mortality in the general population and children in particular. (MoH, 1998; NMCC/CBoH, 2000). It has traditionally been regarded as a rural health problem. However, in recent years the urban and peri-urban populations have been experiencing a growing incidence of malaria.

The prevalence and incidence of malaria has been increasing, noticeably since the late 1970's. When we compare the period 1976-1999, the incidence rate per 1,000 population has nearly tripled. In 1976 the incidence rate for malaria was reported to be 121.5 cases per 1,000 population a rate equal to a little more than one case of malaria for every 8 persons. By 1999, the

incidence rate for malaria had risen to 321.4 per 1,000 population a rate equal to one case for every 3 persons. (NMCC/CBoH, 2000). Recent research in Zambia has shown malaria to have a significant and increasing impact on anaemia and maternal deaths which according to Demographic Health Survey (DHS) Report of 2002 is rated at 726 deaths per 1,000 population.

Though malaria cases occur throughout the year, most cases are reported between November and April. The reason for this is that during this period it is rainy season, there is a lot of stagnant water around most residents which favours the breeding of mosquitoes. Hence mosquito population is on an increase, thus exposing the human population to high chances of malaria infection. Malaria outbreaks are determined by the extent of human mosquito contact and the infectivity rate of the mosquito.

Information on the extent of problem of malaria in pregnancy is not well tabulated at the MoH/CBoH. It is mixed up with the general malaria case information which is classified as for under five and above five years. With the increasing concern to prevent malaria in pregnancy, National Malaria Control Centre has embarked on a project in which information on malaria in pregnancy will be recorded separately. This will be in the vein to ensure that cases of malaria in pregnancy are easily monitored. This will be done in an effort to determine the impact of the bed nets on the control and prevention of malaria in pregnant mothers in all areas where Roll Back Malaria programmes are being conducted.

Statistics at the MoH/CBoH (2002) does not specify the malaria cases clearly. The cases are classified in two categories only, that for the under fives and that for five years and above.

According to the figures obtained from the documentation statistics office at CBoH/MoH, malaria cases throughout the country increased from 3,591,621 in the year 2000 to 4,150,096 in the year 2001. This in percentage indicates a 15.5% increase in malaria cases.

In a continued effort to fight malaria the MoH/CBoH has developed a new policy for malaria treatment. According to the press release by the Permanent Secretary, MoH in the Post Newspaper of Tuesday, June 17, 2000, on page 18, treatment of malaria in pregnancy is classified into three categories:

➤ Uncomplicated Malaria

- First line treatment

- (i) Quinine in the first trimester of pregnancy;
- (ii) Sulphadoxine – pyrimethamine in the second trimester of pregnancy and
- (iii) If no available option, coartem can be given under supervision in the second and third trimesters of pregnancy

➤ Severe Malaria

- Quinine is first line drug for management of severe malaria.

➤ Intermittent Presumptive Treatment (IPT)

- Sulphadoxine – pyrimethamine would be used for IPT during the second and third trimesters of pregnancy.

According to Mwengwe, L. (2003) he quoted the Minister of Health's speech. Speaking when he officially opened an international conference on malaria in pregnancy for Eastern and Southern Africa (MIPESA) on 4th March, 2003, Dr. B. Chituwo noted that during pregnancy, malaria accounts for 10% of maternal anaemia. He also said that the tropical disease was also responsible for between 5-14% of low birth weight, 30% of preventable low birth weights and 3-8 % of infant deaths. He explained that the impact of malaria during pregnancy is further exacerbated by the high rates of malnutrition or under-nourishment adding that this also contributes to anaemia and poor fetal development.

The Minister pointed out that it is against this background that government with its firm commitment to the principles of Roll Back Malaria has intensified its efforts in combating the problem of malaria during pregnancy.

2.5 CONCLUSION

Malaria is killing at least one million people every year. It causes more than three hundred million acute illnesses, mostly those living in the world's poorest countries are at risk of contracting malaria. Malaria is a disease of warm, humid climates where pools of water constitute perfect breeding

grounds for the anopheles mosquito. With a bite of this mosquito, malaria parasites are transmitted from an infected to a healthy person. (UNICEF/WHO, 2003).

To control and prevent malaria every one should contribute to it. This includes community members and people working in education, environment, water supply, sanitation and community development. It must be an integral part of national health development and community action for control must be sustained and supported by intersectoral collaboration at all levels and by monitoring, training and evaluation, and operational and basic research. (www.afrol.com)

Africa challenges the global community to step up the momentum by:

- Increasing global investment to support implementation of programmes to control malaria in endemic countries.
- According higher priority to malaria on the health agenda of endemic countries.
- Encouraging greater private sector involvement in the national supply and distribution of quality antimalarial drugs, and insecticide treated nets.
- Ensuring the availability of the new generation of high effective antimalarial combination during treatments to populations at risk. (UNICEF and WHO, 2003).

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

A research design is the researcher's overall plan for answering the question, (Polit and Hungler, 1995).

In this study a non-experimental descriptive study was used. Reasons for using this design are that:

- The independent variable cannot be manipulated;
- The circumstances make ethically undesirable to carry out experimental or quasi experimental studies;
- Practical problems prevent the researcher from creating divided groups at random for experimental studies, (Basson, and Uys, 1991).

3.2 RESEARCH SETTING

The study was conducted at Mbereshi Rural Health Centre in Kawambwa District, Luapula Province. A catchment population of 6,416 people surrounds the Health Centre. It is situated on the Luapula Valley an area infested with a lot of mosquitoes. The residents of this area are mostly fishermen and businessmen/women.

STUDY POPULATION

It is defined as the entire number of units under study, (Treece and Treece, 1986). The study population constituted pregnant women receiving antenatal care services at Mbereshi Rural Health Centre.

3.3 SAMPLE SELECTION

Systematic random sampling was to select the sample units (pregnant mothers). In this type of sampling, the element next to the first element is chosen at random from the sampling frame and every K^{th} element in the sample is systematically chosen. Systematic sampling was used for the selection of the mothers because it is usually quick and easy, and it is often a far more convenient method. All units have an equal chance of inclusion in the sample.

3.4 SAMPLE SIZE

Sample size is the number of students, families or electors from whom you obtain the required information, (Kumar, 1999). The sample size for this study was consist of a total of 50 respondents. This sample meets the school requirement for Research in Nursing (RN420)

3.5 DATA COLLECTION TOOL

Data collection tool is an equipment used to collect data, (Treece and Treece, 1986). The investigator collected data by use of a structured schedule. The tool comprised a series of open and closed ended questions because both

were appropriate in assessing the knowledge and incidence of malaria among pregnant mothers. This structured interview schedule was used in order to accommodate respondents who are unable to read and write.

ADVANTAGES OF THE TOOL

- It is suitable for use with illiterate subjects;
- Depth of response can be assured;
- It is suitable for probing complex situations and sensitive issues;
- There is standardization of questions;
- A higher proportion of responses;
- It permits clarification of questions.

DISADVANTAGES OF THE TOOL

- Respondents may give false information;
- It is time consuming;
- The interviewer has little or no choice in the date or place of interview;
- Subjects may become nervous about the fact that their answers are being written down or recorded;
- It is expensive to train research assistants;
- The interviewer's presence can influence the respondents to answer differently than they would do it when alone.

3.6.1 VALIDITY

According to Polit and Hungler (1995) validity refers to the degree to which an instrument measures what is supposed to be measuring. The use of

interview schedule as a data collecting instrument enabled the researcher collect valid data. To ensure the validity of the data, the questionnaire was completed in full and the exact statements given by the client were recorded.

3.6.2 RELIABILITY

Polit and Hungler (1995) refer to reliability as the degree of consistency with which an instrument measures the attribute it is supposed to be measuring. For the reliability of the data being collected, the respondents were directly involved in the interviews and had to respond and give data of which if the questions were paraphrased, the answers would not differ from the original one.

3.7 DATA COLLECTION TECHNIQUE

Data collection technique is the way a researcher or investigator collects data using an instrument (Polit and Hungler, 1995). Collection of data involved oral questions using a questionnaire. It was applicable to each of the respondents. Face to face interviews with each respondent was conducted. During the interviews, the questions that were written in simple English were verbally translated into the language that each respondent understood best. The researcher thanked each of the respondents after each interview session.

3.8 PILOT STUDY

It is a small-scale study conducted before the main study on a limited number of subjects from the same population, (Brink, 1996). The group taken for a pilot study was not eventually considered as part of the sample group.

The purpose of a pilot study includes:

- Identification of the action of the intervening variables so that they can be eliminated;
- Acquainting the researcher with instrument, respondents and analysis of data;
- Providing a miniature trial run of the methodology planned for the major project and an opportunity to refine or adjust methods and techniques (instruments).

The pilot study was conducted at Kazembe Rural Health Centre, Kawambwa district. It comprised 5 respondents that is 10% of the 50 respondents for the research. The pilot study helped the researcher in the identification of areas that needed modification in the data collection instrument.

3.9 ETHICAL AND CULTURAL CONSIDERTIONS

Ethical consideration involves an understanding of ethical codes and guideline for protecting the rights of human subjects who participate in research, (Dempsey and Dempsey, 2000).

The researcher got permission to carry out the research from the District Director of Health for Kawambwa district. The researcher also ensured that the human rights of the participants are protected. This was done by ensuring that confidentiality, anonymity and privacy were maintained at all costs. This were achieved by interviewing one respondent at a time in a private room and assuring each respondent of confidentiality and anonymity.

The participants gave consent to the researcher to collect data from them without causing any harm.

The respondents had all their rights reserved to withdraw their participation in the research at any time they so wished.

CHAPTER FOUR

4.0 DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 DATA ANALYSIS

According to Polit and Hungler (1993) data analysis is defined as methods of organizing data in such a way that research questions can be answered.

The results presented in this chapter were obtained from fifty (50) respondents who were all pregnant mothers. The raw data collected from the respondents was edited for completeness and accuracy. After which it was then entered on a data master sheet according to categories as appropriate. The entered data was then analysed manually with the aid of a calculator.

4.2 PRESENTATION OF FINDINGS

The findings of this study are presented in table and graph forms with data appearing in both absolute and relative frequencies. The tables and the graphs are used to present the findings because they are a simple and effective way to communicate the results of the study. These tables and graphs are mostly arranged according to the questions in the instrument for the purpose of consistency and clarity.

TABLE 3: RESPONDENTS' AGE DISTRIBUTION

n = 50

AGE GROUPS	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
15 – 19 years	10	20%
20 – 24 years	17	34%
25 – 29 years	10	20%
30 – 34 years	4	8%
35 – 39 years	3	6%
40 – 44 years	4	8%
Age not known	2	4%
TOTAL	50	100%

Table 3 above shows that most of the respondents (34%) were age group of 20 - 24 years, while those aged between 15 and 19 years, and those between 25 and 29 years were each represented by 20% each.

TABLE 4: RESPONDENTS' PLACES OF RESIDENCE AND THEIR APPROXIMATED DISTANCES FROM THE HEALTH CENTRE

n = 50

PLACE OF RESIDENCE	DISTANCE FROM THE HEALTH CENTRE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
Kabalenge	6 kilometers	4	8%
Kasumpa	3 kilometers	9	18%
Lubansa	6 kilometers	6	12%
Mbereshi	< 2 kilometer	17	34%
Mukamba	5 kilometers	14	28%
	Total	50	100%

Table 4 shows that the majority of respondents (34%) lived in places within reach to the health centre. 18% and 28% of the respondents lived in villages 3 and 5 kilometer away from the health centre respectively.

FIGURE 1: RESPONDENTS' SCHOOL ATTENDANCE

n = 50

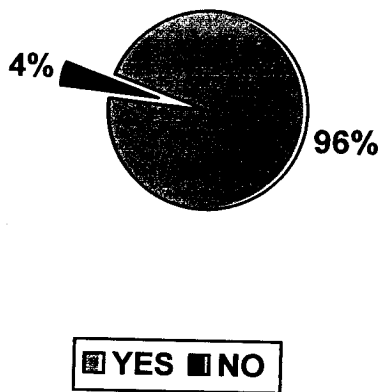


Figure 2 above shows that the majority (96%) of the respondents said they had ever attended school. Only 4% of them did not attend school at any time.

FIGURE 2: RESPONDENTS' LEVELS OF EDUCATION

n = 50

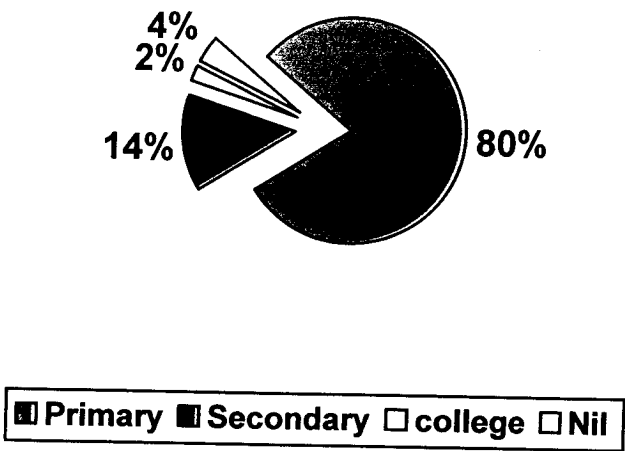


Figure 3 above shows that the majority 40(80%) of the respondents had at least attained primary education. 14% and 2% had attained secondary school

and college education respectively. Only 4% of the respondents never attended school.

FIGURE 3: RESPONDENTS' MARITAL STATUS **n = 50**

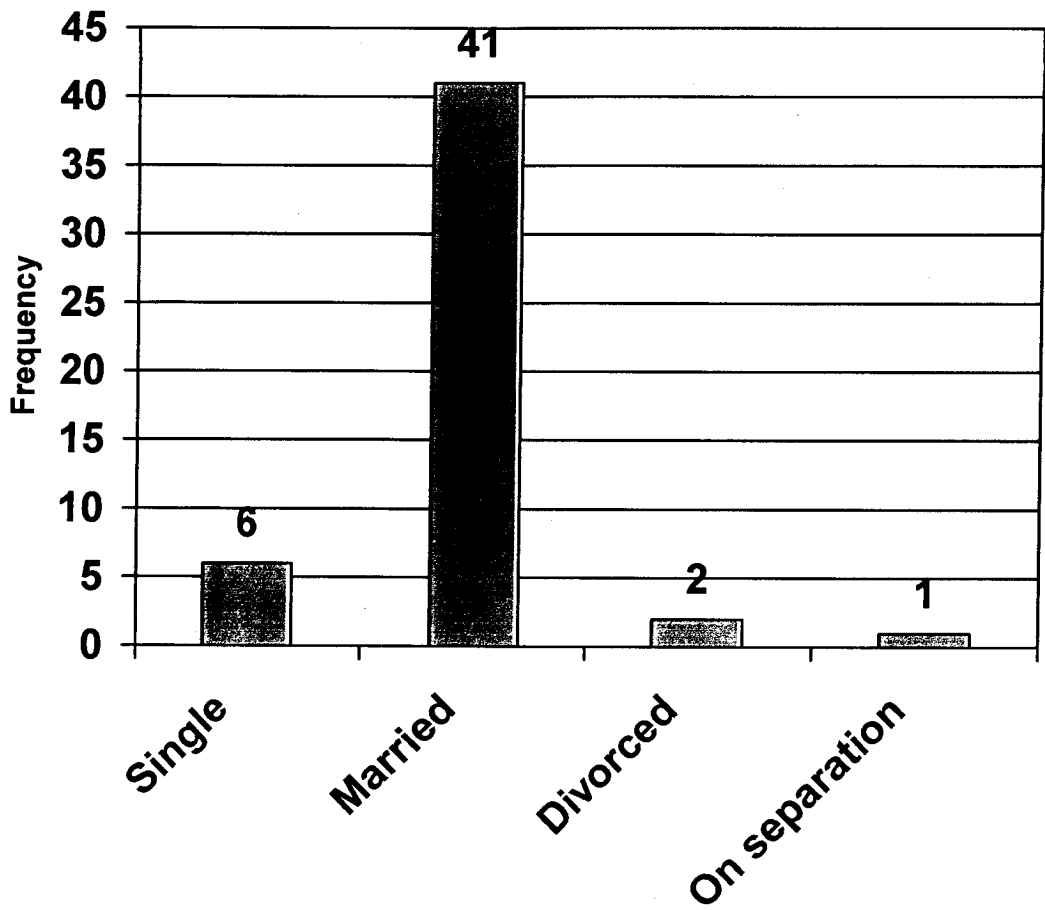


Figure 4 above shows that the majority 41(82%) of the respondents were married, 6 (12%) were single, 2(4%) were divorcees and 1(2%) was on separation

FIGURE4: RESPONDENTS' NUMBER OF CHILDREN

n = 50

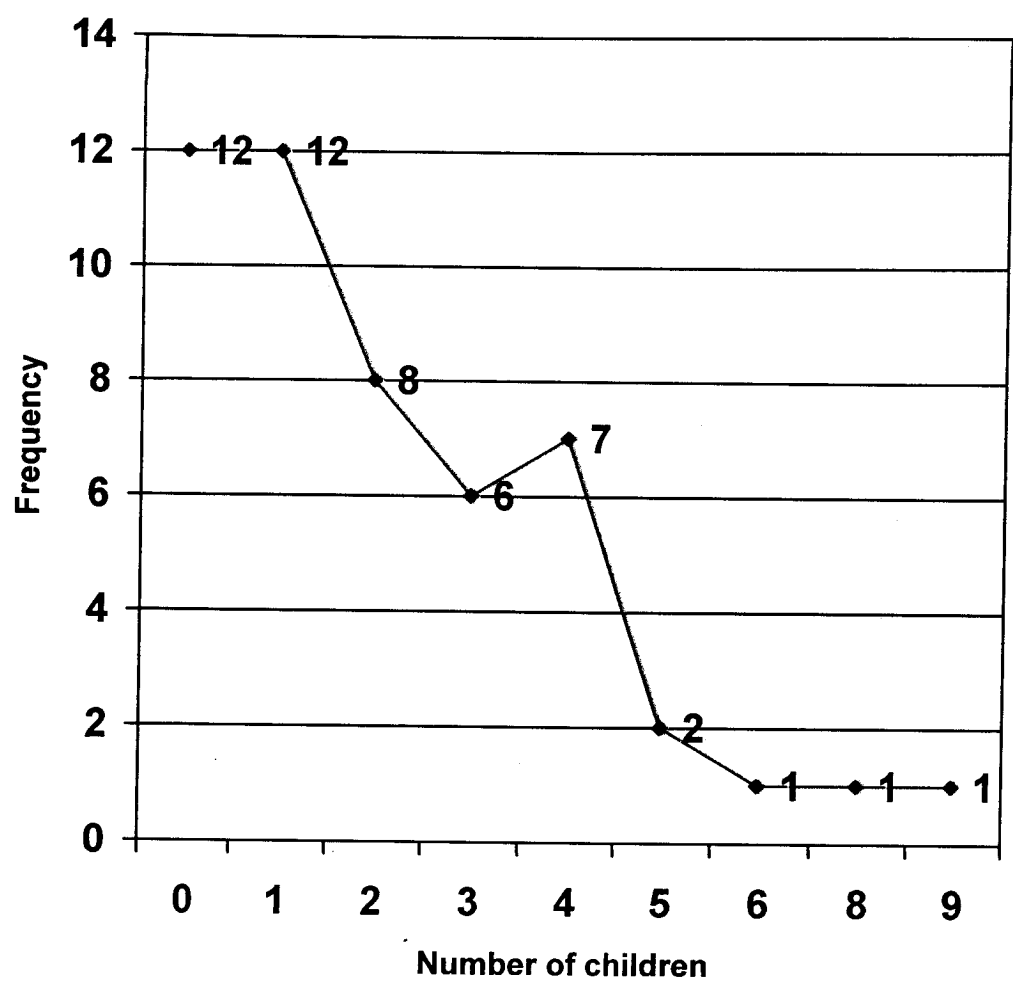


Figure 5 above shows that almost half (48%) of the respondents had only 1 or no children at all. 8(16%) of them had 2 children, 6(12%) had 3 children, 7(14%) had 4 children and the rest had 5 to 9 children.

FIGURE 5: RESPONDENTS' RESPONSES ON WTHER THEY HAD EXPERIENCED PREGNANCY BEFORE
n = 50

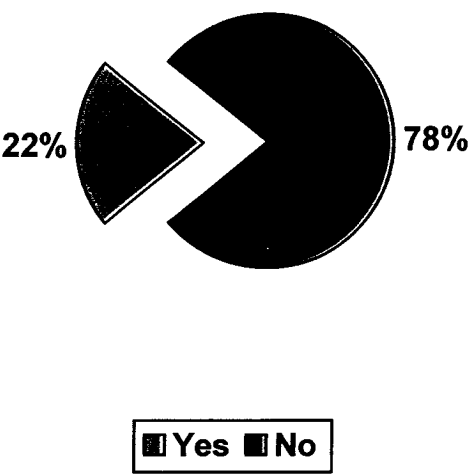


Figure 6 above shows that most of the respondents (78%) had experienced pregnancy before. Only 22% of them were experiencing pregnancy for the first time.

TABLE 5: RESPONDENTS' RESPONSES ON ACTIVITIES THEY DO TO EARN A LIVING

n = 50

ACTIVITIES DONE TO EARN A LIVING	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
Nothing	6	12%
Housewife	38	76%
Informal employment	4	8%
Formal employment	2	4%
Total	50	100%

Table 5 above shows that the majority of respondents (78%) were housewives. For the rest of the respondents, 8% were in informal employment, 4% were in formal employment and 12% did nothing.

TABLE 6: RESPONDENTS' RESPONSES ON ACTIVITIES THEIR HUSBANDS DO TO EARN A LIVING

n = 42

ACTIVITIES DONE TO EARN A LIVING	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
Nothing	1	2.4%
Formal employment	3	7.1%
Informal employment	38	90.5%
Total	42	100%

Table 6 above shows that majority 38(90.5%) had their husbands in informal employment.

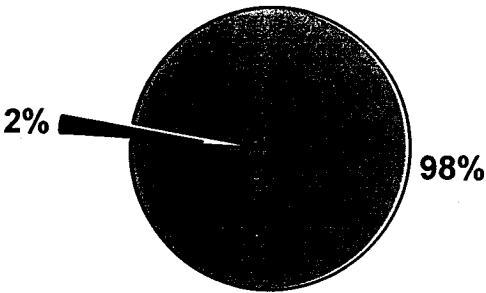
TABLE 7: RESPONDENTS' FAMILY INCOME PER MONTH

n = 50

INCOME PER MONTH	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
< K100,000	8	16%
K100,000 – K300,000	3	6%
K300,000 – K500,000	2	4%
K500,000 and above	3	6%
Do not know	34	68%
Total	50	100%

Table 7 above shows the respondents' family income per month. The majority of the respondents (68%) did not know the income they earn per month. Few respondents (16%) earned an income of less than K100,000. The rest of the respondents earned an income ranging between K100,000 and K500,000 or above.

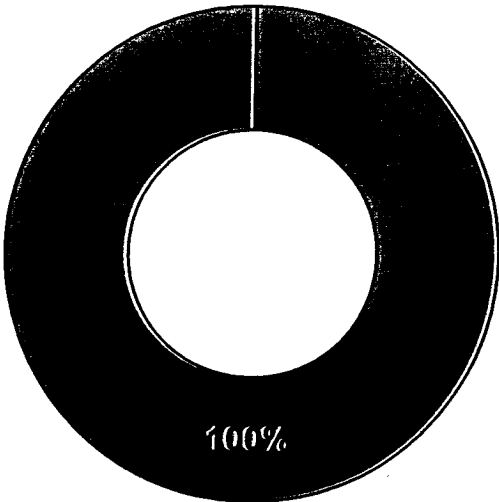
FIGURE 6: RESPONDENTS' SOURCE OF MEDICAL CARE n = 50



■ Clinic ■ Stay home

Figure 7 above shows that most of the respondents (98%) went to the clinic to seek medical advice whenever they became sick. Only 2% of the respondents preferred staying at home.

FIGURE 7: RESPONDENTS' RESPONSES AS TO WHETHER THEY HAD EVER HEARD OF MALARIA n = 50



■ Yes

Figure 8 above shows that all the respondents (100%) had ever heard of the disease called malaria.

FIGURE 8: RESPONDENTS' SOURCE OF INFORMATION ABOUT MALARIA
n = 50

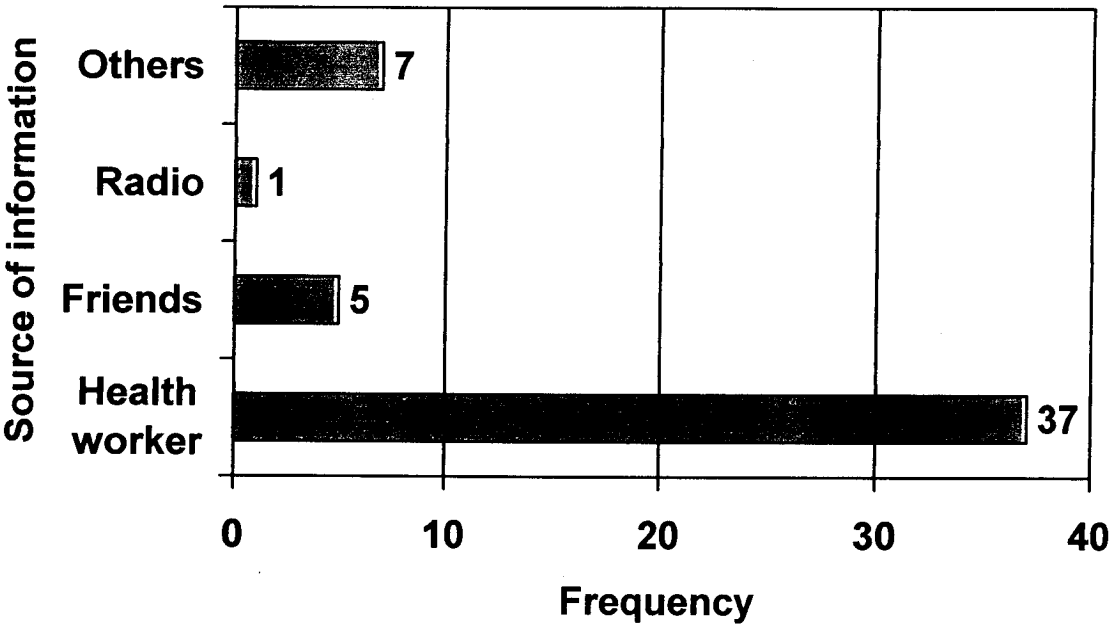


Figure 9 above indicates that 37(74%) of the respondents had heard about malaria from health workers. 14% of the respondents heard about malaria from other sources (not specified) as shown in the graph above. The rest of the respondents that is 1% and 10% heard from the radio and friends respectively.

TABLE 8: RESPONDENTS' RESPONSES ON HOW A PERSON GETS INFECTED WITH MALARIA

MODES OF MALARIA TRANSMISSION	n = 50	
	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
Bite by mosquito	28	56%
Being soaked by rain water	1	2%
Breathing in bad air	1	2%
Do not know	20	40%
Total	50	100%

Table 8 above shows that most respondents (58%) acknowledged that malaria infection is through mosquito bite. 40% of the respondents not know the mode of malaria transmission. 2% of the respondents said that the infection is through being soaked by rain water and another 2% responded that it is through breathing in bad air.

FIGURE 9: RESPONDENTS' RESPONSES ON HOW THEY COULD TELL THAT ONE HAS MALARIA n = 50

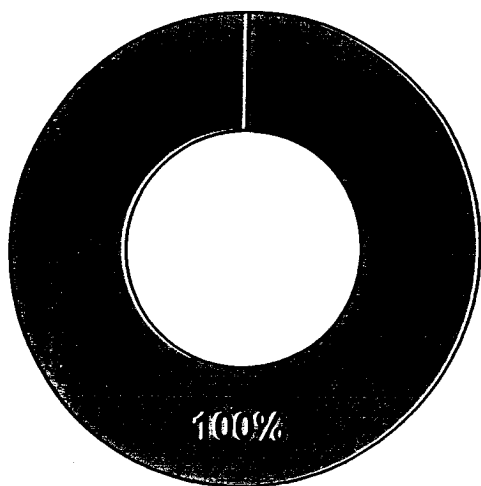


Figure 10 shows that all the respondents (100%) acknowledged that they could tell that one as malaria infection through the signs and symptoms he / she presents with.

TABLE 9: RESPONDENTS' ANSWERS AS TO WHETHER MALARIA CAN BE TREATED

n = 50		
RESPONSES	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
Yes	50	100%
No	0	0%
Total	50	100%

Table 9 above indicates that all respondents (100%) acknowledged that malaria could be treated.

TABLE 10: RESPONDENTS' RESPONSES ON THE DRUGS THEY TOOK WHEN THEY HAD MALARIA

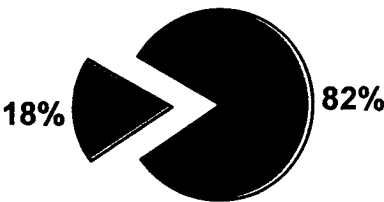
n = 50

DRUGS TAKEN	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
Chloroquine alone	19	38%
Fansidar alone	14	28%
Panadol alone	3	6%
Cafenol alone	3	6%
Chloroquine and Panadol	5	10%
Others (not specified)	5	10%
Cafenol and others	1	2%
Total	50	100%

Table 10 shows that most of the respondents used chloroquine or fansidar alone as represented by 38% and 28% respectively.10% of the respondents used other drugs which were not specified and the other 10% of the respondents used both panadol and chloroquine. Only few respondents used panadol or cafenol alone as represented by 6% for each category. The remaining 2% of the respondents used cafenol and other drugs not specified.

FIGURE 10: RESPONDENTS' RESPONSES AS TO WHETHER MALARIA IS DANGEROUS IN PREGNANCY

n = 50



■ Yes ■ No

Figure 11 shows that the the majority (82%) of the respondents interviewed acknowledged that malaria was actually dangerous in pregnancy. The rest (18%) responded that malaria was not dangerous in pregnancy.

TABLE 11: RESPONDENTS' REASONS AS TO WHY THEY THOUGH MALARIA WAS DANGEROUS IN PREGNANCY

n = 41		
REASONS	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
It causes abortions	14	34.2%
The baby can be born with malaria	10	24.4%
It causes anaemia	5	12.2%
It causes difficulties during delivery	2	4.9%
No reasons given	10	24.4%
Total	41	100%

Table 11 above shows that 14 (34.2%) responded that malaria in pregnancy causes abortion, 10 (24.4%) responded that the baby can be born with malaria. The other 10 (24.4%) gave no reasons as to why they thought malaria was dangerous in pregnancy. 5 (12.2%) of the respondents responded that it causes anaemia. Only 2 (4.9%) of them responded that it causes difficulties during delivery.

TABLE 12: RESPONDENTS' ANSWERS ON WHAT THEY USED TO PREVENT MALARIA IN PREGNANCY

n = 50		
PREVENTIVE MEASURE USED	ABSOLUTE FRQUENCY	RELATIVE FREQUENCY
Bed nets only	22	44%
Prophylactic drugs only	8	16%
Nothing	9	18%
Others	8	16%
Bed nets and prophylactic drugs	3	6%
Total	50	100%

Table 12 shows that most of the respondents 22 (44%) used bed nets only as a mode of preventing malaria in pregnancy, 9 (18%) of the respondents said they did not use anything. The rest of the respondents had the following to say, 8 (16%) used prophylactic drugs, the other 8(16%) used other means not specified and the remainder 3 (6%) used both bed nets and prophylactic drugs.

TABLE 13: RESPONDENTS' FAMILY INCOMES IN RELATION TO PREVENTIVE MEASURES OF MALARIA USED

n = 50

FAMILY INCOME	Used bed nets only	Used prophylactic drugs	Used nothing	Others	Used bed net and prophylactic drugs	TOTAL
< K100,000	4 (18.2%)	1 (12.5%)	1 (11.1%)	-	2 (66.6%)	8 (16%)
K100,000 TO K 300,000	1 (4.5%)	1 (12.5%)	1 (11.1%)	-	-	3 (6%)
K300,000 TO K500,000	1 (4.5%)	-	-	1 (12.5%)	-	2 (4%)
K 500,000 AND ABOVE	2 (9.1%)	-	-	-	1 (33.3%)	3 (6%)
NOT KNOWN	14 (63.6%)	6 (75%)	7 (77.7%)	7 (87.5%)	-	34 (68%)
TOTAL	22 (44%)	8 (16%)	9 (18%)	8 (16%)	3 (6%)	50 (100%)

Regardless of the difference in the family income, table 13 indicates that 22(44%) of the respondents afforded bed nets. Out of the 22(44%) respondents, 14 (28%) were those who did not know their monthly income.

FIGURE 11: RESPONDENTS' RESPONSES ON WHOM THEY THOUGHT WAS RESPONSIBLE FOR PREVENTING MALARIA IN PREGNANCY
n = 50

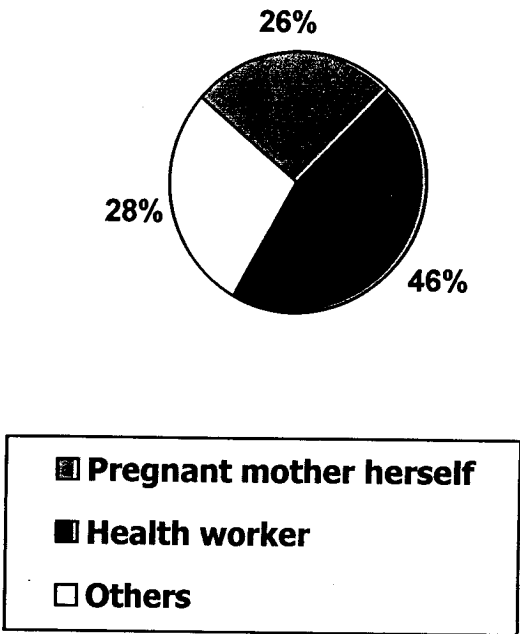
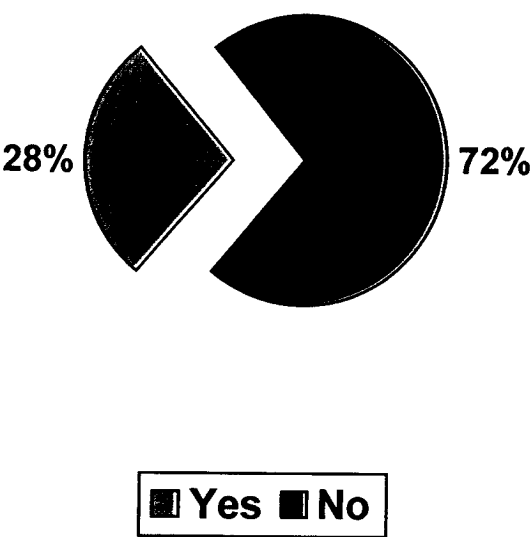


Figure 12 shows that the majority (46%) of respondents responded that it was the responsibility of the health worker to prevent malaria in pregnancy. Others (28%) responded that it was the responsibility of the pregnant mother herself and 28% respondents said it was the responsibility of others people for example the husbands.

FIGURE 12: RESPONDENTS' RESPONSES ON THE PRESENCE OF POOLS OF STAGNANT WATER IN THEIR RESIDENCE **n = 50**



According to figure 13 above the majority (72%) of the respondents, stated that there where no pools of stagnant water around their residences. Only 28% of the respondents said there were pools of stagnant water in their residence.

TABLE 14: RESPONDENTS' RESPONSES AS TO WHETHER THE POOLS OF STAGNANT WATER WHERE A POTENTIAL SITE FOR MOSQUITO BREEDING

n = 14

RESPONSE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
Yes	12	85.7%
No	2	14.3%
Total	14	100%

Table 13, reflects only the 14 (28%) who said they had pools of stagnant water in their residence as shown in figure 13. Out of the 14 (28%) respondents, 12 (24%) responded that the pools of stagnant water were a

potential site for mosquito breeding, while 2 (4%) of them said they were not.

TABLE 15: RESPONDENTS' RESPONSES AS TO WHETHER THEY COULD PARTICIPATE IN THE BURYING OF THE POOLS OF STAGNANT WATER

n = 14

RESPONSE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
Yes	13	92.9%
No	1	7.1%
Total	14	100%

Table 15 above indicates that the majority 13 (92.9) respondents accepted that they had the responsibility to participate in the burying of the pools of stagnant water in their residence. Only 7.1% of the respondents said it was not their responsibility to participate in the burying of the pools of stagnant water in their residence.

FIGURE 13: RESPONDENTS' LEVELS OF KNOWLEDGE ON MALARIA
n = 50

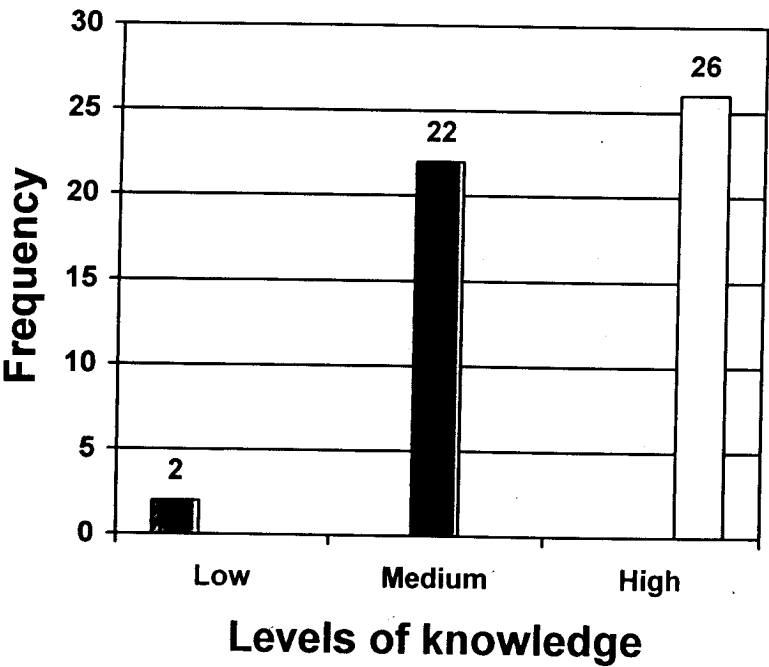


Figure 14 shows the respondents' levels of knowledge on malaria. According to this figure, 26(52%) of the respondents had high knowledge, 22(44%) had medium knowledge and 2(4%) had low knowledge.

TABLE 16: RESPONDENTS' AGE GROUP IN RELATION TO LEVEL OF KNOWLEDGE ON MALARIA

AGE GROUP IN YEARS	LEVEL OF KNOWLEDGE			TOTAL
	Low	Medium	High	
15 – 19	1 (50%)	8 (36.3%)	1 (3.8%)	10 (20%)
20 – 24	1 (50%)	6 (27.2%)	10 (38.5%)	17 (34%)
25 – 29	-	4 (18.2%)	6 (23.1%)	10 (20%)
30 – 34	-	1 (4.5%)	3 (11.5%)	4 (8%)
35 – 39	-	-	3 (11.5%)	3 (6%)
40 – 44	-	2 (9.1%)	2 (7.7%)	4 (8%)
Not known	-	1 (4.5%)	1 (3.8%)	2 (4%)
TOTAL	2 (4%)	22 (44%)	26 (52%)	50 (100%)

Table 16 above shows that the majority of the respondents (10 out of the 17) who fell in the age group 20 – 24 years had high level of knowledge on malaria. They were seconded by those who fell in the age group 25 – 29 years represented by 6(12%) out of 10(20%). Those with medium knowledge in the age groups 15 – 19 years and 20 – 24 years wre represented by 8(16%) and 6(12%) respectively. Those with medium knowledge in the age group 25 – 29 years were represented by 4(8%). All those with low level of knowledge were below 25 years old.

TABLE 17: RESPONDENTS' LEVEL OF KNOWLEDGE IN RELATION TO THE LEVEL OF EDUCATION

n = 50

LEVEL OF EDUCATION	LEVELS OF KNOWLEDGE			TOTAL
	Low	Medium	High	
Primary	2 (100%)	17 (77%)	21 (81%)	40 (80%)
Secondary	-	3 (14%)	4 (15%)	7 (14%)
College I	-	-	1 (4%)	1 (2%)
Never in school	-	2 (9%)	-	2 (4%)
TOTAL	2 (4%)	22 (44%)	26 (52%)	50 (100%)

Table 17 above shows that out of the respondents with primary education, 21(42%) had high level of knowledge on malaria, 17(34%) had medium knowledge and only 2(4%) had low knowledge. Of the 7(14%) respondents who attained secondary education, 4(8%) had high level of knowledge on malaria and 3(6%) had medium level of knowledge. The one and only respondent who attained college education had high level of knowledge on malaria. The 2(4%) respondents who never attended school at any given time had medium level of knowledge on malaria

FIGURE 14: RESPONDENTS' RESPONSES ON WHETHER THEY SUFFERED FROM MALARIA DURING PREGNANCY **n = 50**

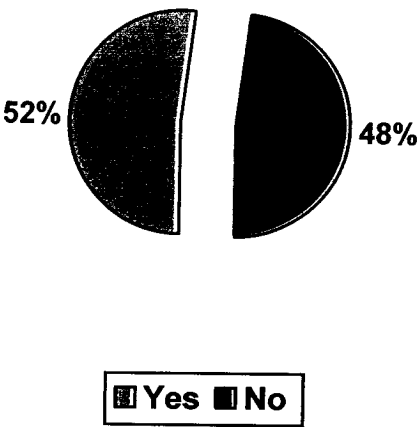


Figure 14 above shows that 52% of the respondents said they suffered from malaria during pregnancy and 48% of them said they did not.

FIGURE 15: RESPONDENTS' RESPONSES ON THE NUMBER OF MALARIA EPISODES THEY EXPERIENCED IN ONE PREGNANCY **n = 26**

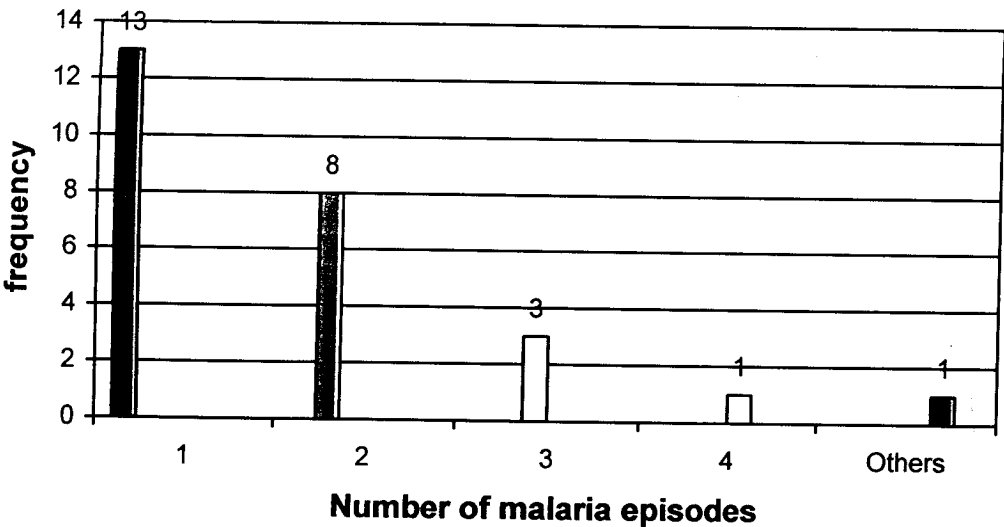


Figure 16 above shows that the majority 13(50%) of the respondents experienced at least one episode during one pregnancy. 8 (30.8%) of them

experienced 2 episodes. The rest 5(19.2%) of the respondents said they experienced 3 episodes and above.

FIGURE 16: RESPONDENTS' RESPONSES ON WHETHER THEIR BLOOD WAS TESTED FOR MALARIA PARASITES DURING PREGNANCY
n = 50

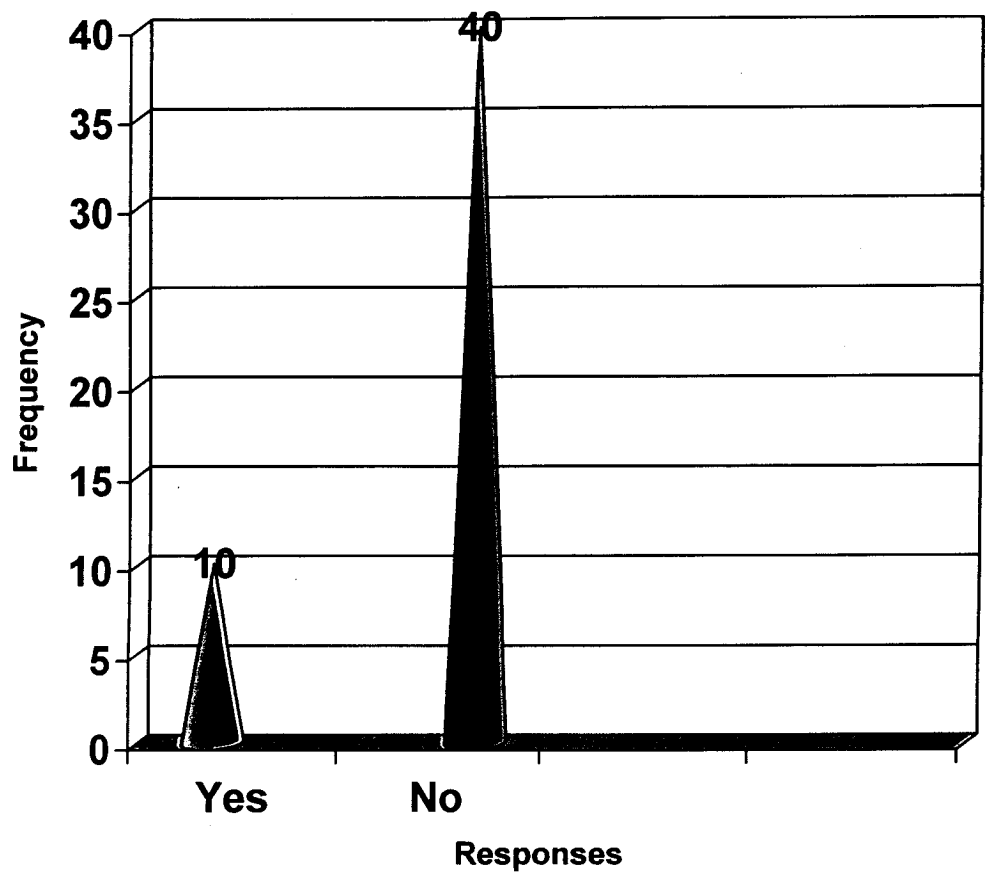


Figure 17 above shows that the minority 10 (20%) of the respondents, responded that their blood was tested for malaria parasites during pregnancy, not as a routine procedure but because they were showing signs and symptoms of malaria. Most of the respondents 40 (80%) responded that their blood was not tested for malaria parasites.

TABLE 18: RESPONDENTS' RESPONSES ON THE RESULTS OF THEIR BLOOD TESTS FOR MALARIA PARASITES

n = 10

RESPONSES ON BLOOD TEST RESULTS	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
Positive	3	30%
Negative	7	70%
Total	10	100%

Table 18 indicates that the majority 7(70%) of the respondents said their results were negative, while 3 (30%) responded that their results were positive.

FIGURE 17: RESPONDENTS' RESPONSES ON WHETHER THEY WERE AT HIGH RISK OF GETTING MALARIA DURING PREGNANCY n = 50

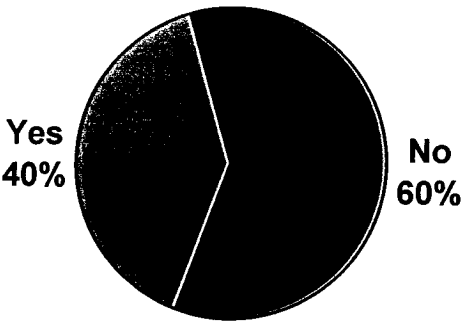


Figure 18 above indicates that 20 (40%) of the respondents acknowledged that they were at risk of getting malaria during pregnancy. On the contrary 30 (60%) of the respondents said they were not at risk of getting malaria during pregnancy.

TABLE 19: RESPONDENTS’ RESPONSES ON WHAT MADE THEM THINK THEY WERE AT HIGH RISK OF GETTING MALARIA DURING PREGNANCY

n = 20

REASONS	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY
Physiological changes that take place during pregnancy	10	50%
Did not give reasons why	10	50%
Total	20	100%

Table 20 above reflects the 20 (40%) respondents that said they were at high risk of getting malaria during pregnancy as shown in figure 17. The 10 (20%) of the respondents attributed their being at high risk to the physiological changes that take place in their bodies during pregnancy. The other 10 (20%) respondents did not know the reasons of their being at high risk of getting malaria during pregnancy.

CHAPTER FIVE

5.0. DISCUSSION OF FINDINGS AND IMPLICATIONS FOR THE HEALTH CARE SYSTEM

5.1. DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

According to the analytical findings as shown in table 3 of chapter four, the majority of the respondents 34% were in the age group 20 – 24 years, 20% in age group 15 - 19 years and 20% in the age group 25 – 29 years. The rest of the respondents were in the age group 30 years and above except for 4% of the respondents who did not know their ages. This picture entails that most of the mothers fell in the active child bearing age group which ranges from 15 - 49 years. (CBoH, 1997)

The majority of the pregnant mothers attending antenatal clinic were residing within a radius of about 6 kilometers from the health Centre. Of all the respondents, 34% lived in places less than 2 kilometers away from the Health Centre, 28% lived 5 kilometers away from the health centre, 18% lived 3 kilometers away and 20% lived in places 6 kilometers away from the health centre. Looking at a maximum of 6 kilometers radius of the residences, it implies that the pregnant mothers live within the 12 kilometers radius, the radius recommended by the CBoH in the achievement of the health reforms' vision (CBoH, 1997). This means that the Health Centre and its services are easily accessible to all the pregnant mothers despite the location of the study which is in the rural area. According to CBoH (1997), the vision of the health reforms in Zambia is to provide equitable access to high quality, cost – effective interventions, as close to the family as possible.

In terms of school attendance, the study reviews that 96% of the respondents accepted having attended school at one time and 4% of them said they did not attend school at any time. Out of the 96% who attended school, the majority (80%) attained only primary school education, 14%

attained secondary school education and only 2% attained college education. The attainment of primary school education by the majority of the respondents could be attributed to lack of encouragement from the parents coupled with poor socioeconomic status. Parents could not support their children in school.

The study also revealed that 82% of the respondents were married, 12% were single, 4% were divorced and 2% were on separation. The majority of the respondents (78%) had experienced pregnancy before and only 22% accepted to have experienced pregnancy for the first time.

Concerning the activities done to earn a living as shown in table 5, the majority of the respondents (76%) acknowledged to be house wives, 8% were in informal employment, 4% were in formal employment and 12% were doing nothing to earn a living. This could imply that the majority of the mothers (76%) in the area depended of their spouses for socioeconomic support. Since the majority of the mothers (80%) as shown in figure 3 had attained only primary school education, this could have an impact on their not being in employment. Out of all the husbands of the married mothers and the mothers on separation, 90.5% were in informal employment. This unemployment could be attributed to lack of employment opportunities in the formal sector. Unemployment of some of the respondents and their husbands (90.5%) could be due to structural adjustment programme that the country went through.

The study also revealed that the majority of the respondents (68%) as shown in table 7 did not know how much income they accumulated per month as a family because they spent the cash on daily basis as they earned it without keeping any records. The non-budgeting and recording of the family income could be attributed to their level of education since most of them (80%) had attained only primary school education. 14% of the respondents said their monthly family income was at least K100, 000 and above. The levels of

family income revealed as shown in table 7 entails that despite the different sources of cash, at least every family earned some cash in one or another. With the Roll Back Malaria programme where the insecticide mosquito nets are provided to the community at a subsidized low price, most of the families could afford to buy nets in order to prevent malaria.

The study also revealed that the majority of the respondents (98%) as shown in figure 7 acknowledged that their source of medical care was the Health Centre. This implies that the majority of the pregnant mother had trust in the health services and the modern medical treatment provided by the health worker at the Health facility. As for the 2% who preferred to stay home when sick, they believed that herbal medicines cured them more than the modern medicine administered at the Health facility.

5.2. DISCUSSION OF EACH VARIABLE

5.2.1. RESPONDENTS' KNOWLEDGE ON MALARIA

According to figure 8 and 10, in the findings of the study revealed respectively that all the respondents (100%) have heard of the disease called malaria and could tell that a person has malaria through the signs and symptoms. Out of the 100% respondents, 74% as shown in figure 9 heard about malaria from health workers. This entails that most of the pregnant mothers have knowledge on malaria and its signs and symptoms. Since the findings revealed that 74% heard about it from the health workers, it implies that the health workers are doing a great job in the dissemination of information about malaria to the pregnant mothers.

On the other hand the findings of the study revealed that 56% of the respondents had knowledge on how malaria can be treated, but did not know about the current regime of malaria treatment. To this effect, it implies that in their health education to pregnant mothers, the health workers should emphasize on how malaria is transmitted and they should also teach the

pregnant mothers on the new regime of malaria treatment and the prophylactic treatment used in pregnancy by "Intermittent Presumptive Treatment (IPT)"

In terms of malaria being dangerous in pregnancy, figure 11 reveals that 41 of the pregnant mothers knew that malaria was dangerous in pregnancy. This could also be attributed to the fact that the health educators are doing good work in the teaching of the pregnant mothers, and that learning is taking place in the mothers. With the findings described above, the objective to determine the knowledge that pregnant mothers have on malaria has been met.

Regarding the methods used in the prevention of malaria, 44% of the respondents used bed nets and the rest used different types/methods. This implies that though the mothers had knowledge on malaria, they were not applying the knowledge to real life practice. Therefore, there is need for the health workers to sensitize the mothers more on the use of bed nets (ITNs). The community health agents need to be fully involved in the dissemination of information.

The study findings also revealed that almost all the respondents earned income in one way or another. On cross tabulation as shown in table 13, 63.6% of the 22 respondents who used bed nets are those who earned and spent their income without keeping records. This entails that despite the different sources of income, on average families could afford to buy the bed nets at subsidized prices.

Concerning the presence of pools of stagnant water in the residential places, the findings revealed that only 14(28%) of the respondents accepted the presence of pools. Out of the 14 respondents the majority (85.7%) accepted that the pools of stagnant water can be potential breeding sites for mosquitoes, and 92.9% of the 14 respondents accepted that it is part of their responsibility to bury or drain the pools. This entails that the mothers actually

knew about the dangers of pools of stagnant water. With sensitization and motivation by health workers through the policy of community participation, the community could be actively involved in getting rid of the breeding sites. According to CBoH (2002), drainage maintenance and filling and removal of breeding sites are measures to avoid the breeding sites.

In general, the study findings revealed that the majority (96%) of the pregnant mothers had knowledge on malaria. These findings show an improvement when compared to the study done in Lusaka by Mushimba (1999) which revealed that only 52% of the pregnant mothers had knowledge on malaria and 48% did not have. This entails that the Roll Back Malaria Programme which was started in 1999 (the same year when Mushimba conducted a study) is having a p[ositive impact where the knowledge on malaria in pregnant mothers is concerned.

Regarding the age groups and the knowledge on malaria, the study revealed that 74% of the pregnant mothers who were knowledgeable fell in the age group ranging from 15 years to 29 years. This entails that younger mothers below the age of 30 years were more knowledgeable than the older pregnant mothers. This could in turn entails that the level of assimilation of the health education given by the health workers was high in younger mothers than in older ones.

The level of education seemed to have no impact on their knowledge on malaria. The study findings as shown in table 18 indicates that despite their different levels of education, the majority of the pregnant mothers (96%) had knowledge on malaria. This entails that their levels of education do not seem to hinder their acquisition of knowledge on malaria. They are able to get the information put across to them. This could be attributed to the fact that in most cases health workers use local and simple languages during their health education sessions, therefore making it easy for the pregnant mothers to assimilate what they are taught.

5.2.2. INCIDENCE OF MALARIA

According to CBoH (2003), the changes that take place in a pregnant mother's body during pregnancy, makes her susceptible to malaria. This is because her immunity is naturally lowered. CBoH (2003) further states that as the malaria parasites circulates in the pregnant mothers' system, it often makes its way to the placenta, which nourishes the growing baby, and malaria can establish an infection in the placenta (*plasmodium falciparum* malaria has a particular affinity for the placenta). When this happen, there is often little or no evidence of the parasite in the woman's blood, so even a blood smear may be negative, yet it affects the development of the baby because it hampers the flow of nutrition and oxygen through the placenta to the developing baby.

The findings of this study revealed that 52% of the pregnant mothers suffered from malaria and 48% of them did not suffer from malaria during pregnancy. According to CBoH (2002), pregnant women may have serious malaria but not feel sick.

It therefore, follows that even the 48% who claimed to have not suffered from malaria, some would have had it only that they could not have felt it since malaria parasites have a particular affinity for the placenta. This is the reason why blood test for malaria in pregnant mothers may be found to be negative even when they have malaria. The study findings also revealed that 80% of the pregnant mothers were not tested for malaria parasites because this test is not routine for them.

With the above information in place, it indicates that the pregnant mothers are at high risk of malaria and that even if they have the malaria it may not show on the blood smear. This situation in pregnancy has brought about the issue of Intermittent Presumptive Treatment (IPT) for all pregnant mothers. Since their status of having malaria is not easily identified, the health workers have to presume that all the pregnant mothers suffer from malaria, hence the need to give IPT by use of sulfadoxine pyrimethamine (fansidar) as a prophylactic measure. According to CBoH (2002), it has been recommended

that all pregnant women should receive ITP which is 3 adult treatment doses of fansidar during their second and third trimester, least one month apart.

The findings of the study also revealed that the majority of the pregnant mothers (60%) as shown in figure 18, acknowledged that they were at high risk of getting malaria during pregnancy. This could be attributed to the that health workers could be doing a good job in educating the mothers on malaria and that the mothers were assimilating what they were taught very well.

5.3. IMPLICATION TO THE HEALTH CARE SYSTEM

In the effort to combat malaria in pregnancy, the Ministry of Health and CBoH should work out modalities. More money should be allocated to the fight against malaria if the battle has to be won. The health workers have to be adequately qualified so that they are able to disseminate information and sensitize the communities on the issues of about malaria. This will help improve the knowledge of the people in the community and it will motivate them to participate in the fight against malaria. This in turn could help reduce on the malaria incidence, of which if achieved, the health sector would serve money and spend it on other health problems of concern in the community.

5.4 CONCLUSION

The findings of this study suggest that the all the mothers receiving antenatal care at Mbereshi Rural Health Centre lived within in reach to the clinic and that the majority of them had knowledge on malaria. Their levels of education did not seem to hinder their acquisition of knowledge. The findings also suggest that young mothers in the age group 15 to 29 years were more knowledgeable than the older mothers in the age group 30 years and above. On the other hand, the findings suggest that the incidence of malaria is still high.

The findings of this study have established that the majority of the pregnant mothers had knowledge on malaria. Despite their knowledge on malaria, the

incidence is still high. Therefore the hypothesis that "the lower the level of knowledge on malaria, the higher the incidence of malaria among pregnant mothers" may not be accepted. The reason being that even if the mothers had knowledge they did not put it into effect so as to fight malaria, hence the incidence remains high. This situation calls for health workers to intensify their campaign against malaria by sensitizing and motivating the mothers to put the knowledge they acquire on prevention of malaria into practice if the picture is to change.

5.5 RECOMMENDATIONS

Looking at the findings of the study, the research made the following recommendations;

- There is need to continue information, education and communication (IEC) on malaria so that the pregnant mothers are updated with full information on malaria regardless of their education levels.
- Since the majority of the mothers seemed to have good knowledge on malaria, but the incidence still seems to be high, there is need to emphasize to the mothers to put the knowledge they have into practice so as to combat malaria effectively.
- There is need for health workers to take each encounter with antenatal mothers as an opportunity to discuss malaria and its impacts on pregnancy.
- There is need to teach the mothers on the new regime of malaria treatment so that their knowledge on anti-malarial drugs can be up dated.
- There is need for a wide scale research to be done on the same topic using a wider sample representative of the population so that findings can be generalized.
- There is need to fully involve the antenatal mothers, their families and the community at large (community participation) in the fight against malaria in pregnancy.
- The researcher was not granted permission for data collection in time. There is need for the officers empowered with authority to get concerned

and be supportive in granting permission in good time. This will help to avoid frustrating / inconveniencing the researcher and delaying his progress.

5.6 DISSEMINATION OF FINDINGS

The study findings and reports will be made available and accessible to the policy makers, and the non – governmental organizations that have programmes to fight malaria. Other copies of the study will be distributed to the following; The University of Zambia medical library and Post Basic Nursing Department, The Ministry of Health (my sponsor) so that other people can have access to the findings and a copy for the Investigator.

5.7 LIMITATIONS

- The health office in authority delayed to grant the researcher permission to collect data. Therefore, collection of data was also delayed.
- Inadequate resources such as money for typing and printing delayed the completion of the research study.
- The research was done alongside with other courses and hence time was not enough to finish as scheduled.
- The sample size was small and therefore, the findings ca not be generalized to a larger population.

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APPENDIX 1


THE UNIVERSITY OF ZAMBIA

SCHOOL OF MEDICINE

DEPARTMENT OF POST BASIC NURSING

STRUCTURED INTERVIEW SCHEDULE ON KNOWLEDGE AND INCIDENCE OF MALARIA AMONG PREGNANT MOTHERS AT MBERESHI RURAL HEALTH CENTRE, KAWAMBWA DISTRICT

INSTRUCTIONS TO THE INTERVIEWER

1. Introduce yourself to the respondent;
2. establish rapport and explain the purpose for collecting data;
3. explain that anonymity, privacy and confidentiality will be strictly maintained;
4. indicate clearly the correct answer by circling the number or ticking in the box  provided;
5. Kindly have all questions answered;
6. Fill in the blank spaces whenever applicable;
7. *No name should be written on the structured interview schedule*

QUESTIONNAIRE NUMBER.....

DATE OF INTERVIEW.....

SECTION A: DEMOGRAPHIC DATA

For official
use only

1. How old are you? _____

2. Where do you live? _____

3. Have you ever attended school?

(a) Yes

(b) No

--

4. If your answer in question 3 is "Yes", what is the highest level of school you attended?

(a) Primary

(b) Secondary

(c) College

(d) University

--

5. What is your marital status?

(a) Single

(b) Married

(c) Divorced

(d) Widowed

(e) Separated

--

6. How many children do you have? _____

7. Is this your first pregnancy?

(a) Yes

(b) No

--

For official
use only

8. What do you do for your living?

- (a) Nothing
- (b) Housewife
- (c) Informal employment
- (d) Formal employment

--

9. What does your husband do for a living?

- (a) Nothing
- (b) Formal employment
- (c) Informal employment

--

10. What is your family income per month?

- (a) Below K100,000
- (b) K 100,000 to K 300,000
- (c) K 300,000 to K 500,000
- (d) K 500,000 and above
- (e) Do not know

--

11. Where do you seek medical assistance when you get sick?

- (a) Traditional Healer
- (b) Clinic
- (c) Stay at home
- (d) Others, (specify) _____

--

SECTION B: KNOWLEDGE ON MALARIA

12. Have you ever heard of an illness called malaria?

- (a) Yes
- (b) No

--

13. If "Yes", to question 12, what is the source of information?
- | | | |
|----------------------------|--------------------------|--------------------------|
| (a) Health worker | <input type="checkbox"/> | <input type="checkbox"/> |
| (b) Friends | <input type="checkbox"/> | |
| (c) Newspaper | <input type="checkbox"/> | |
| (d) Radio | <input type="checkbox"/> | |
| (e) Television | <input type="checkbox"/> | |
| (f) Others (specify) _____ | | |
14. How does a person get infected with malaria?
- | | | |
|----------------------------|--------------------------|--------------------------|
| (a) Bite by mosquito | <input type="checkbox"/> | <input type="checkbox"/> |
| (b) Being soaked by rains | <input type="checkbox"/> | |
| (c) Breathing in bad air | <input type="checkbox"/> | |
| (d) Do not know | <input type="checkbox"/> | |
| (e) Others (specify) _____ | | |
15. How can you tell if one has malaria?
- | | | |
|---------------------------------------|--------------------------|--------------------------|
| (a) When one has fever and body pains | <input type="checkbox"/> | <input type="checkbox"/> |
| (b) When one has a cough | <input type="checkbox"/> | |
| (c) When one has vaginal discharge | <input type="checkbox"/> | |
| (d) Don't know | <input type="checkbox"/> | |
16. Do you think malaria can be treated?
- | | | |
|---------|--------------------------|--------------------------|
| (a) Yes | <input type="checkbox"/> | <input type="checkbox"/> |
| (b) No | <input type="checkbox"/> | |
17. What drugs do you take when you have malaria?
- | | | |
|-----------------------------|--------------------------|--------------------------|
| (a) Chloroquine | <input type="checkbox"/> | <input type="checkbox"/> |
| (b) Fansidar | <input type="checkbox"/> | |
| (c) Panadol | <input type="checkbox"/> | |
| (d) Cafenol | <input type="checkbox"/> | |
| (e) Chloroquine and panadol | <input type="checkbox"/> | |
| (f) Others, specify _____ | | |

18. Is malaria dangerous in pregnancy?

(a) Yes

(b) No

--

19. If "Yes", to question 18, explain why? _____

20. What do you use to prevent malaria in pregnancy?

(a) Use of bed net

(b) Use of prophylactic drugs

(c) Closing windows early

(d) Nothing

(e) Others, specify _____

--

21. Who do you think is responsible for preventing malaria in pregnancy?

(a) The pregnant mother herself

(b) The health worker

(c) Neighbours

(d) Others, specify _____

--

22. Are there any pools of stagnant water in your residential area?

(a) Yes

(b) No

--

23. If "Yes", to question 22, do you think pools of stagnant Water can be potential sites for mosquito breeding?

(a) Yes

(b) No

--

24. Do you know that you can participate in burying of the Pools of stagnant water?

- (a) Yes
- (b) No

--

SECTION C: INCIDENCE OF MALARIA

Have you ever suffered from malaria during pregnancy?

- (c) Yes
- (d) No

--

25. If "Yes" to question 22, how many episodes did you have?

- (a) 1 episode
- (b) 2 episodes
- (c) 3 episodes
- (d) 4 episodes
- (e) Others, specify _____

--

26. Has your blood been tested for malaria during pregnancy?

- (a) Yes
- (b) No

--

27. If "Yes" to question 24, did it come out positive or

 negative

--

28. Do you think that you are at high risk of getting malaria during pregnancy?

- (a) Yes
- (b) No

--

29. If "Yes" to question 29, what makes you think so? _____

THANK YOU FOR YOUR PARTICIPATION

APPENDIX 2

GHANT CHART

no.	task to be conducted	person responsible	AUG 2003			SEP 2003			OCT 2003			NOV 2003			DEC 2003			JAN 2004		
1.	Final Research Proposal	Researcher																		
2.	Clearance	supervisor																		
3.	Data Collection Tool	researcher																		
4.	Data Collection	Researcher																		
5.	Data Analysis	Researcher																		
6.	Report Writing	Researcher																		
7.	Draft Report to PBN	Supervisor																		
8.	Finalizing of Report	Researcher																		
9.	Monitoring and Evaluation	Researcher																		

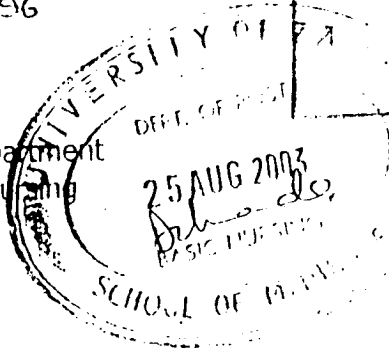
APPENDIX 3

University of Zambia
School of Medicine
P. O. Box 50110
LUSAKA

14th August, 2003

The District Director of Health
Kawambwa District Health Office
P. O. Box 730096
KAWAMBWA.

UFS: Head of Department
Post Basic Nursing
UNZA
LUSAKA



22-8-03

Handwritten signature and text: "Permission granted"

Re: **PERMISSION TO CONDUCT RESEARCH**

In partial fulfillment of the requirements of the Bachelor of Science in nursing degree programme that I am undertaking, I am expected to carry out a research study.

Therefore, I would like to ask for permission from your office to carry out the study at Mbereshi Rural Health Centre. My topic of study is "to determine the knowledge and incidence of malaria among pregnant mothers attending antenatal clinic".

I will highly appreciate if you consider my request as valid.

Yours faithfully,

Hezron Kanswata Chilefu
4th YEAR STUDENT

APPENDIX 4

BUDGET

BUDGET CATEGORY	UNIT COST (K)	QUANTITY	TOTAL
1. Stationery			
(a) Typing paper	28,000	4 reams	112,000
(b) Note book	5,000	1	5,000
(c) Diskettes	4,000	3	12,000
(d) Pencil	200	2	400
(e) Pens	500	5	2,500
(f) Tipex	6,000	2	12,000
(g) Spirals	2,000	1	2,000
(h) Staples	10,000	1 box	10,000
(i) Stapler	12,000	1	12,000
(j) Manila paper	5,000	2	10,000
(k) Markers	2,000	2	4,000
SUBTOTAL			181,900
2. TYPING SERVICES			
(a) Typing research proposal	2,000	40 pages	80,000
(b) Typing questionnaires	2,000	10 pages	20,000
(c) Photocopying questionnaires	200	10 pages x 55	2,000
(d) Typing report (draft)	2,000	90 pages	180,000
(e) Typing final report	2,000	90 pages	180,000
(f) Photocopying report	200	90 x 4 copies	72,000
(g) Binding final report	30,000	4 copies	120,000
SUBTOTAL			654,000
3. PERSONNEL			
(a) Allowances	30,000	14 days	420,000
(b) Lunch allowance	50,000	14 days	700,000
SUBTOTAL			1,120,000
TOTAL			1,955,900
10% CONTINGENCY			195,590
GRAND TOTAL			2,151,490

BUDGET JUSTIFICATION

STATIONERY

The stationery to be bought will be used during the research process. It will be used in the preparation for data collection, during data collection and after data collection when the report will finally be compiled.

TYPING SERVICES

These services will be provided during preparation of the questionnaires to suit the number of respondents needed for the study. Then typing and printing of the draft and final copies of the research report.

PERSONNEL

The money is for lunch allowance for the investigator and his assistants for two weeks duration.

CONTINGENCY

Is the amount of money equivalent to 10% of the total budget that is included to the total amount just in case of shortfalls this money can be used to build the gap that may be created/to cushion the effects of inflation.