**UNIVERSITY OF GHANA, LEGON**

**DEPARTMENT OF GEOGRAPHY AND RESOURCE DEVELOPMENT**

**THE EFFECTIVENESS OF THE NATIONAL MALARIA CONTROL**

**PROGRAMME IN AKWAPIM SOUTH MUNICIPALITY**

**BY**

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MPHIL GEOGRAPHY AND RESOURCE DEVELOPMENT DEGREE**

**JULY, 2013**

**DECLARATION**

I, Abudu Musah herein declare that the thesis titled:

"The Effectiveness of the National Malaria Control Programme in Akwapim South Municipality'' was my originality.  No part of this work referred to has been submitted in support of an application for another degree or qualification in this or any other institution. Where I have consulted any published and unpublished work of others, this is always clearly acknowledged.

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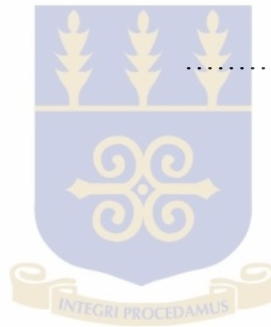
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# ABSTRACT

Malaria control has received significant attention in the Akwapim South Municipality yet remains the highest cause of ill-health among the people. Not only must interventions be put in place but they must actually be effective in ensuring that malaria morbidity and mortality are eliminated. There have been series of strategies that have been implemented under the malaria control programme to control and prevent malaria. Despite the fact that interventions have been introduced, their effectiveness is in doubt since malaria still remains a major public health problem in the Akwapim South Municipality. The study attempts to evaluate the effectiveness of this programme in terms of its outcomes on access to these interventions, knowledge on malaria and the overall impact of the strategies on trends of malaria prevalence among households in Akwapim South Municipality.

The study used the cluster based sampling technique to solicit the views of 200 households using a questionnaire. Also, interviews with 20 health workers provided crucial qualitative data as well as the review of secondary data from the district and regional health offices. Other qualitative methods employed were in-depth interviews and focus group discussions with programme stakeholders and households who were the beneficiaries.

The results show a significant increase in terms of coverage of most of the strategies. There is increased possession of insecticides treated nets (74%) of the 100% target by 2015. Despite the increases on access to the ITNs, their utilization remains low among households. All pregnant women who visited health facility were put on Intermittent Preventive Treatment for pregnant women as targeted to achieve by 2015. There was evidence of limited coverage of indoor residual spraying and likewise there was low access to prompt treatment of malaria. Overall, the

malaria situation remains high with a prevalence of 67% of households reporting of malaria in the past two weeks. The study indicates a decrease in terms of malaria mortality. Against the target of achieving a 100% for all malaria cases confirmed before treatment by 2015, the findings showed that only 50% of malaria cases were confirmed before treatment. There was also an over concentration on the curative aspect of malaria cases than measures for prevention which are more likely to ensure sustainable malaria control. The key challenges of the programme included inadequate funding, low staffing and low involvement of the people. Poor involvement of the people led to low levels of acceptability.

The study concludes by recommending that interventions of the malaria control programme in Akwapim South Municipality be repositioned in a way that increases the performance and effectiveness of the programme.

## DEDICATION

I dedicate this work to my mother, Mama Siata and my sister for their love, encouragement and

support throughout the study years.

## ACKNOWLEDGEMENTS

I would like to acknowledge with sincere gratitude those individuals and institutions who in diverse ways have helped in making this study possible. Let me particularly thank my academic supervisors, Naa Prof. J. S. Nabilah and Prof. Samuel Agyei-Mensah whose pieces of advice and guidance have made this study possible. I also wish to thank Prof. Owusu the Head of Department and all other lecturers in the geography department especially Dr. Kofi Teye for their encouragement.

Acknowledgement also goes to the Co-ordinator of the Periperi-U project on urban disaster risk reduction for their financial assistance in getting the work completed on time.

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# ABBREVIATIONS

ACT                            Artemisinin Combination Therapy

CDC                             Centre for Disease Control

GDHS                            Ghana Demographic and Health Survey

DDT                             Dichloro-Diphenyl Trioxocarbonate

DHMT                             District Health Management Team

GHS                             Ghana Health Survey

FGDs                             Focus Group Discussions

HMM                            Home Management of Malaria

ITN                            Insecticide Treated Bed Nets

IRS                             Indoor Residual Spray

IPT                            Intermittent Presumptive Treatment

IPTp                            Intermittent Preventive Treatment of Pregnant Woman

LLINs                           Long Lasting Insecticide Nets

MCP                           Malaria Control Program

MDGs                            Millennium Development Goals

MOH                             Ministry of Health

NMCP                            National Malaria Control Programme

NHIS                            National Health Insurance Scheme

OPD                            Out-Patients Department

RBM                            Roll Back Malaria

RDTs                           Rapid Diagnostic Test

| | |
|---|---|
| SSA | Sub-Saharan Africa |
| UNDP | United Nations Development Programme |
| UNICEF | United Nation International Children Fund |
| WHO | World Health Organisation |

# 1.0 CHAPTER ONE: INTRODUCTION

## 1.1 GENERAL INTRODUCTION

The highest burden of malaria and other vector borne diseases are common among the developing countries where malaria especially remains the leading cause of illnesses and deaths (WHO, 2004; WHO, 2005). This has led to global initiatives in terms of policy and political will to combat the challenge that it posits to health. The first major attempt to fight the disease in recent times was the setting of the Global Malaria Control Strategy by the World Health Organization in 1992. Subsequently, a policy framework was promulgated during the 1998 World Malaria Summit to support the malaria endemic countries financially to manage and control malaria. The Roll Back Malaria (RBM) partnership was immediately introduced in 1998 by the World Health Organisation (WHO), United Nation International Children Fund (UNICEF), United Nations Development Programme (UNDP) and the World Bank with the goal of halving the global burden of malaria by 2010 (UNCEF, 2000; World Bank, 2001). The partnership brought together nations with the disease, their bilateral and multilateral development partners, the private sector, academia and international organizations (World Malaria Report, 2005).

The Abuja declaration in the year 2000 committed 44 African countries to halve malaria in Africa by 2010. This was to be achieved through the introduction of some core-technical strategies for the sustainable control of malaria namely; prompt treatment of malaria attacks with an effective drug, use of insecticide treated bed nets (ITN) and other preventive measures of malaria control and eradication (Feachem et al., 2010).

In addition,  the World Bank has launched a  Booster Programme for Malaria Control in Africa in 2005 together with the President's Malaria Initiative by the USA government which is under the WHO and  aimed at reducing malaria incidence by 75% by 2015 (World Malaria Report, 2010). All of these points to the relentless commitment to halting the menace, given the nature of impact that malaria has on human health and development. There have also been renewed calls to fund eradication programmes particularly since the 2007 Bill and Melinda Gates Foundation Conference at which the couple boldly called for global malaria eradication which was supported by Margaret Chan, the Director General of the WHO. This clarion call came to add energy to malaria control efforts and the long-term goal of eradication (Jeremy et. el, 2011).

In Ghana, where malaria prevalence is high in all the ecological zones (GDHS, 2008), attempts have equally been high on the agenda as far back pre-independence concerning interventions of malaria control including indoor residual and aerial spraying in addition to the use of chloroquine and salt in the 1950s. Between 1996 and 1997, the focus accelerated to better case management through prompt treatment of malaria which continued till 1998 when the "Roll Back Malaria" initiative was adopted which uses a combination of preventive and curative measures to reduce malaria morbidity and mortality by 50% by 2010 (Sodzi, 2011). This has since become the policy guide in the country towards controlling malaria termed now as the National Malaria Control Program (NMCP). Some of the specific strategies under this program include prompt and effective treatment, and prevention of mosquito bites through the use of ITNs. The Roll Back Malaria Partnership by the WHO has set the target to have diagnosed and treated promptly and effectively 50% of cases of malaria illness with effective anti malarial medicines by 2010. This intervention sought to improve upon the factors that influence prompt and effective

treatment on the part of the provider and consumer within one day of the onset of illness (Source: Bulletin of Health Information, October 2004).

Despite the considerable efforts at the global, regional and national levels to contain the disease, it still remains high and concentrated most especially to SSA. It is especially the most prevalent and devastating disease in the tropics with a crippling effect on the economic growth and perpetuates vicious cycles of poverty (Mba, 2007) who also observed that malaria affects children and pregnant women most accounting for about 20% of deaths of children under five. The estimated cost to Africa is US$10 – 12 billion every year in lost domestic product even though it could be controlled for a fraction of that sum (UNICEF 2004). It also causes approximately 20% of cerebral conditions leading to coma and death. This has resulted in the high attendance at the various health facilities in Ghana (GDHS, 2008) and stands to worsen the already stack poverty situation of the people. In fact, the economic and social cost of malaria to the individual and nation can be enormous.

Global deaths attributable to malaria annually have also seen an increase since 2004 due greatly to patterns in Africa where mortality increased from 493000 in 1980 to 1.6 million in 2004 with the highest burden of the disease occurring in Sub-Saharan Africa (TDR/WHO, 2002; RBM/WHO, 2000). Also, deaths due to malaria alone stood at about 85% of all deaths among children under five years with 95% of such happening in Africa (Roll Back Malaria, 2010; WHO, 2010). This pattern is similar to the case of Ghana where malaria is the major cause of illness and death with 38.6% of all outpatient illness and 43% in 2009 and 2010 respectively. It

has also resulted in 36.9% of all admissions in 2009 alone for all ages with more than 80% among children alone in Ghana (Isaac Adams et al., 2004).

Furthermore, what this means is that the malaria control strategies have yet to halt the debilitating effects of the disease due probably to the fact that a large proportion of these treatments were not started within 24 hours of the onset of fever, and may not therefore have been sufficiently and timely treated to reduce the risk of progression of simple malaria into severe life-threatening one (World Malaria Report, 2008).

In Ghana the Ministry of Health has had a policy to procure and distribute insecticide treated bed nets, as an additional control measure to back the RBM project (Chinebuah 1999). Another measure adopted to control malaria is through the IRS in Ghana similar to the United Nations Environmental Programme (UNEP, 2000) recommendation to the use of Dichloro-Diphenyl Trioxocarbonate (DDT) for spraying to kill the vector, which transmits the disease.

Moreover, the success of the overall global malaria control strategy is to translate into the attainments of the Millennium Development Goal six (MDG6) which is targeted at combating HIV/AIDS, malaria and other diseases by 2015 (United Nations, 2008). More so, the Global Health Council Research Associate Conference held in Nairobi, Kenya has observed that the MDG6 is important to achieving the targets of the other MDG goals relating to child and maternal mortality. But it is unlikely that developing countries will achieve the target of the Millennium Development Goal Six (UNDP, 2006). What this means is that the other MDGs are likely not to be achieved by 2015.

Also, it is important to note that effective implementation of malaria control programs requires multi-faceted approach which must move beyond treatment and management to include prevention through vector control. But it is possible that emphasis may be placed on funding, case management over integrated vector control strategies through evidence-based interventions, tailor-made for local settings, and provides a way to coordinate and refocus resources for vector control. What this means is that effective vector disease control programmes must be ecologically and socio-economically sensitive of which consideration is given to locally suitable environmental management and personal protection methods.

There is therefore the need to assess the extent to which the malaria control interventions have caused desired changes among households. Ezemenari et al., (1999) has suggested the use of an analytical framework to evaluate the net impact of malaria control interventions on households. In addition, the WHO (1992) has urged institutions to adopt the Logical Framework as an effective tool for planning, monitoring and evaluating control programmes by defining the structure in terms of inputs, outputs, outcomes as well as performance indicators. Against this background that the study examines the problem identified in the area.

## 1.2 STATEMENT OF RESEARCH PROBLEM

The health challenges that malaria poses to the people of Akwapim South Municipality are enormous. It remains the number one cause of disease burden despite the considerable interventions put in place under the National Malaria Control Programme (NMCP) to fight it. According to the Akwapim South District Health Management Team (DHMT) in December (2011), malaria contributed to the highest burden of all other diseases representing 46.3% in

2011 compared to the regional prevalence of 40.2% in 2009, 37.7% in 2010 and 33.7% in 2011(Source: Eastern Regional Health Directorate Annual Report, 2011). It is especially the major cause of morbidity among children in the past ten years in the district and incidentally ranked the third childhood disease after diarrhea and anemia among children in Ghana (Ministry of Health, 2012). This situation has led to congestion often characterizing all the health facilities in the municipality. The effect goes beyond this to include the loss of productive hours which results in low income or productivity.  From the look of things it is not likely that the prevalence of malaria incidence will reduce any time soon due to the favorable conditions for mosquitoes which transmit disease as well as the lack of behaviour change on the part of the people towards malaria control.

Against this background that the Municipal Health Directorate in collaboration with the Ministry of Health introduced interventions and strategies under the National Malaria Control Programme in order to control the disease. These strategies are in line with the World Health Organization's programme for malaria control as highlighted in the Roll Back Malaria partnership. They include: prompt and effective treatment of malaria through the use of anti-malaria drugs, indoor Residual Spray (IRS) and Insecticide Treated Net (ITN). In addition, the availability of health facilities in the Municipality and the introduction of the National Health Insurance Scheme (NHIS) are to enhance prompt and effective health care delivery. Yet, the burden of malaria is no where under control as it is topping the list of the top ten diseases in the municipality. This has therefore put the success of the NMCP in doubt. This makes it necessary to conduct a scientific investigation so as to better understand the outcomes of the activities of the NMCP among households in the area.

Previous studies on the topic have placed emphasis on the prevalence and management (Chuks and Irene, 2007), the use of Insecticide Treated Net (ITN) and its Acceptability (Chinbuah, 1999) and the Transmission Dynamics and Patient Compliance with Treatment (Appaw, 2003 and Yeboah-Antwi et al. 1997).

However, there are no adequate and systematic studies in the study area by way of an assessment of the effectiveness of the malaria control programme based on outcomes of the interventions meant for the control and management of the disease. This gap in knowledge identified is the reason for the study.  It will cover the entire Akwapim South Municipality. It will also take a critical look at the agencies responsible for malaria control and the various strategies put in place to control malaria. Such studies are necessary to obtain more in-depth, locally relevant and descriptive data on effective malaria control and factors which impede the effectiveness of malaria control strategies. Importantly, such data are required to inform pragmatic efforts on how to improve performance. This must be the immediate attention to reduce the malaria burden in order to reach the targets of the Millennium Development Goals.

Monitoring and evaluation enhance the effectiveness of programmes and projects by establishing clear links between past, present and future interventions and their likely results. Without evaluation, it would be impossible to assess whether progress and success could be claimed, and how future efforts can be improved. To improve performance then one has to find out to what extent malaria control programmes in the municipality are building the capacities of the local people and improving on the access to malaria control interventions to the people.

## 1.3 RESEARCH QUESTIONS

1. What is the malaria situation in Akwapim South Municipality?

2. What are the interventions of the NMCP introduced in the Akwapim South Municipality?

3. What are the challenges of the NMCP programme in the Akwapim South Municipality?

4. What are the outcomes of the activities of the NMCP in the Akwapim South Municipality?

## 1.4 RESEARCH OBJECTIVES

The main objective of this study was to assess the effectiveness of the National Malaria Control Programme in the Akwapim South Municipality.

## 1.4.1 THE SPECIFIC OBJECTIVES

Specifically, the study addresses the following specific objectives:

1. To assess the malaria situation in the Akwapim South Municipality.

2. To identify the interventions of the National Malaria Control Programme introduced in the Akwapim South Municipality.

3. To identify the challenges of the National Malaria Control Programme in the Akwapim South Municipality.

4. To assess the outcomes of the activities of the National Malaria Control Programme in the Akwapim South Municipality.

1.5 THE CONCEPTUAL FRAMEWORK

The author adopted and used the Logical Framework to evaluate the performance and effectiveness of the malaria control programme. This Analytical Framework was developed by Leon Johan Rosenberg in (1969) and used by the United States Agency for International Development to evaluate the performance of donor sponsored programmes.

The framework has four main stages which are *inputs, outputs, outcomes and impact.*

**Inputs**: These are the resources that go into the various strategies in the form of human and financial resources, supplies and malaria-related commodity procurement.

**Outputs:** These are seen in terms of services delivered such as insecticides, ITNs distributed, nets retreated, anti-malarial drugs distributed, number of malaria cases managed or treatment given, number of times health workers were trained on management of malaria cases. They in fact are the direct results of the inputs or activities of the programme.

**Outcomes:** The outputs should bring about the outcomes in the form of changed behaviour, coverage of anti-malarial treatment of children less than five years, household ITN possession and usage, number of pregnant women put on IPT and number of malaria cases detected and treated. The outcomes measure the purpose for implementing the various specific strategies. They also measure the effectiveness of the programme implemented.

 **Impact:** Seen as the overall goal of the programme in terms of reductions in morbidity and mortality, outpatient visits to health facilities, and admissions due to malaria. Information to measure malaria impact includes malaria cases from surveys and reports, proportional outpatient visits, hospital admissions and hospital deaths due to malaria; all-cause under-five mortality, pregnant women and all ages.

The basic important assumption is that the inputs and activities will logically result in the overall success of the programme which is reduction in malaria morbidity and mortality

Table 1.1: The Logical Framework for Tracking Progress of Malaria Control Programmes

| Intervention Logic | Performance Indicators | Means of Verification | Assumptions |
|---|---|---|---|
| Impact or Goal: malaria morbidity and mortality reduced | Malaria prevalence rate among among households reduced | Annual reports, DHS reports, household surveys | Availability of financial support |
| **Outcome:** The coverage and results of malaria prevention and control strategies to reduce morbidity and mortality. | Coverage of control interventions e.g The % of children under fives who slept under ITNs the previous night. <br><br> % of households with atleast one ITNs. <br><br> % of pregnant women who slept under ITN the previous night. <br><br> % of reduction in malaria morbidity and mortality rates Number of households who had house sprayed | • Household surveys <br><br> • DHMT reports <br><br> • Hospital records <br> • DHS reports <br> • Number of malaria cases detected and treated | • Availability of ITNs <br> • Subsidies for ITNs <br> • Awareness and acceptance of ITN among households <br> • Availability of trained staff and equipment |
| **Outputs:** | % of malaria case-fatality rate <br><br> General crude death rate <br><br> Number of cases of severe malaria among target groups <br><br> Malaria-specific death rate | 1. Routine HIS <br><br> DHS <br><br> Health facility surveys <br><br> Household surveys | Strong HIS <br><br> Availability and use <br><br> Effective and affordable drugs available <br><br> Sustainable funding and partnership |
| **Inputs:** The specific activities of the MCP | The number of ITNs purchased for distrib- ution. Availability of trained professionals. Availability of diagnos- tic materials | Reports Review of health records In-depth Interviews FGDs | It is assumed that funds are readily available. |

(Source: World Health Organization and UNICEF, 2005).

For a programme to achieve its goals, inputs such as money and staff time should result in the delivery of outputs such as the number of ACTs, LLINs, and trainings conducted among others. The outputs are the result of specific processes, such as trainings for staff which should be included as key activities aimed at achieving the outputs. If these outputs are well designed and reach the populations for which they were intended, the programme is likely to have positive outcomes, for example increased use of insecticide-treated nets (ITNs). These positive short-term outcomes should lead to changes in the longer-term impact of programs, measured in fewer new cases of malaria burden among the people.

The stages of the evaluative framework imply that the activities or strategies of malaria control programme should logically result in the overall reduction of malaria burden. But some important determinants of effective malaria control such as environmental conditions (ecological and climate), socio-economic (economic status, occupation, housing condition) and demographic characteristics such as age, immunity, gender and behaviour change are important measures of the overall success or failure of which the framework does not incorporate fully.

FIGURE 1.1 THE INTERVENTION FRAMEWORK OF ACTION

| PROGRAMME FACTORS | | **INPUTS**<br><br>Funds, ITNs/LLINs, IRS<br><br>drugs, campaigns,<br><br>diagnostics | **ACTIVITIES**<br><br>Diagnostic and Treatment<br><br>Prevention and Control | **OUTPUTS**<br><br>Number tested and treated with ACTs, LLINs distributed, number of campaigns |
|---|---|---|---|---|
| **EXTERNAL FACTORS**<br><br>Socio-economic and<br><br>Environmental factors | | | **OUTCOMES**<br><br>% of people receiving correct treatment, ITNs/LLINs and IRS | **OVERALL**<br><br>**IMPACT**<br><br>Reduction in malaria morbidity and mortality |

(Source: Modified Version of the Logical Framework; WHO Version, 2005)

Policy regulation and the programme activities are essential for successful malaria control. The policy plays a crucial role in the provision of key inputs such as diagnostics, ITNs/LLINs, drugs and most importantly funds.

Socio-economic and environmental factors play an equally important role in ensuring programme success because the activities of the programme take place within space and time. Therefore factors such as education, housing, income, social values, customs and climate can influence the success or failure of the programme.

## 1.6 SIGNIFICANCE OF THE STUDY

To the best of my knowledge few studies have been carried out on the effectiveness of the malaria control programme based on the outcomes of interventions for malaria control in the Ghanaian context to date. In particular, very little is known in the study area concerning this very important subject matter. On the basis of available empirical evidence, it is necessary to furnish decision- makers and other stakeholders with vital information regarding the performance and challenges of malaria control initiatives in the area for possible policy interventions. The study to a large extent will also contribute to knowledge and among other things stimulate further research.  On this note, the general objective of this study is to assess the effectiveness of the malaria control programme in the Akwapim South Municipality to understand the factors of sustainable malaria control in Akwapim South Municipality and Ghana at large.

## 1.7 THE NATIONAL MALARIA CONTROL PROGRAMME OF GHANA

In response to the malaria burden WHO adopted the Global Malaria Control Strategy (GMCS), to which Ghana became a signatory. Following that the Ministry of Health (MOH) launched its first 5-year (1992-1997) nationwide Malaria Control Action Plan (MCAP) in November 1992 with the objective of reducing malaria related morbidity and mortality to such low levels that it will cease to be a public health problem (Ahorlu et al. 1997).  Ghana then committed itself to the Roll Back Malaria (RBM) initiative in 1999 and developed a strategic framework to guide its implementation. The partners include UNICEF, UNDP, the World Bank, ministries, NGOs, private sector, private sector organizations as funders and research institutes, and the community at large.

Overall, the Ghana RBM emphasizes the strengthening of health services through multi and inter-sectoral partnerships and making treatment and prevention strategies more widely available. The initial goal was to reduce malaria specific morbidity and mortality by 50% by the year 2010. To achieve the goal, four main strategies have been introduced and pursued nationwide. These include the promotion of multiple prevention interventions which include the use of treated bed nets, chemoprophylaxis in pregnancy and environmental management. The second and major intervention was by improving upon malaria case management at all levels (from household to health facility). There was also the need to encourage evidence-based research to come up with effective interventions and lastly to improve partnership with the partners at all levels.

Then came the Malaria Control Strategic Plan (2008-2015) with the goal of achieving 75% reduction of malaria morbidity and mortality by the year 2015 in line with the attainment of the Millennium Development Goals (MDGs). This goal was to be achieved through an overall health sector development, improved strategic investments in malaria control, and increased coverage towards universal access to malaria treatment and preventive interventions. The choice of programmes and targets for the malaria control programme were informed by the actions of the Roll Back Malaria partnership. The NMCP in collaboration with the Ghana Health Service adopts and implements programmes and strategies in a decentralized system (Source: GHS, Eastern Region, 2012).

## 1.7.1 THE ORGANISATIONAL STRUCTURE OF THE MALARIA CONTROL PROGRAMME

In terms of structure, the National Malaria Control Programme (NMCP) is hierarchical (NMCP, 2008) but fused to the broad health sector having the MOH as the body at the helm of affairs formulating policies where as Ghana Health Services (GHS) acts as the implementing body which has been decentralized. Since 1998 the country established the NMCP Unit (MOH/GHS, 2008) charged with the responsibility of translating policies and strategies into interventions. The noticeable problem with the malaria control organisational structure has been that only three programme officers manage the whole country with only one focal person each at the district and regional levels. Those at the district levels still have additional responsibilities to perform in addition to malaria control activities. Therefore coordination of activities was difficult and thus posed a great challenge in dealing with malaria problems at the community levels.

FIGURE: 1.2 ORGANISATIONAL STRUCTURE OF THE GHS
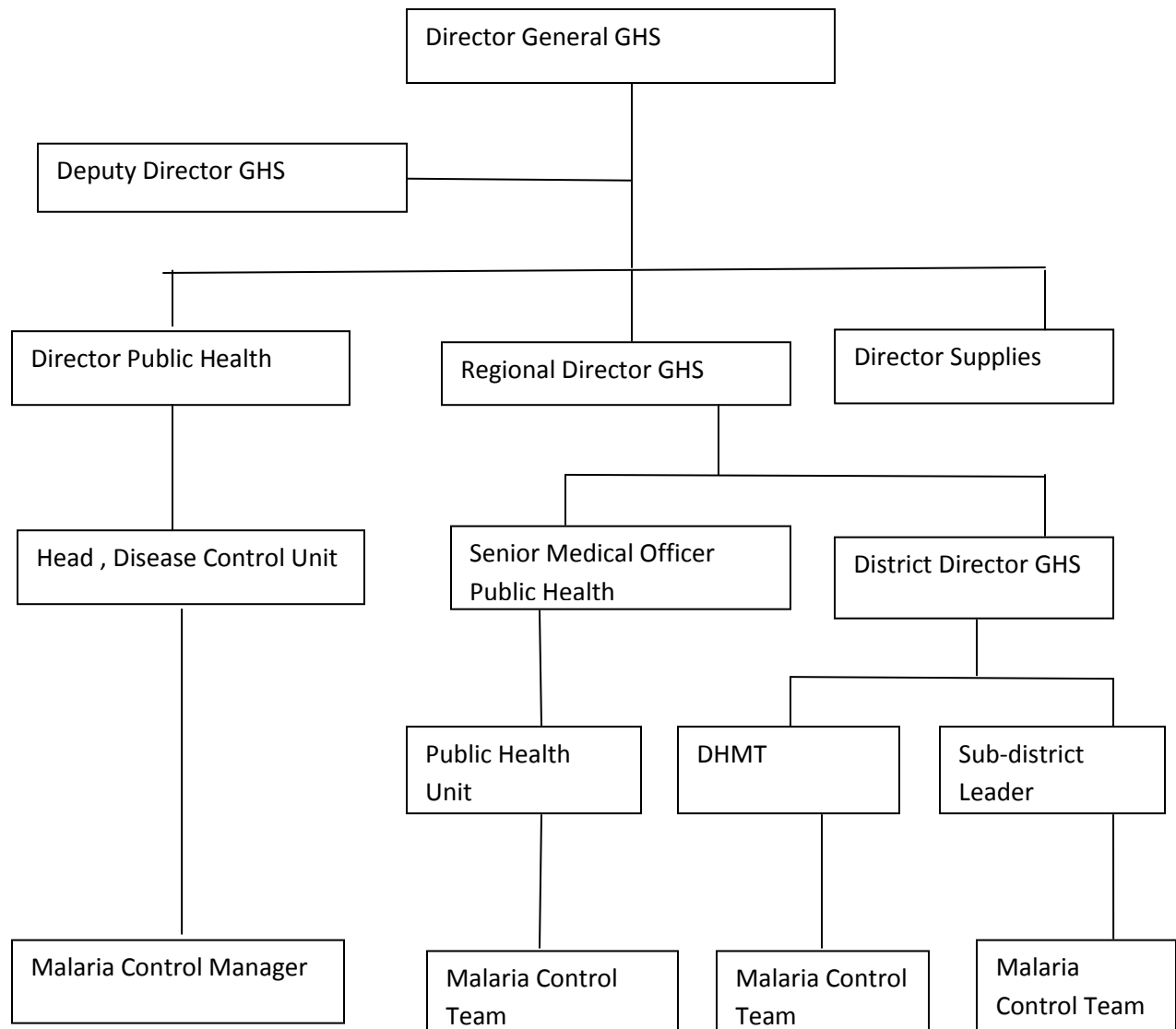


(NMCP; ANNUAL REPORT, 2008)

The above diagram depicts the orgonogram of the GHS and the malaria control unit. The malaria control unit is actually fused into the structure of the Ghana Health Service. The current structure appears to be all encompassing in the sense that malaria control teams are fused to the structure of Ghana Health Service. Unfortunately, there is no direct placement of the National Malaria

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Control Programme in the GHS structure. As a result there seems to be the problem of co-ordination between the two bodies. Therefore the strategizing activities for successful malaria control might not be achieved since the GHS is supposed to be the direct implementer of policies formulated by the Ministry of Health whilst the National Malaria Control Programme is equally an independent body tasked to control malaria.

## 1.7.2 THE GOAL AND OBJECTIVES OF THE MALARIA CONTROL PROGRAMME

Overall, the Ghana Roll Back Malaria (RBM) emphasizes the strengthening of health services through multi and inter-sectoral partnerships and making treatment and prevention strategies more widely available through the PHC system at the local levels. The goal was to reduce malaria specific morbidity and mortality by 50% by the year 2010. This has been accelerated with a goal that generally aimed at reducing deaths and illness due to the malaria disease by 75% by the year 2015 in line with the attainment of the Millennium Development Goals (MDGs). This goal is to be achieved through overall health sector development, improved strategic investments in malaria control, and increased coverage towards universal access to malaria treatment and preventive interventions (Source: Field reports from GHS). But for the purpose of the thesis the targets are tracked up to 2012 to assess the progress made.

This has often served as an important indicator to measure the performance or effectiveness of the malaria control programme and so it is the case for the study. In order to ensure the effectiveness of the various programmes and strategies of malaria control, timelines were tagged to the activities to put on track the progress made by the local and national control programmes.

Those specific strategies and timelines identified include:

i) To have increased household ownership of ITNs by 75% in 2010 and 100% by 2015

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ii) 50% of the general population will sleep under ITNs by 2010 and 80% by 2015

iii) To have increased the number of children under-five and pregnant women sleeping under treated net to 85% by 2015

iv) 75% of pregnant women shall be on appropriate Intermittent Preventive Treatment by 2010 and 100% by 2015

v) To have covered about 90% of all districts with indoor residual spraying

vi) To have 75% in 2010 and all (100%) by 2015 of all health facilities providing prompt and effective treatment using ACTs

vii) To have had 90% of all patients with uncomplicated malaria correctly managed at public and private health facilities using ACTs

viii) All (100%) communities should have access to community-based treatment for uncomplicated malaria by 2015

ix) Specifically 90% of caretakers or parents should be able to recognize early symptoms and signs of malaria by 2015

x) Lastly, 90% of children under five years of age with fever should receive an appropriate ACT within 24 hours of onset.

 (Source: Adapted from NMCP, Strategic Plan for Malaria Control in Ghana 2008–2015, Retrieved on 12th December 2012).

1.8 THE STRUCTURE OF THE THESIS

The first chapter is on the introduction which focuses on the general introduction, problem statement, objectives of the study, the conceptual framework, a brief description of the NMCP and the rationale for the study. The second chapter provides a review of relevant literature on the past and present strategies of malaria control globally and within. Also, a review of the factors that influence the prevalence of malaria was done as well as those factors of effective malaria control.

Chapter three discusses the methodology and the study area of the research. In general, the methodology emphasizes on an evaluative approach as a methodology for empirically analyzing the performance of the malaria control programme. In terms of methods, the study combines both quantitative and qualitative methods, but with emphasis on qualitative. As a result techniques associated with qualitative methods were used for the study including in-depth interviews, focus group discussions, direct observation and review of policy documents. The second aspect of the chapter highlighted on the profile of the study area and the general socio-economic features of the respondents.

Chapter four examined the various activities of the malaria control programme in the area. Chapter five addresses the perceptions of households on the outcomes of the malaria control interventions and then the challenges of the programme as well as the coping strategies adopted by households. The sixth and final chapter presents the conclusion and recommendations of the study.

# 2.0 CHAPTER TWO: LITERATURE REVIEW

## 2.1 INTRODUCTION

This chapter reviews some of the published and unpublished literature which is relevant to the context of this research. This addresses various aspects of the disease with respect to the disease and human health as well as initiatives and programs instituted by international and local organizations to control and prevent it. Lastly, the literature on the Malaria Control Programme under the Roll Back Malaria Partnership was examined.

### 2.1.1 The Malaria Disease

The definition of a case of malaria is essential in assessing incidence as well as prevalence, which are both crucial indicators in measuring the effectiveness of any malaria control intervention. Malaria is an infectious disease caused by a parasite, plasmodium, which infects red blood cells (Beers et al., 2004). Studies show that the malaria disease is often characterized by repeated chills, fever, pain, and sweating (CDC, 2007). The fever as generally recognized refers commonly to high body temperature. Malaria is also believed to have been with mankind in far back time as historical records suggest malaria infections among humans since the beginning of early civilizations. The name "mal aria" was used to refer to "bad air". The term was shortened to "malaria" in the 20th century and the parasite first identified in human blood by Laveran, 1880. In 1889, R. Ross discovered that mosquitoes transmit malaria and recognized four common species of plasmodium that cause malaria. The most serious type is plasmodium falciparum which can cause life-threatening malaria. The other three common species of malaria (Plasmodium vivax, plasmodium malariae, and Plasmodium ovale) are generally less serious and are usually not life-threatening (Webster's New World Medical Dictionary, Third Edition, 2008).

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So, for a very long time the malaria disease has had a devastating effect on societies which necessitated global efforts to finding an antidote to it.

Common symptoms attributable to the disease as identified from the literature ranges from mild, to life threatening. Mild is often referred to as the uncomplicated form of malaria that is easily treated with anti-malaria drugs where as the severe malaria may need serious attention in order for it to be treated (CDC, 2007). Common symptoms of the disease identified by the Centre for Disease Control in (2007) include that of fever, chills, headaches, vomiting, joint pains, high temperature and general weakness. But it should be noted that fever has been the commonly identified symptom that is recognized and forms the basis of diagnosis and treatment of malaria.

2.1.2 The Malaria Situation

Review of relevant literature shows a high malaria morbidity and mortality especially in SSA countries (RBM/WHO, 2000; WHO, 1998; WHO, 2004). An estimated 40% of the world population is believed to be exposed to the risk of malaria, of which nearly 10% of the population will suffer a case of malaria yearly (RBM, 2002). According to (Snow et al., 1999) there are more malaria related deaths due each year occurring in SSA alone where an estimated 360 million people live in endemic areas commonly prone to high rate of plasmodium falciparum transmission.

The high malaria burden in SSA results from a wide range of factors largely environmental, socio-economic and species type. Highly efficient anopheles gambiae and anopheles funestus vectors are commonest species in the tropics and with the parasite population composed largely of plasmodium falciparum which is by far the most virulent human malaria species (World

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Health Organization, 2012). There is also poverty and poor healthcare infrastructure among the developing countries (Snow et al., 1999). This means that malaria control interventions would be ineffective due to poor resource and infrastructure among poor countries (Killeen et al., 1999).

Indeed, it is also estimated that the highest burden of the disease is borne by children and pregnant women characterized by anemia and low birth weight which have contributed to about 50% of the overall malaria morbidity and mortality in Africa (Murphy, 2000). In fact, similar studies in Ghana have put the incidence and burden of the disease to be very high as has been the number one cause of illnesses among the population (MOH, 2011).

2.1.3 Predisposing Factors of Malaria

It is only possible to effectively control malaria when the determinants and their manifestations are clearly understood which informs of which appropriate interventions to put in place. It is important to note that malaria transmission is dependent on a complex interaction between host, vector, parasite, and environment where the anopheline mosquito feeds on the blood of an infected host (human) and then infects other people while feeding on their blood (Nevill, 1990). This is a clear call of the environmental and social aspect of malaria disease where control interventions should acknowledge.

The manifestations of malaria in patients and its toll on communities and households reflect the intrinsic and extrinsic determinants (Molineaux, 1988). The intrinsic factors that influence malaria incidence include host (human) factors such as immunity, parasite species and anopheline longevity have the greatest impact on the malaria burden (Molineaux, 1988). Extrinsic factors such as climate (mainly rainfall and temperature), economic conditions

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(poverty), political commitment, and effectiveness of control and prevention efforts are recognized as the most important determinants of malaria burden (American Society of Tropical Medicine and Hygiene, 2001). Indirectly, these factors tend to influence the interventions of malaria control hence the need to understand this as part of efforts to halt the disease burden.

Figure 2.1: Predisposing Factors of Malaria.
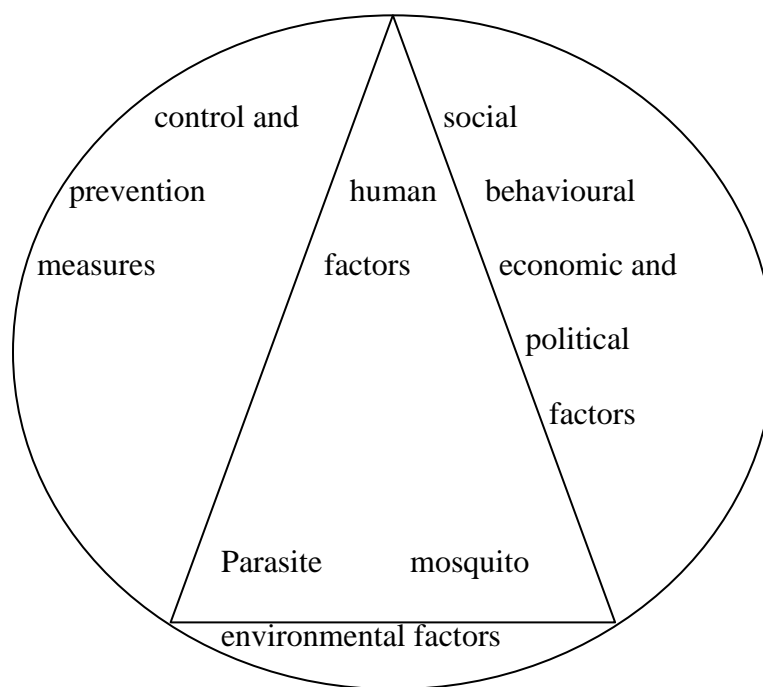


Source: Ears of the Hippopotamus, 1994: cited in American Society Journal of Tropical Medicine).

2.1.3.1 Host factors

Host factors among human populations exposed to malaria infection may vary in their level of susceptibility to the infection and severity of illness (Ears and Hippopotamus, 2000). The genetic makeup of some people naturally protects them of the malaria disease, particularly cerebral malaria which basically is a function of heredity which naturally powers the red blood cell with decreased susceptibility to severe malaria. Although knowledge of host and parasite genetics has

added greatly to the understanding of susceptibility to malaria, the use of genotype information for improved malaria treatments and prevention remains a big challenge.

2.1.3.2 Malaria Parasite

Plasmodium falciparum is the most virulent of the four species of plasmodia affecting humans (CDC, 2010) though plasmodium vivax is known to cause relapse of malaria months after an infection thus causing substantial morbidity but fewer severe complications (Singh et al., 1997). Knowledge of the species type is often important for knowing what strategies to adopt for successful malaria control among a population.

A review of literature shows that plasmodium falciparum often resists to drugs which is responsible for the poor performance of malaria control strategies and increasing burden in Africa (WHO Malaria Report, 2008). Its resistance to chloroquine and multi drugs is widespread which calls for mapping out new strategies under control programmes (Gupta et al., 2004). This is partly the result of the halt in global malaria eradication since 1980 which probably created a period of lapse. This situation forced societies to depend on the use of effective drugs to reduce mortality and morbidity as has been the major strategy for malaria control, particularly in Africa (Breman et al., 1988). The increasing malaria burden should then be seen as the inadequacy and inappropriateness of current strategies which still places emphasis on drug usage with less attention to vector preventive measures.

The malaria parasites have the ability to infect and destroy the red blood cell when they find their way into the blood stream. It is the destruction of these important cells that lead to fever and flu-like symptoms, such as chills, headache, muscle aches, tiredness, nausea, vomiting and diarrhea

which may be non-specific (Wells et el, 2009). It is also proven by researchers that severe malaria is caused by plasmodium falciparum which if not promptly treated can lead to complications of aneamia, breathing difficulties and sometimes coma.

2.1.3.3 The Malaria Vector

A study by Snow et al., (1999) confirms that the *plasmodium falciparum* is highly prevalent in all of Sub-Saharan Africa (SSA) of about 400 species of anopheles, with only sixty of this transmitting malaria. Anopheles gambiae and Anopheles funestus are the most efficient vectors of plasmodium falciparum transmission in Africa (WHO, 2005). Of the factors related to malaria transmission with the exception of the host immunity, the density, human-biting habits, and longevity of anopheline mosquito vectors are the most important (World Malaria Report, 2011). Given the fact that health service delivery in SSA has been poor for malaria control and other vector diseases, most malaria control initiatives have had limited success in developing countries (Magmus et al., 2006). Coupled with this is the fact that vector control has not been a major strategy to control malaria through attacking the mosquito with classical vector control technologies to prevent and control epidemics except the current interest in the use of insecticide-impregnated bed nets and other materials for personal protection (Nevill, 1996; Binka et al., 1998 and Greenwood et al., 2004). Therefore, for any of such vector control measures to be successful an understanding of the cycle of the mosquito is important and must be a guiding principle for effective control measures to be put in place.

2.1.3.4 Environmental Factors

Climatic factors such as temperature, rainfall and high humidity are necessary conditions for mosquito breeding. The longevity of the parasite is often associated with the warm tropical areas. Anopheles gambiae mosquitoes breed readily in large and small collections of sun-exposed still water, such as exist throughout tropical Africa.  In addition, the seasons and man's built environment in the form of the construction of dams, roads, and industrial and residential centers, can result in disruption of the terrain, allowing an increased mosquito breeding. According to Appawu et al., (2007), malaria transmissions vary largely due to environmental factors such as temperature, rainfall patterns and proximity to breeding sites of mosquitoes.

Again, it has been found out that malaria cases by season in South Africa from 1999 – 2003 vary with seasons peaking from the months of March to June when heavy rainfall is recorded but with low reported cases from November to January, the dry season (South African Journal of Medicine, 2007). This is similar to the findings of Appawu and colleagues (2007) who studied malaria transmission dynamics in the Kassena Nankana District, a site in northern Ghana indicated that transmission was highly seasonal and the heaviest transmission occurring from June to October due to the rains. The study further indicates that climatic conditions may influence mosquito breeding and hence transmission of malaria. This means that the rainy season actually favours the prolific breeding of mosquitoes and hence high malaria transmission. If environmental conditions change in ways that would increase the survival time of mosquitoes, then they would be able to transmit other species of malaria that were not present in that area.

Analysis of these dynamics can inform policy makers of which strategy to adopt in controlling malaria. In addition, it may be important to do a geographical mapping of malaria endemic

regions so as to help reduce the epidemic risk and prevention of catastrophic and disasters of malaria epidemics since that can bring about the bridging of gaps associated with malaria control programmes (Snow et al., 1999).

Urbanization in developing countries has also led to increased malaria cases in most of these large cities thereby making them risk zones of epidemics. This is especially common among the developing world where urbanization does not match the level of economic and social transformation (UN-HABITAT, 2008). Rapid urbanization brings about major changes in ecology, social structure and disease patterns in sub-Saharan Africa. It is estimated that 300 million people currently live in urban areas in Africa and two-thirds of them are at risk of malaria (Keiser et al., 2004). There is a lack of understanding of the complex interactions between human social structure, the environment and malaria infections (Donnelly et al., 2005). Measures to prevent malaria can be easier to implement and more cost-effective in urban and peri-urban areas than in rural zones due to the level of literacy and improved health system (Omumbo et al., 2005).

2.1.3.5 Socio-Economic Determinants of Malaria

It is generally established throughout the world that morbidity and mortality rates are directly associated with socioeconomic status. Socio-economic conditions such as education, behavior, poverty, community participation, housing and occupation turn to influence malaria incidence as they directly affect the performance of specific interventions to control malaria among households. The drastic reduction of malaria transmission in Europe and some parts of American countries including a few in the tropics was largely the result of an improvement in education and other socio-economic conditions (CDC, 2010). The improvement of general hygiene and

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public health including the filling of swamps, elimination of open drainage ditches and other mosquito breeding sites, screening of windows and doors, widespread use of air conditioning, and availability of rapid diagnosis and drugs for acute illness were some of the public measures that resulted in the reduction (WHO, 2005). Poverty turns to correlate directly with malaria burden in Africa which has become necessary for its alleviation in order to decrease malaria endemicity according to studies by WHO, (2005). Such communities are resource-poor, have limited access to health and other social services, and low levels of literacy. Other enabling factors such as age, poverty, knowledge and awareness, housing type and the overall behaviour of the people can have an impact.

Housing type may influence malaria transmission depending on the degree of exposure of the outdoors, for instance the lack of windows or screens which can facilitate contact between an individual and the mosquito vector. Similarly, the presence of some particular structural features that limit contact with the mosquito vector are likely to reduce infection (Shell, 1997).

In Sri Lanka for example, Gamage-Mendis et al. (1991) argued that the housing type is a more important determinant of variability in malaria risk than the socio-economic differences that accompany it.

Fawole and Onadeko (2001) also examine the treatment seeking behaviour of urban poor mothers with fever and found a direct correlation between the level of education and treatment-seeking behaviour. It was found that those with no formal education are less likely to attend health facility first compared to educated women who attended a facility first. Herbal treatment of malaria is also likely to be associated with uneducated compared to those with higher education (Koram et al., 2000).

2.1.4 MALARIA CONTROL INTERVENTIONS AND STRATEGIES

The global campaign to eradicate malaria began around the 1940s to the late 1960s which saw the use of DDT to spray widely, coupled with the coating and draining of breeding grounds (Brown, 1986). This resulted in the eradication of malaria in Europe and parts of Asia, geographically referenced as sub-tropics. However, the story was different in the tropics due largely to vector resistance and inadequate health facilities which therefore result in the inability to eradicate malaria through vector control (WHO, Malaria Report, 2008). The present strategies to contain malaria are through prevention and treatment of malaria cases (WHO, 2008). The current strategies are perceived effective and implemented on large-scale having largely to do with vector control using indoor residual spraying (IRS) and case management based on definitive diagnosis and treatment with artemisinin combination therapy ACTs (Conteh et al., 2004, Barnes et al., 2005 and Sharp, 2007).

In many parts of the world where the disease is endemic the control strategies have been through the provision of Insecticide Treated Nets (ITN) for children under 5years, pregnant women and people living with HIV/AIDS. There is also the use of Intermittent Presumptive Treatment (IPT) during pregnancy and Indoor Residual Spray (IRS) where appropriate as preventive measures. In terms of treatment emphasis has been placed on early and effective case management for clinical and suspected cases (Lorraine Thiel, 2005). These are in line with the international strategy for malaria control under the RBM programme put in place by the international community in 1998.

Moreover, to ensure prompt and effective treatment of malaria the World Health Organisation introduced the Home Based Management of malaria in Africa where transmission is severe. The

strategy fits into the primary health care system of making treatment responsive to local needs of various communities (Malaria Journal, 2007). The involvement of UNICEF in the procurement and distribution of ITNs to children under 5years and pregnant women at highly subsidized prices has led to increase accessibility by the core vulnerable (Chuks J. Mba and Irene K. Aboh, 2007).

But studies in Guatemala has shown that a significant number of individuals do not report promptly for the treatment of malaria because they did not think they had malaria (Christopher M. Booth et. el., 2001). This also points to the fact that treatment of malaria is not likely to be prompt in addition to the fact that others often resort to self-treatment usually with anti-malaria.

Furthermore, the Ugandan Ministry of Health teamed up with the WHO to pilot malaria eradication proramme in Kigezi with the aim of lowering malaria prevalence in the area and also to test the feasibility of malaria eradication in Sub-Sahara Africa, which had previously been excluded from the 1955 Global Malaria Eradication Campaign due to intense transmission and lack of infrastructure. The eradication campaign consisted of the distribution of anti-malarials alongside the mass spraying with DDT and education for behaviour change.

2.1.5 The Roll Back Malaria Initiative

The Roll Back Malaria (RBM) initiative is a global partnership and initiative of national governments, civil society, non-governmental organizations, research institutions, professional associations, UN and development agencies, development banks, the private sector and the media teaming up against malaria (RBM Framework for M&E, 2007). The emphasis was on the

implementation of malaria control programs in Africa with the objective to reduce the malaria burden through interventions adapted to suit local needs of the people with support from the health systems of the countries (Roll Back Malaria Framework, 2000).

Currently, the RBM's global strategic plan of (2005-2015) is in line with the Millennium Development Goals (MDG6) which has generally shaped malaria control efforts in Africa (RBM, 2005). To ensure that goal is achieved the RBM's strategic plan aims to reduce malaria morbidity and mortality by 75% by the year 2015 by ensuring universal access to interventions (both preventive and curative) through increased coverage of interventions (RBM, 2005).

In sum, current malaria control strategies have largely consisted of case management of malaria within the first 24 hours of illness onset with appropriate malaria drugs, the use of ITNs, prevention of malaria in pregnancy and the use of IRS remains the core interventions identified (http://www.rbm.who.int). Most national malaria control programmes have adopted RBM's strategic approaches and developed a plan of action and targets including that of Ghana's.

Table 2.1: Intervention Strategies and Targets of the RBM

| Strategy | RBM Target by 2015 |
|---|---|
| Prompt access to effective treatment | 90 percent of those suffering with malaria should have access to and be able to use correct, affordable, and appropriate treatment within 24 hours of the onset of symptoms. |
| Provision of ITNs and IRS | 100 percent of those at risk for malaria, particularly children under five and pregnant women, will own and use ITNs<br>80 percent of general population will sleep under ITNs<br>75 percent of all households in endemic areas will have access to IRS |
| Prevention and control of malaria in pregnant women | 100 percent of pregnant women at risk of malaria will have access to IPTp |
| Epidemic and emergency response | 90 percent of cases detected within two weeks of onset and treated<br>100 percent of all health facilities provides prompt and effective treatment with ACTs |

(WHO, 2010)

In order to achieve the objectives of the program, it was important that effective malaria control interventions be accessible and have maximum coverage of the population especially the vulnerable. The healthcare system under which the program has been placed should be able to provide rapid, accurate diagnosis, prompt and effective patient management in terms of quality diagnosis, treatment, counseling and education, referrals and the use of insecticides to repel mosquitoes (Jamison et al., 2006).

## 2.1.6 MALARIA CONTROL EFFORTS IN GHANA AND THEIR OUTCOMES

Malaria control efforts in Ghana can be traced back to the colonial era. Before colonialism herbal medicine was the prime source of treatment by the local people. But during colonial administration malaria was controlled through the use of orthodox and traditional herbal medicine (Twumasi, 1986a). In the case of the formal method, Dwuma-Badu, et al. (1978) noted that there was an introduction of anti-malarial drug called quinine to treat victims of malaria. Apart from that there was also the use of environmental management interventions for vector control since the local ecology and vector dynamics put the populations at high risk. The aim of the environmental management was to eliminate the breeding sites of the vector. Other individual and household protection strategies for malaria prevention were through the building of houses away from breeding sites like the dams and water pools to reduce the human-vector contact (WHO, 1982 and Walker, 2002). These measures did not work perfectly and very costly for reducing the number of mosquitoes.

Chloroquine was subsequently introduced as the main intervention adopted to control malaria in Ghana as was the case in the global dimension (Twumasi, 1971). Until parasite resistant begun to emerge, chloroquine had been depended on for malaria control. There was however too much focus on the biomedical interventions without consideration to the influence of socio-cultural and conditions of the communities (WHO, 2006).

According to Twumasi (1986b), the communities relied on their own methods of keeping mosquitoes away from biting them especially in the night. Households resorted to the burning of dried peels of oranges in their rooms before going to bed. In addition, the communities had to rely on traditional herbalists for treatment. The implication here is that the current system of

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most local parents treating their malaria infected children at home before seeking treatment in hospitals has its roots in the past. In order to promote general health delivery system and effective malaria control, it is important to have a national health unit or system (Konadu, 2008) and this must go hand in hand with the use of traditional medicine. Equally important was that Ghana also adopted the Global Malaria Eradication Programme initiated by the World Health Organisation globally in 1955 which advocated the use of dichlorodiphenyltrichloroethane (DDT) (Anto et al. 2009). In addition, indoor spraying was also depended on to control malaria (Agyepong, 2002).

Between the 1970s and 1980s there was a continuation of most of the activities which included indoor residual house spraying and the use of chloroquine for malaria treatment. The use of chloroquine was again intensified at all health facilities in Ghana and bed nets use was also promoted. These were coupled with the use of mosquito repellents, insecticides and mosquito coils. But others who could not afford the modern approaches mostly in the remote parts resorted to some traditional preventive measures, such as burning of leaves or dried orange peels as well as malaria treatment from the traditional herbalists though their effectiveness has not been effectively demonstrated (Mills et al. 2005). The implication is that multiple interventions are most likely to bring about malaria control than single control programmes.

2.1.7 STRATEGIES OF MALARIA PREVENTION

Malaria control measures aimed at preventing people from being bitten by mosquitoes that carry the malaria parasite are important to integrate into malaria control programmes. Malaria transmission can be reduced by preventing mosquito bites by the use of mosquito nets and insect repellents, or by mosquito-control measures such as spraying insecticides inside houses and

draining standing water where mosquitoes lay their eggs (Kilama and Ntoumi, 2009).The most important and most frequently used vector control measures in terms of prevention globally are discussed here.

2.1.7.1 Insecticide Treated Nets (ITNs) and Long Lasting Insecticide Nets (LLINs):

These have the ability to prevent mosquito bites which mostly occur (WHO, 2005) if used properly. The standard bednet (ITNs/LLINs) are supposed to contain averagely 1.8persons which implies that only two persons can sleep in it over time. This explains why the mass distribution of ITNs to households may not just be enough to protect all household members against mosquito bites hence malaria prevalence. The mosquito nets, if properly used and maintained, can provide a physical barrier to mosquitoes. If treated with insecticides their effectiveness is greatly improved and the chemicals used can extend beyond the mosquito net itself which then tends to repel mosquitoes away and also shortens the mosquitoes' life span so that they cannot transmit malaria infection (WHO, 2007). Studies show that mosquito nets help keep mosquitoes away from people and greatly reduce the infection and transmission of malaria (WHO, 2004).

LLINs are nets treated with chemicals that ensure protection for four to five years period thus avoiding the problem of regular re-treatment which is often difficult (RBM, 2007a). Studies show that the use of ITNs in sub-saharan Africa has resulted in improvement in maternal health, infant health and survival by about 25% (RBM, 2007b). One major factor that influences the demand for bednets is gender (Rashed et al, 1999). This may be so because pregnant women and children are the most vulnerable and hence likely to bring about this.

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2.1.7.2 Environmental Management

A second method of malaria prevention is through Environmental management (EM) defined by WHO (2005) as the planning, organization, carrying out and monitoring of activities for the modification and manipulation of environmental factors or their interaction with man. John Glasson (1974) defined planning as "a future-oriented, problem-solving process". It therefore implies that planning is a sequence of actions designed to solve current and anticipated problems resulting from the use or misuse of the land, location of activities, movement of people and goods, and careless management of the environment.

Hence, planning the environment will be a good way of eradicating malaria incidence by disabling the chances of mosquitoes to breed. This is a potent method of dealing with malaria incidence since the environment is largely influenced by cultural, socio-economic and ecological factors (Olokesusi, 1991). Some of these important environmental interventions are; filling puddles, introducing fish which eat mosquito larvae, repairing and improving drainage which also improves the agricultural value of farm lands in one operation at a reasonable cost, pouring oils on stagnant ponds, vegetation clearance, modification of river boundaries and house screening (Utzinger et al., 2002; RBM, 2007).

Some other cost effective ways identified from the literature and relating to environmental management of malaria prevention especially at the household level which do not entail a significant cost include the disposing of empty tins and containers to prevent accumulation of water, covering rainwater tanks, pouring oil on or draining of stagnant water, closing windows and doors early in the evening. Furthermore, burning mosquito coils, which expels mosquitoes,

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and eating a proper diet, which helps to make the body stronger and less susceptible to the disease, may also contribute to reducing malaria.

2.1.7.3 Intermittent Preventive Treatment (IPT)

The World Health Organisation (WHO) 20th Malaria Expert Committee designated IPT using an efficacious, preferably single-dose, anti-malarial drug as the preferred approach to reduce the adverse consequences of malaria during pregnancy (GHS/NMCP, 2005). It involves the provision of at least two preventive treatment doses of effective anti-malarial to pregnant women during routine antenatal visits at the health centre or clinic. This approach has been shown to be safe, inexpensive and effective. The treatment helps to protect pregnant women against maternal anaemia and low birth weight (WHO, 2005).

2.1.7.4 Indoor Residual Spraying (IRS)

The WHO recommends that at least each house is sprayed once each year in areas of seasonal and even endemic malaria incidence in order to reduce the mosquito population. This usually involves the use of insecticides to spray mosquitoes onto the inside walls and ceilings or onto the underside of the roofs of houses. IRS kills mosquitoes when they are resting indoors after having had a blood meal. This means that the IRS in general only kills the mosquitoes after and not before the infectious bite. Therefore, IRS does not directly prevent people from getting malaria. However, it does reduce the number of present vectors which transmit the malaria parasite. IRS must be done before the expected peak transmission season to ensure effectiveness as well as ensuring coverage of at least 85% of the walls or ceilings in order that the mosquitoes are

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exposed to the chemicals sprayed. One of such chemicals which is effective but less expensive is the use of Dichloro-Diphenyl-Trichloroethane (DDT) (NetMark USAID, 2007).

## 2.1.8 INTERVENTIONS FOR MALARIA TREATMENT

The WHO has recommended to populations affected by malaria to report at health facility for diagnose and treatment. However, the first line of treatment of malaria does not easily converge as several different sources are resorted to especially in developing countries. Sectors such as the public and private health facilities, the retail sector consisting of drug shops, pharmacies, herbal medicine treatments and faith based treatment are the common lines of treatment (WHO, 2004).

Generally, the type of facility used differs greatly between areas and countries with the most visited sectors being the public and retail sectors. For example studies in Tanzania showed an average of 2% visits to the public sector due to the patronage of herbal medicine (Conteh et al., 2007) to an average of 98.5% of visits in South-Africa and nearly 0% visits for herbal medicine in South-Africa. What this means is that treatment of malaria among a given population is not different from other diseases but are influenced by the perception of where it could be successfully treated (Chuma et al., 2010).

Finally, many people have resorted to home management or self medication as first line of treatment for malaria. It is important therefore that any formal convention of malaria control to incorporate such perceptions which are likely to impact on their outcomes.

Other scholars have attempted establishing the factors of prompt and effective treatment of malaria. Understanding people's perceptions of malaria, and the factors which influence these

perceptions, must be a central part of mounting successful interventions by any malaria control programme throughout the world (Lipowsky et al., 1992). Attention to these perceptions is critical to public health efforts because beliefs that differ from the scientific explanation about the cause and transmission of malaria may lead to inaction, a delay in seeking appropriate treatment and failure to adopt preventive measures.

Several factors do influence the treatment seeking behaviour among malaria patients. According to Asenso-Okyere et al., (1997a), there are direct and indirect costs of malaria to the household which are important factors influencing treatment decisions. The direct costs include the cost of medication and transport cost whereas the time or lost days of work are indirect cost. Another important factor for deciding to seek treatment for malaria either in the public or retail sector is the ability to pay (Asenso-Okyere et al., 1997b) and ( Brown, 2002). There seems to be preference for care seeking in the retail sector as compared to the public sector as a result of the fact that the retail sector is more accessible, have longer and more flexible opening hours, provide quicker services, willingness to negotiate charges and offer credit, are perceived as being cheaper, have more reliable drug stocks" (Kangwana et al., 2011) and are also perceived as being approachable (Williams and Jones, 2004). It will be appropriate to fine tune malaria control services in that direction to make them more acceptable to the people it was meant for.

## 2.1.9 CHALLENGES OF MALARIA CONTROL

 Ministries of Health in malaria endemic countries are normally charged with malaria control as part of their overall public health programme (WHO, 2008). However, there are many reasons why malaria still remains a major public health problem under this arrangement (http: malariajournal.com, 2008). According to the World Malaria Report (2008) one of such

challenges is the inability to convince decision-makers of the importance of sound vector control measures. In Ghana, Necodemus, (2011) found that the low involvement of the local people and intersectoral collaboration have to a large extent impacted negatively on malaria control activities and therefore called for the collaboration to improve malaria control through their involvement in vector control measures. He noted the mere existence but in practice, the current type of collaboration has proved difficult especially due to poor economic and social development of communities. This opinion was further affirmed by (Ahmad et al., 2007) when they did a comparative evaluation of malaria control programmes in five countries and found that one of the key challenges to successful malaria control is the lack of inter sectoral collaboration. Many control programmes are structured under the Ministries of Health, without proper organizational links to other government ministries like environment, education, agriculture, tourism and municipal entities including engineering, sanitation and water resources or linked to stake-holders in communities and NGO activities.

Morens (2008) cites five fundamental deficiencies that inhibit efforts to find realistic solutions for vector borne disease problems which include deterioration of public health infrastructure, lack of adequate funding, lack of adequate training and training models, over-specialization in the biomedical sciences, driven by emerging technology and emphasis on the basic sciences, and bureaucratization. If malaria control interventions are to be successfully integrated into national malaria control programmes, these deficiencies must be addressed. Also,

WHO (2000) reports of the situation where many African countries lacked the infrastructure and resources necessary to ensure effective campaigns against malaria and as a result few benefits often abounds from historical efforts to eradicate malaria.

Furthermore, the literature review shows that areas with endemic malaria generally lack adequate supply of diagnostic materials for malaria which makes its diagnoses too expensive therefore presumptive treatment of malaria (Bartoloni and Zammarchi, 2012). Some common possible treatment for malaria is through the use of chloroquine, amodiaquine, quinine, artemisinins, chlorproguanil-dapsone and sulfadoxine/pyrimethamine. However, resistance to all of these drugs has been reported globally (Winstanley et al., 2004). As a result, the World Health Organization (WHO, 2006) has recommended the use of Artemisinin-combination therapy (ACTs) as first line treatment for uncomplicated malaria. The ACTs are a combination of monotherapies including lumefantrine, mefloquine, amodiaquine, sulfadoxine and pyrimethamine (Malaria Consortium, 2012) which is why the ACTs are able to reduce malaria resistance to drugs (Yeung et al, 2004).

In the face of the challenges highlighted above integration of interventions towards malaria control could work effectively by combining different interventions to complement other existing malaria control strategies (ITN use, access to effective treatment) by avoiding reliance on any single intervention to reduce the burden of malaria (Killeen et al., 2000).

2.1.10 Factors of Effective Malaria Control Programme

Many actors including donor partners, health professionals, public health workers, medical personnel, researchers, NGOs, and others who have interest in malaria control often want to be well informed about the factors of programme effectiveness (WHO, 2003). Bremen et al., (2006) summarized that targeting the effectiveness of the programme requires that components such as: early diagnosis and treatment of cases, regular use of insecticide treated nets as vector control,

indoor residual spraying of dwellings with insecticides, use of home repellants as well as health education and counseling are crucial if positive results are to be achieved.

Snow, (2010) has observed that single interventions do not always bring about their success contrary to integrated efforts that have proven to be more dependable. The reason is that such integrated programmes are likely to combine both preventive and curative measures.

The WHO (2008) has identified affordability as one major barrier to malaria treatment and health care throughout sub-Saharan Africa. On the demand side, health care charges, seasonal incomes, transport costs and waiting time all interact to make affordability a major barrier for the poorest households. It is therefore necessary for authorities to pragmatically make malaria treatment very affordable if not completely free to enhance effective malaria control. For instance, in a bid to ensuring prompt and effective treatment of malaria, the Kenyan government provides free anti-malarials to all public health care facilities which are dispensed free of charge to malaria patients. Malaria treatment is therefore, officially free to all Kenyans (Chuma et al, 2009a). This significantly improved upon early treatment of malaria. The difficulty of identifying patients suffering from malaria from other diseases due to poor diagnoses in addition to shortage of drugs supplied by the government did not ensure effective malaria control.

Furthermore, acceptability also referred to as cultural access (Birch et al., 2009) affects the outcomes of public health interventions since it involves the interactions between the health care system and service users, provider and patient attitudes, and expectations of each other  (Chuma et al, 2009).

# 3.0 CHAPTER THREE: A DESCRIPTION OF THE RESEARCH AREA AND METHODS

3.1 INTRODUCTION

In an attempt to understand the determinants of malaria control interventions implemented in Akuapim South Municipality (where the study was carried out), it was important to outline the geography of the area.   Knowledge of the study area helps to unravel various factors which influenced the performance of the interventions of malaria control. The chapter is therefore divided into two parts. The first part looks at the profile of the municipality. These include a description of the broader physical context, demographic and socio-economic aspects of the study population. It also examines the various programmes and strategies that have been initiated to promote the health of the people in the municipality. The second aspect discussed the study methods that were used to accomplish the goal of the research.

3.1.1 The Study Location and Physical Characteristics

Akuapem South Municipality (now Nsawam-Adoagyiri Municipality and Akwapim South District) lies at the South Eastern part of the Eastern Region of Ghana and located approximately 23kms from Accra, the national capital and a land area of about 503 square kilometres. The Municipality lies between latitude $5^0$ 45N' and $5^0$ 58'N of the equator and longitude $0^0$ 07'W and $0^0$ 27'W of the Greenwich Meridian (Source: Town and Country Planning Department, Akwapem South, 2012). In terms of special interaction, it is bordered to the south by Ga West and Adenta Municipalities both in the Greater Accra Region, to the north-east by Akuapem

North District, to the north-west by Suhum-Kraboa-Coaltar Municipality and to the west by West Akim Municipality. In terms of distance, the municipality is nearer to Accra than the capital of the Eastern Region, Koforidua. The municipal capital, Nsawam, is a gap town along the Accra - Kumasi highway. There is a conurbation between Nsawam and Adoagyiri (the second largest settlement in the municipality).

The pattern of human settlement was largely influenced by the road network. The three urban centres are along two major highways. Nsawam and Adoagyiri are located on the Accra–Kumasi highway while Aburi is on the Accra–Mamfe–Koforidua highway. Most of the rural settlements are dotted along the arterials to Nsawam.

Figure 3.1: Location Map of The Study Area Showing The GHS Sub-Districts
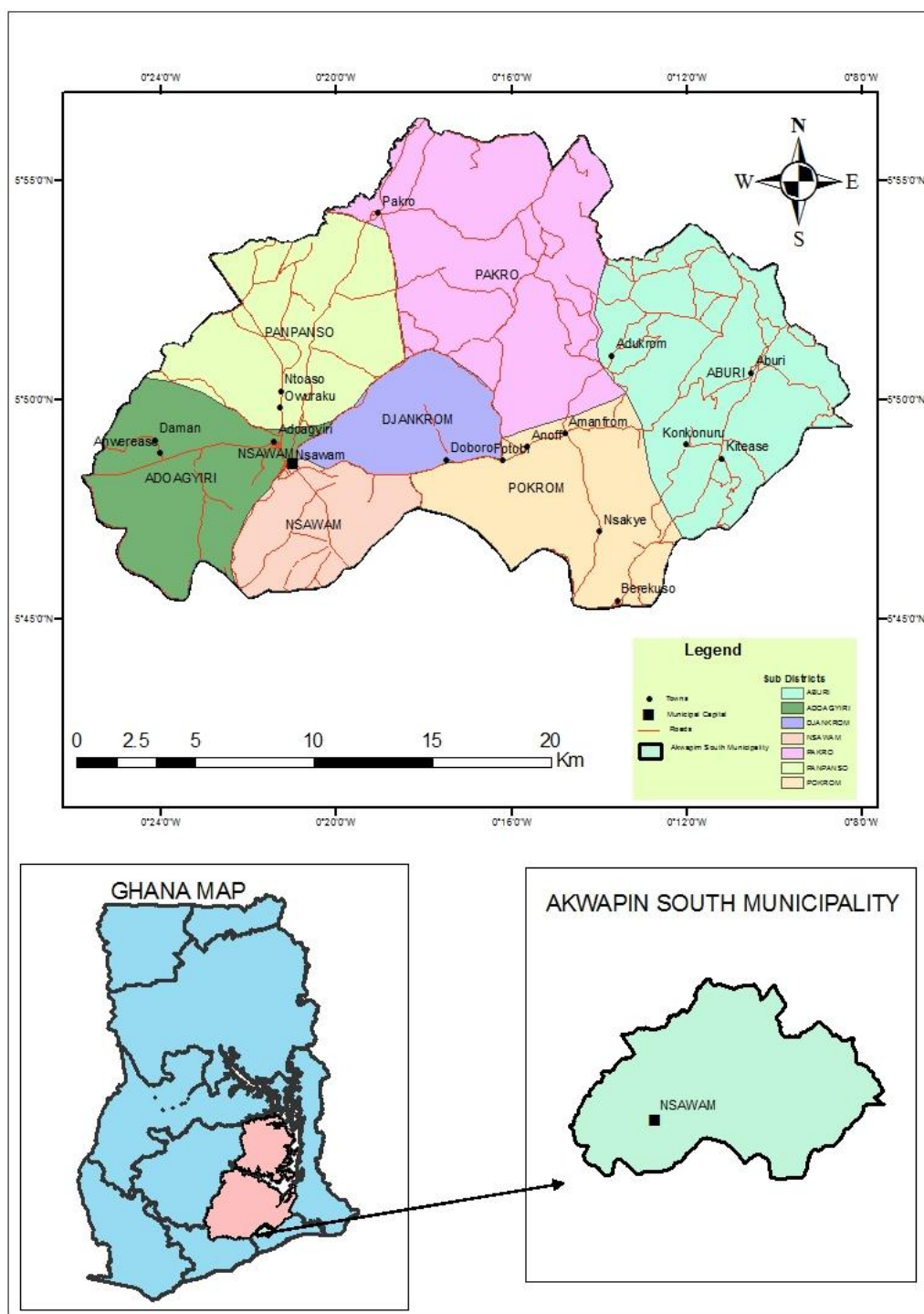


(Source:   Authors' Own Construct with Assistance from Geography Department, UG)

3.1.2 Relief and Drainage

Topographically, the municipality comprises the Densu Plain, the Pompon narrow gorge and the Akuapem–Togo Ranges, which is over 1000ft above sea–level at Aburi. It is drained by the Densu River, which is about 115.8 kilometres and takes its source from the Atiwa Mountains near Kibi with its tributaries such as the Ntuo, Pompon, Ahumfra and Dobro in the municipality. It drains into the sea through Weija in the Greater Accra Region which supplies potable water to parts of the Central Region (Kasoa) and western part of Accra for both domestic and commercial use. It is the Densu River which separates Nsawam and Adoagyiri. An analysis of the relief and drainage was important to study since the malaria vector thrives under such conditions.

3.1.3 Vegetation and Climate

The municipality is covered by two main vegetation types, the moist semi-deciduous forest covering about 90% of the municipality and coastal savannah grassland which covers only 10%. The weather condition in the municipality is generally cool because of the many trees that can be found in the area. In addition, the Akuapem-Togo Ranges on the east of the municipality contributes to the coolness of the area. The municipality enjoys a double maxima rainfall with an average annual recording of between 125 centimetres and 200 centimetres. The first rainy season is from May to June and the second in September and October. The temperature of the municipality ranges between $26^{oc}$ the lowest and $30^{oc}$ the highest (Source: Secondary data from the municipal office, 2012). Again, the implication here is that the malaria vector can always dwell under such conditions.

3.1.4 The Study Population and their Socio-Economic Characteristics

Going by the 2010 population and housing census, Akwapim South Municipality has an estimated population of 123,501 representing 4.7% of the total population of the Eastern Region. The share of male population was around 60907 representing 49.3% whiles the female population of 62594 represents 50.7% which means that there are more females in Akwapem South Municipality than there are males. The high population density can be attributed to the commercial nature of Nsawam and Adoagyiri and the proximity of to the Akuapem South Municipality to Accra, the national capital. Nsawam and Adoagyiri have the larger share of the population of 38,031 and 14,660 respectively closely followed by Aburi with a total population of 10148 people (Source: Ghana Statistical Service, 2012; also, www.ghanastarts.gov.gh). The Municipality has experienced a population growth rate of 6.1% which is higher than the regional and national growth rates of 2.8% and 3.2% respectively (2010 PHS Summary Report, 2012).

The population distribution of the settlements is characterized by rural-urban divide.  These classifications into rural or urban according to the Ghana Statistical Service are based on population. A population size of five thousand and over is urban where as a population size of less than five thousand is classified as rural.  Going by this definition, then, the above table indicates that Nsawam, Adoagyiri and Aburi could be classified as urban areas. The rest of the settlements are rural. This therefore means that there are more rural areas in the municipality than urban. These rural communities depend on the urban ones for some of the best services.

The research sampled the views of 200 households of which 68% were males and the females representing 42%. Majority of the respondents were married representing 79% and those not married were 14% where as only 7% of the study population have divorced. For their levels of

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education 22% had basic education, those with secondary education were 33% whilst 32% of the population had tertiary education and with no education were 14%. The table below is a summary of the age, gender, educational and marital status of the study population.

Table 3.1: Gender, Age, Marital Status and Education Of Respondents

| Gender | Frequency (N=200) | Percentage (%) |
|---|---|---|
| Males | 136 | 68 |
| Females | 64 | 42 |
| Ages of Respondents | | |
| 18-24 | 10 | 5.0 |
| 25-34 | 23 | 11.5 |
| 35-44 | 53 | 26.5 |
| 45-54 | 64 | 32.5 |
| 55-64 | 39 | 19.5 |
| 65+ | 10 | 5.0 |
| Marital Status | | |
| Single | 28 | 14 |
| Married | 158 | 79 |
| Widowed | 14 | 7 |
| Educational Status | | |
| Basic | 43 | 21.5 |
| Secondary | 66 | 33 |
| Tertiary | 63 | 31.5 |
| No Education | 28 | 14 |

(Source: Field Survey, 2012)

The oldest age of the respondents was eighty one (81) and the youngest was twenty (20) years. Incidentally, there were more male respondents than females which stood at 136 and 64 respectively.

3.1.6 Occupation, Income and Housing Conditions of the Study Population

In terms of occupation, a significant number (31.7%) of the respondents were public servants predominantly from Nsawam, Aburi and Adoagyiri Sub-districts.  Those who were farmers constituted 21% but the traders and artisans (dressmakers, hairdressers, etc) were the majority of (32.2%). The "others" under occupation were mainly drivers who constituted 10%. The unemployed and students were only 5% of the study population.

On their level of income, forty two people said they had a very low income while eighteen had average income. This shows that 65% of the respondents were classified as having low income (less than GH¢200) where as 25% earn average income and only 10% had high income (more than GH¢400). The classification of income levels was done taken into account the local economy. The housing pattern of the area is presented in table 3.2 below which also indicates that majority of the households (83%) lives in block houses. Those who live in the houses constructed with thatch were the least 1.0%.  The table below is a summary of the occupation, income, housing and religious status of the study population.

Table 3.2: Occupation, Income, Housing and Religion of Respondents

| Demographic Characteristic | Frequency | Percentage (%) |
|---|---|---|
| *Occupation* | | |
| Farmer | 42 | 21 |
| Trader | 64 | 32 |
| Public Servant | 63 | 31 |
| Student | 10 | 5 |
| Others (drivers etc) | 20 | 10 |
| *Monthly Income (GH¢)* | | |
| Low      (0-199) | 78 | 39 |
| Medium (200-399) | 65 | 32.5 |
| High      (400+ ) | 57 | 28.5 |
| *Housing* | | |
| Block | 166 | 83 |
| Thatch | 4 | 2 |
| Bamboo Sticks | 6 | 3 |
| Bricks/Mud | 24 | 12 |

(Source: Field Survey, 2012)

3.1.7 The Economic Activities

The economic activities were to a large extent dominated by agricultural activities representing 37%. Agriculture is the major economic activity. Farmers engage in both animal farming and crop production. Though subsistence farming is the commonly practised system, some major commercial farmers exist. They include Koranco Farms, Combine Farms, Greentex, Green Span, Astek, Buella & Rose Farms, and Bomart. This is followed by the commercial activities

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employing about 28% of the work force. The commercial activities took the form of petty trading or buying and selling. One of the notable commercial activities in the municipality is bakery (bread) businesses which are located at Nsawam and Adoagyiri. This is due to the location of these towns on the Accra-Kumasi road. The industrial sector contributes the least as has generally characterised other parts of Ghana. Some of the few industries include the Nsawam Cannery Limited and Blue Skies Company Limited, a free zone enterprise which specializes in the export of chopped fresh fruits is another industry which serves as a major source of employment to the people (Source: Secondary Data, Akwapim South Municipality).

The major source of water supply in the urban areas of the district is pipe-borne, which serves about 60% of urban dwellers in the district. About 42% of the populations in the rural areas however rely on streams or rivers, especially River Densu, while 36% rely on wells and 22% on boreholes. Also, some 45% of the population have access to electricity and this proportion is expected to rise to 60% when the Self Help Electrification Programme (SHEP), is completed.

3.1.8 HEALTH CARE SYSTEM

The Ministry of Health (MOH) and the Ghana Health Service (GHS) collectively oversee both the public health and clinical care sectors in Ghana. The MOH exercises oversight and overall control of the entire health system, as well as policy formulation, and monitoring and evaluation (M&E) of progress in achieving set targets. GHS is responsible for delivery of public health and clinical services along with the three teaching hospitals in Accra, Kumasi and Tamale. GHS operates at four levels: national, regional, district, and sub-district.

There are a good number of health facilities across the Municipality. The only municipal hospital is located at Nsawam. There are a number of other health facilities including Clinics, Health

Centres, Reproductive and Child Health (RCH) Centres and Community Based Health Planning Services (CHPS). The private sector is also active in the delivery of health service. There are four private health institutions: one maternity home, one hospital and two clinics.

The World Health Organization (WHO) defines health as a state of complete physical, psychological and social well being and not simply the absence of disease or infirmity. The health needs of the municipality incorporate wider social and environmental determinants of health, such as deprivation, housing, diet, education and employment. This wider definition of health determinants must serve as a guide to allow health planners in the municipality look beyond the confines of the medical model based on health services, to the wider influences on health. According to the health directorate, the existing health facilities are likely to remain constant over some period of time due to resource constraint which can impact on healthcare

(Source: http://ghanadistricts.com/districs/?r=4&=66&sa=1840).

Some other health needs of the people include health education to curtail the spread of preventable diseases such as malaria, bilharzias, cholera and diarrhea. Records show that the number of health personnel allocated by the Ministry of Health to man the various health facilities seems to be inadequate but this deficit in terms of personnel to man the various institutions must be provided to ensure proper health care delivery in the municipality. Authorities must therefore lobby for adequate personnel for all the levels of health care.

The current levels of health care delivery in the municipality which is in line with the PHC standards are as follows;

- Level A (Community Clinics, CHPS) made up of 200 to 5,000 population

- Level B ( Health Centres) made up of 5,000 to 10000 population

- Level C (District Hospital) which caters for 17,500 to 240, 000 population

Table 3.3: Categories of Health Institutions and Their Locations in The Municipality

| Type of Facility | Number | Location |
|---|---|---|
| Municipal Hospital | 1 | Nsawam |
| Private Hospital | 2 | Adoagyiri, Nsawam |
| Clinic | 3 | Aburi, Adoagyiri, Nsawam, |
| Health Centre | 2 | Pokrom/Nsaba, Pakro |
| RCH Centres | 5 | Aburi, Adoagyiri, Djankrom, Kitase, Nsawam, |
| CHPS Centres | 6 | Berekuso, Chinto, Duayeden, Oblegima, Oboadaka, Obotweri, |
| Orthopaedic Centres | 1 | Adoagyiri |
| Private Maternity Home | 1 | Nsawam |
| Total | 22 | |

(Source: Ghana Health Service, Nsawam, 2012).

## 3.2 RESEARCH DESIGN AND METHODS

### 3.2.1 Introduction

The research adopted an evaluative approach to accomplish the goal of the study. Therefore both qualitative and quantitative data collection techniques were employed. According to Holme and Solvang (1997), a qualitative method makes the researcher understand and interpret the qualitative nature of the data that stands in the centre of the study. This was however complemented by quantitative data through the use of questionnaire survey. Therefore, the study adopted a mixed method approach of data collection which was meant to allow for triangulation and the exploration of issues and contexts from a range of different perspectives. This was justified on the grounds that it enabled the researcher to explore the research questions from various perspectives which brought about a deeper understanding of the issues. The chapter begins by looking at the research design of the study. The next section explains in details, a description of the data sources with emphasis on data collection and data analysis procedures.

### 3.2.2 DATA SOURCES

The data for the study was basically obtained from both primary and secondary sources.

### 3.2.2.1 Secondary Sources of Data

The secondary data for the study came from the District Health Directorate, CHPS Compounds, Ghana Demographic Health Survey (GDHS), the National Malaria Control Programme (NMCP), Nugushi Malaria Institute and the District as well as Regional Health Directorates. The secondary data also came from different websites, annual reports, books, journals and articles, websites, newspapers, magazines, and case studies. The aim of this data collection was to find

out the related data regarding strategies adopted by the malaria control bodies at national, regional and global levels. Also, a cartographic map was sought for at the offices of the Town and Country Planning Department (Nsawam) which shows clearly the study area. Lastly, the Ghana Statistical Service was visited for the collection of data on the population size and other data in relation to housing, sanitation and source of water for the inhabitants of the study area.

3.2.2.2 Primary Sources

 The primary sources were use to gather empirical information through an intensive field work in the municipality through the administration of questionnaires; in-depth-interviews and participant observation were employed to collect primary data. The study also conducted Focus Group Discussions (FGDs) among households and health facilities to solicit their views on various aspects of malaria control. Also, a checklist for the management of out- patients and in-patient by the health care provider was used to collect data on severe malaria which later turned to be difficult and so the researcher made use of the DHMT reports rather.

3.2.3 QUESTIONNAIRE

The questionnaire survey was the principal research instrument that was used to collect household data. A total of 200 structured questionnaires which were pre-coded with both open and closed ended questions were administered. Questions on the questionnaire survey covered issues relating to the demographic characteristics and socio-economic profile of households such as age, income level, housing conditions, level of education and awareness on cause and treatment or prevention of malaria. Also, there were questions on the determinants of malaria

incidence among households, malaria control interventions and their outcomes and challenges of malaria control among households as well as the coping strategies.

The questionnaire for collecting the household data did not vary due to the fact that the strategies for malaria control in the municipality did not vary.

3.2.4 Sampling Procedure for Questionnaire Survey

The cluster sampling technique was used for the study. The reason for the choice of this technique was informed by the fact that the Akwapim South Municipality is vast but has been zoned into seven health administrative districts. These health administrative districts formed the clusters. Also, this was to allow for spatial dimensions in order that the study truly reflected what exist in the entire municipality. Obviously, the advantage was that it led to cost reduction general inclusion of the study population. The clusters were based on the health sub-districts which I prefer to call geographical regions (Table 3.4) which were a total of seven zones in the municipality based on which disease control programmes are implemented under the primary health care system. The universe constituted the number of households within the municipality. A proportionate sampling procedure was then used for the selection of the number of households from the various clusters as the sample frame to constitute the sample size for the study. Thereafter a simple random sampling procedure was applied in the administration of the questionnaires in order to give equal chance to all the households.

The sample was apportioned across the geographical regions according to the relative share of localities and households in each cluster. This resulting sample share in all the clusters is given in table 3.5. As a result of the logistical and time constraints, five localities were selected from

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each cluster randomly for the questionnaire survey. In each locality households were selected and interviewed by systematically walking through the localities and interviewing every 5th house in the localities or sections. For houses that had more than one household, only one household was randomly selected and interviewed. But for houses with only one household then the head or principal homemaker was interviewed. The questionnaires were administered on Thursdays, Saturdays and Sundays when most people were at home. The researcher was assisted by three research assistants who knew the terrain very well and could also speak Twi, Ga, Ewe and Hausa.

Table 3.4: Showing the Sub-Districts and the Number of Localities as Well as Households

| Health sub-districts (clusters) | Localities or Residential Sections | Number of Households |
|---|---|---|
| Nsawam Sub-district | 30 | 9,135 |
| Adoagyiri Sub-district | 29 | 5,300 |
| Djankrom Sub-district | 24 | 1,826 |
| Panpanso Sub-district | 22 | 975 |
| Paakro Sub-district | 40 | 2,344 |
| Pokrom Sub-district | 31 | 2,100 |
| Aburi Sub-district | 24 | 3,020 |
| TOTAL= 7 | TOTAL= 200 | TOTAL= 24700 |

Source: Based on Ghana Health Service Report, (2011).

Table 3.4 above illustrated the information on the various health administrative districts in the municipality. Altogether the Akwapim South Municipality have seven health sub-districts which

formed the clusters for the sampling. The total numbers of sections or localities and households in the various clusters have also been indicated.

3.2.5 Sample Size

As stated earlier the sample size for the study was 200 units. These were actually made up of 190 non-health workers and 10 health workers for the questionnaire survey. This choice for the move was to ensure that the views of households, nurses and other health actors into malaria control had their views sampled. The total of 200 sample size and the sample share were then based on the number of households in each cluster.

Table 3.5: Sample Size by Clusters

| Clusters | Number of Selected Localities or Sections | Total Households | Sample Share |
|---|---|---|---|
| Nsawam Sub-district | 5 | 1827 | 81 |
| Adoagyiri Sub-district | 5 | 914 | 40 |
| Djankrom Sub-district | 4 | 304 | 13 |
| Panpanso Sub-district | 3 | 134 | 6 |
| Paakro Sub-district | 8 | 352 | 16 |
| Pokrom Sub-district | 7 | 474 | 21 |
| Aburi Sub-district | 5 | 503 | 22 |
| Total = 7 | Total = 37 | Total =4508 | Total =200 |

Source: Authors own construct

From the table in 3.5 above shows that Nsawam sub-district or cluster had the highest sample share of 81 while the least sample share was 6 for Panpanso cluster.

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3.2.6 Focus Group Discussion

The researcher made use of seven focus group discussions in order to accomplish the goal of this work. The questionnaires for this purpose were unstructured and flexible because according to Weiss (1994), there is always the need to take into consideration the needs of the interviewees' ability to express their views with ease and in a manner that is suitable for them. Practically, from what I saw, such flexibility also helped the interviewees to expand on their own views (Oppenheim, 1992; Stake 1995). Both men and women groups were involved to solicit their views on the interventions for malaria control and their outcomes at the household or community level as well as their level of participation on activities of malaria prevention. They were also interviewed on their coping strategies to reduce malaria burden. The groups composed of between five to ten members. Other issues covered included cause, incidence, treatment and prevention of malaria and their perception concerning the effectiveness of malaria control in their localities. In sum, discussions were generally based on the objectives of the research.

3.2.7 In-Depth Interviews

In this study, one other main form of data collection was by having interviews with malaria control policy actors at both the national and district levels. In doing that the researcher made use of in-depth interviews which were also 'semi-structured. They were made flexible to allow the interviewees give in-depth information (Robson, 2002) on some of the issues that were raised during the FGDs. This was used principally to get information on the malaria control interventions; programmes, outcomes and the challenges of the malaria control programme.

The researcher interviewed community health nurse at level 'A' of the primary health care and therefore work closely with the communities to control malaria in the municipality. Officials of the MCP at the district and national levels were also interviewed regarding policy, success or failure as well as challenges of the program at national and local levels. In addition, the private health providers and pharmacists were the other groups that were interviewed. Selection of interviewees was hence purposefully selective. My decision to do so was in line with Walshman, (1995) who thinks that interviews allow the best access to the interpretations that the participants have regarding the actions and events, which have or are taking place and the views and aspirations of themselves and other participants. In qualitative approach there is an added advantage, as it allows the researcher to go back and evaluate the interpretations provided by the respondent in some detail where other methods in general do not allow.

3.2.8 Direct Observation

Semi-structured form of personal observation was also sought to collect information on the level of environmental cleanliness, the use of ITNs among households and patients on admission due to malaria.

3.2.9 THE INDICATORS TO MEASURE THE EFFECTIVENESS OF THE PROGRAMME

In order to measure the performance of the various strategies of malaria control, timelines were tagged to the activities to put on track the progress made by the programme at both local and national levels. The programme is assessed with regard to access, coverage, utilization, quality and impact of malaria control services.

These specific strategies and timelines identified have been summarized in the table below;

Table 3.6 **Indicators To Measure Effectiveness of The Malaria Control Programme**

| Strategies | Indicators | Source of verification |
|---|---|---|
| Use of ITNs/LLINs | • 100% of households will own at least one ITNs by 2015<br>• 85% of children under-five and pregnant women will sleep under treated net by 2015 | Household surveys<br>DHS report |
| IPT | • 100% (All) pregnant women shall be on appropriate Intermittent Preventive Treatment by 2015 | DHS Report<br>Household survey<br>Health facility report |
| Case Management | • All (100%) health facilities will provide prompt and effective treatment using ACTs by 2015<br><br>• 90% of all patients with uncomplicated malaria will be correctly managed at public and private health facilities using ACTs 2015<br>• All (100%) communities will have access to community-based treatment for uncomplicated malaria by 2015<br><br>• 90% of children under five years of age with fever will receive an appropriate ACT within 24 hours of onset by 2015<br>• ALL (100%) of all cases be confirmed with RDTs or laboratory means by 2015 | Health facility survey<br>Household survey |
| Knowledge/Awareness | • 90% of caretakers and parents will be able to recognize early symptoms and signs of malaria by 2015 | Household survey |
| IRS | • 90% of all structures in districts will be covered through indoor residual spraying by 2015 | Household survey |

(Source: Adapted from NMCP, Strategic Plan for Malaria Control in Ghana 2008–2015, Retrieved on 12th December 2012).

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The impact of malaria control is measured from infection and disease levels, on the basis of the numbers of reported malaria cases and deaths and the prevalence of asymptomatic malaria infection. National programmes must try to achieve the goals and targets of the Roll Back Malaria (RBM), the World Health Assembly and the Millennium Development Goals. The planning and management of public health programmes cover the continuum from inputs to results, with outcomes, impact and clear timeframes based on the five-year strategic planning.

3.2.10 DATA ANALYSIS

The data that was collected from the field was analyzed using a statistical software package (SPSS for windows 16.0). All responses were numerically coded on the questionnaire based on the research questions and objectives (Ghauri & Gronhaug, 2005) and frequencies and percentages used to compare some study variables. Some discrete variables were analyzed using the technique of cross tabulation. A bivariate analysis was used to measure the relationships among variables like age, sex and prevalence of malaria. Some of the responses were manually analysed along defined themes including general knowledge about malaria (causes, symptoms), Knowledge of malaria control interventions and their outcomes, prevention and treatment of malaria and the challenges of malaria control programme.

Tables and charts have been used to illustrate quantitative data for interpretation and discussion. In addition, the study used extensively content analysis for the data that was collected from focus group discussions and interviews. This largely allowed for data reduction and for the identification of patterns and themes so as to gain an understanding and insight about the effectiveness of the MCP in Akwapim South Municipality.

## 3.2.11 LIMITATIONS OF THE STUDY

The study depended on the responses of households and the number of reported cases to underscore the malaria situation in Akwapim South Municipality. This however did not affect the results due to the fact that respondents indicated yes if they have had malaria in the past two weeks to determine the prevalence.

Lastly, the time available for the study was such limited and therefore clearly not adequate to undertake a study of that importance. Pooling the views of all actors involved was quite challenging due to the time for the study. That notwithstanding, the researcher adopted the necessary methodological techniques including sampling to achieve the objective of the study.

# 4.0 CHAPTER FOUR: MALARIA SITUATION AND THE ACTIVITIES OF THE NATIONAL MALARIA CONTROL PROGRAMME IN ASM

## 4.1 INTRODUCTION

This chapter examines the malaria situation and the key interventions and activities of the National Malaria Control programme introduced in Akwapim South Municipality to control malaria and how effective the interventions have been. In line with the first objective, fieldwork was undertaken in order to collect primary and secondary data on the malaria situation. Analysis of the data indicates a high malaria situation despite the interventions of the malaria control programme. The chapter is mainly analytical and so it examines by drawing on official documents and  materials collected from the study area and at the national and regional levels in Ghana. The first section examines the trends in malaria cases and the top ten diseases in terms of morbidity and mortality in Akwapim South. The second section examines the key interventions of the programme introduced to control malaria in the study area. It made use of available data at the district, regional and national levels in order to present a situational analysis of the intervention activities of the programme. The interventions primarily can be grouped into two; preventive or curative. The case of early detection and treatment of malaria with effective antimalarials were identified as the two main curative approaches to malaria control where as integrated vector control measures through indoor residual spraying (IRS), efficient management of the environment to interrupt the breeding of the insect vector, the use of insecticide treated bed nets (ITN) and in particular long-lasting insecticide nets (LLINs) to protect all individuals at risk of malaria infection particularly children under five years and pregnant women and

Intermittent Preventive Therapy (IPTp) for pregnant women were the major preventive measures identified.

The choice of intervention activities and targets for the malaria control programme were informed by the actions of the Roll Back Malaria partnership. The NMCP in collaboration with the Ministry of Health and the Ghana Health Service adopted selected interventions and strategies (Source: GHS/NMCP, 2008).

4.1.1 TREND OF MALARIA SITUATION IN AKWAPIM SOUTH

Malaria disease is endemic in the Akwapim South Municipality thereby putting the entire population of about 121,501 at risk of contracting malaria. This is especially worrying that the incidence is high despite the interventions put in place in recent times to prevent or control the disease. This is similar to earlier studies in Ghana that concludes that malaria incidence is high (NMCP, 2007; MOH, 2008). Evidence has shown persistent increases in malaria incidence rate since the year 2000 to date as in figure 4.1 below.

Figure 4.1: Trend of Malaria Reported Cases at the in Akwapim South from (2000-2011)
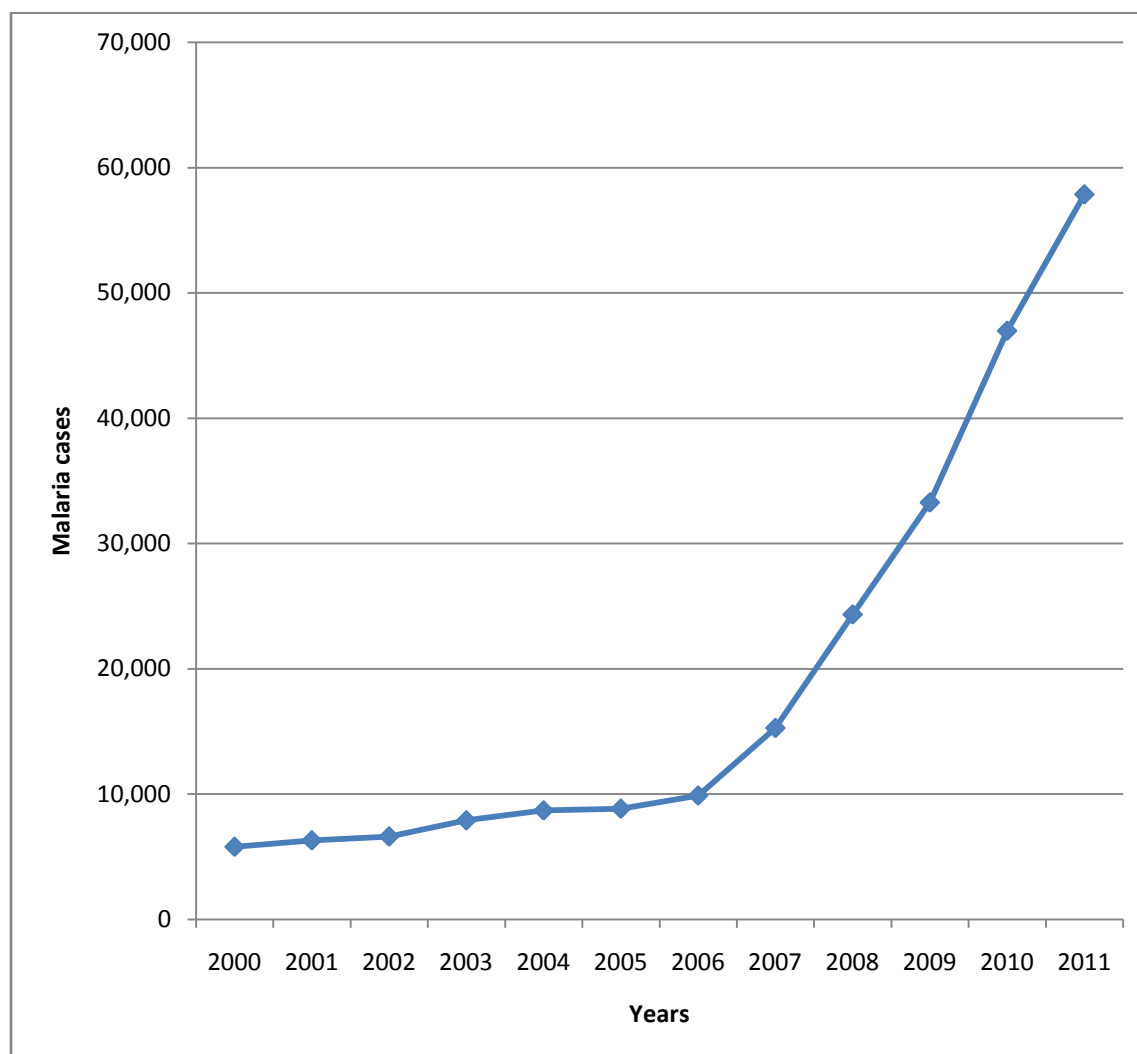


(Source: GHS/DHMT Nsawam, 2012)

The trend as shown above presents changes in malaria incidence based on the number of malaria cases diagnosed each year. Therefore it must be recognized that the situation could be alarming since the trend was based on the number of reported cases at the health facilities in addition to the fact that many malaria cases were often managed outside the health facility which results in under-reporting (Aqyepong et al. 2004). A lot more of the malaria cases have been managed in the informal health sector and local networks in the communities all of which result in under estimation of the malaria situation (Ahorlu et al. 2005).

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Despite the alarming rate especially from 2006 to present times it can be largely attributed to increasing numbers of patients showing at the health facilities due to the introduction of the National Health Insurance Scheme in 2005. This notwithstanding the trend on the incidence of malaria in the district tells a lot about the burden of the disease as well as the level of effectiveness of the interventions put in place to reduce this disease burden. Since the interventions are to halt the disease burden any slightest increase should not be taken lightly against the background that there have been scaling-up of malaria control strategies since 2005.

4.1.2 Perceptions of Malaria Incidence

The study had 67% of the respondents or households who have had malaria in the past two weeks as against 33% who responded in the negative. This further shows how serious it is as was earlier seen in the trend analysis.

Table: 4.1: Perceptions About Malaria Prevalence

| Malaria Among Respondents | Percentage (%) |
|---------------------------|----------------|
| Yes | 67 |
| No | 33 |
| Total | 100 |

(Source: Field Survey, 2012)

4.1.3 Spatial Patterns of Malaria Incidence in Akwapim South

The malaria incidence was found to be high 67% as shown in table 4.1 above. But going by the spatial pattern of the incidence it was noticed that Adoagyiri and Paakro sub-districts had the highest burden 80% and 87% respectively. This was probably due to the internal geography of the areas that supported the growth of the anopheline mosquito and the poor socio-economic conditions. The details are shown on table 4.2 below.

Table 4.2: Spatial Patterns Of Malaria Incidence in Akwapim South

| Sub-district | Yes | | No | |
|---|---|---|---|---|
| | Frequency | Percentage (%) | Frequency | Percentage (%) |
| Nsawam | 47 | 58 | 34 | 42 |
| Adoagyiri | 32 | 80 | 8 | 20 |
| Djankrom | 13 | 74 | 1 | 24 |
| Panpanso | 4 | 40 | 6 | 60 |
| Paakro | 14 | 87 | 2 | 13 |
| Pokrom | 12 | 55 | 10 | 45 |
| Aburi | 12 | 71 | 5 | 19 |

 (Source: Field Survey, 2012)

The reason for the high malaria situation in Adoagyiri sub-district especially was due to the unplanned nature of most part of the settlement thus allowing pockets of water to stay any time it rains. Most drains were also choked and worst of all the Densu River runs through Nsawam and Adoagyiri which supports mosquito breeding conditions.

4.1.4 Malaria Among Different Groups

The thesis findings show that bears the greatest burden of malaria in the studied area. This was followed by pregnant women. Generally, adults suffered the least burden of malaria.

Figure 4.2 below has the details.

Figure 4.2: Groups And Percentage Of Malaria Burden
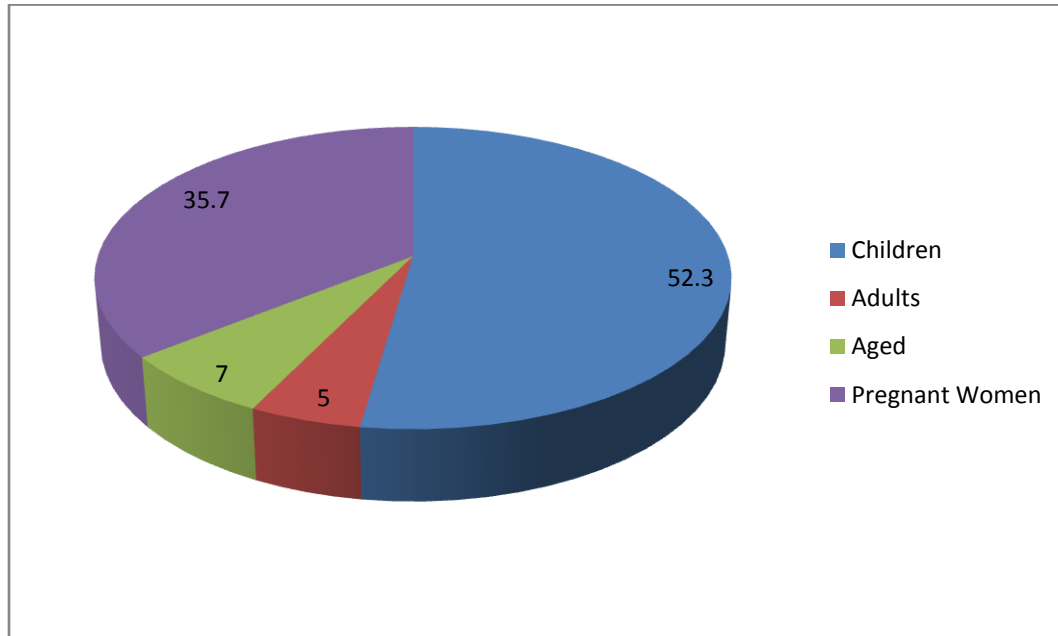


(Source: Field Survey, 2012)

In figure 4.2 above it can be seen that women and children were actually the two most vulnerable groups of the malaria disease. This was apparent from the questionnaire survey and health facility report.

4.1.5 Malaria Compared With Other Diseases in Akwapim South

In terms of morbidity the analysis of data indicates that malaria ranks among the top ten causes of disease burden for all ages and children under five years especially. Again, malaria was the leading cause of OPD and in-patient admission as Table 4.3 illustrates. The number of OPD reported cases among all age groups have a percentage share of 46.3% which was three times higher than the second highest 18.4%. Also, in the case of the under five children, malaria was

still the highest. In effect what this means is that malaria is the greatest contributor to the daily congestion at the health facilities in Akwapim South Municipality which calls for serious attention.

Table 4.3: Top Ten Diseases for All Ages in Akwapim South in (2011)

| Rank | Disease | Total Cases | Morbidity Rate (%) |
|---|---|---|---|
| 1 | Malaria | 57850 | 46.3 |
| 2 | ARI | 23650 | 18.4 |
| 3 | Skin Diseases and Ulcers | 8473 | 6.6 |
| 4 | Diarrhoea Diseases | 6942 | 5.3 |
| 5 | Rheumatism & Joint Pains | 6087 | 4.8 |
| 6 | Acute Eye Infection | 5870 | 4.6 |
| 7 | Anaemia | 5729 | 4.5 |
| 8 | Pregnancy Related Complications | 3861 | 3.0 |
| 9 | Hypertension | 3732 | 2.9 |
| 10 | Acute Urinary Tract Infections | 2530 | 2.0 |

(Source: Ghana Health Service, Nsawam 2012)

The findings of the study revealed that malaria is the leading cause of all ill-health in the municipality as depicted in table 4.3 above. However, it should be noted that other diseases in the municipality carried relatively small proportion of morbidity particularly among children and under five years of age due largely to improvements in vaccine preventable diseases such as measles and polio including high coverage of selected major child survival interventions through

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Expanded Programme of Immunization (EPI). Provision of such preventive vaccines is likely to reduce or prevent malaria disease as well. The high burden of the disease was partly due to the resistance of the parasites to drugs especially the monotherapies such as chloroquine and quinine which were the main source of treating malaria in the past years and which were still sold by drug vendors to suspecting malaria patient in recent times (WHO, 2006).

More so, the area has become more urbanized with the double problems of open gutters and poor sanitation which were considered to have increased the risk of malaria and other diseases which were of public health concern.

4.1.6 Admissions Due To Malaria

Another important finding of the research was in relation to malaria admissions. Suspected malaria admissions in 2009 were 3080, then in 2010 it was 2840 and in 2011 it stood at 1996 cases. Clearly, there have been significant reductions over the years which clearly indicate an improved performance of the programme in terms of case management.

Trend for suspected malaria admission from 2009 to 2011 in the study area is shown below in Figure 4.3

Figure 4.3: Trend showing Malaria Admissions from 2009 to 2011
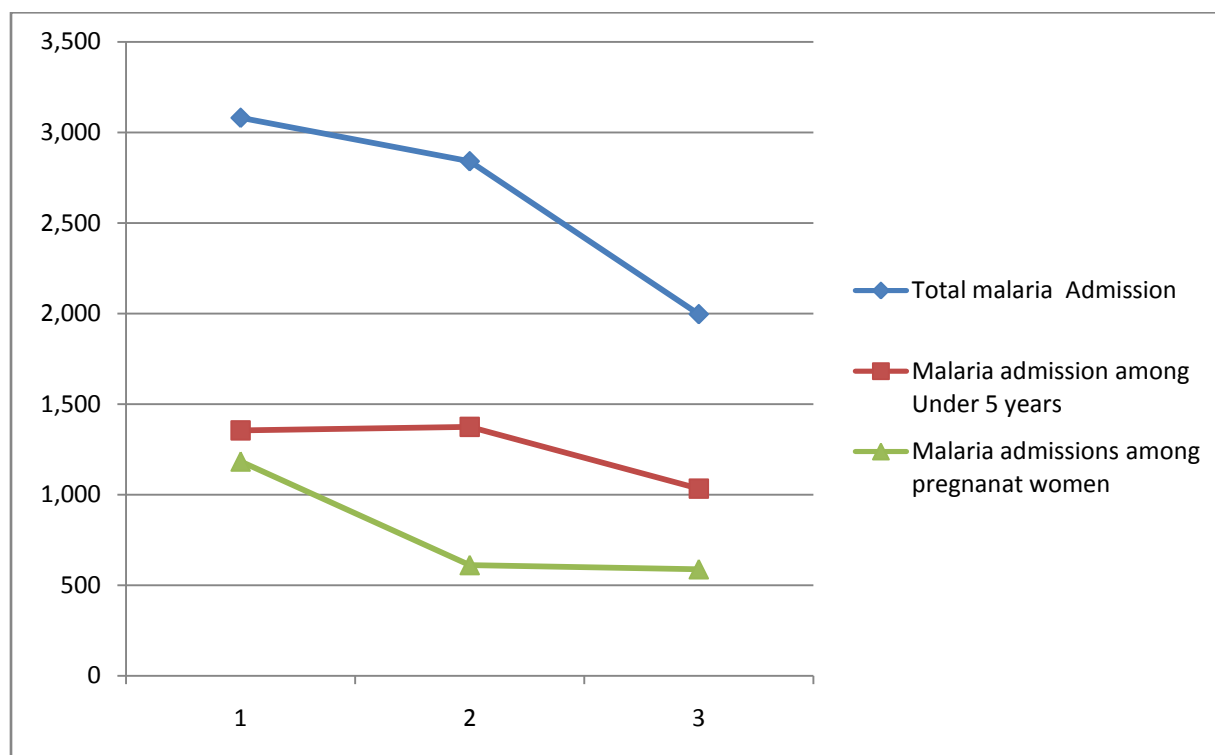


(Source: Field Reports, 2012)

The trends of malaria cases on admissions were stable with slight decreases.  The reductions were largely due to the case management interventions for the pregnant women and children under five years who were identified as the high risk groups.

The proportion of malaria related admissions was used as a proxy indicator of severity of malaria cases. Reports from the municipal health directorates indicated a 27% of all admissions due to malaria in 2009. There was however a drastic declined to 6.5% in 2010 and further to 3.5% in 2011 with the reasons attributable to the free mosquito nets distribution. Though the rates may have been considerably low compared with figures from other districts in the region or elsewhere malaria still remains the number one disease in the municipality.  Of these the case severity rate

of all malaria cases for the same three year period were 20% in 2009, 10% in 2010 and 20% in 2011 (DHMT Reports, 2012).

4.1.7 Malaria Mortality

The number of malaria cases reported at the health facilities in the municipality continues to increase consistently over the years (Field Reports, 2012) though at a slow rate since 2008 in terms of Out-Patients Department (OPD) cases (GHS; Nsawam, 2012). The proportion of malaria mortality as in terms of OPD attendance was low. This was far below the national rate of 33.6% in 2011 (Regional Health Directorate, Koforidua 2012).

Table 4.4 Malaria Related Mortality

| Years | Pregnant women | Children under 5years | Above 5years | Total |
|-------|----------------|-----------------------|--------------|-------|
| 2008  | 14%            | 17                    | 3.7          | 34.7% |
| 2009  | 0%             | 10%                   | 2%           | 12%   |
| 2010  | 0%             | 5%                    | 2.8%         | 7.5%  |
| 2011  | 0%             | 2.6%                  | 1.7%         | 5.3%  |

(SOURCE: District Health Directorate, Nsawam 2012).

Obviously deaths due to malaria have been decreasing considerably in the Akwapim South Municipality over the years. In 2008 it was 34.7% and has considerably decreased to 5.3% in

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2011. The most affected group remains children under five years whose death were due to malaria.

The reason for the decrease in deaths due to malaria in Akwapim South has largely to do with the stepping up of malaria control interventions nationwide beginning the last two decades, both at the global and national levels which have positively influenced a drastic reduction in malaria related deaths though morbidity cases are still increasing. Evidence has shown that the scaling-up of malaria prevention measures through various means such as Intermittent Preventive Treatment for pregnant women (IPTP) and Insecticide Treated Net (ITN) over the past decade have been responsible (WHO/RBM Report, 2010).

Table 4.5 Summary of Malaria Related Case Management and Clinical Cases in Akwapim South (2008-2011)

| INDICATOR | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|
| Malaria Cases (all ages) | 24,330 | 33,265 | 46,963 | 57,850 |
| Malaria among (>5years) | 1,829 | 5,826 | 12,316 | 18,982 |
| Total Malaria Admissions | 2,700 | 3,080 | 2,840 | 1,996 |
| Malaria Admissions (>5years) | 1,876 | 1,355 | 1,374 | 1033 |
| Malaria Deaths  (>5years) | 5 | 3 | 1 | 2 |
| Malaria Deaths (< 5years) | 4 | 3 | 2 | 2 |
| Malaria Case Fatality Rate | 0.3 | 0.2 | 0.1 | 0.2 |
| Malaria among Pregnant Women | 150 | 183 | 611 | 980 |
| Deaths Among Pregnant Mothers Due to Malaria | 0 | 0 | 0 | 0 |

(SOURCE: District Health Directorate, Nsawam 2012).

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It was observed from table 4.5 above that OPD malaria related cases have been increasing consistently over the years. The same can be said about malaria as the highest cause of morbidity among all age groups in Akwapim South as shown above. From these figures, it can be said that the groups greatly affected by malaria in the district have been children under-five years with a proportional mortality rate of over 26% whilst that of all other ages is a little over 20%.

4.2 INTERVENTION AND ACTIVITIES OF THE NMCP INTRODUCED IN THE STUDY AREA

Since its inception over the years different strategies have been put in place by the National Malaria Control Program (NMCP) to fight the disease. These strategies have consistently been modified over time in order to improve their effectiveness with emphasis laid more on early diagnosis and treatment, and personal protection especially with insecticide treated bed nets (ITN), adoption of IRS, and Environmental Management (EM).

4.2.1 ACTIVITIES OF THE NATIONAL MALARIA CONTROL PROGRAMME TARGETING MALARIA PREVENTION IN AKWAPIM SOUTH

4.2.1.1 Insecticide Treated Nets (ITNs)

The malaria control programme in May 2002, adopted the Insecticide Treated Materials (ITMs) policy, which emphasized on Insecticide Treated Nets (ITNs). Ghana's National Strategic Plan of malaria control (2005-2015) calls for universal coverage with ITNs, per two persons. Currently, the programme has targeted vulnerable groups such as pregnant women and children under five's. The ITNs were sold at a highly subsidized fee of GH¢2.00 or free and distributed

through health facility especially on Anti-Natal Clinic (ANCs) visits. This target was in line with the WHO/RBM's target of one net per every 1.8persons. The specific targets set to achieve were:

i) To increase the proportion of the general population sleeping under an ITN to 80% by 2015

ii) To increase household ownership of at least one ITN to 100% by 2015

iii) To increase the number of children under five and pregnant women sleeping under an ITN to 85% by 2015.

To achieve these targets in the municipality, the GHS in collaboration with the malaria control programme took to series of activities to increase net ownership. One of the ways to achieve this strategy was dubbed the "catch up" strategy which rolled out free mosquito nets through mass distribution and campaigns to cover children under five years and pregnant women. The nets were distributed through a program of door-to-door visits by community volunteers and Health Workers (HWs) among households in the municipality. According to the municipal malaria focal person, all the activities were to bring about the desire result of a reduction in malaria cases. The ITNs programme was funded by the NMCP/GHS and other corporate bodies such as NGOs.

Also, series of Behaviour Change Communication (BCC) exercises were done to increase demand for the use of ITNs, to increase knowledge about how to use ITNs such as hanging, washing, and retreatment of the ITNs to enhance their effectiveness. The insecticides on the net does not last for the lifetime of the ITNs and therefore supposed to be re-treated in 3years or up to 20 times of washing (Interview at NMCP in Accra, December 2012). Health experts say, LLINs/ITNs could protect all populations at risk of malaria if used properly. Aside the protection of one against mosquito bites, LLINs/ITNs also killed other domestic pests such as fleas, lice, bedbugs and cockroaches that come into contact with the net each time it was properly treated.

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Generally, Ghana continues to promote a "mixed model" of distribution for ITNs as the study area is no exception as outlined below:

1. Mass distribution at health facilities during ANCs and child welfare clinics

2. Subsidised prices on nets at health facilities

3. Free mass distributions through government-led campaigns

4. Free or subsidized distributions by NGOs, corporations, and other private entities, and

5. Commercial sales at full cost (Source: GHS Nsawam, 2012)

In addition, many education campaign programmes were carried out in an attempt to promote the correct use of ITNs and their maintenance. In 2010, the Health Workers (HWs) and Community Volunteers (CVs) carried out the hang-up campaign for behavioural change in the municipality. The majority of nets, approximately 70% of households were given LLINs. The primary target groups have been children under five years and pregnant women. Also, there is the involvement of NGOs in the distribution of the nets among the core groups in the municipality (Eastern Regional Health Directorate Annual Report, 2011).

Table: 4.6 The Effect Of The LLINs Hang-Up Programme in Eastern Region

| Districts | District Population | Population to be Covered | Population Covered | % Covered |
|---|---|---|---|---|
| Akwapim North | 93196 | 42540 | 42336 | 99.5% |
| **Akwapim South** | **133698** | **51739** | **49505** | **95.7%** |
| Akyemansa | 62980 | 28907 | 27355 | 94.6% |
| Birim North | 65656 | 32264 | 30153 | 83.9% |
| Birim South | 83698 | 30000 | 29074 | 96.3% |
| East Akim | 114837 | 39802 | 39224 | 98.5% |
| Kwahu North | 156203 | 59200 | 49000 | 82.8% |
| Kwahu West | 81803 | 39978 | 35020 | 87.5% |
| Upper Manya | 67850 | 34452 | 31610 | 92% |
| Asuogyaman | 87244 | 40789 | 40789 | 100% |
| Atiwa | 103903 | 56245 | 56245 | 100% |
| Fanteakwa | 99004 | 56356 | 56356 | 100% |
| Kwabibirem | 205958 | 105275 | 104518 | 99% |
| Kwahu East | 78088 | 41632 | 41151 | 98.8% |
| Kwahu South | 89813 | 40845 | 40575 | 99.3% |
| Lower Manya K | 86283 | 57133 | 56236 | 98.4% |
| Suhum K. C | 191303 | 84208 | 84208 | 90% |
| West Akim | 177155 | 93750 | 92054 | 92.2% |
| Yilo Krobo | 98877 | 49194 | 48099 | 97.8% |
| New Juaben | 157164 | 84821 | 81600 | 96.2% |

(Source: Ministry of Health, Eastern Region,  2012)

Table 4.7: ITN Ownership and Outcomes Among Households, Under Five Children and

Pregnant Women

| Indicator | 2003 | 2006 | 2008 | 2009 | 2010 | 2011 |
|-----------|------|------|------|------|------|------|
| Proportion of households with one or more ITN | 3% | 19% | 33% | 52% | 56% | 74.3% |
| Proportion of children under five years old who slept under an ITN the previous night | 4% | 22% | 28% | NA | NA | 72.3% |
| Proportion of pregnant women who slept under an ITN the previous night | 3% | NA | 20% | NA | NA | 72.3% |

(Source: Field Reports, 2012)

As seen in table 4.7 above the proportion of households, pregnant women and children
ownership of ITNs have increased from 2003 to 2011. It is therefore likely that the target of
having all pregnant women and children under age five have these bednet by 2015 would be
achieved.

Figure 4.4 Picture Showing Two Children in LLIN



Children under five in a LLIN

4.2.1.2 Intermittent Preventive Treatment (IPT)

An Intermittent Preventive Treatment (IPT) of pregnant women and infants as an intervention is aimed at protecting the unborn child and pregnant women from getting malaria. The purpose of the IPT was in two folds. One is to clear any parasite, even in people with asymptomatic disease. Secondly, it gives protection from re-infection for an extended period. It was also a means of

treating malaria among pregnant women. The National Malaria Control Programme in its Strategic Plan (2005-2015) targets to achieve 100% coverage for all pregnant women to receive at least two doses of SP by 2015. The doses were administered at least one month apart with the last dose administered at least one month before delivery.

To ensure the proper administration of the dose, it has been tied to the ANC attendance to position the malaria control programme well enough to make gains in IPT coverage for pregnant women. The WHO has stipulated the IPTp administration every four weeks during pregnancy until all three doses of SP have been administered. This objective was in line with RBM targets and despite evidence of progress made there is still room for improvement. The records indicate coverage of 89.8% in 2009 which decreased to 87.4% in 2010 and then increased to 99.5% in 2011. It should however be noted that the figures were facility based and therefore issues of non-reporting comes into play.

From the interviews conducted it was found that all (100%) of the women who visited the health facility during pregnancy, admitted taking medicine to prevent malaria except those who reported to the health facility at the latter stages of pregnancy for ANCs and thus confirm the statistics from the district office. This was commendable as the district was close to the 2015 target of 100% coverage of IPTp for pregnant women. This achievement was largely due to the availability of staff midwives and community health workers at the remote parts of the municipality who frequently went to the communities as part of their outreach programmes (Source: GHS Nsawam through key informant interview)

4.2.1.3 Indoor Residual Spraying (IRS)

In April 2007, the National Policy for Vector Control by the NMCP incorporated IRS as part of malaria control programmes. This was as a result of the successful implementation of the IRS in Obuasi in the Ashanti Region where in 2005 its implementation led to a drastic reduction of malaria cases from 7000 to 1000 reported OPD cases annually (NMCP Annual Report, 2008). According to the Akwapim South Municipal Assembly, any of such programme of IRS has yet to be carried out in the municipality. Only six households admitted the adoption of this strategy realizing its effectiveness in malaria control. Since the mosquitoes are constantly present due to the environmental factors then it is arguable that such a strategy was necessary to help reduce the vector population.

4.2.2 INTERVENTIONS MEANT TO CONTROL MALARIA

These strategies were basically meant to manage malaria cases. This approach has been the major intervention of malaria control though not a proactive measure.

4.2.2.1 Case Management

The objective here is to improve the care of patients through the rational use of anti-malaria drugs such as ACTs, proper diagnoses and to strengthen surveillance systems. The current target has been to achieve a 100% treatment of malaria promptly by 2015. The strategy of testing and treating under fives and pregnant women promptly was modified in 2009 to actively promote a policy of universal malaria case confirmation (microscopy or RDTs) in all age groups, consistent with the new WHO guidelines. A visit to the health facilities show that there have been the

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regular supply of microscopy equipment, RDTs, and other laboratory supplies except that there was inadequacy in most facilities. This strategy was also to ensure capacity building for microscopy and RDTs use, support implementation of diagnostic policy and provide technical assistance in diagnostics.

The research found that a wide range of sources had been depended on for managing and treating malaria cases. They included modern health providers in the public sector, commercial private sectors, traditional healers, licensed pharmacist shops and vendors. Mostly, treatment was sought for "fever", a symptom that individuals associate closely with malaria. Recommended drug regimes vary based on patients malaria history though ACTs and amodaiquine were generally used.

Improving case management primarily ensures that signs and symptoms of malaria were recognised early and appropriate management provided promptly at individual, family, community and facility levels. Significant efforts have been made under the malaria control prprogramme since 2005 to date aimed at improving early diagnosis and prompt treatment of malaria. There has been improved access to anti-malaria drugs at the public and private health facilities as well as through Home Base Management (HMM) of malaria. The capacities of health workers at the health facilities and community health volunteers were also enhanced consistently in the past three years.

4.3 SUMMARY

The chapter examined the malaria situation and identified the interventions of the NMCP introduced in the Akwapim South Municipality. Generally, malaria prevalence still remains very high though there has been a reduction in terms of malaria mortality. Factors including the environmental conditions, low socio-economic status and poor high illiteracy leading to ignorance.

The key interventions introduced under the NMCP in the study area include the use of bednets, the adoption of IPT for pregnant women and infants, behaviour change interventions and general case management of the disease. IRS as proposed by the NMCP for malaria vector control has not been introduced fully in the area.

# 5.0 CHAPTER FIVE: THE CHALLENGES AND OUTCOMES OF THE ACTIVITIES OF THE NATIONAL MALARIA CONTROL PROGRAMME IN AKWAPIM SOUTH MUNICIPALITY

## 5.1 INTRODUCTION

This chapter answers the last two objectives of the thesis:

What are the challenges of the National Malaria Control Programme in Akwapim South Municipality?

What are the outcomes of the activities of the National Malaria Control Programme in Akwapim South Municipality?

To achieve these objectives the research solicited the views of the respondents on the challenges of the malaria control programme in Akwapim South using the questionnaire and FGDs. The findings of the thesis on the challenges are in two parts. The first section discusses the findings on challenges based on households' perceptions and the second aspect looks at the challenges of the malaria control programme from the perspective of health workers. The chapter also looks at the coping strategies adopted by households in the wake of the high malaria situation in Akwapim South Municipality. The second aspect of the chapter examines the outcomes of the activities of the NMCP in the study area as a measure of the effectiveness of the programme in the municipality.

## 5.1.2 CHALLENGES AS PERCEIVED BY THE HOUSEHOLDS

The findings of the thesis revealed among others the following findings as challenges confronting the malaria control programmme as perceived by households. These include the high cost of antimalarials, persistent presence of mosquitoes, long distance and high transport cost to access treatment, delays at the health facility, fake anti-malarial drugs, anti-malarial drugs sometimes were not given to patients with the National Health Insurance cards and the inability to complete malaria dosage as discussed in details below.

From the interviews that were conducted, it was found that a good number of the people mentioned the difficulty of getting these malaria drugs, bednets and other insecticides that are used to prevent malaria. For example some household members had this to say; *"I do not have enough money on me to always visit the health facility any time I suspect of having malaria"*

....*"With the insurance sometimes malaria medicines are not given because they (anti-malarials) were claimed to have finished"*.

During the FGDs session with the health officials, the claim was that there were times that the facilities had ran out of stock in which case patients were advised to buy from outside since treatment could not be delayed.

Also, the respondents raised the issue that mosquitoes were almost present all year round. This they argued has continued to pose as a challenge to successful malaria control. For instance, some household members said that: '*'as for this place that we live the mosquitoes are always there even during the dry season and inside the room"*. Others added that in addition to the poor sanitation condition which supports the breeding of mosquitoes in the municipality, there was also the influence of River Densu which runs through the municipality. This they think has led to

the continuous presence of mosquitoes in the area. A field survey was undertaken around the Densu River which separates Adoagyiri from Nsawam by the researcher and the leader of the FGD to ascertain the extent of the claim. Majority of the interviewed respondents admitted that there was lack of support from the health authorities in this regard. For most of these people, the authorities have not been able to spray around the river at any time though that could have been the best way of reducing the mosquito species.

In addition to the above, the respondents in most of the FGDs lamented that accessibility of health care was not easy for most of the rural people which affected prompt treatment. This woman for instance had this to say; *"we beg the government to reduce the lorry fare for us because most of us here have to spend GH¢3.60 on transportation alone any time we have to go to the health centre,.....so we rather use the money to buy drugs from the drug vendors".* This was also brought about because majority of the respondents preferred to have treatment for malaria at the Nsawam government hospital where a doctor was available suggesting the poor state of health delivery in most of the rural communities.

During the FGDs, most of the members agreed that there had been little efficacy with regard to most of the malaria drugs especially those often paraded by the vendors as well as in some private pharmacy shops not even excluding that of the health facilities sometimes. This situation has led to resistance and recurrent of malaria among households as reflected in the following statements:

**………..***"We take these drugs and may be the malaria is not treated so we have to go again or buy from those selling it".*

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*"…….even completing these drugs is a problem because they are very powerful and make my child weak so sometimes I stop it and use local herbal medicine''.*

*"As for me I prefer to have injection because I do not trust the tablets since they do not work well and difficult to take".*

Clearly, most of the respondents were getting frustrated regarding the factors that have undermined successful malaria control in the municipality. On this issue, most of the interviewees admitted that they have not been given adequate and proper education on these. Such insufficient education has not helped most of the household members to have positive views about the efficacy of the drugs.

Similarly, the findings show that majority of the respondents (27%) perceived that the resistance of malaria disease to anti-malaria drugs was a key challenge to effective malaria control. The least was 9% of the respondents who think that the unwillingness of household members to sleep under bednets is a challenge to malaria control. The table below depicts a summary of the issues presented above.

Table 5.1: Challenges of the Malaria Control Programme among Households

| Challenges | Frequency | Percentage (%) |
|---|---|---|
| Fake drugs | 42 | 21 |
| Resistance of parasite to drugs | 54 | 27 |
| Poor sanitation | 35 | 17.5 |
| High cost of (drugs, transport, ITNs etc) | 25 | 12.5 |
| Low usage of ITNs | 18 | 9 |
| Non compliance to medication | 25 | 12.5 |
| Total | 200 | 100 |

(Source; Field Reports, 2012)

### 5.1.3 CHALLENGES OF THE MALARIA CONTROL PROGRAMME AS PERCEIVED BY THE HEALTH OFFICIALS

Health officials were asked in an interview with open ended questions for their views on the challenges of the malaria control programme which have undermined successful malaria control in the municipality. Potential challenges of effective malaria control from the perspectives of the health officials include inadequate funding, poor adherence to drugs, inadequate staffing, low rate of bednet use among households, poor community involvement in changing malaria prevention and treatment behaviour, insufficient baseline information on malaria, inadequate supply of ACTs and RDTs and high rates of treatment seeking in the private sector (pharmacies, drug vendors) and the use of herbal medicine, fake drugs and quack medical practitioners were among others mentioned by the health officials.

Many of the health officials indicated that the lack of funds affected the full implementation of the planned activities and their inability to expand the existing interventions in place. This official with NMCP had this to say;

*"Our activities are good but we do not have enough funds to scale-up the LLINs distribution and fully implement the IRS".*  Asked how good the IRS could be the reply was positive; *"this was the only way mosquito population could be reduced in the area or completely eliminated which will make malaria control very easy for us".*

It appears that the problem actually was a common concern inferring from what this CHN also said;

*Last year we distributed a lot of Long Lasting Insecticide Nets (LLINs) freely among households but we could not cover all the households in the sub-district,........the office people say there is no money to finish the phase two".*

On the basis of the responses received from a greater number of the interviewees, one can make an argument that although there were some initiatives to control malaria, their scale of implementation however, leaves much to be desired.

Also, the nurses and midwives reported that patients often fail to complete full dosage of malaria drugs given to them. *"We give them the drugs but our understanding is that many of them do not complete the dosage".* This was exactly what one of the nurses said. The situation according to the health officials has contributed to the surge in resistance of the parasite to the anti-malaria drugs.

One other common challenge that the health officials mentioned was the inadequate supply of RDTs and other logistics for laboratory diagnosis of malaria. Four out of the eight health facilities visited reported the inadequacy and delay in the supply of the test kits. This they say has encouraged the treatment of malaria through presumptive diagnoses which may not be perfect.

Another issue that was strongly raised by the District Health Management Team (DHMT), Nsawam was that malaria control is fused to the PHC in Ghana but this they said has not functioned very well due to poor staffing at the local levels. The research identifies that CHNs and volunteers were those usually found at the community level where most attention was however needed. It was further revealed that in a whole sub-district there was only one malaria

focal person who was equally tasked to perform other general duties as well. At the district level there was again only one focal officer in charge of malaria control from the disease control unit.

### 5.2.1 COPING STRATEGIES AMONG HOUSEHOLDS

Coping strategies or mechanisms are defined as strategies adopted by households to minimize the effects of a disease. In the wake of the high malaria prevalence among households, respondents were asked in an open ended question to state the coping mechanisms that have been adopted by households. Through the findings of the research it was realized that a large number of the respondents (70%) have adopted any form of coping strategy to avert the malaria disease. These notwithstanding, about 30% of the respondents have not adopted any form of coping strategy against the disease.

TABLE 5.2: COPING STRATEGIES

| *Adoption of Coping Strategy* | Frequency | Percentage (%) |
|---|---|---|
| Yes | 131 | 70 |
| No | 56 | 30 |
| *Strategies/Mechanisms*(N=131) | | |
| Use of herbs | 52 | 40 |
| Clearing of the environment | 41 | 31 |
| Burning of orange peels | 18 | 14 |
| Closing windows and doors | 11 | 8 |
| Wearing long slit and pair of trousers to avoid bites | 9 | 6.9 |

(Source: Field Reports, 2012)

From table 5.2 above it can be seen that many residents are into the use of herbal medicine as a coping strategy in the wake of the high malaria incidence in Akwapim South Municipality. This is characteristic of what happens in other parts of Ghana. Besides, there is also the burning of orange peels as well as environmental cleanliness among some households.

## 5.3.1 OUTCOMES OF THE ACTIVITIES OF THE NATIONAL MALARIA CONTROL PROGRAMME IN AKWAPIM SOUTH

The outcomes of the programme are in respect of the knowledge and awareness level among households, access to interventions of malaria control and their utilization among households, the level of coverage of the key interventions in the study area as well as prompt treatment of malaria and whether the introduction of these key interventions have led to a reduction in malaria morbidity and mortality.

### 5.3.1.1 Knowledge and Awareness of the Malaria Disease

It was found that the awareness level of malaria was high among the respondents, where 195 respondents representing 97.5% of the study population indicated to have heard about the disease with only 5 respondents (2.5%) who claimed not to have any idea about the disease at all. Those who said they were aware of the malaria disease referred to it in the local language as "*Nteriden Yarae''* or *"Ntumtum Yarae''*. This was seen to be very significant because it is only through awareness of a disease that influences the treatment seeking behaviour of people.

Generally, both rural and urban dwellers were aware of the disease in the study area. However, it was realized that more males were aware of malaria than their female counterparts. This is shown on the figure below.

Figure 5.1: Awareness By Gender
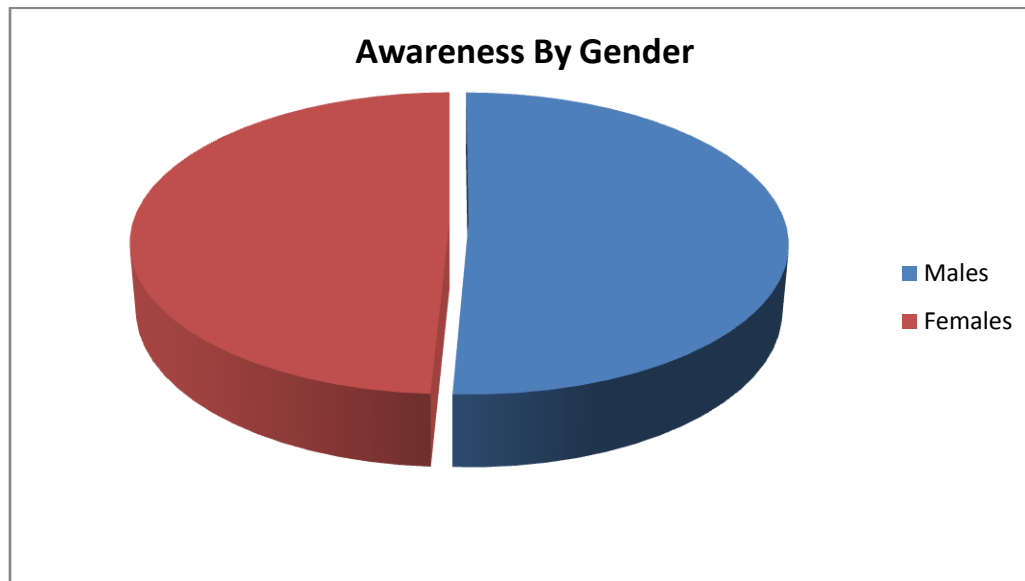


(Field Survey Report, 2012)

5.3.1.2 Knowledge on Cause of Malaria

The findings also show that community members' knowledge about the cause of malaria has increased significantly probably due to the intensity of public education and awareness programmes that have been embarked upon by the NMCP in the area and the whole of Ghana at large.

 The Akwapim South ITN survey of 2011 indicates the knowledge level on cause of malaria to be as high as 75.4%. The research found the knowledge level to be as high as 83.5% in the area.

Knowledge of the fact that only mosquitoes cause or transmit malaria is crucial to its control. This is shown on the figure below.

Figure 5.2: Knowledge on Cause of Malaria
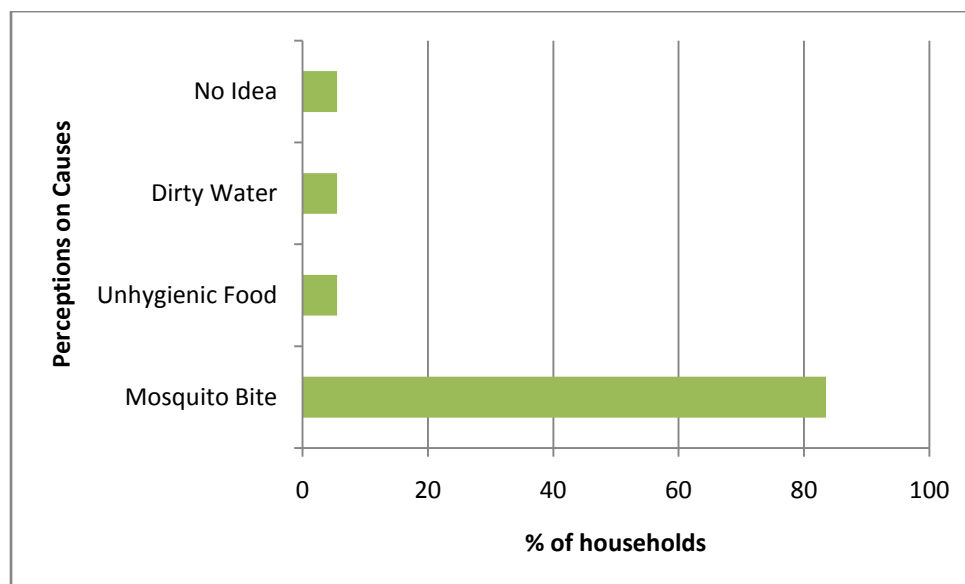


(Source: Field Reports, 2012)

5.3.1.3 Misconceptions About Malaria

A good number of the study population also attributed the cause of malaria to factors including the case that malaria was caused by drinking unhygienic water with others having no idea about the cause of malaria. To make malaria control effective it may be necessary to eliminate all of these misconceptions about the disease in this 21st century.  A study done in Iganga (Namusobya *et al*, 1998) also observed similar perceived misconceptions about the cause of malaria namely: drinking dirty water, eating of raw fruits, cold environment and the bite of tsetse fly were mentioned as factors that cause malaria.

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Those who responded not to have any idea on the cause of malaria were from the rural localities where community outreach programmes by Community Health Nurses (CHNs) and Community Volunteers (CV) were the principal agents. Unfortunately many of these people prioritised going to the farm as their main source of livelihood activities than staying back home for the programmes. Do they not have access to other sources of information about malaria? Again this person had this to say during one of the FGDs sessions; *"....because of the hard conditions I do not have money to buy television for my family members and my children have also spoilt my radio".* Overall, it can be argued that although there were differences in percentages or numbers of responses among households but at the same time it shows that there was a general awareness of the cause of the disease in Akwapim South. Clearly, this can be considered as a manifestation of the outcome or effectiveness of the activities and strategies of the malaria control programme in that area.

5.3.1.4 Households' Recognition of Symptoms of Malaria

The general knowledge about signs and symptoms of malaria has been relatively high with most respondents indicating awareness of key symptoms including increase in temperature, vomiting, loss of appetite, restlessness and headache and fever. Households' recognition of malaria symptoms is shown on the figure below.

Figure 5.3: Households Recognition of Symptoms of Malaria
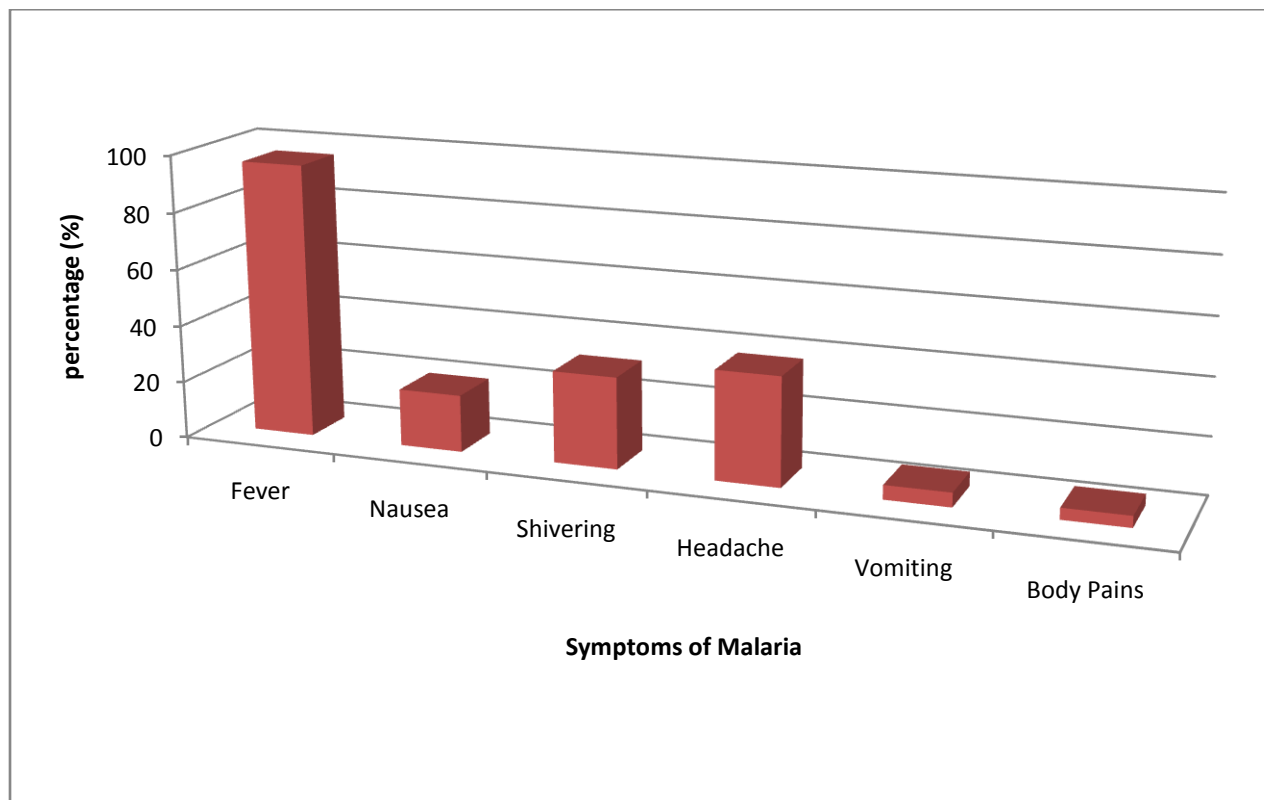


(Source: Field Reports, 2012)

These signs and symptoms of malaria mentioned were however associated with simple and uncomplicated malaria with many respondents not aware of the signs of severe malaria among the respondents. These findings have been reported elsewhere by Njama, D *et 'al* (2003) in Kampala where caretakers had a good understanding of recognizing symptoms of malaria with 89% reporting fever but same study revealed poor recognition of severe malaria among the caretakers, with only 20% mentioning convulsions as a sign of severe malaria.

5.3.1.5 Sources of Information about Malaria

The respondents' sources of information about malaria were varied; television (TV) was indicated to be the main source of information on malaria (48%) followed by radio (24%) with the health workers (19%) ranked third while news papers were the last source (3%) mainly a few urban residents.

Figure 5.4: Respondent's Source of Information about Malaria
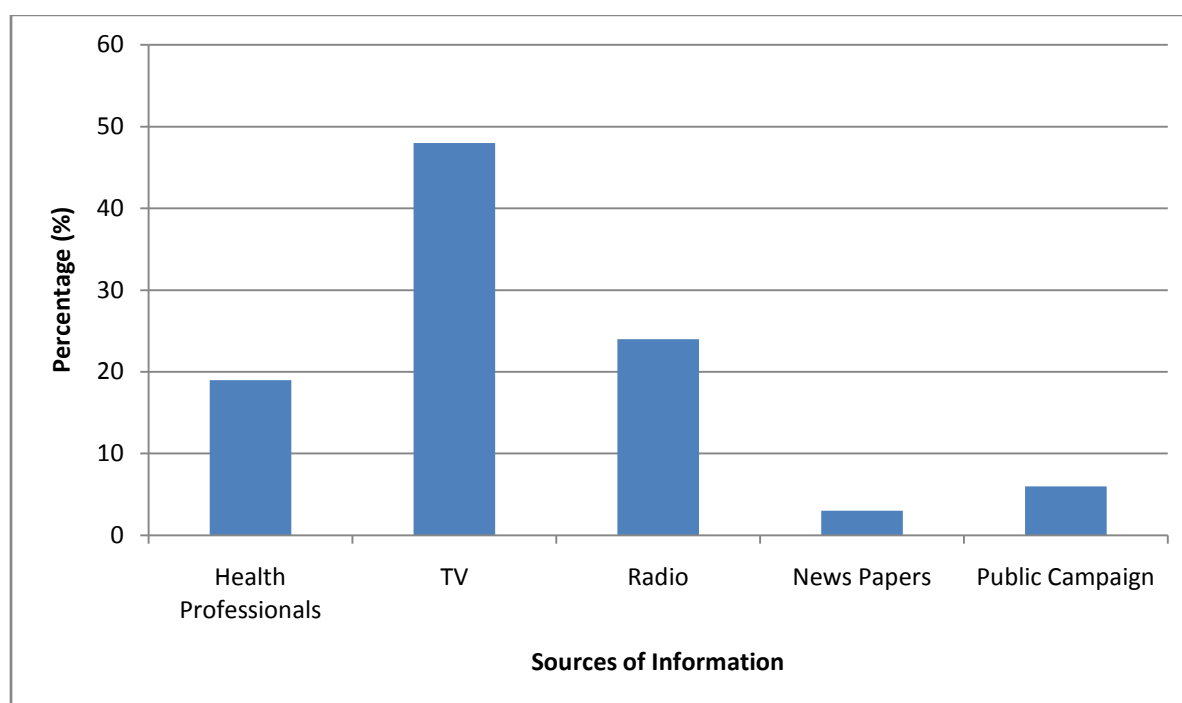


(Source: Field Reports, 2012)

Information about the herbal treatment for malaria was mainly obtained from the older generation, relatives, friends, and herbalists in the villages which came to light during the FGDs held. Some other sources of information on herbal medicine as noticed by the researcher were through the aggressive marketing by drug vendors even at the Nsawam lorry station and in the schools. The impression from the findings generally shows that the rural settings have less

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access to the various sources of information on malaria which could impact negatively on their care-seeking behaviour. The opportunity here is that information on malaria which is useful for its control and management can easily be passed on from the implementing institutions to the people through the mass media such as TV and radio.

5.3.1.6 Knowledge on Ways of Malaria Control

The respondents indicated several ways through which malaria can be controlled. The majority of them (80%) indicated that malaria can be controlled through prompt visit to health facilities for treatment with anti-malaria drugs. These have been summarized in the table below.

Table 5.3: Ways of Malaria Control

| Interventions (N=200) | Frequency | Percentage (%) |
|---|---|---|
| Health Facility Visit for prompt Action | 80 | 40 |
| Use of ITNs/LLINs | 58 | 29 |
| Spraying with Insecticides | 19 | 9.5 |
| Anti-Malarial Drugs | 43 | 22 |
| Total | 200 | 100 |

(Source: Field Reports, 2012).

5.3.1.7 Outcomes of Malaria Case Management Activities

The findings indicate a wide range of sources from which malaria cases were treated and managed. These include visiting health providers in the public sector, commercial private

sectors, traditional healers, licensed pharmacies shops and market. Mostly, treatment was sought for "fever", a symptom that individuals associate closely with malaria. Recommended drug regimes vary based on patients malaria history though ACTs and amodaiquine were generally used.

Improving on case management primarily ensures that signs and symptoms of malaria are recognized early and appropriate management was provided promptly at individual, family, community and facility levels. Significant efforts have been made under the malaria control prprogramme since 2005 to date aimed at improving early diagnoses and prompt treatment of malaria. There have been improved access to antimalaria drugs at the public and private health facilities as well as through HMM of malaria. The capacities of health workers at the health facilities and community health volunteers were also enhanced consistently in the past three years though that of the volunteers has not been enough.

5.3.1.8 Treatment Options for Malaria Among Respondents

The study found that majority of the respondents (60%) chose to attend the health facility to seek for malaria treatment where as the remaining 40% either visited the herbalist (14%) or the pharmacy shop (25.5%).

Figure 5.5: Percentage of Respondent's Treatment Options for Malaria
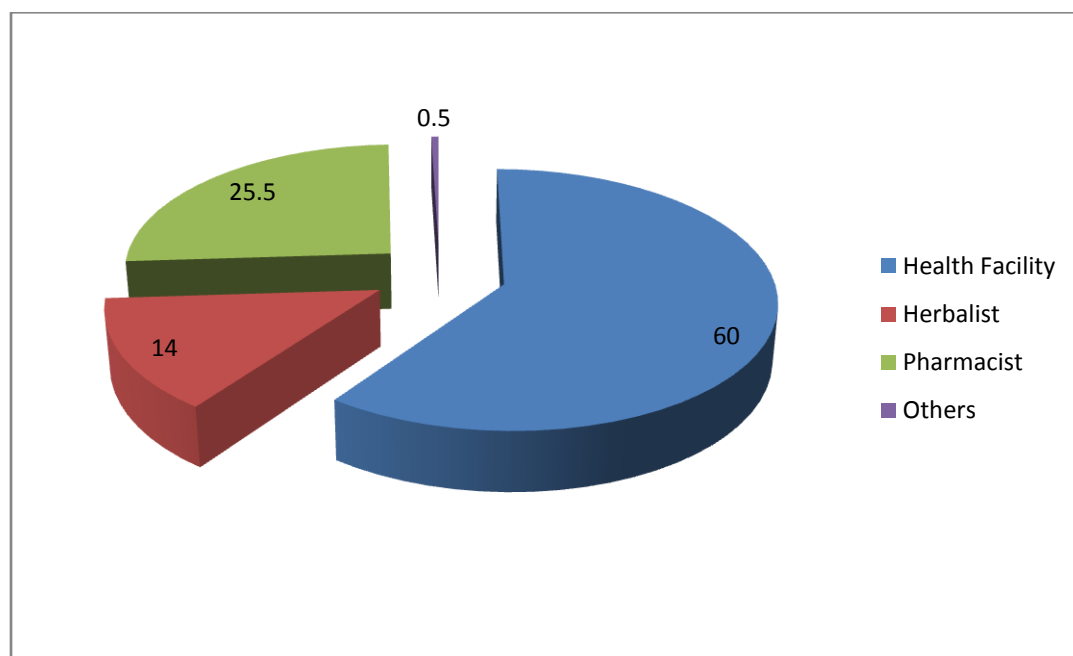


(Source: Field Reports, 2012)

Though most of the respondents reported at the health facility for the treatment of malaria because of the presence of doctors, still a large number also depended on pharmacists which is quite challenging to effective case management of malaria. This was influenced by quick services, steady availability of drugs and sometimes, the presence of qualified providers (Luanniale and Rajais 1996).

5.3.1.9 Factors Influencing the Treatment Options Of Malaria

According to the respondents, inherent factors influencing the choice of first line malaria treatment were distance to the health provider or facility, the cost of drugs (especially where it was low), influences from friends and relatives, the media which has often showcase successful

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treatment with drugs or provider and lastly those sources that are quick service, steady availability of drugs and sometimes, the presence of qualified providers.

5.3.1.10 Interventions Targeting Case Management of Malaria

The research came out with one major finding that case management was one obvious intervention that was generally resorted to by households in the study area. This took the forms of health facility visit for treatment of which (40%) of the people readily depended and through Home Base Management (HBM) of malaria. The second intervention that the study findings show was the use of bednets. More so, it was found that Indoor Residual Spraying (IRS) was not implemented for lack of funds except for some individuals who had occasionally sprayed the houses. In an interview with a Principal Nursing Officer in charge of public health, she lamented that malaria control programme in the municipality and Ghana at large was narrowed to facility case management and the use of mosquito nets as the only major vector control intervention which was inadequate.

5.3.1.11 Health Seeking Behaviour for Early Treatment

The World Health Organisation (WHO) and the RollBack Malaria (RBM) guideline on early case detection and treatment of uncomplicated malaria within 24hours of onset was found to be low among the respondents of which some were care takers. The questionnaire survey indicates that 48% of the general population seek early treatment for malaria where as 30% did not.

Also, the findings show that 22% of households were not certain whether treatment was done promptly within the 24hours or otherwise. What this means is that the target of getting all malaria cases treated promptly at the health facility with appropriate drugs is not achievable within the stipulated 2015 timeline. The reasons why most of these people do not seek early treatment was partly due to the preference for malaria treatment outside the health facility because of the delays that characterized public sector health delivery and likewise the high cost associated with the private health facilities (Source: Field Survey; FGD, 2012). In addition, the lack of adequate finance for formal medical consultation and treatment, distance from health facility as against the availability of home stocked drugs and herbs and the convenience of home treatment have all led to this delay in reporting for treatment at the health facility.

Figure 5.6: Prompt Treatment of Malaria
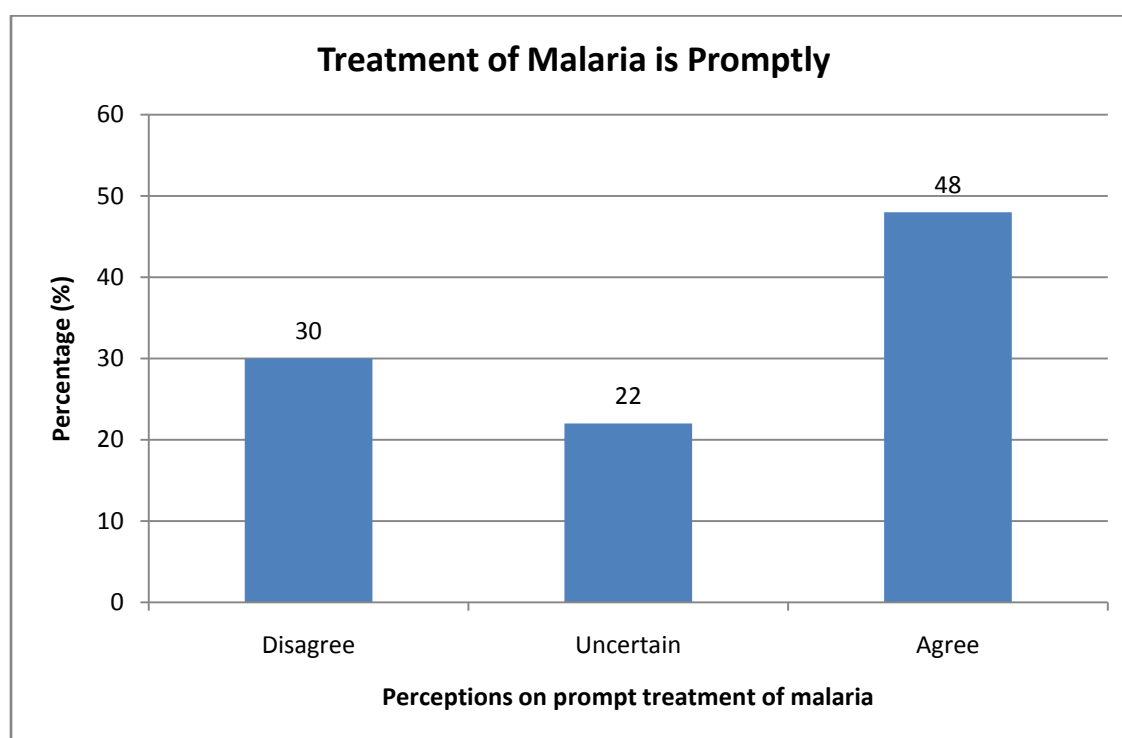


(Source: Field Survey, 2012)

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5.3.1.12 Treatment of Malaria Among Pregnant Women And Children Under Five

It was found that pregnant women and children under five years old were the majority who seek early treatment of malaria as soon as symptoms were noticed. The reason was partly the result of high preference for treatment of malaria among caretakers and households for children under five than all other groups which clearly indicates a potential danger. Pregnant women also generally visited the health centers for their ANCs of which malaria treatment featured prominently.

Figure 5.7: Prompt Treatment Of Malaria Among Children And Pregnant Women
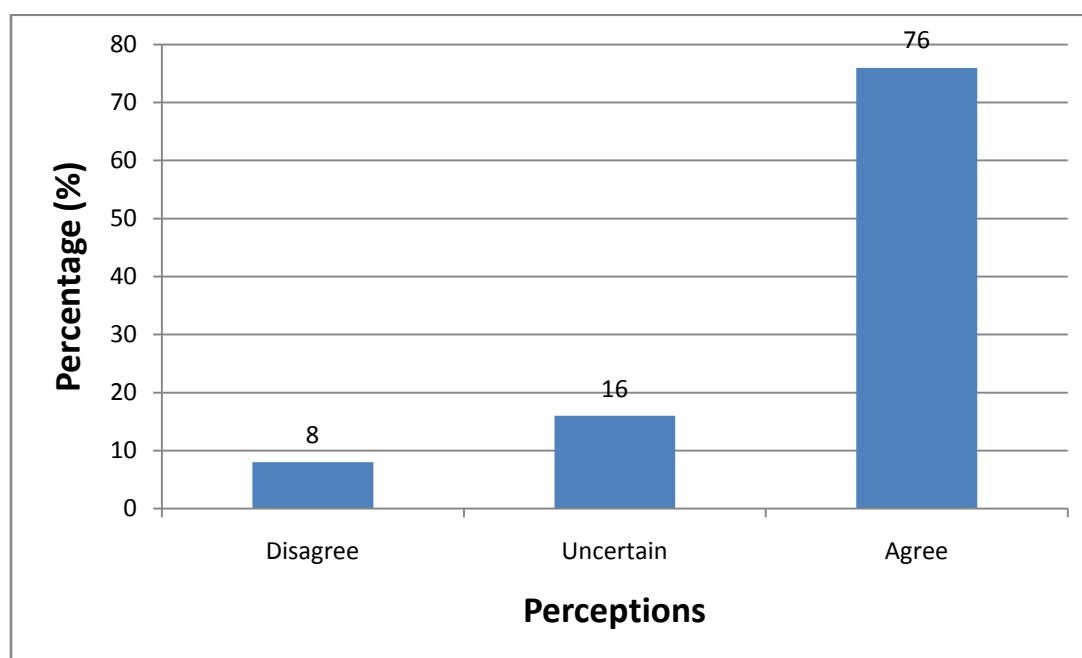


(Source: Field Survey, 2012)

Women and children have remained the two most vulnerable groups to the malaria disease for now. A check on the health records truly confirms that. Therefore, the fact that the knowledge

and prompt treatment level among these groups was high is good news since they are the most affected and required urgent treatment of malaria.

The study can confidently conclude that case management was the most effective intervention of malaria control in Akwapim South. This finding was compared with Goodman et al., (2000) who noted in a malaria cost effectiveness studies in low income countries and indicated that improvement of case management was the most effective intervention.

The research found this positive for effective case management when the findings revealed that 76% of the respondents agreed that malaria treatment among pregnant women and children was sought promptly.

5.3.1.13 Malaria Cases Confirmed

Malaria cases confirmed before treatment was given has seen an improvement but far below the 2015 target. The research found that most of the reported suspected cases of malaria were not confirmed in a laboratory or through the use of RDTs kit. This was identified by the study as a wake-up call to ensuring effective malaria control in the area. The questionnaire survey indicated that 50% of cases were confirmed before ACTs were given. This is far below the 100% target to be achieved by 2015. It was attributed largely to inadequacy of RDTs and the long time it takes to be diagnosed in the laboratory. Therefore, the drugs were given on presumption to avoid delay. A review of the District Health Management Team (DHMT) reports yielded similar results where most cases have not been confirmed before treatment of malaria. This is shown on figure 5.7

Figure 5.8: Malaria Cases Confirmed or Unconfirmed
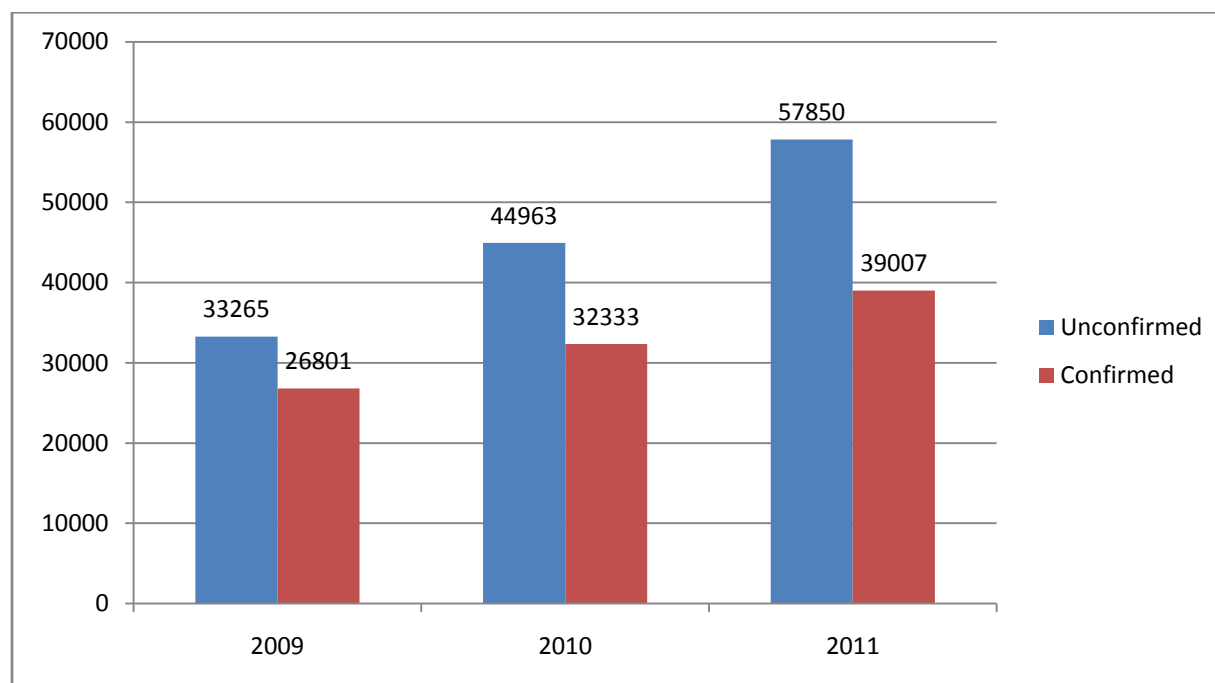


(Source: Field Reports, 2012)

As shown above diagrammatically, most of the cases of malaria were handled only on presumption with the reason that laboratory diagnostic or RDTs were not available and also the high attendance. This represented 80.6% in 2009, 71.9% in 2010 and 64.4% of cases unconfirmed. The situation here is gloomy in the realization of the target of the malaria control programme in having all cases confirmed before treatment by 2015.

5.3.1.14 Knowledge on Anti-Malaria Drugs

The thesis also found that health providers in both the public and private clinics gave ACTs in line with the WHO and MOH guidelines as recommended for the use of ACTs other than monotherepies such as chloroquine and quinine for effective malaria control. The exception had

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to do with the drug vendors who still secretly sell the monotherapies to malaria patients. This was possible in the light of the fact that a significant number of the households still could not recognize the appropriate anti-malaria drugs to use in managing malaria cases.

Figure 5.9: Perceptions on The Effectiveness of Anti-Malaria Drugs
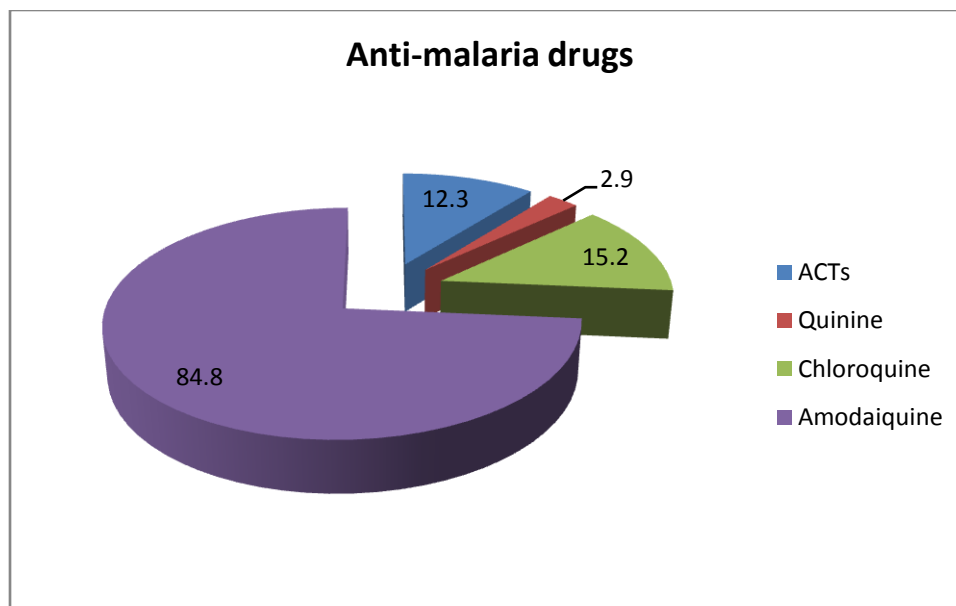


(Source: Field Survey, 2012)

In spite of the fact that most of the respondents were aware of amodaiquine as belonging to the ACTs and effective for malaria treatment, a good number (18%) on the other hand thinks that chloroquine and quinine still remains effective anti-malaria drugs.

5.4.1 Interventions Targeting Vector Control

The study found that 72.9% of the respondents knew that malaria can be prevented while others thought otherwise. Most of those interviewed believed bush clearance (29.5%) and draining of gutters were the main vector control methods. The use of insecticides spray, mosquito coils, ITNs as vector control methods were much recorded. Most of the urban respondents indicated that the use of bed nets was the best way to preventing the malaria vector.

5.4.2 POSSESSION OF ITNS AS A VECTOR CONTROL STRATEGY

The findings did indicate that 72.4% of the respondents owned any type of bednet. Despite the fact that households ownership of at least a net was 72.4% it remains that a significant number of households (43.6%) do not often sleep under a mosquito net in addition to the fact that 27.6% do not own a bednet. This gap seriously is one factor that undermines the effectiveness of malaria control programme in Akwapim South. It was also clear from the findings that majority of the bednets owned were Long Lasting Insecticides Nets (LLINs) which are considered best since they can be use for long before retreatment, which has also been one major challenge associated with the ITNs among the respondents.

Furthermore, it was realized that most of the bednets (50.5%) were acquired through self purchase from the market. The rest of the bednets were acquired through mass distribution (41%) and NGO donations comprised (8.5%) of bednets owned. Also, 54% of the household heads agreed that the use of ITNs was an effective way of malaria control with the reason that they provide physical barrier between human and mosquitoes. Again, 21.5% of the respondents strongly agree that the use of ITNs had been an effective malaria control strategy. About 20.5%

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of the respondents however disagreed on the effectiveness of the use of ITNs as one of malaria control strategies. Those who were not sure or undecided about the effectiveness of ITNs were only 4%.

Table 5.4: Possession of Bednets and Malaria Prevalence

| Bednet Possession and Malaria Prevalence (N=200) | *Prevalence of malaria* | | Total |
|---|---|---|---|
| *Bednet Possession* | Yes | No | |
| Yes | 97 | 50 | 147 |
| No | 37 | 16 | 53 |
| Total | 134 | 66 | 200 |

(Source: Field Reports, December, 2012)

5.4.3 UTILISATION OF INSECTICIDE TREATED NETS (ITNs)

It was found intriguing that despite the high coverage of ITNs, not all household members had access to it. The reason is that a net was said to contain 1.8persons which is roughly 2persons. This could not therefore contain most household members. What this means is that the high coverage of ITNs was the fact that ownership of ITNs has often been measured per household but in fact a household had more than two persons in most cases.

In the FGDs held in the study area, it was realized that the general awareness of ITNs was found to be high but there were still some negative perceptions about nets such as: the thinking that mosquitoes can still bite even when one sleeps under a bednet and the believe that sleeping under bednets was uncomfortable and produces heat while sleeping. Even though mosquito nets were

supposed to be retreated after every three months and three years for ITNs and LLINs respectively, little was achieved in that respect. This was attributable to the lack of logistics and adequate education.

From the above discussion it is apparent that the malaria control programme is likely to achieve the target of having 100% ownership of bednets among households except that the 90% target of their utilization is unlikely to be met by the 2015 timeline.

## 5.4.4 INDOOR RESIDUAL SPRAYING (IRS) AS A VECTOR CONTROL STRATEGY

The findings of the study revealed that the use of IRS as a vector control mechanism has largely been under emphasized though it was supposed to be a cost effective public health intervention given its ability to protect a large number of people at a relatively low cost of spraying. Only 10% of the households were found to have occasionally sprayed their house which is too low. The reason was the lack of information and high cost. It also came to light that 72% of the respondents had not adopted IRS though 33.5% of them believed it was an effective way of vector control and malaria prevention. Malaria control in the Akwapim South Municipality therefore had largely involved case management and the use of bednets.

The respondents were asked to rank ITNs/LLINs and IRS according to the following statements: very strong, strong, not strong and undecided. Their views have been represented below on the chart which indicates that majority of the respondents agreed that ITN use was stronger than IRS.

Figure 5.10: Respondent's Perception about the Effectiveness of ITNs/IRs
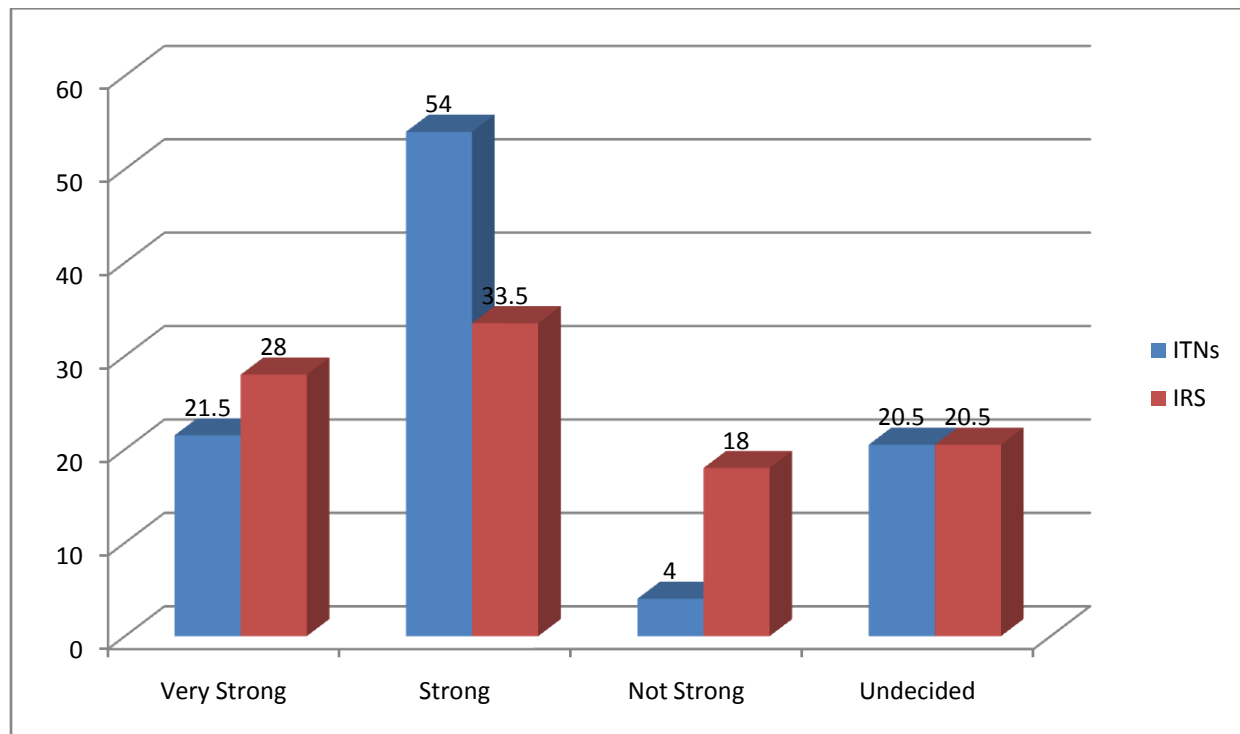


(Source: Field Report, 2012)


5.4.5 SUMMARY OF PROGRESS MEASURING EFFECTIVENESS OF THE MALARIA CONTROL PROGRAMME IN THE STUDY AREA

Looking at the targets of the malaria control programme and the progress made in terms of the achievements of the targets then one can say that more still needs to be done.  These targets and the progress made are summarized in the table below.

Table: 5.5 Summary of Progress Made With Respect To The Targets

| Strategies | Indicators | Progress made |
|---|---|---|
| Use of ITNs/LLINs | 1. 100% of households will own at least one ITNs by 2015<br>2. 85% of children under-five and pregnant women will sleep under treated net by 2015 | 1. 74.2% of house- holds own at least an ITNs. |
| IPT | 1.. 100% (All) pregnant women shall be on appropriate Intermittent Preventive Treatment by 2015 | All (100%) of pregnant who visited health facilities were put under IPT. |
| Case Management | 1. All (100%) health facilities will provide prompt and effective treatment using ACTs by 2015<br><br>2. 90% of all patients with uncomplicated malaria will be correctly managed at public and private health facilities using ACTs 2015<br><br>3. All (100%) communities will have access to community-based treatment for uncomplicated malaria by 2015<br><br>4. 90% of children under five years of age with fever will receive an appropriate ACT within 24 hours of onset by 2015<br>5. ALL (100%) of all cases be confirmed with RDTs or laboratory means by 2015 | 1. All those who visited the health facility were treated with ACTs but promt treatment was low (48%).<br>2. Community based Management of malaria is still low of about 20%<br><br>3. Prompt treatment among children was 76%.<br>4. 50% of cases were confirmed before drugs were given. |
| Knowledge and level of awareness | 1. 90% of caretakers and parents will be able to recognize early symptoms and signs of malaria by 2015 | 1. Awareness level was (97.5%)<br>2. Knowledge on cause Was about 75% |
| IRS | 2. 90% of all structures in districts will be covered through indoor residual spraying by 2015 | Coverage of IRS was as low as 10% |

(Source: Field Reports, 2012)

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5.4.6 RESPONDENTS PERCEPTIONS ABOUT THE EFFECTIVENESS OF ACTIVITIES OF THE NMCP

The research solicited the opinions of the respondents on the effectiveness of the NMCP in the area. It was found that majority of the respondents (50%) thinks that its performance is just average. Few of the respondents (5.6%) ranked the performance as excellent. This is not surprising given the fact that malaria situation before the introduction of the activities and now is not significantly different. The others are displayed on the table below.

Table 5.6 Perceptions on the Effectiveness of the NMCP

| Respondents Perceptions | Frequency | Percent (%) |
|---|---|---|
| Excellent | 11 | 5.6 |
| Very good | 20 | 10.1 |
| Good | 38 | 19.2 |
| Average | 99 | 50.0 |
| Poor | 30 | 15.2 |
| | | |

(Source: Field Reports, 2012)

The findings support the general perception about the ineffectiveness of the activities of the NMCP in most other parts of the country. The reason most of them argued is based on the inability of the programme to prevent the disease despite the intense activities in place. There is simply a missing link of translating the increase in outputs into outcomes.

# 6.0 CHAPTER SIX: SUMMARY, CONCLUSION AND RECOMMENDATIONS

The study was carried out with the aim of finding out the effectiveness of the malaria control programme in terms of its ability to drastically reduce morbidity and mortality in the Akwapim South Municipality.

This chapter therefore summarises the major findings of the study, draws conclusion and offers some recommendations which could help improve the performance of the malaria control programme in Akwapim South Municipality.

6.1.0 SUMMARY OF KEY FINDINGS

This section of the research provides a summary of the research findings based on the objectives set out for the study.

6.1.1 The Malaria Situation in Akwapim South Municipality

Following what other researchers have found about the malaria situation in malaria endemic areas, the thesis found that the Akwapim South Municipality had a high burden of malaria. The high malaria situation is characterized by the increasing cases of malaria in all the health facilities of the municipality. The research indicates 67% of malaria prevalence among the study population. Pregnant women and children below five years were the most affected. Again, it was realized that malaria was ranked first among the top ten diseases in the Akwapim South Municipality.

Also, the study identified key factors that have contributed to the high malaria situation in Akwapim South. These include the environmental conditions of the area which were conducive

for the malaria vector. For instance the MOH, 2008 attributes the high malaria incidence in Ghana to the suitable climatic conditions. There was also the issue about the low socioeconomic status of the households thereby putting malaria control in the hands of donors which makes such interventions of malaria control programme unsustainable.

6.1.2 Summary of Activities of the National Malaria Control Programme in the Study Area

The research outlined the various interventions and activities introduced in the study area under the National Malaria Control Programme of Ghana. The activities were aimed at prevention and case management of malaria.

The preventive interventions that were put in place to successfully control malaria took the forms of bednet use, IRS which largely was not practiced though, Intermittent Preventive Treatment (IPT), environmental management and public campaigns to create awareness of the malaria disease (Lorraine, 2005). The activities of case management of malaria related to diagnosis and treatment of malaria. Unfortunately, it was found that much attention has been paid to the latter that is not likely to result in sustainable malaria control in Akwapim South Municipality.

6.1.3 Challenges Of The Malaria Control Programme In Akwapim South Municipality.

Firstly, the findings of the research showed inadequate funding as one of the challenges of the malaria control programme. This has not only limited the scaling-up of malaria control activities but has also led to the inadequacy of logistics such as RDTs kits and ITNs for mass distribution. The situation has made malaria control activities highly donor depended which does not support

sustainable malaria control. Even though a financial gap analysis was not done it was realized that many of their proposed activities could not be carried out.

Secondly, the poor attitude of the people towards the utilization of malaria control interventions is one other challenge of the malaria control programme. The effect of the lack of behaviour change led to the under utilization of the interventions introduced in the area. For instance people still refuse to sleep under bednets whiles possessing it. So, despite the fact that household ownership of at least a net was 79% it remains a challenge that most other household members (64%) did not often sleep under a mosquito net. This gap seriously was one factor that undermined the effectiveness of the malaria control programme in Akwapim South. Likewise, most people did not seek early treatment for malaria.

Also, one other challenge was the thinking that activities of malaria control are the government's responsibility and by that it was only the government's actions that could bring about reduction in malaria morbidity and mortality. To that extent people were not willing to purchase ITNs/LLINs and other vector control measures even though they were fully aware of the enormous benefits associated. This challenge needs to be overcome if effective malaria control was required.

Another challenge identified was that malaria control in the Akwapim South Municipality was virtually through case management and the use of bednets excluding the vector control measures such as IRS which has been proven to be effective in other parts of Ghana, such as in Obuasi by Anglo-Gold Ashanti in partnerhip with the NMCP in 2007.

Further, the cost of ITNs and ACTs still remains expensive for the poor people. As at now the programme only caters for the free distribution of ITNs and treatment of malaria cases for free

among pregnant women and children under five years. This problem was partly due to the fact that increased malaria parasite resistance to the monotherapies has necessitated the adoption of ACTs as first line drugs for the treatment of malaria which were expensive. Again, the problem was partly the fact that majority of the malaria patients who visited health facility with the National Health Insurance Scheme (NHIS) were sometimes not given the malaria drugs for the reason that it was out of stock or not available at the dispensary. This situation did encourage the treatment of malaria outside the health facility.

6.1.4 The Outcomes Of The Activities Of The National Malaria Control Programme In Akwapim South Municipality.

First of all, the study found that household's awareness of malaria was high. Majority of the people could recognize the symptoms of uncomplicated malaria especially with fever except that the same could not be said of severe malaria. The common source of information about the awareness and knowledge of malaria was through the television. This means that all those without the television have less access to information on malaria. Public campaign as one of the activities of the malaria control programme was not a major source of information on malaria among the people.

Also, a good number of the people in the Municipality still depended on herbal medicine for the treatment of malaria despite the availability of health facilities where appropriate treatment was assured. This is an indication that the malaria control programme has not been too effective in terms of its public education in bringing about behaviour change among the people. This is also an indication that similar medium of information dissemination must be discouraged since it is

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not likely to serve as a good source of Behaviour Change Communication (BCC) for both urban and rural dwellers or literates and non-literates.

Health services distribution was also found to be poor and negatively skewed to the rural settlers of the municipality. This situation has forced some of the people to cover long distances each time they had to treat malaria in the public sector. It was this situation that led to the use of herbal medicines and unlicensed drug peddlers since they were easily accessible. The Home Based Management (HBM) of malaria was identified by the NMCP to have the ability to bridge this gap of distance decay by treating malaria promptly and appropriately at the household level. But it was found that volunteers at the community level were either not properly trained to handle such key initiative or there was the loss of trust by the community members for the volunteers.

In terms of malaria prevention the study found that the insecticide treated bednets was the most used strategy. Little emphasis was placed on other important measures of malaria prevention such as IRS and good environmental management practices. Hence malaria control interventions in Akwapim South Municipality largely had to do with case management and the use of mosquito nets as happening in other parts of the country.

Since the overall objective of the National Malaria Control Programme is to bring about a reduction in malaria morbidity and mortality then one will not be wrong to rate the effectiveness of the programme low in the Akwapim South Municipality.

6.2.1 CONCLUSION

In conclusion the evidence from the study did not show any significant reduction of malaria cases despite the introduction of the intervention activities of the National Malaria Control Programme in the Akwapim South Municipality. The introduction of the activities of the NMCP in the area was geared towards malaria prevention and control though the emphasis has largely been on case management. The scaling-up of the intervention activities in the Akwapim South Municipality have only led to an increase in their access while their outcomes in terms of reduction in malaria related cases still remains high.

The objective of reducing malaria related morbidity and mortality by 75% by 2015 led to the scaling-up of the activities of the NMCP in the area. However, looking at the trend of the disease and implementation challenges, it is not likely that the objective can be achieved within the time frame.

To a large extent this has put the effectiveness of the malaria control programme in doubt and thus must be a wake-up call to reposition the activities in ways that will result in their positive impact by addressing the implementation challenges.

**Methodological Challenges:** The researcher adopted an analytical method for the study. In doing that the primary data was largely complement by secondary data in the form of review of documents tin order to accomplish the goal of the project. The challenge, however, was that the information collected from the from the various health facilities was liable to problems of over and under recording, poor records keeping and diagnoses which influenced the research outcomes. These and other limitations did not in any way, however, bias the findings of the thesis.

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**Research Implications:** Despite the contributions of the study there is the need for further research on the effective use of the various strategies of the malaria control programme such as ITNs, Indoor Residual Spraying and case management of malaria. Again, it is necessary to conduct further research in the area of the challenges of fusing malaria control into the Primary Health System.

## 6.3.1 RECOMMENDATIONS

The study examined the effectiveness of the NMCP in Akwapim South Municipality. Among the objectives of the study was to identify the challenges of the activities of the NMCP in the study area. Based on the findings of the thesis the following recommendations are made to improve on the effectiveness of the malaria control programme in the area and Ghana at large.

The first recommendation is that Communal labours have to be organized on regular basis to clean the environment, by weeding the surroundings, draining stagnant waters, removing empty cans as a way of removing the breeding sites since the mosquito vectors that transmit this disease is persistently present in the area. As noted from the findings, there have been over concentration on the case management activities of the malaria control programme in the area though 'solo' interventions are not likely to bring about effective malaria control, the approach must be holistic without priority. There must be equal emphasis on both prevention and curative interventions of the programme.

Also, apart from getting more qualified personnel to improve the staffing situation, it is also important to train community volunteers in identifying common signs of malaria. They should be able to use RDT materials and these should be supplied regularly.

To make the activities of the NMCP in Akwapim South Municipality effective there is the need to increase funding and prompt delivery of logistics. So, not only should donors and partners increase their financial support but it is important for the government of Ghana and the district assembly to make more funds available for the malaria control activities in the study area. This would make malaria control more sustainable.

The cost of malaria treatment is also high. It is therefore necessary for authorities to pragmatically make malaria treatment very affordable if not completely free to enhance effective malaria control. It was wrong that most patients could not get anti-malaria drugs at the facilities they visited to seek treatment. Therefore, there is also the need for the GHS to ensure that anti-malaria drugs are procured and promptly delivered to avoid the situation where malaria patients are referred to buy those anti-malaria drugs outside the health facility. This will curtail the tendency of consuming fake drugs but enhance effective malaria control through case management.

Last but not the least, the chemical sellers in the communities should be educated to avoid selling anti-malaria drugs to the public but rather encourage them to report to health facility for regular checkups to avoid abuse of the drug. They should also be educated to follow the national policy of treatment of malaria.

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APPENDICES

APENDIX I: QUESTIONNAIRE


UNIVERSITY OF GHANA, LEGON


DEPARTMENT OF GEOGRAPHY AND RESOURCE DEVELOPMENT


RESEARCH CONDUCTED ON THE EFFECTIVENESS OF THE MALARIA CONTROL PROGRAMME IN AKWAPIM SOUTH MUNICIPALITY. I WOULD BE GRATEFUL IF YOU COULD ASSIST ME ACHIEVE THIS GOAL BY GIVING YOUR RESPONSES. THIS IS PURELY AN ACADEMIC WORK AND YOU ARE FULLY ASSURED OF THE CONFIDENTIALITY OF YOUR RESPONSES. THANK YOU.

Part A:

Sub-district code…………………          Questionnaire code…………………..

Please thick or indicate the correct response.

**Section A: Socio-Demographic Characteristics of Respondents**

1. Gender of respondent     (1) Male [ ]          (2) Female  [ ]

2. Age of respondent……………

3. Marital status?  (1) Single [ ]    (2) Married [ ]  (3) Widowed [ ]  (4) Other specify…………..

4. Ethnicity      (1) Akan [   ]    (2) Ewe [   ]   (3) Ga-Adangbe [   ] (4) Hausa [   ] (5) Others specify…………

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5. Educational level     (1)   Basic [  ]   (2) Secondary [  ] (3) Tertiary [  ]   (4) No education [  ]

6. Occupation      (1) Farmer [  ]   (2) Trader [  ] (3) Public service [  ] (4) Student [  ] (5) Others, specify……

7. What's your average household income per month…………………………....?

8. Housing type of respondent

|  | Housing Type | Tick if applicable | Ability to protect against malaria |
|---|---|---|---|
| 1 | Block |  | 1. Very effective     2. Effective            3. Less effective |
| 2 | Thatch |  | 1. Very effective     2. Effective            3. Less effective |
| 3 | Bamboo sticks |  | 1. Very effective     2. Effective            3. Less effective |
| 4 | Bricks/Mud |  | 1. Very effective     2. Effective            3. Less effective |
| 5 | Others |  | 1. Very effective     2. Effective            3. Less effective |

9. Source of drinking water? (1) Piped drinking water in residence [  ]   (2) Water piped into yard [  ] (3) Public faucet (piped) [  ]   (4) Water from a well with a pump [  ]   (5) Water from a well with no pump [  ]   (6) Rain water [  ] (7) Other source specify……………………….

10. What is the religion of respondent (1) Traditionalist [  ] (2) Christianity [  ] (3) Islam [  ] (4) Others, specify……..

**Section B:  Knowledge on Spread, Symptoms and Treatment of malaria**

11a. Have heard of a disease called malaria?    (1) Yes [  ]    (2) No [  ]

11b. If yes what is the local name given to the disease?...............

12a. If yes, have you or any member of your family confirmed of having malaria in the past one month?     (1) Yes [  ]   (2) No [  ]

12b.If yes what was your first line of treatment? (1) Prompt reported to the health facility [  ] (2) Treatment soughed from herbalist [  ] (3) Visited pharmacy shop [  ] (4) Others, specify…..

12c.Did you seek further treatment (1) Yes [  ], specify where………… (2) No [  ]

13a.Is malaria transmissible    (1) Yes [  ]    (2) No [  ]

14. Mode of spread (1) Mosquito bite [  ] (2) Drinking dirty water [  ] (3) by eating unhygienic food [   ]   (4) No idea [   ]

15. Common symptoms of malaria (1) Fever [   ] (2) Nausea [   ]  (3) Shivering [  ] (4) Headache [  ] (5) Vomiting [  ]  (6) Body pains [   ]  (7) Others, specify………

16. Which of these groups suffer most from malaria? (1) Children [  ] (2) Adults [  ] (3) Aged [  ] (4) Pregnant women [  ]  (5) Others, specify…..

17a. Are you Aware of any anti-malaria medicine(s) against malaria? (1) Yes (2) No

17b. If yes name them (1) Chloroquine [   ] (2) Quinine (3) Amodaiquine [   ] (4) Artemethel lumefantrine [  ]  (5) Others, specify……………..

18. What is the best way(s) of malaria prevention? (1) Use of smoke [  ] (2) use of coils [  ] (3) use of mosquito spray [  ]  (4) use of fan [  ]  (5) use of cloth [  ] (6) use of ITNs [  ]  (7) Others specify…………………..

19. What is the source(s) of information about malaria awareness/knowledge? (1) Health professionals [  ] (2) TV [  ]  (3) Radio [  ]  (4) News papers [  ] (5) Internet [  ] (6) Public campaigns [  ] (7) Others specify………

## Section c: Interventions and outcomes

20. Is any of these interventions dependable for malaria control (1) Report promptly to health center [  ] (2) use ITNs [  ] (3) Spraying [  ]  (4) Drugs [  ] (5) Others, specify……..

21. What do you think can be done to eradicate malaria    (1) Prevent water stagnation [   ] (2) Clearing of bushes [  ] (3) Spraying with DDT [  ] (4) Use of ITNs [  ] (5) Others specify………

## Indoor Residual Spraying

| 22 | At any time in the past 12 months, have you or anyone sprayed your house against mosquitoes? | 1. Yes [ ]<br>2. No [ ]<br>3. Don't know [ ] |
|---|---|---|
| 23 | Who sprayed the house? | 1.Government worker/program [ ]<br>2. Private company [ ]<br>3. Household member [ ]<br>4. Other, specify………………<br>5. Don't know [ ] |
| 24 | How do you rank the effectiveness of indoor in the control of malaria? | 1. Very strong [  ]    2. Strong [    ]  3. Not strong [    ] 4. Undecided [   ] |

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**Bednet coverage and use**

| | | |
|---|---|---|
| 25a | Did you sleep under the mosquito net the previous night? | 1. Yes [ ]<br>2. No [ ] |
| 26b | Do all the household members sleep under a net last night? | 1. Yes [ ]<br>2. No [ ] |
| 27a | Type of net own or use | 1. ITN [ ]   2. LLIN [ ]  3. Untreated net [ ]<br>4. Don't know [ ] |
| 27b | Source of acquisition of net | 1. At the market [ ] 2. At the health facility [ ]<br>3. Mass distribution [ ]  4. NGO donation [ ] |
| 28 | Mode of acquisition of net | 1. Self [ ]   2. NGO donation [ ]   3. Others, specify…… |
| 29 | Do you think the net has effectively protected you against malaria? | 1. Strongly agree [   ]      2. Agree [   ]<br>3. Uncertain [ ]  4. Disagree [ ] |

**Prompt Treatment and Effective Case Management**

30. Do you usually access treatment for malaria fever early? 1. Yes [ ]  2. No [ ]

31. Please respond to the following questions by ticking Strongly Disagree, Disagree, Uncertain, Agree and Strongly Agree in the table below:

| Statement | Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |
|---|---|---|---|---|---|
| Treatment of malaria fever among is done promptly | | | | | |
| Treatment among pregnant women and children is prompt | | | | | |

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32. Do you think the various ways of malaria control have brought about reduction of the disease

(1) yes [  ]  (b) uncertain [  ]  (3) do not think so [  ] (4) no idea [  ]

33. How will you grade the performance of the interventions for malaria control

| Intervention | Excellent | Very Good | Good | Average | Poor |
|---|---|---|---|---|---|
| Use of anti-malaria drugs | | | | | |
| ITNs/LLINs | | | | | |
| Indoor spraying | | | | | |
| Others specify | | | | | |

34. What coping strategies have you adopted on your own to manage malaria? ........................

…………………………………………………………………………………………………

**Section D: Challenges of malaria control**

35. What are some of the challenges of the interventions for malaria

control?........................…………………………………………………….…………………………

**Part B: Questionnaire for Health Workers**

36) How many people do you attend to everyday?.............................................

37) What type of diseases are mostly reported?………………………………….

38) Has malaria disease come to your attention? a)Yes b)No

39) What are the treatment methods/drugs (1) ACT (2) Chloroquine (3) Amodaiquine (4)

Others……..

40) Specification of health worker (1) CHN (2) RGN (3) Mid-Wife (4) HATs (5) Others…….

41) Have you had any special training or in-service training on malaria treatment? (1) Yes (2) No

42 If yes, how regular (1) Half-yearly (2) Yearly (3) Not sure

43) Is the cost of malaria treatment high? (1) Yes   (2) No

44) If yes who bears it (1) Government (2) NGOs (3) Patient (4) MOH

45) Is it covered by NHIS? (1) Yes (2) No

46) How do usually diagnose a patient with malaria (1) Use of RDT kits (2) Laboratory diagnoses (3) Presumptive (4) Others……..

47) Are you regularly supplied with RDT kits (1) Yes (2) No

48) Are you regularly supplied with anti-malaria drugs (1) Yes (2) No

49) If yes who supplies you? (1) MOH (2) GHS (3) DHMT (4) Facility purchases (5) NGOs (6) Others……

50) Do you think the MCP is effective (1) Yes (2) No?