

**SCHOOL OF PUBLIC HEALTH  
COLLEGE OF HEALTH SCIENCES  
UNIVERSITY OF GHANA**

**PERFORMANCE OF COMMUNITY-BASED AGENTS (CBAS) IN HOME-  
BASED CARE OF UNCOMPLICATED MALARIA UNDER-FIVE YEARS IN  
THE ATIWA DISTRICT IN THE EASTERN REGION OF GHANA**

**BY**

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## DECLARATION

I, Diwura Mukaila, do hereby declare that this submission is my own work and that to the best of my knowledge, it contains no material previously published or written by another person nor material, which has been accepted for award of any degree or diploma of this university or other institution of learning except where due acknowledgement is made.

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INTEGRI PROCEDAMUS

## **DEDICATION**

I wish to dedicate this work of mine to the Almighty Allah for the abundance of Grace and Mercy throughout the entire academic year, my wife, Abu Memunatu, my children, Diwura Huzaimatu Matima and Diwura Sohaila Titiaka and to my extended family and all friends for their support, encouragement and prayers.



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## ABSTRACT

**Introduction:** Malaria contributes substantially to the poor health situation in Africa. It is on record that, Sub-Saharan Africa accounts for 90% of the world's 300 – 500 million cases and 1.5 – 2.7 million deaths annually. About 90% of all these deaths in Africa occur in young children. Home-based Management of Malaria (HMM) is a strategy to increase access to malaria treatment. This study was conducted to assess the performance of Community - Based Agents in Home- Based Care of Malaria under-five years in the Atiwa District in the Eastern Region of Ghana after five years of its implementation.

**Objective:** The objective of the study was to assess the performance of Community - Based Agents in Home- Based Care of Malaria under-five years in the Atiwa District in the Eastern Region of Ghana.

**Methods:** A cross-sectional approach was used to assess the performance of Community - Based Agents in Home- Based Care of Malaria under-five years in the Atiwa District in the Eastern Region of Ghana using quantitative data collection technique; all the 65 trained CBAs in the district were purposively selected and interviewed using a structured questionnaire and 46 CBAs were observed offering treatment at the time of the interviews through the use of a checklist. Age, sex, education, occupation and indicators on knowledge and management practices were the variables obtained and the results were analyzed using SPSS so version 22.0.

**Results:** The age of CBAs ranged from 18 to 75 years, 46 (70.8%) were males and 31(47.7%) had Middle school education with subsistence farming being 46 (70.8%). All the respondents 65 (100%) received training before starting the HMM. Out of the 65 CBAs interviewed, 34 (52.3%) and 20 (30.8%) had knowledge on 4 and 3 dangers signs respectively and measured as good knowledge and 3 (4.6%) and 5 (7.7%) had knowledge on 2 and 1 danger signs, respectively which is an indication of poor knowledge and out of the 46 CBAs observed, 29 (63%) gave correct age appropriate dose. Using the chi-square test, there was an association between level of education and knowledge on the correct dosage of ACTs.

A Chi-square value of 4.110 with a p-value of 0.029 (<0.05) shows that there is an association between health educational practices and referrals of sick children to health facilities. Forty-seven (47) CBAs who were observed to have had good health educational practices made referrals of sick children promptly.

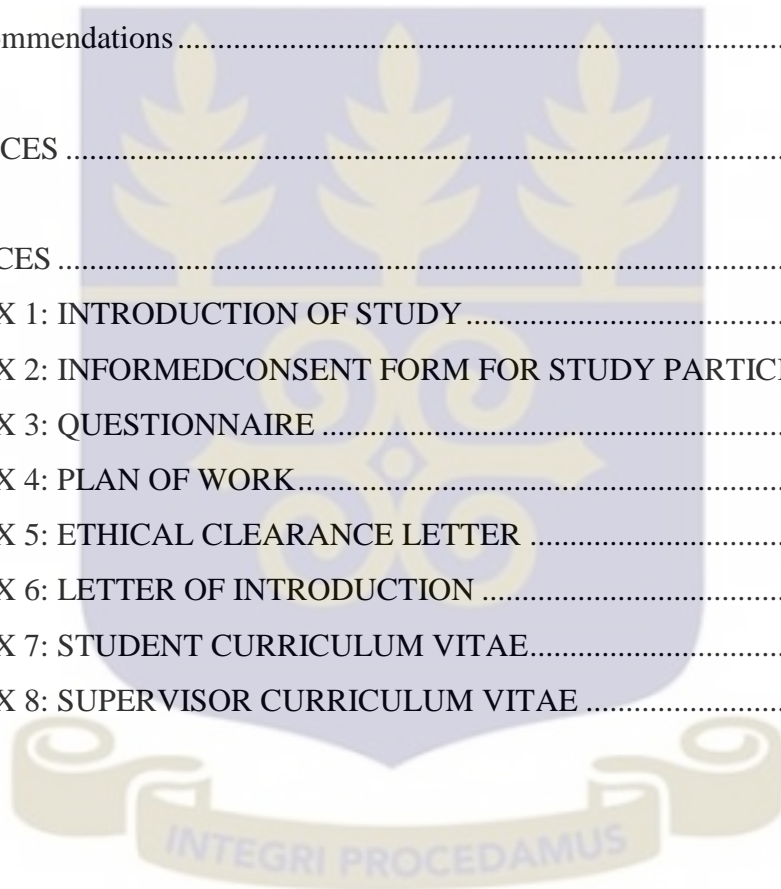
**Conclusion:** More than 60% of the CBAs were able to administer the correct dosage of the ACTs to the age specific groups and the referral practices by the CBAs was high and health education on the prevention of malaria was delivered by the CBAs.

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## LIST OF ABBREVIATIONS

ACT:	Artemisinin-based Combination Therapy
ACT:	Artemisinin-based Combination Therapy
AL:	Artemether-Lumefantrine
AS-AQ:	Artesunate Amodiaquine
ASCD:	Child Survival and Development Programme
CBA:	Community-based Agent
CCMm:	Community Case Management of Malaria
CDD:	Community Drug Distributor
CHPS:	Community-Based Health Planning and Services
CHW:	Community Health Worker
CMD:	Community Medicine Distributors
CMD:	Community Medicine Distributor
CMV:	Community Malaria Volunteer
DCE:	District Chief Executive
DD:	Drug Distributor
DHIMS2:	District Health Information Management System - two
DHMT:	District Health Management Team
ER:	Eastern Region
ERC:	Ethics Review Committee
GDHS:	Ghana Demographic and Health Survey
GHC:	Ghana Cedis
GHS:	Ghana Health Service
GSS:	Ghana Statistical Service
HBC:	Home- Based Care

HBC:	Home-Based Care
HBM:	Home-Based Management
HBMF:	Home-Based Malaria Facility
HCF:	Health Care Facility
HMM:	Home-based Management of Malaria
ICCM:	Integrated Community Case Management
IE&C:	Information, Education and Communication
ITN:	Insecticides Treated Net
KNUST:	Kwame Nkrumah University of Science and Technology
MD:	Medicine Distributor
MOH:	Ministry of Health
NMCP:	National Malaria Control Programme
OPD:	Out Patient Department
PMI:	President's Malaria Initiative
RBM:	Roll Back Malaria
RDT:	Rapid Diagnostic Test
RHIU:	Regional Health Information Unit
SPSS:	Statistical Package for Social Sciences
TDR:	Tropical Disease Research
UNICEF:	United Nations Children's Fund
US\$:	United States Dollar
WHO:	World Health Organization

## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 Background Information

Malaria is a global health emergency killing millions of people each year (Roll Back Malaria [RBM]/ World Health Organization [WHO], 2012). The disease affects people of all ages and economic groups, but the most affected are pregnant women and children under five years of age because of their lowered immunity. Over 80% of malaria related illnesses and deaths occur in Africa (United Nations Children's Fund [UNICEF]/ WHO, 2006) with about 75% of the deaths occurring in children (WHO, 2012a). Malaria kills a child every minute in Africa (UNICEF, 2013; WHO, 2014).

The economic toll of malaria on healthcare system is enormous, with the cost of treatment consuming as much as 40% of national health care budgets in developing countries. It is estimated that malaria- related illnesses and deaths cost Africa's economy about US\$12 billion per year (Management Strategies for Improving Health Services, 2003; RBM/WHO, 2012) and the cost related to complicated malaria drives households into poverty (The President's Malaria Initiative, 2007 as cited in Ghana Statistical Service and GHS, 2009).

Approximately 3 to 3.5 million suspected cases of malaria are reported yearly in public health facilities constituting 30-40% of Out Patient Department (OPD) attendance. Out of this figure, more than 900,000 are children less than five years of age (The President's Malaria Initiative, 2007 as cited in Ghana Statistical Service & Ghana Health Service, 2009; UNICEF, 2012).

The National Malaria Control Programme (NMCP) also indicated that, over the past five years, between 3.1 and 3.5 million cases of clinical malaria were reported in public

health facilities each year, of which over 900,000 cases were children under-five years (NMCP Annual Report, 2007).

Malaria is said to account for about 48.8% of total hospital admissions of children under five years (NMCP, 2010) and about 30% of under-five mortality in Ghana (UNICEF, 2012). According to Asante and Asenso-Okyere (2003), malaria accounts for an average of 9 work days lost per malaria episode by the patient and more than 5 work days by the caretaker in Ghana. School children also lose four school days due to malaria illness (“Economic Burden of Malaria in Ghana Economic Burden of Malaria in Ghana,” 2015).

Malaria stands out prominently as the first among the top ten causes of morbidity and mortality in Ghana. A survey carried out on the economic burden of malaria in Ghana using Chloroquine indicated that malaria contributes to GHC147.54 (US\$ 78.90) of our per capita income; this means that in every household GHC 378.95(US\$405.30) is spent on malaria treatment alone representing 9.74% of per capita government expenditure of health at the time the study was done (Global Fund, n.d.). The MOH/GHS estimates the cost per case of malaria to be GHC8.24.

A study conducted by Akazili, Aikins & Binka (2007) in Northern Ghana, direct or out of pocket expenditure on malaria constituted 29% of the total cost of malaria treatment and the indirect cost, which involves waiting and travel times accounted for 71% of the total cost of a malaria episode. The cost of malaria care was also estimated to be 1% of the income of the rich and 34% of the poor household's income.

Under -5 year mortality in Ghana remains high (111/1000 live births in 2001-2006), with stagnation of the rates over the past two decades. Also, the 2008 Ghana Demographic and Health Survey (GDHS) recorded an under one year mortality rate of

80 per 1000 live births. The cause of mortality in this age-group have malaria accounting for about 25% (Global Fund, n.d.).

Prompt access to effective anti-malarial treatment within 24 hours of onset of symptoms is one of the major strategies for reducing the malaria burden (WHO, 2005a). This means having treatment close to the community or the home itself. In response to this challenge, African leaders committed themselves to actions targeted at ensuring that 80% of malaria episodes are adequately treated within 24 hours of onset of symptoms by 2010 (WHO/RBM, 2005c). Initiatives to provide such access should however take into consideration the poor, rural and vulnerable populations in malaria-endemic countries who are underserved by the formal health system (WHO, 2000).

In Ghana for instance, almost 50% of the total population live in rural areas (Ghana Statistical Service, 2012b), thus treatment of malaria is challenged by geographical and socio- economic barriers, inadequate and inequitable distribution to health –care infrastructure and the requisite man power. This means that patients with malaria, particularly children are likely to die before accessing health services. Studies have shown that treatment of children with malaria at home using shop- bought drugs is a common practice; (Foster, 1991), (Agyepong, 1992), (Mwenesi, Harpham, & Snow, 1995), (Buabeng, Duwiejua, Dodoo, Alex, Matowe, & Enlund, 2007). The risk of taking incorrect doses and non-compliance to treatment regimen in such home based treatments is very high. Additionally, self-medication may not only result in the use of sub-standard and counterfeit medicines but also increase the risk of resistance to anti-malarial.

In a bid to increase prompt access to early diagnosis and effective anti-malarial therapy. WHO is promoting Home-based Management of Malaria (HMM) in Africa. The strategy promotes access to pre-packed quality anti-malarial drugs within 24 hours of

the onset of symptoms delivered through trained community resource persons. Several African countries have adopted the WHO home-based management of malaria in an effort to improve prompt access to treatment. HMM is being implemented and scaled up in countries such as Ethiopia, Uganda, Burkina Faso and Nigeria (UNICEF, 2005).

The GHS in collaboration with UNICEF and the department of Community Health of the Kwame Nkrumah University of Science and Technology (KNUST) have since 2003 made efforts to scale up and strengthen the implementation of HMM in the country. The strategy is aimed at increasing access to prompt and effective malaria treatment to children under five years delivered by trained CHWs.

From 1994 to 2003 malaria had accounted for 44.5% of all outpatient illnesses, 36% of all admissions, and 33.4% all deaths in children under – five years. (Global Fund, 2010).

The NMCP in Ghana aims to “reduce malaria disease burden (morbidity and mortality) by 75% by the year 2015, using 2006 as baseline”. To address the problem of malaria, Ghana has adopted the Roll Back Malaria (RBM) Strategy that employs a multi-pronged approach.

HMM implementation started on pilot basis in Ghana in 1999, as part of the WHO/TDR funded multi-country study. HMM therefore became possible due to the advantage of prepacking antimalarial for treatment of malaria as documented by pagnoni et al in 1997.

A network of community-based agents (CBAs) was selected by the communities guided by criteria agreed upon by the study team. Apart from the core interventions, training updates, qualitative surveys, and Information, Education and Communication (IE&C)

sessions were organized. In communities where these activities were regular, compliance was found to be very high (Brown, 2002).

In 2005, the malaria drug policy was revised and artesunate-amodiaquine was adopted as the first line drug. The HMM team was further commissioned to do a feasibility study using artesunate-amodiaquine, in HMM. The positive findings showed that it was feasible to use AS-AQ in HMM.

As a follow up, UNICEF-Ghana, GHS and the HMM team collaborated to pilot the programme in Upper East, Upper West and Northern Region under the Accelerated Child Survival and Development programme (ACSD). The favourable results of the pilot study as well as the successful implementation in the three northern regions have prepared the ground for nationwide implementation of HMM.

## **1.2 Problem Statement**

Results from the Ghana Demographic and Health Survey (GDHS) in 2014 revealed that only 32.6% of the 44.7% of children under five years in Eastern Region who received anti-malarial received the treatment the same day or the next day. The low coverage of children treated with anti-malarial drugs in 24 hours is a possible indication that, access to prompt malaria treatment is still a challenge in the region in spite of the existence of Community – based Agents (CBAs) in the under-serve communities.

Again, after four years of implementation of the HMM programme in the region, malaria has remained the top cause of OPD attendance, with malaria in children under five years accounting for 23% of cases in 2012, 25% in 2013 and 29% in 2014. The regional annual reports from 2012 – 2014 have also shown that CBAs reports are incomplete and sometimes complaints regarding quality of care received from some CBAs are undocumented (RHIU, ER, 2014).

In the Atiwa District of the Eastern Region, information pertaining to the performance of CBAs in HMM among under-fives is currently lacking.

### **1.3 Justification**

Despite the widespread advocacy and strong evidence supporting HMM and the vital role of Community Health Workers (CHWs) in improving outcomes for childhood malaria (Lewin et al., 2005), several concerns have been raised with respect to the performance of Community-Based Agents (CBAs) in the Eastern Region. Many operational aspects such as selection and training of CBAs, programme supervision, health information management and drug supply systems could affect the performance of CBAs.

At present, there is little or no evidence about the performance of CBAs in the Eastern Region; how they can deliver safe and effective care to children with malaria in the community.

This study will therefore be of immense benefits to policy makers and other development partners about the performance of CBAs in the region. The findings will also be used by both Atiwa district and Eastern Region to Strengthen, sustain and improve the existing HMM programme.

### **1.4.0 Objectives**

#### **1.4.1 General Objectives**

The general objective of the study is to assess the performance of Community Based Agents in Home Based Care of Malaria under-five years in the Atiwa District in the Eastern Region of Ghana.

### 1.4.2 Specific Objectives

The specific objectives of the study are to:

1. Assess the treatment of under-five years with uncomplicated malaria by Community Based Agents (CBAs) in the HMM programme.
2. Evaluate the referral system of CBAs in Home-based Management of Malaria (HMM)
3. Determine the health education practices among CBAs in HMM



## CHAPTER TWO

### 2.0 LITERATURE REVIEW

The recognition of home and community role in the management of malaria especially in children under five years has led to the development of many models for what is now called Integrated Community Case Management (ICCM), although the terms Home-based Management of Malaria (HMM), Home-Based Care (HBC) and Home-Based Management (HBM) are also used interchangeably. All these terms refer to the management of malaria and other childhood illnesses in the community (Sundararaman, 1999).

The community resource persons used in HBC have been given different names in different countries. In Ghana, Burkina Faso, Nigeria and Uganda they are called Community-Based Agents (CBAs), Community Health Workers (CHWs), Medicine Distributors (MDs) and Drug Distributors (DDs) respectively (World Health Organization [WHO]/Tropical Disease Research [TDR], 2007).

In recent years, HMM has gained wider acceptance and is endorsed by many (Were, 2004; WHO, 2005a). The strategy has been portrayed as a new paradigm for ensuring early and effective treatment of malaria in children under five years at the community level. Its impact on reducing progression of simple malaria to severe malaria and overall childhood mortality has been well documented (Sirima et al., 2003). Uganda is currently leading the way, with a large-scale HBM programme, which is now the country's official national treatment policy. The Ugandan programme showed that over 52% of febrile children in implementing areas had access to treatment within 24 hours of onset of fever and data from the Community Drug Distributors (CDDs) demonstrated a high

recovery rate between 79%-99% (Matsiko, Musoba, Lutwama, Kaitiritimba, & Jitta, 2007).

Also, training of community resource persons with the provision of pre-packed anti-malarial medicines reduced progression of simple malaria to complicated malaria by more than 50% in Burkina Faso and overall childhood deaths by 40% in Ethiopia (Kidane & Morrow, 2000), (Baume, 2002).

The most promising impact seen in HMM was the reduction in facility based mortality rate (Root, Collins, Munguti, & Sargent, 2003). In contrast, a systematic review in Kenya of the impact of HMM on health outcomes in Africa revealed that presumptive treatment of malaria by CHWs had no impact on malaria-specific or overall mortality in spite of the high utilization (Hopkins, Talisuna, Whitty, & Saedke, 2007).

HMM goes beyond the mere distribution of anti-malarial to parents/care givers of children with malaria. It involves all the actions and commodities needed such as; proper assessment and diagnosis of sick children, provision of appropriate age-specific treatment, and follow ups in a timely fashion for compliance to treatment regimen (Brieger, 2009).

The operational components contributing to CHWs performance can therefore be viewed as a chain of events (UNICEF/WHO, 2006). Ranging from the management of children with malaria, referrals by CHWs, health education practices, documentation and reporting.

### **2.1 Assess the treatment of under-fives.**

In Sierra Leone, Community Malaria Volunteers (CMVs) are trained to test and treat febrile children and pregnant women for malaria using rapid diagnostic tests (RDTs)

following which RDT-negative patients and severely ill patients are referred to health facilities for further diagnosis and care (Thomson et al., 2011).

Community Based Agents (CBAs) or volunteers have been identified and trained to administer rectal artesunate suppository at the community level in the Dangme West district where they have been given artesunate suppositories to be used as first aid in the management of malaria in the under-fives (Ofei, 2011).

In evaluating the performance of CBAs in Osu-Doku Sub-district of the Dangme-West District in the use of Coartem in home management of malaria, Chinbuah et al., (2006) reported that CBAs in which 92.9% of them were told that their child had uncomplicated malaria and 1.6% severe malaria and therefore given Coartem. Over the past couple of decades, studies have shown that community health workers (CHWs) can help reduce morbidity and mortality in settings that have traditionally lacked access to health care (Bagonza, Kibira, & Rutebemberwa, 2014).

Sufficient training is fundamental in the implementation of any activity and should be based on an agreed formal training manual (WHO, 2005b). Studies have shown that, the more exposure CHWs have to basic training, the better the diagnosis and care given to children (Faiz, Abdullah, Kaosar, & Shameem Ara, 2001). Findings from Ghana indicate that CBAs training lasted five days and both CBAs and their supervisors were given regular updates (WHO/TDR, 2007).

A study conducted in Ghana, Burkina Faso, Ethiopia and Malawi through records review revealed that, 99% children with an episode of fever who were treated with ACT by CMDs prescribed the correct dose for their age (Akweongo et al., 2011). However, 54% for which information about the promptness of treatment was available were treated within 24 hours from the onset of symptoms.

It clearly shows that in a supervised setting, it is possible to achieve a high degree of adequacy of prescription by community-based drug distributors as well as adherence by caregivers to the correct regimen for children <5 years of age, when pre-packaged Coartem is deployed at the community level (Chinbuah, Gyapong, Pagnoni, Wellington, & Gyapong, 2006a).

A comparative analysis and documentation of the processes that facilitated teams in Ghana, Nigeria, Burkina Faso and Uganda to implement HMM in various settings revealed that, only 59% of children treated with anti-malaria in Burkina Faso, received drugs for the recommended 3-day period. Among the children treated, 51.8% received the correct age-specific dose, 31% were given under dose and 17.2% were given over dose (WHO/TDR, 2007). Hamel, Odhacha, & Roberts (2001) also found out that dosages of drugs given in Kenya were often incorrect.

According to Bategaet al., (2004), DDs gave relatively good advice to caregivers about the management of their sick children and on treatment compliance. Majority of caregivers affirmed to these findings said they were satisfied with the way the DDs handled their sick children. Regardless of the good advice given to parents/caregivers by DDs, the findings further revealed that only about two-thirds of the DDs received IE&C materials, which are important tools for relating to caregivers. Aside the inadequate supply of IE&C materials to DDs, almost all aspects of the health system in the districts assessed required support for a successful HMM implementation. A good number of pre-packed drugs were found to be ruptured at all levels of the system, posing a serious threat to the programme.

Fapohunda et al., 2004 also noted better counseling in districts with HBMF compared to the non-intervention districts; however counseling on danger signs, referral, feeding and

giving fluids was rarely given. In the case of Ghana, CBAs counseled and gave the first dose of drugs as a demonstration to the mother/caregivers before giving the rest of the drugs to be taken at home. They also made follow-ups to ensure treatment compliance (WHO/TDR, 2007). Compliance is better and more effective with home visits and follow-ups (WHO, 2005b). It revealed that 363 children sought care from CBA. 235 (64.7%) of the children 6-35 months were correctly given treatment (Chinbuah et al., 2006a).

A study in Kenya revealed that, of the antimalarial treatments given at home, 91% were started by the second day of fever and 92% were with chloroquine, the nationally recommended antimalarial at the time. The administration of incorrect dosages, which proved common with chloroquine, may occur less frequently with sulfadoxine pyrimethamine, as its dosage regimen is simpler (Hamel, Odhacha, Roberts, & Deming, 2001).

## **2.2 Evaluate the referral system of CBAs**

Community referral is an important role of CBAs as they are engaged in detection of severely ill children and administration of pre-referral treatment and other indications for referral (Tibenderana, 2010).

A study on referral of children by Community Health Workers (Village Team Worker) to higher health facilities in Uganda observed that 46.8% of under-five children were referred to such facilities because of fever even though they were tested negative for malaria with Rapid Diagnostic Test (RDT) kit (Nanyonjo et al., 2015).

In the Bo and Pujehun districts of Sierra Leone, 17% of children under five were referred by Community Malaria Volunteers (CMV) to Médecins Sans Frontières (MSF) health facilities for malaria treatment (Thomson et al., 2011).

In the Dangbe West District of the Greater Region, mothers were trained to tepid sponge their children when there was fever and to give paracetamol before sending them to the CBAs for rectal Artesunate. The CBAs after the insertion of the suppository would refer the mothers to Health Care Facility (HCF) for the continuation of treatment (Ofei, 2011).

A study in Osu-Doku Sub-district of the Dangme-West District revealed that out of 17 (22.1%) children under-five years old who had warning and danger signs that warranted immediate only 29.4% were referred to the health centre by the CBAs (Chinbuah et al., 2006b).

In Uganda, 240 CMDs were interviewed in some districts, 159 (66%) could mention at least four danger signs in children that needed referral. An additional 56 (23%) could mention three danger signs (Uganda Ministry of Health, 2009). Despite the training given to DDs to understand the scope of their work and to make referrals in complicated cases of fever, adherence to these guidelines was still a challenge (Meek et al., 2005). CHWs should know the circumstances that need referral and a reliable way of passing information about patients to a health facility and vice versa (Walley & Hubley, 2001). They should also communicate effectively to the mother/caregiver on the reasons and the need for referral to allay fears and ensure compliance. Distributors are sometimes compelled to treat severely ill children because of the insistence of some mothers/caregivers. This practice could be dangerous, because if a child dies as a result of the mother's insistence on management at the community level when the child needed to be referred to a health facility, the distributor's credibility could be seriously undermined (WHO/TDR, 2007).

In Northern Uganda, stock out of medicines, other than danger signs was the main reason for referrals. Feedback on referred cases was however good, as 71.3% of CMDs received regular feedback from the health facility staff about referred cases. The feedback was either obtained from the health staff during meetings or by family members of the patient (Uganda Ministry of Health, 2009).

Performance of CHW managing malaria and some other diseases (diarrhoea and pneumonia) was measured using composite scores based on their activities; treating children under five, referring children who were severely ill, home visits and community sensitization. The overall level of good performance was 21.7%. The sex of a CHW, community support, feedback from referral hospital and availability of drugs were significantly associated with good performance (Bagonza et al., 2014).

In a case series study in Western Uganda, 1,454 children from different parishes sought for care from community drug distributors. The overall referral rate was 8%. 14% of children referred were lost to follow up. 87% of referred children completed the referral by either going to the health centre of a hospital. Children who were less than one year were more often referred than others. The study found that Urgent referrals were more likely to assess care and treatment quickly than non-urgent ones (Källander et al., 2006).

It was demonstrated in a study in Western Uganda that 87% of children referred in the Ugandan Home Based Management of fever strategy (HBM) reach a health facility. The high community referral compliance rate observed indicate that it is possible to extend the health system to the village to catch likely malaria episodes early while still having potentially severe cases reaching the health facility for assessment (Källander et al., 2006). Only 5 of 17 children were correctly referred. Adherence of agents to the treatment was 92.5%. (Chinbuah et al., 2006a).

Referral of caregivers from CMDs was occasioned by the shortage of artemether–lumefantrine (AL), CMDs usually went to the health centre to restock, collected AL from fellow CMDs, referred the caregiver to a health centre, waited for research staff to replenish the stock, asked the caregiver to buy other antimalarial drugs, or resorted to dispensing cotrimoxazole and paracetamol (Ajayi, Falade, Yusuf, Happi, & Pagnoni, 2009).

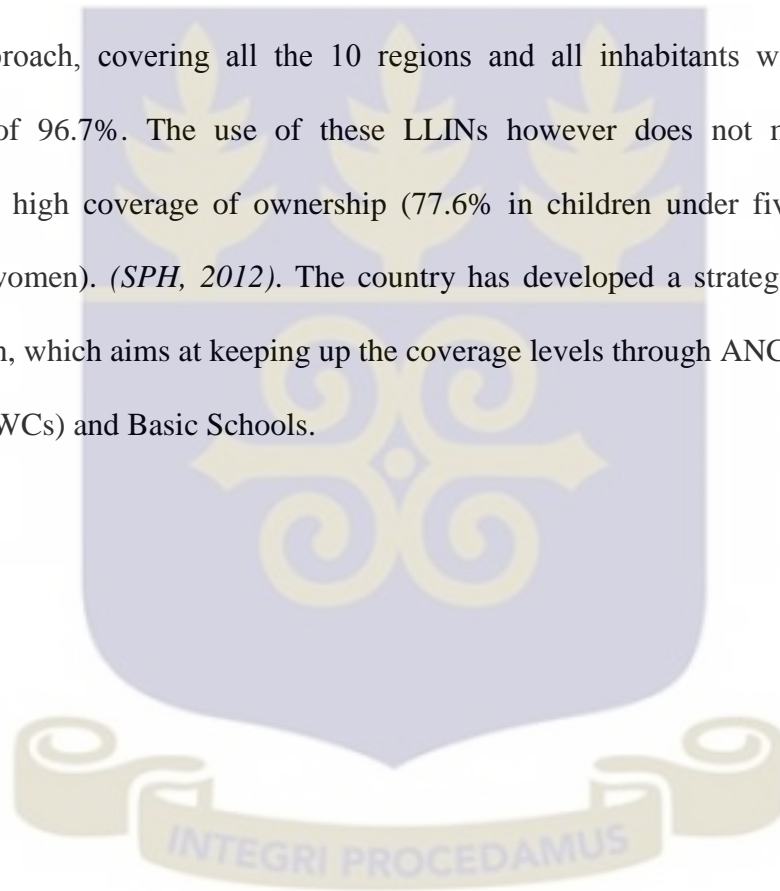
### **2.3 Determine the health education practices**

In Kenya, a year after the start of HMM project resulted in increased access to ACTs due to education provided by volunteers to their local communities, ensuring that treatment seeking behaviours improved. It is argued that the volunteers worked in their own communities and understood the daily problems and needs of the families, friends and neighbours and communicated in local dialects which helped to break down barriers to improving maternal and child health (Health Department, 2010).

In the Ejisu-Juabeng District of Ghana, Community Medicine Distributors (CMDs) involved in community case management of malaria (CCMm) counselled caregivers on the causes of fevers and the need for prompt action and effective preventive measures such as sleeping under insecticide-treated nets (ITNs) (Agyei-Baffour et al., 2012).

Community Medicine Distributors (CMDs) were trained to educate caregivers, diagnose and treat malaria cases in < 5-year olds with artemisinin-based combination therapy (ACT) (Akweongo et al., 2011). Community-based interventions are meant to provide prompt and appropriate treatment for ill children in the community and are delivered by lay people commonly known as community health workers (CHWs). (Kalyango et al., 2012).

On prevention of malaria, Integrated Vector Control (IVM) in the country has been promoting the use of LLIN and indoor residual spraying as the main focus with larval source management as a complimentary strategy (Strategic Plan for Malaria Control, 2014). LLIN has been a major strategy implemented in Ghana. In 2003, the coverage (ownership) was only 2.2%, but this improved to 48.9% in 2011 (*DHS 2003; MICS 2011*). A nationwide mass campaign was undertaken over a two-year period from 2010-2012. A total of 12.5 million LLINs were distributed and hanged using the 'Door-to-Door' approach, covering all the 10 regions and all inhabitants with an estimated coverage of 96.7%. The use of these LLINs however does not match up to the impressive high coverage of ownership (77.6% in children under five and 59.7% in pregnant women). (*SPH, 2012*). The country has developed a strategy for continuous distribution, which aims at keeping up the coverage levels through ANCs, Child Welfare Clinics (CWCs) and Basic Schools.



## CHAPTER THREE

### 3.0 METHODS

#### 3.1 Study Design

A cross-sectional study was conducted using quantitative data collection technique. Quantitative data were obtained by administering structured questionnaires to Community-Based Agents (CBAs), CBA records review and by observing the practices of CBAs during case management through the use of a checklist developed from the CBA training manual.

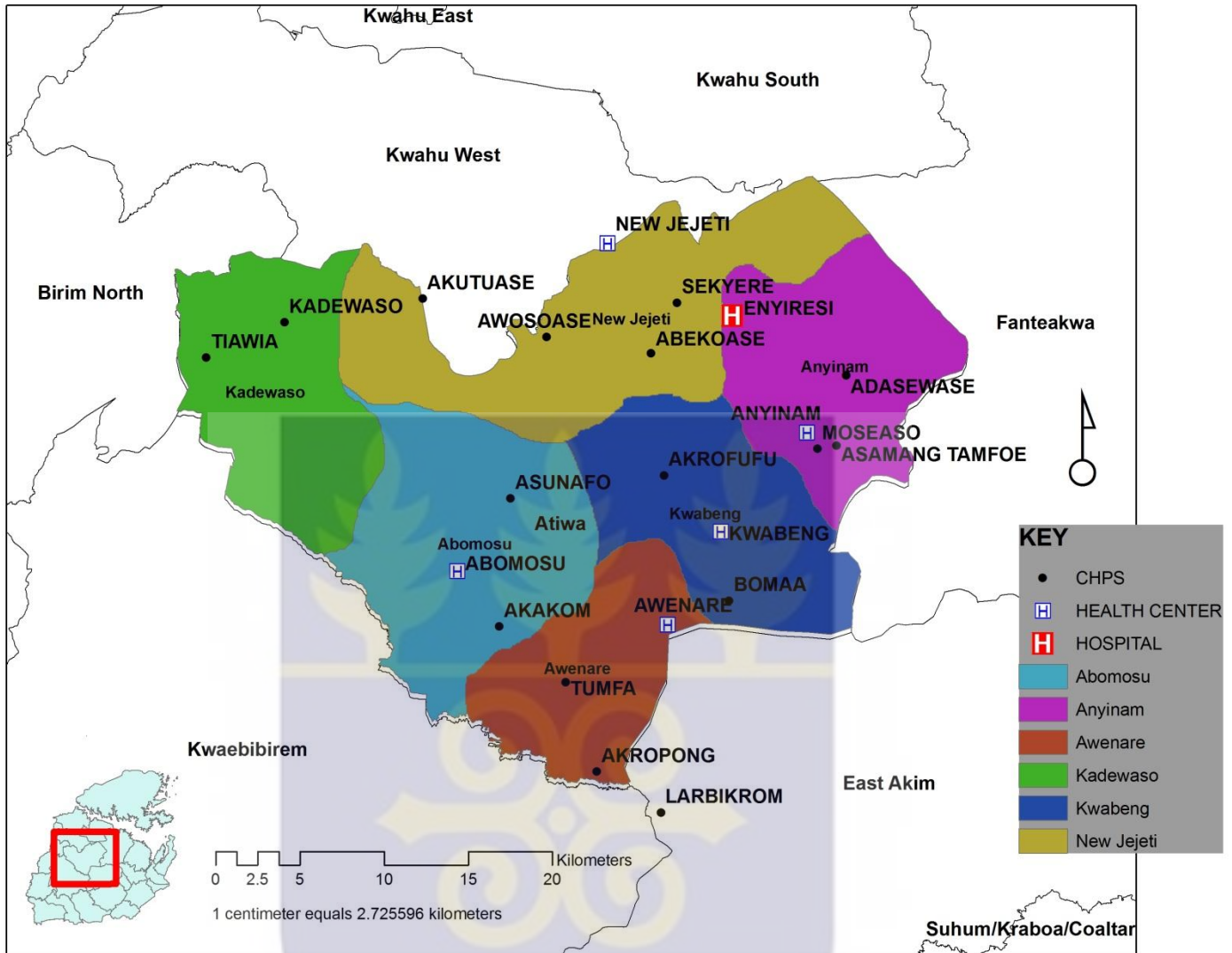
#### 3.2 Study Area

The study was conducted in the Atiwa District (Figure 1- Map of Atiwa District) which is one of the twenty-six (26) districts of the Eastern Region of Ghana;

- Atiwa district was selected for the study because it is one of the Home –based Management of Malaria (HMM) implementing districts in Eastern Region.
- The district is also a fairly newly created district, rural, and has fewer health facilities as compared to most of the other districts in the region.

Geographically Atiwa district is bounded in the; North by Kwahu West District, South by Kwaebibirem district, East by part of East Akim and Fanteakwa districts and to the west by Birim North district.

The district is made up of six (6) sub districts namely Abomosu, Anyinam, Kwabeng, New Jejeti, Awenare and Kadewaso.



**Figure 1: Map of Atiwa District Showing the Health Facilities and Sub Districts.**

The main water bodies include the Birim River, River Awusu, River Sea and River Mmerpong. May and June are the major wet seasons with the minor wet season occurring in September and November. The District has a large mixture of thick forest as well as semi forest area and high mountains such as the Atiwa Range at Kwabeng and Daade at Adasewase. Predominantly the people are farmers and they cultivate plantain, maize, cocoa and cassava. Lumbering and mining activities have engaged most of the youth in the district.

Akans are the predominant group with Krobos, Kyerepong, Northerners and a few foreigners. Majority of the people are Christians with few Moslems and other Africans Traditional religions.

**Table 1: Type of Health Facilities in Atiwa District.**

FACILITY	NUMBER	COMMENT
Hospital	1	Government
Health Centres	5	Government
Clinic	1	Private
Maternity Homes	1	Private
CHPS Centres (functioning)	18	Government

The people of Atiwa District have pipe borne water as their source of drinking water. The district is under the political administration of the District Chief Executive, a Presiding Member and Assembly members forming the District Assembly. The District Chief Executive (DCE) is both the administrative and political head of the District. The District Director of Health Services is the head of the health sector in the District.

### 3.3 Variables

The scope of the study was guided by the training curriculum on HMM and this include; socio-demographics, treatment, referral and health education activities.

The main outcome measure was CBA performance; the CBA performance was scored using a structured questionnaire and checklist. The components of the questionnaire and

checklist included; ability of the CBAs to elicit signs and symptoms of malaria, assess and give age appropriate dose of ACTs to children, identify and respond to danger signs, appropriate referral and health education activities.

### **3.4 Sampling**

#### **3.4.1 Study Population**

The study population was all CBAs (65) working in the deprived areas of the Atiwa district where there are no formal health care services.

#### **3.4.2 Sample Size**

A total number of trained CBAs in the district is 65. The study targeted to contact and interview at least 80% of CBAs in the district. Thus a minimum of 52 CBAs was to be contacted, interviewed and assessed but at the end of the study, all the 65 trained CBAs were interviewed and assessed during the period of the study.

The initial choice of interviewing at least 80% was to ensure that a good percentage of the CBAs would have been covered.

#### **3.4.3 Sampling Method**

In order to ensure that respondents are within the population sample, purposive sampling was used. It is a sampling method where the participants in a study are selected by the researcher subjectively. The researcher will pick a sample that he or she believes is representative of the population of interest. The purposive sampling method allows for the selection of interviewees whose qualities as well as experiences permit an understanding of the phenomena in question, and are therefore valuable.

### **3.5.0 Data Collection Techniques and Tools**

Data was collected during a period of four weeks. Ten data collectors with two supervisors were used for the data collection. A structured questionnaire was used to interview CBAs in their respective homes; the questionnaire included both closed and opened ended questions. The questions included; background data, training, knowledge on malaria and HMM. Other questions were on the treatment of uncomplicated malaria, identification of danger signs in children under five years, prompt referral and health education activities.

Verification and observation component was conducted because some areas such as assessment and management of the sick child could only be objectively assessed by observing the practices of the CBAs. A checklist for the observation was developed based on the training content and the expected practice after the CBA training.

#### **Ethical consideration**

Ethical clearance to conduct the study was obtained from the Ghana Health Service Ethical Review Committee. Written and verbal consent was also obtained from the Regional Director of Health Services (Eastern Region) through the School of Public Health (SPH), the District Director of Health Services (Atiwa District), Sub-districts Heads and Community Health Officers in charge of the selected CHPS zones.

Informed written consent was sought from all respondents. Respondents were assured of confidentiality and anonymity. The privacy of the respondents was ensured during the interview and the discussion processes as well as data collected were kept confidential. Respondents were urged to participate at their own will (i.e. interviewees were briefed on the research and the indirect benefits to be offered, then left to decide whether to participate in the interview or not). Respondents were made aware that there are no

incentives and they could withdraw at any time during the study. The procedures that were used did not cause any physical or mental harm to the participants.

### **3.5.1 Training of Interviewers**

Research assistants who can speak English and the local dialect (Akan) were recruited and a day training session organized for them on how to conduct interviews before embarking on the field work.

The training content included an overview of the project, objectives of the study, and interviewing skills.

### **3.5.2 Pre-testing and Review of Instruments**

The data collection tools were reviewed after the pre-testing with the research assistants to ensure standardization in the way the questions were asked. The essence of the pre-testing was to improve validity of the data collection tools before the actual field work.

CBAAs from the pre-testing communities were not part of the study subjects. This process allowed for clarification of ambiguous questions and also gave the investigator an idea of the length of time it will take for a questionnaire to be administered.

The participants in the pilot gave their opinion on whether or not the length of time is reasonable or too long, and also the user friendliness and applicability of the questionnaire.

The questionnaires from the pilot study were entered into the data entry screen and frequency analysis obtained using SPSS version 22.0 to uncover likely data entry and analysis problems.

### **3.5.3 Data Collection**

The data collection was done within a period of four weeks. Four data collectors with two field supervisors were used for the data collection. A structured questionnaire was used to interview CBAs in their respective homes; the questionnaire included both closed and opened ended questions. Questions included; background data, training, knowledge on malaria and HMM. Other questions were on treatment of uncomplicated malaria, identification of danger signs in children under-fives, prompt referral and health education activities.

Verification and observation component was conducted because some areas such as assessment and management of the sick child could only be objectively assessed by observing the practices of the CBAs. A checklist for the observation was developed based on the training content and the expected practice after training.

### **3.5.4 Quality Control**

The following measures were adopted to ensure data quality:

- ❖ The research assistants involved in the data collection had previous experience in data collection; they were fluent in English language and at least the Akan language; because the Akan language is the predominantly spoken local dialect in the study area.
- ❖ A field test (pre-test) was done and relevant amendments made to the questionnaire before data collection.
- ❖ The investigator and the other supervisors did a spot check and also conducted field editing of the data before the questionnaires were finally submitted.

### **3.5.5 Data processing and analysis**

The investigator and supervisors undertook field visits and cross checked completed questionnaires in the field for completeness, consistency and accuracy. During this process, missing data were collected and other errors in the data rectified.

All the close ended questions in the questionnaire were pre-coded and the open-ended questions were coded after reviewing the responses and developing a coding manual.

Data entry was done by a data entry clerk using SPSS version 22.0. Missing data were carefully looked and to confirm whether they were genuine omissions or they were due to skip patterns. In situations where they were genuine omissions, CBAs were called to assist in getting those missing data and data cleaning conducted upon completion of data entry. Where discrepancies were found, they were resolved by cross checking with the hard copies of the data capture tools.

Descriptive data analysis was undertaken using the same software, SPSS version 22.0. Univariate analysis using categorical data was expressed in the form of frequencies, proportions and percentages and the results were presented in tables and graphs. The bivariate analysis was done through the use of chi-square cross tabulation to ascertain the relationship between formal education and knowledge, practices on the correct dose of ACTs for children aged 6-59 months. P value of 0.05 was used as the cut off to detect statistical significance.

Performance was measured by comparing the reviewed records of the CBA and also by observing how malaria is being treated in under-fives in relation to the CBA treatment protocol of malaria in children under- five years in the HMM programme.

The referral system and health education practices were also observed and compared with what the protocol and the training manual of the CBAs in Home-based Management of Malaria (HMM) contained.



## CHAPTER FOUR

### 4.0 RESULTS

This chapter presents the findings and results of the study. This study used primary data from Atiwa District in assessing the Performance of Community Based Agents in Home - based Care of Malaria under-five years. Descriptive Statistics such as bar charts, pie charts and cross tabulations were used to graphically explain the data while statistical tools such as Chi-square test and odds ratio were used for analyzing the data collected. This chapter is in two sections, the first section presents the results of the preliminary analysis, and the second presents the main analysis.

#### **4.1 Demographics and Socio-economic Characteristics of CBAs in Atiwa Districts.**

A total of 65 CBAs were interviewed from Atiwa district. Specifically, they were interviewed from 6 sub districts in 63 communities. The demographic data of all respondents are shown in Table 2a. Participants in this study were mostly males 46 (70.8%) and married 48 (73.8%). The highest percentages were obtained from age groups 41-50 years of age 20 (30.8%); the majority of males were also from 41-50 years of age 15 (32.6%). Most of the respondents had their occupation to be subsistence farming 46 (70.8%).

The gender difference registered 46 (70.8%) male and 19 (29.2%) female with majority of the respondents having Middle school education 31(47.7%). The majority of workers being male may be influenced by the predominant job type in the district which is subsistence farming.

The results in Table 2 below shows that most of the respondents have 3-4 years of working experience 25 (38.5%).

**Table 2: Demographic and Socio-economic characteristics of CBAs interviewed in Atiwa Districts, 2016 (n=65).**

<b>Characteristics</b>	<b>Male N (%)</b>	<b>Female N (%)</b>	<b>Overall N (%)</b>
<b>Marital Status</b>			
Single	3(6.5)	6(31.6)	9(13.8)
Married	39(84.8)	9(47.4)	48(73.8)
Divorced	4(8.7)	2(10.5)	6(9.2)
Separated	0(0)	2(10.5)	2(3.1)
Widow/Widower	0(0)	0(0)	0(0)
<b>Age(Years)</b>			
Less than 20	0(0)	2(10.5)	2(3.1)
21-30	1(2.2)	3(15.8)	4(6.2)
31-40	14(30.4)	3(15.8)	17(26.2)
41-50	15(32.6)	5(26.3)	20(30.8)
51-60	11(23.9)	5(26.3)	16(24.6)
Above 60	5(10.9)	1(5.3)	6(9.2)
<b>Educational Background</b>			
None	1(2.2)	4(21.1)	5(7.7)
Primary School	6(13)	3(15.8)	9(13.8)
Middle School	28(60.9)	3(15.8)	31(47.7)
Junior High School	6(13)	6(31.6)	12(18.5)
Senior High School	3(6.5)	3(15.8)	6(9.2)
Certificate/Diploma	2(4.3)	0(0)	2(3.1)
<b>Occupation</b>			
Farming	36(78.3)	10(52.6)	46(70.8)
Trading	5(10.9)	7(36.8)	12(18.5)
Formal Sector	5(10.9)	2(10.5)	7(10.8)
Others	0(0)	0(0)	0(0)
<b>Religion</b>			
Christian	44(95.7)	19(100)	63(96.9)
Muslim	2(4.3)	0(0)	2(3.1)
Traditionalist	0(0)	0(0)	0(0)
Others	0(0)	0	0(0)
<b>Years of Experience</b>			
Less than 1 year	1(2.2)	2(10.5)	3(4.6)
1-2 years	11(23.9)	4(21.1)	15(23.1)
3-4 years	20(43.5)	5(26.3)	25(38.5)
5-6 years	13(28.3)	6(31.6)	19(29.2)
Above 6 years	1(2.2)	2(10.5)	3(4.6)

Table 3 below shows the demographics in relation to knowledge of the correct dosage of A/A for children 6-59 months in Atiwa District in 2016.

**Table 3: Demographics in relation to knowledge of the correct dosage of A/A for children 6-59 months in Atiwa District, 2016.**

<b>Characteristics</b>	<b>Knowledge N (%)</b>	<b>Of Dosage N (%)</b>	<b>Overall N (%)</b>	<b>Odds Ratio</b>	<b>P- Value</b>
<b>Gender</b>					
Male	34(75.6)	12(60)	46	1.591	0.207
Female	11(24.4)	8(40)	19	Reference	
<b>Marital Status</b>					
Single	5(11.1)	4(20)	9(13.8)	0.466	0.887
Married	35(77.8)	13(65)	48(73.)	0.175	0.495
Divorced	4(8.9)	2(10)	6(9.2)	Reference	0.676
Separated	1(2.2)	1(5)	2(3.1)		
<b>Age(Years)</b>					
Less than 20	2(4.4)	0(0)	2(3.3)	0.761	0.480
21-30	1(2.2)	3(15)	4(6.2)	0.603	0.437
31-40	13(28.9)	4(20)	17(26.)	1.398	0.237
41-50	15(33.3)	5(25)	20(30.)	1.293	0.255
51-60	11(24.4)	5(25)	16(24.)	0.649	0.420
Above 60	3(6.7)	3(15)	6(9.2)	Reference	
<b>Educational Background</b>					
None	3(6.7)	2(10)	5(7.7)	502.556	< 0.001
Primary School	5(11.1)	4(20)	9(13.8)	228.213	< 0.001
Middle School	24(53.3)	7(35)	31(47.7)	306.919	< 0.001
Junior High School	7(15.6)	5(25)	12(18.5)	353.755	< 0.001
Senior High School	4(8.9)	2(10)	6(9.2)	333.040	< 0.001
Certificate/Diploma	2(4.4)	0(0)	2(3.1)	Reference	
<b>Occupation</b>					
Farming	33(73.3)	13(65)	46(70.)	0.000	0.986
Trading	7(15.6)	5(25)	12(18.)	0.322	0.570
Formal Sector	5(11.1)	2(10)	7(10.8)	Reference	
<b>Religion</b>					
Christian	45(100)	18(90)	63(96.)	3531.089	< 0.001
Muslim	0(0)	2(10)	2(4.3)	Reference	
<b>Years of Experience</b>					
Less than 1 year	2(4.4)	1(5)	3(4.6)	0.000	1.000
1-2 years	9(20)	6(30)	15(23)	0.037	0.829
3-4 years	18(40)	7(35)	25(38.)	0.064	0.847
5-6 years	14(31.1)	5(25)	19(29.)	Reference	0.80
Above 6 years	2(4.4)	1(5)	3(4.6)		

## 4.2 CBA Training

Table 4 below shows the number of CBAs who have received training before starting the HMM programme in Atiwa District including the institution who organized the training, the duration of the training and the year CBAs attended the training. All the respondents 65 (100%) received training before starting the HMM and the training was organized by Ghana Health Service. Thirty-eight (38) CBAs representing 58.5% said the training lasted between 4-6 days which was the highest days spent in training. All respondents 65 (100%) said the training duration was long enough for them to gain sufficient skills. Also, all the 41(89.1%) males and 19(100%) females said they benefited from training updates on HMM.

**Table 4: Background information of CBAs based on their training in Atiwa District, 2016.**

	Male N (%)	Female N (%)	Overall N (%)
<b>Training before HMM</b>			
Yes	46(70.7)	19(29.3)	65(100)
No	0(0)	0(0)	0(0)
<b>Duration of training</b>			
Less than 1 day	3(6.5)	3(15.8)	6(9.2)
1-3 days	15(32.6)	6(31.6)	21(32.3)
4-6 days	28(60.9)	10(52.6)	38(58.5)
Above 6 days	0(0)	0(0)	0(0)
<b>Time attended the Training</b>			
Less than a year	2(4.3)	4(21.1)	6(9.2)
1-3 years ago	8(17.4)	2(10.5)	11(16.9)
4-6 years ago	32(69.6)	12(63.2)	44(67.7)
More than 6 years ago	4(6.5)	1(5.3)	4(6.2)
<b>Sufficiency of training</b>			
Yes	46(100)	19(100)	65(100)
No	0(0)	0(0)	0(0)
<b>Benefited from updates</b>			
Yes	41(89.1)	19(100)	60(92.3)
No	5(10.9)	0(0)	5(7.7)

#### 4.2.1 Cross Tabulations between the levels of education and those who have knowledge of the correct dosage of A/A for children 6-11

Table 5 below shows the cross tabulations between the levels of education and those who have knowledge of the correct dosage of A/A for children 6-11months. Five (5) CBAs who didn't have formal education had correct dosage of A/A for children 6-11 months while 6 CBAs who didn't have formal education had wrong dosage of A/A for children 6-11 months. Also, 9 CBAs who had primary education had correct dosage of A/A for children 6-11 months. Twenty-four (24) CBAs who had Middle school education had correct dosage of A/A for children 6-11 months while 2 CBAs who had Middle school education had wrong dosage of A/A for children 6-11 months. Ten (10) CBAs who had junior education had correct dosage of A/A for children 6-11 months while 2 CBAs who had junior education had wrong dosage of A/A for children 6-11 months. Two CBAs who had certificate had correct dosage of A/A for children 6-11 months.

**Table 5: Cross Tabulations between the levels of education and those who have knowledge of the correct dosage of A/A for children 6-11 months, 2016.**

	Knowledge of Dosage			Chi-Square	P-Value
	Correct	Wrong	Total		
Level of Education				2.625	0.037
None	5	6	11		
Primary	9	0	9		
Middle	24	2	26		
Junior	10	2	12		
Senior	4	2	6		
Diploma	2	0	2		
Total	59	6	65		

A chi-square test was used to test the association between formal education and knowledge of the correct dosage of A/A for children 6-11 months old. A Chi-square

value of 2.625 with p-value of 0.037 ( $<0.05$ ) shows that there is an association between formal education and knowledge of the correct dosage of A/A for children 6-11 months old.

#### **4.2.2 Cross Tabulations between the levels of education and those who have knowledge of the correct dosage of A/A for children 12-59 months.**

Table 6 below shows the cross tabulations between the levels of education and those who have knowledge of the correct dosage of A/A for children 12-59 months. Four CBAs who didn't have formal education had correct dosage of A/A for children 12-59 months while 5 CBAs who didn't have formal education had wrong dosage of A/A for children 12-59 months. Also, 9 CBAs who had primary education had correct dosage of A/A for children 12-59 months. Twenty-three CBAs who had Middle school education had correct dosage of A/A for children 12-59 months while 4 CBAs who had Middle school education had wrong dosage of A/A for children 12-59 months. 9 CBAs who had junior education had correct dosage of A/A for children 12-59 months while 3 CBAs who had junior education had wrong dosage of A/A for children 12-59 months. 2 CBAs who had certificate had correct dosage of A/A for children 12-59 months.

**Table 6: Cross Tabulations between the levels of education and those who have knowledge of the correct dosage of A/A for children 12- 59 months, 2016.**

Level of Education	Knowledge of Dosage			Chi-square	P-Value
	Correct	Wrong	Total		
None	4	5	9	3.65	0.042
Primary	9	0	9		
Middle	23	4	27		
Junior	9	3	12		
Senior	4	2	6		
Certificate	2	0	2		
Total	59	6	65		

The chi-square test showing the association between formal education and knowledge of the correct dosage of A/A for children 12- 59 months old gave a p-value of 0.042

(<0.05). This shows that there is an association between formal education and knowledge of the correct dosage of A/A for children 12-59 months old.

#### **4.3 Association between health educational practices and the referral system of CBAs.**

For the purpose of the study, CBA was assessed to have a good health educational practice based on the availability of IE&C/ health promotion materials and the provision of health promotion activities within the last six months. A CBA who gives the correct health education including sleeping under mosquito net is observed to have a good health educational practice.

**Table 7: Cross tabulation between health educational Practices and the referral system of CBAs.**

			Referrals of Sick Child		Chi-square	P-Value
			Yes	No		
Health educational Practices	Yes	47	6	53	4.110	0.029
	No	7	5	12		
	Total	54	11	65		

Table 7 above shows the cross tabulations between the health educational practices and the referral system of CBAs. Forty-seven (47) CBAs who were observed to have had good health educational practices made referrals of sick children promptly while 6 CBAs who were observed to have good health educational practices did not make any referrals of sick children. Also, 7 CBAs who were observed not to have good health educational practices made referrals of sick children while 5 CBAs who were observed not to have good health educational practices did not make any referrals of sick children. A chi-square test was used to test the association between health educational practices

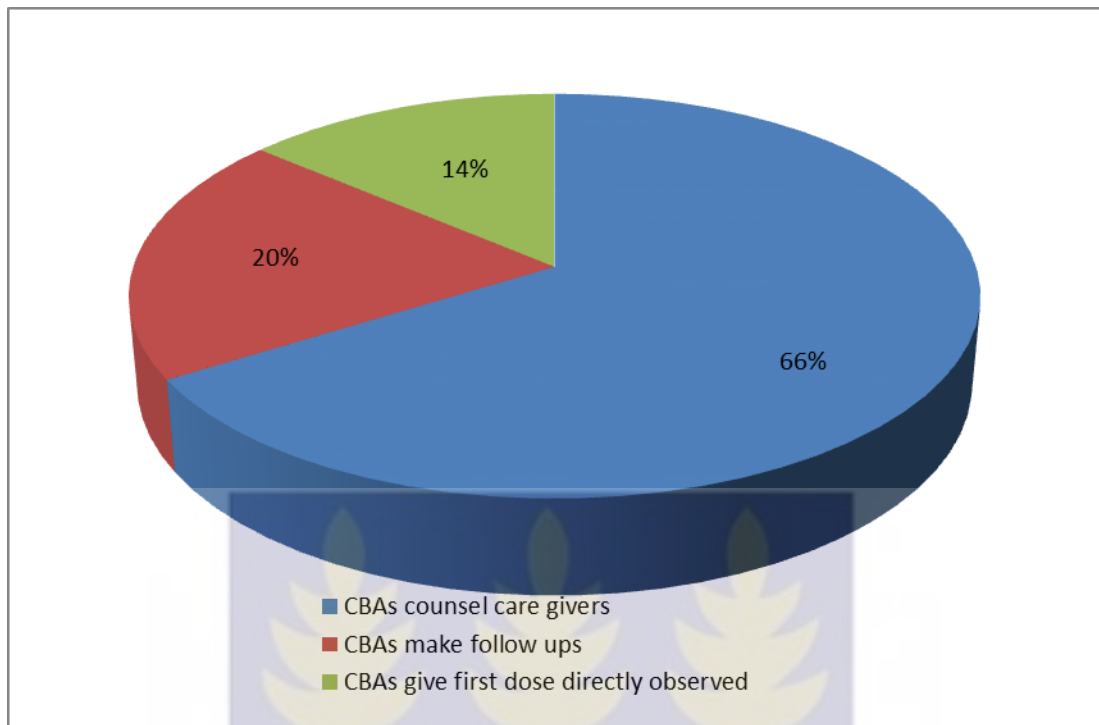
and referrals of sick children. A Chi-square value of 4.110 with a p-value of 0.029 (<0.05) shows that there is an association between health educational practices and referrals of sick children to health facilities.

#### **4.4 Activities Undertaken by CBAs to Ensure Mothers Comply with Treatment**

##### **Instructions.**

Most CBAs counselled or educated care givers on the need to comply with treatment instructions and the treatment regimen, made follow ups to ascertain whether mothers/care givers complied with treatment instructions, they also gave first dose of medicine when they treat a child with malaria to enable the mothers continue with treatment thereby complying with treatment instructions. Out of the 65 CBAs interviewed, 43 (66%) of CBAs said they counsel care givers, 13(20%) said they make follow ups and 9(14%) said they give first dose directly observed in other to ensure treatment compliance by care givers or mothers. Figure 2 below shows what CBAs do immediately they observe symptoms of malaria in the child to enable the mothers comply with treatment instructions.



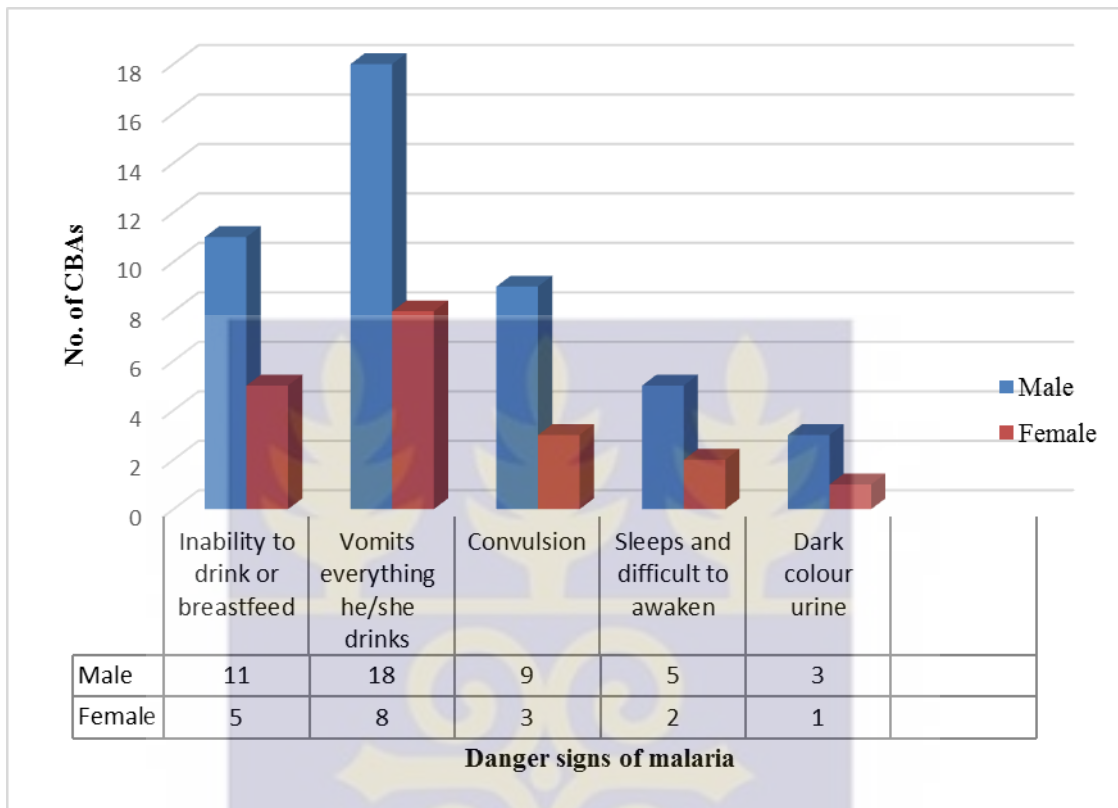


**Figure 2: Activities Undertaken by CBAs to Ensure Mothers Comply with Treatment Instructions.**

#### **4.5 CBAs Knowledge on Signs of Severely Sick Child and Necessary intervention undertaken on the Sick Child suffering from Malaria.**

The signs of severely sick children mostly identified by CBAs were; child not able to eat or breastfeed, child vomiting everything he/she takes, child having convulsions, child being lethargic and unconscious and child having dark colour urine. Out of the 65 CBAs interviewed, 34 (52.3%) and 20(30.8%) had knowledge on 4 and 3 dangers signs respectively and measured as good knowledge and 3(4.6%) and 5(7.7%) had knowledge on 2 and 1 danger signs, respectively which is an indication of poor knowledge. Also, those who did not have any knowledge of the danger signs were 3(4.6%). Figure 3 below shows CBAs knowledge on danger signs between males and females in Atiwa district. From figure 3 below, majority of both the men and women

expressed vomiting everything the child drinks or eats as the most dangerous sign of the sick child with malaria.

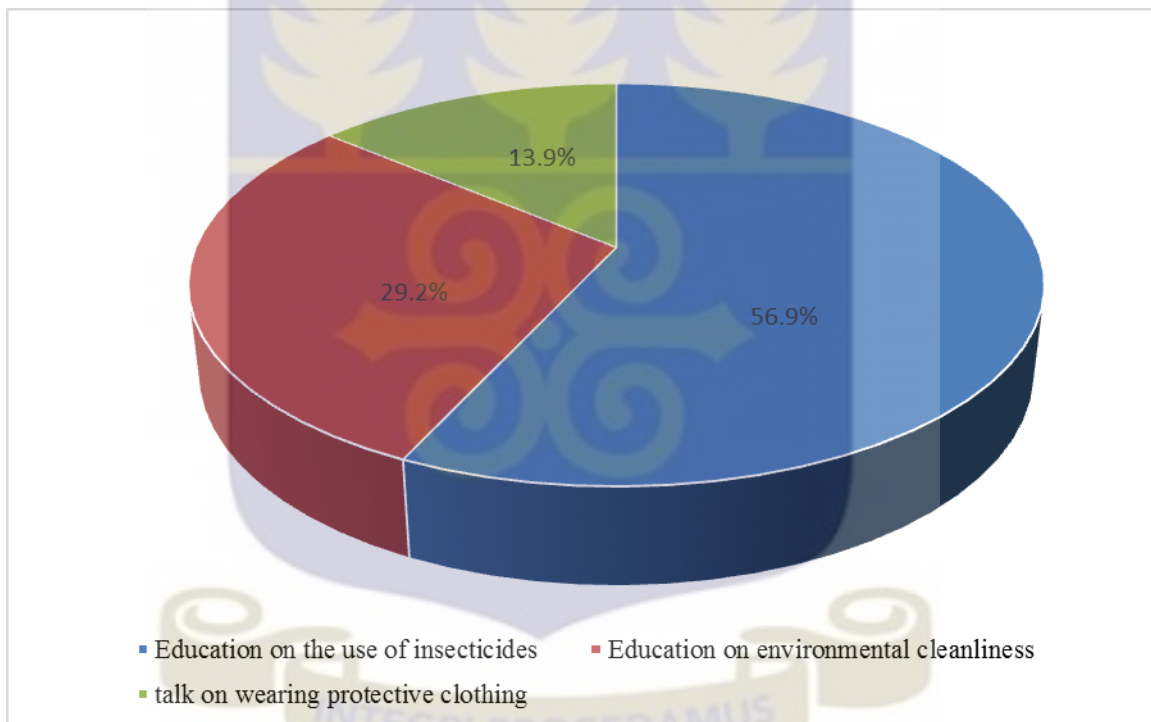


**Figure 3: CBAs knowledge on danger signs between males and females in Atiwa district, 2016.**

Also, the necessary intervention undertaken on a severely sick child suffering from malaria by CBAs are; given pre-referral treatment and refer promptly, refer to health facility, keep child and treat, use herbal preparations or consult the gods and ancestors. Out of the 34 CBAs interviewed who did not have any knowledge on the signs of severely sick child, 21 (61.8%) give pre-referral treatment and refer promptly, 9(26.5%) refer to health facility, 4(11.8%) keep child and treat, 0(0%) use herbal preparations and 0(0%) consult the gods and ancestors.

#### 4.6 Mothers or Care Givers Education on how to Prevent Malaria in Children by CBAs

Out of the 65 CBAs interviewed, 37(56.9%) said they educate caregivers on the use of Insecticide Treated Nets (ITNs) for malaria prevention, 19(29.2%) said they educate them on environmental cleanliness and 9(13.9%) talked about wearing of protective clothing, drinking or smearing herbal preparations, using mosquito repellent and using insecticides spray. Figure 4 below shows the various mothers or care givers education by CBAs on how to prevent Malaria in Children.



**Figure 4: Mothers or care givers education by CBAs on how to prevent Malaria in Children in Atiwa District, 2016.**

#### 4.7 Practices of CBAs in HMM

Our major concerns of the Practices of CBAs in HMM were the expiring dates of drugs, where the drugs are stored, whether they take and keep proper records of

referred children, how they treat children with malaria, the availability of drug and how they keep the logistics available.

#### **4.7.1 Drug Availability and Storage**

In terms of drug availability, 33 CBAs said the drugs were out of stock in the last two months. At the time of the interview only 16 of CBAs had ACTs expired, 11 had ACTs that were not expired and the rest had complete stock outs. Per the records at the sub-district level, Anyinam and Awenare got their last consignment of ACTs in April 2016 while New Jejeti, Abomосу and Kwabeng got their last consignment of ACTs in May 2016. Some CBAs substitute ACTs with paracetamol tablets to treat malaria. Majority of the CBAs stored their drugs in the appropriate kit boxes.

#### **4.7.2 Logistics Availability**

The conditions of most of the logistics supplied to CBAs were not in a good condition. Table 8 below shows the availability and condition of some selected logistics



**Table 8: Availability and condition of CBAs logistics in Atiwa, 2016.**

<b>Item</b>	<b>Male N (%)</b>	<b>Female N (%)</b>	<b>Overall N</b>
<b>Kit boxes</b>			
Available in good condition	33(71.7)	16(84.2)	49(75.4)
Available in poor condition	9(19.6)	1(5.3)	10(15.4)
Not available	4(8.7)	2(10.5)	6(9.2)
<b>IE&amp;C materials</b>			
Available	33(71.7)	13(68.4)	46(70.8)
Not available	13(40.6)	6(46.2)	19(29.2)
<b>Raincoats</b>			
Available in good condition	5(10.9)	2(10.5)	7(10.8)
Available in poor condition	7(15.2)	5(26.3)	12 (18.5)
Not available	34(73.9)	12(63.2)	46(70.8)
<b>Wellington boots</b>			
Available in good condition	3(6.5)	1(5.3)	4(6.2)
Available in poor condition	12(26.1)	6(31.6)	18(27.7)
Not available	31(67.4)	12(63.2)	43(66.2)
<b>Bicycles</b>			
Available in good condition	1(2.2)	0(0)	1(1.5)
Available in poor condition	32(69.6)	14(73.7)	46(70.8)
Not available	13(28.3)	5(26.3)	18(27.7)

From Table 8 above, 49(75.4%) of the kit boxes were available and in good conditions with contents while most of the raincoats 46(70.8%), wellington boots 43(66.2%) were not available during the time of the interview. IE&C materials were available 46(70.8%) and 46(70.8%) bicycles were available in poor condition.

#### **4.7.3 Management of Childhood Malaria**

At the time of the interviews, only 46(70.8%) CBAs were observed treating a sick child. Out of the 46 CBAs observed, 43 (66.2%) asked for the child's name and

39(60%) personally touched the child for the presence of fever. 40(61.5%) CBAs were observed to have asked for other signs and symptoms of malaria.

**Table 9: Assessment of sick children by CBAs in Atiwa district, 2016.**

<b>CBAs Assessment</b>	<b>Yes N (%)</b>	<b>No N (%)</b>
Asked for child's name	43(66.2)	3(4.6)
Asked for presence of Fever	39(60)	7(10.8)
Asked for other symptoms of malaria	40(61.5)	6(9.2)

#### **4.7.4 Providing the correct dose of ACTs to the right age group.**

Out of 46 CBAs observed treating children at the time of the interview, 29(63%) CBAs were observed to have given the correct dose of ACTs to the right age group, 37(80.4%) supplied the right dosage to children aged 6-11 months and 31(67.4%) supplied the right dosage to children aged 12-59 months.

**Table 10: Frequency table showing CBAs observed supplying the right dose of ACTs to children aged 6-59 months.**

<b>Age and Dose</b>	<b>Frequency</b>	<b>Percent</b>
<b>6-11 months</b>		
Correct dose	37	80.4
Wrong dose	9	19.6
<b>Total</b>		
<b>12-59 months</b>		
Correct dose	31	67.4
Wrong dose	15	32.6
<b>Total</b>		

**4.7.5 The association between CBAs level of education and CBAs observed giving the correct dose of ACTs to children aged 6-59 months.**

CBAs observed to have given the correct dosage of ACTs to children 6-11 months and 12-59 months was generally good as the correct dosage of ACTs to children aged 6-59 months were given the correct dose of ACTs according to the corresponding age groups. CBAs observed to have given one wrong dosage of drug to either 6-11 months or 12-59 months is said to have given a wrong dosage of ACTs to children aged 6-59 months.

Table 11 below shows the cross tabulation between educational level and CBAs observed giving the correct dose of ACTs to children aged 6-59 months.

**Table 11: Cross Tabulation between Educational Level and CBAs observed giving the correct dose of ACTs to children aged 6-59 months**

		Dosage	Of Drug		Chi-Square	P-Value
		Correct	Wrong	Total		
Level of Education	None	4	1	5	3.151	0.033
	Primary	5	0	5		
	Middle	21	4	25		
	Junior	4	2	6		
	Senior	3	1	4		
	Diploma	1	0	1		
Total		38	8	46		

From Table 11 above, 4 CBAs who have never had formal education were observed to have given correct dosage of ACTs to children aged 6-59 months while 1 CBA who have never had formal education was observed to have given wrong dosage of ACTs to children aged 6-59 months. Also, 21 CBAs who had middle school education gave

correct dosage of ACTs to children aged 6-59 months while 4 CBAs who had middle school education gave wrong dosage of ACTs to children aged 6-59 months.

A chi-square test was used to test the association between the level of education and the administration of age specific ACTs which gave a chi-square value of 3.151 with a p- value of 0.033 which is found to be significant since the p-value is less than 0.05

#### **4.7.6 Education of Parents on Correct Dosage and Prevention of Malaria by observed CBAs**

Out of the 46 CBAs observed, 43 were observed to have both educated parents on correct dosage and prevention of malaria while only 1 CBA was observed to have failed to educate parents on correct dosage and prevention of malaria. Also 1 CBA observed to have educated parents on correct dosage failed to educate parents on the prevention of malaria while 1 CBAs observed not to have educated parents on the correct dosage failed to have educated parents on the prevention of malaria. Out of 44 CBAs who educated the parents on the prevention of malaria, 36(55.4%) educated them on the use of LLIN, 7(10.8) educated them on the use of Insecticide Sprays and 1(1.5%) talked about wearing of protective clothing.

#### **4.8: Motivation**

Table 12 below shows the motivation of CBAs in the 6 sub districts of the Atiwa District.

A total of 1 CBAs reported to have received motivation both in cash and kind.

**Table 12: Motivation of CBAs by sub-districts in Atiwa District, 2016.**

Sub-districts	Motivation	
	Yes	No
Abomosu	0	11
Anyinam	0	10
Awenare	4	8
Kadewaso	7	4
Kwabeng	2	8
New Jejeti	2	9
<b>Total</b>	15	50

The most motivated sub-district was Kadewaso while the least motivated sub district was Abomosu. Also, Out of the 15 CBAs who received motivation at the sub-districts, 7 received T&T during meetings, 3 received in cash and 5 received in kind.

#### **4.9 Attrition of CBAs**

Out of 65 CBAs interviewed, 12(14%) said they knew CBAs who had dropped out while 53(86%) said they didn't know those who had dropped out and the main reason for the attrition is the lack of motivation. Other reasons were that the CBAs wanted to focus solely on their farming activities.

## CHAPTER FIVE

### 5.0 DISCUSSIONS

The main objective of this study was to assess the performance of Community Based Agents in Home Based Care of Malaria under-five years in the Atiwa District in the Eastern Region of Ghana.

Majority of the CBAs were males 46 (70.8 %) and 48 (73.8%) of the CBAs were married while 31(47.7%) had middle school education. This is in contrast with a similar observation made in Uganda where majority (62.0%) of the distributors were women with majority of them attaining primary-level education (WHO/TDR 2007). From the study, most of the CBAs 46 (70.8%) being farmers with a few being traders 12 (18.5%) was not unexpected since the predominant occupation in the district was subsistence farming.

The study gathered information on CBAs knowledge on malaria, the impact of the training attended on job performance, examining sick children and providing medication to sick children suffering from malaria. Our findings showed that all the CBAs 65 (100%) had pre -service trainings while 41 (89.1%) males and 19 (100%) females had training updates during implementation of the HMM programme. This is encouraging because WHO, 2005a; emphasized that training is central to most approaches and selected CBAs must be given the requisite knowledge and skills to enable them deliver high-quality care.

Majority of the CBAs appreciated that, the well-organized training which covered the syllabus was sufficient for them to acquire the needed knowledge and skills. The contents of the syllabus used for the training covered the symptoms, causes and prevention of malaria, examining and categorizing fevers, providing care for the sick

child, the ability to recognize danger signs and make referrals to health facilities. Also, as part of the syllabus, the CBAs were supposed to provide health education on malaria prevention and reporting. Out of the 65 CBAs interviewed, 37 (56.9%) said they educate caregivers on the use of Insecticide Treated Nets (ITNs) for malaria prevention and this is in line with the Strategic Plan for Malaria Control, 2014.

The condition of drugs based on their expiry dates and storage conditions were also assessed. 16 (24.6%) of CBAs reported that they had expired ACTs in stock. This calls for effective monitoring and supervision of CBAs.

Training is an appropriate means of equipping CBAs with the knowledge and skills for effective delivery of care to sick children. In view of this, the stipulated numbers of days for training should be observed to enable those who had no formal education to be well equipped and the provision of regular updates to enable the CBAs maintain the skills in handling sick children. The findings showed that some CBAs were not selected using the laid down procedure but rather succeeded from friends or relatives who had either quit the job or passed on.

One of the major findings is the knowledge of CBAs on the cause and the recognition of fever in children which is the most common sign of malaria in children. WHO (2005a) stated that a lot of children who die from malaria, do so within 48 hours from the commencement of illness. Hence there is the need for every CBA to recognize fever for quick and needed action. On the other hand, knowledge of other known signs of malaria such as malaise, vomiting and loss of appetite varied among CBAs. Knowledge on general signs of malaria is not only a prerequisite for effective and efficient care but also important to minimize the health cost. From the information gathered on CBAs knowledge of danger signs, 83.1% CBAs could mention 3-4 danger signs and very few

8(14.3%) failed to check for danger signs in sick children. This is in contrast to the findings in a study conducted by Balagumyetime (2014) where very few CBAs checked for danger signs in children.

CBAs are only trained to manage only uncomplicated malaria in children aged 6-59 months. Hence, it is very important for every practicing CBA to know the danger signs of complicated malaria for immediate referral to the nearest health facility. CBA delaying a few hours in the referral of children with complicated malaria could cause the life of the children. Meek et al. (2005) stated that distributors are sometimes forced to treat severely ill children because of the pressure from some mothers/caregivers. This practice could be dangerous, because if a child dies as a result of the mother's insistence on management at the community level when the child needed to be referred to a health facility, the distributor's credibility could be seriously undermined (WHO/TDR, 2007). Regular updates should be given to constantly remind them of the dangers associated with delays to prevent them from keeping children who need urgent referral to health facilities.

The study also identified that majority of CBAs interviewed were more conversant with the dosage of A/A for children aged 6-11 months compared to children aged 12-59 months. The inherent danger is that this age group could be under dosed thus promoting drug resistance or over dosed which could be life-threatening. The national policy (Ministry of Health [MOH], 2009) recommends ACTs as the first line drug of choice for the treatment of uncomplicated malaria, but it was noted that a few CBAs gave paracetamol tablets for treatment of malaria instead of ACTs, which has to be given serious attention.

A cross tabulation was used to find the association between the various levels of education and knowledge on the age appropriate dose of ACTs. The findings showed that majority of those who gave correct and wrong dosage of A/A for children aged 6-11 and 12-59 months were those who have middle school education and no formal education respectively. The chi-square test which was used to test the association between formal education and knowledge of the correct dosage of A/A for children 6-11 months old showed that there was an association between formal education and knowledge of the correct dosage of A/A for children 6-11 months old. Hence, there was no significant difference in terms of formal education and knowledge on age appropriate dose. This could mean that for selection of CBAs, formal education may not be a strong criterion. However, other sources such as effectiveness of the trainings and non-formal education might have contributed significantly to the improved knowledge and skills.

Proper supervision of CBAs in the form of follow up as part of measures to enhance treatment compliance was encouraging, even though continuous monthly or quarterly meetings will be preferred. Such meetings will create the platform for socialization and sharing of ideas or experiences. Also, constant counselling and follow-ups for treatment compliance by CBAs on sick children is necessary to promote effective use and compliance to treatment regimens and to prevent treatment failures and drug resistance.

Despite the widespread advocacy and strong evidence supporting Home-based Management of Malaria (HMM) and the vital role of Community Health Workers (CHWs) in improving outcomes for childhood malaria (Lewin et al., 2005), several concerns have been raised with respect to the performance of Community-Based Agents (CBAs) in the Eastern Region. Many operational aspects such as selection and training

of CBAs, programme supervision, health information management and drug supply systems could affect the performance of CBAs.

Poor performance on the part of CBAs was recorded to be due to the farming seasons, lack of motivation and family responsibilities. The delay in supply of ACTs as a major challenge raises concerns as to whether to charge an amount of money for ACTs or allow mothers/caregivers to consult CBA services using their National Health Insurance (NHIS) cards in order to make possible the supply of drugs. This research is similar to reports from Nosten and White (2007) who used ACTs for HMM. According to Ajayi, Jegede, Falade (2012), unavailability of drugs was also seen as a threat to the sustainability of HMM in Nigeria.

Poor management of logistics at the health facilities, district and regional level could be the reason of the shortage of drugs. The difficulty in the procurement processes at the national level could result in the undue delays. According to Balagumyetime (2014), management of health commodity requires that health providers create consumption patterns and begin the process of requisition when they reach the least availability of stock to avoid complete stock out.

Majority of CBAs had IE&C materials available at the time of interview; the proportion that carried out IE&C activities in their respective communities was encouraging. According to WHO (2005), appropriate dissemination of information to community members and patient education can improve health-seeking behaviours, treatment compliance and treatment outcomes. Generally, one of the responsibilities of CBA is to inform and create awareness about prevention and treatment through home visits, community meetings and durbars using the IE&C materials provided.

One good practice carried out by CBAs is referral of serious cases to health facilities. However, unavailability of drugs shouldn't be a reason to refer a child to health facility. Shortage of drugs does not only interfere with the treatment of sick children aged 6-59 months but also tarnishes the reputation of the Ghana health services, thereby undermining all the efforts associated with the programme. Mothers or Caregivers may also lose confidence in the credibility and resort to alternate sources of care, which could be harmful to the health of their children. Stock out of medicines was identified to be the main cause for referral in northern Uganda (Uganda Ministry of Health, 2009). The high rate of referrals in Atiwa district is not surprising because most of the CBAs with good health educational practices referred sick children to health facilities.

CBAs are mostly indigenous people given primary training to cater for sick children aged 6-59 months and therefore should receive constant assistance and monitoring from the formal health sector. Frequent and well organized supervision does not only help to point out areas poor performance, but also make CBAs feel some sort of belongingness to enable them easily share their challenges. Effective supervision of CHWs in the various communities results in bringing good results with regards to providing the correct treatment (WHO/TDR, 2007).

In this study, most CBAs raised lack of motivation as a major problem which needed attention. Moreover some CBAs had high expectations in terms of future engagement by the formal health system and other benefits for the services they render. They complained that the work is time consuming which demand much attention for sick children. Due to the time involved, this impede their personal activities such as farming and other income generating activities which provides a means to an end. It is therefore not surprising that some respondents cited the lack of motivation as the main reason for

attrition of some CBAs; the dilemma is the kind of motivation that should be given to ensure sustainability and not disrupt the existing social network. Individuals have varying degrees of motivation (Katarawa, Mutabazi, & Richards, 1999); some CBAs perceive volunteerism as a calling; however others stated that they cannot be volunteers for life. WHO recommends that incentives or remuneration for CHWs should be decided and agreed by the communities involved in the programme implementation (WHO/TDR, 2007).

Majority of the respondents stated that if there are no laid down plans to improve the remuneration schemes of CBAs, very soon, the HMM programme will collapse. Therefore providing yearly awards to the best CBAs in the district and payment of NHIS premiums for CBAs as suggested by some respondents is necessary and could prevent attrition of volunteers. According to Balagumyetime (2014), the use of sub district Internally Generated Funds (IGF) for quarterly CBA meetings where they are given a token for lunch or for transport is a source of motivation of CBAs. Also, quarterly or yearly release of funds for maintenance of bicycles could serve as a motivation and retention.



## CHAPTER SIX

### 6.0 CONCLUSIONS AND RECOMMENDATIONS

#### 6.1 Conclusion

The present study assessed the performance of Community Based Agents in Home Based Care of Malaria under-five years in the Atiwa District in the Eastern Region of Ghana.

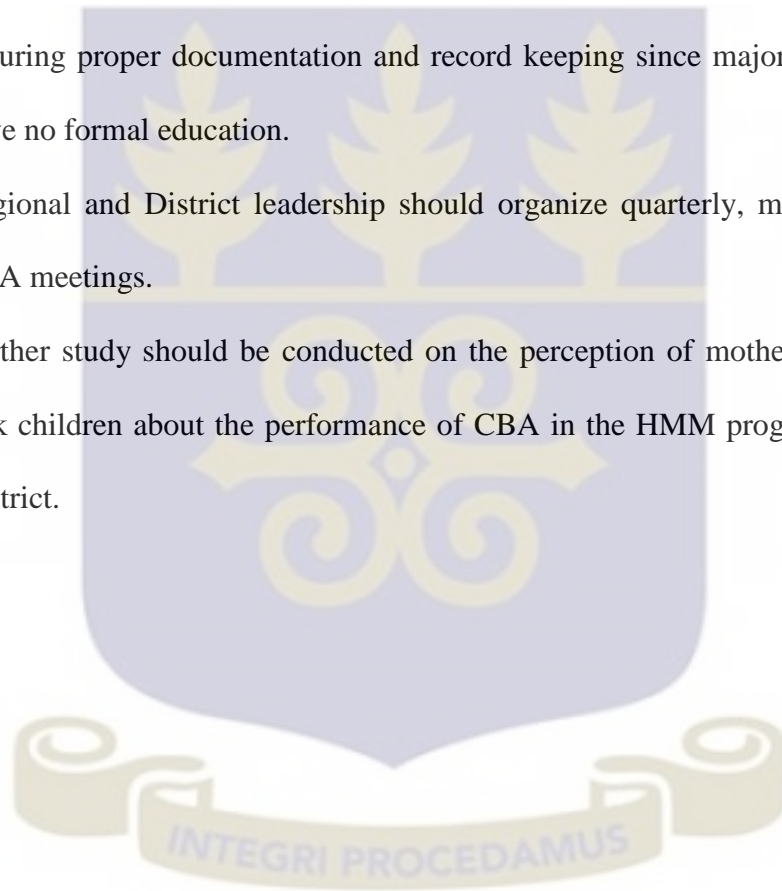
The study was not only significant but also timely as it presented necessary information for addressing the challenges on the performance of CBAs with regards to the treatment of malaria. The study showed that more than 60% of the CBAs were able to administer the correct dosage of the ACTs to the age specific group. The referral practice by the CBAs was high and all CBAs also gave health education on the prevention of malaria. Majority of CBAs were not monitored frequently and motivated. Apart from some of the CBAs having drugs expired in stock and drugs out of stock, their logistics such as bicycles, wellington boots and raincoats are not available or available but in a poor condition.

#### 6.2 Recommendations

The following recommendations are being made in the light of the findings from the study:

- The Regional and District Health Directorate should re-train CBAs and establish regular refresher training to strengthen their knowledge and skills.
- The drug and logistics supply system must be re-assessed so that there will be constant supply of logistics and drugs to communities that are out of stock. Specifically, the following areas need to be considered;

1. The District health leaders should provide proper supervision to CBAs to serve as a way of addressing their challenges.
2. MOH should formulate policy on CBA motivation to improve their commitment.
3. District in collaboration with the National Malaria Control Programme should replace unavailable CBAs logistics and those available but in poor conditions should be maintained.
4. Sub district leadership should provide some staff who will be assisting CBAs in ensuring proper documentation and record keeping since majority of the CBAs have no formal education.
5. Regional and District leadership should organize quarterly, monthly or yearly CBA meetings.
6. Further study should be conducted on the perception of mothers/care givers of sick children about the performance of CBA in the HMM programme in Atiwa District.



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## APPENDICES

### APPENDIX 1: INTRODUCTION OF STUDY

The main investigator is Diwura Mukaila, a student at the School of Public Health, Legon and conducting a study on the performance of Community Based Agents in Home Based Care of Malaria under-five years in the Atiwa District in the Eastern Region of Ghana.

This study is for academic purposes and a requirement for the award of Master in Public Health and supervised by Dr. Adolphina Addo-Lartey, a lecturer of School of Public Health, University of Ghana, Legon.

#### **Procedure:**

Structured questionnaires will be used to conduct the interview and in some cases a checklist will be used during an observation during treatment or health education. The questions would be posed either in English or Twi as the choice of respondents. There would be no recording of names and everything we say should remain here. There is no right or wrong answer everybody is free to share his/her mind. You are at liberty to object to participation at any time but if you accept to start I will encourage you to stay on till we finish. It would take about 15minutes of your time

## **APPENDIX 2: INFORMED CONSENT FORM FOR STUDY PARTICIPANTS**

**Project Title:** Performance of Community Based Agents in Home Based Care of Malaria under-five years in the Atiwa District in the Eastern Region of Ghana.

**Institution of affiliation:** School of Public Health, University of Ghana, Legon.

### **Purpose of Research**

My name is Diwura Mukaila, a Master of Public Health Student at the School of Public Health, University of Ghana. I am conducting a study on the Performance of Community Based Agents in Home Based Care of Malaria under-five years in the Atiwa District in the Eastern Region of Ghana. I am interested in knowing how the treatment of under-five years with uncomplicated malaria by Community Based Agents (CBAs) in the HMM programme is done, I also want to know which cases you refer and how your referrals are done.

I would greatly appreciate your participation in my study. Your insight will assist me to assess the performance of Community Based Agents in Home Based Care of Malaria under-five years in the Atiwa District in the Eastern Region of Ghana.

### **Research Procedure**

If you agree to be in this study, you will be asked to answer questions about yourself as well as questions about how you treat uncomplicated malaria in children under five years of age. These questions will be asked in a form of individual interview using an interviewer administered structured questionnaire. The interview will take about 10 – 15 minutes.

### **Risks and benefits:**

There are minimum or no risks if you take part in this study. There are also no incentives but the information you provide will help you improve on your work and the work of other CBAs and also improve the health of children under five years in this district.

### **Voluntary Nature of Participation**

If you decide to participate in this study, you are free to answer the questions with much or as little details as you wish and feel comfortable to explain. You are also at liberty not to answer any particular question or withdraw from the study at any time for any reason with no penalty.

### **Compensation**

There is no monetary compensation or incentive for this study. Participation is voluntary.

### **Confidentiality**

You are assured of strict anonymity and confidentiality on any information you give. Only the research team will have access to the answered questionnaires. Confidentiality and privacy will be maintained by keeping all materials under lock and key. Your name will not be recorded. Instead, all data files will be coded and stored in randomly selected identification number making it impossible to identify you or your answers in anything written about this study.

**Contact and Questions**

If you have any further information or questions about the study, you may contact the principal investigator, Diwura Mukaila on phone number: 0245411112

Or email: dmukaila@yahoo.com

**Your rights as a Participant:**

This research has been reviewed and approved by the Ethical Review Committee (ERC) of the Ghana Health Service. If you have any questions about your rights as a research participant you can contact the ERC administrator Ms. Hannah Frimpong on 0243235225 or 0507041223 between the hours of 9am – 4pm on Monday to Friday.

**Statement of Consent**

I have read the information above, or it has been read to me. I consent voluntarily to be a participant in this study

Name of Participant: .....

Signature or Thumb print of Participant: .....

Date: .....

Thank you for agreeing to participate

Name of witness: .....

Signature or Thumb print of witness: .....

Date: .....

I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Name of Researcher or Principal investigator: .....

Signature of Researcher: .....

Date: .....



**APPENDIX 3: QUESTIONNAIRE**  
**UNIVERSITY OF GHANA, LEGON**  
**SCHOOL OF PUBLIC HEALTH**



**QUESTIONNAIRE FOR COMMUNITY-BASED AGENTS**

Greetings, my name is..... I am a member of a team from the University of Ghana conducting a research on the Performance of Community Based Agents in Home Based Care of Malaria under-five years in the Atiwa District in the Eastern Region of Ghana. If you agree to take part in this study, I will read and explain the questions to you and your response will be recorded by me. The questions will take about 10 to 15 minutes.

Your responses to all questions will be confidential and will not be shared with anyone other than members of the study team. No answer is wrong.

Your participation in the study is voluntary and you are free to end the interview process at any time. However, I will be happy if you participate in the study to contribute to existing knowledge on the management of malaria under five years by CBAs.

**Questionnaire for interviewing community Based Agents (CBAs)**

Do you agree to participate in this survey? Yes  No

Record time interview begins.....

Identification	Codes (official use only)
Questionnaire CODE.....	<input type="text"/>
District.....	<input type="text"/>
Sub district.....	<input type="text"/>
Community/village.....	<input type="text"/>
Name of CBA.....	
Name of interviewer.....	
Interview date: Day...../Month...../Year.....	

**NB: Circle appropriate options and fill in the space where indicated**

**Section I: Background data**

NO	Questions	Coding categories	skips
1.	How old are you	<input type="text"/> Age in completed years	
2.	Sex	Male .....1 Female .....2	
3.	Religious background	Christian.....1 Muslim .....2 Traditionalist.....3 Others(specify).....99	
4.	Marital status	Single.....1 Married.....2 Divorced.....3 Separated.....4	

5.	What is your occupation	Farming.....1 Trading.....2 Formal sector.....3 Others (specify).....99	
6.	What is your level of education?	None.....1 Primary.....2 Middle school.....3 Junior high school.....4 Senior high school.....5 Others (specify).....99	
7.	How long have you been working as a CBA?	Less than 1 year.....1 1-2yrs .....2 3-4yrs .....3 5-6yrs .....4 Above 6yrs .....5	

### Section II: CBA training

No.	Questions	Coding categories	Skips
8.	Were you given any training before you started this job?	Yes.....1 No.....0	If No, go to 16
9	If yes, by Who?	GHS.....1 NGO.....2 Private.....3 Others(Specify).....99	
10	Which illness have you been trained to manage? ( multiple response allowed)	Malaria .....1 ARI Pneumonia .....2 Diarrhoea .....3 Disease surveillance.....4 Others(specify) .....99	
11	How many days did the training you received take?	Less than 1 day.....1 1-3days .....2 4-6days .....3 Don't know .....88	
12.	How long ago was the training?	Less than 12 months.....1 1-3years .....2 4-6years .....3 Don't know .....88	
13.	Was the training long enough for you to gain sufficient skills?	Yes .....1 No .....0	
14.	Have you benefited from any	Yes .....1	

	training updates?	No .....0	If No, go to 16			
15.	In which areas were you given the updates?	Malaria .....1 Diarrhoea .....2 ARI/Pneumonia .....3 Disease surveillance .....4 Others(Specify).....99				
16.	What are the three primary tasks that you perform in your in your community? (multiple response allowed)	Management of sick children ....1 Disease surveillance .....2 Health promotion activities .....3 Conducting deliveries .....4 Referrals .....5 Other(specify) .....99				
17.	How many children have you treated from malaria in the past one year	<table border="1" style="width: 100%; height: 20px;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;"></td> <td style="width: 33%;"></td> </tr> </table> Don't know .....88				
17.	Are you the only CBA in this community	Yes .....1 No .....2				
19.	How many are you?	One .....1 Two .....2 Three .....3				



**Section III: Knowledge and perceptions**

No.	Questions	Coding categories	Skips
20.	What causes malaria?	Mosquito bites .....1 Living near stagnant water.....2 When you offend the gods or ancestors .....3 Drinking dirty water .....4 Don't know .....88 Other(Specify) .....99	
21.	What is the most common sign of malaria in children?	Vomiting.....1 Convulsion .....2 Poor feeding .....3 Fever .....4 Don't know .....88 Others(Specify) .....99	
22.	Mention / describe 3 other signs of malaria in children? (multiple responds allowed)	Vomiting .....1 Fever .....2 Poor feeding .....3 Convulsion .....4 Don't know .....88 Others(Specify).....99	
23.	What do you do when a sick child is brought to u you? (multiple response allowed)	Take verbal history from caregiver.....1 Ask and examine child for fever .....2 Observe child for danger signs .....3 Sponge child with fever .....4 Give treatment .....5 Others (Specify) .....99	
24.	What drug do you use for treatment of malaria in your community?	Artemisinin Based Combination (ACTs)	

		<p>.....1</p> <p>SP.....2</p> <p>Chloroquine.....3</p> <p>Don't know .....88</p> <p>Other (Specify).....99</p>	
25.	What dosage of Artesunate/Amodiaquine (AA) do you give to a child 6-11 months old?	<p>½ tablets of AA .....1</p> <p>¼ tablets of AA .....2</p> <p>1 tablet of AA .....3</p> <p>Other ( specify ) .....99</p>	
26.	What dosage of Artesunate /Amodiaquine do you give to a child 12-59 months old?	<p>½ tablet of AA.....1</p> <p>¼ tablet of AA .....2</p> <p>1 tablet of AA .....3</p> <p>Others (specify) .....99</p>	
27.	What do you do to ensure mothers / care givers comply with your treatment instructions? (multiple response allowed)	<p>Counsel/educate care givers .....1</p> <p>Make follow up .....2</p> <p>Give first dose of medicine directly observed.....3</p> <p>Others( Specify ).....99</p>	
28.	Mention 4 signs of a severely sick child (multiple response allowed)	<p>Child is not able to eat of breastfeed.....1</p> <p>Child vomiting everything he/she takes.....2</p> <p>Child has convulsions .....3</p> <p>Child is lethargic and unconscious .....4</p> <p>Child has dark colour urine .....5</p> <p>Don't know .....88</p> <p>Others( Specify) ... .....99</p>	
29.	When do you refer a child? (multiple response allowed)	<p>Any sick child less than 6months old .....1</p> <p>No improvement after treating a child for 24hours .....2</p> <p>Child is severely sick or with the danger signs .....3</p> <p>Don't Know.....88</p> <p>Others( specify).....99</p>	
30.	What do you do if you find a severely sick child?	<p>Give pre-referral treatment and refer promptly .....1</p> <p>Refer to health facility .....2</p> <p>Keep child and treat .....3</p> <p>Use herbal preparations .....4</p> <p>Consult the gods and ancestors .....5</p> <p>Don't Know .....88</p>	

		Others( Specify) .....99	
31.	Do you usually refer patients to the health facility?	Yes .....1 No .....0	If No, go to 36
32.	How many have you referred in the last 6 months? (check records if available)	<input type="text"/> <input type="text"/> Don't know .....88	
33.	Do mothers/care givers comply with referrals?	Yes .....1 No .....0	
34.	Do you usually get feedback from the health facility on children you have referred?	Yes .....1 No .....0	If No, go to 36
35.	How do you get feedback? (multiple response allowed)	Through family members .....1 During meetings with health staff .....2 Written notes .....3 During home visits .....4 Others(Specify) .....99	
36.	What do you educate mother/care takers on to prevent malaria in children (multiple response allowed)	Sleep under insecticide treated net .....1 Use insecticide sprays .....2 Clean your surroundings .....3 Wear protective clothing .....4 Drink or smear herbal preparations.....5 Use mosquito repellent .....6 Others(Specify).....99	
37.	Have you had any medicine stock out in the last 3 months?	Yes .....1 No .....0	If No, go to 39
38.	What were the causes of the stock outs?	Failed to make a request .....1 District/health facility did not have drugs .....2 No money for transport to collect drugs .....3 Others(Specify) .....99	
39.	Do you have any medicine in stock today?	Yes .....1 No .....0	
40.	What materials were you supplied with following your training as a CBA? (multiple response allowed)	Record books .....1 Kit box .....2 Wellington boots .....3 Job Aides .....4	

		Bicycles .....5 IE&C .....6 Rain coats .....7 Others(Specify) .....99	
41.	How many times have you relieved supervision in the year 2015	1-3 .....1 4-6 .....2 7-9 .....3 10-12 .....4	
		None .....5 Don't know .....88	
42.	Of these, how many took place in your home/community?	<input type="text"/> <input type="text"/>	
43.	Which type of supervision would you prefer?	Supervisor visiting you at home .....1 Supervisor meeting you at the health facility .....2 Others(Specify) .....99	
44.	How many reports have you submitted to your health centre in the past year (2012)?	1-3 .....1 4-6 .....2 7-9 .....3 10-12 .....4 Don't Know .....88	
45.	If less than 6 reports, give reasons for low reporting	..... .....	
46.	What is your opinion about the workload?	Ok .....1 Too much .....2 Too little .....3	
47.	Are you given any motivation for the work done?	Yes .....1 No .....0	If No, go to 49
48.	In what way are you motivated?	Cash .....1 In kind .....2 Awards .....3 T&T during meetings .....4 Others(Specify) .....99	
49.	Do you know of any CBA who has dropped out?	Yes .....1 No .....0	
50.	If yes, do you know the reasons for the drop out?	..... .....	

51.	What is your general perception about the HMM strategy?	..... .....	
52.	What challenges do you face in the process of doing your work?	..... .....	



**Section IV: Practices**

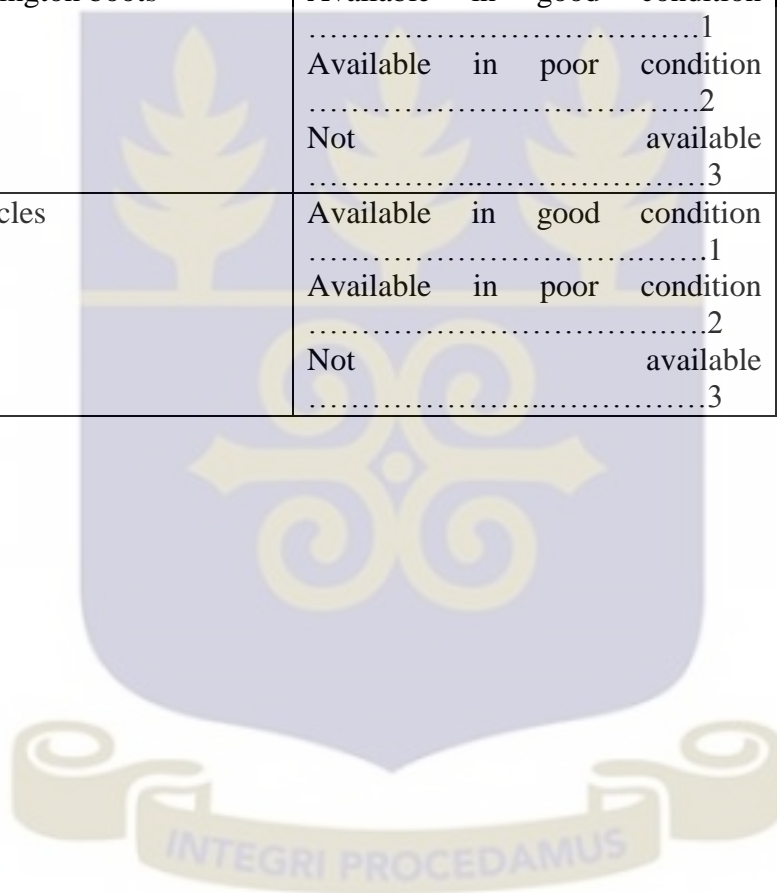
I am also interested in knowing whether you use the knowledge and skills acquired from your training in your practice or not? This is not a test; it is to inform us about how well the training has helped you to improve your job performance. Please think of any changes you made after the training, whether they are significant or not. If you never used the knowledge or skills, I am also interested in knowing the challenges that prevented you from using the skills.

Practices

No.	Check for the following;	Coding categories	Comments
53.	ACTs	Available and not expired .....1 Available but expired .....2 Not available .....3	
54.	Storage of medicines	Stored in dry cool place .....1 Store in humid place .....2 Exposed to sunlight .....3 Other(Specify) .....99	
55.	Monthly reports (2015)	Copies available and complete .....1 Available but incomplete .....2 Not available .....3	
56.	Records of referred children	Available .....1 Not available .....2	
57.	IE&C/health promotion materials	Available .....1 Not available .....2	
58.	Health promotion activities carried out within the last six months	Carried out and records available.....1 Carried out but no records .....2 Not carried out .....3	

Check for the availability and condition of the following logistics

59.	Kit box with contents ( use checklist )	Available in good condition .....1 Available in poor condition .....2 Not available .....3	
60.	Raincoats	Available in good condition .....1 Available in poor condition .....2 Not available .....3	
61.	Wellington boots	Available in good condition .....1 Available in poor condition .....2 Not available .....3	
62.	Bicycles	Available in good condition .....1 Available in poor condition .....2 Not available .....3	



**Checklist for observation of CBAs**

Observe any CBA treating a sick child using the checklist below

A	Assessing the sick child		
No.	Question	Coding categories	Comments
63	Was the child brought to CBA or CBA was called	Child brought to CBA.....1 CBA called .....2	
64	Did CBA greet and congratulate parent/care taker for seeking health care	Yes .....1 No .....0	
65	Did CBA ask for name of child	Yes .....1 No .....0	
66	Did CBA ask if child has fever	Yes .....1 No .....0	
67	Did CBA touch the child to check for fever	Yes .....1 No .....0	
68	Did CBA ask for the other signs and symptoms of malaria	Yes .....1 No .....0	
69	If yes which ones (multiple response allowed)	Vomiting .....1 Diarrhoea .....2 Loss of appetite .....3 Others(Specify).....99	
70	Did CBA ask or observe for danger signs	Yes .....1 No .....0	
71	If yes, which ones	Child unable to drink or breastfeed .....1 Vomits everything she/he drinks or eats .....2 Convulsions .....3 Difficult to awaken child or child is very sleepy .....4 Others(Specify) .....99	
	<b>Management of fevers and malaria</b>		
72	Was 25mg/67.5mg (1/2 tablet) of AS/AQ given to child 6-11 months	Yes .....1 No .....0	Skip to 73 if child is above 6-11 months
73	Was 50mg/135mg (1tablet) of AS/AQ given to child 1-5yrs	Yes .....1 No .....0	
74	Did CBA counsel/educate parent/care giver on correct dosage and treatment compliance	Yes .....1 No .....0	

Parent/care giver education			
75	Did CBA educate parent/care giver on prevention of malaria	Yes .....1 No .....0	
76	If yes, which ones	Use of LLINs .....1 Insecticide sprays.....2 Protective clothing .....3 Indoor residual spraying .....4 Others(Specify).....99	

Record time interview ends .....

Thank you for your time



**APPENDIX 4: PLAN OF WORK**

Period Activity	Sept 2015	Oct 2015	Nov 2015	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016
Submission of dissertation topic	↔									
Submission of objectives	↔									
Submission of problem statement and justification	↔	↔								
Writing of introduction and literature review	↔	↔								
Proposal presentation		↔								
Submission of full proposal			↔							
Designing of questionnaires			↔	↔						
Field work and data collection								↔	↔	
Data analysis and write up								↔	↔	
Submission of draft dissertation to supervisor									↔	↔
Submission of dissertation										↔


**APPENDIX 5: ETHICAL CLEARANCE LETTER**

**GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE**

*In case of reply the number and date of this Letter should be quoted.*

My Ref: GHS/RDD/ERC/Admin/App/  
Your Ref. No.

Mukaiila Diwura  
University of Ghana  
School of Public Health  
Legon, Accra



*Year Muli-Du-Danana*

Research & Development Division  
Ghana Health Service  
P. O. Box MB 190  
Accra  
Tel: +233-302-681109  
Fax + 233-302-685424  
Email: Hannah.Frimpong@ghsmail.org

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	<b>GHS-ERC 41/12/15</b>
Project Title	"Performance of Community-Based Agents (CBAS) In Home-Based Care of Malaria Under-Five Years"
Approval Date	18 <sup>th</sup> April, 2016
Expiry Date	17 <sup>th</sup> April, 2017
GHS-ERC Decision	<b>Approved</b>

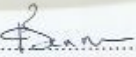
**This approval requires the following from the Principal Investigator**

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report **after completion** of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....  
DR. CYNTHIA BANNERMAN  
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra

## APPENDIX 6: LETTER OF INTRODUCTION



**UNIVERSITY OF GHANA**  
DEPARTMENT OF EPIDEMIOLOGY AND DISEASE CONTROL  
SCHOOL OF PUBLIC HEALTH

Ref. No.: .....

6<sup>th</sup> June, 2016

The Regional Director  
Eastern Regional Health Directorate  
Ghana Health Service  
Koforidua – Eastern Region

Dear Sir/Madam,

**LETTER OF INTRODUCTION – MUKAILA DIWURA**

We wish to introduce to you, *Mukaila Diwura*, a Master of Public Health student in the Department of Epidemiology and Disease Control of the School of Public Health, College of Health Sciences, University of Ghana, Legon.

Mr. Diwura is conducting a research on the topic *“Performance of Community-based Agents (CBAs) in Home-based Care of Malaria Under-five Years in the Atiwa District”*.

It will be appreciated if you could provide him with the necessary support to undertake his research work in your institution.

We thank you for your cooperation.

Yours faithfully,

  
Dr. Patricia Akweonga  
Head

cc: School Administrator      SPH, UG  
The District Director      Atiwa District Health Directorate

**COLLEGE OF HEALTH SCIENCES**

P. O. Box LG 13, Legon, Accra, Ghana.  
• Telephone: +233 (0) 289 109 008      • Email: [sph-epdc@ug.edu.gh](mailto:sph-epdc@ug.edu.gh)      • Website: [www.publichealth.ug.edu.gh](http://www.publichealth.ug.edu.gh)

**APPENDIX 7: BUDGET**

<b>Budget category</b>	<b>Unit cost (GHC)</b>	<b>Multiplication factor</b>	<b>Total (GHC)</b>
<b>Personnel Allowance</b> Allowance for research assistants	10.00	28days x 10.00 x 6	1,680.00
<b>Transportation</b> Transportation to field (Researcher and research assistance)	100.00	28days x 100.00	2,800.00
<b>Communication</b> Phone calls Internet cost	5.00 200.00	28days x 5.00 200.00	140.00 200.00
<b>Training, pre-testing</b> Refreshment for research assistants & Trainer Trainee allowance Pre-testing of questionnaire for 1 day	15.00 10.00 100.00	2days x 15.00 x 7 2 days x 10 x 6 1 day x 100.00	210.00 120.00 100.00
<b>Stationery and other secretarial services</b> A4 Pencils Pens Markers Note pads Carrier bags Printing Proposal Questionnaire Draft report Final report Binding	50.00 5.00 10.00 10.00 5.00 5.00 50.00 0.50 50.00 50.00 5.00	1 x 50.00 1 packet x 5.00 1 packet x 10.00 1 packet x 10.00 6 x 5.00 6 x 5.00 4 copies x 50.00 400 copies x 0.50 2 x 50.00 4 x 50.00 4 x 5.00	50.00 5.00 10.00 10.00 30.00 30.00 200.00 50.00 100.00 200 20.00
<b>Miscellaneous</b>	250.00	250.00	250.00
<b>Grand Total :</b>			<b>6,205</b>

## **APPENDIX 8: BUDGET JUSTIFICATION**

### **Personnel Allowance**

Daily subsistence and feeding allowance of GHS 10 for research assistant is crucial to guarantee his comfort and ensure commitment.

### **Transportation**

Commuting from community to community to contact and interview CBAs in their homes by research assistant in a rented vehicle will cost GHS 100.00 daily. This is essential for effective data collection.

### **Communication**

There is the need for Internet connectivity and phone/scratch cards for effective communication between the principal investigator, research assistant and supervisor. This is key to ensure smooth running of activities.

### **Training & pre-testing**

Refreshment and allowances given at training sessions serves as motivation and encouragement for the research assistant. The pre-testing is done for needed revision and validation of survey tools. It also helps to brace up for field work.

### **Stationery and other office supplies**

There is the need to purchase stationery and other needed materials including secretarial services to ensure the study is conducted smoothly.

### **Miscellaneous**

An amount of GHC 250.00 would be used to cater for any unforeseen expenditure which may come up.