ADMINISTRATION OF HEALTH SERVICES AND CHALLENGES IN THE MANAGEMENT OF THE PREVENTION AND CONTROL OF MALARIA IN ZAMBIA: THE CASE OF LUANGWA DISTRICT

BY

MUSOLE SIACHISA

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APPROVAL

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Internal Examiner 1

Name: ……………………………… Signature……………………Date………………

Internal Examiner 2

Name: ……………………………… Signature……………………Date………………

External Examiner

Name: ……………………………… Signature……………………Date………………

Chairperson, Board of Examiners

Name: ……………………………… Signature……………………Date………………

Supervisor

Name: ……………………………… Signature……………………Date………………

ABSTRACT

Malaria is a major public health concern in Zambia and it has for a long time remained the leading cause of morbidity and mortality especially among the under five children and pregnant women. Historically, Zambia has been implementing malaria control measures from the colonial/pre-independence era, through the post-independence period to date. Despite the efforts, the disease has continued to be a serious concern especially in rural districts like Luangwa.

The purpose of this study was to investigate the administration of health services and challenges in the management of prevention and control of malaria. Using the case study strategy, the research investigates the administration of health services and challenges in the management of the prevention and control of malaria in Luangwa District of Zambia. The research is both quantitative and qualitative in nature. Two types of data were collected, namely, secondary and primary data. Primary data was collected from samples of key informants using interview guides and respondents (local people) using structured questionnaires. The total number of key informants is 46 which included 2 managers from the District Health Office, 19 health providers, 15 neighbourhood health committee members and 10 community health workers. The total number for the local people (respondents) who were interviewed is 200. Secondary data was collected by reading documents on malaria control. The quantitative data was analysed using Statistical Package for the Social Sciences and qualitative data was analysed using the method of content analysis.

The findings reveal that government and its cooperating partners has been implementing various malaria control measures in Luangwa District. These control measures include; insecticide-treated nets, indoor residual spraying, community sensitization, health infrastructure, human resource for health, malaria case management and prevention of malaria in pregnancy. However, the measures were not adequate to effectively control malaria. The study also revealed that the community members do not fully utilise the measures which are being implemented to control malaria. Further, the local people are not fully involved in malaria control programmes for successful implementation; instead, they are just mere recipients of the services which were provided by programme implementers. The implication is the continued high prevalence rate of malaria in the district.

Keywords: *Malaria, Malaria Control, Community participation, Decentralisation.*

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DEFINITION OF CONCEPTS

In this study, the key terms have been understood in the context explained below:

1. Administration- refers to management of public affairs / is the range of activities connected with organizing and supervising the way that an organization or institution functions.

2. Advocacy- a continuous and adaptive process of gathering, organizing and formulating information into argument, with a view to raising resources or organizing the acceptance and commitment of political and social leadership to a development programme, thereby preparing a society for its acceptance.

3. Anopheles - refers to a female mosquito which carries the parasite which causes malaria.

4. Artemisinine Combination Therapy - refers to the combination of various malaria drugs which make a malaria drug known as Coartem.

5. Catchment area- area served by a particular health facility (hospital, health centre etc.).

6. Chemoprophylaxis - refers to a special treatment given to high risk groups (pregnant mothers, sicklers, children etc.).

7. Chloroquine - refers to the first line antimalarial drug in Zambia.

8. Coartem - refers to a drug which is a combination of Artemether and Lamefantrin, currently being used to cure malaria in Zambia.

9. Community- a group of people with common interests and fellowship living in the same local area (i.e. more intimately involved than at either district or regional areas).

10. Community Participation- the active involvement of people living together in some form of social organization and cohesion in planning, operations and evaluation of a programme using local, national and other resources. It is a process through which communities ultimately influence and share control over the development, local initiatives, decisions and resources of projects (e.g. malaria control) that directly affect them.

11. Decentralisation- dispersion or distribution of functions and powers from central authority to regions and local authorities.

12. Epidemiology- the branch of medicine which deals with the incidence, distribution, and possible control of disease and other factors relating to health.

13. Environmental Management- a purposeful activity with the goal to maintain and improve the state of an environmental resource affected by human activities.

14. Health- it is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

15. Key Informants- persons carefully selected to inform the programme because of their special knowledge of specific relevant aspects of the target population or their in-depth understanding of the key issues.

16. Malaria Control - refers to measures put in place to eradicate the malaria disease.

17. Malaria control phase – malaria prevalence levels are in proportions of public health concern necessitating continuous and sustained interventions/control measure (statistical description – 25% malaria prevalence).

18. Malaria pre-elimination phase – reduction of malaria prevalence, in a defined area as a result of deliberate intervention measures, to remarkably low levels but the disease still poses to be a public health problem (statistical description – malaria prevalence of between 0 and 5% with zero or near zero morbidity rate).

19. Malaria elimination phase – reduction to zero prevalence of malaria in a defined area, as a result of deliberate efforts, such that the disease is no longer considered a public health concern in the area despite still needing sustenance of interventional measures (statistical description – localized and sustained 0% prevalence of malaria with zero percent morbidity and mortality).

20. Malaria eradication phase – permanent reduction to zero of the worldwide prevalence of malaria necessitating no need of any interventional or control measure (statistical description – global 0% prevalence of malaria with 0% morbidity and mortality).

21. Morbidity - the rate of disease in a population.

22. Mortality – the number of deaths in a given area or period, or from a particular cause.

23. Participatory learning and action- a community development approach whereby facilitators work with communities to help them analyze their needs, identify solutions to fill those needs, and develop and implement a plan of action.

24. Participatory rural appraisal- a way of learning from and with community members while investigating, analyzing and evaluating locally-based development projects. It is a method by which a trained team can quickly and systematically collect information for the general analysis of a specific development intervention (e.g. needs assessments, feasibility studies) in non-literate rural communities.

25. Plasmodium Falciparum – refers to the most dangerous of malaria parasites.

26. Sulfadioxine Pyramethamine (commonly known as Fansidar) refers to the second line antimalarial drug in Zambia.

27. Unitary State- is a state governed as one single unit in which the central government is supreme and any administrative divisions exercise only powers that their central government chooses to delegate.

28. Vector- is an organism that does not cause disease itself but which spreads infection by conveying pathogens from one host to another, e.g. species of mosquito, serve as vectors for the malaria disease.

ABBREVIATIONS

ACD	Active Case Detection
ACT	Artemisinine Based Combination Therapy
AIDS	Acquired Immune Deficiency Syndrome
AMC	Artesunatehere Mefloquine Combination
AMCP	Accelerated Malaria Control Programme
ANC	Antenatal Clinic
ART	Anti-Retroviral Treatment
BCC	Behaviour Change Communication
CBD	Community Based Distributor
CBOH	Central Board of Health
CBV	Community Based Volunteer
CDC	Centre for Disease Control
CHA	Community Health Assistant
CHAZ	Churches Health Association of Zambia
CHW	Community Health Worker
CIP	Capital Investment Plan
CSO	Central Statistical Office
DDT	Dichloro Diphenyl Trichloroethane
DfID	Department for International Development
DHIS	District Health Information System
DHMT	District Health Management Team
DHO	District Health Office

DHS	Demographic and Health Survey
DHD	District Health Director
DOT	Directly Observed Therapy
EDPT	Early Diagnosis and Prompt Treatment
EHT	Environmental Health Technologist
GDP	Gross Domestic Product
GFATM	Global Fund against Tuberculosis and Malaria
GIS	Geographical Information System
GMA	Game Management Area
GRZ	Government of the Republic of Zambia
HCC	Health Centre Committee
HFC	Health Facilities Census
HRH	Human Resource for Health
HIV	Human Immuno-Deficiency Virus
HMIS	Health Management Information System
IEC	Information, Education Communication
IMCI	Integrated Management of Childhood Illnesses
IMF	International Monetary Fund
IPT	Intermittent Preventive Treatment
IRH	Integrated Reproductive Health
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Net
IVCC	Innovative Vector Control Consortium

IVM	Integrated Vector Management
JHMRI	John Hopkins Malaria Research Institute
KCM	Konkola Copper Mines
LCDA	Luangwa Child Development Agency
LLIN	Long Lasting Insecticide Net
LSTM	Liverpool School of Tropical Medicine
MACEPA	Malaria Control and Evaluation Partnership in Africa
MCH	Mother Child Health
MCP	Malaria Control Programme
MDGs	Millennium Development Goals
MIAM	Malaria Institute at Macha
MICS	Multiple Indicator Cluster Survey
MIS	Malaria Indicator Survey
MNDP	Ministry of National Development and Planning
MOFNP	Ministry of Finance and National Planning
MOH	Ministry of Health
MOJ	Ministry of Justice
MSD	Medical Stores Limited
MTC	Malaria Transmission Consortium
NDP	National Decentralisation Policy
NDP	National Development Plan
NGO	Non- Governmental Organisation
NHC	Neighbourhood Health Committee

NHSP	National Health Strategic Plan
NMCC	National Malaria Control Centre
NMSP	National Malaria Strategic Plan
NVBDCP	National Vector Borne Disease Control Programme
PECM	Prompt and Effective Clinical Management
PHC	Primary Health Care
PHD	Doctor of Philosophy
PHO	Public Health Officer
PLWHA	People Living with HIV/AIDS
PMI	President Malaria Initiative
PMTCT	Prevention against Mother to Child Treatment
RAPIDS	Reaching HIV/AIDS Affected People with Integrated Development and Support
RBM	Roll Back Malaria
RDT	Rapid Diagnostic Test
RHC	Rural Health Centre
SDGs	Sustainable Development Goals
SFH	Society for Family Health
SHHD	Scottish Home and Health Department
SMAGs	Safe Motherhood Association Groups
SM&E	Surveillance, Monitoring and Evaluation
SNDP	Sixth National Development Plan
SP	Sulphadoxine Pyremethamine

SPSS	Statistical Package for the Social Sciences
TB	Tuberculosis
TBA	Traditional Birth Attendant
TDRC	Tropical Disease Research Centre
TWC	Third World Countries
UNICEF	United Nations Children's Fund
UNZA	University of Zambia
USAID	United States Agency for International Development
VBC	Valent Biosciences Corporation
VCT	Voluntary Counselling and Testing
VHC	Village Health Committee
WHA	World Health Assembly
WHO	World Health Organisation
WHOPES	World Health Organisation Pesticide Evaluation
ZACCI	Zambia Association of Chambers of Commerce and Industry
ZANIS	Zambia National Information Services
ZEMA	Zambia Environmental Management Agency
ZHMIS	Zambia Health Management Information System
ZIHP	Zambia Integrated Health Programme
ZISSP	ambia Integrated System Strengthening Programme
ZNMPP	Zambia National Malaria Programme Performance
ZPPA	Zambia Public Procurement Act

CHAPTER ONE

INTRODUCTION

1.1 Background

Malaria is an illness caused in man by infection with a parasite. In Zambia about 98% of the malaria cases are due to the most dangerous parasite (plasmodium falciparum). The name malaria came about as a mistake belief by European explorers who associated it with bad air i.e. mal meaning bad and aria meaning air.

MacLeod (1998) defined malaria as an infection, which may be acquired wherever there are human hosts carrying the parasites and a sufficiency of suitable female mosquitoes together with conditions of temperature and humidity that favour the development of the parasite in the mosquito. It may also be transmitted by transfusion or inoculation of infected blood and rarely transplacentally.

The disease presents itself mainly by symptoms of generalised body aches, headache, vomiting, nausea, chills, malaise and fever. Hence, the disease is very difficult to differentiate from other infectious diseases. Malaria is a potentially deadly disease that is caused by infection with the parasite which is transmitted to humans through the bite of a female mosquito infected with the parasite. The female mosquitoes survive by feeding on blood. It is through this process of feeding that the parasite is transmitted from one human being to the other. When a mosquito bites someone who is infected, it sucks blood containing the parasite that causes malaria. And when the same mosquito bites another person who is not infected, it injects that malaria parasite into that person. When the parasite is injected into the blood stream, it attacks the liver where maturation and multiplication occur. From the liver, the parasites enter the red blood cells. In the cells, the parasites further mature and multiply until the cells burst. During the time the parasites are in the liver, the person may feel fever, nausea and vomiting, headache, abdominal pains and general body pains. Once it gains entry the plasmodium finds its way into the blood stream destroying red blood cells. Sometimes, the malaria parasites can invade organs such as the brain and cause cerebral malaria or the kidneys and cause black water fever. These could be severe forms of malaria and cause death.

1.1.1 The vector

The female mosquito as the vector, breeds in fresh water bodies such as ponds, ditches, swamps, holes, road gullies and agricultural fields. The female mosquitoes have shown resistance to numerous insecticides and are widely distributed. The female mosquito which carries the parasite that causes malaria is the most widespread in Africa, and the most difficult to control.

1.1.2 Control Measures

The problem of malaria could be brought under control with the combination of some or all of the following measures:

1.1.2.1 Chemotherapy and Chemoprophylaxis

This involves the use of drugs that eliminate the malaria parasites in the human body. The destruction of the plasmodia also reduces the morbidity and mortality of the disease among humans. The disadvantage with the measure is that it is costly both in terms of the cost of the drug and the administration of the drug. In Zambia, the most widely used drug for chemotherapy is coartem and fansidar for chemoprophylaxis. Currently, chemoprophylaxis is confined to pregnant women and is being given as intermittent presumptive treatment (WHO, 1998).

1.1.2.2 Destruction of the Vector

This involves the elimination of the vector mosquito as well as the mosquito larva and eggs. The commonest way of achieving this is through the use of insecticides and larvicides to destroy the mosquitoes and larvae respectively. The use of insecticides in the destruction of malaria vectors is a very effective method of malaria control. Its disadvantage is the high cost of chemicals and the high operation cost of executing spraying programmes. This method of malaria control in Zambia proved very effective during the economically vibrant years of the 1960s right through to the early 70s. During this period, two rounds of spraying were undertaken annually with a resultant effect of low malaria transmission. This effort was so successful especially in the urban areas. The economic downturn of the Zambian economy following the falling price of copper resulted in abandoning these effective spraying campaigns. This demise was not helped by the international ban on Dichloro-diphenyl-trichloroethane (DDT) use. The

ban on the use of this affordable and effective chemical in the early 80s meant an almost abandonment of spraying against the malaria vectors.

1.1.2.3 Biological Control

Biological control involves the use of fish, most notably Gambusia fish to feed on mosquito larva. This has been a considerable measure in East Africa. This method has a big advantage in that it is environment friendly and relatively cheaper. This method also has a big potential of sustainability in that once the fish is introduced in a body of water it will multiply by itself and maintain itself. From such a school of fish, seed fish could be got to introduce to other bodies of water. The disadvantages of this method include its limited utility due to the general inadequate knowledge on aquaculture by most people. Scientific knowledge is also scanty on this method and probably there is need for more research and its dissemination to make this method more readily available.

1.1.2.4 Environmental Management

Environmental management refers to the whole range of activities and practices that should be observed and carried out in order to minimize or at its best create an environment where mosquitoes cannot breed and thrive. These include conscious removal of all standing water where mosquitoes might breed, clearing bushes and tall grass around dwelling areas, careful construction of roads, dams, farms and canals so that mosquito breeding is minimized. These practices are fundamental and have a potential of reducing malaria. The disadvantage is in their applicability. Carrying out these measures is not only costly but also requires conscious effort on the part of the local people and contractors on one hand and an effective monitoring system by both the central and local governments on the other. Such capacities seem not to exist.

1.1.2.5 Blocking contact between people and mosquitoes.

Blocking contact between people and mosquitoes involves putting in place effective barriers between the mosquitoes and the potential bite victim. The most renowned method is the use of the insecticide treated mosquito net (ITNs). The major strengths of this method are that ITNs, are at once capable of protecting individuals from lethal bites as well as killing vector mosquitoes. The ITNs are also capable of killing other vermin like bedbugs. The other advantage is its applicability. The method is individual based

and is relatively easy to adopt, once adopted the use of the net could be lifelong. The cost of the method is also very cheap. According to Sikazwe (2003), the major disadvantage is the lack of the culture to use nets in Zambia. The lack of this culture sometimes is translated into cost implications, i.e. the communities cannot afford the ITNs.

1.1.2.6 Repellants and Protective clothing

This is a useful measure among campers and people that are forced by circumstances to stay outdoors. However, it has little practical use as a long term measure (Sikazwe, 2003).

1.1.3 The Global Picture

According to the latest World Malaria report, released in December 2019, there were 228 million cases of malaria in 2018 compared to 231 million cases in 2017. The estimated number of malaria deaths stood at 405,000 in 2018, compared with 416,000 deaths in 2017. About 90% of all malaria deaths in the world occur south of Sahara, Zambia included. The report further indicates that some 40% of the world's population is at risk of malaria and the vast majority live in the world's poorest countries. The disease is found throughout the tropical and subtropical regions of the world. Given the variable nature of the disease, its vectors, and the vulnerability of particular human populations, WHO, stresses the need for a range of malaria control approaches in its Global Malaria Control Strategy (WHO, 1993). WHO recommends an integrated approach that relies on early case identification and treatment, as well as selective and sustainable prevention measures, including vector control.

A large scale control of malaria with the aim of eventual eradication was launched by the World Health Organisation (WHO) in 1955 and in 1957, the World Health Assembly (WHA) of WHO established and supported a worldwide malaria eradication programme which ended in 1969. At the end of the programme, the goal was revised from eradication to control because the eradication goal had proved unfeasible. However, even though the programme did not achieve its intended goal of global eradication of the disease, its direct and indirect effects were credited with the elimination of malaria from Southern United States, Europe, some parts of the Middle East, North Africa and certain areas in Southern America.

According to the journal, Lacent (April, 23, 2005:19) in 1998, the World Health Organisation (WHO) identified malaria as a key priority, and announced the launch of the Roll Back Malaria (RBM) campaign, which aimed to bring about a significant reduction in the global malaria burden, with an initial emphasis on the high transmission areas of Africa. The new initiative rose out of a strong and growing political commitment to combat malaria, both in affected countries and the Donor Community. Malaria assumed a high profile globally, regionally and nationally.

1.1.4 The African Picture

According to WHO Report (2003), Malaria is a serious problem in Africa; it afflicts more than one half of the continent's population. The disease kills nearly one million children in Sub Saharan Africa each year, with several million more in their prime working age unable to perform to their potential due to regular bouts of malaria. More than 300 million people suffer from mosquito bites each year. Around ten percent (10%) of the total disease burden in Africa is due to malaria. Further, over eighty-eight percent (88%) of the world malaria burden falls on Africa.

Attempts to control the disease in Africa have, so far, failed. Firstly, there has been lack of information on the magnitude of the economic and social burden of the disease, information that should have motivated policy makers to design and implement more effective control programmes. Secondly, little is known about the economic behavior of households in seeking treatment or prevention for malaria, thus making it difficult to design appropriate policy incentives for households to effectively allocate resources towards control. Thirdly, in many African countries, there has been little knowledge about drug distribution systems in private and public sectors through which anti malaria drugs, as well as other malaria control products and services, are delivered to populations. Consequently, these systems cannot be properly reformed for effective delivery of anti-malaria drugs (WHO Report, 2003).

In his thesis, Njovu (2009) argues that malaria deaths and morbidity in Africa vary greatly from one region to another because of the differences in malaria transmission mechanisms, which include cultural, economic, environmental and political factors. He further argues that no single factor can be pinpointed as the primary cause of malaria. Consequently, interventions for malaria control should be regionally and contextually specific.

1.1.5 The Zambian Picture

At independence, Zambia inherited a Malaria Control Programme that had urban and rural components, though, the control effort was concentrated in urban areas. There were few health facilities, so that access to malaria treatment was poor. After independence, the Government increased its health budget and improved health infrastructure. There was a new emphasis on health for all. However, a poor national economic climate continued to impact negatively on that progress. Zambia has one of the highest rates of malaria incidences.

According to (MOH, 2016), it is estimated that in 2015, there were over 5 million malaria cases in Zambia. The report further indicates that the disease remains a significant cause of morbidity and mortality in Zambia, with one in five children under age five infected with malaria parasites, and other vulnerable population groups at risk.

The Zambian Government has identified malaria control as one of its main public health priorities. This is emphasised in all successive National Development Plans (NDP) and the National Health Strategic Plans (NHSP). In that respect, the Government, through the National Malaria Control Centre (NMCC) has been developing successive National Malaria Strategic Plans (NMSP), aimed at significantly scaling up malaria control interventions toward the achievement of the national vision of "a malaria free Zambia".

The Zambian Ministry of Health (MOH), in collaboration with multiple partners, has set high targets for coverage of interventions and reductions in malaria burden outlined in the NMSPs. Evidence of progress in rolling out malaria interventions to affected communities comes from several partners and sources, including the 2001 – 2002 and 2007 National Demographic and Health Surveys (DHS), the 1999 UNICEF- supported Multiple Indicator Cluster Survey (MICS) and smaller scale household surveys such as the Roll Back Malaria (RBM) baseline and follow-up surveys (2001 and 2004), Net Mark evaluation surveys (2000 and 2004) and others.

Malaria is a major public health concern in Zambia, and fighting the disease is a national priority that requires a focused, comprehensive, and consistent approach in order to achieve the vision of "a malaria free Zambia by 2030." Even though significant reductions in the malaria burden have been recorded over the past ten years, the disease

is still among the major causes of morbidity and mortality in the country, particularly in high-endemic areas and among the vulnerable population groups, which include pregnant women and children less than five years of age (MOH, 2012). In 2009, malaria incidence per 1,000 populations was reported at 246, a reduction from 358 recorded in 2006. However, in 2010 it increased to 330 due to resurgence experienced in some parts of the country, particularly the Eastern, Northern, and Luapula provinces. In 2010, 4.2 million clinical and laboratory-confirmed cases were reported, representing an increase of 31% from 2008 (Ibid, 2012).

In 2010/2012, the Central Statistical Office (CSO) carried out a Sample Vital Registration with Verbal Autopsy study in Zambia. According to the CSO report of 2014, the study indicated that malaria-related deaths accounted for 11.5 percent of all deaths. Female deaths resulting from Malaria were recorded at 12.2 percent while male deaths were at 10.9 percent. There were more Malaria-related deaths in rural than urban areas at 12.9 and 8.7 percent, respectively. About 18 percent of all deaths in children under 5 years (0-4) were due to malaria related causes. Similarly, 39.3 percent of all deaths in children aged between 5 and 14 years were due to malaria related causes while in the age group 15 years and older 5.9 percent of all deaths were related to malaria.

In 2006, the MOH and partners conducted the first nationally representative malaria indicator survey (MIS), measuring the coverage of the core RBM interventions and Malaria – related disease burden. This survey is part of a planned national evaluation of malaria control efforts implemented under the NMSP 2006 – 2010. The results of the survey provided a baseline of key malaria interventions. These interventions included; the adoption of the use of artemisinine based combination therapies (ACTs) strategy as a replacement for the initial monotherapy options in the management of uncomplicated malaria in Zambia, the use of Rapid Diagnostic Tests (RDTs) since 2006 throughout the public sector for malaria diagnosis, the introduction of Indoor Residual Spraying (IRS) and Larviciding (Chemical Control Programme), introduction of Intermittent Presumptive Treatment (IPT) in pregnant mothers and increased use of Insecticide Treated Mosquito Nets (ITNs). It was believed that the implementation of all these interventions would, if not eradicate malaria, reduce the morbidity and mortality rates to lower levels.

World Health Organisation (WHO) report on 2009 World Malaria Day indicates that malaria deaths reported from health facilities in Zambia had reduced by 66%. Though major achievements have been made in malaria control, the disease remained a significant cause of morbidity and mortality in Zambia, with one in five children under age five infected with malaria parasites, and other vulnerable populations groups at risk. According to MOH (2016), despite significant progress made over the period 2005 to 2015, malaria continued to be a major burden in Zambia, resulting in 2000 deaths in 2016. Malaria prevalence varied across districts with 14 million Zambians at risk, including the most vulnerable groups, such as pregnant women and children under the age of five years.

In view of the above, in 2017, the Ministry of Health developed the National Malaria Elimination Strategic Plan for 2017 to 2021 under the guiding principle of "a malaria-free Zambia". The goal was to eliminate local malaria infection and disease in Zambia by 2021 and to maintain malaria-free status and prevent re-introduction and importation of malaria into areas where the disease had been eliminated.

1.2. Statement of the Problem

The Zambian Government has identified malaria as a major public health concern and as a result it has put malaria elimination by the year 2021 as one of its main priorities. Malaria control has been emphasized in successive National Health Strategic Plans (NHSP). For instance, the aim of the 2000-2005 NHSP was to achieve the targets set by the Abuja Declaration with the vision "reducing malaria morbidity and mortality by 50%". The 2006-2010 NHSP aimed at achieving 80% coverage of key interventions, reducing malaria incidence by 75% and significantly reducing deaths attributable to malaria by end of 2011. The 2011-2015 NHSP sought to build upon previous successes and address prevailing and the emerging challenges in the fight against malaria. For the 2017-2021 National Malaria Elimination Strategic Plan (NMESP), the guiding principle is "a malaria free Zambia". The goal is to eliminate local malaria infection and disease in Zambia by 2021 and to maintain malaria free status and prevent re-introduction and importation of malaria into areas where the disease had been eliminated.   In that respect, the Government through the National Malaria Control Centre, has been developing and implementing strategic plans aimed at significantly scaling up malaria control interventions toward the achievement of the national vision

of "a malaria free Zambia". The Zambian Ministry of Health, in collaboration with multiple partners has set high targets for coverage of interventions and reductions in malaria burden as outlined in the successive National Malaria Strategic Plans. In doing so, the health sector through National Malaria Control Centre has put in place strategies and interventions aimed at reducing the incidence of malaria and to eventually eliminate the disease by the year 2021. Some of these strategies are; scale up of high impact preventive, curative and care interventions; use of Indoor Residual Spraying; use of Insecticide Treated Nets; use of Intermittent Presumptive Treatment of malaria in pregnancy; Availability and use of Anti-Malarial drugs; Introduction of Rapid Diagnostic Tests in all health facilities which do not have microscopy services; and Provision of quality health facilities and staff. Yet up to date, malaria continues to be a major public health concern. According to CSO (2010/2012) SAVVY report, malaria is the major cause of death at 18% followed by malnutrition at 16.1% especially among children aged 0-4 years in Zambia. Malaria continues to be the leading cause of morbidity and mortality in spite of government, NGOs and the private sector's interventions to ensure that cases of malaria are reduced especially among the children and pregnant mothers who are most vulnerable. Effective prevention and control of malaria requires the implementation of cost-effective measures in the communities. Whereas programmes to ensure that malaria is prevented and controlled have been vigorous, the prevailing situation seems not to be the mirror of the efforts being put in place.

According to Luangwa District Annual Health reports of 2011 to 2016, the district for example recorded Malaria Incidence Rates of 842/1000 in 2011, 361/1000 in 2012, 560/1000 in 2013, 893/1000 in 2014, 469/1000 in 2015 and 439/1000 in 2016. Maybin et al (2015) in their study done in Lusaka Province to examine morbidity and mortality rates of malaria from 2009 to 2013, report that malaria remains a major cause of morbidity and mortality in Lusaka Province especially in Luangwa district where both morbidity and mortality have been very high during the study period. For instance, concerning the total malaria burden by district, in 2013, the study indicates that Luangwa District reported the highest morbidity of 574 per 1000 populations from 320 per 1000 populations which was reported in 2012 while the other three districts reported malaria morbidity of less than 250 per 1000 populations. The district also reported the highest malaria mortality of 1.23 per 1000 populations while the other

three districts reported malaria mortality of less than 0.17 per 1000 populations in 2013. Effective prevention and control of malaria can only make a substantial reduction in malaria morbidity and mortality if adequate and effective measures are properly implemented. But what measures have been put in place to control malaria in Luangwa District? If there are measures which are being implemented, do people comply with those measures? If compliance is a problem, what factors determine non-compliance? Do the local people participate in controlling malaria in their communities? If they do, what is the nature and extent of community participation in controlling malaria in their respective communities? What are the challenges being faced in controlling malaria? There seemed to be unanswered questions which this study sought to provide answers. The preceding data about the malaria situation in the country and more especially the prevailing malaria situation in the rural district of Luangwa prompted the study to ask some questions.

1.3. The objectives of the study

1.3.1. General Objective

The general objective of the research is to assess the challenges in the management of the prevention and control of malaria in Luangwa District.

1.3.2. Specific Objectives

1. To establish management measures being implemented to prevent and control malaria in Luangwa District.
2. To examine the extent to which the local people utilise the malaria preventive and control measures implemented in the community.
3. To establish the nature and extent of community participation in preventing and controlling malaria in Luangwa District.

1.4. Research Questions

1. What measures are being implemented to prevent and control malaria in Luangwa District?
2. To what extent are the local people utilising the malaria preventive and control measures implemented in the community?
3. What is the nature and extent of community participation in preventing and controlling malaria in Luangwa District?

1.5. Significance of the study

Given the need to control and eventually eliminate malaria in Zambia, especially in Luangwa district which records high prevalence rates of malaria, there is need to determine the administration of health services in the control of malaria in Luangwa district, especially that the district is one of the first districts in Zambia to be targeted for scale-up to ITNs. Consequently, this study will contribute to scholarly work and policy on malaria. This study will provide critical information, which may be used to try and control malaria in Luangwa district and elsewhere in the country. The study will contribute towards people's participation on policy issues by airing their views on matters that affect them such as health.

1.6. Theoretical Framework

There are many theories that conceptualize, describe and predict health and illness from different perspectives. Some related theoretical frameworks have been explored in this section. Therefore, this section looks at the Structuralist Theory, the Democratic Theories of Local Government, Arnstein's ladder of participation theory, the Social Cognition Theories, Explanatory Theories and Ecological Theories.

1.6.1. Structuralist Health Theory

According to the Structuralist Health Theory, health care is a state supported consumer good or service. Most of the health facilities and services are owned by the state, though there can be a number of mission-owned and private owned health facilities.There are three cardinal elements in the Structuralist approach. The first element is that of its structure. There is usually a tendency to decentralise. In Scotland, for example, the National Health Service is administered from the Scottish Home and Health Department (SHHD), which, in turn, administers the Scottish Health Service through fifteen Health Boards and Local Units of Management (Hunter, 1989). Decentralised administration entails the localisation of accountability for the delivery of health services to the community, leading to community participation in the provision of health services.

The second element of the Structuralist approach concerns the process of health delivery (Ibid: 206). At this level, three specific aspects are emphasised. These are cost-efficiency, managerialism, and health planning. Cost-efficiency entails having healthy

citizens by making health services easily accessible but without precipitating an unmanageable escalation of costs. Managerialism involves the training of administrators of the decentralised health system, while planning takes the perspective of interactive, adaptive and "mixed planning". This view of planning tries to design a desirable future and thereafter, inventing ways of bringing it about.

The third major element of the Structuralist approach focuses on behaviour. This element also constitutes three specific aspects that Hunter (1989) refers to as "the behavioural synthesis". The first aspect of the behavioural synthesis is the structural determinants of illness. This concerns a general agreement that illness is "located" not in the individual but in the social, economic and political structure of society. Hence, the approach emphasis is a health service rather than a disease service (emphasis is on prevention and health promotion and not on treatment). Domestication of the health system is the second specific aspect of behaviour. This approach tries to achieve quality health care through the strategy of prevention and health promotion- "going upstream a little in order to rescue people before they begin to drown and still going further upstream in order to stop them from being thrown into the river" (Hunter, 1989). This strategy can only be successful if society participates- no health for all unless all for health. The third aspect of the behavioural element that is emphasised on is that, systems have to adopt planning based on "power with" and not "power over". That is, managers of the health systems have to spend most of their time interfacing with other organisations in order to build cross-agency coalitions which can enable them formulate new possibilities in regard to processes of innovation and change (Battilana, 2006).

From the Structuralist theory point of view, it can be argued that the extent to which responsibilities, functions, and resources are delegated by central government (decentralization) to the Provincial, District and Community levels has a bearing on the provision of public services like health. Decentralisation can take many forms that include functional, areal, horizontal and vertical. Generally, local administrative units are granted authority through vertical decentralization in the form of either deconcentration or devolution. Deconcentration involves transfer of selected functions within the central government hierarchy through the shifting of workload from central ministries to field officers, the creation of field agencies, or the shifting of responsibility to local administrative units that are part of the central government structure. It is worthy, to note that although deconcentration results in some dispersal of

power, few decisions can be taken without reference to the centre. Devolution on the other hand involves the transfer of legislative powers and institutional autonomy to sub-national units of government. The sub-national units include Local governments, local authorities, district councils, provincial government and state governments. Local governments in a devolved system can do what they want, bound only by the broad national policy guidelines, their financial, human and material resources (Lolojhi, 2008). In a devolved system of administration, local government is perceived as a separate level over which central government exercises little or no direct control; local units must have clear and legally recognized geographical boundaries over which they exercise authority and within which they perform their functions: and local units must be given corporate status meaning that they can sue or be sued, be involved in business ventures and raise funds from their own resources, and should be free to revise rent charges.

Inspite of the global demand for decentralization, it is important to note that if not properly handled, decentralization can increase disparities; can undermine the implementation of fiscal policie; and can enhance corruption (Prud'homme, 1995). A detailed analysis of this argument is beyond this thesis, suffice to state that the adoption of a good decentralization policy and other government rules and regulations should be able to effectively mitigate the adverse effects of the perceived dangers of decentralisation. Generally, the benefits associated with decentralization include the strengthening of democracy and management efficiency; promotion of transparency, accountability, and sustainable development projects: and fostering of political education and training for political and administrative leadership (Lolojhi, 2008). Clearly, from the Structuralist health theory point of view, the benefits of decentralized government epitomizes the tenets of community participation and good governance. Community participation in the activities of local administrative units can help to enhance transparency and accountability. Our main concern here is participation. The concept of participation maybe defined as the organized effort to increase control over resources and regulative institutions in given social situations on the part of groups or movements hitherto excluded from such control. The concept captures the aspect of empowerment, control, and decision-making. Participation may generally be seen as both an end and a means. Human development stresses the need to invest in human capabilities and then ensure that those capabilities are used for the benefit of all.

Greater participation has an important role to play here: it helps maximize the use of human capabilities and is thus a means of increasing levels of social and economic development. But human development is also concerned with personal fulfilment. So active participation, which allows people to realize their potential and make their best contribution to society is also an end in itself (HDR, 1993). It is a concept that represents a vehicle through which desired objectives such as democratization, equity, human rights, and sustainable development can be realized. Benefits associated with participation are many and varied but maybe divided into three categories namely: instrumental, developmental and intrinsic values. Regardless of the level or type of participation, there is significant evidence that participation can, in many circumstances, improve the quality, effectiveness and sustainability of projects, and strengthen ownership and commitment of government and stakeholders. These are attributes of good governance.

The notion of good governance (good government) is associated with the need to institute fundamental changes in political and administrative structures as a prerequisite for development. According to United Kingdom's Overseas Development Administration (ODA), there are four main elements that underpin the concept: the legitimacy of government; accountability of both the political and official elements of government for their actions; the competency of government to formulate policies, make timely decisions, implement them effectively and deliver services; and the respect for human rights and the rule of law. To achieve good governance, there is need for many institutions, and other stakeholders, in any given society to interact effectively by way of sharing ideas and being accountable for certain responsibilities. The process of interaction should, as much as possible, be free from intimidation and only characterized by a spirit of interdependence and mutual respect.

The delivery of services, whether by private or public institutions, depends on the effectiveness with which such institutions are managed. An organization may have all the resources at its disposal but how such resources are managed is very critical to the service delivery process (Lolojhi, 2008). Local administrative units, like any other institutions, have to be well managed in order for them to deliver the desired results. The examination and understanding of the relevant theories is therefore, very important not only to academicians and theoreticians but also to those that actually manage institutions whether public or private. According to Fox et al (1991), the trend in the

evolution of management theory has been a shift from a closed system approach searching for principles of management to an open system approach selecting management strategies in relation to the particular situation within which the organization finds itself. Management and organization theory is linked to at least four schools of thought namely; the Classical School, the Behavioural School, Open Systems School, and the Contingency School.

The Classical School was based on the belief that rationality in structure and process could be attained by building a theory around what was defined as the "one best was" of doing things. The school maintained that it was possible to devise a set of principles of management which should be applied to improve management performance and that these principles could be applied in any type of organization. Three observations can, however, be made and constitute a critique of the classical approach. First, the school utilizes a mechanistic analogy for the studying of management and organization phenomena. There is a narrow view of task performance and the human element is not effectively considered in the process. Second, the school emphasizes a search for universally applicable principles of management. However, the notions of 'universal principles of management' and 'one best way' that are applicable in all management situations, are explicitly rejected by the system school. Finally, the school focuses on internal efficiency and does not give significant attention to the environment and factors in the environment (Fox *et al.,* 1991).

The Behavioural School aimed at enabling management to understand human behavior in order to be capable of modifying it for the improved effectiveness of the organization. The school emphasized the importance of studying people as behaving individuals in an organized setting (Fox *et al.,* 1991). The behaviouralists sought to adopt an integrated and interdisciplinary approach, for according to them all human actions are motivated by social, economic, political and psychological environment where they come from. This approach aims at substituting empirical and realistic judgement from where they come. This approach has been criticized for being of limited utility in the analysis of all types of administrative phenomena mainly because it is value-laden and consequently less likely to effectively and realistically respond to management challenges related to human behavior. It is also noted that behavioural sciences appear to be largely valid and applicable to small groups, whereas the study of public administration deals with larger communities. The behavioural approach, thus,

appears to be of limited relevance in dealing with many types of administrative problems and their solutions, since the complexity and variability of human nature, motivations and behavior prelude the attainment of precision that is so characteristic of the physical sciences (Basu, 1994).

The Systems School views organization not merely as a formal arrangement of superior and subordinates, or a social system comprising informal organization and people's influence on each other, but a total system of formal organization, individuals, social system, the physical setting, and the environment, all constantly interacting with each other (Goel, 1994). An open systems approach like the Contingency School views the environment as a very critical component to the successful management of organisations. It is generally accepted that the total situation of the relevant environment has to be taken into account in organization theory. The relevant environment has undoubted influence on organizational processes such as management. The environment is of such importance that it should be regarded as the starting point in understanding any internal subsystem (Kast and Rosenzweig, 1974). It should be noted however, that the system theory in management has many limitations as it deals with complex and ever-changing phenomena. It is observed that the selection of variables and their interconnections are not subject to control. The theory does not offer a unified philosophy. Models based on the systems theory of management cannot comprehend social phenomenon. With the help of new electronic gadgets, however, it is possible to develop and perfect the systems theory of management over a period of time (Goel, 1994).

According to Weiner (1982), Contingency theory, regardless of its particular expression- situational organization form, situational leadership style, or situational decision-making, is generally accepted as the dominant emerging theory of organization and management of societal institutions. Carlisle (1973), argued further that the contingency theory approach to management supports the notion that there is no one best way to lead people, organize groups, arrange tasks, or manage an enterprise. Also there is no one best system for planning, controlling, budgeting, coordinating, or integrating the operations of an organization. Management strategies have to be selected and/ or adapted for the particular situation facing the organization (Fox *et al.,* 1991). In other words, the tenets of the contingency school uphold the need

for managers to be adaptable, flexible, analytical and ingenious in their decision-making and management.

However, critics have argued that despite many years of health decentralization initiatives in many countries worldwide, the knowledge of the relationships between particular forms of decentralization and performance of health systems remains limited. The difficulty lies in the inherently contextual relationship between decentralization and health systems performance, as well as the difficulty in untwine decentralization from other health sector reforms. Bossert et al (2003), argue that in Zambia, for instance, utilization of health services, immunization coverage and family planning activities appeared to bear little relationship to the degree of decision space at the district level, and found little variation during the period 1995-98 except for a decline in immunization coverage, which may have been affected by changes in donor funding. Inspite the criticism, decentralisation of health systems is a common pillar of health sector reform initiatives and is often viewed as a means to improve efficiency and quality of services as well as promoting accountability and local governance of the health system.

Therefore, basing on these assumptions, the efficient and effective decentralisation of resources, such as financial and human resources to district levels, in the case of Zambia, will result in satisfactory public service delivery. It should, however, be noted that in as much as government can decentralise operations in order to ensure efficiency in public service delivery, there is a limit to the process of decentralisation by virtue of the fact that the process takes place within the framework of a unitary system of administration. The question that arises, therefore, is that how much power and authority should central government decentralise in a unitary system of administration without compromising the principle of sovereignty. Furthermore, if it is agreed that there is a limit to decentralisation, then chances are that Zambia as a unitary government could be found in a situation where it does not adequately decentralise for "fear" of losing or sharing sovereignty with local administrative structures. The effects of this inadequate decentralisation are obvious, poor public service delivery at the local level.

1.6.2. Democratic Theories of Local Government

Owing to the importance of decentralisation in enhancing the effectiveness and efficiency with regard to service provision at local level, Democratic theories of Local Government have also been deemed appropriate as guiding theories for the research. It is generally understood that the provision of public services at the local level (especially district level) can best be done by local administrative structures which may be in a better position to understand the problems of the people at the local level and how best to address those challenges. Therefore, an understanding of democratic theories of local government is important in analysing the management of public services like health as one moves away from the center to the periphery. These theories are in two categories; Centralist and Decentralist theories. Centralist theories are further sub-divided into intermediate theory, utilitarian theory, and the social relations theory, while decentralist theories include Law-state theory, Local self-government theory and the Localist theory.

Centralist theories (derived from the term centralisation) support or justify the need for the central government to have increased control of matters at the local level. In effect, the advocates of centralist theories support a top-bottom approach in the governance system. They argue that a bias towards local democracy may result in neglect of issues such as territorial, social and economic justice. Further, that due to limited resources at the local level, the central government should play a greater role in the re-allocation of resources at the local level to avoid imbalances in the nation as a whole. For instance, some regions or districts may not be in a position to raise adequate resources for delivery of health services in the district, while certain districts could be in a position to raise local resources for service provision due to flourishing economic activities. Hence, without central government intervention in resource re-allocation, there could be imbalances in the development of the whole nation. The local structures (e.g. councils and departments for line ministries) are viewed as entities or tools for merely carrying out the delegated functions of the central government without exercising independent authority or power from central government.

However, centralist theories have been criticized for not recognizing the importance of the bottom-up approach in the delivery of public services at the local level and there seem to be a global consensus to the effect that in order to ensure good governance and

sustainable development in general, and to guarantee the effective and efficient delivery of public services, there is need to adopt a bottom-up approach in the decision-making process. In other words, advocates of the Law-state theory and the Localist theory, for example, do recognize the strategic position of local self-government in national development. Localist theory, in effect, argues for effective transfer of power, functions and resources (both human and financial) to the lower levels of governance system in order to facilitate efficiency and effectiveness in public service delivery. The Localist theory is, therefore, oriented towards maximum decentralization of functions and powers. Supporters of the theory maintain that the local tier is closest to the citizens, and because of this strategic placement, can be more responsive and accountable to the communities. Therefore, the bottom-up approach in the governance system is highly favoured. For these theorists, autonomous local administrative units whose decision-making processes are characterized by popular participation constitute effective channels for the delivery of public services (Lolojih, 2008).

Critics of the Localist theory argue that the theory does not take sufficient account of the tension that exist between the regional and national levels and the need for policy making at these levels, as well as the need for meaningful citizen control at the local level. The critics also maintain that the theory does not seem to acknowledge that a bias towards local democracy may result in neglect of issues such as territorial, social and economic justice. Another observation is that the theories fail to appreciate that if the limited resources at the local level were not centrally coordinated then the uneven resources of various local units can lead to serious imbalances in the nation. In effect, such criticisms view the theories to overestimate the capacity and capability of the local level to single-handedly exercise citizen control and regulation.

These criticisms, as expected, are supported by centralist theories that generally tend to emphasise central control of local administrative units. The utilitarian theory for example, stresses that local administrative units can be dissolved or reorganized from top to bottom, and their historical privileges withdrawn. The utilitarians see local government as a tool for aiding civic education and thus progress, but stress the responsibility of territorial sub-divisions such as local government to the sovereign authority and the technical competence of central government, as well as to the local electorates.

Inspite of the criticism, however, the Localist theory does have sound foundations with regard to local government communalism, accountability and democracy. In fact, it can be argued that current global debates that espouse the efficacy of devolution, local autonomy and community participation in the decision making process clearly ascribe to the tenets of the localist theory. It can, in effect, be said that a theory that essentially argues for increased central control and seemingly underestimates local capabilities is clearly out of tune with the current global view that, among other things, emphasizes the importance of building democratic institutions to enhance good governance.

Democratic theories of Local government, therefore, are helpful in understanding the challenges in the management of the prevention and control of malaria in Luangwa District, because it is through the dispersal of power, functions and resources from the center, that governments in a unitary system deliver public services to the people across the country. What remains of contention is how much of this power, functions, and resources should be devolved to the local level in order to effectively and efficiently manage public services like health? The research, therefore, highlighted that inadequate decentralisation, within the framework of a unitary system of administration, is not desirable because the effect is poor delivery of public services, as local administrative structures remain incapacitated in the performance of their functions. It can hence be deduced that the problem is not with the unitary system of administration, but the apparent failure by national leaders to decentralise power and authority within the unitary system to ensure effective public service delivery at the local level.

1.6.3. Arnstein's Ladder of Participation Theory

In examining the challenges in the management of the prevention and control of malaria in Luangwa District, the researcher applies also Arnstein's 'ladder' framework in measuring the degree to which communities have connections to power where participation in malaria prevention and control is concerned. According to Arnstein (1969) citizen participation is a process which demonstrates not only the way in which power is shared but also how those that are marginalised in society are allowed to be involved in the decisions that affect them. It is therefore, a mechanism to allow for the underprivileged to take part in the necessary reforms that can bring about change in their society and to allow them to have a share in the wealth of their community.

In measuring community participation, the various degrees to which a community has connections to power were compared to a ladder. Based on this analogy, Arnstein (1969) suggested a framework with three main levels as depicted below.

8. Citizen control -	degree of citizen power
7. Delegated power-	degree of citizen power
6. Partnership-	degree of citizen power
5. Placation-	degree of citizen tokenism
4. Consultation-	degree of citizen tokenism
3. Informing-	degree of citizen tokenism
2. Therapy-	non-participation
1. Manipulation-	non-participation

Arnstein's ladder of participation; Source: Arnstein 1969

The lowest of all the levels represents a position where no participation takes place at all. After this level, the next levels are characterised by situations wherein those who are marginalised in the society are informed and consulted. Next to those levels are superior degrees which allow community members to be able to influence decisions in various ways through for example, collaboration with those at a higher level of authority. The final level represents the highest position, where the members have power over the decision-making process (Nelson et al, 1995).

In essence, the framework demonstrates the way in which power is redistributed and its significance lies in the standard that is employed in order to make a distinction between those who are at a higher position and the ordinary people found at the lowest level of society. At the lower levels, Arnstein (1969) argues that there are certain types of participation that provide an opportunity to the community members to either support or be informed about decisions which, by and large, have already been made. Under such circumstances, community participation becomes temporal and is sometimes only ceremonial. In addition, communities are allowed to participate, for example, in developing health programme plans and activities so as to ensure legitimacy, gain support and prevent future criticism or sabotage. However, at the more advanced (ultimate) levels, the kind of participation that takes place can often be seen as potentially empowering. Participation at these levels allows the community the ability

to mobilise and transform themselves and ensures that access to resources and services become relatively easier (Espino *et al.,* 2004).

Although the notion of community participation has been known to be significant in health programme activities, there is still a dispute over its actual meaning and the way it should be assessed. According to WHO (2002), community participation is a process by which people are enabled to become actively and genuinely involved in defining the issues of concern to them in making decisions about factors that affect their lives, in formulating and implementing policies, in planning, developing and delivering services and in taking action to achieve change.

It has, however, generally been accepted that community participation is not only the means by which communities become aware of the challenges facing them but also a better instrument for empowering and facilitating better living conditions for those who are underprivileged within society (WHO, 1989). The above characterisation highlights the importance of the power associated with participation, which helps community members to be able to identify what they need, make decision and develop the means of attaining such desires. In doing so, they can take control of their own health and wellbeing. This eventually helps them to build their own capacity to sustain local development rather than having to rely on external agents.

In addition, it has also been argued that engaging communities provides two contrasting but useful definitions of community participation, namely, 'participation as a means' and 'participation as an end' (Nelson *et al.,* 1995).

Participation as a means implies that the way people take part in programme activities is characterised by a situation where the goal or objective (not known to all the members) has already been set for them by those in higher positions (Owusu, 2014). Under these circumstances, participation becomes a tool through which the available resources of the community are used in order to attain the desired goal. This kind of participation often appears to be short-lived and usually fails to make use of the results of the strenuous efforts put in by the various community members. In this way, participation is seen as something imposed by a higher authority as it does not reflect the original ideas of the local community. Rather it becomes a device employed by powerful organisations, such as governments, looking for involvement as a means of

utilising community resources such as local knowledge in order to ensure programme effectiveness (Morgan, 2001).

Participation as an end, however, has the tendency to be a long term process, contributing toward building and fortifying the self-capabilities of the community members and enabling them to become more involved in health programmes (Owusu,2014). Participation in this sense helps to achieve goals such as social justice, equity and democracy. In this situation, the source, the form of participation and the process are understood and initiated by the community members themselves, which enhances integration and empowerment (Rifkin *et al.,* 1988). The underlying idea is that not only are the community members' independence and management skills enhanced, but their capacity to make decisions that have a direct impact on their lives is also nurtured (Everatt *et al.,* 2010).

In effect, it can be argued that, through participation, communities can either be led by others to recognise their local health challenges and develop a method of solving them, or they can be empowered to address their own problems and to realise the basic healthcare needs for all of the members.

However, there are criticisms of Arnstein's Ladder of Citizen Participation. According to Collins and Ison (2006), Arnstein's ladder, with its focus on power, is insufficient for making sense of participation at a conceptual or practice level. Other critics cite various limitations for Arnstein's Ladder of Citizen Participation, such as the assumption that participation is "hierarchical" in nature with citizen control held up as the "goal" of participation – an assumption that does not always align with participants' own reasons for engaging in decision-making processes (Collins & Ison, 2006). Additionally, researchers emphasize the limitation that Arnstein herself cites, that each problem or decision is unique and can require different levels or types of participation that are not reflected in the broadness of the ladder. Collins and Ison, (2006) have the following two critiques of Arnstein's Ladder of Citizen Participation: First, at a conceptual level, Arnstein's notion of participation is both devoid of context and, critically, has no means of making sense of the context in which the ladder is used. Second, in situations when the nature of the issue is highly contested or undefined, Arnstein's ladder provides few insights into how participation might be progressed as a collective process between all of the stakeholders involved.

1.6.4. Social Cognition Theories

Most social psychologists use social cognition models (SCMs) for the study of health related bahaviour by assuming that human behaviour is best understood as a function of people's perceptions of reality including disease and illness. Commonly used social cognition models include the health belief model (HBM) (Becker, 1974; Janz and Becker 1984; Sheeran and Abraham, 1996), theory of planned behaviour (Ajzen and Fishbein 1980; Conner and Sparks, 1996), self- efficacy theory (Bandura 1982, Shwarzer and Fuchs, 1996) and health care utilization model (Anderson and Newman, 1993; Aday and Awe, 1997). Among these, HBM is the most well-known theoretical model in the field of public health. The HBM is based on the four central premises of health beliefs of individual that govern individual perceptions, action and behaviour. The first of these beliefs is the individual's perception of susceptibility or vulnerability to disease. The second belief is that of severity of the disease. Third is the perceived efficacy of the behaviour in dealing with the condition. The fourth key belief is composed of the perceived barrier to adopting the behaviour. Cues to actions such as advice from others and mass media, health education are also important in this model. In the case of malaria, individuals are likely to take action to prevent malaria if they believe that the severity of malaria will affect some parts of their lives and specific action will be beneficial by reducing susceptibility to the disease. However, many people who seek health services are motivated to take actions only by the appearance of symptoms. Health behaviour is shaped not only by health beliefs and perceptions, but also by social and political context of health care systems, which are not taken into consideration in HBM. Nor does it take the service into account. The theory of Planned Behaviour (TPB) assumes that the proximal determinant such as perceptions, attitudes and intentions determines individuals' health behaviour. This helps to depict behaviour as a linear regression function of behavioural intentions and behavioural control. Behaviourial change is facilitated by a personal sense of control. Those behaviours which require skills, resources or opportunities that are not freely available are not considered to be within the domain of the TPB. Health service utilization model is developed by Anderson and Newman (1973), Aday and Awe (1997). In this model, predisposing, enabling and need factors are grouped in logical sequence to show how these factors act upon health services utilization behaviour of people. Predisposing variables include family composition, social structure and health beliefs (value of

health services, physician, good health, knowledge of disease, and attitude toward health services). The enabling component includes family resources and attributes of the community in which they live (residence, region, doctor and hospital, clinic). Need refers to health status or illness, which in the most immediate and important cause of health services use in this model. This is actually 'prediction model', which provides useful insight about the level of utilization. A major problem of this model is that it does not take into account in the manner in which how an individual evaluates his or her own symptoms and seeks services. The earlier mentioned social cognition approaches are rigid theoretical frameworks that guide researchers to select variables and procedure for developing reliable and valid measures, and how these variables are combined in order to conceptualize and predict health behaviour. These may be useful in quantitative type of research focusing on cognitive aspects of behaviour. Focusing mainly on cognitive variables, and neglecting other variables such as socioeconomic status, resources, community participation, that are potentially important in understanding a particular behaviour or outcomes are major limitations of these theoretical models. Behavioural theories and models basically focus on individual cognition and behaviour. Individual approaches are class biased and unable to include broad economic, social and political determinants of health and health behaviour (Turshen, 1989).

1.6.5. Explanatory models (EMs)

Medical anthropologists and sociologists have been interested in people's ideas (cognition) about illness and illness narratives, and their response to illness. Traditionally such approach deals with the study of beliefs and practices associated with illness by persons from diverse cultures. The process of social theorizing of health, illness and behaviour starts from the patient understanding of illness and symptom's meaning (Amstrong, 2000). This means that health-seeking behaviour can be linked to patient's ideas about illness or lay explanation of illness. Kleinman (1980) terms these ideas as the 'explanatory models' (EMs, forms of theoretical knowledge) which are held by both patients and practitioners involved in health care system. Lay explanatory models, which may differ from practitioners' EMs, helps ones understand how they make sense of given episode of illness, and how they choose and evaluate particular treatment. More specifically, the explanatory model for a particular illness consists of signs and symptoms by which the illness is recognized; assumed causes of illness;

recommended treatments; how the illness is believed to work inside body; and expected prognosis. They are based on health belief systems but applied to particular episodes of illness. This model is mainly useful for analyzing and explaining patient's understanding of illness in terms of her or his experience and belief systems in the context of culture. But EM approach emphasizes on cognitive structure and medical efficacy of individual cases and mystifies the social origin of disease, the social determinants of sickness (Young, 1982). Health behaviour is related to cultural perceptions and meaning of health problems, and cultural mechanisms for coping with health problem in given sociocultural and economic setting (Banerji, 1982). Depending on the perceptions and meanings of a health problem, communities develop their own devices and institutions for coping with their problems through their own innovations or innovations from other cultures which get diffused into their culture. These three factors and the behaviour of individuals in a community are closely related with one another; changes in one will lead to changes in all others. These inter-related factors form a sub-cultural complex of the community, which Banerji (1982) terms 'health culture'. Health culture undergoes changes with a result of cultural innovations, cultural diffusions and purposive interventions from outside, and with change in the overall culture. There is also obvious relationship between the cultural meaning/practices and socio-economic setting. Thus, health behaviour ought to have been seen as a component of a complex whole and it should be studied only in the context of the overall culture of the community. This concept of 'health culture' provides valuable framework for researcher to explore cultural perceptions and meaning of health and illness, and health behaviour, and analyze socio-epidemiological aspects of health problems in a given socio-cultural context.

1.6.6. Ecological Theories

Ecological and bio-cultural theories, influential in the early 1970's view the human species as part of environmental systems interacting with other animal and plant species in energy exchange cycles. Disequilibrium of ecological systems or changes in environment affects the epidemiological profile of diseases (Dubos, 1959, 1980). This perspective emphasizes on adaptive response (behaviour) of human being to their environment (McElory and Townsend, 1996). Development of the sickle cell traits among people of tropical Africa was the biological response to the increased incidence of malaria (Livingstone, 1958). The use of bed net, smoke and herbal medicine, for

instance, are all socio-cultural responses to malaria problem. Ecology model is still a logical framework for investigating patterns of diseases including malaria in geographical context, epidemiological change, and differential access to health care resources. Though ecology of health model is a holistic concept, it has been restricted to bounded ecosystem and fails to link local condition to larger macro-processes such as the economic systems and ignores the socio-economic determinant of health. Although the term 'health culture' is essentially derived from medical anthropology, it goes beyond the limits of conventional medical anthropology. This concept seems akin to the emergent paradigm of medical anthropology, known as critical medical anthropology (Singer, 1995), which focuses on politics, economic and class structure. Critical medical anthropology is a theoretical and practical effort to understand the problems of health, illness and treatment in terms of the interaction between the macro level (political economy, class structure, health policy and health care systems) and the micro level factors (illness experience, behaviour, beliefs and cultural meaning). Poor socio-economic circumstances and structural arrangement create the options of risky behavior to which McKinlay (2001) calls the activities of manufactures of illness. Concepts of illness disease, and health related behavior vary from higher to lower class due to differences in social and material conditions (Stacy, 1988). Therefore, health related issues need to be understood within the context of political and economic condition that influence human relationship, shape social condition and behavior, collective experiences and cultural meaning (Singer et al., 1992). In a society, different components of the system are integrated through social relationships among individuals and groups in particular setting (Coreil *et al.,* 2001). For instance, a woman as a mother has a relationship to her child and the family members; she likely interacts with people at work place and with other community groups, and she belongs to a social class, gender and ethnic group within the larger society. How she responds when her child gets sick is influenced by various factors at different level of the system. She may evaluate certain symptoms of illness based on local concepts and norms shared with her reference group. Her ability to seek care is constrained by her work situation, the type of job, availability of cash at home, available health care services and their distance, transportation and so on. It is obvious that treatment seeking behavior is likely to be influenced by interpersonal, social, cultural and physical environmental variables which are likely to interact. People's perceptions and behaviour concerning particular illness/disease- malaria are determined by a wide range of factors including both macro

(political, social, economic, ecological and cultural environment) and micro factors (illness experience, beliefs, social and cultural meanings, and individual's characteristics). The Ecological theories are useful in exploring existing meaning and explanations about a particular illness/disease in a society, but they are not concerned how sociopolitical structures of the society, intra house and community factors create different perceptions and behavior. Instead of single theoretical model, a combination of models has been used that would provide the researcher valuable framework to understand and analyze management challenges in the prevention and control of malaria in Luangwa District. For the sake of this research, the Structuralist health theory, the Democratic theories of Local Government and Arnstein's Ladder of Participation theory will be used as guiding principles of the study.

1.7. Review of Literature

There is a plethora of literature by a number of scholars dealing with different aspects of malaria including measures to prevent and control malaria in the context of tropics and sub-tropics, especially in Zambia in particular. Therefore, I have gleaned most of literature from South-East Asia, South America and African contexts.

1.7.1. Zambia

In his dissertation entitled "The impact of malaria control programmes in shanty compounds: the case of Zambia", Njovu (2008) looks at the impact of malaria control programmes in urban areas of Kafue town in Zambia. He argues that current targeting of insecticide treated nets (ITN) programmes tend to be roughly associated with the higher middle income bracket to be reached through the commercial sector and social marketing. He further observes that the lower middle - average rural population is reached through Non-Governmental Organisations (NGOs) and donor supported efforts through the district and that the poorest population is targeted by the public sector. There is no doubt that the study has made a significant contribution to this study because it provides insights that current targeting of ITN programmes tends to be associated with the privileged than the underprivileged, an approach which may affect the effective utilisation of ITNs by the most vulnerable groups. It is important to note, however, that Njovu does not provide further analysis to indicate that there could be intra house dynamics that may influence the utilization of malaria prevention and control measures by the underprivileged even when they are provided with free ITNs.

Further, Njovu (2008) did not put into consideration the fact that the level of community involvement in malaria prevention control programmes could have been another factor influencing utilization of malaria prevention and control measures. The fact that the malaria prevention and control measures were implemented in a particular environment, there could have been social, economic and political factors at play, and Njovu's study is devoid of that analysis. In addition, Njovu's work was done under a different context with a focus on Kafue town, which is an urban setup. This study attempted to cover up that gap and having been carried out in a rural settings of Luangwa District.

The Zambia Demographic and Health Surveys of 2001-2002 and 2007 and the National Malaria Indicator Surveys of 2006 and 2008, give an account of consistent increasing trend in coverage rates of all malaria interventions over the period 2000 to 2005. The reports also indicate that availability of insecticide treated mosquito nets (ITNs) reached 60% of Zambian households, and ITN use more than doubled among children and pregnant women over the period under review. Indoor residual spraying made gains on already previously high levels by increasing coverage from five (5) districts in 2003 to above 30 districts in 2005. More importantly, these gains were realised in the most rural, hard-to-reach, malaria areas of the country, demonstrating a commitment at all levels of the health care system to achieving these remarkable results. Most notably, the reports suggest gains in reducing malaria parasitemia (from 22% to 17%) among children across all demographic background over the period under review. These reductions were coupled with even more reductions in severe anemia (15.8% to 9.8%), an indication that Zambia was breaking malaria's chronic grip on the lives of its children. The reports indicate that despite these gains, the effort is not complete.

It is clear that the study reports revealed many important observations that are relevant to this study. This is especially on the observation that effective implementation of malaria prevention and control measures, and increased trend in coverage of all malaria intervention may bring about major gains in the fight against malaria especially among the children and pregnant women who are most vulnerable, more so in rural areas. Nonetheless, the study reports do not further provide analysis of the level of utilization of the measures which were implemented during the period under review and factors which could have influenced the utilization of the measures by community members. Furthermore, the study reports are giving a general picture of major gains at national

level without indicating specific challenges faced in the fight against malaria in urban and rural areas which may be different. This study endeavored to critically look at those issues.

Lessons can be drawn from a study carried out by Maybin et al (2015) in Lusaka Province in the four old districts (Lusaka, Chongwe, Kafue and Luangwa) to assess the epidemiological trends of malaria among various age groups from 2009 to 2013 through the Zambia District Health Information System (DHIS). The findings were that malaria remains a major cause of morbidity and mortality in Lusaka Province especially in Luangwa district where both morbidity and mortality have been very high during the study period. For instance, concerning the total malaria burden by district, in 2013, the study indicates that Luangwa district reported the highest morbidity of 574 per 1000 populations from 320 per 1000 populations which was reported in 2012 while the other three districts reported malaria morbidity of less than 250 per 1000 populations. The study further revealed that the district also reported the highest malaria mortality of 1.23 per 1000 populations while the other three districts reported malaria mortality of less than 0.17 per 1000 populations in 2013.

The findings by Maybin and others are important to this study because a lesson is learnt that malaria epidemiological trends vary among age groups and even among districts. Epidemiological trends among district entails that each district or environment has its unique features/factors which need to be understood if malaria is to be controlled and eliminated. In addition, the findings of the study are significant to this study with regard to the observation that the under five children and the pregnant women are the most affected by malaria. The study further reveals that more effort should be put to ensure that effective strategies and measures are implemented to reduce the morbidity and mortality rates amongst the children and the pregnant women. Consequently, the study has made a contribution in terms of directing our study on issues that needed to be investigated. However, limitations in relation to this study are that the study does not provide information on measures which were implemented to control malaria in the respective districts. The high morbidity and mortality rates especially in Luangwa District could have been as a result of a number of factors at household, community and national levels but the study is devoid of that information. Further, the study does not provide critical analysis of issues to do with utilisation of the health services by the people, community participation and challenges in the control of malaria in respective

districts especially Luangwa District which recorded the highest morbidity and mortality rates in Lusaka Province.

Annie Banda (2009) conducted a study on factors influencing Indoor Residual Spraying (IRS) in Lusaka district's Mtendere, Kanyama and Matero compounds. The study findings are worth noting in that Banda investigated the implementation of one of the measures which has been adopted to control malaria in Zambia. Her findings were that indoor residual spraying programmes were mainly carried out during the peak malaria period from December to May which coincided with the rainy season and had inherent potential to influence indoor residual spraying coverage. She argues that because IRS operations were done during the rainy season, people were not willing to keep some of their properties in the rain to pave way for spraying. According to her findings, government failed to reach 85% IRS coverage because community participation in IRS was almost nonexistent, despite the community being the recipients of the services. The study also indicates that access to information, education and communication regarding IRS was one factor which influenced IRS coverage. Banda's study further reveals that only a few (8.2%) of the respondents were aware of the IRS activities. It is clear that Banda's dissertation revealed many important observations that are very relevant to this study because she gives an insight on factors which may influence the effectiveness of an intervention against malaria like IRS. However, her study looks at just factors which influenced IRS coverage in three compounds (peri urban areas) of Lusaka. The study does not look at other malaria control measures like insecticide treated nets and how they were administered. Further, the study is also devoid of issues to do with people's utilization of other malaria control measures and challenges faced in the control of malaria in general.

Commenting on contemporary Zambian political, economic and social issues, Tembo (2009), having considered the US President's Malaria Initiative (PMI), one of Zambia's partners in the battle against malaria, said adherence to four key messages which include sleeping under an insecticide treated mosquito net every night, spraying of homes with indoor insecticides, getting tested early for symptoms of malaria, adhering to the treatment regime and pregnant women going for regular prenatal care and taking fansidar monthly starting after the 16th week to prevent malaria, is the antidote of a malaria-free Zambia. He asserts that new studies are being focused on how long treated bed nets lasted, the efficacy of fansidar - a therapy for prevention of malaria in pregnant

women and their unborn babies, and efforts to determine where the disease is continuing to have its greatest impact. Tembo further indicates that the Tropical Disease Research Centre was given a further US$ 60,000 for the malaria and pregnant women study which is intended to investigate whether fansidar is still effective in protecting pregnant women from malaria.

Notable in the commentaries is that Tembo (2009) is quick to point out that despite Zambia's progress against malaria being held up as an example to other African nations; the disease continues to infect three million people yearly, the bulk of it falls on pregnant women and children. Tembo's (2009) commentaries are significant because he tried to give a prescription of what needs to be done if 'a malaria free Zambia' is to be realized, in view of the efforts by national and global partners in the fight against malaria. A lesson is also learnt from the commentaries in that, despite the fact that Zambia has been held as an example to other African nations, the disease continues to affect millions of Zambians every year. Hence there is need to adopt different approaches in the fight against malaria in Zambia. To this extent, Tembo has helped to provide very useful insights and consequently made a contribution in terms of directing our study on issues that needed to be investigated. However, the generality of Tembo's observations makes it substantially different from my case study and emphasis on management challenges in the prevention and control of malaria in Luangwa District. Further Tembo's observations are more prescriptive and lacks critical analysis related to management challenges in the prevention and control of malaria in specific areas of Zambia, especially Luangwa District which this study is all about.

Sipilanyambe (2005), in his paper entitled, "Evaluation of the Social Economic Factors Associated with Malaria" stated that there was a correlation between the illness, particularly in the community and social economic factors. Sipilanyambe observes that the proportion of malaria prevalence decreased with increasing age. He further argues that the malaria prevalence is higher in under five (5) years than in persons who were five (5) years and above, which correlated with the physiological development cycle of the immune system. The findings in the paper established that the distribution of malaria prevalence is linked to the seasonal variations (such as drought and flooding conditions), meaning that in carrying out malaria control programmes, seasonal variations should be factored in as a determinant of malaria prevalence in certain situations. The study further revealed that the bigger the household size, the higher the

malaria prevalence owing to the increasing chances of contracting it from another household member.

Sipilanyambe's study brings out very fundamental issues as regards the understanding of the factors which may determine the prevalence of a disease like malaria of which this study is concerned about. The issues among others include the observation on the correlation between the illness and social economic factors in a particular community. It is also worthy to note that Sipilanyambe observed that there are certain factors like seasonal variations and physiological development cycles which may determine the prevalence of malaria. All these revelations have been considered to be significant in guiding this research study. Nonetheless, Sipilanyambe's study is confined to evaluating social economic factors associated with malaria. He does not critically discuss different measures to prevent and control malaria and bring out factors that may influence the utilization of specific measures. The study is devoid of information on challenges encountered in the implementation of malaria prevention and control measures. Consequently, such a study is less likely to provide a comprehensive understanding of the constraints in the implementation of malaria prevention and control measures in specific areas and associated influencing factors when it comes to utilization of such interventions.

Fosu (2007) examined the economic burden of malaria in Africa. He presents four (4) country case studies drawn from different parts of Sub-Saharan Africa (SSA): East (Kenya), West (Nigeria), Central (Cameroon) and Southern Africa (Zambia). The studies undoubtedly provide a lot of information regarding statistics on the impact of malaria and challenges in the malaria control programmes. According to him, the economic toll in Africa amounts to at least ten (10) percent of gross domestic product per year and that the cumulative effects of malaria are enormous. Fosu argues that the debate should have by then been shifted from malaria eradication to control. He asserts that the objective of malaria eradication, which was thought to be achievable in the 1940s and 1950s, was later believed to be unattainable. Notable in his argument is that appropriate cost benefit analysis is required to determine the level and nature of malaria control programmes. Furthermore, he states that a proper measurement of the economic benefits of malaria control required that the effects of other intervening factors on malaria reduction be isolated. He further argues that identifying such factors and entangling their effects in turn requires generating additional information that can be

used to design malaria control programmes and measure their economic effects. According to Fosu (2007), ninety percent (90%) of the malaria cases are managed at home and that most categories associated malaria with mosquito nets. He notes that although nearly fifty percent (50%) of households use mosquito nets to prevent malarial illness, they are unaware that insecticide treated bed nets are a relatively effective means of malaria prevention, suggesting that health education can be an important strategy for malaria control.

For the case study on Zambia, Fosu (2007) examined the issue of pharmaceutical supplies in relation to national malaria control efforts. He showed that malaria is endemic in Zambia and that up to twenty percent (20%) of the mortality in the country is attributed to malaria. He further indicated that since 1976, malaria prevalence had increased rapidly from 122 cases per thousand to nearly 400 cases per thousand in 1998. Fosu identified six (6) main sources of drugs and pharmaceutical supplies for the health facilities in the country: private, retail and wholesale distribution system, the local drug manufacturers, the Ministry of Health (MOH), the Non-Governmental Organisations, donors and the Medical Stores Limited (MSL). Most of the pharmaceutical products which have been used in the country are imported. He states that the MoH is the largest importer, accounting for forty-six (46%) of the value of drug import in 1996. The wholesalers sell drugs at a profit to commercial pharmacies, and to health facilities. He indicates that the MSL, which has a special role in the area of pharmaceuticals drugs, is an example of an organisation that both imports and distributes drugs directly to the retailers. It serves as the government's storage and distribution agent, and is responsible for distributing to individual health facilities drugs procured directly by the MOH. In addition, it distributes essential drug kits financed by donors to all health centers in the country at a fee. Fosu, however, notes that despite the elaborate drug system, government facilities experience frequent shortages of anti-malarial drugs. He argues that these shortages are partly blamed for the emergence of drug-resistant malaria in Zambia. In particular, the shortages have been associated with sub-optimal treatment of malaria using chloroquine, which in 1990s was still the drug of choice in Zambia, as in other countries in Africa, for the first line of malaria treatment. The chloroquine failure rate was fifty-two percent (52%) which means that only about half of the malaria patients treated with chloroquine recovered. Alternative anti-malarial drugs in the country at that time, and less commonly used included

fansidar, quinine and coartem. The author argues that the main factors contributing to drug resistance malaria in Zambia included: outdated malaria preventive methods, high costs of insecticide treated nets, introduction of cost sharing in public health facilities, and the lack of malaria diagnostic equipment in government health facilities. As a strategy for effectively combating malaria in Zambia, Fosu recommends a modification in drug policies, emphasising discontinuation of chloroquine as the first line of treatment, given its high failure rate. He argues that switching to other drugs is feasible because alternative anti-malarial drugs are available, and are acceptable to the government and the general population. According to Fosu's case studies in the selected countries i.e. Nigeria, Cameroon, Kenya and Zambia, the malaria programmes have been based on a combination of malaria treatment and prevention activities. He concludes that the main determinants of the demand for malaria treatment include the availability of anti-malaria drugs, the cost of treatment and socio-economic characteristics of patients such as education, sex and age. He argues that the cost of care at health facilities reduces the demand for malaria treatment, as does the non-availability of anti-malarial drugs. Fosu (2007), further states that education increases the utilisation of modern health facilities for malaria treatment and reduces the probability of utilising anti-malarial drugs of uncertain quality.

Fosu's work is useful to this research in the sense that it dwells in detail on the malaria control programmes, their operations, failures and successes. His case study on Zambia also widens the scope of the research especially that he highlighted a number of factors which may affect effective malaria control like availability of drugs, cost of treatment and socio-economic characteristics of patients like level of education, sex and age. However, a cross-national comparison naturally poses a great challenge with regard to the determination of the nature as well as the amount of data that need to be considered in the study. What this means, in effect, is that the probability of overlooking certain data and/ or over- emphasizing on various issues at the expense of others is much higher. For instance, Fosu's work is devoid of critical analyses on issues pertaining to other measures in malaria control like IRS, insecticide treated nets etc., people's utilisation of the measures, community participation and challenges faced in the fight against malaria in Zambia, especially in rural districts like Luangwa which this study intends to tackle.

Findings by Lolojih (2008) on the performance of local councils in Zambia with regard to public service delivery provided a useful understanding of challenges faced by local councils in ensuring effective and efficient delivery of public services like malaria control to the communities. Although the study by Lolojih (2008) focused on public service delivery by local councils, the findings are relevant for this study because he stated that local councils are created by the central government to deliver services to the people at the local level on its behalf and currently, the health department at district level is one of the functions which have been devolved from the central government to the local councils. The findings by Lolojih (2008) also highlighted the importance of effective decentralisation in creating capacity at the local level to deliver services to the people. According to Lolojih (2008), the responsibility of central government, among other things, include the provision of public services to its citizens. As stated above, public service delivery may not necessarily be provided directly by the central government, but by its agents such as local councils and other government institutions operating at the local level. Due to deficiencies in the decentralisation reforms to local councils in Zambia, Lolojih (2008)'s findings indicated that many factors have, therefore, inhibited local councils to effectively and efficiently deliver quality services to the people. These factors were seen to be related to the internal problems of the councils themselves, such as inadequate supervision and poor financial management, while external factors identified included inadequacies of policies and other government directives. The study showed that what the local councils were lacking for them to perform well in the delivery of public services were not administrative powers and functions, but resources; both human and financial resources. Furthermore, local councils in Zambia were found to be faced with serious challenges with regard to the attraction and retention of qualified and experienced manpower, as well as financial resources to enable them acquire new equipment and service existing ones.

Councils also did not have the financial capacity to develop and train their own personnel, let alone to institute meaningful training programmes that would help fill in the gap caused by their inability to compete effectively for personnel that is already trained and/ or experienced on the open labour market. The effects, are certainly visible: institutions that are struggling to perform basic services such as street lighting, waste management and road maintenance. According to Lolojih (2008), the severe shortage of plant and equipment in most councils in Zambia has adversely affected their

ability to perform according to the expectations of the local communities. In addition to inadequate plant and equipment, the problems faced by local councils were largely due to serious financial constraints, compounded by inadequate financial support from the central government.

Lolojih's study alluded to many critical issues of local governance that were of great relevance and interest to this study. These issues among others include the observation that due to deficiencies in the decentralisation reforms to local administrative units in Zambia, many factors have, therefore, inhibited these local units to effectively and efficiently deliver quality services to the people. These factors were seen to be related to the internal problems of the local administrative units themselves, such as inadequate supervision and poor financial management, while external factors identified included inadequacies of policies and other government directives. The detailed examination of qualitative data collected from individual local authority areas, operating under a similar economic, social and political environment as the case is in this study, provides a much more comprehensive basis for understanding the impact of decentralization and other central government measures on the delivery of services by local administrative units. However, Lolojih's study is focused on service delivery in general, taking case studies derived from three tiers of local government. He does not look at one specific public service in a particular local authority and in this case, he takes a qualitative approach in terms of data collection. This study is centered on one specific public service, which is malaria and takes a mixed methods (qualitative and quantitative) approach in terms of data collection. This difference in the study design and emphasis is very critical to the understanding on issues related to public service delivery at local level.

There are some contributions in the book edited by Momba and Kalabala (2006) that focus on issues of decentralisation and provision of public services in Zambia. Notable in this regard is the contribution by Lolojih (2006) who uses lessons from bilateral cooperation to discuss the prospects of enhancing local government in order to improve public service provision. He argues that despite the local government system in Zambia having been reformed in the post-independence era, it did not have the capacity to provide services. He notes that the system had several limitations such as "the lack of financial resources and capital equipment, inadequate administrative facilities, poor working relations between councillors and administrative staff, and undemocratic

attitudes towards work" (Lolojih, 2006). However, he reveals that cooperating partners had tried to improve the situation by undertaking a number of activities. These included training of local stakeholders in the area of democracy, renovating buildings belonging to local councils, purchasing bicycles for councillors, and establishment of local News Letters and sub-district organisations for community participation in development issues (Lolojih, 2006). This contribution reveals the significance of partnerships between lower level government institutions and cooperating partners in the provision of public services. Nonetheless, Lolojih (2006) does not cover implications of partnerships including bilateral cooperation in the provision public services like health.

In the journal article entitled, "Operational scale entomological intervention for malaria control: strategies, achievements and challenges in Zambia", Chanda et al (2013) state that Zambia has solid, consistent and coordinated policies, strategies and guidelines for malaria vector control. The authors argue that the Zambian experience demonstrates the significance of a coordinated multi-pronged intergrated vector management approach effectively operationalised within the context of a national health system. The study also revealed that in view of the scaling up, logistical challenges included inadequate transport and storage capacity at district level that invariably deterred efficient delivery of both IRS and ITNs. Delays in disbursement of funds for IRS affected timely procurement and implementation of interventions, resulting in IRS not covering 100% of the earmarked households. Challenges with ITNs still remained low utilisation, lack of plans on disposal and replenishment of worn out nets, less efficacy and durability and abuse of nets e.g. in fishing areas. Further Chanda et al observed that continuous replacement of long lasting insecticide nets is not yet part of the national plan to maintain universal coverage of the intervention. Most vector control related IEC/BCC campaigns are in conjunction with malaria commemorative events such as World Malaria Day. The development of insecticide resistance in major malaria vectors in the country has great potential of compromising the efficacy of interventions. The findings further indicate that at provincial and district levels, there was a lack of entomological capacity for optimal monitoring of interventions, funding to this component is not prioritised, with weak coordination and public-private sector involvement. They conclude by observing that while consensus on malaria vector control policy and strategy has stimulated unprecedented political-will in sub-Saharan Africa, backed by

international funding organisations and donors, vector control interventions are expansively being implemented based on assumptions with unequaled successes.

It is clear however, that the study revealed important observations that are relevant to this study. Notable in the findings is that inadequate funding by government invariably threatens sustainability of malaria control efforts. The findings have also indicated the policy strategies, achievements gained and challenges faced in the malaria vector control interventions in Zambia. Another observation by Chanda et al which is of interest to this study is that combining ITNs and IRS is a good strategy in fighting malaria. Further, the literature shows how an integrated approach in fighting malaria can yield positive results. It is worthy to note that ownership and utilization of ITNs remains minimal and the operational scale deployment of IRS is more complex than ITNs. Another important observation to this thesis is that there is mounting evidence that combining IRS and ITNs affords enhanced protection to exposed populations compared to using one method alone and that these core interventions can be supplemented in specific locations, by larval source management strategies i.e. larviciding and environmental management. However, the study was mainly focused on vector control methods, which are IRS, ITNs and larviciding without considering other malaria prevention and control measures which this study endeavored to also look at. Further, the authors basically outlined the historical malaria vector control efforts in Zambia in accordance with the vector control policy and strategies. The generality of the study makes it substantially different from my case study approach and emphasis on the management challenges in the prevention and control of malaria in Luangwa District.

Chipeta *et al.'s* (2014) article entitled 'Doubling National Efforts to Control and Eliminate Malaria in Zambia', analyses factors attributable to successes and failure in malaria control in Zambia and worldwide. The article indicates that the first attempt by the World Health Organisation to eradicate malaria through a robust programme, the Global Malaria Eradication Programme (GMEP) of 1955-1969, yielded some remarkable successes despite failing to achieve the outright programme goal of complete global malaria eradication. Chipeta *et al* (2014) argue that eradication of malaria may remain a pipe dream for any individual nation unless there are collated and sustained efforts by all nations towards elimination activities of the disease. It is further argued that while individual countries can eliminate malaria through sustained and well

planned evidence-based control measures, eradication of the disease is only achievable at a global level needing concerted and sustained efforts by all countries. It is worth noting here the factors that contributed to both the success and failures of the 1955-1969 GMEP. Inherent in these factors are the key lessons learnt for effective planning of successful individual countries' national malaria control and elimination activities that can herald the global eradication of the disease. Chipeta *et al* (2014) attributes the success of the GMEP to the following factors: Discovery and development of DDT, the first residual-long lasting and highly effective insecticide (in its early days before resurgence of resistance); Political commitment; Robust global resource mobilisation from both public and private partners with establishment of dedicated GMEP funding mechanism- the malaria eradication special account; Creation of expert technical groups with spelt out eradication strategies and concurrent socio-economic growth. Factors attributable to failure of the GMEP include: Dependence on a single intervention/control tool, the indoor residual spraying with DDT with abandonment of previously well-known and evidence-based control tools; Inadequate GMEP access to remote areas such as tropical Africa; Inadequate human resource and weak infrastructure; Failure to maintain technical standard of complex field operations; Failure to establish sustained surveillance systems concurrent with the GMEP activities; Ineptiness of the programme to embrace as well as utilize existing and evolving research evidence; Complacency in the programme; and Political instability.

A point of emphasis here by Chipeta *et al* (2014), though, is the observation that by 1969, countries that vigorously embraced the cited factors of success with sound economies and relative political stabilities, North America and most of Europe, managed to eliminate malaria by the time the GMEP collapsed in 1969. Meanwhile countries with no or limited resources, the whole of Tropical Africa, Asia and Latin America, that could not embrace the factors of GMEP success were also conspicuously rampant with the program failure. Notable in the study is the fact that the enormous inequality in the geographical distribution of the GMEP success had nothing to do with the biological factors of the vectors' nor the virulent malaria parasites' perceived better biological fitness in the Tropics such as sub-Saharan Africa. A short glimpse into history (Narain, 2011) will show that by the end of the 19th century, malaria was ravaging the whole world more so in Europe such that at the end of the First World War a number of malaria intervention initiatives led by various expert groups were taken.

According to Narain (2011), one such expert group was led by Ross, Gorgas and Watson who advocated for large scale vector control campaigns with mass drug administrations while the other expert group was the League of Nations Malaria commission together with the Italian and Dutch schools of thought who favored locally designed programs of controlling the disease by sustained development of case management facilities and effective management of the environment/sanitation (public health) in the background of sustained progressive improvement of socio-economic status of targeted communities. The argument is that this was the genesis and solid background of the global malaria eradication efforts that heralded the successes of the 1955-1969 GMEP resulting into malaria elimination in Europe with cascade similar successes in North America. Chipeta *et al* (2014) observe that these successes achieved by the initial malaria eradication activities not only underscored the importance of embracing current scientific knowledge for effective management of the disease but also, and more importantly, signified the necessity of political and socioeconomic stability as critical pre-requisites for the success of national malaria control and elimination activities. According to Boyd (1939), "Malaria control should not be a campaign; it should be a policy, a long term program. It cannot be accomplished or maintained by spasmodic effort. It requires the adoption of a practicable program, the reasonable continuity of which will be sustained for a long term of years".

It is worth to note that the study by Chipeta *et al* (2014) indicates that at this time of the First World War up to the Second World War and throughout the period of the GMEP the whole of Africa, most of Asia and Latin America were either under siege as European colonies or in turmoil of liberation and civil wars with political instabilities everywhere. The critical factors to ensure GMEP success could not be adhered to nor assured in these countries. There were no governments of the peoples of these malaria endemic regions and thus political commitments were elusive towards the GMEP in these geographical locations. In sub-Saharan Africa, and elsewhere, political instabilities (in form of military coup d'états, liberation and civil wars) persisted even during the post-colonial period of the 1960s till even as late as the 1980s with poor and unstable national economies. This thus, in part, explains the unequal distribution of the 1955-1969 GMEP outcomes with remarkable successes of malaria elimination being achieved almost exclusively in Europe and North America only and the program failures predominantly registered in the Tropics (Africa, Asia and Latin America).

Another point of emphasis with regard to key lessons learnt from the GMEP successes and failures is the critical necessity of having adequate and sustained program funds. The GMEP malaria special account largely (85%) depended on the generous contributions by the United States of America (USA) and thus there was a sudden huge financial constraint incurred by the program when in 1963 the USA cut off this contribution. This dramatically reduced the capacity of the WHO to provide technical assistance to the program. An additional point of emphasis besides the aforementioned necessity of political, socioeconomic and financial stability to ensure success of national malaria control and elimination activities is the ability and consistence for the program to embrace as well as utilise existing and evolving research evidence. Ineptness or complacency in this area results into ineffective programs (Chipeta *et al.,* 2014). The best example of this observed from the GMEP experience was Sri Lanka, Ceylon as it was then known. Sri Lanka was the GMEP model country with regard to the training of malariologists. However, during its GMEP activities, Sri Lanka somewhat ignored and not utilised the 30 years accumulated knowledge of the periodicity of the malaria epidemic in the country and worse the program failed to react to the surveillance data showing 4 years' deterioration of the disease morbidity and mortality. Hence during the period 1968-1969 there was resurgence of malaria in Sri Lanka after some remarkable GMEP successes. It was this experience, in part, that made the WHO, at its 22nd World Health Assembly in 1969, to admit and declare that the GMEP main goal of global eradication of malaria, in short term, was not feasible but reaffirmed malaria eradication to remain the ultimate objective in the long term.

Another observation by Chipeta *et al* (2014) which is of interest to this study is that during the early years after independence (1964-1975), the period coinciding with the latter part of the GMEP, in Zambia malaria at national level was more seasonal than perennial and more of a rural disease than urban. There were robust control activities throughout the country with prominent involvement of the copper mining companies. During the period 1975-2000, the country experienced extreme economic recession with some relative political instability due to the liberation and civil wars of its neighbours. This period recorded the worst of the national malaria disease situation with the transmission becoming more perennial than seasonal and endemic throughout the country with somehow no rural preponderance. When looked at from the national malaria program perspective, there were poor malaria disease control activities with

probably prominence of features synonymous with program failure than with successes in reference with the GMEP key lessons learnt.

The study undoubtedly provides a lot of information regarding success and failure factors on GMEP. Further, there are key lessons learnt from the GMEP which include the following: the need to understand the epidemiology and transmission of the disease; the necessity of consistently having and utilising effective (evidence-based) tools for diagnosis, treatment and prevention; knowledge of the social, cultural and political factors of the target populations; and the need for broad coalition and partnerships (both at political and community levels) towards resource mobilisations and execution of targeted control/intervention activities. Nonetheless, the limitations of the study is that it is focused on global and national successes and failures during the time when most of the developing countries like Zambia were still very unstable, politically, socially and economically. Further, the generality of Chipeta *et al's* (2014) work makes it substantially different from my case study approach and my emphasis on management challenges in the prevention and control of malaria in Luangwa District.

1.7.2. Literature on other experiences

Literature has been written about effective malaria eradication programmes in sub-Saharan Africa and identified a comprehensive study implemented at copper mines of the former Northern Rhodesia and Southern Rhodesia (now Zambia and Zimbabwe respectively) between 1929 and 1949 (Watson, 1953). In his study entitled "Malaria Eradication Programmes in Sub-Saharan Africa", Watson's study revealed that the programme applied a multiplicity of interventions, most of which were centred on environmental management (vegetation clearance, modification of river boundaries, draining swamps, oiling and house screening). Watson observes that, for some employees, the programme also included quinine administration for prevention and cure of malaria, and provision of mosquito nets. Costs were recorded, including physical resources and unit prices and systematically accounted to the same cost position throughout the programme. Mortality, morbidity, malaria incidence rates and vector densities were monitored. He further argues that environmental management of mosquito resources is a promising approach with which to eradicate malaria, but it has been little applied in Africa for more than a half a century. The study noted that environmental management for malaria control requires specialist skills that are lacking

in sub-Saharan Africa where they are needed most. The study concludes by observing that infrastructure and human capacity building in clinical, public health, and environmental disciplines should, therefore, be prioritised so that growing financial support for tackling malaria can be translated into truly integrated control programmes.

The findings are of great interest to this thesis as it has also noted that if developing countries adopt a multiplicity of interventions in controlling malaria, there are social and economic gains realized. Another observation of great relevance to my study is the emphasis on the need for developing countries to invest in infrastructure and human capacity building in clinical, public health, and environmental health disciplines. Nonetheless, there are limitations to the study done by Watson in that it is confined to urban areas in the fifties when for instance, Zambia's population was under two million. This study focuses on the rural environment in the post-colonial Zambia with over 15 million people.

In his Dissertation entitled "Utilisation of Insecticide Treated Nets in households with children under five years in Muhorro Sub County, Kibaale District, Uganda", John Bosco Bashinyora (2010), examines the intra-household factors that affect the utilization of ITNs in households with children under five in Uganda. It is clear that Bashinyora's dissertation revealed many important observations that are very relevant and supported the need for our study. He examines the knowledge, attitudes, perceptions and beliefs of caregivers towards the usage of ITNs; and analysed the affordability of ITNs by households with children under five years. His findings were that, the size of the household structures compared to the number of people sleeping in the household structure affected the use of ITNs. The argument is that even if some people were in possession of bed nets, they could not use them due to lack of enough space within the household. Secondly, the sleeping arrangements were found to influence the use of ITNs among the under-fives. The findings also revealed that most of the respondents did not have enough beds for household members and the most affected were children who are not given priority. Most of the children were found to be sleeping on the floor which makes it difficult to deploy the net. Another interesting observation was that the plight of the children is made worse by visitors who are given first priority to use the beds available and children are made to sleep on the floor. Therefore, the disruption of sleeping arrangements was found to have an influence on the proper and consistent usage of ITNs in the households. Utilisation of ITNs was also

affected by gender relations, cultural rituals and functions, poor perceptions, beliefs and attitudes that discourage caregivers from using ITNs. Bashinyora (2010) further argues that given the fact that most of the respondents were peasant farmers; their level of income was low. This made the ITNs expensive for them to purchase as there were more pressing needs that required immediate attention like buying clothes for the children and school fees. Even when the under five children got them free of charge from government, the parents could not/never treat the nets because of the high cost of insecticides.

There is no doubt that the study has made a significant contribution as regards the understanding of intra-household factors that influence the utilization of malaria prevention and control measures like ITNs. Also of value to this study is the observation that the most affected are the under-five children due the attitude, perceptions and knowledge of caregivers on matters related to malaria. Although Bashinyora's study is of significance to this study, there are limitations to it since his focus was mainly on utilisation of ITNs in households with children under five years in Muhoro Sub County of Uganda. The study was done under a different context since even if Uganda is also a developing country like Zambia, they have different social, economic and political experiences. Further, the study is devoid of information on other measures to control malaria in general, utilisation of the measures by not only the under-five but by the local people in general, their participation to control malaria and challenges in the prevention and control of malaria; which this study focuses on.

Lessons can also be drawn from a study carried out in Mbarara district of Uganda on the perceptions about Malaria prevention by Nuwaha (2002). According to Nuwaha (2002), avoiding mosquitoes was the most common method mentioned for prevention of malaria. In his findings, preventive strategies mentioned include boiling of drinking water, improved sanitation, clearing of bushes around the compound, avoiding cold weather, good nutrition, burning mosquito coils, screening of buildings, taking anti-malarials regularly and closing windows early. He argues that while most people in this study said ITNs were efficacious both in preventing mosquito bites and malaria, they expressed ignorance of insecticide treated nets and could not tell whether a bed net was treated or not. Nuwaha's (2002) findings are that, there were some doubts about the bed net efficacy in preventing malaria. Participants mentioned that some households sleep under mosquito nets but their children die of malaria. The findings by Nuwaha (2002)

are worthy noting in that whether mosquito nets work or not remains a myth in the minds of some people. From the above analysis, it seems to be clear that there are factors within the household which hinder effective utilisation of malaria control measures like ITNs that needed further investigation. He further indicates that barriers towards use of bed nets that would negate their use include; being expensive, being difficult to keep from holes, being inconvenient by increasing heat and sweating, causing suffocation and that it is impossible to buy a net for everybody in a big family. Also notable in his findings is that people only use bed nets when mosquitoes are plentiful in the rainy season but stop using them when there are no mosquitoes in the dry season. In the same study, he further found out that mosquitoes were perceived as a cause of malaria but at the same time use of bed nets was low (26 percent). He observes that people who did not use bed nets cited discomfort due to heat and humidity; and the high cost of ITNs as reasons for non-use. This therefore accounted for low utilisation of ITNs. Similarly, in a baseline study on malaria in Uganda in districts of Mukono, Jinja, Mbarara and Arua by Mbonye (2005), it was found out that 99 percent of respondents knew about malaria with a high level of knowledge that mosquitoes are the main cause of malaria. Nearly half of the urban respondents 48.3 percent observed that the use of nets was the most effective way to prevent malaria. While among rural respondents there was limited knowledge of the best method for prevention. Relatedly, in a study carried out in Western Kenya by Alaii et al (2003), community reactions were assessed before the introduction of permethrin-treated nets. Although malaria was found to be an important disease, ITNs were believed to be only partially beneficial because of the perception that malaria had multiple causes, and further to this, fear was expressed that chemicals used to treat ITNs were associated with use of family planning.

The findings from the above literature are significance to this study because they show how people's different perceptions about malaria control measures like ITNs may affect effective utilisation of the measures. Another interesting observation which is of relevance to this study is that knowledge about different measures to control malaria is vital for people to appreciate and utilise the measures. Although these findings are important, the focus of the studies was confined to perceptions and attitudes towards utilisation of ITNs in general. The studies do not look at perceptions and attitudes towards other measures, people's participation in the control of malaria and challenges faced in the control of malaria which this study attempts to do. Further, even if Zambia,

Uganda and Kenya are developing countries, they may have different social, economic and political experiences and environments.

In his paper entitled, "Community Participation in Malaria Control Strategy of Inter-sectoral Collaboration in Ghana: Myth or Reality" Owusu (2014) discusses the level at which communities have been allowed to participate and to understand whether the idea of community participation in malaria control strategy is a myth or a reality. The study was done in the rural district of Ahafo-Ano South in the Ashanti region of Ghana. The findings show that although the community members were allowed to take part at the district level in the policy-making process of malaria control, there was no power offered to the local residents. The findings were that the level of community participation was only tokenistic. Communities were only informed and /or consulted after decisions had been made, but the real engagement and negotiations were absent. Owusu (2014) argues that communities thus had limited opportunities to air their views in the planning process.

Lessons can be learnt from the study since the study was carried out in Ghana which is still a developing country like Zambia and in a rural district of Ahafo-Ano like Luangwa district where this study was done. Further, the study gives some insights that lack of community participation may affect the prevention and control of malaria in communities. However, despite the fact that Zambia and Ghana may be both developing countries found in Africa, they may have different social, economic and political challenges. Hence, this study attempts to close up that gap by undertaking a different study on management challenges in the prevention and control of malaria in the rural district (Luangwa) of Zambia by further looking at people's compliance with malaria control measures, and challenges faced in the control of malaria than just concentrating on community participation.

In his study entitled, "Urbanisation in Sub-Saharan Africa and Implication for Malaria Eradication", Keiser et al argue that malaria not only remains a leading cause of morbidity and mortality, but also impedes socio-economic development, particularly in sub-Saharan Africa. The study reveals that rapid unprecedented urbanisation, going hand in hand with often declining economies, may have profound implications for the epidemiology and eradication of malaria, as the relative disease burden increases among urban dwellers. In their study, the authors observed that entomological

inoculation rates in cities range from 0 to 54 per year, depending on the degree of urbanisation, the spatial location within a city, and overall living conditions. The study further revealed that about 200 million people (24.6% of the total African population) live in urban settings where they are at risk of contracting the disease. Importantly, the estimated total surface area covered by these urban setting is only approximately 1.1-1.6% of the total African surface. The study indicates that considering different plausible scenarios, it is estimated that there is an annual incidence of 24.8-103.2 million cases of clinical malaria attacks among urban dwellers in Africa. These figures translate to 6-28% of the estimated global annual disease incidence. Notable in the study is the argument that, basic health care delivery systems providing early diagnosis and early treatment and prevention actions through mother and child health programmes and the promotion of insecticide-treated bed nets for the rapidly growing numbers of the urban poor must be improved alongside well-tailored and integrated malaria eradication strategies. The authors are proposing environmental management and larviciding within well-specified productive sites, as a main feature for such integrated eradication approach. They further argue that mitigation of the burden of malaria by this, in urban African settings, in turn, is a necessity for stimulating environmentally and socially sustainable development.

The findings are significant to this study with regard to the understanding that unprecedented urbanisation in Sub-Saharan Africa has implications on malaria control coupled with failing economies of most of developing countries. Further, recommendations are made on the measures which are needed to be taken in order for sub-Saharan countries to successfully eradicate malaria. However, there are limitations to the study since it is confined to implications of urbanisation for malaria eradication in urban settings and not in rural settings in Sub-Saharan Africa so that malaria control could be understood contextually since different countries have different social, economic and political challenges in the control of malaria depending on the environment they are. Further, a cross-national study poses a great challenge with regard to the determination of the nature as well as the amount of data that need to be considered in the study. What this means, in effect, is that the probability of overlooking certain data and over-emphasising various issues at the expense of others is much higher. Consequently, such studies are less likely to provide a comprehensive understanding of the experiences of particular countries. The detailed examination of

qualitative and quantitative data collected from an individual country (Zambia) in a specific rural district of Luangwa as the case is in my study, provides a much more comprehensive basis for understanding management challenges in the prevention and control of malaria in specific sub-Saharan countries like Zambia.

In his study study entitled "Utilisation of Insecticide Treated Nets in Households with Children Under-Five Years in Muhoro Sub-County, Kibaale District, Uganda", Bashinyora (2010) asserts that there are positive effects of insecticide treated nets in reducing the mortality and morbidity of children under five years of age and yet coverage remains low. The lives of 400,000 children could be saved every year if African children under five sleep under ITNs (Africa Health, 2000). Mosquito nets if properly used and maintained can provide a physical barrier to hungry mosquitoes and provide 46 percent protection against malaria (RBM, 2001). Similarly, a number of studies have found out that ITNs provide varying degrees of protection against malaria morbidity. In a trial of untreated bed nets in the Gambia, nets were found to reduce the number of infective bites but not enough to reduce morbidity from malaria (Snow et al 1988). Bashinyora (2010) argues that malaria decreases with the use of ITNs. He attributes that to the fact that mosquitoes are not only kept away from the sleeping people, but would die when they come into contact with the insecticide. According to Dolan et al (1993), the use of ITNs in pregnancy reduces maternal parasitaemia and anaemia, premature deliveries, increases mean birth weight and subsequently reduces neonatal and infant mortality. ITNs have a mean protective efficacy against malaria episodes of approximately 50 percent in highly endemic areas of Africa (Langeler and Snow 2004). Relatedly, in a study carried out by Guyatt and Ochola (2003) in Kenya, it was established that ITNs reduced overall mortality among children by 63 percent in villages using impregnated nets. Further, bed nets which were given to pregnant women were found to be protective to women against malaria in both high and low malaria transmission areas of the study areas.

The findings by various scholars are important to this study because they show that the utilisation of ITNs among the under-five and pregnant women in protecting them against malaria should not be ignored. In addition, the findings have shown that even if ITNs have proved to be effective in preventing malaria among the under-five, the coverage is still low. However, there are limitations to these studies since mainly examined the effectiveness of ITNs in reducing morbidity and mortality among the

under-five and the pregnant women. Further, the studies are devoid of matters related to other malaria control measures, the level of utilisation of the measures to control malaria, community participation in controlling malaria and challenges faced in controlling malaria, which makes this study different from the previous ones. Further, even if the studies were carried out in developing countries like Uganda, Kenya and Ghana, they may have different social, economic and political experiences and environments compared to those prevailing in Zambia.

In his study entitled 'Comparing Care Seeking for Childhood Malaria', Baume (2002) argues that malaria caused illness and death all over the world until just half a century ago. He states that although the disease has been eradicated in the industrialised countries of the Northern Hemisphere, it still threatens 40% of the world's people, mostly those who live in the poorest countries. He states that at least 300 to 500 million people become acutely ill with malaria each year and more than a million die from the infection. His findings are that over 80% of malaria deaths occur in Africa, South of the Sahara, and most of those deaths affect infants or very young children. Every day, 3,000 children die from malaria. If children survive the disease, they may suffer from brain damage or paralysis.

Baume's findings are of value to this study because he gives a global picture of malaria infections statistically. The study also shows that malaria is common among the poorest countries and affects mainly the infants and young children. Hence, a lesson that governments in developing countries should seriously show commitment in fighting malaria considering its effects on national development. However, even if the findings are important to this study, Baume (2002) does not discuss the underlying factors leading to high morbidity and mortality rates due to malaria in poor countries like Zambia. Neither does he look at measures to control malaria, people's compliance with the measures, community participation and challenges in controlling malaria in developing countries like Zambia.

In his article entitled, "Malaria among Gold Miners in Southern Para, Brazil", Vol. 30, NO. 10, Stephen Vost (1990) notes that malaria has grown more prevalently in the Amazon frontier (particularly among gold miners in Brazil) despite increased expenditures by disease control authorities. Vost indicates that waves of migrants into the delicate ecosystems of the Amazon jungle by gold miners have triggered alarming

increases in malaria. These dramatic increases provoke renewed interest in the individual and environmental factors that influence malaria transmission, with an eye towards re-evaluating the control methods which are being employed. Vost (1990) has made an attempt to investigate a series of complex interrelationships that linked social-economic factors to the prevalence and spread of malaria at the individual and household levels. He states that by identifying the relevant and potentially manipulatable links, disease control can be made more flexible. The researcher agrees with the view that there is need to emphasise the importance of a flexible set of disease control measures that can be altered to fit the socio-economic and ecological realities of specific endemic areas, as well as react to changes in the disease environments and other circumstances.

The findings by Vost are relevant to this study in the sense that they provide an insight on factors that are likely to trigger malaria infections and affect effective control of malaria in Zambia in view of the increase in the number of migrants due to social-economic factors. That is because both Brazil and Zambia are Third World Countries (TWCs) with similar political, economic, social and administrative difficulties. However, despite the two being TWCs, there can be some slight variations in certain sectors because Brazil is in South America and Zambia in Africa. The actual levels of accessibility to resources can be different between the countries. Therefore, this study focuses on management challenges in the prevention and control of malaria in Luangwa, a rural district of Zambia.

Catherine Goodman, in her submission about "Economic Analysis of Malaria Control in Sub – Saharan Africa (SSA)," (2000), argues that appropriate and timely malaria case management should be seen as not only a key component of any Malaria Control Programme, but also a fundamental right of all populations affected by malaria. She further argues that in reality malaria case management is often highly inadequate for the following reasons:

  (i)   Inappropriate drugs are prescribed;

  (ii)   Compliance with the recommended regime is low;

  (iii)   Drugs are often ineffective due to resistance or poor quality; and

  (iv)   Patients with severe malaria are managed inappropriately.

She states that inadequate care results in higher morbidity and mortality from malaria, and may also encourage the development of drug resistance. Goodman (2000), has proposed several interventions for combating malaria. The proposed interventions are;

(i)   Using more effective drugs; improving the availability of second and third line drugs by changing the first line drugs for treatment.

(ii)   Improving compliance; through pre-packing and training.

(iii) Using combination therapies; this will reduce the growth of resistance.

(iv)   Strengthening diagnosis; the introduction of new diagnostic techniques.

She further argues that other strategies to improve the case management include the introduction of the Integrated Management of Childhood Illness (IMCI), and improving the quality of drugs. She states that IMCI is being piloted in some African countries, which aims to improve the treatment of the most common childhood diseases and conditions (acute respiratory infections, measles, malaria, diarrhea and malnutrition). An observation has been made by her that due to the considerable overlap in the signs and symptoms of these diseases, a single diagnosis for a sick child is often inappropriate, and can lead to other serious and potentially life threatening conditions which are overlooked. She indicates that drug quality is a major problem in some countries. She asserts that the implications of increasing drug quality, while recognised to be potentially important, are very difficult to assess due to lack of available information on the proportion of drugs that are then sub-standard. Furthermore, she states that the interventions which are being proposed are expensive to implement.

The study has endeavored to examine the effects of interventions proposed by Goodman in her work. This study concurs with the writer's views that appropriate and timely malaria case management should be seen not only as a key component of any MCP, but as a necessity. Nonetheless, Goodman's study is mainly centred on case management in malaria control and how to improve it especially in children which is more curative but she does not look at other malaria control measures, more so, those which are preventive in nature.

Najera (1991) in his submission entitled, "New Patterns and Perspectives" (1990), states that most available anti-malaria interventions are far from ideal, not only in effectiveness but in their suitability for incorporation into long term policies or the everyday practices of people and communities. He further states that many of the

interventions against malaria have lost much of their original effectiveness because resistant strains of parasites or anopheles have developed. According to Najera (1991), there is need to understand the epidemiology of malaria and problems of parasites and vector resistance. He argues that the tools of epidemiological investigations should be improved in order to identify problems concerning malaria, plan and evaluate potential solutions. He has also pointed out that there is need to understand and monitor social and economic processes that may influence the epidemiology of malaria and facilitate or hamper the effectiveness of potential control measures. Najera (1991) observes that funding for MCPs shrank when people began to recognise that malaria could not be eradicated, and that was due to failure of models developed for incorporating malaria eradication into the primary health care strategy. According to him, the most damaging effect of malaria eradication for years has been the neglect of malaria research. And that throughout the world, support for further research has contracted swiftly. He points out that the reawakening of interest in malaria research has shown a marked bias towards new technological development through laboratory based research, mostly in chemotherapy, immunology, genetics and the genetic control of vectors.

Najera's (1991) study is useful to this research in that it has highlighted most problems faced in the control of malaria especially in developing countries like Zambia. He has also brought out to surface how malaria, as a disease, would be perceived at the time of study. Notable in his article is the fact that he has emphasised the importance of research in the fight against malaria. He points out that the neglect of research in preventive medicine has implications in the fight against malaria. However, the generality of Najera's work makes it substantially different from this case study approach and my emphasis on management challenges where malaria prevention and control is concerned in a specific developing country (Zambia) with a focus on a rural district of Luangwa. The difference in the study design and emphasis is very critical to the effective understanding on issues related to malaria prevention and control.

A number of scholars have endeavored to carryout studies as regards to the relationship between poverty and malaria. Zurbrigg's (1992) historical analysis of malaria epidemics in India shows that price hike in food triggered by crop failure and massive increase in export to Britain was associated with severe epidemics in Punjab. The rise of price in wheat created food scarcity for the village poor and landless. It was found that hunger/malnutrition played an important role in the severe epidemics of Punjab before

1909. Similarly, famine, heavy rainfall, rise in maize price and decline in economic conditions were found to be associated with major epidemics and severity of malaria in colonial Swaziland (Packard, 1984). Zurbrigg argues that the linkage between poverty and malaria still exists in India. Malaria situation in States with higher below poverty line population (Bihar, Utter Pradesh, West Bengal, Orissa) is appalling. Declining trend of malaria in well-performing States and reverse situation in States with stagnant growth and development has been observed in the past three decades (Sharma, 2003).

Some scholars have argued that certain occupational activities may place individuals at greater exposure to mosquito and malaria than others. A study of socioeconomic aspects of malaria in Kheda District, Gujarat, reveals that education, occupation, income, housing pattern, and social groups play an important role in malaria transmission (Bhati *et al.,* 1996). Bhati *et al* (1996), observed that socio-economically upper castes had very low malaria incidence in both urban and rural areas. The study reveals that in rural areas, the labour population is at higher risk of malaria infection due to their outdoor sleeping habits, sleeping without bed nets, frequent movement and lack of access to proper treatment. The study concludes by observing that poor people often suffer from malaria because they live in poor houses nearby the forest, river and places, where malaria vectors are abundant.

A prospective study conducted by Subramanian *et al* (1991) in a rural community of Orissa in India found that the incidence of malaria was highest in the thatched-houses without false ceiling and risk of contracting malaria (relative risk-RR) was higher among people living in thatched-houses with (RR = 6.7) and without false ceiling (RR = 11.3) than people in tiled houses (RR = 1.0). The study further indicates that the risk of acquiring malaria infection varied significantly within a village stratified by proximity of breeding sources to human dwelling. Another similar study in Sri Lanka shows that individuals living in houses with an incomplete roof, windows without shutters, and doors with holes were subjected to repeated malaria infections while others in houses without these characteristics experienced little infections (Mendis *et al.*, 1990). The study shows an association between poorly constructed houses and higher risk for malaria, and when houses were structurally improved malaria was reduced by 36% in the whole population, reduced by 75% in the communities whose houses were improved. The study further reveals that the risk for malaria is high among those living close to the stream even in early of the transmission season. Results of a

study conducted by Ghebreyesus *et al* (2000) in hypo endemic highland in Northern Ethiopia coincide with the findings of the studies in India and Sri Lanka. These studies clearly suggest that structural factors are clearly associated with the prevalence and incidence of malaria.

A matched case control study of socio-economic risk factor for malaria in Gambia found that the quality of house such as the use of mud for wall construction, the absence of ceiling, crowding and poor cleanliness of the house were associated with the occurrence of malaria; however after multivariate analysis, only cleanliness was statistically significant (Koram, 1995). Similarly, only the possession of a refrigerator indicating improved socio-economic status was significantly associated with protection against malaria.

Another Gambian study using similar index for measuring socioeconomic status found that the prevalence of malaria decline significantly with increasing wealth (Clarke *et al.*, 2001). Butrapom *et al.* (1986) reported that various risk factors such as income, educational level, housing construction and location, and occupation were significant for predicting malaria in Thailand. Human behaviour including location and type of housing, sleeping habit, outdoor activities, poor knowledge about the disease and its treatment seeking behaviour are found to be significant determinants of malaria transmission in tribal areas of Orissa (Sharma *et al.,* 2001). A poor knowledge of transmission, low use of mosquito nets and residing or working in forest areas were found significantly associated with malaria occurrence (Fungladda *et al.,* 1987). In some cases, local environmental factors are more important for the risk of contracting malaria than the knowledge and human behavior concerning malaria (Ittiravivongs *et al.*, 1992).

A prospective study of forest malaria in Vietnam found that males and young adults who usually entered into the forest were significantly more at risk than female and children. Regular forest activities (wood cutting and agriculture) were the main risk factor for clinical malaria (Erhart *et al.,* 2004). Another study of the risk factor for malaria in urban setting also reported that infection was positively associated with people with rural occupation involving in the forest activities (Mendez *et al.,* 2000). In many parts of Southeast Asia, where the principal vector of malaria is forest breeder,

living in or near forest and involving in forest related activities are found to be a predictor of malaria (Singanetra-Renard, 1993).

There is no doubt that the above mentioned studies have made a significant contribution as regards the understanding that malaria is associated with hunger and poverty. The studies reveal that groups of lower socio-economic status are more vulnerable to the consequence of malaria infection compared to those with better socioeconomic status. However, these studies have not defined and stratified the population into different socioeconomic strata. The socioeconomic conditions measured by using assets or money alone or occupations and locations/constructions of the houses cannot fully capture the multidimensional nature of poverty. Due to the methodological limitation, relationship between socioeconomic status and malaria are not properly explored. Most of the observed differences in malaria incidence by the socioeconomic status appear less significant after multivariate analysis. It is partly due to the biased in selection of the cases and partly due to the problem in determining the socio-economic status. Also very limited and inadequate in that the studies were carried out in countries which may have different social, economic and political environment compared to that of Zambia, even though they are all developing countries.

In conclusion, the literature review shows that a lot of scholars have largely carried out studies in relation challenges in the prevention and control of malaria in Asia, South America, Africa and Zambia in particular from which this PhD work taps. The views or conclusions of various authors in the literature reviewed add credence and value to this study. However, these studies have not comprehensively analysed issues on management challenges in the prevention and control of malaria in Zambia, particularly in rural districts such as Luangwa. More importantly, such studies, especially in specific regions, have been rare even in the midst desire for such surveys. This is the gap that the research attempts to fill.

1.8. Research Methodology

This section presents an overview of the study design and methodology. It presents how the study was conceptualised, designed and executed. It shows the methods, the sample size, sampling procedures that were used and also gives the ethical standards which were followed.

1.8.1. The Area and Population of Study

The study was conducted in Luangwa District of Lusaka Province. Luangwa District is one of Zambia's 117 districts, located furthest on the eastern side of Lusaka Province, about 325km from the capital city, Lusaka. To the east, the district forms the border with Mozambique and to the south, the district forms the border with Zimbabwe. In the west and north, the district borders with Rufunsa district. Luangwa District covers an area of 3,471sq km and situated 350-500 meters above sea level. Luangwa District has a population of 25,294 inhabitants with the population density of 7.3 per sq. km (Central Statistical Office, Preliminary Report, 2011). The population is concentrated along the Luangwa and Zambezi rivers and is primarily a rural population depending on subsistence agriculture, trading in goods, small scale fishing, mat making from reeds, and forest products (e.g. masau). The district is mainly inhabited by the two ethnic groups; the Chikunda people under Mphuka Chiefdom and the Nsenga Luzi under Mburuma Chiefdom. Other ethnic groups from different parts of Zambia, Mozambique and Zimbabwe have settled in the district. The district has a total of eighteen (18) health facilities. These include two (2) First Level Hospitals, one of which is a Mission Hospital run by the Catholics, nine (9) Rural Health Centres and seven (7) Health Posts. Thirty-two (32) Primary Health Care units are also located in various communities within the district.

The area was purposively chosen because Luangwa District is among the districts where malaria is highly endemic. According to the 2016 Luangwa District Health Annual report, Luangwa District recorded Malaria Incidence Rates of 842/1000 in 2011, 361/1000 in 2012, 560/1000 in 2013, 893/1000 in 2014, 469/1000 in 2015 and 439/1000 in 2016. The report further indicates that among the top ten causes of morbidity in all ages in 2016 in Luangwa District, Malaria was the second highest cause of morbidity in all ages accounting for 439 per 1000 cases after Respiratory Infections (non pneumonia). Luangwa District is also known to be one of the first districts in Zambia to be targeted for the scale up to ITNs, serving as a pilot for mass distribution in 2005 (Thomas, 2010).

1.8.2. Research Design

The study was both qualitative and quantitative in terms of its design. In other words, the study utilised a mixed-methods research design (qualitative and quantitative

methods). Within the context of a qualitative research process, the study embraced the case study approach with a view to collecting as much data from the selected key informants as is necessary for the purpose of this study. Data was, therefore, collected on factors, that could facilitate the discussion and examination of the central argument or thesis of the study and assist in making some conclusions. Qualitative research is adopted because of the following reasons: first "It enables researchers to gain insight into attitudes, beliefs, motives and behaviours of the target population, and gain an overall better understanding of the underlying processes (Mwanje, 2001). Second, it allows the researcher to be flexible in the process of conducting the research (Berg and Latin, 2008). Third, it helps the researcher to gain insights into the feelings of the participants about the issue under investigation (Allan, 1991; Berg and Latin, 2008; Maxwell, 1996). Fourth, it enables the researcher to become knowledgeable of the context within which the participants operate and how this context affects their behaviour (Berg and Latin, 2008; Maxwell, 1996).

Quantitative method was also used for gathering numerical data and generalising it across groups of people to explain a particular phenomenon through graphical presentations. The goal in conducting quantitative research was to determine the relationship between one thing (an independent variable) and another (a dependent variable or outcome variable) within a population. Using this method, the data was gathered using mainly structured research instruments. The results were based on sample size that was representative of the population. The researcher clearly defined research questions to which objective answers were sought. Tools such as questionnaires or computer software were used to collect numerical data. In this case, the approach was used to generalise concepts more widely, predict future results, and investigate causal relationships. In practice therefore, qualitative and quantitative research methods tend to reinforce each other both during data collection and analysis, and the reporting of study findings.

1.8.3. Research Strategy

The research uses the case study strategy. A case study research strategy was used since the study required detailed investigation of the area under study. The case study approach was adopted for in-depth analysis of the selected social unit, which is Luangwa District in order to understand its history and the environment within which it

operates. The case study approach was also used to enable the researcher to identify challenges faced by the social unit as it interacted with the environment and make recommendations on how to deal with the challenges faced by the social unit.

1.8.4. Sources of Data

The researcher collected two types of data. These are secondary and primary data. Secondary data on one hand consist of documented data in the area of administration of health services in relation to malaria control in Zambia and other parts of the world. The documents include textbooks, journal articles, working papers, research reports, conference papers, workshop papers, seminar papers, dissertations and theses. These documents were obtained from individuals, libraries and the internet. Secondary data were gathered so as to provide insights into what is already known about the issue under investigation. These data also help with the historical background and to identify gaps in the existing literature. Primary data on the other hand, consist of undocumented data which is both quantitative and qualitative in nature. Quantitative data was collected from the local people through interviews using structured questionnaires. Qualitative data was collected using unstructured interviews (interview guides) from key informants who included; selected officials from the District Health Office (DHO), selected health providers (health personnel), selected Neighbourhood Health Committee (NHC) members and Community Health Workers (CHWs).

1.8.5. Sample Size and Selection

Primary data were collected from a sample of 246 comprising two categories of respondents. The first category comprises 46 key informants drawn from District Health Office, selected health facilities, neighbourhood health committees and communities. The second category comprises of 200 local people (community members).

In the first category, key informants were selected from DHO, health facilities, NHCs and communities using purposive sampling. Under purposive sampling, the researcher uses his or her judgement to draw the sample (Bless and Achola, 1988). Two key informants were selected from DHO and these included the Acting District Health Director and the District Malaria Focal Point Person who is a Public Health Officer. In this research, the researcher used his judgement to select two managers considered to

be more knowledgeable about the administration of health services in relation to malaria control in Luangwa District. It was assumed that views captured from the two managers would be adequate and relevant to the issue under investigation. The remaining 44 key informants from the health facilities were selected from the six (6) public health facilities (one hospital and five health centres) which were selected from the total ten (10) public health facilities found in the district. To come up with six health facilities, the researcher first had to pick Luangwa District Hospital since it was the only public hospital in the district. But for the five health centers, the researcher had to randomly sample from the nine (9) health centers found in the district. At this stage, the lottery method was used. The lottery method involves assigning a number or name to each unit in the population. The numbers or names of the units are then put in a container or box and mixed completely. Thereafter, the required sample of the units is drawn (O'Sullivan et al, 2003). In this research, the names of the five (5) health centers and one hospital were identified from which health providers were selected using purposive sampling. The health facilities selected were, Luangwa District Hospital, Luangwa Boma health center, Mandombe rural health center, Mphuka rural health center, Chitope rural health center and Kasinsa rural health center.

The sample for the remaining 44 key informants was arrived at using purposive sampling. The researcher used his judgement to identify those who were familiar with the issue under investigation. These key informants included four (4) health personnel from the district hospital, three (3) health providers (health personnel) from each of the selected health centers, three (3) members of the NHC from respective catchment areas of the selected health centers and two (2) community health workers from respective catchment areas of the selected health centers. The four (4) health personnel from the hospital included the Medical Officer In Charge, one Principal Clinical Officer, one Nursing Officer and an Environmental Health Officer. At health center level, the researcher selected three (3) health providers (health personnel) from each selected health centers that included the Officer In Charge of the health center (who were either a clinical officer or registered nurse by qualification), Environmental Health Officer (Malaria Focal Point Person at health center level) and a Nursing Officer. All these were purposively sampled because the researcher used his personal judgement that the officers were more knowledgeable of the issue under investigation not only as health

providers, but as public service workers who were in daily contact with communities and dealing with all malaria related issues.

At community level, the researcher selected three (3) members of the neighbourhood health committees from respective catchment areas of the selected health centers. These included the chairman, the secretary and one member of each selected NHC. The researcher purposively sampled these key informants at community level with the assumption that they were familiar with malaria control related matters at community level since they were the main link between the community and the health facilities. Therefore, they were in a good position to provide the required information at the community level, having in mind that they are custodians of health information at that level. From each respective catchment area of the selected health centers, two (2) community health workers were purposively sampled. This is because the researcher assumed that they had the knowledge of the issue under investigation since they are always in touch with community members hence they know very well malaria issues that affect their lives.

In the second category of respondents, the sample for the local people was selected using the Multi-stage sampling method (also known as cluster sampling). Multi-stage sampling involves selecting the sample in stages (Bless and Achola, 1988). According to Ghosh (2002), multi-stage sampling is a method where the items are selected in different stages at random. In a sense, this method is a combination of random sampling and stratified sampling. This method is applicable only where the universe is very large. The sampling process was done in four stages. The first stage involved selecting five health centers from the total nine (9) public health centers through simple random sampling using the lottery method as earlier indicated. In the random sampling, the individual units are selected from the population in such a way as to afford every unit of the population the same chance of being selected (Ghosh, 2002). In the lottery method, the names of the individuals or units are written on slips of paper and they are put in a box. Then, the slips of paper are mixed thoroughly and some slips are picked up from the box. These papers are taken up for sampling (Ghosh, 2002). At this stage, names of all the nine (9) public health centers were written on slips of paper and using the lottery method, five (5) health centers were selected. These included Luangwa Boma health center, Mandombe rural health center, Mphuka rural health center, Chitope rural health center and Kasinsa rural health center.

The second stage involved selecting zones from the catchment area for each selected health center using the method of stratified sampling. This is because each health center catchment area is divided into zones. Stratified sampling is a probability sampling technique wherein the researcher divides the entire population into different subgroups or strata, then randomly selects the final subjects proportionally from the different strata (Explorable.com, 2009). The researcher used stratified sampling at this stage so as to representatively sample even the smallest and most inaccessible subgroup (zone) in the population (each catchment area). In other words, it allowed the researcher to sample the rare extremes of the given population. With this technique, you have a higher statistical precision compared to simple random sampling. Because this technique has high statistical precision, it also means that it requires a small sample size which can save a lot of time, money and effort of the researcher. The third stage involved compiling a list of households in each selected zone and later using stratified sampling, a proportionate number of households in each zone was sampled. The lists of households in each selected zone were sourced from village registers compiled by the Department of Chiefs and Traditional Affairs and village headmen from respective selected zones. Since the selected catchment areas may not have the same number of residents, the method of stratified sampling according to ratios, was employed to select the households. The total number of households which were selected is two hundred (200). The fourth stage involved compiling a list of all adults in each selected household and then randomly selecting one respondent using the lottery method.

1.8.6. Method of Data Collection

As mentioned earlier, the researcher collected two types of data. These are secondary and primary data. Secondary data on one hand were collected by reading documents on malaria control, analysing their contents and writing down relevant information. This method was used so as to gain insights into what was already known about management challenges in the prevention and control of malaria in Zambia and elsewhere in the world. This method also helped with the historical background and to identify gaps in the existing literature. Primary data on the other hand were obtained through structured and unstructured interviews from two categories of respondents as shown in the sample size and sampling method. Primary data consists of undocumented data which is both qualitative and quantitative in nature. Qualitative data was collected using unstructured interviews (interview guides) from key informants (first category of

respondents) who included; selected officials from the District Health Office, selected health providers, selected Neighbourhood Health Committee members and Community Health Workers. Unstructured interviews are also known as semi-directive interviews. A semi-directive interview is a method that uses a flexible interview guide to collect information on a particular issue from an informant. The interview guide comprises a number of open-ended questions that should be answered by the informants. Although the informant is given the right to decide the way he/she answers the questions, the interviewer can ask for clarifications and has the responsibility of ensuring that the informant sticks to the subject of discussion (Mwanje, 2001). In line with the principles of semi-directive interviews, the researcher conducted one-on-one interviews with the informants. Quantitative data was collected from the local people (second category of respondents) through interviews using structured questionnaires. This mainly involved asking closed-ended questions.

1.8.7. Pre-testing and Reliability of the measurement

The data collection (research) instruments were pre-tested to ensure that the questions were clear, concise and consistent. The pilot study was conducted in Sinyawagora (catchment area), a rural area within the district different from the study area but with similar characteristics.

The instruments used to collect data were quite reliable. Reliability relates to "the degree to which a particular measuring procedure gives equivalent results over a number of repeated trials" (Bless and Achola, 1988). This means that if a particular research instrument is used two or more times in the same setting, the results should be the same. In this research, the type of reliability being assessed is inter-rater reliability (also known as inter-observer). Inter-rater reliability is "used to assess the degree to which different raters or observers give consistent estimates of the same phenomenon". Based on this method, a measuring procedure is considered reliable if different raters use it to measure the same phenomenon and manage to obtain consistent results. The application of this method in this research was as follows; first, three investigators were involved in the process of data collection. These are the researcher and his two assistants. Second, there was a questionnaire for the local people and an interview guide for each category of the informants (see appendices). This means that some sampled local people (community members) and selected informants in each category were

required to respond to the same items. Third, the responses obtained by the three investigators were compared. Responses that were consistent with each other were identified and taken as reliable data. This shows that the research instrument was reliable. The researcher uses the method of inter-rater to determine the reliability of the research instruments because it is the most convenient.

1.8.8. Method of Data Analysis

Quantitative data was analysed using Statistical Package for the Social Sciences (SPSS). This involved generation of both descriptive and inferential statistics. Descriptive statistics are used to describe the basic features of the data in the study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data. Descriptive statistics are used to present quantitative descriptions in a manageable form. Descriptive statistics are typically distinguished from inferential statistics. With descriptive statistics, you are simply describing what is or what the data shows. With inferential statistics, you are trying to reach conclusions that extend beyond the immediate data alone. In this study for instance, we use inferential statistics to try to infer from the sample data what the population might think should be done to adequately control malaria in Luangwa District. Thus, we use inferential statistics to make inferences from our data to more general conditions (William, 2006). The statistics also include univariate, bivariate and multivariate statistics.

Qualitative data was analysed using content analysis. This involved grouping information into themes. Content analysis as a research technique was used for systematically describing written, spoken or visual communication. By systematically evaluating texts (e.g. documents, oral communication, and graphics) qualitative data was converted into quantitative data. In content analysis, "researchers are preoccupied with searching for structures and patterns or regularities in the text, and systematically drawing informed inferences based on the available evidence" (Mwanje, 2001). In this research, the technique of grouping was used to understand the patterns in the data. Grouping is a technique that involves related elements being put in the same category (Mwanje, 2001). In this research, four groups of the data are created. The first group contains data focusing on malaria control measures implemented in Luangwa District. The second group consists of data relating to the local people's compliance with the

malaria control measures being implemented. The third group contains data focusing on people's participation in the control of malaria in the communities. The fourth group consists of data relating to challenges associated with the control of malaria in Luangwa District. Based on this analysis, some conclusions about management challenges in the prevention and control of malaria in Luangwa District are drawn. The research used the method of content analysis to analyse data because it was the most appropriate method considering that some data were in text form.

1.8.9. Research Ethics Statement

The research was conducted in accordance with the Research Ethics Policy of the University of Zambia. In this regard, the following ethical obligations were met;

- Before conducting the research, the project proposal was first submitted to the Department of Political and Administrative Postgraduate Studies Committee for consideration. After its approval at departmental level, the proposal was forwarded to the School of Humanities and Social Sciences Postgraduate Studies Committee for further consideration. The project was then registered and cleared of the ethics by the above mentioned committees.
- Request for permission to conduct the research in Luangwa District was made through an introductory letter written by my supervisor. The letters were given to the District Commissioner for Luangwa District and the Acting District Health Director for Luangwa District. (See Appendices).
- Introductory letters to Officers In Charge of health facilities were given to the researcher by the Acting District Health Director before undertaking the research in respective catchment areas (See Appendices).
- All potential informants were told about the objectives of the research, sampling methods and data collection methods.
- All potential informants were allowed to ask any questions about the research.
- All the informants were asked, for their consent.
- The informants were told that their participation in the research was voluntary.
- The informants were told that they had the right to withdraw their consent whenever they felt like doing so.
- The data collected during the research are kept confidential.

- The anonymity of all the participants in the research is maintained. In line with this obligation, job titles are used to identify the informants.
- Honesty and integrity have been maintained in the process of data gathering, analysis and presentation.

1.8.10. Organization of the Thesis

The thesis is divided into seven chapters. Chapter 1 introduces the thesis. It includes the background/context for the thesis, problem statement, general and specific objectives, significance of the thesis, and definition of concepts used in the thesis. The chapter further presents the theoretical framework guiding the analysis of management challenges in the prevention and control of malaria in Luangwa District based on the selected theories. The chapter reviews literature on the concept of malaria control in Zambia and other developing countries in the world. The chapter also discusses the design and methodology of the research project used to analyse the management challenges in the prevention and control of malaria in Luangwa District. The chapter explains the type of research conducted for the purpose of the thesis. It presents the research strategy, describes the sources of data, sample size, sampling methods, and methods of data collection. The chapter also explains the reliability of the measurement, presents the method of data analysis, research ethics statement and the organisation of the thesis.

Chapter 2 examines the nature and historical context of the malaria prevention and control efforts in Zambia. It presents the country profile which includes the geography, demography, political and administrative overview, education characteristics, health characteristics, economic characteristics, poverty levels and malaria situation (current trends). The chapter discusses the nature of efforts in controlling malaria during the colonial administration, post- independence period, and post-independence period after the introduction of health reforms to date. As milestones in the history of malaria control are being examined, the following areas are covered; achievements, challenges, policy and strategic directions, monitoring and evaluation and finally, partnership and coordination.

The reporting of empirical data is based on the sequence or line up of specific objectives of the study on page 10.

Chapter 3 examines the measures which are being implemented in Luangwa district to prevent and control malaria. The chapter discusses different measures which are being put in place in an effort to prevent and control malaria. These measures include the following; the provision of Insecticide Treated Nets, provision of Indoor Residual Spraying, provision of information, education and communication/ behavior change and communication, provision of health infrastructure, human resource for health, malaria diagnosis and case management and prevention of malaria in pregnancy. The chapter also presents graphical results which have been done concurrently with discussions of the same. Comparison with previous studies on measures to prevent and control malaria in Zambia and other parts of the world are done to bring out the bigger picture.

Chapter 4 examines the extent to which the local people are utilise malaria prevention and control measures implemented in the community. The chapter discusses the extent to which the community members utilise insecticide treated nets, indoor residual spraying, health facilities and services. It further looks at factors which influence the local people to utilise and not utilise the various measures implemented to prevent and control malaria in the community.

Chapter 5 discusses the nature and extent of local people's participation in malaria prevention and control activities. The chapter looks at how the local people are involved in preventing and controlling malaria in their respective communities. It also examines different factors which influence the local people not to be involved in malaria prevention and control activities.

Chapter 6 focuses on the conclusions and recommendations of the thesis. It restates the purpose and objectives of the thesis. It also explains the main findings of the research. In addition, the chapter presents the conclusions of the thesis. Furthermore, it shows how the thesis has contributed to the field of research. The chapter ends with the recommendations of the thesis.

CHAPTER TWO

HISTORICAL CONTEXT OF MALARIA PREVENTION AND CONTROL EFFORTS IN ZAMBIA

2.1. Introduction

This chapter looks at the historical context of malaria prevention and control efforts in Zambia from the colonial era to date. The chapter is a discussion of the nature of efforts in preventing and controlling malaria under the colonial administration and during the period after independence to date. As milestones in the history of malaria prevention and control in Zambia are being examined, the following areas are covered: country profile and historical milestones in the prevention and control of malaria,

2.2. Country Profile

2.2.1. Geography

Zambia is a land-locked country located in sub-Saharan Africa, with a surface area of 752,612 square kilometers. Zambia shares borders with eight countries: the Democratic Republic of Congo and Tanzania to the North, Malawi and Mozambique to the East, Botswana and Zimbabwe to the South, Namibia to the Southwest, and Angola to the West. Administratively, the country is divided into 10 provinces and 117 districts following the recent re-organisation. Zambia's capital city is Lusaka. Approximately 60.5 percent of the population resides in rural areas, while 39.5 percent lives in urban areas. The Lusaka and Copper belt provinces are predominantly urban, while the other provinces are largely rural (MOH, 2017).

2.2.2. Demography

According to the Central Statistical Office (2015), the population of Zambia increased almost threefold from 5.7 million in 1980 to an estimated 15.5 million in 2015. Between 2010 and 2015, the population increased from 13.1 to 15.5 million representing an increase of 18.3 percent. Population projection reports from the Central Statistical Office (2013) indicate that the population of Zambia was estimated to be 15.5 million in 2015, with a life expectancy of just over 53 years. This rate of population growth indicates the need for the government to increase the levels of service delivery so as to meet the demands of a growing population.

According to the Population and Demographic Projection 2011-2035 Report, Zambia's population is estimated at 15.9 million in 2016. Out of these, 7.9 million are males and 8.0 million are females. Further, 9.2 million reside in rural areas while 6.7 million are in urban areas. Therefore, in terms of the rural-urban divide, 60.5 percent of the total population resides in rural areas while 39.5 percent is in urban areas. This shows that a majority of the Zambian population lives in rural areas. This implies that rural areas are supposed to receive a larger share of goods and services than urban areas. In terms of distribution by sex, 49.3 percent are males while 50.7 percent are females. This shows that the population of females is slightly bigger than that of males. This implies that a slightly larger share of services should be directed at females than males.

The report further indicates that the population is expected to grow to 17.9 million by 2020 of which 10.1 million will reside in rural areas while 7.8 million will reside in urban areas. During the projection years, the age structure is expected to remain relatively unchanged although the proportion of children within the population will fall. The young population is expected to result in growth in the reproductive age group (15-49) and the economically active age group (15-64). As at 2016, the estimated life expectancy at birth was 53.7 years. Females had a higher life expectancy at birth of 56.1 years compared to 51.5 years for males. The projected decline in fertility and mortality is expected to lead to an increase in life expectancy at birth and at different ages as well as the proportion of the elderly, 65 years and older, in the long run.

In terms of age, Zambia is characterised by a young population. Its median age is 16.9 years (Central Statistical Office, 2012). This means that the population in Zambia is characterised by young people. As of 2012, Zambia's population was served by a network of 1,956 health facilities, including 109 hospitals, more than 1,500 urban and rural health centers and over 300 health posts (MOH,2013). The country's average population density is 20.6 persons per square kilometer, while Lusaka Province has the highest density of 126.8 persons per square kilometer. There are 73 ethnic groupings in Zambia with seven major languages used besides English which is the official language. The seven major languages are Bemba, Kaonde, Lozi, Lunda, Luvale, Nyanja and Tonga.

According to the Seventh National Development Plan (2017-2021), the country's population age structure has created high child dependency with a heavy burden on the

working population. Zambia's overall dependency ratio stands at 92.5 while the child dependency ratio is 87.4. This has increased pressure on the Government to provide public goods and services, such as education, health, housing, water and sanitation and employment. However, the large numbers of young people may represent great economic potential, but only if adequate investment is made in their health, entrepreneurship and education, thus continuing to stimulate new economic opportunities for all.

2.2.3. Political and Administrative Overview

Zambia got its independence from Britain in 1964. Zambia is a unitary state with a multiparty system of government. Politically, the country has gone through the era of multi-party democracy, 1964 – 1972 and one party rule, 1972 – 1990 and later multi-party democracy since 1991. Administratively, the country is divided into 10 provinces namely Central, Copperbelt, Eastern, Luapula, Lusaka, Muchinga, Northern, North-Western, Southern and Western. These 10 provinces are further sub-divided into 117 districts. The capital city of Zambia is Lusaka, which is located in Lusaka province. This means that Zambia has three levels of government and administration. These are central, provincial and district levels. Since independence in 1964, Zambia has remained among the most peaceful and politically stable countries in Africa. The country has also prioritised the fight against malaria, which has continued to receive significant political will and support at all the levels within the Government structures.

2.2.4. Socio-Economic Situation

2.2.4.1. Education characteristics

In terms of literacy levels, most of the people in Zambia are able to read and write in one language or another. The national literacy rate for people aged five years and older is 70.2 percent. However, the literacy rates vary from one region to another as well as from one sex to another. The literacy rate is higher in urban areas (83.8 percent) than in rural areas (60.5 percent). The literacy rate is also higher among males (73.2 percent) than females (67.3 percent) (Central Statistical Office, 2015). These rates correspond to the levels of accessibility of education services in the country. The national net school attendance rates are as follows: at primary school level (grades one to seven for the population aged 7-13 years) the rate is 83.1 percent while at secondary school level (grades 8 to 12 for the population aged 14-18 years) it is 75.7 percent (Central

Statistical Office, 2015). The gross attendance rate for secondary school was relatively lower than that for primary school. According to Central Statistical Office (2015), at national level, Primary and Secondary school net attendance rate is 78.6 percent and 43.7 percent, respectively. Urban areas tend to have higher net attendance rates than rural areas. These data show that more than two thirds of the primary school-age population in Zambia has access to primary education. However, the country has a very low progression rate from primary to secondary school. From the data, it can be noted that a majority of the secondary school-age population cannot access secondary education. This implies that Zambia is characterised by a largely unskilled population. This, in turn, presents challenges for productivity and the quality of service delivery.

In addition, the completion rates at various levels of education are low. The situation is worse as people move from lower to higher levels of education. The completion rates for the population aged 25 years and older are as follows: at primary school level the completion rate is 47.8 percent, at secondary school level it is 37.3 percent and at tertiary education level it is 14.5 percent (Central Statistical Office, 2012). The school completion rates also vary between rural and urban areas. At primary school level, rural areas have a higher completion rate at 67.0 percent than urban areas at 28.2 percent (Central Statistical Office, 2012). Nonetheless, the opposite is the case at secondary school and tertiary education levels. At these higher levels, the completion rates are higher in urban areas than in rural areas. At secondary school level, the completion rate in urban areas is 48.0 percent while in rural areas it is 26.8 percent. At tertiary education level, the completion rate in urban areas is 23.6 percent while in rural areas it is 5.7 percent (Central Statistical Office, 2012). These data indicate that a few highly skilled people are located in urban areas while most of the unskilled people are in rural areas. This implies that the quality of educated people is low especially in rural areas. According to Madimutsa (2016), Central Government still remains the main provider of education at all levels with 84 percent of the school attendants in Government school. However, the private sector has a notable contribution to education particularly at college and university levels.

There are also gender inequalities in the school completion rates for the population aged 25 years and older. At primary school level, females have a higher completion rate at 56.9 percent than males at 39.7 percent (Central Statistical Office, 2012). However, the opposite is the case at secondary school and tertiary education levels. At these

higher levels, the completion rates are higher for males than females. At secondary school level, the completion rate for males is 42.6 percent while for females it is 31.4 percent. At tertiary education level, the completion rate for males is 17.5 percent while for females it is 11.3 percent (Central Statistical Office, 2012). From these data, it can be noted that despite a majority of the people in the country being literate, their level of education is low. In this regard, females are more affected than males. This implies that there is discrimination against females in the process of delivering higher education services in the country.

2.2.4.2. Economic characteristics

The total value of goods and services, i.e. Gross Domestic Product (GDP), in Zambia in 2010 was estimated to be Zambian Kwacha 97,215.9 million (Central Statistical Office, 2014). Zambia's economy has been experiencing strong growth in recent years. The economy grew at an average rate of 5.8 percent per annum during the period 2000-2005. It then grew at an average rate of 6.9 percent per annum during the period 2006-2015 (Republic of Zambia, 2017). By 2013, Zambia's GDP growth was still above 6 percent (Chikwanda, 2013). This growth was higher than the regional and global economic growth rates. At that time, economic growth in Sub-Saharan Africa was about five percent while for the global economy, it was about three percent (Chikwanda, 2013). This implies that Zambia has the capacity to improve the health delivery system and reduce poverty in general.

The structure of Zambia's economy is dominated by the services sector, which accounts for 56.5 percent of the country's GDP. This is followed by the industrial sector at 33.9 percent. The agricultural sector accounts for the smallest share of GDP at 9.6 percent (Hartzenberg and Kalenga, 2015). This shows that Zambia's economy relies heavily on the services sector. This also means that institutions in the services sector including public administration play a very important role in sustaining the economy of the country.

However, the structure of the economy of Zambia differs from other Southern African Development Community countries. The country where the services sector contributes the largest share of GDP is Seychelles at 86.3 percent while Angola has the smallest share of this sector at 32.1 percent. In terms of industrialisation, the most industrialised country in the region is Angola where the industrial sector accounts for 57.8 percent of

GDP while the least industrialised is Seychelles at 11.3 percent. In terms of agriculture, the country with the largest share of agricultural contribution is Mozambique where the sector accounts for 29 percent of GDP while the ones with the smallest share of this sector are Seychelles and South Africa at 2.4 percent respectively (Hartzenberg and Kalenga, 2015).

According to the 2010 Census of Population and Housing, the working-age population (i.e. people aged 12 years and older) in Zambia was 7,715,022 in 2010. Of this population, 4,259,170 are economically active (constituting the labour force). This translates to a national labour force participation rate of 55.2 percent. The economically inactive population accounts for 44.8 percent of the working age population. The economically inactive population cannot look for employment because of a number of reasons. These include full-time students, full-time homemakers, full-time housewives, beggars, patients and elderly people, among others (Central Statistical Office, 2012). This means that there are many dependants in the country. According to Central Statistical Office (2012), an average household has five people. This implies that the government has the responsibility of providing social security to vulnerable groups including workers that are unable to meet their basic needs.

A majority of the labour force is in rural areas, accounting for 62.1 percent. Urban areas account for only 37.9 percent of the labour force. The labour force participation rate is also higher in rural areas (60.3 percent) than in urban areas (48.5 percent). In terms of gender dimensions, there is a higher participation rate in the male population (65.0 percent) than in the female population (46.0 percent) (Central Statistical Office, 2012). This means that there are more males available for employment than females in Zambia. This also implies that females are not empowered to actively participate in economic activities.

Most of the employment is in agriculture, accounting for 62.8 percent of the working population (Central Statistical Office, 2012). This implies that most of the unskilled workers are engaged in agricultural activities in rural areas which account for a very small share of Zambia's GDP. As noted by Hartzenberg and Kalenga (2015), the agricultural sector accounts for 9.6 percent of Zambia's GDP.The overall unemployment rate in Zambia is 13.0 percent of the total labour force. The unemployment rate is higher in urban areas (22.1 percent) than in rural areas (7.5

percent) (Central Statistical Office, 2012). This shows that it is easier for people to find work in rural areas than in urban areas. However, rural employment is not lucrative. It is just for survival purposes.

In terms of the distribution between the formal and informal sectors, most of the people in Zambia are employed in the informal sector. According to the 2014 Labour Force Survey, about 84 percent of the working population was employed in the informal sector (91.2 percent for females, 75.8 percent for males). This means that the proportion of formal sector employment is 16.0 percent of the total employment in the country. According to the Seventh National Development Plan (7NDP, 2017), informal employment between 2005 and 2014 remained high, at between 84 and 89 percent of the total number of people employed. This also means that the agricultural sector (which employs a majority of the labour force) comprises mainly informal enterprises. In addition, although the informal sector employs a majority of the labour force in Zambia, its contribution to GDP is lower than the formal sector. Central Statistical Office (2014) indicates that the value of the formal sector is 66.4 percent of the total GDP while the value of the informal sector is 33.6 percent of the total GDP. This implies that employment in the informal sector is "survivalist" in nature.

2.2.4.3. Health characteristics

Zambia is among countries with the lowest life expectancy in the world. The life expectancy at birth in Zambia is 51.2 years. In terms of rural-urban residence, people residing in rural areas are expected to live longer than their urban counterparts. Life expectancy at birth in rural Zambia is 51.7 years while in urban areas it is 50.8 years. In terms of sex disparity, females are expected to live longer than males. Life expectancy at birth for females is 53.4 years while for males it is 49.2 years (Central Statistical Office, 2012). This implies that Zambia is faced with the problem of population growth due to sickness and death. The 2010 Census of Population and Housing shows that Zambia's Crude Death Rate (CDR) is 13.1 deaths per 1,000 population. The CDR is higher in the male population at 14.3 deaths per 1,000 males than the female population at 12.0 deaths per 1,000 females. The CDR is also higher in rural areas at 13.6 deaths per 1,000 population than in urban areas at 12.5 deaths per 1,000 population. Most of the deaths are due to illness/disease, which accounts for 75.7 percent of all the reported causes of death in the country (Central Statistical Office, 2012). The main illness in

Zambia is fever/malaria, accounting for 47.9 percent of all the reported illnesses/injuries. This is followed by cough/cold/chest infection at 17.9 percent, headache at 6.6 percent, diarrhea without blood at 3.6 percent and abdominal pains at 3.4 percent. The other types of illness, each account for less than three percent of the reported cases (Central Statistical Office, 2012).

The Zambian Government and its cooperating partners had committed themselves to start reducing the cases of major diseases including malaria by 2015. This commitment was part of the Millennium Development Goals (United Nations Development Programme [UNDP], 2013). However, the cases of malaria (the main illness in Zambia) have continued to increase. According to UNDP (2013), "New cases [of malaria] increased from 255 per 1,000 population in 1990 to 330 in 2010. Similarly, the fatality rate increased from 11 per 1,000 population in 1990 to 34 in 2010." This represents 29.4 percent increase in the infection rate of malaria and 209.1 percent increase in the death rate due to the same disease. This implies that productivity of the country is affected by the illness and death of workers. The other implication is that the government is facing a challenge to deliver health services.

Health sector development is firmly linked to the overall national development agenda. Zambia's efforts to reduce the malaria burden and address other health challenges are part of a broader agenda aimed at attaining significant and sustainable socio-economic development. The country's long-term development agenda is guided by the vision 2030 strategy, which seeks to transform Zambia into "a prosperous middle-income nation by 2030." The vision 2030 strategy is being implemented through successive five-year national development plans, including the current Seventh National Development Plan. Vision 2030 identified malaria control as a key priority area in terms of achieving the stated development goals. The health component of vision 2030 seeks investments that will contribute to the attainment of health for all by 2030, with a mission of providing "equitable, cost-effective health services close to the households."

Zambia is a country inundated with a huge burden of disease, leading to high morbidity and mortality levels among the population, with significant impact on socio-economic development. The disease burden is largely influenced by the high prevalence of preventable and treatable communicable diseases, such as malaria, HIV and AIDS, sexually transmitted infections, and tuberculosis (TB). Zambia is also among the

countries with the highest levels of maternal and child mortality levels in the world, with a Maternal Mortality Ratio of 591 per 100,000 live births (MOH, 2012). The country is also experiencing a growing burden of non-communicable diseases, particularly hypertension, cardio-vascular diseases, diabetes mellitus, mental health, trauma, and various forms of cancer.

2.2.5. Poverty Levels

The other challenge facing Zambia is poverty. Central Statistical Office (2015) defines the poor as "those members of society who are unable to afford minimum basic human needs, comprising food and non-food items, given all their total income." Despite the strong GDP growth (above six percent) experienced in recent years (Chikwanda, 2013; Republic of Zambia, 2011), a majority of Zambia's population continues to live in poverty. According to Central Statistical Office (2015), the proportion of the population falling below the poverty line was 54.4 percent in 2014. In terms of the distribution between rural and urban areas, poverty is more prevalent in rural areas than in urban areas. The level of poverty in rural areas is 76.6 percent compared to 23.4 percent in urban areas. 40.8 percent of the population is extremely poor and while 13.6 percent is moderately poor (Central Statistical Office, 2015). The sum of extreme and moderately poor gives overall poverty. In terms of the distribution between sexes, poverty levels are higher among female headed households than those headed by males. In 2010, the level of poverty among female headed households was 62.4 percent compared to 60.1 percent among male headed households (Central Statistical Office, 2012). This means that the government has a burden to provide services like health and education especially in rural areas and to the female population. This also means that the public sector is inefficient and ineffective, hence the need to reform it.

2.2.6. The Malaria Situation in Zambia (Current Trends)

Zambia's malaria epidemiology is a result of several forces, including;

- The geographic, climate, and social features of the country that are conducive or restrictive to malaria;
- The introduction and scale-up of malaria control interventions across the country, which alter transmission and consequent infection, morbidity and mortality rates associated with malaria.

Not only is Zambia a highly malaria-endemic country, but malaria is also endemic in all eight neighbouring countries. Malaria incidence in Zambia varies widely from under 50 cases per 1,000 population in some districts to above 500 cases per 1,000 population in others (MOH, 2015). Malaria prevalence in the most vulnerable age group (children under five years) varies from below 3 percent in some districts (such as Lusaka) to over 30 percent in the most rural provinces (MOH, 2016). There have also been changes in disease prevalence within the same locations over time, owing to variations in coverage rates of prevention interventions.

The malaria burden has markedly decreased with the massive scale-up of control efforts in the past decade, although the disease is still a major public health challenge in Zambia and remains endemic across all ten provinces. There is a wide variation in infection prevalence across provinces and districts (MOH, 2016). Malaria transmission is highly seasonal, with the rainy season (December to April) leading to transmission peaks between January to April, and peak parasite prevalence at the end of the transmission season in April and May.

In Zambia, there are four types of Plasmodium parasites that can cause malaria in humans; P. falciparum, P. malariae, P. vivax, and P. ovale. Out of these, P. falciparum is the most predominant, causing the most severe form of malaria. P. falciparum, accounts for 98 percent of all malaria infections in the country, with low frequency of infections from P. malariae (>1 percent) and P. vivax (<1 percent), and little or no transmission of P. ovale (MOH, 2016).

Malaria in Zambia is transmitted by the members of the Anopheles gambiae complex and of the Anopheles funestus group of mosquitoes. The main vector species are Anopheles gambiae s.s., An. arabiensis, and An. funestus. Recent field research demonstrated the presence of An. nili in the An. nili complex, and An. funestus-like and An. rivulorum within the Anopheles funestus group. However, their role in malaria transmission has yet to be established (MOH, 2016).

According to MOH (2015), the main risk groups in Zambia differ based on morbidity/mortality considerations versus infection incidence/prevalence. The risk groups for severe illness and death include: young children less than five years of age; pregnant women; HIV-infected persons (especially those not on treatment and with compromised immune responses); and others with compromised immune systems. The

risk groups for infection include: rural populations (compared to urban or peri-urban populations); populations at lower altitudes and /or living close to water bodies that may be potential mosquito breeding sites, (e.g. Luangwa District population); poorer and less educated populations; mobile populations that shift seasonally for work (e.g. farming or fishing), and therefore pose a risk to themselves and to reintroducing infection into their home communities; Children and adolescents, especially those not sleeping under LLINs or accessing other vector control measures; and military and police forces deployed on national security operations.

2.3. An Overview of Malaria Control Efforts during the Pre-Independence Era

Malaria is an ancient disease and the battle against it began as far as 1955 when the Eighth World Health Assembly endorsed World Wide Programme of Malaria eradication. This endorsement saw the World Health Organisation taking over coordination and provision of technical assistance. This global effort achieved some success. Endemic malaria was eliminated from Europe, parts of Asia, and the Middle East, Japan, Taiwan, Australia, America, North of Mexico and most of the Caribbean (Stevens, 1987).

Malaria eradication was achieved mostly in developed temperate countries. In 1970, it became apparent that worldwide eradication, especially in the tropics was not achievable. The eradication strategy was watered down to "Control Strategy", which implies the reduction of the disease to a level at which it is no longer an important public health problem. However, the control strategy could not be sustained. The shrinking economies of the Third World and the resultant poverty worked to reverse the malaria programme achievements. This was compounded by the ban of the use of DDT, which worked effectively against mosquitoes. This was made worse by the development of resistance of the parasite to chloroquine, which had been an affordable, and wonder drug against malaria. For Zambia, by 1979 malaria had become a serious public health problem (Sikazwe, 2003).

Zambia's health policy and strategies can be said to have evolved through four significant phases. First, was the pre-independence period whose health policies were influenced by the colour-segregation ideology. Secondly, immediately after independence, health policies and strategies were formulated that aimed at eliminating the imbalances in the provision of public health. The third phase was the adoption of

the Primary Health Care (PHC) approach to the provision of public health services in 1980. The PHC approach, however, did not perform as expected so much that when the MMD government took office in 1991, they embarked on health reforms whose core focus was the establishment of the District Health Boards as the basic management units. These boards were in operation till 2007 when the Central Board of Health was abolished as the mother body.

A brief view of the health provision practices and policies of the colonial administration shows that these were part of the colour-segregation ideology that existed at that time. The distribution of health services like malaria control closely followed the formally instituted categories of Europeans, Asians (who came into the country as traders and shop owners), coloured (off springs of black and white unions) and Africans, in that order of importance. In addition, because the economic situation at that time demanded that the African had to provide cheap labour for the mines, the colonial administration provided Africans with social services such as health and education in order to have a healthy, literate labour force. Since mining was done in the urban areas, the health and educational services provided were first and foremost to the urban Africans rather than to rural African population who were in the majority (Lengwe, 1985 and Zambia, 1965).

British colonial authorities recognized the burden of malaria in Northern Rhodesia- the area that later became Zambia and sought preventive measures as towns and cities grew. In the 1920's when most of the urban centers in Zambia emerged, town and country planners took malaria control into consideration. As early as 1932, some pieces of legislation were passed regarding malaria prevention and control, which became law in 1944 (Mosquito Extermination Act, 1944). Malaria control in Zambia commenced in 1929, and progressed through several stages. According to Ultzinger et al (2002), pioneering interventions constituted environmental management and mosquito net use, coupled with diagnosis and treatment, using quinine. The success of vector control was enhanced by the enactment of statutory instruments "the Mosquito Extermination Act" Cap 312 of 1944 and Cap 537 of 1964. The Mosquito Extermination Act of 1944 mandated households' management of outdoor water containers in order to eliminate mosquito breeding sites. The Act however, did not include the rural areas in its vector control initiative. The Act also stipulated that the urban centers be covered 100% with two rounds of residual insecticide application every year.

Zambia (formerly Northern Rhodesia) first initiated indoor residual spraying with Dichloro Diphenyl Trichloroethane in the 1950s, at the same time malaria became a notifiable disease (MOH, 2000). Municipal councils and the Ministry of Health sprayed urban areas, and mining companies administered and financed the programme in the districts. The mining conglomerate in the Copperbelt towns continued with DDT spraying programmes especially in areas where their employees resided. The malaria cases that occurred in these areas therefore were infections contracted outside the towns. The risk of contracting the disease within the larger townships was very minimal (MOH, 1998). Insecticide spraying was not conducted in rural areas, where malaria control was restricted to treatment services. In this regard, reports show that spleen rates were lowest in urban areas and were high in the rural school children attending rural health facilities. Chloroquine, the most effective and inexpensive antimalarial at the time, was provided for free in the public sector across the country. One of the most effective early prevention and treatment efforts was observed in the Copperbelt among private mining companies, which implemented these efforts in the 1920s in order to sustain a healthy workforce.

As indicated earlier, the control of malaria started in 1929 in the modern day Copperbelt area. The experience with environmental management of malaria in the copper-mining communities of Zambia (formerly Northern Rhodesia), between 1929 and 1949, has provided a historical example of how integrated malaria control strategies may yield substantial economic benefits, as well as public health gains (Ultzinger et al, 2002). Since the Northern Rhodesian programme was undertaken in an area fraught with high rates of malaria disease, it also illustrates how integrated management may be relevant in areas of endemic disease – as well as in areas of more marginal and epidemic transmission.

Ultzinger et al (2002), state that in the Northern Rhodesian programme, a package of integrated control measures reduced the malaria incidence rate by 50–75% in the first 3–5 years of programme operation. Between 1930 and 1936, malaria incidence within the four mining communities involved in the programme declined from 457–514 cases to 135–251 cases per 1000 people per year. When indoor residual spraying with DDT was introduced in 1946, supplementing but not replacing the environmental management measures, there was another sharp decline in malaria incidence to just 21-30 cases per 1000 people.

According to Ultzinger et al (2002), Northern Rhodesia's programme was a comprehensive approach, first including improvements in housing, water, sanitation, medical treatment and facilities, and bed nets. When these measures alone proved insufficient to substantially reduce disease incidence, surveys of local malarial vector habitats were conducted and environmental management strategies were designed to reduce breeding habitats. The measures that were designed included vegetation clearance, modification of river boundaries, increasing velocity of the river flow to interrupt larval development, and swamp drainage. An additional component – albeit not one that would be considered environmentally sound today – was the application of oil to open water bodies, which also interrupted larval development.

The studies indicate that strategies were tuned to the local ecology and behaviour of the malaria vectors, some of which preferred shady habitats, and others thrived in sunshine. The measures were implemented in parallel by careful cooperation among health, water management, and planning authorities. Monthly malaria-incidence rates and vector-density surveys provided a constant stream of updated information on the effectiveness of the measures taken, so that they could be fine-tuned, and performance improved.

The detailed records kept of the programme costs and procedures – together with health, employment, and revenue data from the mining company operations – have facilitated cost-effectiveness analysis. It has been estimated by some experts in retrospective analysis that the malaria-control effort may have averted over 14 000 deaths, and over 517 000 malaria attacks, in a mining community population that swelled from 11,000 employees and their families to over 140,000 people over a period of 20 years. Over the same period, integrated malaria-control costs were estimated to total about US\$ 11 million, while nearly US\$ 6.5 million in direct medical costs and indirect costs of lost worker productivity were estimated to have been averted (Ultzinger et al, 2002).

Important economic development and macroeconomic benefits may also have been generated by malaria control. Over the 20-year period the programme was in operation, Northern Rhodesia was transformed from an insignificant player in copper mining, to the third most important copper ore producer worldwide, and in 1938, copper represented 55% of taxable national income. Prior to 1929, unsuccessful malaria control efforts had resulted in migrant workers abandoning some of the same copper

mine sites, and rumours flourished along the labour routes of the malaria dangers associated with copper mining in the area. Integrated malaria management both dissipated these fears and stimulated unprecedented in-migration to the mining communities – essential ingredients in the rapid expansion and sustainability of the mining operations.

Ultzinger et al (2002) argue that while this programme occurred under a colonial regime that is now a historical artifact, such historical experiences with malaria control have been recognised by experts in Africa and elsewhere as potentially relevant to the struggle of modern and independent African nations to address issues of disease, environment and development. In particular, the experience illustrates how concerted intersectoral action between health and economic sectors can yield public health benefits, as well as economic payoffs of malaria vector control in Zambia.

Despite the achievements recorded in the control of malaria in the selected copperbelt mining communities, malaria remained the most significant health problem in Northern Rhodesia. As early as 1947, 25% of the total admissions to the European hospitals were malaria admissions whereas African hospitals accounted for 10%.

2.4. An Overview of Malaria Control Efforts during the Post-Independence Era

When Zambia gained independence in 1964, the new government inherited a regime whose health policy was very much oriented along racial lines and which had imbalances between rural and urban areas. That means that, Zambia inherited a Malaria Control Programme that had urban and rural components, though not surprisingly; the malaria control efforts were concentrated in urban areas. There were few health facilities, so that access to malaria treatment was poor. Government was, therefore, confronted with the problem of how to create a public health system which could eliminate these imbalances in the provision of, and access to, health services and facilities. The government's major concern in health service delivery was equity access to health care. To achieve this, the Zambian government adopted a health management system, which formed some kind of pyramid. The aim of the government health policy at that time was to improve the quality of the health services in the rural areas by constructing as many clinics and health centers as possible. As stated in the outline of the Transitional Development Plan, in general, government policy leaned towards strengthening of facilities and services so as to make 'normal' medical treatment

geographically and even locally accessible to all (Zambia, 1965). In fact, the UNIP government in 1972 brought about the theme of "Health-for-all" and the Zambian government abolished user fees and private hospitals (First National Development Plan 1966-1968).

Considerable progress in providing health facilities and services was made after independence. In 1964, the Mosquito Extermination Act was amended to improve measures to reduce mosquito breeding. Between 1964 and 1974 the following improvements were made: central government expenditure on health services increased fourfold while the number of hospitals and hospital beds increased by nearly two-thirds to reach one of the most favourable in Africa. In addition, the number of health centers and clinics doubled (International Labour Organization, 1970, and Zambia, 1992). Because of those improvements, chemoprophylaxis against malaria was introduced in rural areas whose aim was to provide continued malaria suppression to prevent the buildup of parasiteamia. In this exercise chloroquine was the drug of choice because of its effectivity, safety, cheapness and its simplicity in administration. Between 1974 and 1983 for instance, chemoprophylaxis using chloroquine was introduced for children through the under-five clinics and primary schools. As a result of this exercise, a positive effect was noted. There was a record of improved daily attendances of the school children in their respective schools. Therefore, an adequate supply of antimalarial drugs is very essential if desired benefits are to be achieved. In 1979, there was no outbreak of malaria epidemic because the supply of chloroquine remained good for the control programme. A decrease in the total of re-attendants in all the health centers was also noted by 1980. The improvements, however, were not very long-lived (Zambia, 1992).

The health services and facilities in Zambia started to deteriorate in the late 1970s. Unfortunately, however, a poor national economic climate continued to impact negatively on this progress. When the world copper price plummeted in the 1970s, the government reduced health expenditure significantly. In 1973 mosquito resistance and toxicity concerns led to a worldwide cessation of DDT use for indoor residual spraying, and Zambia halted national malaria prevention efforts completely. As chloroquine-resistant strains increased, malaria rates quickly rose in both urban and rural settings. IRS coverage was reduced by 30% by 1973 and stopped in the mid-1980s. With

reduced vector control and the development of drug resistance, malaria cases increased from 121.5 per 1,000 in 1976 to 394 cases per 1,000 in 2002.

 There are two sets of decline. The Zambian economy started to decline in 1975 as the copper prices fell due to the economic recession experienced by Western economies. For example, the Quarterly Financial Statistical Review of Bank of Zambia, June 1982 indicates that the unit value of copper (K/tonne) declined from K1, 245.20 in 1974 to K947.90 in 1978. Not only did the copper prices fall, but there was also a decline in copper production. Momba (2006) states that copper production declined from 825,000 tonnes in 1969 to 252,000 tonnes in 2003. The reduction in both copper prices and copper production led to a decline in copper export earnings. As a result, mines reduced expenditure on malaria control.

In view of the fact that export copper earnings constituted the most significant component of the country's Gross Domestic Product (GDP), there was, consequently, a decline in GDP in real terms. The Bank of Zambia Report and Statement of Accounts for the year ended December 31st, 1987 shows that there was an overall decline in the GDP between 1982 and 1987. There was a decline of -2.8% from 1981 to 1982, -1.9% from 1982 to 1983, -0.4% from 1983 to 1984. It gained slightly in the next three years by 1.6% and 0.5% respectively and then declined again from 1986 to 1987 by 0.2%. This, therefore, led to the decline of the economic and social advances achieved in the post-independence decade (Zambia, 1980).

In addition, the oil prices rose, terms of trade deteriorated, trade routes through what was then Southern Rhodesia (now Zimbabwe) were closed. As if this was not enough, the external debt grew as the government turned to the International Monetary Fund (IMF) for the balance of payment support (Kelly, 1991). The second reason is the adoption of a system of medical care which was mainly curative in nature and originally developed in the industrial countries. The system places emphasis on curative medicine rather than on prevention of disease. Increasingly, such a system relies on complex high technology method which requires highly trained personnel to carry out. It is also highly expensive, such that it reaches a level that no country, particularly, developing countries, can afford to offer all its citizens a standard of care to match the potential which exists (Zambia, 1980).

In an effort to redress the unfavourable public health provision situation that the country was experiencing during the 1970s, the Zambian government in 1980 adopted the Primary Health Care concept as a major element in the improvement of health facilities and services in the country. This concept came as a product of a conference jointly sponsored by the World Health Organisation (WHO) and United Nations Children's Emmergency Fund (UNICEF) in Alma Ata in the Soviet Union. PHC was declared a strategy for the attainment of health for all by the year 2000. The concept of PHC was defined at the conference as follows; Primary care is essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation on and at a cost that the community and country can afford. It forms an integral part both of the country's health system of which it is a nucleus and of the overall social and economic development of the country", (WHO/UNICEF, 1978).

The primary health care approach was supposed to achieve its objectives of health for all by the year 2000 by emphasizing three key aspects. The first one is community participation. This is a realisation that in order to achieve the declared aim of making health care accessible to all the people, the nation must make effective use of all its resources. Since the most important resource is the population itself, the people must become actively involved in all aspects of primary health care: from planning and development through implementation of the day to day management of primary health care activities. The second aspect was support from other sections. This is a recognition that no section involved in community development can work effectively in isolation because interdependence is such that activities in one section have an impact on the goal of another. And the third aspect emphasised the health system support. That is, primary health care cannot function without back-up and guidance from more skilled workers. By adopting the primary health care approach, the Zambian government aimed at paying special attention to the rural areas where the health needs of the people, for instance, malaria control were greatest.

In spite of the efforts made by the government, there were no indications of improvements on the health status of the Zambian people. This gave rise to a situation whereby instead of moving towards the achievement of the objectives of health for all, there was a downward trend in health service delivery. The country experienced an erosion of the health infrastructure, the quality of access to health services declined.

The deterioration was further manifested in the increasing cases of malaria, malnutrition as well as inadequate supply of drugs, high infant and child mortality rates, and poor staff morale due to unfavourable working conditions (Zambia, 1992; UNDP, 1992; Zambia, 1994). Accordingly, case fatality rates in hospitalised patients increased from 10.6 deaths per 1000 malaria admissions in 1976 to 51 deaths per 1000 malaria admissions in 1994 (MOH, 2006). In 1999, approximately 3.46 million malaria cases were recorded for a population of 10.8 million inhabitants. The malaria case rate was 4- to 5-fold higher in children under 5 years of age compared to those above 5 years of age (MOH, 2006).

The report article entitled "Achievements in Malaria Control: The Zambian Story 2000–2010" was published in 2010 by the Directorate of Public Health and Research of the Ministry of Health in Zambia. The publication indicates that in the 10–20 years leading up to the year 2000, relatively limited malaria prevention existed in the country and much of the activities were focused on treatment of malaria. That led to steady increase in the disease burden, with hospital admissions increasing from 8.8% in 1976 to over 20% in the 1990s. The situation prompted the Zambian Government to place malaria as a priority area and clearly outlined it in both the National Health Strategic Plan and the National Development Plan. In an effort to reduce the impact of malaria and contribute to the attainment of the Roll Back Malaria targets and health related Millennium Development Goals (MDGs), malaria control measures using an integrated approach with evidence-based proven prevention, control and management interventions were reintroduced in Zambia (MOH, 2010).

The failure of the PHC to achieve its objectives could be attributed not only to the declining Zambian economy as alluded to earlier, but also to some management issues which were not successfully tackled during the implementation of the PHC concept. These included:

(i)   Health planning or planning for health. Health planning is a general condition of planning method for somebody in mind, especially in terms of presence of illness, injuries or impairment. The problem in this area was associated with a lot of enthusiasm and haste in implementing the programme that went far ahead of coordinated planning and management.

(ii) Integration, vertical or horizontal programmes. Integration is the process of opening a group, community, place or organisation to all regardless of race, ethnicity, religion, gender or social class. Horizontal and vertical collaboration between the health institutions and other stakeholders remained very weak. Hence opportunities for consultations and coordination could not be utilized.

(iii) Institutional funding or programme budgeting. This is the process of providing the money required for health activities or programmes. The economic recession at the time of trying to implement the Primary Health Care concept widened the gaps in levels of development and income thereby making it difficult to adequately finance the programme.

(iv) Centralised control. This is the removal of political or administrative power from local or subordinate levels and concentrate it in central authority. There was very little commitment to the programme. (MOH: 1994).

When the Movement for Multiparty Democracy came into power in 1991, it took office against the unfavourable situation discussed above. As such, it was realised that the health of people could only be improved if the health system in the country underwent a radical reform. Consequently, the health reform programme that involved a radical restructuring of the health system whose goal was to reorient health care away from the urban curative bias that characterised it during both the colonial and post-independence periods (World Bank, 1965) was introduced in 1992.

2.4.1. The 2000-2005 National Malaria Strategic Plan

Malaria incidence rates in Zambia increased over the period 1976 to 2003, from 121/1000 in 1976 to 428/1000 in 2003. Many factors led to this increase, including the spread of drug resistance, reduced vector control, decreased access to health care, HIV, and poverty. As Zambia was implementing health reforms, malaria control was prioritised in the basic health care package and the National Malaria Control Centre was established in 1997 under the directorate of the Public Health and Research division in the MOH to coordinate malaria control across the country.

In preparation for the inception of Roll Back Malaria Partnership objectives in Zambia, in 1999 the Zambian government participated in global and regional Roll Back Malaria Partnership consensus-building meetings. In April 2000 the Minister of Health signed

the Abuja Declaration, committing to bring malaria control interventions to 60% of Zambia's population by 2005. The NMCC began to integrate RBM Partnership principles of evidence-based decision making and locally adapted strategies after conducting a national malaria situation analysis to gather baseline data in 2000. In consultation with domestic and international technical experts, the NMCC formulated the National RBM strategy for 2000-2005- Zambia's first National Malaria Strategic Plan- to achieve the targets set by the Abuja Declaration with the vision "reducing malaria morbidity and mortality by 50%". Among the targets of the plan, included the following:

1. Insecticide Treated Net coverage target- 60% of households with at least one ITN.
2. Indoor Residual Spraying (IRS) coverage target- Not defined.
3. Intermittent Preventive Treatment in pregnancy (IPTp) coverage target- 90% of pregnant women using IPTp.
4. Target for ITN use in pregnant women- 50% of pregnant women sleeping under ITN.
5. Target for ITN use in children under 5 years of age- 60% of children under 5 years of age sleeping under ITN.
6. Target of PECM (Prompt and Effective Clinical Management) - 60% of sick persons have access to PECM.

In accordance with Abuja Declaration, the NMCC planned to implement integrated prevention, treatment, and education interventions. Prevention focused on ITNs and IPTp starting in 2003 and some vector management, including IRS and elimination of mosquito breeding sites. The government established an interministerial National Malaria Task Force- reporting directly to the vice president and chaired by the deputy minister of health to oversee the development of the programme. Following the national inception process, the NMCC introduced the RBM Partnership principles to individual provinces and districts, which were encouraged to prioritise malaria in local planning cycles and annual budgets. As the RBM movement catalysed global interest in malaria, new partners approached Zambia to become involved in malaria control, while existing partners increased their contributions. Zambia saw an enormous rise in finances, malaria commodities, and technical support for the NMCC, through many partners. In addition, Zambia was awarded a total of $ 82,769 million over five years in the first and

fourth rounds of the Global Fund Against Tuberculosis and Malaria (GFATM) malaria support. According to the Ministry of Health Report of 2001, the policy emphasized prevention with insecticide treated nets. In 2000, the private sector reintroduced IRS with pyrethroids and DDT resulting in the National Malaria Control Programme (NMCP) to, again, implement IRS alongside Long Lasting Insecticidal Nets.

According to WHO (2009), accelerated malaria control activities started in Zambia in 2003 when approximately 500,000 insecticide-treated nets were distributed and artemisinin-based combination therapy started in seven pilot districts through a grant from the Global Fund. Since 2003, the Ministry of Health further expanded malaria control activities with grants worthy US$ 120 million from the Global Fund and support from partners, including the President's Malaria Initiative (PMI), the Malaria Control and Evaluation Partnership in Africa (MACEPA) and the World Bank Booster Program for Malaria Control in Africa

Since the Zambia RBM Partnership inception in 2000, Zambia made significant progress in the strategic areas of partnerships, policy, funding, and communications, and in the programme areas of specific tactical interventions for drug treatment, malaria in pregnancy and access to insecticide treated nets and indoor residual spraying. In some of these areas, Zambia became a path-finder and a model for other national control programmes in the African region.

Programming was strongly made to be district based and that fostered capacity development of district health management teams. Insecticide treated nets distribution has had strong district specificity, with a wide range of programme strategies being tested, including, social marketing and commercial distribution along with pro-poor distribution for the poorest and most vulnerable populations. According to MOH (2006), in 2004, total malaria incidence dropped to 388/1000 and the total number of reported under-five deaths also dropped to its lowest level in six years.

2.4.1.1. Antimalarial Policy Change

During the period under review (2000-2005), Zambia established strong control policies including revisiting its national malaria drug therapy policy to adopt Artemisin combination therapy as the standard of care nationally. As malaria control activities expanded, ongoing drug efficacy studies revealed increasing resistance to chloroquine

across the country. By 2002 chloroquine resistance averaged 60% nationally, up from 1995 chloroquine treatment failure rates that ranged from 5.4% to 13.6%. The WHO recommended changing drug policy when chloroquine reached 25%. The increasing incidence of drug- resistant malaria prompted the MOH to establish a multidisciplinary Drug Technical Advisory Group, consisting of pharmaceutical, medical, research, policy, and DHMT representatives to review Zambia's malaria treatment policy. The advisory group reviewed the limited range of alternative antimalarials to replace chloroquine and subsequently recommended the ACT artemisinin-lumefantrine as a first-line treatment in March 2002 (MOH, 2006). It selected artemisinin-lumefantrine because of its proven therapeutic efficacy in Zambia and because it was the only ACT available as a fixed-dose combination (a combination of two different drugs in one tablet). At the time, however, a single course of Coartem the artemisinin-lumefantrine formulation manufactured by Novartis was 40 times more costly than chloroquine, even after the WHO and Novartis negotiated a pricing agreement.

As a result, some advisory group members were concerned that Coartem pricing was beyond what the public sector could afford in Zambia. After much debate, the MOH adopted artemisinin-lumefantrine as first-line treatment for malaria in October 2002, and Zambia became the first African country to provide ACTs as first-line treatment for free in the public sector. The MOH remained directly involved in the national roll-out process. In early 2003 the NMCC developed Guidelines for the Diagnosis and Treatment of Malaria to reflect this drug policy change. With its 2003 funding, the NMCC purchased quinine and diagnostic tests as well as the ACTs it had committed to providing for free in the public sector; sprayed five urban areas; trained health workers in ACT use and IPTp.

2.4.1.2. Malaria Prevention in Pregnancy

In 2003 Zambia introduced intermittent presumptive treatment (IPTp) for pregnant women, to mitigate the effects of malaria in pregnancy. Currently, IPT consists of three doses of Sulphadoxine- Pyremethamine (SP), commonly known as Fansidar to be taken one-month part in the second and third trimesters of pregnancy. This is to be taken as directly observed therapy (DOT) in antenatal clinics. By the year 2005, 90% of pregnant mothers in Zambia had at least one antenatal visit during their pregnancy. That led to 65% of women taking a dose of IPT during a single pregnancy. Given this

scenario, about 35% of pregnant women who attended antenatal clinics (ANC) for the first time did not complete the three doses. The key challenge was that pregnant women did not attend ANC as per recommended practice. The recommendation in the malaria treatment policy is that each pregnant woman takes all three doses of IPT.

Malaria programme coverage increased substantially across the country from 2000 to 2005. However, coverage levels remained considerably under the targeted 60% levels established in the plan and far below the levels (>60% coverage) at which major impact of the interventions on malaria burden would be expected.

2.4.2. The 2006-2010 National Malaria Strategic Plan (NMSP)

According to MOH (2011), despite the expansions in malaria control stimulated by the Abuja Declaration, RBM Partnership, and the increased funds, by 2005 Zambia was falling short of its target to cover 60% of the population with malaria interventions. It struggled with forecasting drug demand, managing the drug supply chain, and with clinical adherence to new guidelines, including both diagnosis and treatment. In response, the NMCC resolved to intensify its efforts.

In 2005, as the MOH prepared the National Health Strategic Plan for 2006 to 2010, the NMCC and its partners began developing the next National Malaria Strategic Plan. The partnership reviewed existing programmes and assessed the gaps between current and target coverage rates and outcomes. The NMCC transitioned to the RBM partnership – recommended "scale-up for impact" approach. This approach was guided by the "three ones": one national plan, one coordination mechanism for implementation of the plan, and one monitoring and evaluation system. It called for rapid national dissemination of a comprehensive package of evidence-based malaria prevention, control, and treatment strategies. The goals of the plan included the following:

1. Reduction of malaria incidence by 75% and deaths due to malaria would be significantly reduced by the end of 2010.
2. Through the attainment of a 75% reduction in malaria incidence, malaria control would ultimately contribute to the reduction of all-cause mortality by 20% in children under five.
3. Malaria control would not only improve the main health prognostic indicators but also provide economic payoffs at the household and national levels.

Target objectives for the 2006-2010 NMSP included the following:

- 80% of all people to sleep under an insecticide treated bed net by December, 2008.
- In 15 districts, 85% of people living in households eligible for Indoor Residual Spraying will have their homes sprayed annually by December, 2008.
- At least 80% of pregnant women access the package of intervention to reduce the burden of malaria in pregnancy by December, 2008. The package of interventions would include a full three courses of IPT, an ITN, and anemia reduction.
- At least 80% of suspected malaria cases are correctly diagnosed by December, 2008.
- At least 80% of malaria patients to receive prompt and effective treatment according to the current drug policy within 24 hours of onset of symptoms by December, 2008.

The NMCC believed that it was well positioned to meet the targets established by the Abuja Declaration and sought to surpass them by: achieving 80% coverage of key interventions, reducing malaria incidence by 75% and significantly reducing deaths attributable to malaria by end of 2011. The national government developed a vision of a "malaria-free Zambia".

Scaling up of malaria prevention and control programme interventions were intensified by the MoH with substantial and important scores made towards achieving the health-related Millennium Development Goals and other key national achievements in relation to Roll Back Malaria targets.

During the period under review, the country implemented a comprehensive package of high impact malaria prevention care, and treatment interventions. Among the interventions the following were implemented; integrated vector management, prevention of malaria in pregnancy, malaria diagnosis and case management, health workforce/human resource for health (HRH), and medical products, infrastructure, equipment, and transport (MOH, 2010).

(A) Integrated Vector Control (IVC)

Integrated Vector Management is an intervention aimed at promoting an integrated approach to the control of malaria vectors. The two main interventions for vector control in Zambia aimed at preventing malaria transmission are the use of ITNs (specifically long-lasting ITNs, or LLINs), and the spraying of eligible targeted structures with IRS. The focus is on strengthening the integrated vector management system that includes other supplemented interventions, such as larviciding, biological control, and environmental management and manipulation.

(i) Long Lasting Insecticide Nets **-** The global definition of LLIN universal coverage is one for every two people. The national vision for the LLIN programme is to achieve universal coverage to ensure that all sleeping spaces in all targeted households are covered by an LLIN translating into an average of three ITNs per household, which provides programmatic distribution of ITNs which began in 1998 and, by 2003, nets were provided to all health facilities and the equity malaria control programme was initiated (MOH, 2005).

The ITN policy initially targeted young children and pregnant women but has since been recommended to covering sleeping spaces in all households to fully address transmission reduction. Two main distribution methods have been used for this: mass distribution campaigns and distribution of free nets to pregnant mothers through the malaria in pregnancy ITN scheme based in antenatal care clinics. Other methods include the equity channel, which targets vulnerable groups (orphans, aged, chronically ill), the Community Malaria Booster Response, the Malaria School Health Programme, the Churches Health Association of Zambia (CHAZ) malaria control programme, and commercial distribution. Except for the commercial route, all the other distribution routes distribute free nets. Programmatic distribution of ITNs began in 1998 and, in 2006; a policy decision was made to distribute only LLINs recommended by the WHO Pesticide Evaluation Scheme (WHOPES), which overcame the challenge of re-treating nets every six months. Since the commencement of the programme, household ownership of at least one ITN increased from 13.6% in 2001 to 35% in 2005 and 64% in 2010 (MOH, 2005). This increase has been attributed to the mass distribution campaigns, which were

subsequently scaled up throughout the country. In 2010, over 6 million LLINs were distributed.

The significant achievement in strengthening and expanding the ITN programme notwithstanding, the programme still faced some challenges, including: declining ownership and use of LLINs in the northeastern and eastern high transmission zone, declining LLIN delivery to risk groups, absence of a routine system of ITN replacement in the interval between mass distribution campaigns, inadequate resources to ensure continuous supply of ITN and IRS commodities, and operational support required for universal coverage (MOH, 2011).

(ii)   Indoor Residual Spraying (IRS) was reintroduced in Zambia by the private mining sector in 2000. With the successful implementation and subsequent reduction in malaria incidences in areas prioritised for IRS by Konkola Copper Mines in 2003, the MOH decided to implement the programme in the public sector, initially on a pilot basis in five urban districts (Ndola, Kitwe, Kabwe, Lusaka and Livingstone) which are all along the line of rail (CBOH, 2000)

Figure 2.1:   **Map of Zambia indicating IRS district coverage for the years 2009 and 2010**

The goal for IRS was to attain operational coverage of over 90% of the IRS targeted structures. As at 2010, IRS had been successfully implemented in 54 districts, an increase from 5 districts in 2003. A total of 54 districts were planned for IRS coverage in the 2010-2011 transmission season. The percentage of targeted homes actually sprayed remained above 85% meeting and exceeding expectations. Compliance by families with neighbourhood spraying in most cases was over 90%. In 2010 alone, over 1.4 million homes were sprayed; protecting over 6 million Zambians. Households, either owning an LLIN or having been sprayed, increased from 43% in 2001 to 73% in 2010 (MOH, 2011).

The emergence of insecticide resistance in several districts in 2010 added a new challenge to this very successful programme. From studies conducted from 2003 to 2004, malaria vectors were documented to be fully susceptible to the insecticides used for vector control in Zambia. However, recent focus studies have raised concerns that insecticide resistance maybe appearing and this is being investigated further. Ongoing resistance monitoring indicates high levels of resistance in Anopheles gambiae s.l. to DDT, Carbamates and pyrethroids in some districts, and this information serves as the basis of evidence-based rotation of insecticide class to manage resistance (MOH, 2012).

The main challenges which faced the IRS programme include: insecticide resistance by some vectors, limited supervisory capacity to ensure timely forecasts and implement IRS at district level, limited storage facilities for IRS commodities at all levels, challenges in selection and procurement of IRS commodities, delays in funding for implementation, inadequate logistical management and estimation of requirements, inadequate stakeholders' involvement at district level, IRS programmes commencing and finishing behind schedule, and dealing with environmental requirements and waste associated with the insecticides.

(iii) Larval control- Although larval control is part of the IVM strategy of the NMCP, it has not been widely implemented in vector control, as much attention and resources were invested in the IRS and ITN strategies. The lack of larval control is also attributed to the vastness and hard-to-reach

breeding sites in the rainy season and difficulties in implementing this intervention in the rural areas. However, with the emergence of insecticide resistance in the country, larval control by environmental management and larviciding could provide alternative vector control. It is a requirement that the selection of larvicides must take into consideration the national insecticide resistance management policy.

As a result of implementation of the vector control interventions, significant reductions in malaria burden were recorded. Concurrent to the reduction in malaria parasite prevalence rates across the country, was the reduction of the anemia prevalence rate from 15.8% in 2006 to 9.8% in 2010, with the provincial distribution of cases in Health Management Information System (HMIS) mirroring the malaria prevalence rate patterns. The MIS 2006-2010 reported a decline in malaria parasitemia in children under five years of age, from 22% to 17%, and a reduction in severe anemia, from 13% to 9% (MOH, NMCC, MIS, 2006).

(B) Prevention of Malaria in Pregnancy

According to MOH (2010), the malaria control programme has developed and is implementing a well-defined Malaria in Pregnancy (MIP) policy, which includes the provision of free intermittent preventive treatment during pregnancy with at least three doses of Sulphadoxine Pyremethamine (SP) during pregnancy; free ITNs; and free prompt diagnosis and treatment of clinical malaria. This malaria control package is implemented as part of routine Antenatal Clinic.

By the end of the year 2010, national coverage rate for pregnant mothers with LLINs and IPTp were among the highest in sub-Saharan Africa (MOH, 2008). The high ANC attendance in the country and a long-standing consistent policy had resulted in high uptake of IPTp, which by 2010, stood at 86% for the first dose (IPTp-I) and 69% for the second dose (IPTp-II). Use of ITNs among pregnant women stood at 46% up from 2% in 2002. While this progress should be celebrated, further discussions with the Integrated Reproductive Health (IRH) programme were needed to identify the factors that could fill the remaining gaps to exceed targets for full IPTp coverage and ITN use. According to the 2010 Malaria Indicator Survey, cultural beliefs against announcing a pregnancy too early in the gestation also played a role in the failure to reach higher IPTp coverage, in addition to occasional SP stock-outs at health facilities.

(C) Malaria Diagnosis and Case Management

Zambia introduced a new malaria treatment policy with first line therapy of ACTs using Coartem in 2003, and in 2008 adopted a policy of universal laboratory diagnosis of suspected malaria infection, using microscopy and Rapid Diagnostic Tests (RDTs) prior to treatment of suspected malaria cases (MOH, 2010).

(i) Malaria Diagnosis- While the malaria case rates were declining, a high proportion of the reported cases were still based on clinical assessment and only a portion were laboratory confirmed with either microscopy or RDTs. On the other hand, 24 districts had capacity to diagnose and treat malaria at community level (Home Management of Malaria Training report, 2008 and 2009). With improved malaria control in Zambia, universal coverage of malaria diagnosis using RDTs and quality slide microscopy became a critical need. That is both for the purpose of directing the identification of illness that are due to malaria or not, so that they can be treated properly (care and treatment), as well as for identifying malaria infection, so that surveillance and response can accurately track transmission, contain it, and chart progress (surveillance and transmission containment). While diagnosis and treatment are typically linked in the language of malaria control, it is emphasized here that Zambia was by the year 2010, in a position where universal diagnosis was both possible and needed in order to progress in the next steps in malaria control.

(ii) Malaria Case Management- In 2003, due to the emergence of chloroquine-resistant malaria, the country changed its first-line treatment for uncomplicated malaria from chloroquine to ACTs (AL or Coartem) (MOH, 2010). Since then, guidelines on case management were developed and most health workers were trained in the new treatment protocol. However, by the year 2010, both the access to diagnostics and coverage of ACTs for management of malaria were still too low in the country.

The 2010 MIS also demonstrated, for the first time, that children being treated for malaria were more likely to receive an artemisinin containing drug than other drugs such as SP. However, the lack of universal diagnosis and stock-outs in ACTs led to confusion about full progress towards

achieving targets in proper and prompt management of malaria. To address this issue, the MOH in conjunction with the World Bank, USAID, the Department for International Development (DfID), and Crown Agents, piloted a new system of commodity ordering and delivery for all essential drugs. This system demonstrated that placing a commodity planner in the pilot districts and shipping health center-specific orders directly to the facility have significantly reduced drug stock-outs.

Significant progress was made in increasing access to malaria treatment in Zambia. However, there were still challenges to malaria case management, the greatest of which was human resource crisis. That was compounded by the fact that the position of a microscopist did not exist in the MOH establishment of microscopists; poor health seeking behavior, leading to late presentation and poor compliance with treatment; absence of rectal artesunates for pre-referral treatments; scarcity of timely information on diagnosis and treatment, making programme decision-making difficult; inability to report malaria diagnosis and treatment undertaken by CHWs, separate from the health facility data. Further, the proportion of confirmed malaria cases was too low, estimated at only 13%. There was a gap in the knowledge levels and availability of malaria guidelines between the referral/district hospitals and the health centers. That resulted in poor adherence to accurate and prompt diagnosis and treatment of malaria cases (MOH, 2011).

(D) Health Workforce/Human Resource for Health (HRH)

According to MOH (2012), the Zambian health sector is experiencing critical shortages of HRH, which is negatively affecting health service delivery, including malaria interventions. Three main problems have been identified, namely; absolute shortage of health workers; inequities in the distribution of the available health workers, which is skewed in favour of urban areas; and skills-mix challenges.

Through the implementation of the Human Resource for Health Strategic Plan 2006-2010, the total number of staff in the health sector increased from 23,176 in 2005 to 29,533 in 2009, representing 57% of the approved establishment of 51,414. However, even though the numbers of health workers increased, they were skewed in favour of

the urban areas, leaving the rural areas extremely exposed. It is estimated that rural areas had 70 clinical health care workers per 100,000 population, compared to 159 per 100,000 in urban areas. The situation was so severe that some health facilities in rural areas were either run by unqualified staff or only with one qualified staff. The available clinical health workers were less than 50% of the approved establishment, leading to high workloads (MOH, 2011). This is shown in Table 2.1.

Table 2.1: Staffing levels and staff population ratios for clinical health workers as of December 2009.

Staff	Number	Per 1,000
Clinical officers	1,376	0.11
Medical doctors	801	0.06
Medical licentiates	34	0
Registered midwife	643	0.05
Enrolled midwife	1,731	0.14
Registered nurses	1,913	0.15
Enrolled nurses	5,210	0.42
	11,708	**0.93**

Source: Human Resource Information System (HRIS), MOH, 2010

The main challenges in respect to human resources for health for the NMCP were: inadequate HRH at various levels of health service delivery; high HIV and TB disease burdens in the country, which overstretched available health workers with increased workloads and affected prioritizations and resource allocation; lack of fully dedicated malaria focal point persons at provincial and district levels; inadequately trained managerial personnel to coordinate malaria interventions, largely due to limited financial resources; inadequate training in diagnosis and case management among health workers at point of delivery to facilitate implementation of the policy which emphasises confirmatory diagnosis for all cases of malaria prior to treatment with antimalarial medicines. In addition, the shortage of human resource for health were

largely attributed to inadequate production of health workers by health training institutions and high attrition rates due to the impact of HIV/AIDS and "brain drain". The critical shortage of human resource for health posed a serious threat to the malaria control scale-up plan, as more trained health workers were required to achieve the goal (MOH, 2011).

(E) Medical Products, Infrastructure, Equipment and Transport

Procurement and Supplies Management- Procurement of drugs and medical supplies for the health sector, including malaria commodities, was managed centrally by the MOH Procurement and Supplies Units. However, some procurements were handled by procurement agents particularly UNICEF. Procurement of commodities supported by the Global Fund to Fight AIDS, Tuberculosis and Malaria are handled by the UNDP who are the interim principal recipients for the public health sector in Zambia. Procurement of malaria drugs and commodities within the public health sector is guided by specific policies and guidelines and regulated by the Zambia Public Procurement (ZPPA) Act of 2008. In addition to the MOH procurement system, Churches Health Association of Zambia (CHAZ) and the private sector also contribute to the procurement and supply of antimalarial commodities (MOH, 2011)

During the period under review, stock-outs of commodities have been reported at all levels of the health service delivery system. This was attributed to a number of factors, including: inadequate government funding; inadequate external support, particularly in 2009 and 2010, when financial support for Zambian health sector was suspended by the Global Fund to Fight AIDS, Tuberculosis and Malaria and by some Cooperating Partners due to suspicion of financial irregularities; and capacity challenges in the procurement and logistics management systems from national to districts, and districts to health facilities.

(i)   Health Infrastructure- In an effort to improve public health service delivery, the government continued to invest in health infrastructure. As a result, a number of health facilities were constructed across the country during the period under review.

Distribution of health facilities in Zambia by type, ownership and province in 2010 is shown in Table 2.2.

Table 2.2: Health Facilities in Zambia by type, ownership and Provincial Distribution, 2010

Description	C.P	CB.P	E.P	LP.P	LSK.P	N.P	NW.P.	S.P	W.P	ZAM
By level of care										
Level 3 hospital	0	3	0	0	3	0	0	0	0	6
Level 2 hospital	2	9	2	1	0	2	2	2	1	21
Level 1 hospital	6	8	8	5	15	6	10	14	12	84
Urban HC	32	137	8	1	182	14	18	34	10	436
Rural HC	113	53	156	125	47	145	120	174	127	1,060
Health Posts	35	25	53	10	32	49	17	30	24	275
Total	**188**	**235**	**227**	**142**	**279**	**216**	**167**	**254**	**174**	**1,882**

By type of ownership

	C.P	CB.P	E.P	LP.P	LSK.P	N.P	NW.P.	S.P	W.P	ZAM
Public H.F.	164	164	211	132	116	189	137	217	159	1,489
Mission H.F.	10	10	16	7	8	14	22	24	11	122
Private H.F.	14	61	0	3	155	13	8	13	4	271
Total	**188**	**235**	**227**	**142**	**279**	**216**	**167**	**254**	**174**	**1,882**

Source: Health Institutions in Zambia, Ministry of Health, 2010

The analysis shows that, as in 2010, there were a total of 1,882 health facilities in Zambia, including public (1,489), private (271), and faith-based/CHAZ facilities (122). Provincial comparisons show that Lusaka Province had the largest number, at 279 health facilities, followed by Southern Province at 254, and Copperbelt at 235. Luapula Province had the lowest number of health facilities in the country, at 142.

Apart from the health service facilities, availability of adequate and appropriate storage infrastructure for storage of malaria commodities and other supplies is considered critical. From 2006 to 2010, despite improved funding from the Ministry of Finance and National Planning, investments in health infrastructure were inadequate. As a result, the country was still far from meeting the policy objective of ensuring that the whole population has access to health facilities within a 5km radius. According to MOH (2012), in rural areas, 46% of households live outside a radius of 5km from a health facility (compared to 1% in urban areas), making it difficult for many people to access the much needed health services. In 2006, the MOH conducted a Health Facilities Census (HFC) and the data from this mapping exercise was used to develop an infrastructure database and Capital Investment Plan (CIP) for infrastructure and equipment, placing priority on underserved rural areas.

In line with the CIP, the MOH embarked on the construction of additional health facilities and the rehabilitation of existing health facilities across the country. In this respect, a total of 42 health posts, 89 health centers, 18 district hospitals (level 1 hospitals), and 70 staff houses were built. The MOH also commenced the implementation of the Health Capital Investment Support Project in 3 pilot provinces with the aim of addressing the management of physical capital assets and the development of standards and guidelines for maintenance of physical infrastructure (MOH, 2011).

The main challenges related to infrastructure include: the inadequacies and inequities in the distribution of health service delivery infrastructure, and the inadequate and, in some cases, poor state of storage facilities for antimalarial drugs and commodities, especially at district and facility levels (MOH, 2011).

(ii)   Health Equipment-The health equipment database was established in 2007 through the Health Facilities Census. Equipment maintenance officers were for the first time recruited and they are now part of the establishment at provincial level. However, there were shortages of some key equipment in most of the hospitals, which was hampering the provision of quality health

services, particularly at Level 2 and 3 hospitals. The health sector was also faced with the challenge of ensuring appropriate management and maintenance of health equipment. Other challenges concerning health equipment included the need to develop criteria to determine human resource needs for equipment management and maintenance at hospital level, the need to develop appropriate maintenance facilities with appropriate tools and calibration equipment, and the need to develop and implement systems for equipment maintenance and management (MOH, 2011).

(iii) Transport**-**Transport capacity was inadequate, and capacity for transport management and maintenance was limited. However, during the period under review, significant progress was made towards improving the availability of transport, and strengthening of the transport maintenance systems. Large numbers of motor vehicles, motorbikes, and boats for districts, hospitals, and training institutions were procured and distributed. However, these still fell short of the country-wide need. Transportation of commodities from the districts to service delivery facilities at lower levels presented major challenges, as the same transport was also used for various other activities (MOH, 2011).

Major challenges included: the resurgence of malaria in Luapula, Northern, and Eastern Provinces: emergence of insecticide resistance; human resource challenges, including shortages of health workers; and skills gaps; inadequate resources for malaria control commodities and activities; data and information management gaps and organisational challenges.

2.4.3. The 2011-2015 National Malaria Strategic Plan

From 2006 to 2010, Zambia implemented the NMSP whose theme was "scale-up for impact". While the implementation of this strategic plan resulted in significant progress and impact on malaria burden, morbidity, and mortality in Zambia, the plan came to an end in 2010. Considering the foregoing, it became necessary to develop a new strategic plan to provide the strategic framework for the next five years, from 2011 to 2015.

Over the period 2006-2010, significant progress was made in malaria control in Zambia and other parts of the African sub-region. However, significant challenges still

remained. The lessons learned from the Malaria Indicator Survey (MIS) 2010, which reported some resurgence of malaria incidence and impact in some parts of the country called for focused and sustained implementation of high impact malaria interventions, differentiated on the basis of evidence. In this respect, the Malaria Programme Review 2010 proposed to fine-tune the strategies by packaging the high impact malaria interventions according to the identified malaria epidemiological patterns. As a result, the National Malaria Strategic Plan 2011-2015 was formulated which provided a strategic framework for comprehensive and coordinated delivery of targeted evidence-based packages of high impact malaria control interventions in order to achieve the national vision of "a malaria-free Zambia by 2030". The plan was implemented alongside the Sixth National Development Plan 2011-2015 (SNDP). At sector level, the Ministry of Health developed the National Health Strategic Plan 2011-2015, which was linked to, and framed part of the SNDP (MOH, 2016).

The NMSP 2011-2015 sought to build upon previous successes and address prevailing and the emerging challenges in the fight against malaria. It was therefore focused on sustaining impact, delivering an integrated package of high impact malaria control interventions by epidemiological strata, strengthening provincial and district capacities for delivering of key malaria control interventions, scaling up expanded use of malaria diagnosis for effective case management, and improved targeting of interventions through strengthening of surveillance, monitoring, and evaluation (SM&E).

According to MOH (2016), the goals of the 2011-2015 National Malaria Strategic Plan included the following:

1. To reduce malaria incidence by 75% of the 2010 baseline by 2015.
2. To reduce malaria deaths to near zero by 2015.
3. To reduce all-cause child mortality by 20% of the 2010 baseline by 2015.
4. To establish and maintain five "malaria-free areas" in Zambia by 2015.

The NMSP 2011-2015 focused the malaria control efforts in Zambia around selected interventions. These included the following:

-   Malaria diagnosis and case management: prompt diagnosis and effective treatment with ACT within 24 hours of symptom onset; management of severe malaria.

- Integrated vector management: provision of LLINs and IRS and larval control.

- Prevention of malaria in pregnancy: provision of LLINs and IPTp with Sulfadoxine-pyremethamine (SP) to pregnant women at antenatal clinics (ANCs).

- Advocacy, communication, education and social mobilization.

(i) Prompt Confirmatory Diagnosis and Effective Treatment: According to the 2015 Malaria Indicator Survey, 46% of the population obtained treatment from a government health facility. The percentage received from community health workers increased substantially from previous MIS surveys- from 2.1% in 2010 to 8.1% in 2012 to 25% in 2015. This reflects the investments that the Ministry of Health and partners had made in training CHWs to provide testing and treatment services for malaria in some parts of the country. The rise of community-level case management was a hopeful trend for Zambia especially as increasing emphasis was put on elimination at the local level, where treatment services were needed closer to communities.

(ii) Insecticide-Treated Mosquito Nets: The 2015 Malaria Indicator Survey results show that overall ownership of nets had risen since the 2012 MIS. 77% households had an ITN and 46.9% of households owned more than one ITN. The average number of LLINs per household was 1.6. ITN ownership was fairly comparable in rural and urban areas. Overall, in households with an ITN, 63.9% had enough LLINs to cover every sleeping space. Almost every province increased their ITN-to-sleeping-space ratio between 2012 and 2015. The most notable jumps were observed in Copperbelt, Luapula and Eastern provinces. ITN use had generally increased among children under age five over the past several years, with 57.7% of children under five reporting having slept under an ITN during the 2015 MIS. ITN usage among women of reproductive age is an important indicator in protecting reproductive-age women and young children (who may often sleep with their mothers). Coverage remained high in 2015, with more than half (58.2%) of women reporting sleeping under an ITN the night before the survey.

(iii) Indoor Residual Spraying: During the 2015 MIS, an estimated 28.9% of Zambian households reported having benefitted from IRS in the previous 12 months. IRS was initially deployed in more urban and peri-urban areas, but

was expanded to include more malarious, rural areas. This allowed for higher impact of IRS on malaria burden. Insecticides used for IRS had also rotated through different compound classes as evidence of resistance patterns had become available to the malaria programme.

(iv)   Intermittent Preventive Treatment during pregnancy: By the year 2015, the National Malaria Control Programme had developed and was implementing a well-defined malaria in pregnancy policy, which included the provision of free IPTp with at least three doses of SP during pregnancy, free long-lasting insecticide nets, and free prompt diagnosis and treatment of clinical malaria. This malaria control package is implemented as part of routine antenatal clinic. The high antenatal clinic attendance in the country and a long-standing consistent policy regarding malaria in pregnancy resulted in high IPTp uptake, which by 2015, stood at 90.1% for any dose and 60.8% for three doses. The uptake of the first dose of IPTp was fairly even across provinces, with the lowest province still reporting 83%, with 78.8% and 60.8% of pregnant women receiving at least two doses and at least three doses, respectively, of SP during pregnancy. Use of long-lasting insecticide nets among women of reproductive age stood at 58.2% (MOH, 2016).

According to the Zambia Daily Mail of May 7th, 2014, Zambia was among countries which made significant progress in reducing malaria prevalence in under-five children. Malaria prevalence among children in this age group fell from 16.1% in 2010 to 14.3% in 2013. This was according to preliminary results from the National Indicator Survey 2012 conducted by the National Malaria Control Centre.

Over 4.7 million cases of malaria were treated at health facilities and 6.1 million rapid diagnostic tests kits were distributed to health facilities in 2012 alone. The percentage of women and children under the age of five sleeping under treated mosquito nets was also increased from 45% to 50% in 2010 to about 57% and 60% in 2012 respectively. In view of these developments, Zambia was awarded the African Leader Malaria Alliance Award by the United Nations in recognition of the country's achievements in reducing malaria infection rate.

The reduction in Zambia's malaria burden during the period under review resulted not only from investments in malaria control but also from contextual changes such as

urbanisation and poverty reduction. Although economic growth should be expected to reduce migration-related malaria risk, factors such as inequality and infrastructure projects near transmission areas maintained migration-related malaria risk, possibly exacerbated by the development of transport networks and the opening of borders (MOH, 2016).

Though major achievements were made in malaria control during the period under review, the disease remained a significant cause of morbidity and mortality in Zambia, with one in five children under age five infected with malaria parasite and other vulnerable population groups at risk (MOH, 2016). Among the challenges included the following: emergence of insecticide resistance; human resource challenges, including shortages of health workers; and skills gaps; inadequate resources for malaria control commodities and activities; data and information management gaps and organisational challenges.

2.4.4. The 2017-2021 National Malaria Elimination Strategic Plan

Despite significant progress made over the period 2011 to 2015, malaria continued to be a major burden in Zambia, resulting in 2000 deaths in 2016 (MOH, 2016). Malaria prevalence varied across districts with 14 million Zambians at risk, including the most vulnerable groups, such as pregnant women and children under the age of five years.

In view of the above, in 2017, the Ministry of Health in collaboration with partners developed the National Malaria Elimination Strategic Plan for 2017 to 2021 under the guiding principle of "a malaria-free Zambia". The main goal is to eliminate local malaria infection and disease in Zambia by 2021 and to maintain malaria-free status and prevent re-introduction and importation of malaria into areas where the disease had been eliminated. In order to achieve this goal, the following objectives were to be pursued:

• Increase the implementation rate of interventions from 36% in 2015 to 95% by 2018.

 • Reduce malaria incidence from 336 cases per 1,000 population in 2015 to less than 5 cases per 1,000 population by 2019.

• Increase the malaria-free health facility catchment areas (HFCAs) from 0.5% in 2015 to 100% in 2021.

• Reduce malaria deaths from 15.2 deaths per 100,000 in 2015 to less than 5 deaths per 100,000 population by 2021.

• Achieve 100% malaria-free certification by 2021.

• Maintain 100% malaria-free, following certification in 2021.

The substantial impact of current interventions at scale, the commitment from national and local governments, a keen interest among partners, and the momentum of scientific advances all converge to create an environment of urgency to eliminate malaria in Zambia.

The rationale for undertaking a malaria elimination strategy in Zambia at this time is based on the following:

• The substantial progress in recent years towards addressing malaria;

• Zambia's domestic financial commitments to prevent and control malaria, which have led to the goal of elimination;

• The trend that in many districts, malaria incidence has been reduced to levels where transmission interruption is a feasible objective;

• A delay in addressing elimination allows the problem of drug and insecticide resistance to emerge, making both malaria elimination and control more challenging in the future;

• Political and financial commitments from neighbouring countries and partners to achieve a greater impact and eliminate malaria;

• Solid evidence that has accumulated over the last decade on approaches for addressing malaria, and new elimination tools that are on the horizon;

• Effective mechanisms that are being established to ensure proper coordination of malaria elimination activities with neighbouring countries, particularly where there is movement across international boundaries. However, the main challenge would be the degree of political will to address the problems of inadequate financial and human resources in the fight against malaria especially at district level.

CHAPTER THREE

MEASURES IMPLEMENTED TO PREVENT AND CONTROL MALARIA IN LUANGWA DISTRICT

3.1. Introduction

In conformity with the first specific objective of this study, this chapter examines the administrative and other measures which were being implemented in Luangwa district to control malaria. Following the Structuralist theory, as a guide in the analysis of the study, health care is a state supported consumer good or service. Similarly, the Centralist theory (derived from the term centralization) support or justify the need for central government to have increased control of matters at the local level. In effect, the advocates of centralist theories support a top-bottom approach in the governance system and further argue that a bias towards local democracy may result in neglect of issues such as territorial, social and economic justice. Further, that due to limited resources at the local level, the central government should play a greater role in the re-allocation of resources at the local level to avoid imbalances in the nation as a whole. According to the Structuralist theory, in as far as the central government takes the center stage in the delivery of health services, it should be in the context of a decentralized system. Therefore, it is assumed that government provides various malaria control measures within the context of a decentralized system. In this regard, the chapter is a discussion on different measures which were being put in place in an effort to prevent and control malaria. This chapter has five sections. The first section is the introduction. The second section looks at the provision of Insecticide Treated Nets as a measure to prevent and control malaria. The third section is a discussion on the provision of Indoor Residual Spraying as one of the measures. The fourth section discusses provision of information, education and communication and the fifth section looks at provision of health infrastructure, human resource for health, malaria diagnosis and case management and prevention and control of malaria in pregnancy. Comparisons with previous studies on measures to prevent and control malaria in Zambia and other parts of the world have been done to bring out the bigger picture. The results presented in this study are based on structured interviews with the local people (respondents) and unstructured interviews (interview guides) with key informants.

3.2. Provision of Insecticide Treated Nets (ITNs)

This section is an attempt to examine the provision of ITNs as one of the measures which have been put in place to prevent and control malaria in Luangwa district. ITNs are a cost-effective alternative to existing vector control methods. However, like any other intervention, treated nets need to be part of the broader malaria prevention and control strategy. ITNs, especially long lasting insecticide nets have greater advantages over untreated mosquito nets. Firstly, personal protection is improved because mosquitoes are repelled or killed by the insecticide before they can have access to the person sleeping under the ITNs. Therefore, this reduces the risk of malaria. Secondly, community exposure to mosquitoes is reduced because, where whole communities are using treated nets the number of mosquitoes and the proportion infected with malaria parasites are reduced. In this situation, even people sleeping without an ITN are less likely to get malaria because there are fewer malaria-transmitting mosquitoes in the area. Where ITN coverage is high enough to have this 'mass effect', people sleeping without a net in rooms where treated nets are present may receive fewer mosquito bites, thereby reducing their risk of malaria. The effect of ITNs on malaria illness is huge and well documented. ITNs also improve child survival by greater margins.

Therefore, in an attempt to examine management challenges in the prevention and control of malaria in Luangwa District, the researcher attempted to investigate the provision of insecticide treated nets as one of the main integrated vector management measures being implemented by government to control malaria. The chart below presents the local people's views on whether insecticide treated nets are being provided by government in their communities in Luangwa District.
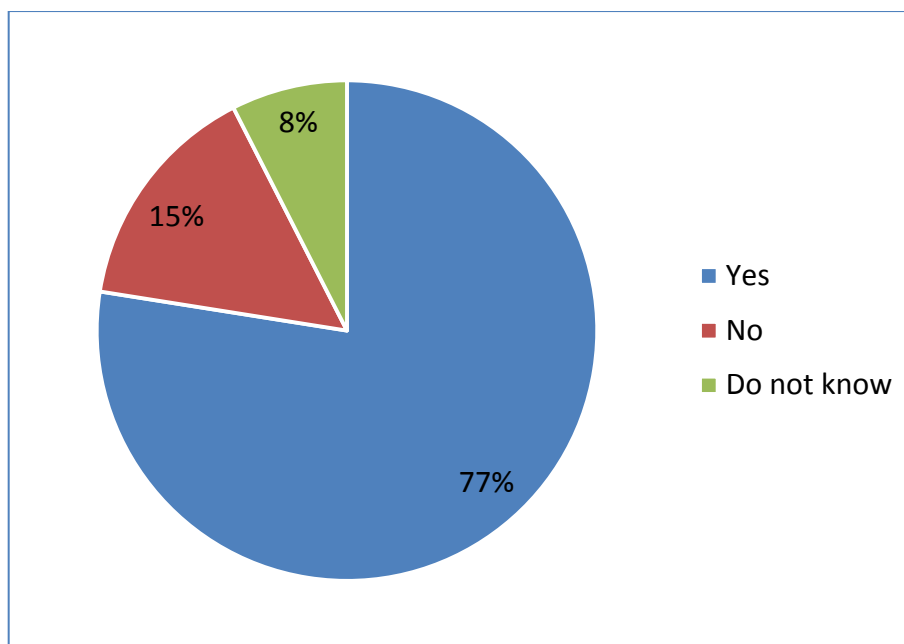
Figure 3.2: Respondents' views on Government's provision of ITNs

According to the research findings, it was established that the majority of people interviewed agreed that government provides ITNs for protection against mosquito bites as shown in the chart. Out of the total number of 200 respondents, 155 or 77% agreed that ITNs were given out or distributed in their respective communities. Only 31 or 15% of the respondents did not agree that ITNs were being given out in their communities and 14 or 8% said that they were not aware of any malaria prevention and control measures which were being carried out in their communities. In addition, all respondents who agreed that ITNs were being given out in their respective communities said that Government was the main provider of ITNs. For instance, the 2016 Annual Report for the Luangwa District Health Office indicates that during the year under review (2016), the Ministry of Health in collaboration with ChildFund Zambia, distributed 6,900 ITNs in the district, targeting mainly the pregnant mothers and the under five children.

Findings of this study about the provision of ITNs in the communities have some similarities with findings in previous studies. In the study done by Bashinyora (2010) on "Utilisation of Insecticide Treated Nets in households with children under five years in Muhorro Sub County, Kibaale District, Uganda", government of Uganda has put in place programmes that target the vulnerable groups supplemented by NGOs and the private sector. Bashinyora (2010) asserts that government and NGOs provide a system of targeted subsidies that focus on vulnerable groups. These comprise the socially

vulnerable for instance, the very poor, orphaned headed households and displaced populations. Subsidies are targeted and implemented in such a way that the private sector is not undermined but rather supported, wherever possible.

The study revealed that ITN policy initially targeted young children and pregnant women but has since been extended to covering sleeping spaces in all households to fully address transmission reduction. Two main distribution methods have been used for this: mass distribution campaigns and distribution of free nets to pregnant mothers through the malaria in pregnancy ITN scheme based in antenatal care clinics. Other methods include the equity channel, which targets vulnerable groups (orphans, aged and chronically ill), the Community Malaria Booster Response, the Malaria School Health Programme, the CHAZ malaria control programme, and commercial distribution. Except for the commercial route, all the other distribution routes distribute free nets. Programmatic distribution of ITNs began in 1998 and, in 2006, a policy decision was made to distribute only LLINs recommended by the WHO Pesticide Evaluation Scheme, which overcame the challenge of re-treating nets every six months (MOH, 2005).

All the 46 key informants who were interviewed indicated that ITNs were being given to community members, more especially to the pregnant mothers, the old aged, people living with HIV/AIDS and the under five children who were the most vulnerable groups to malaria infection. Reports from Luangwa DHO indicated that for medical reasons, priority was given to pregnant women, children under 5 years, and People Living with HIV/AIDS, as they are prone to severe illness and death from malaria. For social reasons, priority was given to vulnerable households, and the poorest of the poor, as they are least able to cope with illness. For epidemiological reasons, priority was given to rural households rather than urban, as the vector is more prevalent in rural environment. Such considerations were usually done in situations where it was not possible to have 100% ITN coverage especially through mass distribution.

The Public Health Officer, who was the district malaria focal point person during the study, said that in Luangwa district, every after five years, the government provided ITNs through mass distribution in an effort to fight malaria. The approach is to give one mosquito net to every two persons in a household. For instance, in the year 2017, government provided 16,000 ITNs under Global Fund with coverage of 85% but there

was a shortfall of 2,800. Despite the fact that most respondents indicated that the main provider of ITNs in communities was Government, key informants who included health providers, Acting District Health Director, District Malaria Focal Point Person, Neighbourhood Health Committee members, and Community Health Workers mentioned that there were other cooperating partners who were complementing government efforts to prevent and control malaria by providing ITNs through the Ministry of Health. These cooperating partners included organisations like ChildFund Zambia, Centre for Disease Control, USAID and Churches Health Association of Zambia. The Acting District Health Director pointed out that the provision of ITNs was actually donor driven because Government could not manage to regularly supply the ITNs. When donors supplied the commodity, it was done through the Ministry of Health. Therefore, at district level, the distribution of the ITNs was done by the District Health Management Team whose main role was to coordinate and manage the various ITN distribution mechanisms in the district and delegate the function to Health Centers in respective catchment areas.

At Health Centre level, community volunteers through Neighbourhood Health Committees, Community Health Workers and other service groups worked with Health Centers and DHMT to manage ITN distribution up to community level. For instance, records from the District Health Office indicated that since the year 2009, Luangwa Child Development Agency (LCDA) which is an affiliate of ChildFund Zambia had been providing a wide range of services in the areas of health, education, water and sanitation, youth empowerment, capacity building, community mobilisation and sensitisation. The reports showed that from the year 2011 to the time of the research, the organisation through the Ministry of Health had provided and distributed a total of 21,000 ITNs mainly to pregnant mothers and the under five children in Luangwa district. It was further found out that the organisation as a cooperating partner had been involved in mobilising and sensitising community members on the benefits of utilising ITNs accordingly during distribution exercises. Actually, the district malaria focal point person stated that the 2017 mass distribution shortage of 2,800 of ITNs was to be supplemented by Child Fund Zambia.

Therefore, it can be argued that the state supports the provision of insecticide treated nets as a public consumer good or service as assumed by the Structuralist theory. This

is done by either government directly providing the commodity or by facilitating the provision of the commodity by cooperating partners.

However, according to the research findings, it was found out that despite the fact that the majority of respondents agreed that ITNs were being provided in their respective communities, the majority complained that the ITNs which were being given out to them were not adequate to cater for all households. Even majority of beneficiary households did not have enough ITNs to cover the available bed spaces. They also argued that even if they were given the bed nets, government did not replace them with new ones on time. They indicated that it took about five years for government to provide them with ITNs. Hence, they continued using the worn out bed nets. To that effect, respondents were requested by the researcher to give the number of ITNs which were being possessed by their respective households. It was emphasised that ITNs which were in a bad state of repair (not usable) or worn out should not be counted. The study revealed that out of the 200 respondents who were interviewed, 40 (20%) of respondents said that they had three ITNs in their households. 50 (25%) of the respondents said that their households possessed two ITNs, and the majority 110 (55%) said that their households possessed only one ITN. The study shows that the majority of households had inadequate ITNs to protect themselves from malaria with the fact that the majority (48.3%) of households had seven household members and other families had more than seven members. The implication is that the majority of household members were at risk of malaria infection even if priority was to be given to high risk members of the family. Even in their general recommendations as shown in figure 3.3, the majority suggested that in order to effectively prevent and control malaria in the communities, government should consistently provide adequate ITNs which should cater for each and every member of a household.
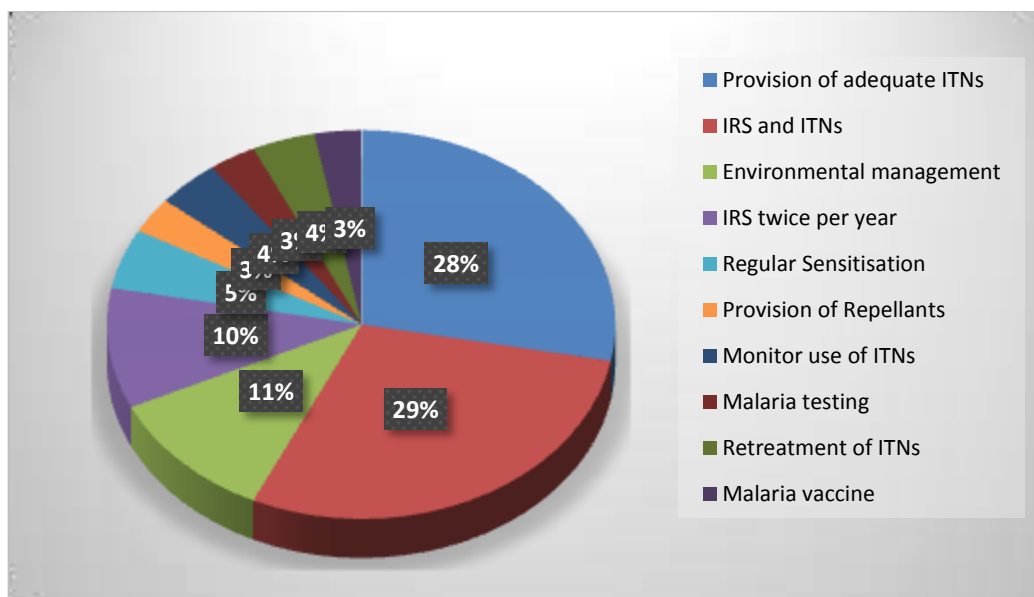
Figure 3.3: **Distribution of respondents by their views on what should be done to control malaria**

According to the statistics as shown in figure 3.3, majority of the respondents (57%) pointed out that there was need to increase the number of ITNs given to each household in order to adequately cater for bed spaces in each household. According to the findings, 28% of the respondents suggested that government should give free adequate ITNs for each household and 29% suggested that government should provide IRS and adequate free ITNs to adequately prevent and control malaria. Other respondents had different views on how to adequately prevent and control malaria in their respective communities. Out of the 200 respondents interviewed, 11% were of the view that environmental management was cardinal in controlling malaria; 10% of the respondents suggested that there was need to conduct indoor residual spraying twice a year; 5% of the respondents recommended that health authorities should conduct regular community sensitisation on measures to prevent and control malaria; 3% of the respondents indicated that government should as well provide repellents; 4% of the respondents said that there was need for health authorities to monitor ITN utilisation; 3% of the respondents were of the view that health authorities should carry out compulsory malaria testing and immediately treat positive cases; 4% of the respondents recommended that health authorities should conduct regular ITN retreatment exercises; and 3% of the respondents suggested that government should come up with a malaria vaccine to adequately fight the disease in Luangwa District.

All key informants alluded to the fact that even if ITNs were provided to community members by government and other cooperating partners, the inconsistent supply made it difficult to cater for each and every household in the catchment areas where they were operating from. They further mentioned that the inadequate supply of ITNs compromised the effectiveness of the measure in preventing and controlling malaria in the district. Findings in this study are somehow similar to the findings in the study carried out in Nigeria by Onwejekwe et al, (2003) where it was found out that accessibility to and possession of ITNs was appallingly low with 10% to 12% of households, each owning only one untreated net and negligible coverage of treated nets. The low coverage was due to affordability problems as households' economic status has been related to net ownership in a number of studies.

The Public Health Officer pointed out that it was a requirement for mosquito nets to be re-treated regularly in order to maintain the efficacy of mosquito nets, especially in situations where timely replacement is a problem. He emphasised that re-treatment of mosquito nets was required because they were prone to wear and tear; especially in rural settings where reed mats (impasa) were used for sleeping and that smoke and dust could also make them dirty. He said that a treated net not only provides a barrier for the person sleeping under it, but also repels and in some cases kills the mosquito as well as other insects. Therefore, one cannot over emphasise the importance of having bed nets re-treated if we are to reduce on vector population as well as the number of malaria cases. However, the Public Health Office indicated that re-treatment of ITNs was not done due to inadequate resources and that compromised the efficacy of mosquito nets. Relatedly, in the study done in Uganda by Bashinyora et al (2010), it was found out that majority of the people never re-treated their nets and awareness with regard to net re-treatment was extremely low. Baume et al (2008), argues that net re-treatment awareness in Uganda was at 23 percent, in Zambia it was at 51 percent and in Senegal, it was at 70 percent during the period 2000 to 2004.

The other challenge with ITN provision was that the supply of ITNs in the district was donor driven. Most of the ITNs which were given to people were for instance, procured using finances from Global Fund and ChildFund Zambia which was the lead organisation when it came to the supply of ITNs. For instance, one NHC member had this to say:

"The use of ITNs is not all that effective because as long as ChildFund Zambia has not supplied, community members just use old ITNs since the majority cannot afford to buy one"

 It was established that the ITNs were usually not adequate to achieve full coverage because of inadequate resources at DHO to procure them. For instance, District reports indicate that during the 2017 mass distribution of ITNs in Luangwa District, government distributed a total of 16,000 ITNs but there was a shortfall of 2,800 ITNs. Having in mind that ITN mass distributions are done once every after five years. Because ITNs supplied were usually inadequate, priority was given to high risk groups like pregnant women and children under the age of five years. Therefore, the inconsistent supply of ITNs by government and its cooperating partners compromised the effectiveness of the measure in preventing and controlling malaria in the district. Hence the continued high number of malaria cases in the district compared to other districts in Lusaka province despite having recorded a "reduction in malaria cases from 842/1000 in 2010 to 439/1000 in 2017", (2016 Luangwa District Annual Health Report).

During the research study, it was established that population mobility led to many imported and exported malaria cases due to porous borders and limited border screening. It was found out that some people from bordering countries-particularly Mozambique and Zimbabwe were often treated in Zambia. Local populations on both sides of the border spoke the same language, traded actively, inter-married and crossed the border frequently. Commodities such as ITNs were frequently picked up in Zambia and taken back across borders. The practice further affected the availability of ITNs to the local people because the smuggling of the commodity reduced the numbers which remained in Luangwa District for prevention and control of malaria. Mobile populations are particularly noteworthy. Recognizing mobility as a system involving multiple demographic groups, localities, and intersecting socio-economic processes is proving increasingly important (Smith and Whittacher, 2014). Even when malaria prevention and control measures were being implemented in Luangwa District, the main concern was the risk of importation of malaria cases from malaria-endemic neighbouring countries and the smuggling of malaria prevention and control commodities like ITNs.

In addition, there was a general feeling among key informants that many stock outs of ITNs, drugs, equipment, RDTs and insecticides were as a result of government procurement and logistical challenges. The argument is that even when antimalarial commodities were supplied, they were not made available on time and that usually they were in insufficient quantities.

3.3. Provision of Indoor Residual Spraying (IRS)

Indoor residual spraying is the regular application of a persistent insecticide inside a house to reduce mosquito life span and density, and as a result, reduce malaria transmission and prevent epidemics. The method relies on the fact that most mosquitoes enter houses at night and rest on the walls and ceilings before and after feeding on occupants. Once the mosquitoes rest on the walls that have chemicals, they absorb lethal dosages of the chemical which eventually kills them before another bite and subsequent transmission of malaria to the next victim.

With the view that the government is promoting the use of indoor residual spraying as one of its core interventions in its malaria prevention and control programme in an effort to reduce the vector population and hence decrease malaria incidence, the researcher attempted to investigate the provision of indoor residual spraying by government in communities in Luangwa District. The local people's views on whether indoor residual spraying is being provided by government in their communities in Luangwa District are presented in Figure 3.4.
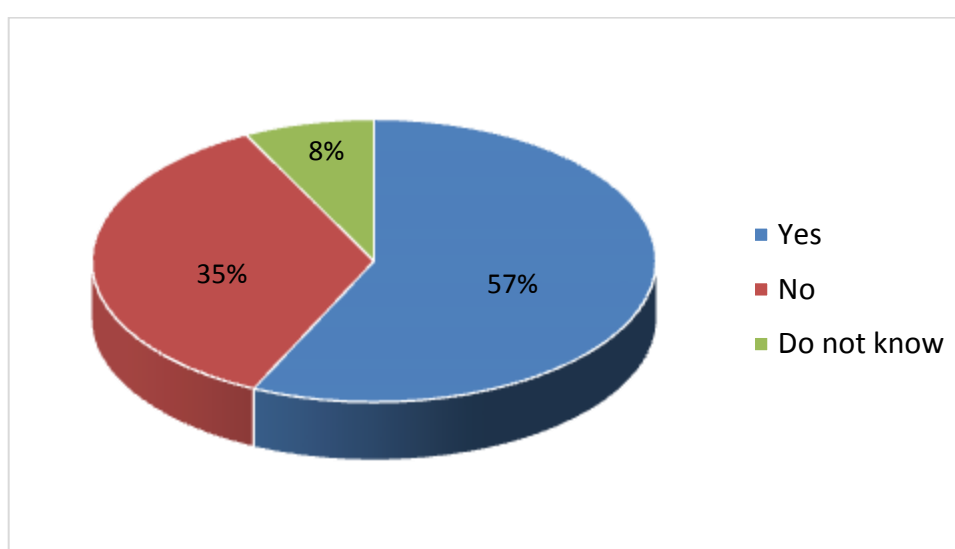
Figure 3.4: Respondents' views on Government's provision of IRS

From the statistics indicated in figure 3.4, it was established that indoor residual spraying services were being provided every year in all the respective catchment areas in the district. Out of the 200 respondents who were interviewed, 115 or 57% agreed that indoor residual spraying was being conducted in their communities. Those who indicated that indoor residual spraying was not done in their respective communities were 71 or 36% of the respondents and 14 or 7% of the respondents said that they were not aware of any malaria prevention and control measures in their respective communities. It was further established that out of 200 respondents interviewed, 186 or 93% pointed out that the main provider of indoor residual spraying in the district was government and 14 or 7% of the respondents said that they were not aware of any malaria prevention and control measures in their respective communities.

According to the Luangwa District Health Office Annual Progress Report of 2016, indoor residual spraying was introduced in Luangwa District in the year 2010. The district malaria focal point person who was the Public Health Officer at the District Health Office during the study, stated that from the time indoor residual spraying started, the operations were done once annually during the months of December and January. He argued that the indoor residual spraying was being done during the beginning of the rainy season before the breeding time for mosquitoes so that by the time they start breeding, the mosquitoes would have found the chemicals on the walls and be killed instantly. He further stated that indoor residual spraying is supposed to be carried out every six months because the chemical which is mainly used (Actellic) lasts for six months.

The study revealed that the operations were done once per year during the onset of the rainy season because of inadequate resources and usually, after the rains, the breeding of mosquitoes reduces. It was established that from the time indoor residual spraying was introduced, there has been a reduction in malaria cases. For instance, before the introduction of indoor residual spraying, the district recorded high malaria incidence rates of 842/1000 in 2009 and during the year of study in 2017, the district recorded the incidence rate of 400/1000, which was the lowest so far. However, the district was still recording the highest number of malaria cases in Lusaka province.

According to the District Health Office Annual Report of 2017, Luangwa District managed to reach 93% indoor residual spraying coverage, which was above the average

target of 85%. The report states that the Government through the Ministry of Health had targeted to spray 9000 houses during the year under review and managed to cover about 8,434 houses in the district. The report further indicates that before the commencement of the 2017 indoor residual spraying programme, the District Health Office conducted trainings for 25 spray men who were drawn from within the community in order to successfully carryout the programme.

All the key informants who were interviewed indicated that residual spraying of houses was being carried out in all catchment areas in the district and that the measure was mainly provided by government. Some key informants said that even if government was the main provider of indoor residual spraying, its efforts were at times complemented by some cooperating partners. For instance, organisations like Centre for Disease Control would come in to provide indoor residual spraying logistics through the District Health Office.

However, just like the provision of ITNs, provision of IRS had its own challenges. According to the research findings, as noted by the district focal point person, the majority of the respondents said that even if indoor residual spraying was being carried out in their communities, the exercise was only done once each year; hence most of the structures were not sprayed. Other respondents complained that at times, spray operators would visit households over the weekends when most of the people go to worship and their houses were not covered during the exercise. It was also mentioned by most respondents that indoor residual spraying was usually done just after the onset of the rainy season, mostly in December and January. During this period, most of the families shifted to their fields to prepare for farming and when indoor residual spraying operators went to their homes, they were not available; hence catchment areas were not adequately covered.

It was established that during IRS operations, some occupiers of houses did not allow spray operators to carry out the exercise, giving various reasons for their refusal. Some said that their bodies reacted to the chemicals which were being used for IRS. Others could not allow spray operators to spray their houses especially the bedrooms to avoid being inconvenienced and for privacy reasons. The Public Health Officer had this to say:

"Indoor residual spraying has been difficult to implement because some community members are complaining that the chemical which is used has a strong smell which lasts for a month from the time it is applied. Others do not like the inconvenience of shifting their belongings during IRS operations. Majority also complain that the chemical which has been in use since the year 2010 is no longer effective to kill the malaria vector (mosquito)".

The research study further revealed that some community members could only agree to have their houses sprayed after giving them an ITN, a practice which was not sustainable and others simply refused without giving any reason. Some community members could not follow instructions given to them during the operations. For instance, after spraying a house, occupants were supposed to enter the house after 3 hours, but others ignored the instructions and entered the houses just after spraying. The habit made them to react to chemicals and later complained that chemicals made them to be sick.

It was established that when chemicals are sprayed in houses, usually mosquitoes, cockroaches and other pests move out of the sprayed structures. When some of the community members see the large number of mosquitoes and other pests moving out of their houses, they believe that the chemicals which are used to spray their houses attract a lot of mosquitoes and other pests, hence their refusal to have their houses sprayed. The PHO pointed out that the use of the same chemical for IRS for the past seven years could have caused chemical resistance in mosquitoes as malaria vectors. The implication is that even if IRS is conducted, mosquitoes continue thriving and transmitting the disease and resources are wasted without expected outcomes. The best practice was to rotate the insecticides used every after two years to avoid resistance.

The study further revealed that the quality of structures compromised the effectiveness of the IRS programmes. That was due to the fact that most of the houses had rough walls which could not allow the chemicals to last longer. It was observed that some structures especially in rural areas were made of mad and grass and were cracked. The implication is that the chemicals could not last longer to kill the mosquitoes and other pests, hence, there is need to raise the standard of living for people who live in rural areas so that they can have modern structures.

It was further established that low participation of the local people in the implementation of programmes could have led to people not to accept and shun the programme. The study revealed that only 9% of the respondents were involved in the implementation of the programme. The utilisation of the preventive and control measures is definitely affected by the community's definition of their priorities regarding health and the illness and the degree to which individuals think they can personally control or prevent the illness. No matter how sound a preventive approach might be, if community members are not treated as partners and owners of a programme, the preventive approaches will fail to some degree.

Another interesting observation was that the geographical location of Luangwa District and the climate also posed as a challenge in the prevention and control of malaria. The District is located at the confluence of two big rivers of Zambezi and Luangwa and experiences very hot temperatures throughout the year, ranging 25 and 45 degrees Celsius with humidity levels of 60%-70%, and three fairly distinct seasons. The District is prone to drought and receives rains ranging between 600mm and 800mm per annum. Rainfall in the District is very precarious and unpredictable with long dry spells at certain intervals. The District also experiences occasional floods from Luangwa and Zambezi Rivers due to excessive rainfalls upstream of the Luangwa and Zambezi Rivers and due to opening of Mulungushi and Kariba Dams respectively. The high temperatures and humidity levels recorded are optimum for mosquitoes to survive and breed massively. The two big water bodies act as the main breeding sites for mosquitoes, hence high populations of mosquitoes leading to high prevalence of malaria. Therefore, the geographical location and the climate pose a serious challenge when it comes to application of vector control measures like ITNs and indoor residual spraying since the geography and the climate promote massive breeding of mosquitoes which would require a lot of resources to adequately implement preventive and control measures like indoor residual spraying.

In view of the above challenge, some key informants suggested and recommended that there was need to introduce other vector control measures like larviciding and aerial spraying of river banks. Unfortunately, a vector control method like larviciding which is one key component of Integrated Vector Management was not done in communities. According to the Ministry of Health (2011), integrated vector management remains the cornerstone of malaria prevention and control with focus on distribution of ITNs, IRS

and Environmental Management. However, the study found out that environmental management was only practiced by a few community members in form of clearing bushes around their homes. That could also explain the reason why there were high mosquito populations, hence, high transmission rates leading to many cases of malaria in communities.

The study further revealed that community perception of insecticides was another big challenge for IRS programmes. During the study, it was established that there were cases of community perceptions, misconceptions, and actions that could negatively affect the efficacy of malaria vector control programme like IRS. It was found out that lack of adequate information about mosquito behavior could skew community perception on the effectiveness of insecticides. Community opposition to insecticide based control could be due to a lack of insecticidal effect on non-target insects and pests because it was found out that after IRS operations, community members expected all insects and pests to die. Certain social customs like regular re-plastering and painting of housing could render sprayed surfaces ineffective. It was established that, expectation of immediate mosquito death and to both smell the insecticide and see dead insects as evidence of working insecticide for long periods of time could influence community acceptance. Further, lacking information about why different insecticides are used for different types of housing, communities may believe that some insecticides are simply more effective and, therefore, reserved for people of higher social economic classes. These problems can be overcome by sensitising communities about common perceptions, misconceptions, and problems and encouraging their participation in malaria control and prevention campaigns.

The emergence of insecticide resistance in several districts like Luangwa in 2010 added a new challenge to IRS programme. From studies conducted from 2003 to 2004, malaria vectors were documented to be fully susceptible to the insecticides used for vector control in Zambia. However, recent focused studies have raised concerns that insecticide resistance maybe appearing and this is being investigated further. Ongoing resistance monitoring indicates high levels of resistance in Anopheles gambiae to DDT, carbamates and pyrethroids in some districts, and this information serves as the basis of evidence-based rotation of insecticide class to manage resistance. Generally, the main challenge facing the IRS programme include: insecticide resistance by some vectors, delays in funding for implementation, inadequate stakeholders' involvement at district

level, IRS programmes commencing and finishing behind schedule, and dealing with environmental requirements and waste associated with insecticides.

3.4. Community Sensitisation

Advocacy, Information, Education and Communication, Behavior Change and Communication and community mobilisation strategies have played a critical role in malaria prevention and control. The reduction in the malaria burden in the country is also attributed to the fact that communication interventions have been fully integrated in the National Malaria Strategic Plan and annual action plans (MoH, 2011).

Government's goal is to reduce the burden of malaria morbidity and mortality in communities through behavioral change communication. Communication is an integral and important component in the prevention and control of malaria. Communication and provision of preventive commodities and services cannot be divorced, as one requires the other in order to achieve successful implementation of interventions. Services may be made available but if the communities do not understand the benefits of the interventions, the desired impact cannot be achieved. Communication is an important process of informing and persuading communities to adopt positive behavioral traits to take preventive measures, recognise signs and symptoms of malaria and seek early and appropriate treatment (MOH, 2011).

The third major element of the Structuralist approach focuses on behavior. This element also constitutes three specific aspects that T.D. Hunter (1989) refers to as "the behavioural synthesis". The first aspect of the behavioural synthesis is the structural determinants of illness. This concerns a general agreement that illness is "located" not in the individual but in the social, economic and political structure of society. Hence, the approach emphasis is a health service rather than a disease service (emphasis is on prevention and health promotion and not on treatment). Therefore, it is expected that the health delivery system in Luangwa District emphasises on prevention and health promotion. In this case, communication that addresses specific behaviors is cardinal. The rapid scale up of malaria control in Zambia will prove successful if communities accepted and used preventive and treatment measures made available to them by both Government and Non- Governmental Organisations. Domestication of the health system is the second specific aspect of behavior. This approach tries to achieve quality health care through the strategy of prevention and health promotion- "going upstream a

little in order to rescue people before they begin to drown and still going further upstream in order to stop them from being thrown into the river" (Hunter, 1989). This strategy can only be successful if society participates-no health for all unless all for health. It is therefore expected that as health messages on health prevention and promotion are being given out to communities, the local people should be fully involved in the dissemination of such messages.

Since community sensitisation is one of the measures which the Zambian government is implementing to prevent and control malaria, the researcher attempted to find out whether sensitisation programmes were being carried out in communities of Luangwa District. Figure 3.5 below presents the local people's views on whether government provides sensitisation services in their communities.
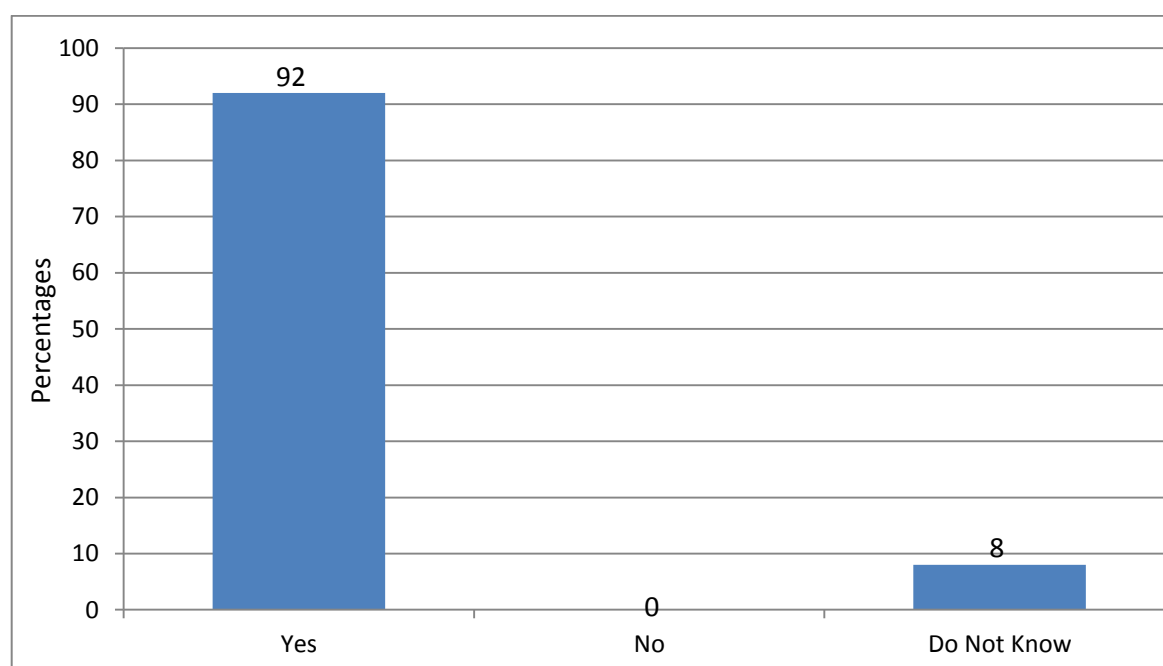
Figure 3.5: **Respondents' views on whether Government provides community sensitization services on malaria prevention and control**

According to the statistics shown in figure 3.5, it was established that sensitisation of communities on how to prevent and control malaria was being done in the district. Out of the 200 respondents who were interviewed, 185 or 92% agreed that community sensitisation was being carried out in respective catchment areas. Out of all the respondents, only 15 or 8% said that they were not aware that sensitisation on the prevention and control of malaria was being carried out in their respective communities. When respondents were asked about who provided community

sensitisation services, 185 or 92% indicated that community sensitisation was mainly carried out by Government through the Ministry of Health. It was further established that the method of awareness which was mainly used to disseminate information on the control of malaria was mainly audio or verbal. Out of the 185 respondents who indicated that government carried out sensitisation, 167 or 90% said that community sensitisation was mainly done through audio or verbal method and 18 or 10% indicated that community sensitisation was done by use of pamphlets.

All the key informants confirmed the above findings and indicated that community sensitisation was being done in all the catchment areas in the district. All the 15 health providers said that as medical personnel, they spearheaded sensitisation programmes in their respective catchment areas where malaria prevention and control was concerned. Even the Acting District Health Director and the District Malaria Focal Point Person pointed out that community sensitisation was cardinal if the impact of malaria prevention and control measures which were being implemented was to be realised.

All the health providers alluded to the fact that they were trained in areas of Advocacy, Information, Education and Communication and community mobilisation and as a result, the knowledge and skills which they acquired were used in sensitising the community on how to prevent and control malaria. The study further established that malaria prevention and control awareness was being done every time health providers had contact with clients/patients. For instance, nurses usually gave health talks to mothers who went for antenatal and under five clinics. For mothers who went for under five clinics were advised and encouraged to sleep under insecticide treated nets with their children who were under five because they were more susceptible to malaria infection. Expectant mothers who went for antenatal clinics and growth monitoring were also encouraged to sleep under an ITN in order to avoid mother to child transmission of malaria during pregnancy. Expectant mothers were also encouraged to have Intermittent Preventive Treatment for prevention of malaria infection from mother to child during pregnancy, which is a direct observation treatment.

Health providers also indicated that they always gave awareness messages whenever they went for outreach programmes. The other critical information which was given out in order to prevent and control malaria included; how people should use ITNs, to regularly retreat mosquito nets, to seek medical attention whenever there were signs

and symptoms of malaria, taking care of their immediate environment (Environmental Management) and to actively participate in matters of prevention and control of malaria in the community.

The study revealed that community sensitisation is also carried out through formal structures or mechanisms which have been established at district level. As stated in the first chapter, the district has nine health centers, meaning there are nine catchment areas. Those catchment areas are further divided into zones and each zone has an operational Neighbourhood Health Committee. A Neighbourhood Health Committee consists of members who are selected from within the community and work closely with health center medical personnel in all matters related to health. Apart from the neighbourhood health committee members, there are also community health workers and community based volunteers (CBVs) who are selected from among community members.

All neighbourhood health committee members, community health workers and community based volunteers work closely with health center staff in carrying out various health activities like community sensitisation. All the neighbourhood health committee members, community health workers and community based volunteers receive some training in areas of advocacy, information, education and communication /behavior change communication just like the medical staff in all health centers and posts in the district. The neighbourhood health committee members, community health workers and community based volunteers are usually engaged by the District Health Management Team in their respective catchment areas to conduct door to door health education on how to prevent and control malaria in the community. One of the community health workers had this to say;

> "Health talks involve encouraging community members to use insecticide treated nets at night, to allow indoor residual spraying operators to spray their houses during IRS programmes, to clean their surroundings, to attend community meetings, go for malaria testing and seek early treatment if found positive. Mothers in the community are encouraged to regularly take their children for under five clinics and go for antenatal clinic during pregnancy."

For instance, during mass distribution of ITNs, neighbourhood health committee members, community health workers and other service groups play a very critical role at community level in social mobilisation by working with local partners to organise local theater groups, dance groups or other social mobilisation available to publicise the net distribution. Organised groups perform before and during distribution process and give messages which highlight malaria prevention and control, net usage, and re-treatment. At times neighbourhood health committee personnel use megaphones and g round communities announcing the day's event and explain the process for receiving nets.

It was further established that similarly, social mobilisation and sensitisation was also carried out whenever there were certain important programmes which were being carried out by the Ministry of Health through the District Health Office. Such programmes included National Malaria Day, Child Health Week and Indoor Residual Spraying. It was found out that before and during such important events, the neighbourhood health committee members and community health workers played an important role in mobilising and sensitising community members. Information about respective programmes was disseminated using organised local theatre and dance groups, posters were hang around targeted areas and leaflets and brochures were distributed if available during sensitisation exercises.

The study revealed that the District Health Office was also working with traditional and civic leaders like councilors and the clergy in the dissemination of information in the community. It was established that the local leadership played a critical role in the prevention and control of malaria through advocacy, information, education and communication/behaviour change communication. The local leadership helped the District Health Office in mobilising people for meetings and also by giving health talks concerning prevention and control of malaria whenever they interacted with community members. For instance, the clergy disseminated information during church services. The health authorities worked with education authorities also to ensure that information was given to pupils during school health programmes. The DHO also always used the Zambia National Information Services (ZANIS) District Office to assist in publicity by use of the public announcement system.

It was found out that community sensitisation was an on-going exercise. Community

sensitisation was mainly done by community volunteers through primary health care programmes in PHC units. Door-to-door campaigns are carried out especially during mass ITN distribution and IRS programmes. During such periods, resources are given out to community volunteers to maximise community mobilisation. For instance, women are targeted at health facilities when they go for antenatal clinic and growth monitoring.

During the study, it was found out that Government effort to mobilise and sensitise community members on how to prevent and control malaria was being supported by cooperating partners. District Health Office reports showed that the Luangwa Child Development Agency, the affiliate of ChildFund Zambia supported Government in mobilising and sensitising community members concerning matters of health. According to the District Health Office reports, the organisation managed to train 85 community volunteers as malaria control agents and provided them with bicycles. The malaria control agents were responsible for community mobilisation and sensitisation and distribution of ITNs in the community.

The Acting District Health Director pointed out that the first objective of community sensitisation was to ensure that behaviour change communication and social mobilisation capacity was strengthened at all levels to ensure that majority of people at risk had appropriate knowledge on malaria and practice recommended behaviours for prevention and treatment. The second objective was to increase use/uptake of malaria prevention and control interventions to at least 85%. All key informants pointed out that community sensitisation through advocacy, IEC/BCC and community mobilisation contributed to the increased awareness and knowledge and skills on malaria prevention and control, increased uptake of interventions and promoting appropriate care seeking behavior.

During the study, it was established that IEC/BCC efforts were targeted at individual, household and community levels. Through those efforts, all key informants said that achievements were seen particularly on successive increase in levels of knowledge and increased uptake of interventions such as use of treated insecticide nets and indoor residual spraying.

However, the study revealed that there still remained a significant gap between knowledge levels and practice of recommended behavior in ITN usage, acceptance of

IRS and IPTp, as well as early care seeking behaviours such as prompt testing and treatment. For instance, key informants complained that despite being sensitised, some community members were still in the habit of selling bed nets which are given to them to prevent malaria infection; others still have negative attitudes towards IRS programmes and never allow IRS operators to spray their houses and others are not willing to take part in any malaria prevention and control activities in their respective communities. That could be attributed to a number of factors.

Firstly, there are inadequate resources to carryout regular sensitisation in all catchment areas. Those resources are needed for instance, to procure more IEC materials, to regularly train district medical staff and community health volunteers in areas of advocacy, IEC/BCC and community mobilisation. Secondly, there is no proper coordination with cooperating partners; hence there are few partners in planning, coordination, dissemination, monitoring and evaluation of effective IEC/BCC plans and activities. Thirdly, community members are not well engaged in planning, implementation, monitoring and evaluation of sensitisation programmes. As a result, the local people are just mere recipients of services provided by Central government. So, the local people feel marginalised and the only thing they can do is to shun government programmes. Fourthly, the infrastructure for PHC units is not maintained and most of the structures are in a bad state of repair despite being important centers where community sensitisation is concerned. The fifth factor is the economic status of the local people. It was established that most local people would prefer to engage themselves in income generating activities than attending community meetings. Last but not the least factor is that the failure to effectively implement the Decentralisation policy has led to the Central government not to give adequate resources to periphery structures like districts for them to provide adequate and quality public services.

In view of the above, it can be argued that there was need to strengthen capacity for advocacy, IEC/BCC and community mobilisation. The Ministry of Health should strengthen research, monitoring and evaluation of IEC/BCC activities by tapping into new and innovative technologies to improve timelines, feedback and use of BCC. If the current goal of eliminating malaria by 2021(as indicated in the 2017-2021 National Malaria Elimination Strategic Plan) was to be achieved, advocacy and communication activities for behavior change needed to be intensified and localised, taking into account the needs of the communities as the scale up of interventions continues. That

calls for increased funding to local administrative units on the part of Central government.

For malaria control programmes to be successful, people need to accept the programmes and support their implementation. This requires effective IEC interventions in order to create awareness about the malaria prevention and control measures being implemented. Effective IEC will also increase levels of knowledge about malaria control measures, build approval of the measures, develop positive attitudes towards the measures and develop skills and ensuring community participation in malaria prevention and control programmes. This calls for prioritisation and implementation of evidence based strategies that will have the most impact at the community level. The focus therefore, should be to boost community involvement, build capacity for IEC/BCC implementation at various levels, increase financial and material resources for IEC/BCC, strengthen partnerships across various sectors and strengthen the evidence base for implementation through monitoring and evaluation based on agreed-upon indicators. There is also need for increased resource mobilisation for IEC/BCC from partners. The District Health Office need to work hand in hand with the department of Education in order to integrate Malaria School Health programmes. It was as well seen as a need to regularly orient community based groups like Neighbourhood Health Committees, Community Health Workers, Traditional Birth Attendants, and Community Based Volunteers.

From the study findings, it was established that to some extent, government through health authorities was trying to disseminate information which aimed at behavior change by emphasising on disease prevention and health promotion in communities. This is according to the Structuralist theory point of view of 'no health for all unless all for health'. However, it was found out that health authorities do not fully engage the community members in the sensitisation process but rather engage them through established structures imposed on them by health authorities. As the Structuralist theory envisages, full participation by people in prevention and health promotion can only be realised if full decentralisation is embraced so that people in the district are able to make decisions, manage their own resources and come up with solutions to their various problems. But as the situation is, where decentralisation is just on paper and Central government still controls a larger share of resources and decide on behalf of the local people, provision of quality public services like health will remain a challenge.

3.5. Health Infrastructure, Human Resource for Health, Malaria Case Management and Prevention of Malaria in Pregnancy

Luangwa District is located at the confluence of the Zambezi and Luangwa rivers in the rift valley formed by lower Zambezi and Luangwa valleys. The district's altitude ranges from 350-500 meters above sea level and this low altitude of the district predisposes it to floods. The district experiences very high temperature and humidity levels. These conditions are favourable for breeding of mosquitoes. Because of the favourable environment, it was found out that the district records high levels of mosquito breeding throughout the year, especially during the rainy season.

It was for this reason that the district has continued to record high Malaria Incidence Rates each year though there has been a reduction in recent years. According to the 2016 Luangwa District Health reports, Luangwa District recorded Malaria Incidence Rates of 842/1000 in 2011, 361/1000 in 2012, 560/1000 in 2013, 893/1000 in 2014, 469/1000 in 2015 and 439/1000 in 2016. The report further indicates that among the top ten causes of morbidity in all ages in 2016 in Luangwa District, Malaria was the second highest cause of morbidity accounting for 439 per 1000 after Respiratory Infection (non pneumonia). Top ten morbidity in all ages are shown in Figure 3.6.
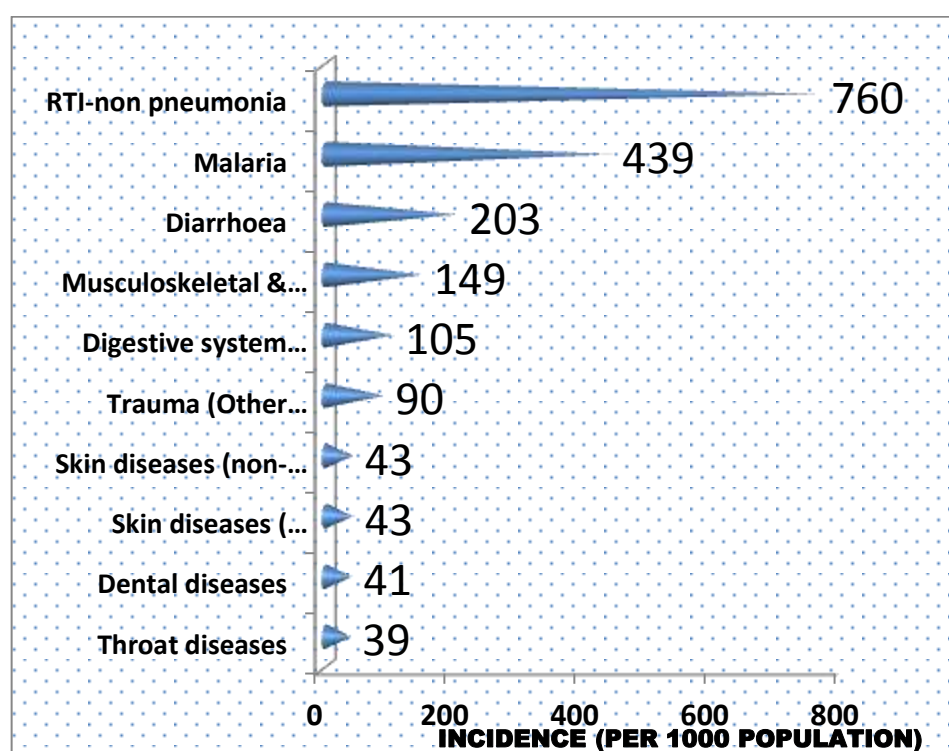
Figure 3.6: Top Ten Causes of Morbidity in All Ages- 2016 Luangwa District

Source: Luangwa District Annual Progress Report of 2016

According to the 2016 Annual progress report, there was a slight reduction in the malaria incidence rate in recent years, though the figures were still high especially among the under five children and expectant mothers, the old aged and people living with HIV/AIDS. Therefore, in order to properly manage malaria cases in the district, there was need to have adequate health facilities, adequate and qualified manpower in all the health facilities, adequate medicines (drugs) in health facilities, adequate transport, adequate medical equipment in health facilities, In-service training for health staff, technical and supportive visits and health authorities to have regular interfacing with other organisations in order to build cross-agency coalitions which can enable them formulate new possibilities with regard to malaria control measures.

3.5.1. Health Infrastructure

During the study, it was established that Luangwa District has seventeen (17) health facilities. These included two (2) First Level Hospitals, nine (9) Rural Health Centers (RHCs) and seven (7) Health Posts. Thirty-two (32) Primary Health Care units were also located in various communities within the district. The two First Level hospitals are Katondwe Mission and Luangwa District Hospitals. Katondwe Mission Hospital is located about 55km away from the main administrative offices and owned by the Catholics. On the other hand, Luangwa District Hospital is located within Luangwa Township about 8km from the main administrative offices. Whereas the Katondwe Mission Hospital is a fully-fledged First Level hospital with most of the required facilities, Luangwa District Hospital was not yet fully operational during the time of study since it was still under construction in the third phase.

The project was in phase III which involved construction of the female and children's wards and six staff houses. It was observed that the project had stalled and was at less than 50% completion because the contractor abandoned the project. As a result, the facility was not fully functional. The two hospitals provide first level referral services to Luangwa District residents as well as Rufunsa and Nyimba Districts, including some patients from Zimbabwe and Mozambique. The implication is that the services are not adequate to cater for the district since the facilities are overwhelmed with extra patients from outside the district. The services provided by the hospitals include curative, preventive, Mother Child Health (MCH), Anti-Retroviral Therapy (ART), Voluntary Counselling and Testing (VCT), Prevention against Mother to Child Treatment

(PMTCT), Mortuary, Laboratory, X-ray services etc. The population distribution per each of the nine Rural Health Centres in Lwanguwa District is shown in Table 3.3.

Table 3.3:   Distribution of Population by Health Facility (Health Centre Catchment Area), Luangwa District 2016

S/N	Health Facility	Population in 2016
01	Luangwa Boma	5931
02	Kavalamanja	1009
03	Mandombe	1919
04	Luangwa High School	1078
05	Katondwe	2924
06	Chitope	5959
07	Kasinsa	5577
08	Mphuka	3300
09	Sinyawagora	780
	Total Population	**28,477**

Source: Luangwa District Annual Progress Report of 2016

The nine Rural Health Centers include Sinyawagora, Kasinsa, Chitope, Luangwa High School, Mphuka, Kavalamanja, Mandombe, Katondwe and Luangwa Boma. These health centers provide primary health care services to the communities within their catchment areas. Eight of these RHCs are lineally located along the district's main road except for Kavalamanja RHC which is about 14km away from the main road. Kavalamanja RHC can be accessed by road and also by boat on the Zambezi River. Luangwa Boma RHC was the only RHC which offered ART, Mortuary and Laboratory services. The seven Health Posts included Kaunga, Mangelengele, Kanemela, Kapoche, Janeiro, Amoro and Feira. Whereas Kaunga and Feira Health Posts had been operational since 2014, the other five were opened in March 2016. The phase three construction of the Luangwa District Hospital which included two wards (Female and Children), six staff houses and water reticulation had stalled.

During the study, it was found out that though Government had made efforts to construct more health facilities, some community members were still covering long distances to reach the nearest health facilities. The implication is that, health providers

are required to conduct regular outreach services to communities that were far from the health centers and health posts which called for more resources. The study further revealed that the health facilities which were available in the district were not adequate due to the increase in population especially that health services available were extended to many patients from neighbouring districts of Nyimba and Rufunsa and countries of Mozambique and Zimbabwe. Due to increased population, most health facilities (health centers and health posts) were not adequate to meet the demand and to worsen the situation, some of the structures were old and in bad state of repair. The study revealed that health facilities especially those in rural areas still faced a challenge of lack of electricity since Luangwa District had not yet been connected to the National grid. The implication is that it becomes difficult to properly store various medical drugs (maintenance of the cold chain) in health facilities which may lead to wastage.

According to study findings, accommodation for health staff was inadequate, forcing some health providers to live in villages. It was observed that in certain situations, three to four health workers were forced to share one house. Even when it came to office accommodation, the scenario was the same where all health facilities did not have adequate office space for health staff. For instance, during the study, it was observed that the District Health Office was accommodated in a small rented house in which the health workers were made to share small office space. The implication is that the health staff cannot perform to the fullest because the environment they operate from is not conducive for human habitation and this may lead to high staff turnover. In this regard, there was need for Government to construct more health infrastructure in order to provide quality and equitable health services as close to the family as possible.

3.5.2. Human Resource for Health

Availability of adequate numbers of appropriate qualified and experienced health workers, in the right skills-mix, is a major determinant of health service performance (MOH, 2012). Zambia has for a long time identified the critical shortages of health workers, as a major obstacle to the attainment of the national health priorities including health related Sustainable Development Goals (SDGs). Appendix VI presents the general numbers of categories of human resources for District Health Office, District Hospital and Health Centers during the year 2016 for Luangwa District.

According to the 2016 Luangwa District Annual Progress Report, the establishment for the District Health Office was 19 health staff and during the time of the study, 17 positions were existing and 2 positions were vacant. The situation at that level was not bad because most of the positions were filled especially that it is the level which manages all health affairs of the District though it was necessary that all positions were filled up. The establishment for the District Hospital was 159 health staff and it was found out that 109 positions had been filled and 50 positions were vacant. As appendix VI indicates, a significant number of critical positions under the District Hospital were vacant. The opening of the new Luangwa District Hospital was one of the greatest developments the district could be proud about. However, inadequate human resource posed a biggest challenge to fully operationalise the hospital. For instance, the new hospital could not conduct operations due to inadequate theatre staff (anesthetists, theatre nurses, etc.). The existing situation compromised the provision of quality and adequate medical services to the people in the district.

For the health centers, the establishment was 61 positions for health staff and it was found that there were 38 positions existing in health facilities with 23 vacant positions. Generally, the situation at health center level was not pleasant as well since a good number of positions were not filled. The study revealed that some health centers did not have critical health workers like Environmental Health Technologists, Clinical Officers and the Nursing Staff. For instance, the 2016 Luangwa District Annual Progress Report indicates that the establishment for the entire district was supposed to have 17 Environmental Health Technologists, but during the time of the study, there were only 7 Environmental Health Technologists and the other 10 health centers and health posts had no Environmental Health Technologists. But, these are professionals who were supposed to be available at that level to provide preventive services in the communities as they are trained in Public Health areas of Malaria prevention and control, Environmental Management, Water Supply, Sanitation, Vector Control, Inspection of Premises, Mother and Child Health etc. The implication is that the provision of adequate and quality public health services such as the prevention and control of malaria in the district is compromised since critical health staff in public health area was inadequate. Similarly, most of rural health centers lacked Zambia Enrolled Midwives who are so important when it comes to issues of maternal and child health. Out of all the nine rural health centers, only one had a Zambia Enrolled Midwife. The

implication is that there is inadequate provision of maternal and child health services at health center level.

It was also established that the district had other formal structures where prevention and control of malaria was concerned. The District Health Office is responsible for planning, coordination, management, implementation and monitoring of all health programmes in the district. The malaria prevention and control aspect falls under the District Public Health Unit. Health workers with the District Health Office have been appointed as district malaria focal point persons. During the study, district malaria focal point person was the Public Health Officer who was responsible for malaria services but had other public health responsibilities apart from malaria control responsibilities. The implication is that the district malaria focal point person was not dedicated solely to malaria services but was given that as an additional responsibility. As a result, proper coordination of malaria activities was lacking.

The study also revealed that at district level, there was also a district malaria task force which functioned as part of the District Health Office and mandated to provide the necessary malaria prevention and control related technical support. Members of the task force included all government departments, relevant non-governmental organisations, private sector and other stakeholders involved in malaria activities at district level. The District malaria task force is chaired by the District Health Director and is responsible for planning, overseeing, and monitoring the implementation of malaria activities at district level. However, it was established that the task force is only seen to be active during rare central government funded programmes like commemoration of Malaria Day, mass distribution of insecticide treated nets and indoor residual spraying. In addition, Hospital advisory committees, health center advisory committees, and neighbourhood health committees have also been established to provide formal linkages between the health delivery systems and the population within the district.

At community level, neighbourhood health committees have been established. The committees consist of community representatives from surrounding villages and are responsible for facilitating linkages between the communities and the health system at the community level. Part of their responsibilities includes dissemination of information on public health issues, and mobilisation of communities to participate in health sector planning, management, and monitoring and evaluation. Community health partners

including community health workers and malaria agents have also been appointed, who are key in providing guidance, sensitisation and assistance to community members on basic health care intervention, for various health problems including malaria. These are community volunteers who are trained in basic identification, prevention and referral methods for common illnesses. In addition, community project committees, with assistance from community health workers, malaria agents, and traditional birth attendants who are currently called safe motherhood association groups (SMAGs), are responsible for the implementation of demand-driven malaria prevention and control activities. However, it was observed and established that the community health partners were not receiving adequate support to motivate them in their work. One community health worker from Kansisa had this to say;

> "*We try to help community members in various health matters on voluntary basis but lack of support from health authorities and resources demotivated a lot of community volunteers*".

Similarly, most of the community health partners were only active when there were central government funded programmes being implemented in the district like child health week, insecticide treated net distribution, indoor residual spraying operations, and public health events.

The study revealed that community health workers worked with the population against malaria at the local level. Community health workers volunteered several hours per day on average with the communities performing malaria testing and treatment and counselling on health care issues. They also conducted malaria case follow-ups. Community health workers worked to sensitise the community on the importance of being tested for malaria and help to dispel any misconceptions about some malaria prevention and control measures being implemented in the communities. One community health worker from Mandombe had this to say;

> "*Community members were previously against being tested because they thought their blood was being taken away for secret purposes. But it is our responsibility to ensure that we educate the local people to dispel such misconceptions*".

Another community health worker from Mphuka had this to say;

"I do door-to-door malaria work. In short, I am a doctor in the community. When patients come to my house, I carry out rapid diagnostic tests to find out if they have malaria. If they test positive, I treat them and then I go out to their homes and test everybody within 140-meter radius. Then I give antimalarial drugs to every person who tests positive for malaria. I know that as a community worker I am a volunteer".

Community health workers also provided reactive case detection in some areas. Case follow-up is a critical component to case management performed by community health workers, but regular occurrence depends upon the leadership strength and the incentives provided to community health workers. It was found out that as volunteers, community health workers did not typically receive compensation for their work, although some organisations did provide meals, small stipends or bicycles for transportation. Health providers indicated that when community health workers were provided with incentives they were more active and remained motivated. The argument therefore is that, providing adequate training, supervision, transportation, and incentives was critical for community health workers retention.

The study revealed that the two main problems concerning the human resource situation were the critical shortages of health workers, leading to abnormal staff to patient ratios, and the inequitable distribution of the available health workers, leading to imbalances. In addition, the existing establishment was inadequate to meet health workforce need. According to the Ministry of National Development Planning (2017), despite various efforts in training and recruitment, a large deficit still remains between the available number of health workers and the needs of the health sector with regard to both the numbers and the skills mix. In support of the study findings, the Public Health Officer and most of the key informants mentioned that there was a big challenge in terms of availability of qualified human resource for health and that rural settings like Luangwa District did not have adequate capacities to attract and retain qualified health workers.

It was further discovered that the human resource situation was perpetuated by factors such as low retention and motivation of existing health workers which led to low productivity and inadequate funding for recruitment of additional health workers. For

instance, there was a critical shortage of staff accommodation for health workers in the district, a situation which forced some health workers to share houses even when they had families. Due to the critical shortage of staff accommodation, some health staff were forced to live in villages. It was also observed that even the available staff houses, most of them were in a state of disrepair. Inadequate or lack of office space was another challenge for the health staff like the District Health Office which was accommodated in a small rented house forcing some officers to share the small office spaces. The implications are obvious, low motivation among health staff, low productivity and high staff turnover which leads to increased disease burden in the district.

The study further revealed that most of the health facilities did not have adequate medical equipment to effectively deliver quality health care services to the people. Inadequate transport was one demotivating factor for the health staff in the district. While the entire district had only two runner utility vehicles and two ambulances, the health centers had inadequate or no transport like motorbikes to carry out activities beyond their static points. Out of the eighteen (18) health facilities, only 4 had motorbikes. The prevailing situation demotivated health workers forcing most of them to request for transfers to other working environments.

The above research findings concerning human resource for health can be looked at from the point of the extent of decentralization of powers to the DHO's office. It was noted that the DHO's office was effective in the district on areas regarding formulation of district plans and their implementation to ensure effective delivery of health services. However, the powers of the DHO's office were limited with regard to the recruitment of the health workers in the sense that the office did not have authority to recruit, but only to make a formal request for manpower from Provincial Health Office (PHO). Even on the recruitment of personnel such as security staff and general workers at DHO's office, authority had to be obtained from Provincial office. This development led to the DHO's office to have difficulties to timely fill vacancies that were being created through retirements and deaths, as it was noted that there were delays by PHO's office in granting authority to recruit new staff. Power can also be viewed in terms of financial autonomy. However, noting that funding for all the operations of the DHO's office came from the Ministry headquarters, and that the office did not have alternative sources of revenue, there were no indications of financial autonomy for the DHO's office that could be used to signify financial decentralization.

Regarding the provision of adequate financial resources by central government to the DHO's office to ensure effective delivery of quality health services, it was noted that there was a problem of inadequate funding to the DHO's office which was highlighted as being the major contributor towards the failure by the office to effectively deliver health services in the district. According to management at DHO's office, the government did not provide adequate funding to the office for effective delivery of health services, adding that when funds were provided, there was usually a shortfall in the budgets. For instance, lack of adequate funding made it difficult for the office to clear various claims for health workers, including payment of repatriation allowances and leave travel benefits: thus leaving a backlog of unpaid retirees. It was also observed that the problem of inadequate funding had made it difficult for DHO's office even to construct its own office where to operate from, including staff houses for health workers. This also included failure by the DHO's office to procure some medical commodities (medical equipment, drugs, ITNs etc) which were not available in the district health facilities.

3.5.3. Malaria Case Management

During the study, it was established that Luangwa District had only three health facilities where microscopic services were being provided. The services were being provided at Luangwa District Hospital, Luangwa Boma Health Center and Katondwe Mission Hospital. All the other health facilities (Rural Health Centers) had no microscopic equipment, instead, they were provided with rapid diagnostic test kits to detect malaria parasites. In terms of personnel, the district had 11 Laboratory Technicians, the number which was sufficient enough to cater for the entire district. The study revealed that it was not possible to have microscopic equipment in other health centers because of lack of electricity since Luangwa District was not yet connected to the national grid. However, all health facilities without microscopic equipment were provided with rapid diagnostic test kits as per Government policy. According to the policy, rapid diagnostic test kits should be deployed in all health facilities, with priority given to facilities where deployment of microscopy may not be possible. The study further revealed that health providers in all health facilities used rapid diagnostic tests to detect malaria parasites in order to confirm whether a patient has malaria or not. Once malaria is confirmed, a patient is put on treatment using

Coartem as the drug of choice for treatment of malaria. Quinine is used in complicated malaria cases and painkillers are given to treat fever.

It was also established that rapid diagnostic test kits were deployed at the community level in the context of Integrated Community Case Management (ICCM) of malaria. Rapid diagnostic test kits were used at community level by community health workers as part of a planned home-based care or screening programmes. Community health workers and community health assistants are community members selected by the communities and trained in management of common illnesses including malaria. These are supplied with materials for diagnosis and treatment of uncomplicated malaria. At community level, it was the responsibility of community health workers and community health assistants to carry out diagnoses according to their training and recognizing danger signs. Rapid diagnostic tests were being used in all cases of fever to confirm malaria before treatment.

All community health workers interviewed pointed out that they were able to administer the first-line antimalarial drugs like coartem. In addition, they were able to take measures to reduce body temperature, such as tepid sponging, funning and giving paracetamol, a pain killer commonly known as Panadol. These community health workers conducted follow-ups with patients, particularly children below five years and pregnant women. They also provided education to the community on the need for compliance to treatment, recognition of danger signs, and prevention of malaria. Further, these community health workers made early referrals to health facilities in case of danger signs and treatment failures and they accompanied referral patients to the health facility or referral letter sent with the patient indicating treatment given and when.

However, the Laboratory Technologist at Luangwa Boma Health Center said that the main challenge was that the levels of parasitamea were high in the district and that in some cases, the parasites were not detected unless under a microscopy. Rapid diagnostic test kits which were in use could only detect P. falciparum but could not detect other species of malaria parasites like P. ovale and P. malariae. There were cases of malaria in the district in which malaria parasites could not be detected using rapid diagnostic tests. When those cases were examined under a microscopy, other malaria species like P. malariae and P. ovale were detected especially that these malaria species

were common in the neighboring countries of Mozambique and Zimbabwe. In Zambia, the common parasite which causes malaria is P. falciparum and the rapid diagnostic test kits which were used in Luangwa District could only detect the P. falciparum parasite. The implication is that there is no proper malaria case management due to misdiagnosis.

According to the research study, the other challenge was that there was no microscopic equipment in all rural health centers in the district and all suspected cases of malaria which could not be detected using rapid diagnostic tests were supposed to be taken to health facilities with microscopes as per government policy. It becomes a problem to treat such cases since the guidelines are that a patient could only be treated for malaria when it is confirmed using rapid diagnostic tests or a microscope and be treated within 24 hours; but some of the health centers were far from health facilities with microscopes. The implication is that there are a lot of missed out malaria cases using rapid diagnostic tests and hence, giving wrong treatment especially to children under five years of age who are more vulnerable to malaria infections. The situation could only improve if all rural health centers were provided with solar power so that they could be provided with microscopic equipment since the district was not yet connected to the national grid.

The study revealed that as per standard procedure, uncomplicated malaria cases were treated using the recommended drug, coartem as the first drug of choice and usually paracetamol (Panadol) was added as a pain killer. Quinine was commonly used as the second line drug in complicated malaria cases by qualified medical personnel. Fansidar was used for intermittent preventive treatment in pregnant women to prevent malaria transmission from the mother to unborn baby. The main challenge was that it was common to have drug stock-outs in health facilities which made it difficult to effectively treat and manage malaria cases especially in rural areas. When health centers run out of drugs and rapid diagnostic test kits, they have to wait for central government through Ministry headquarters to deliver the next consignment of the required medical commodities to the district. Such situations compromised the provision of adequate and quality health services in the district due to lack of financial decentralization at district level. One health provider at Chitope Rural Health Center had this to say;

> *"Sometimes, there are delays in the procurement and distribution of antimalarial drugs and as a result, it is difficult to effectively manage malaria cases especially in rural settings. Even when drugs are supplied, sometimes consignments are not adequate to cater for the demands in our respective catchment areas. In situations when antimalarial drugs are not available, we are forced to just give pain killers like Panadol to patients just to treat headaches and fever".*

Therefore, there was need for government to allocate enough resources for the procurement of adequate antimalarial drugs for health facilities especially in rural areas where malaria transmission and infections are high. Once procured, there is need for the district health authority to distribute the drugs on time and regularly monitor the use of drugs in all health facilities in the district. Ultimately, financial decentralization at district level is the best solution.

3.5.4. Prevention of Malaria in Pregnancy

The malaria control programme has developed and is implementing well-defined Malaria in Pregnancy (MIP) policy, which includes the provision of free intermittent preventive treatment during pregnancy with at least three doses of sulfadoxine-pyrimethamine (commonly known as fansidar) during pregnancy; free insecticide treated nets; and free prompt diagnosis and treatment of clinical malaria. This malaria control package is implemented as part of routine Antenatal Clinic (MOH, 2005).

Pregnant women in malaria-endemic areas are known to be particularly at risk of malaria infection and its consequences of maternal anaemia, placental infection, low birth weight (due to fetal intra-uterine growth retardation and prematurity), and increased risk of abortion, stillbirth, or early infant mortality (MOH, 2010). As a consequence, regional recommendations in sub-Saharan Africa include specific prevention in pregnancy including the regular use of ITNs and the delivery of intermittent preventive treatment in pregnancy through antenatal clinic services with women recommended to receive at least three doses of sulfadoxine-pyrimethamine (fansidar) starting after quickening (about 16 weeks of gestation) and delivered at least one month apart. And, in settings with high prevalence of HIV infection, a relatively high proportion of pregnant women may already have HIV infection and they will

benefit particularly from two or more doses of sulfadoxine-pyrimethamine (fansidar) for malaria prevention.

Malaria in pregnancy is a major concern in Zambia. Pregnant women are particularly at risk due to the lowered acquired partial immunity during pregnancy, hence the need to prevent and control the disease during pregnancy. The study revealed that in Luangwa District, malaria prevention and control during pregnancy was being done through three approaches: effective case management, use of insecticide-treated bed nets and intermittent preventive treatment. These services were being delivered as a package of antenatal care. In terms of case management, like other cases, pregnant mothers were tested for malaria and once malaria was confirmed, they were given prompt treatment by giving them appropriate antimalarial medicine. All key informants indicated that all pregnant women were given insecticide treated nets to protect themselves from mosquito bites and for further protection of the newly born baby. The other approach was the provision of intermittent preventive treatment to pregnant women. That was because malaria infection during pregnancy was a major public health problem in the district, with substantial risks for the mother, her fetus and the newborn infant. Intermittent preventive treatment of malaria in pregnancy is a full therapeutic course of antimalarial medicine given to pregnant women at routine antenatal care visits, regardless of whether the recipient is infected with malaria or not. The study revealed that all pregnant women who went for antenatal care were given Sulfadoxine-Pyrimethamine, commonly known as Fansidar as per government policy and WHO recommendations as preventive treatment. The treatment was given during the second and third trimesters of pregnancy on a monthly basis at all scheduled antenatal care visits. This is to be taken as directly observed therapy in antenatal clinics. The treatment reduced maternal malaria episodes, maternal and fetal anaemia, placental parasitaemia, low birth weights and neonatal mortality. In addition, all pregnant mothers were given insecticide treated nets for them to use at night in order to protect themselves and the unborn child against malaria infection. It was pointed out by all health providers that in situations where insecticide treated nets were not adequate to cater for all households during mass distributions; priority was given to pregnant mothers and the children under five years of age.

The neighbourhood health committee members and community health workers played a critical role to encourage all pregnant mothers in their respective communities to

regularly attend antenatal clinics so that they could be protected against malaria infection. However, the only challenge is that some pregnant women do not appreciate the importance of attending antenatal clinics and seeking medical attention whenever they have signs and symptoms of malaria. It was mentioned that some pregnant women only attend antenatal clinic once, meaning that they fail to take all the three doses required for prevention of malaria in pregnancy and those are the mothers who develop complications during the delivery process. It was further found out that cultural beliefs against announcing a pregnancy too early in the gestation also played a role in the failure to reach higher intermittent preventive treatment in pregnancy coverage, in addition to occasional sulfadoxine-pyrimethamine (fansidar) stock-outs at health facilities.

3.6. Conclusion

During the study, it was established that there were a number of measures which were put in place by government in order to prevent and control malaria in Luangwa District. These measures included, provision of insecticide-treated mosquito bed nets, indoor residual spraying, community sensitisation, health infrastructure, human resource for health, medical equipment, transport and malaria case management. From the Structuralist theory point of view that health care is a state supported consumer good and service, most of these measures were being provided by Government in collaboration with its cooperating partners. In addition, most of the health facilities and services are owned by the state, though there are mission-owned ones like Katondwe mission hospital. Cooperating partners like ChildFund Zambia played a very critical role in the provision of insecticide treated nets and training of malaria agents in the district.

However, the study revealed that the interventions were not adequate enough to effectively prevent and control malaria in Luangwa District. For instance, indoor residual spraying was only done once each year just after the onset of the rainy season and as a result, targeted areas were not adequately covered due to inadequate resources and most of the people were in the fields to prepare for the farming season. Insecticide treated nets were not adequate enough to cater for all household members though it was emphasised that where insecticide treated nets were not adequate, priority was usually given to pregnant women and the under five children.

The study also revealed that government has continued to provide health infrastructure so much that majority of the community members were within 5km radius from health facilities. However, in some communities, access to quality health services was a challenge due to long distances they have to cover to go to the nearest health facility and some structures are in a state of disrepair. It was also established that there was inadequate or lack of transport especially in rural health centers so much that it was difficult for health workers to carry out health activities like outreach services. It was further found out that house and office accommodation was inadequate for health workers in the district.

From both qualitative and quantitative analysis of data done to examine the measures being implemented to adequately prevent and control malaria in Luangwa district, it was apparent that the provision of malaria prevention and control measures was seriously hampered by various factors, but common among them included lack of adequate funding from the central government. Interviews conducted with health providers from health facilities that were included in the study also highlighted glaring ineffectiveness by the DHO's office to deal with various challenges in the delivery of health services in the district. Meanwhile, there was consensus from DHO management staff and health staff in health facilities on the apparent inadequate delivery of quality health services to members of the community. As earlier indicated, the major problem identified was lack of funding to DHO's office to ensure that the office carries out its mandate in the district effectively.

CHAPTER FOUR

EXTENT TO WHICH LOCAL PEOPLE UTILISE THE PREVENTIVE AND CONTROL MEASURES IMPLEMENTED IN COMMUNITIES.

4.1. Introduction

This chapter, guided by the second specific objective, examines the extent to which local people utilize the preventive and control measures implemented in communities. The chapter has four sections. The first section is the introduction. The second section is about utilisation of insecticide treated nets by the local people. The third section is a discussion on utilisation of indoor residual spraying by community members. The fourth section looks at utilisation of health facilities by the local people.

4.2. Utilisation of Insecticide Treated Nets by the Local People

This study recognised the fact that Government was determined to ensure that insecticide treated nets were provided to households in communities and attempted to establish whether the local people utilised the insecticide treated nets and establish factors that determined underutilisation of the bed nets if at all there were such challenges. Distribution of respondents by their views on the utilisation of Insecticide Treated Nets is presented in Figure 4.7.
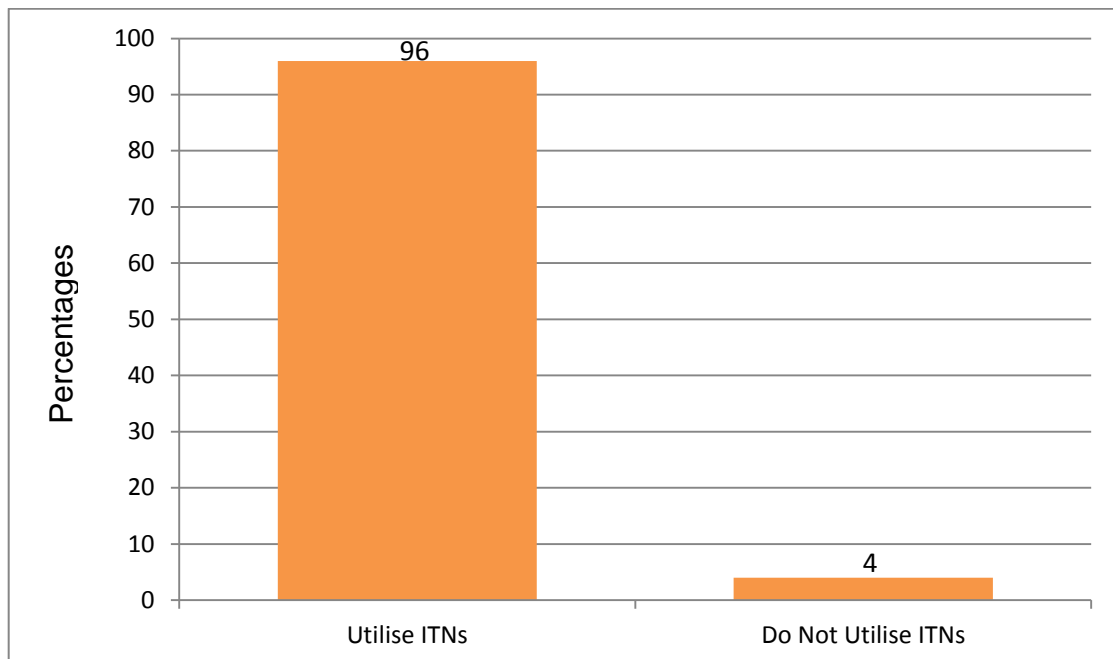

Figure 4.7: **Distribution of respondents by their views on the utilisation of Insecticide Treated Nets**

The study revealed that 96% of the respondents said that they were using mosquito nets to protect themselves against malaria and only 4% said that they did not use insecticide treated nets as a protective measure against malaria. In this study, being given health commodities and using them does not amount to one thing. Therefore, statistically, the majority of the local people utilised insecticide treated nets in the prevention and control of malaria in the communities. The study further established from the analysis that other variables (sex, age, marital status, occupation, family size and level of education) played a marginal role in determining the local people's utilisation of the insecticide treated nets. This is because under each variable, majority of respondents in all categories utilised treated mosquito bed nets as a measure to protect themselves from mosquito bites.

However, as stated in chapter three, majority of respondents complained that even if mosquito nets were being provided by Government in the communities, the insecticide treated nets which were being given out to them were not adequate to cater for each and every household member. To that effect, respondents were requested by the researcher to give the number of insecticide treated nets which were being possessed by their respective households. It was emphasised that insecticide treated nets which were in a bad state of repair (not usable) or worn out should not be counted. The study revealed that out of the 200 respondents who were interviewed, 40 (20%) of the respondents said that they had three insecticide treated nets in their households. 50 (25%) of the respondents said that their households possessed two insecticide treated nets, and the majority 110 (55%) said that their households possessed only one insecticide treated net. The study revealed that the majority of households did not have adequate number of insecticide treated nets to protect them from malaria given the fact that the majority of households had seven household members. The implication is that, members of the households that did not have adequate insecticide treated nets to use at night were still vulnerable to mosquito bites and later on malaria infection. It can also be argued that the fact that the majority of the respondents (96%) said that they utilised insecticide treated nets, it means that the majority of the community members know and appreciate the use of insecticide treated nets as a preventive measure against malaria.

Even in their general recommendations as noted earlier in chapter three (the chart below shows) the majority suggested that in order to effectively prevent and control malaria in the communities, government should consistently provide adequate

insecticide treated nets which should cater for each and every member of a household. As the study shows, the majority of respondents (48.3%) were from households with seven members on average and other households had more than seven members. So, even if each household was given a maximum of two insecticide treated nets, the prevailing situation indicated that the number of insecticide treated nets may not be enough, considering other intra house factors which may affect the utilisation of insecticide treated nets. Bashinyora (2010) argues that the number of rooms and people staying in each household determine the number of people sleeping in one bed net or not even sleeping under the bed net. In his study, Bashinyora (2010) established that the number of children under five also overstretched the capacity of the household in as far as provision of insecticide treated nets is concerned. And given the low level of household income, the households find themselves incapacitated to afford insecticide treated nets for all their children under five.

A meta-analysis of household surveys by Korenromp (2003) on net possession and utilisation, found a wide gap between net possession and use. Insecticide treated net ownership was found to be between 0.1 percent and 28.5 percent, while insecticide treated net use ranged between 0 percent and 16 percent especially among children less than five years of age (Korenromp, 2003). This is still unacceptably very low to have an impact on reduction of malaria episodes especially among the under-five. Korenromp (2003) argues that equality is a major issue in insecticide ownership and that net ownership has been found to be lowest among the poorest households. Figure 4.8 shows the distribution of respondents by their views.
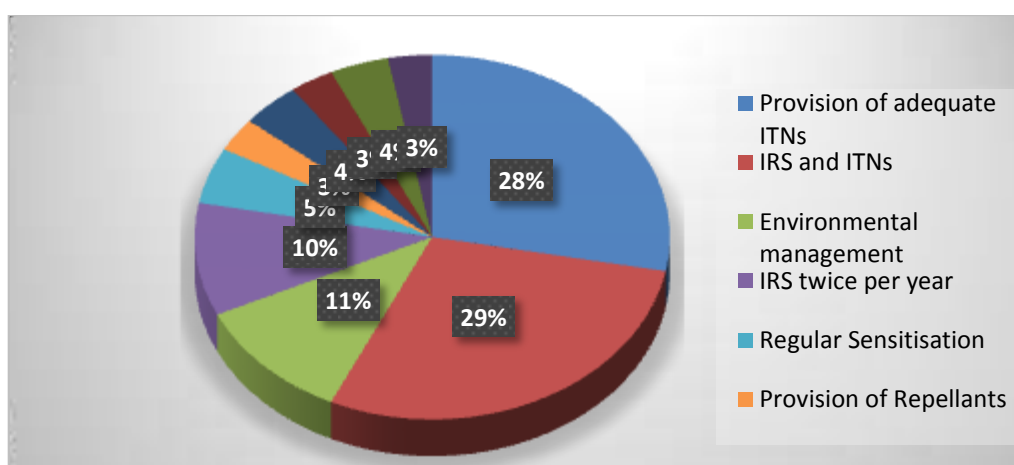
Chart 4.8: **Distribution of respondents by their views on what should be done to control malaria**

According to the statistics in Figure 4.8, majority of the respondents (57%) pointed out that there was need to increase the number of ITNs given to each household in order to adequately cater for bed spaces in each household. This means that the majority of the community members know and appreciate the use of insecticide treated nets as a preventive measure against malaria. However, the main challenge was the inadequate ITNs provided to the communities.

Key informants alluded to the fact that even if insecticide treated nets were freely given to community members by government and other cooperating partners, the inconsistent supply of insecticide treated nets made it difficult to replace the old ones and adequately cater for each and every household in their respective catchment areas. It was also established that situations where insecticide treated nets were not enough, priority was given to pregnant women and the under five children. Key informants pointed out that the inconsistent supply of insecticide treated nets compromised the utilisation and effectiveness of the measure in preventing and controlling malaria in the district because even if priority was given to pregnant women and the under five children, transmission of malaria continued as long as other household members were not protected. A lesson can be learnt from a study which was done by Carnevale et al (1988) in Burkina Faso where the mass and collective use of insecticide-treated nets reduced malaria incidence by 90% for all community members, even those not sleeping under the nets. The high net usage was sufficient to decrease the number of malaria-infected mosquitoes, such that malaria rates in the entire area were reduced. It is only with extensive use of insecticide-treated nets by community members that a significant reduction in mosquito population and thus further malaria burden can be realised.

The mosquito nets which were given to the community members were supposed to be re-treated by health authorities after six months or a year to enhance the efficacy of the insecticide-treated nets. But it was established that mosquito nets which were given to people were never retreated and that compromised the efficacy of mosquito nets. The argument is that there was need for insecticide-treated nets to be re-treated because mass distribution of insecticide-treated nets was done once every five years. The fact that the mosquito nets were not retreated, some people were hesitant to use the bed nets since they knew that insecticide-treated nets should be retreated regularly.

The study revealed that even if the majority of respondents said that they did use mosquito nets, in practice that was not the case due to a number of factors. These factors included geographical, economic, social, cultural and behavioral factors. It was found out that the biggest challenge with insecticide-treated nets as a measure to prevent and control malaria in the district was the underutilisation of the measure by community members; though there has been an improvement in recent years. One important factor which made people not to effectively use the mosquito bed nets was the unfavorable weather in the district. One health provider from Luangwa Boma Health Centre had this to say;

> *"Luangwa district is located in the Zambezi valley and as a result, the district records high temperatures the whole year round. Due to the excessive heat or hotness, most of the people usually spend their evenings outside their houses until when the temperatures reduce to optimum levels. The time when they are outside their houses, their bodies are exposed to mosquito bites because the female Anopheles mosquito which transmits malaria is known to be active between 22:00 hours and 04:00 hours, hence the high incidence rates of malaria recorded in the district".*

According to MOH (2010) studies conducted at TDRC, UNZA, and Macha Malaria Institute on the biting and resting habits of Anopheles showed peak biting hours between 02:00 hours and 06:00 hours. However, according to the studies from the mentioned institutions, vector bionomics may vary from site to site. For example, in Luangwa District, Anopheles gambiae was noticed to be biting in the early hours of the night between 19:00 and 21:00 hours. In contrast the Anopheles funestus complex species peak biting period was in the early hours of the day. The implication is that the mosquito bed nets are not fully utilized due to excessive heat; hence people are vulnerable to mosquito bites.

 NHC members and CHWs who were interviewed said that some community members especially women believed that ITNs caused suffocation to children and opted not to use mosquito bed nets to protect the under five children. The findings in this study are similar to findings in the study which was done by Nuwaha (2002) in Mbarara in Western Uganda where majority of the study participants especially mothers perceived

ITNs to be causing suffocation to children. Nuwaha (2002) argues that the perceptions could be due to the fact that the number of individuals staying in each household is high and this leaves little space and using the net increases on heat within the household. The research study in Luangwa District further established that every after a mass distribution of ITNs, a lot of community members complain of body itches when they use the new nets for a month and that could affect the effective utilisation of ITNs.

During the study, some community health workers proposed that if it were possible, Government could just introduce other alternative measures like mosquito repellants because ITNs were not properly used in their respective catchment areas where they operated from. The other observation was that the type of structures negatively affected the utilisation of ITNs in the district. The dwelling houses especially in rural settings were not big enough to accommodate the number of household members. This implied that congestion was common and affected the proper use of ITNs due to heat and inability to provide ITNs to all household members. In Nuwaha (2002) and Bashinyora (2010)'s studies, there are similar revelations where some local people were found not to be using the nets due to lack of space wanting to use the nets when they construct a bigger house.

The study further revealed that some beneficiaries of ITNs had a habit of selling the mosquito bed nets to buyers from the neighboring countries of Mozambique and Zimbabwe to generate income. This was confirmed by all the NHC members and CHWs who were interviewed and further argued that high poverty levels especially in rural settings made some community members to sell the mosquito nets which were given to them in order to generate income. As a result, the habit of selling the ITNs given to them compromised the utilisation in the community and that could contribute to high prevalence of malaria in the district.

The study also revealed that some community members used the ITNs to catch fish from Luangwa and Zambezi Rivers. Fishing was one of the main income generating activities in the district and the use of nets was the common method used to catch fish by some community members. As they carried out the fishing activities, some fishermen opted to use ITNs to catch fish instead of using the mosquito bed nets to protect themselves and their family members against malaria, hence, low utilisation of the measure. The findings of the study were confirmed by the District Fisheries Officer

who argued that since some fishermen did not use recommended fish nets but opted to use mosquito bed nets, the practice disturbed the ecological system because bed nets caught even the fingerlings (small fish) which are known to usually help to control mosquito populations by feeding on mosquitoes at the larval stage of their life cycle. The implication is that there was continued increase in population density of the vector (mosquito) in the district especially along the main breeding sites (Luangwa and Zambezi Rivers) as fingerlings continue to be depleted. There is need to further research on this potential biological control of malaria.

The other observation which was done during the study was that fishing which was one of the main income generating activities in the district was mainly done in the evenings and at night. That meant that fishermen and fish mongers spent most of the time outside their houses due to their occupation and did not utilise their ITNs to the fullest in order to protect themselves against malaria. The same challenge is with the peasant farmers in the district. It was found out that during the rainy season; most of the farmers spend most of their nights in their fields as they try to guard their fields against the wild animals that usually destroy their crops. The practice makes them to be exposed to mosquito bites at night since they do not sleep in their houses where they would use a mosquito bed net at night. Therefore, it can be argued that, mobile populations that shift seasonally for work (e.g. fishing and farming), pose a risk to themselves and to reintroducing malaria infection into their home communities.

It was also found out that many community members are involved in rearing chickens as an economic activities. It was a common habit by some community members to use insecticide treated nets to cover chicken runs as a way of protecting the birds from predators. The implication is the number of ITNs available is reduced and people remain susceptible to malaria infections.

The study further revealed that there were social cultural factors within communities that affected ITN utilisation in households with children. As it is part of the African culture, relatives and family friends pay constant visits and spend nights or even a few days in another household. Due to poverty, most households do not have capacity to have separate bed rooms for visitors. As a result, they disrupted the existing sleeping arrangements within the household. Even when you have children sleeping on a bed with a mosquito net, the culture allows that visitors within the household are given first

priority compared to children. This leaves children vulnerable to mosquito bites since they cannot hang the nets in the sitting room where there are no supportive mechanisms for net hanging. The practice affected ITN utilisation in households with children who are most vulnerable to malaria infections. As visitors come and go, mosquito bed nets may not be moved to ensure coverage of children as sleeping arrangements change and the relative status of house occupants varies (a child may be allowed to use his or her ITN only when no adult is visiting). The implication is that the child is exposed to mosquito bites that consequently cause malaria; hence accounting for persistent high incidence rates of malaria among the children despite widespread campaign on ITN usage. In his dissertation entitled, "An assessment of factors influencing access to and compliance with antimalarial measures in children under five years, the case of Iganga district", Kagaha (2008) argues that African tradition plays an important role in households when it comes to sharing of resources. He asserts that seniority in the household further precipitates the inability of the under-fives to properly and consistently use ITNs that initially are meant for them.

It should be noted that there were other social cultural factors that were found in the communities that disrupted sleeping arrangements and thus exposed people especially the under-five children to mosquito bites despite the fact that some of them may already be having ITNs. One community health worker from Mphuka pointed out that it was common practice in the community to find that when a family member dies, close relatives and neighbours spend a number of days mourning by spending the nights at the funeral home. This exposes mourners and especially children to mosquito bites since some of them do spend the nights with their mothers at funeral homes without any protection against mosquito bites.

The Public Health Officer indicated that the inconsistent use and misuse of insecticide treated nets needed close monitoring by the local leaders because it was difficult for the health authorities to monitor the use of the commodity. Therefore, it should be recognised that community and intra house dynamics in ITN use by the local people is complex and needs further inquiry since it is influenced by various social, economic, geographical and cultural realities. The success of ITN utilisation largely depends on how local people are able to cope with these realities and how policy makers and implementing organs understand these realities. Otherwise, continuous distribution of nets without proper knowledge on the community and intra house dynamics will

continue to offer little success in prevention and control of malaria in the communities, especially that now the main focus by Government is to eliminate malaria by the year 2021.

4.3. Utilisation of Indoor Residual Spraying (IRS) by the Local People

Government can provide IRS as a measure to prevent and control malaria but community members should accept and be willing to use the intervention if positive results were to be realised. Therefore, this section is a discussion on the extent to which the local people comply with and utilise indoor residual spraying. Distribution of respondents by utilisation of Indoor Residual Spraying is as shown in Figure 4.9.
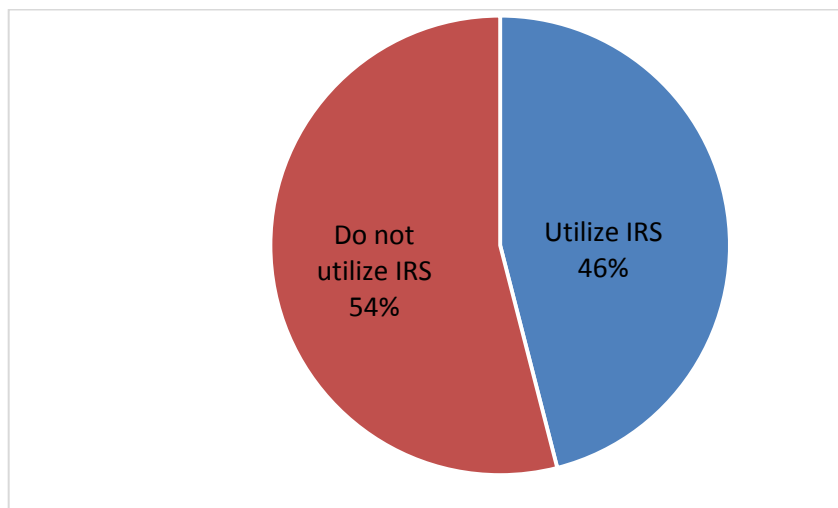
Figure 4.9: Distribution of respondents by utilisation of Indoor Residual Spraying

From the interviews, it was established that majority (57%) of the people were aware that IRS was being provided in the communities. It was also established that out of the 200 respondents who were interviewed, 46% said that they utilised IRS as a malaria preventive and control measure and 54% said that they did not use IRS. Therefore, according to the statistics, majority of the respondents did not utilise IRS even if the majority (57%) indicated that the measure was being provided by Government in their respective communities as shown in chapter three.

In view of the findings in figure 4.9, the researcher attempted to find out if other variables played a role to determine the utilisation of IRS by the local people. It was established from the analysis that out of the 90 respondents who said that they utilised IRS, 50% of males and 50% of females utilised the measure. Out of 106 respondents who did not utilise IRS, 49% were males and 51% were females indicating a marginal

difference between the two categories. Therefore, the quantitative data indicates that the sex variable played a marginal role to determine the local people's utilisation of IRS. The study further analysed the relationship between marital status and utilisation of IRS. It was established that out of 46 respondents who were single, 52% utilised IRS and 48% did not utilise. Out of the 126 married respondents, 45% utilised IRS while 55% did not utilise IRS. Among the remaining few respondents (28) under the categories of divorced, separated and the widowed, it is only the in the separated category where the majority utilized IRS.

According to Kalyalya, (1995), education is a vital tool in understanding issues at higher level. For people to understand issues there is need for them to have acquired formal education. As long as people are educated, it is likely that they will be able to understand IRS and the value of utilising it. In order to establish whether the level of education determined the local people's utilisation of IRS, a statistical analysis was done to establish the relationship. Out of 14 of those who never been to school, 40% utilised IRS and 60% did not utilise IRS. Out of 85 of respondents who went up to primary level, 44% utilised IRS and 56% did not utilise IRS. Out of 68 respondents who went up to secondary level, 44% utilised IRS and 56% did not utilise IRS. Out of 33 respondents who reached tertiary education, 58% utilised IRS and 42% did not utilise IRS. This presentation is summarized in Figure 4.10.
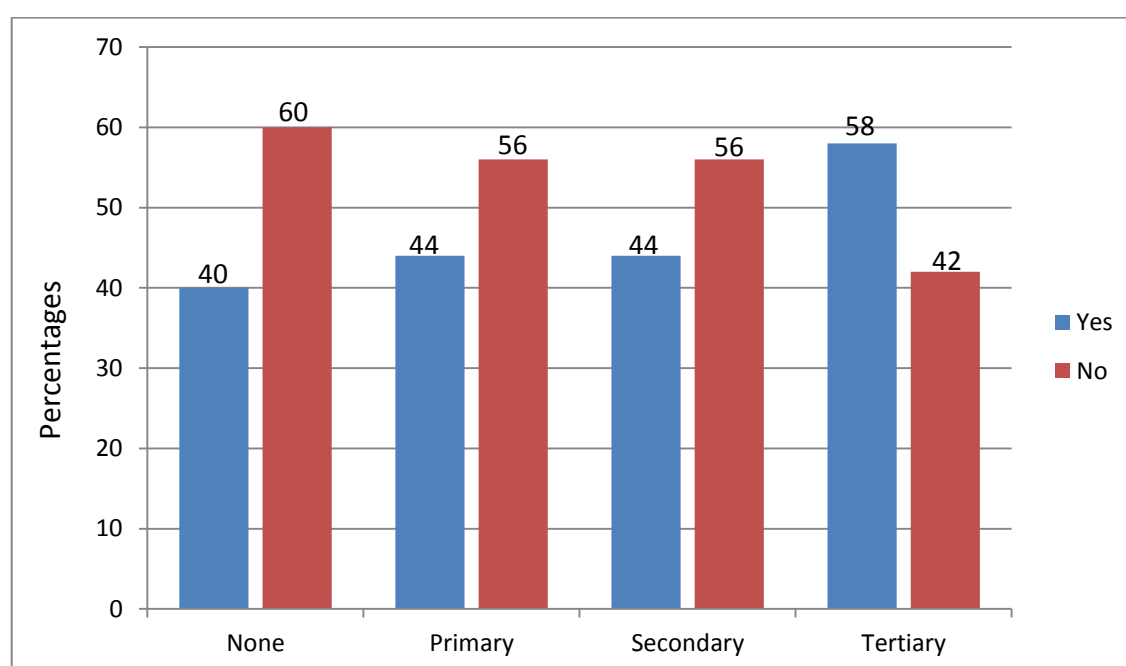
Figure 4.10: Indoor Residual Spraying utilisation by Level of Education

According to the statistics, it was established that a large number of people who never attained education, those who attained primary and secondary education did not utilise IRS but a large number of those who attained tertiary education utilised IRS. In other words, it could be argued that the majority of those who went up to tertiary level appreciated the use of IRS as a measure to prevent and control malaria because of their level of education attained. However, it can be concluded that the level of education played a marginal role in determining the utilisation of IRS because even majority of those respondents who attained secondary level of education did not utilise IRS just like those who never went to school. After analysing other variables (occupation, age and family size), it was found out that they too, played marginal roles in determining the local people's utilisation of IRS though the study revealed that the majority of those who attained tertiary education utilised IRS. Therefore, the researcher attempted to find out whether occupation played a determining role in the utilisation of IRS as shown in Figure 4.11
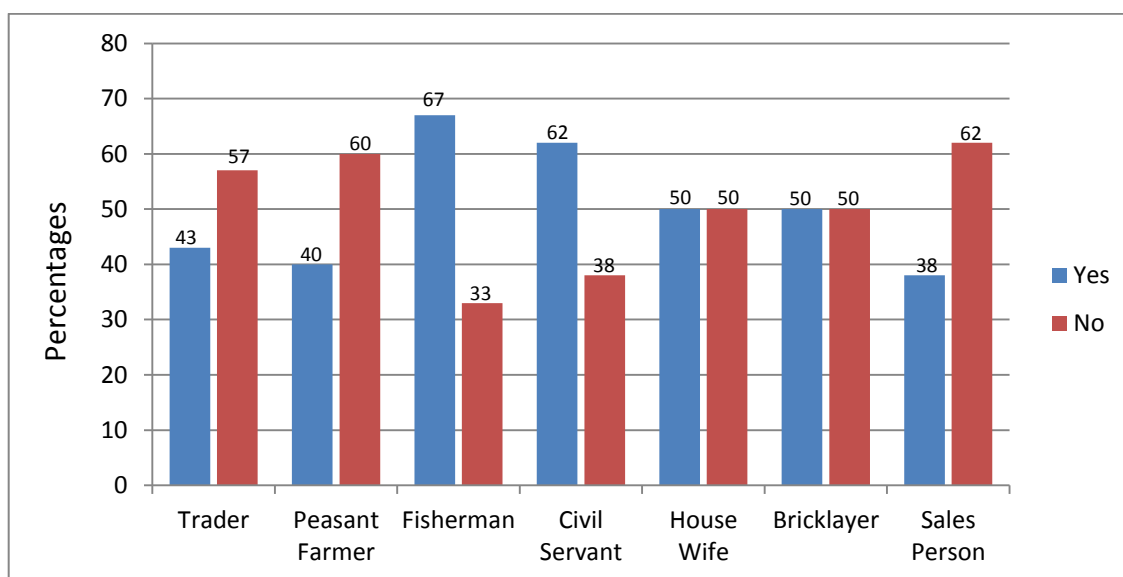
Figure 4.11: Indoor Residual Spraying utilisation by Occupation

According to the findings, out of 28 traders interviewed, 43% utilised IRS and 57% did not utilise IRS. Out of 96 peasant farmers, 40% utilised IRS and 60% did not utilise IRS. Out of 15 fishermen, 67% utilised IRS and 33% did not utilise IRS. Out of 29 civil servants, 62% utilised IRS and 38% did not utilise IRS. For the house wives and brick layers, in each category, 50% utilised IRS and 50% did not utilise IRS. Out of the 16 sales persons interviewed, 38% utilised IRS and 62% did not utilise IRS. According to the occupation variable, most of the people who utilised IRS were the fishermen and

civil servants at 67% and 62% respectively followed by the house wives and bricklayers at 50% utilisation. High utilisation levels among civil servants could be attributed to the level of education since it was established that the majority of those who attained tertiary education utilised IRS. Therefore, they understand and appreciate the value of utilising IRS as a measure to prevent and control malaria. Low utilisation was established among the traders, peasant farmers and sales persons. It can as well be argued that occupation also played a marginal role in influencing the local people's utilisation of IRS because we find the majority of fishermen utilising IRS even when they may be considered to have attained low levels of education. Interestingly, even the Public Health Officer complained that there was a lot of resistance against the use of IRS among the urban dwellers compared to those who live in rural areas. He further said that majority of the people who shun IRS services are the educated like civil servants and other community members with some form of formal employment.

When asked why their houses were not sprayed, respondents gave different reasons. As the chart below shows, 23% said that they did not utilise IRS because chemicals which were used as insecticides were poisonous and caused flu, cough, headaches and eye irritation. The study also established that 24% of the respondents argued that they did not have their houses sprayed because the programme was usually carried out just after the rainy season, the period during which they were busy in their fields preparing for the farming season. So whenever spray men visited them, no one was found in their homes hence their houses were not sprayed. This could be the reason why out of the 96 peasant farmers interviewed, the majority (60%) could not utilised IRS. 10% of the respondents said that they did not utilise IRS because no one was home when spray men visited their homes. They argued that sometimes, spray men carried out their activities during weekends when most of the community members went to church and as a result, their houses were not covered. Other respondents (23%) did not utilize IRS just because they believed that the chemicals attracted more house pests. The farmer responses are shown in Figure 4.12.
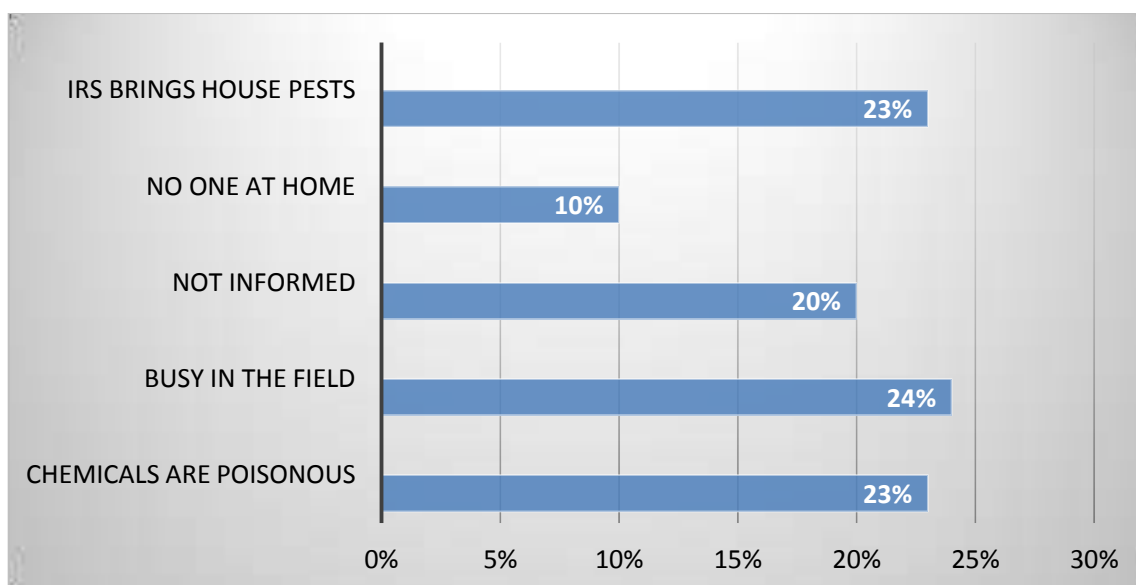
Figure 4.12: Distribution of respondents by reason why they did not utilise IRS

These findings were further confirmed with views from key informants who revealed that even if IRS was being provided by Government in the district, its utilisation was being hampered by a number of factors. Firstly, as stated in previous chapter, the IRS programmes were being carried out once in a year just after the onset of the rainy season. It was mentioned that the practice of conducting IRS once in a year due to inadequate resources, made it difficult to adequately cover all targeted structures in all their respective catchment areas in the district. The proposal from the majority of key informants was that IRS should be conducted just before the rainy season and just after the rainy season when there is plenty of water and vegetation conducive for mosquito breeding and high malaria transmission levels. One Environmental Health Technologist further argued that the inconsistent conduct of IRS programmes affected its utilization and promoted the development of insecticide resistance in mosquitoes. Secondly, from the time IRS was introduced, the operations are done once a year and only one type of a chemical (Actellic) is used. The argument is that according to National Guidelines for indoor residual spraying in Zambia, there is need to change the type of chemicals used for IRS after two years. It was likely that the use of one type of a chemical caused mosquito resistance against the chemical because majority of community members were complaining that even if their houses were sprayed, not all mosquitoes died. In other words, the argument is that the chemical was no longer as effective as it used to be and people were questioning its usefulness; hence, majority were not willing to utilize IRS. Thirdly, it was found out that some community members did not want their

houses to be sprayed because of the strong smell from the chemical used which lasts for a month. The argument is that, there was need to rotate chemicals used during indoor residual spraying operations as per government policy to deal with the challenges of chemical resistance in the vector and underutilisation due to the strong smell.

In some instances, IRS was not utilized local people were not available because of wrong timing since at times spray men carried out the exercises during weekends when people were in churches to worship. Another proportion of respondents (20%) said that they did not utilise IRS because they were not informed about the programmes hence spray men did not find anyone at home. That reaction from the local people could be because community participation was not enhanced to promote full involvement of the local people in the IRS operations. Studies have shown that most of the programmes that do not involve the community tend to fail (Sharp, 2002). The cited reason was that when the community is not involved from the onset of a programme, they feel that the services provided are imposed. The communities feel they do not 'own' the activities consequently tend to shun such programmes.

4.4. Utilisation of Health Facilities

The research study revealed that out of all the respondents who were interviewed, the majority (99%) said that they usually sought for medical attention at a health facility whenever they or any member of the household fell sick and only 1% said that they did not seek for medical attention at any health facility when they got sick as shown in Figure 4.13..
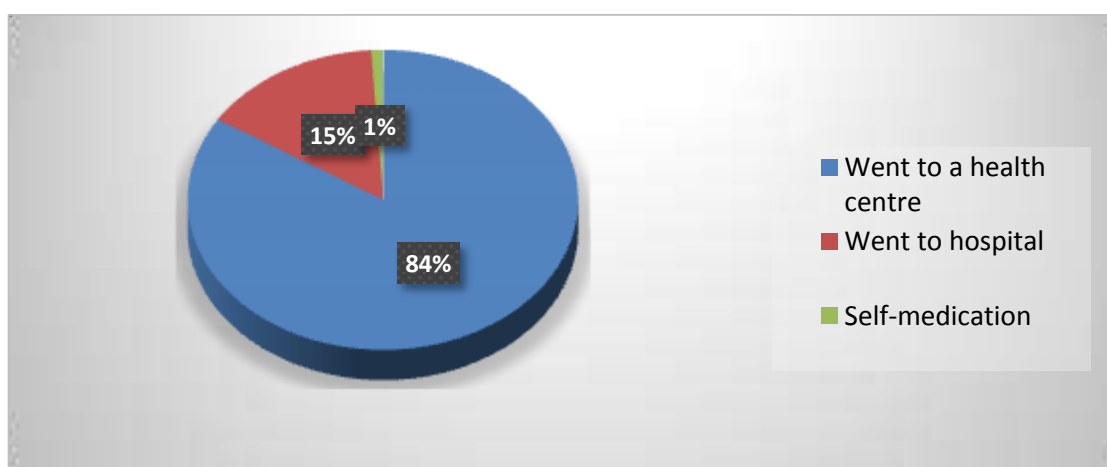
Figure 4.13: Distribution of respondents by utilisation of health facility

As the chart above indicates, the majority of respondents sought for medical attention from health facilities whenever they or any member of the household got sick. Out of all the respondents, 84% said that they sought for medical attention from a health center, 15% said that they went to hospital and only 1% had self-medication from their homes. It was further established from the data analysis that other variables like sex, occupation, marital status, age, occupation and level of education played a marginal or no role in determining one's behavior to seek for medical attention from health facilities when sick.

The findings of the study were further confirmed by key informants who revealed that majority of the local people usually utilised health facilities whenever they or any member of the household fell sick. That could be attributed to the fact that the majority of the local people were able to access the health facilities and services which the Government has continued to provide and therefore, they appreciated them. The study revealed that majority of people were able to access health facilities within the radius of 5km as per government policy due to the increased number of health facilities which have been built by government and its cooperating partners. In addition, there has been an increase in the number of people seeking for medical attention in health facilities.

However, majority of key informants pointed out that some local people still had challenges to access health services due to long distances which they had to cover before they reached health facilities especially in rural areas. The situation negatively affected the utilization of health facilities and that prompted them to resort to self-treatment in their homes. It was observed that there was an increased demand for health services due to the increased population in the district. It was further observed that some health facilities are old and have limited space to operate effectively, hence, the need to construct more modern health infrastructure. In addition, it was mentioned that some community members did not seek medical attention when they fell sick especially among pregnant women who were more vulnerable to malaria infection even when health facilities were within their reach.

One health provider from Mandombe Rural Health Centre had this to say;

> *"The only challenge is that some pregnant women do not appreciate the importance of attending antenatal clinics and seeking medical attention whenever they have signs and*

symptoms of malaria. Some pregnant women only attend antenatal clinic once, meaning that they fail to take all the three doses required for prevention of malaria in pregnancy and those are the mothers who develop complications during the delivery process".

It was further found out that cultural beliefs against announcing a pregnancy too early in the gestation also played a role in the failure to reach higher intermittent preventive treatment during pregnancy coverage, in addition to occasional sulfadoxine-pyrimethamine (fansidar) stock-outs at health facilities. The study further revealed that sometimes the local people shun health facilities because of non-availability of essential drugs and medical equipment. The implication is that there is reduced utilization of health facilities when people are given prescriptions when they seek medical attention.

4.5. Conclusion

It was established that the majority of the local people agreed that they utilised ITNs as one of the measures to prevent and control malaria in the communities. The study revealed that variables (age, sex, education, occupation, family size and marital status) played a marginal or no role in determining the utilisation of ITNs among the local people. However, even if the majority of the respondents said that they utilised ITNs, it was established that there were community and intra house factors which compromised the effective utilisation of ITNs by the local people as confirmed by key informants and some local people. These included geographical, economic, social-cultural and behavioral factors which needed further inquiry.

The research study revealed that the majority of the local people did not utilise IRS as a measure to prevent and control malaria in the district. It was found out that to a certain extent, the level of education played a role to determine the utilisation of IRS because among all the categories, the majority of the respondents who utilised IRS were those who had attained tertiary level of education. Even when it came to the occupational variable, it was found that the majority of civil servants utilised IRS, a category believed to have attained tertiary education. However, it was found out that resistance against IRS was more manifest in urban areas among the educated than in rural areas. It was established that other variables played a marginal or no role in determining people's utilisation of IRS.

It was also established that majority of the local people utilised health facilities whenever they or any other family member fell sick. This could be attributed to the fact that the majority of the local people had access to health facilities and appreciated the services. However, the study revealed that some local people had challenges to access health facilities and services due to long distances which they covered before they reached the nearest health facility especially in rural settings. Non availability of some essential medical equipment and drugs in health facilities make some local people not to seek medical attention at the facilities. The study further revealed that most of the health infrastructure were old and could not match the increased demand for health services. Hence, there is need to construct more modern health facilities. It was found out that there were other factors which could have led to the low utilisation of the measure by the local people. These included low coverage by the programme implementers, misconceptions about the programme, negative attitudes by the local people, inadequate sensitisation and low levels of community participation.

CHAPTER FIVE

NATURE AND EXTENT OF COMMUNITY PARTICIPATION IN THE PREVENTION AND CONTROL OF MALARIA

5.1. Introduction

In chapter four, it was established that there was low utilisation of some measures put in place by Government by the local people. This could be because people were not fully involved in the programmes which were being implemented to prevent and control malaria in communities. Studies have shown that most of the programmes that do not involve the community tend to fail. A study by Newberry and Jansen (1986) found that a project is much more likely to be sustainable if the community identifies with an initiative and feels that it is benefitting from its involvement and is seeing results. According to the Structuralist approach (guiding principle of this study); it is assumed that for the Luangwa District health delivery system to effectively provide quality health services, it should be decentralised. Decentralised administration entails the localisation of accountability for the delivery of health services to the community, leading to community participation in the provision of health services. According to the Structuralist approach, domestication of the health system is the second specific aspect of behaviour. This approach tries to achieve quality health care through the strategy of prevention and health promotion. It is further argued that this strategy can only be successful if society participates-no health for all unless all for health.

The proponents of Decentralist theories argue that in order for central government to respond to diverse local needs and interests, it should devolve power, functions and resources to local governments (e.g. councils and departments for line ministries) which are best suited to effectively deal with local needs and problems. Therefore, the bottom-up approach in the governance system is highly favoured. Furthermore, the theorists argue in support of autonomous and elected local authorities or governance structures at the local level for effective participation of local communities in the governance system (Lolojih, 2008)

The persistent high burden of malaria significantly affects both communities and countries. Evidence illustrates the significant damage that malaria does, in economic terms alone, by retarding national development. In personal terms, the effects on families and communities are devastating. Significant progress in the reduction of

malaria cannot be made without giving first consideration to those most affected by the disease. Therefore, community participation in malaria interventions is essential and the community must be empowered to make changes for its own welfare. Communities must attempt to move away from the unsustainable position of being mere recipients of services, resources and development interventions towards being active partners, or owners of the interventions (World Bank, 1996). Participation promotes self-awareness and confidence, causes people to examine their problems and to think positively about solutions.

Therefore, chapter five is a discussion on the nature and extent of community participation in the control of malaria in Luangwa District, as intended by specific objective number three. This is divided into three sections. The first section is the introduction. The second section looks at nature and extent of local people's involvement in malaria control activities and the third section is the conclusion.

5.2. Nature and extent of local people's participation in malaria prevention and control activities

During the research study, respondents were asked if they were involved in any activity to prevent and control malaria in their respective communities. Out of the 200 respondents, 72% said that they were involved in one way or another in activities to fight against malaria and 28% said that they were not involved in activities to fight against malaria in communities as shown in Figure 5.14.
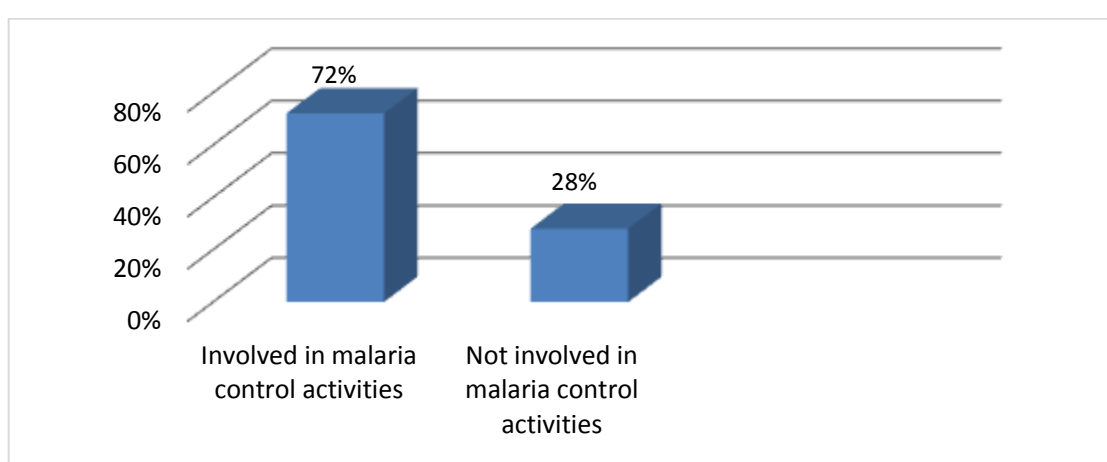
Figure 5.14:   Distribution of respondents by their involvement in malaria prevention and control

The statistical data shows that the majority of the respondents indicated that they were involved in one way or another to prevent and control malaria in their respective communities. That was irrespective of the nature and level of participation in the prevention and control of malaria in their communities.

In order to understand the nature of community participation, respondents were further asked how involved they were to prevent and control malaria in the communities. The study revealed that out of all the respondents who said that they were involved in community activities to prevent and control malaria (145), 79% were involved in the use of ITNs/IRS, 9% said that they were involved in ITN/IRS programmes, 2% said that they were involved in monitoring, 4% said that they were involved in supervision and 6% said that they were involved in bush clearing and digging rubbish pits. The statistical data shows that the majority of respondents were involved by use of ITNs/IRS basically as measures which were being provided by Government. There was low participation in ITN/IRS programmes, monitoring, and supervision and in environmental sanitation activities like bush clearing and use of rubbish pits as indicated in Figure 5.15.
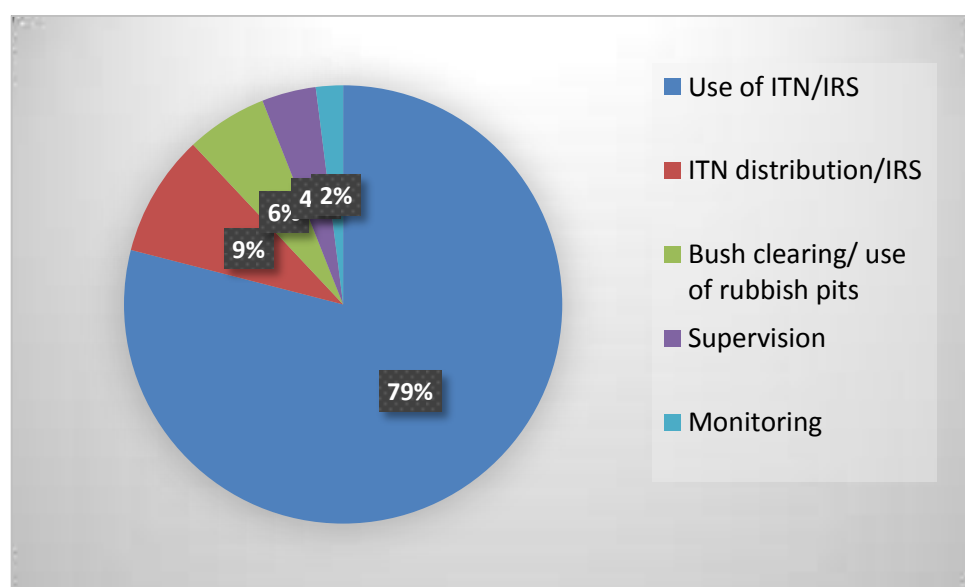
Figure 5.15: Distribution of respondents by nature of participation in malaria prevention and control

Further analysis was done to assess the level of community participation in the prevention and control of malaria. The researcher looked at the first level of community participation whose indicators are planning, implementation, supervision, monitoring,

evaluation and training. The second level is community involvement in the use of home management methods to prevent malaria. These methods include use of ITNs, use of insecticides, use of mosquito coils, doors/window netting, antimalarial drugs, repellant creams and wearing long sleeves. The third level is community participation in environmental sanitation activities like bush clearing, clearing refuse dumps, sewerage, drainage of gutters and larviciding.

The study established that there was very low or no community participation in the first level. Only 9% of the respondents indicated that they were involved in ITN distribution and IRS programmes (implementation stage). Only 4% of the respondents said that they were involved in supervision and 2% said that they were involved in monitoring of malaria control programmes. It was established that there were no respondents who said that they were involved in planning, evaluation and training. The local people who were involved in ITN distribution and IRS programmes were mainly NHC members and CHWs as was confirmed by key informants. The fact that the majority of the local people were not involved at that level, it can be suggested that even their involvement in decision making was nonexistent. The local people were just made to be mere recipients of the services which were provided by programme implementers. The implication is that the local people feel marginalized and in future, they may not be willing to participate in developmental programmes.

The majority of the community members (78%) held the view that despite the fact that some members have been participating in various malaria control activities and indirectly through their local health committees, the level of participation leaves much to be desired. For most of the members, the participation of the community has been a reaction to what the health officials would like them to do. This was reflected in most of the arguments put forward by the majority of those who voiced their opinions during the interviews. For example, one participant made the following statement;

> *'They always come here to tell us what they intend to do but how they arrived at such decisions is not something we have any means to know'. (Female: Local Head woman)*

Others added:

> *'It is all good for them to contact us after they have taken a decision and come to seek our support but what I would have liked is to have us during the time of decision making'. (Male: Community Based Distributor)*

> *'Although we have our community health committees, they only bring us into the discussion when they have made a decision on how they want us to give our support. I find it wrong'. (Female: Community Health Worker)*

> *'We are only to obey what they tell us to do but nobody comes to say, this date or that date we want you to come so we can all decide on what is best for you'. (Female: Malaria Agent)*

> *'Often when the health officials who come here…. I think they purposely come here to make us know what they intend to do which is not the same as asking for our opinions'. (Male: Local farmer)*

However, from the perspective of a minority group within the interviewees (22%), it was noted that although they did admit that there was only consultation, they were satisfied with the type of participatory approach that was adopted. During the interview, various assertions were made by the interviewees. For example, one of the responents said:

> *'Definitely, we are not considered at the initial stages of the planning process, but when it comes to health, it is good that doctors, nurses do the planning'. (Male: Local fisherman)*

In addition, a local bus driver also expressed his concern, saying:

> *'I think we do need these experts to decide for us, especially on complex health issues that affect our lives like malaria. I think it will be wrong to let us decide on our own'. (Local bus driver)*

Finally, at the time of the interview, another participant said:

'They are trained to do that job and we are only to support them.
So consulting us alone for me is fine. (Female: Local shop owner)

The views expressed above by the community members reflect two divergent but important fundamental views regarding how the concept of community participation is understood. Firstly, there were those who (22% minority views) acknowledged that community participation had been minimal, but nonetheless accepted it to be a step in the right direction. For them, if there was any participation at all, it should be as a reaction to the wishes of the health experts. This perception of participation agrees with the narrowest level of Rifkin's (1969) idea of health which is considered to be a condition where there is no existence of illness (the medical approach). In this context, community participation is described as being a process whereby community members perform certain tasks such as providing a healthy environment within a community under the directives of health experts. What this means is that community members are only service users and must, therefore, follow the orders provided by the professionals without taking part actively in health issues that affect them. Thus, with regard to malaria control, some members within the community wanted to be passive when it comes to decisions that affect their own health. They preferred, instead, to leave such a task in the hands of the health experts whilst following their orders.

In contrast, the second group, (78%), i.e. majority view) saw community participation in wider context and perceived community participation to be the community members' involvement in malaria control programmes without necessarily resorting to dictates of health experts. This way of seeing community participation is consistent with the second approach of the Structuralist health theory which is called the health service approach. With this approach, community participation is viewed in the wider context as the mobilisation of community people to take an active part in the delivery of health services (Rifkin, 1969). To this group of people, decision- making regarding malaria should not be left solely in the hands of health professionals; instead, the community members should also be involved. This is in contrast to the minority group who argued that because of the complex nature of health and, for that matter, malaria; decisions should not be left to anyone other than the health professionals. This seems to suggest that the second group's majority opinion exemplifies the belief that the definition of health should not be merely the absence of disease (the medical approach), but should

rather have the broader meaning of the word, which involves 'the physical, mental and social wellbeing of the individual' (WHO, 1978).

The findings were further confirmed by most of the arguments made by some of the key informants during interviews:

'We consult them when it is necessary and it is not always the case that their decisions are acted upon in the process'. (Male, Environmental Health Technologist)

'I am not surprised that the community members are sidelined when it comes to the final decision on priorities because it is the government who has the resources. It is a pity but that is the reality of the situation'. (Male, NHC Chairperson)

'We consult them when it is necessary and it is not always the case that their decisions are acted upon in the process'. (Male, District Malaria Focal Point Person)

These arguments confirm that the final outcome of the malaria control programme activities do not represent the views of all those involved. The general picture that one can get from these arguments is that when it comes to the planning process, the inclusion of community members' priorities, as well as the chances to explore the cultural significance of their views, is lacking. Such limited participation by the communities can lead to the neglect of important sources of lay knowledge particularly to local decisions. This raises a question as to whether community participation in malaria control programmes at the local level is a means or an end. From the above analysis, it is fair to say that the community participation in the malaria control programmes may be described aptly as a tool for the attainment of the needed goal of the health authorities through the use of the community's own resources (a means). This is in contrast with having communities themselves becoming more involved in developing their own capabilities in order to achieve the desired goals (an end) without being dictated to by the health officials.

That could explain why there was low utilisation of some measures put in place to prevent and control malaria in communities because the local people were not taken on from the inception of programmes as partners who were supposed to examine their problems and think positively about solutions. According to World Bank (1996), true participation means the involvement of the people concerned in analysis, decision making, planning and programme implementation as well as in all activities.

The study findings were further confirmed by findings from NHC members and community health workers who were interviewed and said that their involvement included mainly sensitisation of communities on how to prevent and control malaria, community mobilisation, ITN distribution and IRS. So, even the NHC members who were the link between the communities and the health authority were not fully involved when it came to issues of decision making, despite the fact that among their responsibilities, they were supposed to be involved in planning, implementation, monitoring, evaluation and training.

It was also established that out of 145 respondents who participated in malaria control activities 79% were mainly involved in the use of home management methods to prevent malaria. At this level the respondents said that they were involved by mainly using either ITNs or IRS or both to prevent and control malaria in the communities, the measures which were being provided by Government. It can be said therefore that there was high community participation in home management methods to prevent and control malaria. However, that in itself does not mean that the majority of the local people were fully involved in malaria control activities in communities because their participation was mainly in the utilisation of the measures implemented by Government. The implication was that, in a situation where the Government did not provide ITNs and IRS, majority of the local people may not have been involved in malaria control activities. Yet according to WHO (2002), community participation is a process by which people are enabled to become actively and genuinely involved in defining the issues of concern to them in making decisions about factors that affect their lives, in formulating and implementing policies, in planning, developing and delivering services and in taking action to achieve change. People were supposed to be involved from the earliest stages of the development process as opposed to simply asking their opinions of project proposals that have already been developed, or for their contributions to the implementation of projects imposed from outside. In other words, the local people were mere recipients of services.

The study further established that community participation in environmental sanitation was very low because out of the 145 respondents who said that they were involved in malaria control activities, only 6% said that they were involved by clearing bushes around their homes and use of rubbish pits. None of the respondents indicated that they were involved in other environmental management practices like drainage of gutters,

clearing refuse dumps and larviciding. High vector (mosquito) populations could as well be attributed to low community participation in environmental management, hence continued high cases of malaria recorded.

Further analysis was done to establish the relationship between community participation and variables like sex, age, family size, marital status, occupation and the level of education. The researcher attempted to find out whether the sex variable played a role to determine respondents' participation in malaria control activities and the responses were as shown in Figure 5.16.
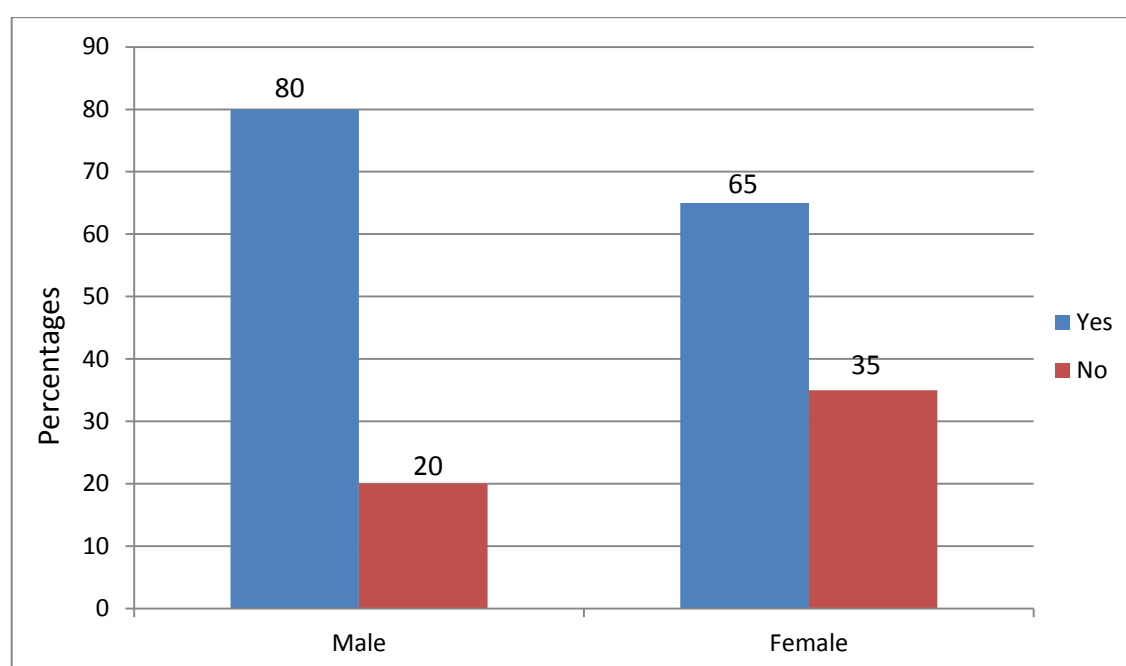
Figure 5.16: Community participation by Sex

The study revealed that out of 101 female respondents, 65% said that they participated in malaria control activities and 35% did not participate. Out of 99 male respondents, 80% said that they participated and 20% did not participate. Following the statistics, it was established that in both categories of the sex variable, the majority of respondents participated in malaria control activities in their respective communities. Therefore, it can be said that sex played a marginal role in determining people's participation in malaria control activities. However, it was found out that there was slightly a higher percentage of males who participated in malaria control activities compared to females. The implication is that there is need to encourage more women to fully participate in malaria control activities since they are the ones together with children who are most affected by malaria as a disease, especially when they are expecting (pregnant).
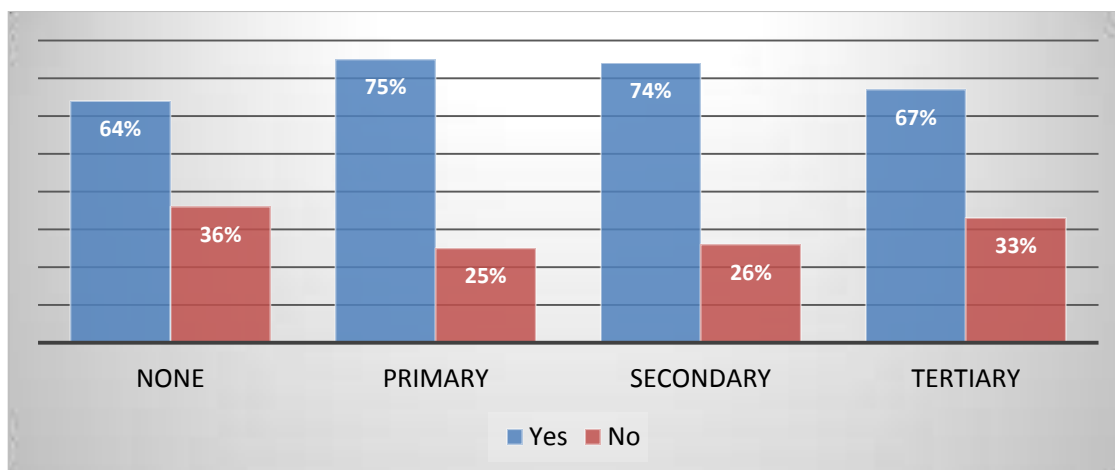
Figure 5.17: Community participation by Level of Education

When people are educated, it is expected that they understand issues more than those who are not educated. Kalyalya, (1995), argues that education is a vital tool in understanding issues at higher level. Thus, an analysis was done to establish the relationship between level of education and community participation in malaria control activities. It was established that for those who never went to school, 64% participated in malaria control activities and 36% did not participate. Out of 88 respondents who attained primary level of education, 75% said that they participated in malaria control activities and 25% did not participate. Out of the 68 respondents who attained secondary level of education, 74% indicated that they participated while 26% did not participate. Out of the 33 respondents who attained tertiary level of education, 67% said that they participated and 33% did not participate. The statistical data shows that in all categories of the education variable, the majority of the local people participated in malaria control activities in their respective communities. From the data analysis, the educational variable played a marginal role in determining the local people's participation in malaria control activities in communities.

So far, it has been found out that sex and education played a marginal role in determining people's participation in malaria control activities. This could mean that probably other factors might have influenced people's attitudes towards being involved in malaria control activities. Therefore, an analysis was done on the occupation variable to determine whether it played a role to influence people's participation in malaria control activities. Out of the 29 traders who were interviewed, 64% participated and 36% did not participate. Out of the 99 peasant farmers interviewed, 76% said that they participated and 34% did not participate. Out of the 15 fishermen, 73% participated and

27% did not participate. Out of 29 civil servants, 69% said that they participated and 31% did not participate. Out of the 10 house wives interviewed, 80% participate and 20% did not participated. 90% of bricklayers participated and 10% did not participate out of the 10 respondents. Out of the 6 sales persons, 83% said that they participated and 17% did not participate. According to the statistical data, in all categories of the occupation variable, majority of respondents said that they participated in malaria control activities. Hence, occupation did not influence people's participation in malaria control activities in communities.

An analysis was also done to try and find out if age played a role in determining people's participation in malaria control activities. Out of 37 respondents aged below 25 years, 65% participated in malaria control activities and 35% did not participate. Out of 84 respondents aged 25-40 years, 73% participated and 27% did not participate. Out of 49 respondents aged 40-50 years, 80% participated and 20% did not participate. Out of 23 respondents aged 50-60 years, 65% said that they participated and 35% did not participate; and those aged above 60 years, 86% participated and 14% did not. It can also be said that the age variable played a marginal role in influencing people's participation because in all categories, majority of respondents indicated that they participated in malaria control activities in communities.

For the marital status variable, out of 47 respondents who were single, 64% said that they participated and 36% did not participate. Out of 123 respondents who were married, 76% said that they participated and 24% did not participate. Out of 9 respondents who were divorced, 44% participated and 56% did not participate. Out of 9 respondents who were on separation, 89% participated and 11% did not participate. Out of 12 respondents who were widowed, 75% participated and 25% did not participate. The study revealed that in all categories of the marital status variable, except for the divorced, majority of respondents participated in malaria control activities in the communities. Thus, marital status played a marginal role in influencing people's participation in malaria control activities.

As indicated earlier on, the study also found out that out of the 200 respondents, 28% said that they were not involved in any community activities to fight against malaria. Thus, the researcher attempted to find out the reasons why they were not involved in malaria control activities. When asked why they were not involved, they gave various

reasons. Out of the 55 respondents who did not participate in the fight against malaria; 44% said that health authorities did not involve them, 42% said that they were not involved because they were busy or concerned with their personal issues, 2% said that they were too old to be involved, 3% said that it was difficult to control malaria and 9% of the respondents did not give any reason. From the findings, it can be said that there was a feeling among the local people that programme implementers did not want to involve the local people in malaria control programmes. Some respondents argued that even when it came to the implementation of some malaria control programmes like ITN distribution and IRS, programme implementers could only select those people they knew or relatives to be involved in the programmes. Therefore, if the local people were not fully involved as partners or owners of interventions, the implication is that they felt alienated and hence developed lack of interest (apathy) in issues that affect their lives.

There are a number of experiences in other countries where some lessons can be drawn concerning community participation. Education programmes have been used in many situations to increase community understanding and participation in malaria prevention and control activities. In India, one programme used folk theaters to teach people about malaria control and prevention. This activity led to a significant increase in knowledge and participation in bio-environmental malaria prevention and control activities (Ghosh et al, 2006). According to Yasuoka et al (2006), in Sri Lanka, participatory exercises were conducted in the field to identify mosquito breeding sites. Opiyo et al (2007) argues that an integrated vector management programme in Kenya taught community volunteers how to identify larval mosquitoes using live specimens. Additionally, the farmer field school is an important example of a successful integrated vector management education programme targeting agricultural areas. This field school curriculum includes participatory exercises to identify mosquito breeding habitats, sample and identify adult mosquitoes, observe their larval stages, learn techniques for source reduction and suppression of mosquito breeding, and map the village to identify areas to focus coordinated environmental management efforts (Vanden-Berg and Knol, 2006). All the above programmes were all successful in increasing community knowledge and participation in effective malaria prevention and control techniques. According to WHO (2002), true participation means the involvement of the people concerned in analysis, decision making, planning and programme implementation as well as in all the activities. As long as the local people are not taken as partners in

issues that affect their lives, like malaria, they will always avoid participation in any programme implemented in their communities. Just like it was established that 42% said that they were too busy with their personal issues to be involved in malaria prevention and control activities.

The findings above were further confirmed by views from the key informants who said that generally the level of community participation in malaria prevention and control activities was low though there has been an improvement in recent years. The Public Health Officer indicated that just like it is with IRS, there is high unwillingness to participate in malaria prevention and control activities among the urban dwellers than those living in rural areas who are the most affected. It was further mentioned that participation has been found to be very low among the educated. He however, said that but due to sensitisation, there has been an improvement in community participation in malaria prevention and control activities in recent years. NHC members and CHWs who were the key informants who worked closely with the local people said that community involvement was mainly in home management methods used to prevent and control malaria. They confirmed that the local people were involved in malaria prevention and control activities like the use of ITNs, insecticides, antimalarial drugs, repellant creams, and wearing long sleeves.

Majority of key informants confirmed that a few local people were involved in environmental sanitation like bush clearing and digging rubbish pits for refuse management. The implication is that there is need to seriously engage the local people in environmental sanitation because it is the key approach to prevent communicable diseases like malaria. It was also established that some local people were also involved in attending community meetings concerning malaria prevention and control. But, some NHC members and CHWs complained that even when people were encouraged to attend meetings to discuss various health issues which affected them like malaria, there was usually general apathy towards meetings especially among the male folk. They further said that community members were only seen to be active and willing to attend meetings during mass distribution of ITNs and public events like World Malaria Day. As a result, it was difficult to adequately engage the local people in order to know their needs or problems they were facing and later on involve them in problem solving by making right decisions towards their problems.

However, the Acting District Health Director (DHD) and health providers mentioned that in an effort to enhance community participation and promote a 'bottom-up approach' in terms of planning and decision making, there were structures which were established at district level. Luangwa District had nine health centers, meaning that there were nine catchment areas. Each catchment area was divided into zones depending on the size of the catchment area. In each zone, there were NHCs and Village Health Committees (VHCs) which were established. NHCs are committees which consist of community representatives from surrounding villages and are responsible for facilitating linkages between the communities and the health system at the community level. Some of the NHCs' responsibilities include dissemination of information on public health issues, and mobilisation of communities to participate in health sector planning, management, and monitoring and evaluation.

It was further established that in addition, village health committees, with assistance from community health workers, malaria agents and Safe Motherhood Association Groups (SMAGs) formerly known as Traditional Birth Attendants were responsible for the implementation of demand-driven malaria interventions and malaria prevention and control activities. The VHCs were usually headed by village headmen or headwomen who are important local leaders at that level to mobilize the local people in order for them to participate in malaria control programmes. Community health partners like CHWs, malaria agents, Community Based Distributors and SMAGs are also selected and appointed from within respective communities. These are key in providing guidance, sensitisation and assistance to community members on basic health care interventions, for various health problems including malaria. There are also community volunteers who are trained in basic identification of, prevention and referral methods for common illnesses like malaria.

Nonetheless, the Acting DHD and health providers argued that, at times it was difficult to involve the local people in critical issues of decision making like planning, monitoring and evaluation because of the low level of education among the majority local people especially in the rural areas. Because of the low level of education, they failed to articulate issues in some situations where they were needed to participate fully. The Acting DHD and all health providers emphasised that there was need to seriously capacity-build the local people so that they were able to fully understand health issues which affected them like malaria and enhance participation.

The argument by the Acting DHD were confirmed and supported by the few health officials (health providers) who believed that participation had taken place. The health providers argued that, faced with the constraints within the various districts, all of the institutional mechanisms that had been put in place at the community level were the ideal way to consult the community members. Arguments made in support of this claim reflected the views that the complex nature of the concept 'participation' had made the issue more difficult to handle. This can be seen from the following statements:

'Participation is a "subtle concept" and it can be interpreted by different people in various ways, so it all depends upon how one views it'. (Female: Registered Nurse)

'If we do not communicate to them, how can we even get their views? They have representatives and all of them are invited to attend some of the general meetings'. (Male: Environmental Health Technologist)

'We expect their representatives to consult their local people before they come and we believe that whatever they present here reflect the views of the community'. (Male: Clinical Officer)

'We have selected community health committee members who are frequently consulted. These committee members act as the voices for the community. So, yes, they are part of the process although we make the final decision'. (Male: District Malaria Focal Point Person)

The above arguments suggest that through the established structures, provision has been made for the community members to participate in the planning process, of which authorities at the higher level are aware. To these officials, with the structures in place, there is an opportunity given to the community members to participate in malaria prevention and control decision-making process through their representatives. However, the argument is that those structural mechanisms were not the initiative of the local people, but rather they were imposed by the health authorities. Furthermore, the study revealed that even those who are selected to represent the people in the community are not involved when it comes to decision making, apart from being informed about what the authorities intend to do. Therefore, it can be argued that the local people's participation in malaria control is merely tokenistic in nature because people are only informed about malaria prevention and control programmes.

Some lessons can be learnt from experiences from other countries concerning the arguments put across by some key informants. According to World Bank (1996), the World Bank-supported Albania Rural Poverty Alleviation Project, rural farmers were asked to collaborate in testing the suitability of methods for rehabilitating the infrastructure and providing credit to their communities. Government officials had always believed that involving rural farmers in designing such a project was a waste of time because villagers 'knew nothing' about complex issues such as credit delivery mechanisms. The World Bank and the villagers designed a pre-pilot project, set criteria and created implementation arrangement. The resulting social fund mechanism, which incorporated village credit committees and community-generated proposals for infrastructure funding, proved effective in reaching communities and building local capacity for participatory decision-making. Government officials were convinced and pushed the World Bank for a larger project. This shows how pilot projects can be used to demonstrate the effectiveness of participatory planning among villagers and so improve acceptance by other partners (government officials in this case).

The Structuralist health approach emphasises that an effective health delivery system adopt planning based on "power with" and not "power over". That is, managers of the health systems have to spend most of their time interfacing with communities and other organizations in order to build cross-agency coalitions which can enable them formulate new possibilities in regard to processes of innovation and change (Battilana, 2006). However, the revelations of the research study are that the local people are not involved from the inception of malaria prevention and control programmes when it comes to planning. District health managers have adopted planning based on "power over" and not "power with". The local people are mere recipients of the programmes which are introduced by programme implementers. The implication is that the local people may not be willing to fully accept the programmes when they are implemented because their inputs are not brought on board at the planning stage.

A study which was done by Chilaka (2005) in five African countries in a Roll Back Malaria Initiative programme, found the practical reality of community engagement in malaria prevention and control to be generally low. The use of the preventive measures is definitely affected by community's definition of their priorities regarding health and the illness and the degree to which individuals think they can personally control or prevent the illness. Thus, community participation in malaria interventions or measures

is essential and the community must be empowered to make changes for its own welfare.

The study further revealed that despite the establishment of structures at district level for effective delivery of health services, community participation was not fully attained due to lack of the implementation of the decentralisation policy at district level. In the year 2015, government issued a circular which gave instructions that all devolved functions from Central Government including the Health Department were supposed to move to the Local Authority (Council) as one way of shifting functions, resources, decision making from Central Government to Local Government and enhancing community participation at district level. Community participation was expected to be enhanced through the establishment of the Area Development Committees through which the local people would make decisions pertaining to development issues in their respective communities. However, during the study, it was found out that the devolved functions like the Health department had not yet fully moved to the Local Authority and the Area Development Committees had not yet been fully functional. Such a situation would not promote the local people to fully participate in matters that affect their lives like health since decisions were still centrally made.

The Public Health Officer had this to say on the implementation of the decentralisation policy:

"Community participation can only be enhanced if the decentralisation policy is fully implemented at district level. In Luangwa district, decentralization has not been implemented because even the Health department which is one of the devolved functions has not fully moved to the Local Authority".

This study finding reflects the extent to which community members are given the chance to voice their concerns regarding malaria prevention and control activities in Luangwa District. There have been underlying variations in the definition of community participation by those involved in malaria prevention and control programme activities which have given rise to convergent perceptions.

On the one hand, the perspective of the local officials is that, there has been community participation. To them, as long as community representatives from the community are invited to attend meetings, the community members are participating in malaria

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prevention and control activities. It is felt that these representatives represent the interests of the community and therefore have the opportunity to bring their communities' concerns to the discussion table.

On the other hand, there are those who think that there has been limited involvement of communities in the planning process. Some interviewed key informants which included health providers agreed with the idea that when community groups are invited to participate, the ultimate real decisions are still in the hands of the health officials. There is, therefore, none of the empowerment and effective participation which the national policy of decentralisation purports to achieve.

This raises a question as to whether community participation in malaria prevention and control programmes at the local level is employed as a means or an end. From the above analysis, it is fair to say that the concept of community participation offers no opportunity to community members to attain real power at the local level planning process. Yet according to the Structuralist health approach, an effective health delivery system should adopt planning based on "power with" and not "power over". Instead, the community members, including their representatives, only play, in the words of Arnstein (1969) a ritual role. They are not permitted to have control over their own health situation but rather are coopted into direct forms of participation which are in essence inactive, passive and, eventually, a convenient way of controlling participation- the participation is not really intended to have any significant input from the community members toward the decision-making process.

From the context of Arnstein's (1969) ladder of participation framework, such participation can be regarded as tokenistic and the highest quality of participation is at consultation levels. This only guarantees the provision of information and consultation on issues and it neither leads to community empowerment nor ensures direct incorporation of inputs from the communities into the malaria control programmes and policy-making process. This implies that the communities are only used as tools (means) for achieving policy goals rather than being the actual decision makers (an end) regarding their local health problems.

Overall, the findings have highlighted some key issues which demonstrate that successful implementation of the community participation strategy in the malaria prevention and control has not yet taken place. In essence, despite the fact that the

process and the right to participate maybe devolved to the local level; the community's influence, which could mould and challenge policy development, as well as supervise the outcomes, is still in the hands of health authorities. This is in contrast to the Structuralist approach which looks at decentralised administration as the localisation of accountability for the delivery of health services to the community, leading to community participation in the provision of health services. However, what the health officials fail to realise is that participation is not merely about having the opportunity to consult or being informed about policy outcomes or attending meetings, but also about having the power to control inputs which would otherwise have been controlled by others who may or may not address the communities' priority (Bandesha et al, 2005).

These findings also reflect the power relationship between the community (weak) and the health expert (strong). To adopt this kind of 'induced' form of participation means that communities only accept ideas on local development that have been developed for them by health authorities instead of the members developing these ideas by themselves.

Community members thus only participated in the malaria prevention and control programmes when the health authorities had to inform them about certain activities rather than engaging with them regarding programme plans. Consequently, the community members had no power to influence negotiations and, under this type of participation, it can be argued using Arnstein's (1969) words that community participants seem to be participating in malaria prevention and control programmes solely to give backing to government's decisions. In addition, the health authorities only consulted the community members by organising general community meetings, but there was no guarantee that their suggestions and inputs on priorities would be considered or acted upon in the final priority selection. This kind of participation, in the words of Arnstein (1969), is regarded as 'placation'. In effect, participation by the communities could be deemed merely ceremonial noting that as malaria prevention and control programmes still bear all the features of a top-down system of decision-making.

This is in contrast to Hunter's (1989) Structuralist health approach that 'planning takes the perspective of interactive, adaptive and mixed planning'. In this case, citizen participation should involve the exchange of power through a mechanism which could promote the interests of communities in the policy processes. Participation that does not

give power to the local community members can be considered to be a fruitless exercise which leads the members nowhere and only maintains the status quo.

On the whole, using Hunter's (1989) Structuralist health approach, it is fair to say that rather than being a reality, full community participation has not been effected because of lack of localisation of accountability for the delivery of health services to the community. Using Arnstein's (1969) ladder of participation, the level of community participation in malaria prevention and control programmes could be termed as a myth characterised merely by provision of information and consultation. As such, whilst the idea of participation is rooted in national health policy documents, there is little explicit practical operation thereof in terms of power sharing since when it comes to planning, what we see is planning based on "power over" instead of "power with", which is in contrast with the Structuralist approach which envisages that a decentralised health system should adopt planning based on "power with" and not "power over".

The study results, therefore, raise concerns over the effectiveness of malaria prevention and control programmes in Luangwa District without full participation. Whilst it can be argued that the government is committed to prevent and control malaria, the same cannot be said about its commitment in promoting community participation in the malaria prevention and control programmes. Having no clear and effective mechanisms for the empowerment of community members seems to put the achievement of malaria prevention and control, let alone elimination beyond the reach of the Zambian government at present.

5.3. Conclusion

The study established that the majority of respondents participated in malaria control activities in one way or another in their respective communities. The study revealed that community involvement was mainly in home management method use like use of ITNs, insecticides and anti-malarial drugs etc. There was low involvement in the implementation, monitoring and supervision of malaria control activities. Further, community members were not involved in planning, training and evaluation activities. It was found out that community participation in environmental management was very low. Environmental management was not practiced by the majority of the local people due to low levels of participation and lack of education of community members about the intervention. It was also found out that variables (sex, age, marital status, family

size, education and occupation) played a marginal role in determining people's participation in malaria control activities in communities.

The study also revealed that some respondents did not participate due to a number of reasons. Among the reasons included non-involvement by programme implementers, people busy with personal issues, misconceptions about malaria prevention and control measures and delayed implementation of the Decentralisation policy at district level. The research study established that despite the central government having emphasised decentralisation in the delivery of health services, the truth is that the principle was not workable because central government tended to decentralise and centralise at the same time. The tendency of centralising public services at local level does not promote community participation since the local people are denied powers to make decisions on matters that affects them.

Thus, it could be concluded that community members were not fully involved in the prevention and control of malaria in the communities. That made communities to continue being in an unsustainable position of being mere recipients of services, resources and developmental programmes, instead of being active partners, or owners of the interventions.

CHAPTER SIX

CONCLUSIONS OF STUDY FINDINGS AND RECOMMENDATIONS

6.1. Introduction

This concluding chapter of the study on the management challenges in the prevention and control of malaria in Luangwa District focuses on two major aspects. Firstly, it provides the key conclusions of the study findings. Secondly, it outlines the recommendations to the policy makers and key players in the implementation of malaria prevention and control measures on some aspects of the implementation process that might require re-visiting and/or where possible changes in the strategies likely to be needed in order to effectively control or possibly eliminate malaria.

6.2. Conclusions of Study Findings

The basic principle that provided the basis of the study is that the provision of quality health services and facilities that can be easily accessed by all the citizens of a particular country is the essence of any public health policy. The focus of the study was to investigate management challenges in the prevention and control of malaria in Luangwa District. With regard to the prevention and control of malaria, policy makers envisaged that increased use of ITNs, introduction of IRS and Larviciding (Chemical control programme), the use of Rapid Diagnostic Tests since 2006 throughout the public sector for malaria diagnosis, and introduction of Intermittent Preventive Treatment in pregnant mothers would, if not eradicate malaria, reduce the morbidity and mortality rates to lower levels. In undertaking this analysis, the study focused on three specific objectives. The first one was to investigate measures being implemented to prevent and control malaria in Luangwa District. The second was to examine the extent to which the local people were utilizing the malaria prevention and control measures implemented in the community. The third was to examine the nature and extent of community participation in controlling malaria.

According to the Structuralist theory, health care is a state supported consumer good or service. In this case, the health delivery system is seen to consist of health facilities and services owned by the state, though there can be a number of mission-owned and private health facilities. Similarly, the Centralist theory (derived from the term centralization) support or justifies the need for central government to have increased

control of matters at the local level. Therefore, before the research study, it was assumed that the government provided adequate and quality health facilities and services in Luangwa District.

Regarding the measures being implemented to control malaria, it was established that there were a number of measures which were put in place by government and its cooperating partners to prevent and control malaria in Luangwa District. These measures included the provision of insecticide-treated mosquito bed nets, introduction of indoor residual spraying, introduction of rapid diagnostic tests and case management, community sensitisation, provision of health facilities and human resource for health. These measures were being provided by Government in collaboration with cooperating partners. For instance, ChildFund Zambia played a very critical role in the provision of ITNs in the district. The study revealed that since the year 2010, government has been providing indoor residual spraying in the district and during the year 2017, there was mass distribution of ITNs which were provided by government with the coverage of 85%. Government has also continued to construct health facilities across the district. The study revealed that Luangwa District had eighteen (18) health facilities. These included two (2) First Level Hospitals, nine (9) Rural Health Centers (RHCs) and seven (7) Health Posts. Thirty-two (32) Primary Health Care units were also located in various communities within the district. The two First Level hospitals were Katondwe Mission and Luangwa District Hospitals. The government has continued to provide skilled manpower to work in the facilities despite continued shortages. Diagnosis and prevention of malaria in pregnancy services are all being offered in all health facilities.

 However, the study revealed that the interventions were not adequate to effectively prevent and control malaria in Luangwa District. For instance, indoor residual spraying was only done once each year and targeted areas were not adequately covered due to inadequate resources and most of the people were in the field to prepare for the farming season during the period when the programme was being conducted. ITNs were not adequate enough to cater for all household members though it was emphasized that where ITNs were not adequate, priority should be given to pregnant women and the under five children. For instance, in 2017, government distributed 16,000 ITNs in the district but the commodity was not adequate with a shortfall of 2,800 ITNs. In some communities, access to quality health services was a challenge due to long distances people had to cover to go to the nearest health facility, though there has been an

increase in the number of health facilities being constructed in recent years. It was also established that there was inadequate or lack of transport especially in rural health centers so much that it was difficult for health workers to carry out health activities like outreach services. It was further established that there was shortage of critical manpower like Environmental Health Technologists and Zambia Enrolled Midwives in rural health centers and some medical staff at Luangwa District Hospital.

The main argument is that, Central government has created local administrative units across the country to provide services closer to the people, but it is widely acknowledged that these administrative units lack the human, financial and legal capacities to enable them provide services effectively and efficiently. The assignment of the functions like health without taking into account capacity, has resulted in local administrative units not performing to the satisfaction of the local communities. Therefore, in a centralised system of administration like Zambia, where power and resources are concentrated at the center, effective service delivery at the local level can mainly be enhanced if there is sufficient decentralisation of central government powers, functions and resources to the lower levels of government administrative units and agencies.

The idea behind the provision of measures to prevent and control malaria was to ensure that people do not suffer from malaria and to reduce malaria infections. The fact is that, measures to prevent and control malaria can be put in place but the cardinal thing is for the local people to utilise the measures being implemented so that they do not suffer from malaria.

According to the study, the majority of the local people said that they utilised ITNs as one of the measures to prevent and control malaria in the communities. The study revealed that variables (age, sex, education, occupation, family size and marital status) played a marginal or no role in determining the utilisation of ITNs among the local people. However, even if the majority of the respondents said that they utilised ITNs, it was established that there were community and intra house factors which compromised the effective utilisation of ITNs by the local people as confirmed by key informants and some local people. These included geographical, economic, social-cultural and behavioral factors.

What came out of the study was that, in as much as the government provided all those preventive and control measures to fight malaria, people's attitudes towards those measures, frustrated government efforts to prevent and control malaria. For instance, some community members had a habit of selling ITNs which were given to them to buyers from the neighboring countries of Mozambique and Zimbabwe. Poverty was cited as the main cause. Others used the ITNs for fishing especially that fishing was one of the main income generating activity in the district. The study also revealed that most people could not use ITNs adequately at night due to high temperatures recorded in the district forcing them to spend most of the night time outside their houses. Some community members do not want to use insecticide treated nets because they believed that the bed nets cause suffocation especially in children, and body itches.

The research study further revealed that the majority of the local people did not utilise IRS as a measure to prevent and control malaria in the district. It was found out that to a certain extent, the level of education played a role to determine the utilisation of IRS because among all the categories, the majority of the respondents who utilised IRS were those who had attained tertiary level of education. Even when it came to the occupational variable, it was found out that the majority of civil servants utilised IRS, a category believed to have attained tertiary education. Interestingly, it was also established that generally, there is higher unwillingness to utilise malaria prevention and control measures among the urban dwellers than the rural dwellers. However, it was established that other variables played a marginal role in determining people's utilisation of IRS. The study also revealed that there were other factors which led to the low utilisation of IRS by the local people. These included low coverage by the programme implementers, misconceptions about the programme, negative attitudes by the local people, inadequate sensitisation, strong smell from the chemical used, reduced effectiveness of the chemical and low levels of community participation.

During IRS exercises, some community members were not willing to have their houses sprayed because of different perceptions and beliefs they had about IRS. Some believed that the chemicals used attracted more mosquitoes and other insects to harbor inside their houses. Others believed that the insecticides used for spraying could cause other diseases while some people could not allow spray men to enter their houses for privacy reasons. The complaints by the local people were confirmed by key informants who said that in recent years, there has been an increase in the number of people shunning

IRS programmes. The other argument is that the chemical (Actellic) which is used in IRS operations produces a strong smell which lasts for a month; secondly, the use of the same chemical since 2010, has resulted in mosquitoes developing resistance, rendering the chemical ineffective. It can, therefore, be concluded that there were measures put in place by government and other cooperating partners to prevent and control malaria in the district, though not adequate. It can also be said that even when government had put in place measures to prevent and control malaria, people were not fully utilising the measures which were being implemented due to a number of factors which need further inquiry.

It was also established that majority of the local people utilised health facilities whenever they or any other family member fell sick. However, the study revealed that some local people had challenges to access health facilities and services due to long distances which they covered before they reached the nearest health facility especially in rural settings. In addition, larviciding was not utilised because the Government was not providing the services and individuals could not manage because it was an expensive measure to undertake. There was also a challenge in the procurement and delivery of essential medical drugs and equipment especially in rural health centers.

With regard to the nature and extent of community participation, the study established that the local people participated in malaria control activities in one way or another in their respective communities. The study revealed that community involvement was mainly in home management method use like use of ITNs, insecticides and anti-malarial drugs. There was low involvement in the implementation, monitoring and supervision of malaria control activities and community members were not involved in planning, training and evaluation activities. It was found out that community participation in environmental management was very low. Environmental management was not practiced by the majority of the local people due to low levels of participation and lack of education among community members about the intervention. Yet environmental management was one key component of Integrated Vector Management together with distribution of ITNs and indoor residual spraying in the prevention and control of malaria. In order for environmental management techniques to succeed in reducing the malaria burden, wide spread community participation is essential. It was also found out that variables (sex, age, marital status, family size, education and

occupation) played a marginal role in determining people's participation in malaria control activities in communities.

Thus, it can be argued that generally, community members were not fully involved in the prevention and control of malaria in the communities. This is because even the majority who said that they participated, their involvement was mainly in the usage of home management methods especially services provided by government like ITNs, IRS and anti-malarial drugs. That made communities to continue being in an unsustainable position of being mere recipients of services, resources and developmental programmes, instead of being active partners, or owners of the interventions. That could explain why some respondents indicated that they did not participate. Among the reasons given for non-participation included, non-involvement by programme implementers, people busy with personal issues and misconceptions about malaria control.

Overall, the findings have demonstrated some key issues which demonstrate that successful implementation of the community participation strategy in the malaria prevention and control has not yet taken place. In essence, despite the fact that the process and the right to participate maybe devolved to the local level, the community's influence, which could mould and challenge policy development, as well as supervise the outcomes, is still in the hand of health authorities. This is in contrast to the Structuralist approach which looks at decentralised administration as the localisation of accountability for the delivery of health services to the community, leading to community participation in the provision of health services. However, what the health officials fail to realise is that participation is not merely about having the opportunity to consult or being informed about policy outcomes or attending meetings, but also about having the power to control inputs which would otherwise have been controlled by others who may or may not address the communities' priority (Bandesha et al, 2005).

No matter how sound a preventive approach might be, if individuals do not see the merit of a particular approach and are not made to determine their priorities in dealing with their problems, the preventive approaches will fail to some degree. Unless individuals in the community are involved in programme development, planning and execution, even the best-designed prevention strategies might not be effective.

Community participation in planning, implementation and monitoring will improve the control strategies.

The major contribution of knowledge in the management challenges in the prevention and control of malaria in Luangwa District has been the identification of Zambia as a unitary state and its linkage to the decentralisation policy. As a unitary state, Zambia, constitutionally, does not share sovereignty between the central government and its peripheral regions such as provinces and districts. Decentralisation, which should allow local participation, is ambivalent. Jealous of its total ownership and control over the whole country, the central government tends to be contradictory, decentralising and centralising functions at the same time.

Due to deficiencies in decentralisation reforms, the system tend to be less responsive to the needs of the people at the local level and that has results in the neglect of the periphery, as government officials tend to pay attention mainly to those areas near the center, which if neglected, may result in sufficient loss of political popularity. The contention that the unitary system of administration results in the neglect of the rural areas can hold in the case of Zambia if sufficient decentralisation of financial resources is not made a priority by the central government to ensure effective and efficient delivery of health services. Because of the ambivalences in the way decentralisation is being implemented, effective administration of health services in Luangwa District is adversely affected.

6.3. Recommendations

In view of the above findings, it is recommended that the following measures be taken:

(a) An integrated approach to fight malaria should be adopted. In order to adequately control malaria and attain the goal of eliminating the disease by 2021, there is need for inter-sectoral collaboration and community involvement, strengthened supervision, technical and operational coordination and collaboration including cross border initiatives and resource mobilisation. In this case, Ministry of Health should collaborate with other sector ministries and the private sector in the fight against malaria. For instance, the Ministry of Fisheries in collaboration with the Ministry of Health and the community can come up with schemes such as Aqua Culture (Fish farming) and other larvivorous fish production to control mosquito

breeding and also sell the fish as a way of boosting the economic status of the local people. Such schemes will also enhance community participation.

(b) The study revealed that malaria control measures like IRS and ITNs were not adequate to cater for all households in the district due to inadequate government resources. Therefore, there is need for Government to allocate more resources for these control measures in order to cater for all households in the district.

(c) Further, it was found out that IRS programmes were conducted once in a year just after the onset of the rainy season. The practice did not adequately cover the targeted household structures especially during the rainy season when most of the local people are not found in their homes since they are busy preparing for the farming season. It is, therefore, recommended that IRS programmes be conducted twice each year, i.e., before the rainy season and also just after the rainy season, the period which is known to be the main transmission period.

(d) The utilisation of ITNs and other malaria control measures among households still remains a big challenge because of the economic status of the local people, most of whom cannot afford beds for all household members in their different age groups and separate beddings for visitors that lead to disruption of sleeping arrangements. In addition, most of the household structures cannot allow or deter the effective utilisation of ITN due to the fact that they are too small and of poor quality. If households are empowered economically, then the local people can afford to build bigger structures and other facilities in their homes and enhance effective utilisation of ITNs and other malaria control measures. Therefore, policy makers should note that, health policy needs to take into account how sickness among the community members and the cost of care contribute to household impoverishment. The interrelationship between poverty, health care policy and its management is thus central to enhancing the utilisation levels of malaria control measures within households and malaria prevention.

(e) The study established that amongst the groups which are most at risk of malaria infections are the rural populations, who are largely poor and less educated. This is attributed to the fact that rural areas do not have adequate health and educational facilities which are key factors in alleviating poverty in the communities. In addition, majority of the rural population have no economic power to be able to

afford malaria prevention and control commodities, and as a result, malaria continues to affect rural communities and the nation at large by worsening poverty through direct and indirect costs incurred in the fight against malaria. Sampao (2010) argues that whilst the disease is in large part determined mainly by climate and ecology, and not poverty per se, the impact of malaria takes its toll on the poorest, those least able to afford preventive measures and medical treatment. National leaders should, therefore, endeavor to eliminate malaria. Such an achievement would save millions of lives and eradicate the vicious cycle of poverty and disease that continues to grip the nation by saving a lot of money that it loses in productivity and medical cost every day.

(f) Like any other new health intervention or change, acceptance always takes long due to cultural lag. The study found out that there were many perceptions, beliefs and attitudes labeled against ITNs and IRS. In order to improve compliance with the control measures being implemented in the communities, there is need to positively transform the local people's perceptions, beliefs and attitudes about the measures. This can be done by adopting a behavior change strategy. Such a strategy should be based on the fact that human beings are rational actors on their perception, and the approach should link individual beliefs, attitudes, intentions and behavior within the context of the social-cultural realities at play. The intervention should address the behavioural beliefs of individuals regarding the outcomes of a defined behavior practice and their evaluation of potential outcomes. At the same time, it should address the normative beliefs in the community that influence the local people's opinions and the evaluation of those opinions.

(g) According to the Decentralisation Implementation Plan 2009-2013, the most fundamental rationale for decentralisation in Zambia lies in its opportunity to bring the government closer to the people by providing citizens with greater control over the decision making process and allowing their direct participation in public service delivery. During the study, it was established that the local people were not fully engaged in planning, implementation, monitoring and evaluation of developmental programmes like malaria control in their communities. They were mere recipients of services being provided by programme implementers. Governance challenges often create or exacerbate challenges identified. Therefore, there is need for strengthened health system and leadership, increased personnel

capacity at district level, and more effective coordination across all governance structures. In this regard, there is need to seriously implement the Decentralisation Policy if full community participation in developmental programmes was to be realized. For instance, for Zambia's 2017-2021 National Malaria Elimination Strategic Plan to be effectively implemented, strong coordination and communication from National government down to local government is needed.

(h) It is recommended that Government should carryout periodic larviciding and aerial spraying of Luangwa and Zambezi river banks as a way of controlling vector populations in the district. In addition, the Government should consider coming up with a malaria vaccine which could complement existing efforts to control the disease.

(i) After mass distribution of ITNs, health authorities in conjunction with the local leaders should regularly monitor the usage of ITNs to enhance compliance and to establish whether the target populations that are most at risk are sleeping under the mosquito nets. More community members (malaria agents) should be capacity built in malariology and be given the mandate to spearhead malaria related activities in the communities.

(j) Population mobility leads to many imported and exported malaria cases due to porous borders and limited border screening. During the study, it was found out that people from bordering countries, particularly Mozambique, are often treated in Zambia. Often times local populations on both sides of the border speak the same language, trade actively, inter-marry and cross the border frequently. Commodities such as ITNs are frequently picked up in Zambia and taken back across borders. Therefore, the population mobility challenge requires active border patrols as well as common treatments on both sides of border to effectively move towards effective control if not elimination.

(k) The study established that CHWs work with the community members against malaria at the local level. CHWs volunteer several hours per day on average with the communities performing malaria testing and treatment and counselling on health care issues. They also support malaria case follow-up. CHWs work to sensitize the community on the importance of being tested for malaria and help to dispel misunderstandings. CHWs also provide reactive case detection in some

areas. Case follow-up is a critical component to case management performed by CHWs, but regular occurrence depends upon the leadership strength and the incentives provided to CHWs. As volunteers, CHWs do not typically receive compensation for their work, although some organisations do provide meals, small stipends or bicycles for transportation. Health providers indicated that when CHWs are provided with incentives, they are more active and remain motivated. Therefore, providing adequate training, supervision, transportation, and incentives is critical for CHW retention.

(l) There is need for the Ministry of Health to provide district managers to train and oversee CHWs, holding them accountable for task completion and ensuring they are empowered with enough information. If CHWs are not familiar with tools like RDTs, they will not use them. This challenge often affects data collection, as CHWs must comply with data and reporting requirements. Delays are caused when they do not receive enough support and supervision. Improved training is also critical for CHWs' activities such as surveillance ramp up. Information management and sharing is a major challenge because health workers do not have the training and tools to succeed.

(m) There is need for government to deploy adequate numbers of skilled manpower in all health facilities and to provide enough medical equipment and drugs. Further, health workers should be provided with adequate accommodation in both urban and rural settings. This will motivate the health workers to deliver quality services to the people.

(n) There is need for further in-depth research on intra house dynamics which seem to play a significant role in determining the effective utilisation of ITNs by the local people. This will help in coming up with other strategies of adequately controlling malaria. Research is also needed on the usage rates for various types of bed nets, looking specifically at size, shape and material. Research is needed on Zambia's growing resistance issues. Insecticide resistance, particularly in bed nets and development of chemical resistance in mosquitoes, was greatly feared and something which some key informants felt warranted immediate investigation and a long term strategic plan to address. A durability study on available bed nets should be conducted so that longer lasting bed nets are procured in the future.

Entomological studies should be done in order to better understand the behavior of mosquitoes so that interventions are more effective against the specific species in each area. Socio-anthropological research is needed to better understand the behavior of people in the district and also look at mobile populations.

(o) Governance and sustainability is critical in the fight against malaria. The growing experience with malaria control scale-up in Zambia and elsewhere has demonstrated that strong national leadership is critical to success, and that a solid and predictable resource base is absolutely required for effective planning and programme action. Recent concerns in Zambia regarding financial management within public sectors like health have led to the suspension of external funding over a period of time. Commodity availability (ITNs, rapid diagnostic tests [RDTs], and ACTs in particular) has been markedly affected and the Malaria Indicator Survey (MIS) 2010 shows substantial drops in household ownership and use of ITNs in several provinces (especially Luapula and Northern Province), and consequent resurgence of malaria infection rates, cases, and hospitalisations (and probably deaths). There is, therefore, need to resolve the issues and revert to effective governance and strong partnership resourcing in malaria control in Zambia in order to take the next critical steps in sustaining impact and advancing on further transmission reductions and finally elimination of malaria.

(p) The majority of governments around the world are operating under a unitary system of administration. This implies that the governments, with the help of the agencies they have established, are responsible for public service delivery to the people. It is, therefore, a matter of priority that efforts should be put in place to ensure that this most preferred system of administration is streamlined to ensure quality public service delivery to the people.

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Appendix I: Questionnaire for the Local People

Date of interview……………………………………………………………….

1.   Sex

    1. Female   [ ]

    2. Male   [ ]

2.   Age

    1.   Below 25 years   [ ]
    2.   25 – 40 years   [ ]

    3.40 – 50 years   [ ]

    4.50 – 60 years   [ ]

    5. Above 60 years   [ ]

3.   What is your marital status?

    1. Single   [ ]

    2. Married   [ ]

    3. Divorced   [ ]

    4. Separated   [ ]

    5. Widowed   [ ]

4.   What is the size of your family?

    1. 0 – 3   [ ]

    2. 4 – 7   [ ]

    3. 8 – 12   [ ]

    4. 13 and above   [ ]

5. What is your occupation?..

6. What is your highest level of educational attainment?

    1. None   [ ]

    2. Primary   [ ]

    3. Secondary   [ ]

    4. Tertiary   [ ]

7. For how long have you been staying in Luangwa District?

    1. Below 5 years   [ ]

    2. 5 – 9 years   [ ]

    3. 10 – 14 years   [ ]

    4. 15 years and above   [ ]

8. What type of residential area?

    1. Urban   [ ]

    2. Rural   [ ]

9. If urban, which category?

    1. High cost residential area   [ ]

    2. Medium cost residential area   [ ]

    3. Low cost residential area   [ ]

    4. Not Applicable   [ ]

10. Are you aware of any malaria control programmes in your community?

    1. Yes   [ ]

    2. No (If no, skip to page 14)   [ ]

11.   What measures have been put in place to control malaria in your community?

1. Indoor residual spraying   [ ]

2. Insecticide treated mosquito nets   [ ]

3. Larviciding   [ ]

4. Others   [ ]

12. Who provides the above measures to control malaria?

1. Self   [ ]

2. Government   [ ]

3. Non- Governmental Organisations   [ ]

4. Church   [ ]

5. Others (Specify)   [ ]

13.   What method of awareness is used?

1. Pamphlets   [ ]

2. Videos   [ ]

3. Audio/ Verbal   [ ]

4. Others (Specify)   [ ]

14.   Do you use any method to protect yourself against malaria?

1. Yes   [ ]

2. No (Skip to question 16)   [ ]

15. If "Yes" to question 14, what method do you frequently use?
1. Indoor residual spraying   [ ]
2. Insecticide Treated mosquito Net   [ ]
3. Larviciding   [ ]
4. Others (specify)   [ ]

16. If "No" to question 14, why don't you protect yourself against malaria?

.....................…………………………………………………………………………

17.   Are you involved in any activities to fight against malaria in your community?

    1.   Yes

       [ ]

    2.   No

       [ ]

18.   If "Yes" how?...

19.   If No to question 17, why are you not involved?...

20.   Have you or any member of your family suffered from malaria?

    1. Yes   [ ]

    2. No   [ ]

21.   If "Yes" how often?

    1. Weekly   [ ]

    2. Monthly   [ ]

    3. Yearly   [ ]

22. Did you or that person get any treatment?

    1. Yes

    2. No (Skip to question 26)

23. If "Yes" to question 22, where was treatment done?

    1. Home (self-medication) [ ]

    2. Clinic   [ ]

    3. Hospital   [ ]

    4. Traditional healers   [ ]

5. Others (Specify)   [ ]

24.   If you went to clinic or hospital, what kind of treatment/ drug were you/he/she given?

   1. Chloroquine   [ ]

   2. Fansidar   [ ]

   3. Coartem   [ ]

   4. Quinine   [ ]

   5. Others (Specify)   [ ]

25. If it was traditional treatment or self- medication, why didn't you go to clinic or hospital?

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

26. If "No" to question 22, why didn't you/ he/she get treatment?

…………………………………………………………………………………………………
…………………………………………………………………………………………………

27. Have you ever lost any member of your family as a result of malaria complications?

1. Yes   [ ]

2. No   [ ]

25.   If "Yes" how many?

....

26.   What do you think should be done in order to adequately control malaria?

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

END OF QUESTIONNAIRE

THANK YOU

Appendix II: Interview Guide for District Director of Health and the Malaria Focal Point Person

Date of interview…………………………………………………………….

Position in the organisation…………………………………………………….

1. Sex:

   Male

   Female

2. What control measures have you put in place to control malaria in Luangwa district?

3. What methods have you put in place to ensure that community members participate in the implementation of malaria control measures?

4. Do you involve local leaders in malaria control programmes in the district?

5. If "Yes", how are they engaged?

6. Are there any cooperating partners you work with in controlling malaria in Luangwa district?

7. If "Yes", who are these cooperating partners and what role does each partner play to control malaria?

8. What are the current malaria morbidity and mortality rates of Luangwa district?

9. What are the most affected categories of people by malaria in the community?

10. What is the common drug used to treat malaria in health facilities?

11. Do you have adequate health facilities and qualified staff in the district to fight malaria?

    Yes

    No

12. If no, what is the staffing level versus the required numbers?

13. What challenges do you face as you implement malaria control measures in the district?

14. What do you think should be done to adequately control malaria in Luangwa district?

Appendix III: Interview Guide For Health Providers

Date of Interview…………………………………………………

Catchment Area…………………………………………………

Name of Health Facility…………………………………………

Position at the health facility……………………………………

1. Sex:

   Male

   Female

2. What measures have been put in place to control malaria in your catchment area?

3. Do community members in your catchment area participate in controlling malaria?

4. If "Yes", how are they engaged?

5. If "Not", what is the problem?

6. Are local leaders in your catchment area involved in controlling malaria?

7. If "Yes", how are they engaged?

8. If "Not", what is the problem?

9. What category of people in your catchment area mainly suffer from malaria?

10. What are the malaria morbidity and mortality rates in your catchment area? (Under five and expectant mothers especially).

11. What drugs are mainly used to treat malaria at your health centre?

12. Are there any cooperating partners operating in your catchment area and involved in controlling malaria?

13. If "Yes", who are these cooperating partners and what role does each partner play?

14. What challenges do you face in controlling malaria in your catchment area?

15. What do you think should be done to adequately control malaria in your catchment area?

Appendix IV: Interview Guide for the Neighbourhood Health Committee Members

Date of Interview……………………………………………………………………….

Name of Catchment Area……………………………………………………………

Name of Health Facility……………………………………………………………..

Position in the Committee………………………………………………..……

1. Sex:

    Male

    Female

2. What measures have you put in place to control malaria in your catchment area?

3. What role do you play as a committee in controlling malaria in your catchment area?

4. Do community members in your catchment area comply with the malaria control measures being implemented?

5. Do community members adequately participate in controlling malaria in your catchment area?

6. If "Yes", what is the level of participation?

7. If "Not", why?

8. Are local leaders in your catchment area involved in malaria control programmes? (To specify leaders that are involved).

9. If "Yes", how and what is the level of participation?

10. If "No", why?

11. Are there any cooperating partners in your catchment area involved in malaria control programmes?

12. If "Yes", who are these cooperating partners and what role does each partner play?

13. Which category of community members mainly suffer from malaria?

14. What kind of treatment do community members usually seek whenever they have malaria?

15. What challenges do you face in controlling malaria?

16. What do you think should be done to adequately control malaria in your catchment area?

Appendix V: Interview Guide for Community Health Workers

Date of interview……………………………………………

Catchment Area………………………………………………..

Name of Health Facility……………………………………….

Position in the Community…………………………………….

1. Sex:

   Male

   Female

2. What measures have you implemented to control malaria in your catchment area?

3. What role do you play in controlling malaria in your catchment area?

4. Do community members in the catchment area comply with the malaria control measures being implemented?

5. If "No", why?

6. Do community members adequately participate in controlling malaria in your catchment area?

7. If "Yes", how are they involved?

8. If "No" why?

9. Are local leaders in your catchment area involved in malaria control programme?

10. If "Yes", how are they involved and to what extent?

11. If "No", why?

12. Are there any cooperating partners in your catchment area who are involved in malaria control programmes?

13. If "Yes", who are those partners and what programmes do they implement to control malaria?

14. What challenges do you face in the community as you get involved in controlling malaria?

15. What do you think should be done to adequately control malaria in your catchment area?

Appendix VI – District Staffing Levels

Category of Staff	Establishment			Existing		
	DHO	Hosp.	H/Cs	DHO	Hosp.	H/Cs
District Health Director	1	0	0	1	0	0
Planning Officer	1	0	0	1	0	0
Clinical Care Officer	1	0	0	0	0	0
Nursing Sister	0	1	0	0	0	0
Nursing Officer	0	1	0	0	0	0
Public Health Officer	1	0	0	1	0	0
Senior Pharmacy Technologist	1	0	0	0	0	0
Principal Clinical Officer	0	1	0	0	0	0
Senior Clinical Officer (HIV/STI/TB)	1	0	0	1	0	0
Environmental Health Officer	1	0	0	0	0	0
Human Resource Management Officer	1	0	0	1	0	0
Assistant Human Resource Management Officer	0	1	0	0	1	0
Health Information Officer	1	0	0	0	0	0
Assistant Accountant	1	1	0	1	0	0
Purchasing and supplies Officer	0	1	0	0	0	0
Purchasing and Supply Assistant	1	1	0	1	1	0
Principal Clinical Officer	0	1	0	0	0	0
Accounts Assistant	1	0	0	1	0	0
Typist	1	1	0	1	0	0

Category of Staff	Establishment			Existing		
	DHO	Hosp.	H/Cs	DHO	Hosp.	H/Cs
Office Orderly	1	5	0	1	5	0
Registry Clerk	1	1	0	1	1	0
Medical Officer In-Charge	0	1	0	0	1	0
General Medical Officer	0	2	0	0	1	0
Dental Surgeon	0	0	0	0	0	0
Senior Nursing Officer	0	1	0	0	0	0
Senior Resident Medical Officer	0	2	0	0	2	0
Medical Licentiate	0	1	0	0	1	0
Senior Radiographer	0	0	0	0	0	0
Radiography Technologist	0	2	0	0	3	0
Radiographer	0	1	0	0	1	0
Physiotherapist	0	1	0	0	0	0
Theatre Superintendent	0	0	0	0	0	0
Nursing Sister	0	1	0	0	0	0
Senior Clinical Officer	0	0	0	0	0	0
Night Superintendent	0	1	0	0	0	0
Clinical Officer Ophthalmology	0	1	0	0	0	0
Clinical Officer Psychiatric	0	0	0	0	0	0
Registered Midwife	0	3	0	0	2	0
Senior Pharmacy Technologist	1	0	0	0	0	0
Clinical Officer Anaethiasist	0	1	0	0	0	0

Category of Staff	Establishment			Existing		
	DHO	Hosp.	H/Cs	DHO	Hosp.	H/Cs
Refrigeration Technician	0	1	0	0	0	0
Electrical Technician	0	1	0	0	1	0
Stenographer	0	0	0	0	0	0
Medical Records Clerk	0	1	0	0	1	0
Catering Officer	0	0	0	0	0	0
Laundryman	0	1	0	0	1	0
Darkroom Assistant	0	0	0	0	0	0
Telephone Operator	0	0	0	0	0	0
Tailor	0	1	0	0	1	0
Plumber	0	1	0	0	1	0
Carpenter	0	1	0	0	1	0
Waiter	0	2	0	0	2	0
Theatre Attendant	0	1	0	0	1	0
Mortuary Attendant	0	1	0	0	1	0
Out-door Servant	0	1	0	0	1	0
Registered Theatre Nurse	0	1	0	0	0	0
Senior Medical Laboratory Technologist	0	0	0	0	0	0
Physiotherapist Technologist	0	1	0	0	1	0
Dental Therapist	0	1	0	0	0	0
Registered Nurse	0	10	1	0	13	3
Environmental Health Technologist	0	0	17	0	0	7
Pharmacy Technologist	0	2	0	0	2	0

Category of Staff	Establishment			Existing		
	DHO	Hosp.	H/Cs	DHO	Hosp.	H/Cs
Clinical Officer	0	8	3	0	4	1
Technologist Nutrition	0	0	0	0	0	0
Nutritionist	0	1	0	0	0	0
Dental Technologist	0	0	0	0	0	0
Medical Equipment Technologist	0	0	0	0	0	0
Zambia Enrolled Midwife	0	1	8	0	4	1
Zambia Enrolled Nurse	0	25	14	0	14	15
Medical Laboratory Technologist	0	1	0	0	1	0
Medical Laboratory Technician	0	2	0	0	2	0
Hospital Administrator	0	1	0	0	0	0
Porter	0	2	0	0	2	0
Cleaner	1	46	9	4	21	11
Security Guard	0	4	0	0	5	0
Watchman	1	0	9	1	1	9
Pharmacy Dispenser	0	2	0	0	1	0
Registered Mental nurse	0	2	0	0	1	0
Cook	0	2	0	0	5	0
Driver	1	2	0	1	2	0
Total	19	159	61	17	109	46

16. Source: Luangwa District Annual Progress Report

Appendix VII: Introductory Letter from the District Health Office

THE UNIVERSITY OF ZAMBIA

SCHOOL OF HUMANITIES AND SOCIAL SCIENCES
DEPARTMENT OF POLITICAL AND ADMINISTRATIVE STUDIES

TO WHOM IT MAY CONCERN

21ˢᵗ May, 2017.

INTRODUCTORY LETTER FOR MR MUSOLE SIACHISA

Dear Sir/Madam,

I am confirming and introducing to you Mr Musole Siachisa, a postgraduate student in a PhD programme at this university. Mr. Siachisa is at the stage of collecting data for his dissertation. Your kind attention to him, as he comes round, requesting for certain information, will be profoundly appreciated.

Truly yours,

Mafuleka, Weston (PhD Public Policy, Senior Lecturer, Mr. Siachisa's Dissertation Supervisor).

E-Mail: westone.mafuleka@unza.zm

Phone: 0965567119.

REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH

LUANGWA DISTRICT HEALTH OFFICE
P.O. BOX 14
LUANGWA

29th May 2017

All Health Facility In-Charges
Luangwa District Health Office
P.O. Box 14
LUANGWA

Dear Sir/Madam,

RE: **INTRODUCTION: MR. MUSOLE SIACHISA**

Please refer to the above subject.

I wish to introduce to you Mr. Musole Siachisa a postgraduate student in a PhD program at UNZA. He is collecting data for his dissertation.

The office has no objection for his request. Please welcome and assist him accordingly.

Your usual cooperation will be highly appreciated.

Yours faithfully,

Dr. Inonge Akekelwa
District Health Director

/bn.