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ASSESSMENT OF THE IMPLEMENTATION OF THE AFFORDABLE MEDICINES FACILITY FOR MALARIA AT KPONE-ON-SEA, GHANA

BY

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DECLARATION

I, Woranola Ibukunoluwa Olatoyosi, declare that except for other people's investigations which have been duly acknowledged, this work is the result of my own original research, and that this dissertation, either in whole or in part has not been presented elsewhere for another degree.

…….. ……

Woranola Ibukunoluwa Olatoyosi Date

STUDENT

…… ……

Dr. Judith Stephens Date

ACADEMIC SUPERVISOR

DEDICATION

I dedicate this work to my HEAVENLY FATHER, who is the source of my wisdom, my knowledge and my understanding. I also dedicate it to my ever supportive parents.

ACKNOWLEDGEMENT

I wish to express my sincere gratitude to my academic supervisor, Dr. Judith Stephens, who directed and guided me to complete this work.

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ABSTRACT

The Affordable Medicines Facility for malaria (AMFm) program is an innovative financing mechanism with the primary objective of making Artemisinin based Combination Therapies (ACTs) affordable in both private and public health sectors, thereby increasing the uptake of ACTs while discouraging the use of Artemisinin monotherapy. This study aims to assess the implementation process of the AMFm initiative among the Licensed Chemical Sellers (LCS) and Community Pharmacists (CP) at Kpone-on-sea by assessing the knowledge and perception of the LCS/CP on the AMFm program, identifying the challenges encountered and assessing the outcome of the program.

A cross sectional study was conducted to collect data on the awareness of the AMFm program, training in the management of malaria, challenges encountered during the implementation and outcome of the program by using structured questionnaire. The study population comprised the LCS/CPs at Kpone-on-sea and included 42facilities in the LCS/CP at Kpone-on Sea. Data was analyzed using Stata software version 12 for descriptive statistics and graphic representation of the findings. The results showed increased knowledge in the management of malaria among the LCS/CP during the training which was held prior to the implementation of the initiative. Activities to create awareness of the AMFm initiative during the implementation process resulted in a high demand of the co-paid ACTs. There was reduction of monotherapy sales/purchase at the facilities. There were however challenges in the availability and accessibility of co-paid ACTs. The implementation of the Pilot Phase1 of the AMFm initiative program was assessed as successful.

Key words: Malaria, AMFm, ACTs, monotherapy, co-paid, Licensed Chemical Sellers

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LIST OF ABBREVIATIONS

AMFm	Affordable Medicines Facility for malaria
ACTs	Artemisinin Based Combination Therapies
CHAI	Clinton Health Access Initiative
CQ	Chloroquine
CPs	Community Pharmacies/Pharmacists
DDT	Dichlorodiphenyltrichloroethane
DALYs	Disability Adjusted Life Years
LCS	Licensed Chemical Sellers
NHIS	National Health Insurance Scheme
NMCP	National Malaria Control Program
NGO	Non-Governmental Organization
RBM	Roll Back Malaria
SP	Sulphadoxine/Pyrimethamine
UNICEF	United Nations Children's Emergency Fund
UK	United Kingdom
UNITAID	United Nation International facility for purchase of diagnostics and drugs for Tuberculosis, AIDs and Malaria
WB	World Bank

WHO	World Health Organization

DEFINITION OF TERMS

Community Pharmacists (CP): People trained to be responsible for controlling, dispensing and distributing medicine. They work with reference to legal and ethical guidelines provided by the Pharmacy Council of Ghana to ensure the correct and safe supply of medical products to the general public. They are involved in maintaining and improving people's health by providing advice and information as well as supplying prescription medicines.

Licensed Chemical Sellers (LCS): People who are trained by the Pharmacy Council to provide health care services, basically to areas where there are no pharmacies.

CHAPTER ONE

1.0. INTRODUCTION

Malaria is a complex and deadly disease prevalent in most tropical countries (Hotez *et al*., 2007). Globally, malaria continues to be a public health challenge accounting for about 300-500 million cases each year and more than one million deaths occurring mostly in malaria endemic countries (Aregawi *et al.,* 2008). Malaria also contributes to the cycle of poverty in many countries thus reduction of the malaria burden, particularly in these areas, is very desirable.

Malaria in Ghana is a major public health concern and it is one of the commonest causes of morbidity and mortality. Malaria diagnosis and treatment at health facilities in most cases is presumptive (Chinbuah *et al*., 2012). It is rated among the first 10 diseases mostly attended to in public health facilities in Ghana (Ahorlu *et al.,* 2006). Studies conducted in 2006 and program data from the WHO World Malaria Report 2010 showed that huge amounts of antimalarials were distributed in public health facilities particularly in Africa. However, low coverage and access to the highly effective antimalarials especially the Artemeter based Combination Therapy (ACT) were reported in high endemic areas. In recent years, there has been improvement in malaria prevention and control particularly in Africa due to major advances in malaria research and public health practices, effective interventions, careful epidemiologic and economic analyses of malaria's burden and cost effective ways to lessen its impact (Kiszewski *et al*., 2007).

In the year 1998, the World Health Organization (WHO), WORLD BANK and the United Nations Children's' Fund (UNICEF) joined resources together to form the Roll Back Malaria movement (RBM) with the sole aim of fighting malaria and reducing the mortality rate to about 50% by 2010and by 50% in 2015 (Rasti N, 2008). The AMFm facility was the second

intervention initiated for the achievement of the Roll Back Malaria goal, which was to help reduce malaria mortality and morbidity.

The AMFm is an innovative financing mechanism managed by the Global fund to fight HIV/AIDS, tuberculosis and malaria (Yamey *et al*., 2012). The project as proposed and launched by the Global fund aimed to enable countries particularly the endemic ones to increase the provision of affordable ACTs through the public, private and nongovernmental organizations. Increasing access to ACTs and displacing monotherapies from the market such as chloroquine and Artemeter was expected to delay resistance to Artemisinine. One of the challenges facing malaria endemic countries especially the sub-Saharan Africa is geographical and financial access to affordable active Artemisinine-based combination therapies (WHO, 2011). Apart from the issue of persistent threat of resistance to antimalaria medicines or the monotherapy, other additional reasons that prompted the setting up of the AMFm initiative were a large market share of substandard antimalaria medications, cost effectiveness and scarcity of highly effective antimalarials, consistency in purchase of highly effective antimalarials, accessibility and availability of quality antimalarials such as the ACTs (Tougher *et al.*, 2012). Through this facility, subsidy was provided to global manufacturers to produce quality assured ACTs at a cheaper cost. The lowered cost of manufacturing ACTs meant that first line buyers in the pilot countries could purchase the medication at a cheaper price and thereby transfer the subsidy to the everyday consumers (Laxminarayan & Gelband, 2009). This consequently increased access to the affordable ACTs and enhanced the efforts for a gradual displacement of the Artemisinin monotherapy from the market, thereby reducing resistance to Artemisinin. The main objectives of the AMFm therefore were to increase the use of effective antimalarials and drive out substandard antimalaria medicines from the market by reducing end user prices to an affordable level. The AMFm facility also received supporting interventions during implementation in the training of prescribers and

dispensers in public and private sector on malaria case management, marketing of the AMFm to consumers to ensure awareness and increase demand, monitoring and evaluation of the AMFm mechanism to inform key stake holders of availability and affordability of price and strengthening of regulatory systems to guarantee quality and efficacy of the ACTs on the market.

Ghana was among the countries that were selected to participate in the two years pilot phase of the AMFm project. The other countries were Nigeria, Madagascar, Uganda, Kenya, Niger, United Republic of Tanzania (mainland and Zanzibar), Benin and The Democratic Republic of Congo.

The eligible first line buyers were companies or organizations particularly of the private sector that directly produced or purchased the ACTs at a reduced cost. This study thus seeks to assess the implementation of the AMFm facility at one of the implementation sites.

1.1. Statement of the problem

Malaria remains an issue of public health concern most especially in endemic countries. It is one of the top ten reported diseases in public health facilities in Ghana (Ahorlu *et al.*, 2006). Majority of the people with malaria seek primary health care from either their families, relatives or from the private pharmaceutical service providers rather than from hospitals and clinics. However, the course of malaria treatment given in those facilities are often sub-optimal relative to the standard treatment required (Ahorlu *et al.*, 2006). This might be due to poor diagnosis as a result of poor/lack of diagnostic kit, lack of professional expertise, prescription of substandard antimalarials and complexity of infection resulting from drug resistance. Over the past decades, successful malaria interventions such as the introduction of initiatives for its prevention, control and treatment have been developed worldwide. These efforts have contributed to a decline in the malaria incidence and mortality (WHO, 2013).

Seven countries have already reduced their malaria burden by 50% in Africa, while many others are seeing a favorable change. Studies have shown progress in reduction in the burden of malaria in Ghana (RBM, 2005).

Among the malaria initiatives that were developed and implemented was the AMFm, which aims at making high quality antimalarials in the form of ACTs available and affordable. In order to achieve these objectives, some activities were undertaken to ensure the smooth implementation, acceptability and use of co-paid ACTs. These activities were creating awareness about the program, training on malaria case management for both public and private health care providers, monitoring of drug quality, pharmacovigilance and monitoring of the progress of the program during its implementation. There is therefore the need to assess the effectiveness of the strategies adopted in the pilot phase after two years of implementation and the contribution of the AMFm programme to the reduction of malaria cases.

1.2. Conceptual framework

The conceptual framework (Figure 1.1) shows that the level of education of the Licensed Chemical Sellers and the community pharmacists, as well as the number of years of practice/experience would affect the knowledge and perception of the AMFm initiative. There is the need for respondents to have some level of formal education to be able to understand information passed across during the publicity of the AMFm program and the training in malaria case management which would influence their respective views or opinions on the outcome of the program. Furthermore, their years of practice/experience would also play a role on the knowledge and perception on the AMFm initiative. The characteristics of the respondents' premises such as daily operational hours and rate of customer patronage in addition to other factors mentioned above, together with the knowledge and perception on the AMFm program would affect the assessment of the

program by the respondents. This might depend on how long the premises are opened in a day and the influx of customers at each premise (depending on competition and location of premises). Challenges encountered such as availability, identification of co-paid ACTs, affordability and accessibility during implementation process would influence assessment.

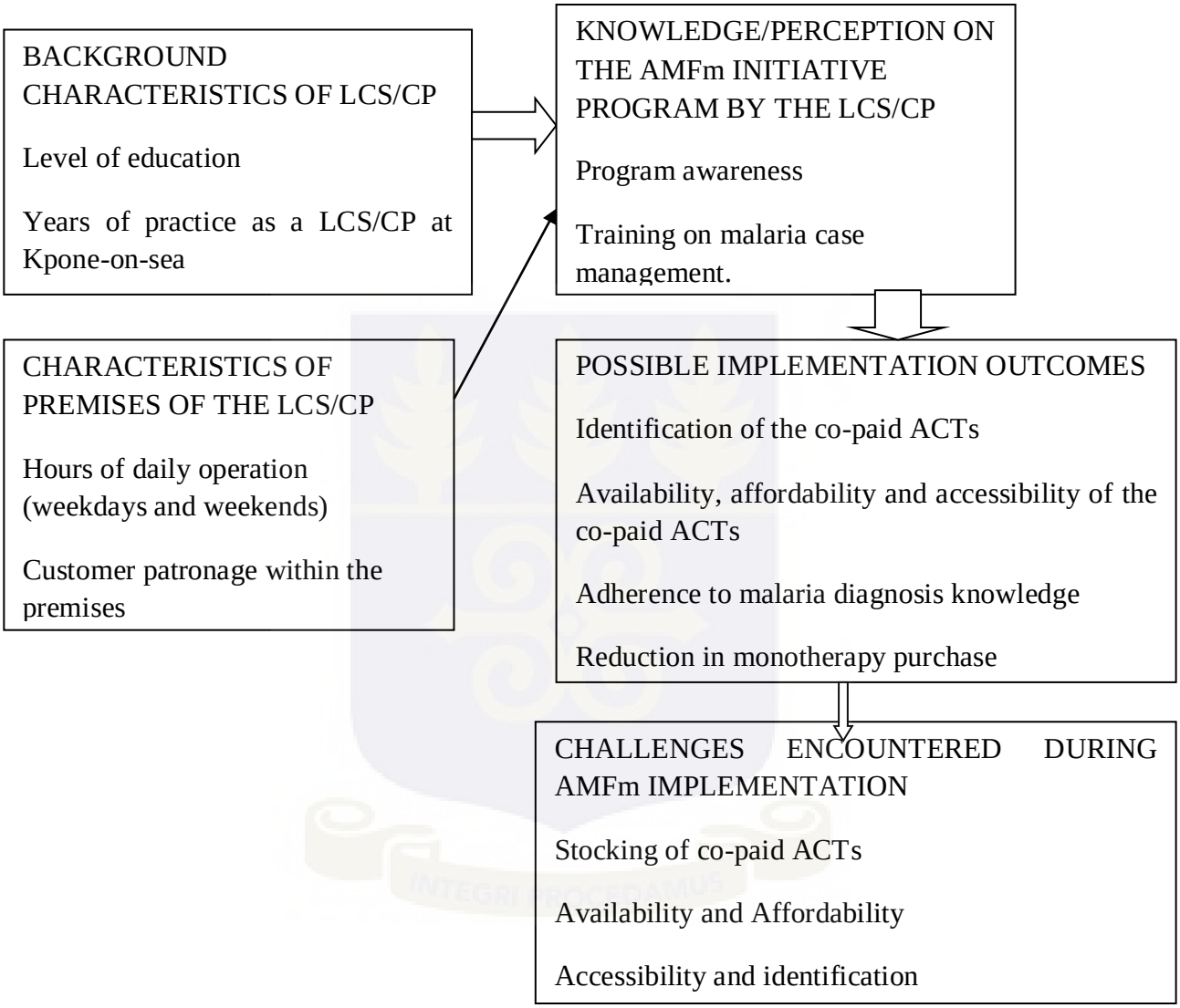


Figure 1.1: Conceptual framework of the assessment of the AMFm initiative at Kpone-on-sea

1.3. Justification

Studies have described the initiation and implementation of the AMFm pilot project (Tougher *et al.,* 2012) as well as the various challenges faced by private first line buyers, the benefits of being an AMFm partner and the various achievement of the project. There were

important compromises during the negotiation and debate about the implementation of the pilot program at national levels in selected malaria endemic countries together with an extensive evaluation of the initial phase for possible scale up (Sabot *et al.*, 2009). Although evaluation was scheduled to be carried out few months after full implementation, that period was clearly insufficient to make responsible judgement of an intervention that was designed to shape a market and the behavior of millions of individuals. Thus, the program implementers suggested to Global Fund to consider extending the evaluation period. This study therefore seeks to assess the effectiveness of the AMFm initiative after two years of implementation at the Kpone-on-sea as perceived by the Licensed Chemical Sellers and the Community Pharmacists.

This study will provide useful information about the challenges encountered by the licensed chemical sellers and community pharmacists during the implementation process and assess the indicators of performance of this programme and its successes at Kpone-on-sea.

The Kpone-Katamanso District was among the randomly selected districts in the Greater Accra Region during the implementation process. It has about 34 Licensed Chemical Sellers shops during the implementation period. Ethical approval for the study was granted by the Ethical Review Committee of the Health Research Unit of the Ghana Health Service (Appendix I).

1.4. Objectives

The main objective was to assess the implementation of the AMFm Facility at the Kpone-Katamanso District.

Specific Objectives:

- To assess the knowledge and perceptions of the Licensed Chemical Sellers and Community Pharmacists on the AMFm program.
- To identify the challenges encountered by the Licensed Chemical Sellers / Community pharmacists during the implementation of the facility.
- To assess the outcome of the AMFm initiative program.

CHAPTER TWO

2.0. LITERATURE REVIEW

2.1. Introduction

The previous chapter provided a background on the global burden of malaria particularly in Ghana, the development of different initiatives for fighting malaria, the issue of drug treatment failure resulting from antimalaria monotherapy, resistance, the financial and geographical accessibility of highly active antimalarials in form of ACTs, affordability and availability. The chapter gave a background to the establishment of the AMFm and its implementation in different countries including Ghana and provided rationale for the assessment of the AMFm at the study location. The chapter also focused on the study location, justification for the study, and the variables of interest to be considered for assessment.

This chapter seeks to provide a review of the available literature on the AMFm implementation and its assessment.

2.2. Malaria: its burden, control effort and elimination

It is estimated that malaria affects more than 500 million Africans annually and this contributes greatly to the health burden of the sub-Saharan Region (Mufunda *et al.*, 2007). Globally, malaria has been estimated to account for about 300-500 million clinical cases and greater than one million deaths occur each year affecting mainly children less than five years in sub Saharan Africa (Reiter, 2008a). Malaria is also reported to be a major contributory factor to the poor social and economic development of the region. Thus malaria control and eradication are increasingly presented as instruments for eliminating economic underdevelopment (Packard, 2009).

Malaria is caused by an infection with a protozoan belonging to the genus *Plasmodium* and is transmitted by the female *Anopheles* species mosquitoes (Cox, 2010).The primary malaria vectors in Africa, *Anopheles gambiae* and *Anopheles funestus*, are strongly anthropophilic and are also the most efficient malaria vectors in the world (Scott & Takken., 2012). *Plasmodium falciparum* is however the most dangerous of the five malaria parasite species that affects humans (Crawley *et al.*, 2010). This species is known to cause majority of malaria deaths by its distinguished mechanism of binding to the endothelium during the blood stage infection and sequestering in organs including the brain (Greenwood *et al.*, 2008). *Plasmodium falciparum* has a long gametocyte life span and this attribute allows the parasite to propagate in blood seeking mosquitoes for a prolonged period, thus increasing its chance to be transmitted to other human hosts (Lucantoni *etal*., 2010).

Only female *Anopheles* mosquitoes bite and take in blood. After a mosquito bites, parasites in sporozoites are injected from the vector into the blood stream of the host and multiply sequentially within liver cells and the red blood cells releasing merozoites which reinvade red blood cells in repetition before changing into male or female sexual forms, the gametocytes. When ingested by a mosquito, they develop into gametes and fuse in the gut of the vector to form zygotes which grow into elongated motile ookinetes. Ookinetes invade the wall of the mosquito midgut where they develop into oocysts. The oocysts further multiply, grow and burst to release sporozoites which migrate into the insect's salivary glands to be injected into to a human host when a blood meal is taken (Bannister & Sherman., 2009). The mosquito requires several blood meals for the development of its eggs. The *Plasmodium* life cycle is very complex and the parasite must undergo development within the mosquito before they become infectious to man. Thus the life cycle alternates between the vector (mosquitoes) and vertebrates' host (Srinivasan *et al*., 2009). The time required for development of parasite in the mosquitoes (the extrinsic incubation period) ranges from 10-21 days depending on

parasite species and temperature, of which the most important is ambient temperature and humidity. That is, higher temperatures accelerate the parasite growth in the mosquito. If the mosquito does not survive longer than the extrinsic incubation period, the mosquito will not be capable of transmitting any malaria parasites. However, studies have shown that it is not possible to measure the life span of mosquito in nature. However indirect estimates of daily survivorship have been made for several *Anopheles* species. The probability of survival of the vector may be the most critical factor in the transmission cycle of the malaria infection (De Barros *et al*., 2011).

Tropical and sub-tropical areas have temperature and rainfall which are most suitable for the development of the malaria vector (Greenwood *et al*., 2008). The prevalence of the vector is high in sub Saharan Africa and some factors contributing to this include poor drainage system, swampy land for cultivation, poor farming practices and methods, poor living conditions, lack of appropriate medical care, lack of appropriate medicines, vector resistance to insecticides and urbanization (Reiter, 2008a). In rapidly expanding areas, increase in industrial and non-industrial activities, poor environmental hygienic practices are more common, hence contributing to the irregular climatic factors that favor the prevalence, incidence and survival rate of the vector (Reiter, 2008b).

Malaria treatment however continues to contribute much to the global burden of diseases and disproportionately affect the poor and underserved populations living in tropical and sub-tropical areas (Beier *et al*., 2008). Chloroquine was the very first medicine that was deployed in a global programme for eradication of malaria which was launched by World Health Organization (WHO) in the year 1955. It was based on two keys modalities; the use of chloroquine for treatment and prevention and Dichlorodiphenyltrichloroethane (DDT) for vector control (Greenwood *et al.*, 2008). The medicine was cheap, thus accessibility and affordability was not an issue. Resistance however emerged from *falciparum* malaria and

monotherapy of chloroquine has being widely discouraged. There was the introduction of sulphadoxine/pyrimethamine for uncomplicated malaria treatment which replaced partly the use of chloroquine (Nsimba, 2006). Again *falciparum* malaria developed resistance against sulphadoxine and pyrimethamine, and this compromised the mass drug administration programs and the eradication strategy (Fairhurst *et al.*, 2012).

Plasmodium falciparum resistance to chloroquine and sulphadoxine/pyrimethamine led to the recent adoption of Artemisinin based Combination Therapy as first line treatment for malaria (Eastman & Fidock, 2009). The complexity and dynamism of the parasite's characteristics, its transmission and the responsible vector could be linked to the development of resistance (Talisuna *et al.*, 2006). The emergence of drug treatment failure partly attributed to abuse of monotherapies from consistent usage, poor compliance to dosage regimen of newly introduced antimalaria combination therapies, poor healthcare facilities, affordability of newly introduced combination therapies, and accessibility of newly introduced combination therapies, misdiagnosis and availability of newly combination therapies all poses a threat to malaria treatment, control and elimination. However, efforts to control malaria have improved in recent years due to increased international funding for malaria elimination and control, the promotion of healthy policies and infrastructural systems, community and political involvement (Fairhurst *et al.*, 2012). The burden of malaria has reduced significantly in a number of countries globally, including some countries in tropical Africa where the prevalence is greatest (Mendis *et al.*, 2009). Hence, achieving the Millennium Development Goal of total control, eradication of malaria infection and prospects of malaria eradication therefore rest heavily on the outcomes of research and development of new and approved medication. Malaria control and elimination are complementary objectives in the global fight against malaria (WHO, 2010).

2.3. The History of Affordable Medicine Facility for Malaria (AMFm)

Malaria endemic countries changed their national treatment plan following the WHO guideline recommendation for malaria infection. The combination therapy that was recommended by the WHO as the first line of treatment for malaria infection were the ACTs (Shewchuk *et al.*, 2011). The rationale for choosing ACT was due to its high pharmacological activity against the protozoan. The compound drug comprises of semi synthetic Artemisinine derivatives paired with distinct chemical classes of long acting drug. Artemisinine and its derivatives are exceptionally potent against the pathogenic asexual blood stages of plasmodium parasites, as well as the transmissible and sexual stages, the gametocytes (Eastman & Fidock, 2009). However, global concern has been raised about Artemisinine resistance regarding its use as a monotherapy in malaria treatment.

As part of the global efforts to eradicate malaria and reduce the prevalence of malaria infection resulting from resistance to monotherapies, access to highly effective antimalarials, low uptake of ACTs and its poor coverage rate, poor health facilities and inadequate health policy systems, different interventions have been established by various organizations towards the achievement of a holistic approach to eradicating malaria to the lowest minimum (Feachem *et al*., 2010). The recent one that was set up by the Global fund was the AMFm initiative.

Many malaria endemic countries are working towards increasing the scope of ACT based therapy on the support they receive from the Global Fund, Tuberculosis and Malaria, the President's Malaria Initiative and the World Bank Booster Program. Nevertheless, if a substantial reduction of the malaria burden is to be achieved, access to effective medicines has to be vastly improved most especially in Sub Saharan Africa. The AMFm initiative was among the initiatives set up and used by the Roll Back Malaria program to reduce mortality

caused by malaria by making effective combination treatment based on Artemisinin available.

The Roll Back Malaria initiative was a partnership program that was established in November 1998 by the WHO, United Nations Children's Fund (UNICEF), and the World Bank (WB). It was a multiyear global effort aimed at reducing the morbidity, mortality and the economic consequences of malaria (Feachem & Sabot, 2008).There was a growing political commitment by African leaders for the action on malaria and this was given a boost by the funding of the Roll Back Malaria partnership. The African Heads of States and their representatives met in Abuja in 1998, to translate the goal of the program to reduce the malaria burden and mortality by 50% by the year 2010, a concerted strategy to tackle the problem of malaria across Africa (Naa*et al.*, 2009).

The AMFm is an innovative financing mechanism set up by the Global Fund to fight HIV/AIDS, Tuberculosis and Malaria and to expand access to ACTs for malaria, thereby saving lives and reducing the use of inappropriate treatment (Kazatchkine *et al.*,2009). The aim of the mechanism is as follows:

- To enable countries (particularly the malaria endemic countries) increase provision of affordable ACTs through the public, private and non-governmental organization sectors.
- To increase access to ACTs and displace monotherapy from the market
- To ensure delay of development of resistance to artemisinin.

The AMFm was launched in April 2009, however phase one of the AMFm commenced in mid-2010 and it was designed to run as a pilot project for two years (Adeyi & Atun, 2010). It was set up as a high level subsidy provided to increase the use of ACTs by reducing its cost through a vigorous price negotiation by the Clinton Health Access Initiative (CHAI) and a

suite of supporting interventions such as training of all health workers on appropriate malaria case management, strengthening in-country regulatory systems and behavior change communication/information (Talisuna *et al.*, 2012). The pilot was supported by the RBM, WB and United Kingdom (UK) Department for International Development and the Bill and Melinda Gates Foundation. Under the AMFm pilot, the first co-paid ACT was brought to Ghana in August 2010 and other piloted countries followed eight months after.

By increasing access to ACTs, the AMFm mechanism and strategy represented One way of bringing a comprehensive long desired goal of universal access and delayed drug resistance to the global problem of malaria. Hence a good example of innovation and logical means of achieving result in public health.

2.4. AMFm objectives

The objectives of the AMFm are:

- To ensure that malaria infected individuals in endemic countries have access to cheap, effective antimalaria treatment in the form of ACTs.
- To promote the effective use of antimalarials in the form of ACTs at an affordable price.
- To drive ineffective antimalarials out of the market and to discourage monotherapy usage (Moon *et al.*, 2009).

AMFm can thus be said to be a welcome step towards improving access to life saving treatment.

2.5. The mechanism of AMFm

The mechanism adopted in AMFm to increase access to ACTs and increase wide coverage and uptake rate to the end user was made possible by using a global level co-payment strategy (Eastman & Fidock, 2009).

The Global Fund negotiated maximum prices with six WHO re-qualified drug manufacturers to reduce the price of ACTs on condition that sale prices must be the same for both the public and private sector. The Global Fund payment was 95% of the ex-factory price of ACTs, a direct payment to the manufacturers of ACTs, and allowed the eligible first line buyers pay the remaining 5% price for the ACTs (Yamey *et al*., 2012). Eligible first line buyers are the wholesalers of ACTs in the participating countries who make direct purchases from the ACT manufacturing companies at a cheaper cost. This therefore makes it possible to provide subsidy to the everyday consumers. The initiative also empowered eligible first line buyers' to sign a contract with the Global Fund which enabled them to access the co-payment arrangement with a mandate to adhere strictly to a reasonable profit on the co-paid ACTs. The first line buyers placed orders directly with the ACT manufacturers and these manufacturers can then applied for co-payment with the Global Fund (Bate *et al.*, 2012).

This subsidy is then expected to be passed on to the consumers in the private and public sectors thus making ACTs available to all patients at prices that are cheaper and getting effective treatment from its usage as compared to the less effective competitive Artemisinine monotherapy (Bate *et al.*, 2012).

2.6. Global Fund and its contribution toward AMFm implementation

The Global Fund to fight AIDS, Tuberculosis and Malaria was created to increase funds to combat these deadly diseases. It is a multi-billion-dollar international financing mechanism, set up in January 2002, with its sole aim to attract, manage and disburse additional resources

worldwide to control these deadly diseases (Nahlen & Low-Beer, 2007). These diseases are known to have a deteriorating effect on the social and economic development of a country most importantly in sub-Saharan Africa. It operates as a partnership among government, civil society, the private sector (including businesses and foundations) and affected communities. It is one of the largest donor organization which aids in combating malaria. Increase support from such donor agencies such as this, efforts and successes in intervention programs, has led to increase in access to newer antimalaria medicines such as the ACTs.

Thus, to address the need for increase access to quality assured ACTs in both public and private sector, the Global Fund established the AMFm (Davis *et al.*, 2013). The Global Fund Board is responsible for the overall governance of the organization including approval of grants. The Global Fund is supported by funds from different donor organizations and agencies and funds are granted to countries especially the developing countries through proposal writing and approval. In addition, an ad hoc committee for the AMFm was recently set up with the responsibility of supervising and advising the board on development, launch, implementation and evaluation of the first phase of the AMFm (Garmaise & Hoover, 2009). The AMFm received funds from multiple sources which included a co-payment fund of US$216 million, financed by the Bill and Melinda Gates Foundation, the UK Government, and the United Nation international facility for purchase of diagnostics and drugs for tuberculosis, AIDs and malaria (UNITAID). The Global fund in addition provided US$127million to fund supporting interventions at country level.

2.7. Public health goals of AMFm

Bate and colleagues (2012) described the public health goals of the AMFm as;

- To compete aggressively on price against less desirable medicines and to drive them from the market

- To reduce recourse to counterfeit and substandard drugs
- To ensure that the ACTs on the market conform with minimum reference (pharmacopeia) quality standards
- To minimize the selective pressures promoting ACT resistance and treatment failure

2.8. The achievement and benefits of the AMFm

AMFm is one of the successful international interventions provided to address the universal problem of poor access to effective malaria treatment, particularly in malaria endemic countries. The AMFm has provided a solution to the dual challenge of inadequate financial and geographical access to effective malaria medicines particularly the ACTs and from the usage of monotherapy (Matowe & Adeyi, 2010). The AMFm has also contributed to the affordability and availability of the ACTs within the health facilities and the communities (Sesay & Esena, 2013). ACTs acceptability, a plus from its pharmacological profile, in addition to attitude, perception of the people towards effective antimalaria treatment has improved markedly due to AMFm initiative. Furthermore, AMFm has contributed to the increased training on malaria case management for healthcare providers both in the public and private sector, thereby strengthening the healthcare regulatory system and improving the system as a whole (Tougher *et al.*, 2012).

In Ghana however, studies indicated that the implementation of the AMFm resulted in a decrease in price of the ACTs. Awareness of the availability of the AMFm ACTs has also been reported to increase drastically consequently resulting in a wide usage of the AMFm ACTs and a low demand for the use of artemisinin monotherapies (Sesay & Esena, 2013). There was a nationwide training of healthcare providers especially in the private sector comprising of outlets and clinics in malaria case management, the availability and

affordability of the AMFm ACTs was well publicized and there was strict adherence to the negotiated price as laid out by the Global Fund-manufacturer's price (Tougher *et al.*, 2012).The benefits especially of being an AMFm partner such as the eligible first line buyers are company recognition from various stakeholders, wide opportunities for other business expansion, increase in patronage of some healthcare facilities providers, self-satisfactory fulfillment of contributions made to the social and economic development of respective countries involved in the implementation towards the achievement of its objectives, enhancement of corporate image and brand equity as a participator in the AMFm program. Hence, companies involved during the pilot phase implementation would be remembered in a long time for life saving and quality mark of their product, and consequently promoting their business for the future.

2.9. Public private partnership during implementation of AMFm

In most countries, the government cannot meet the health needs of the people alone with public resources. The importance of the private sector in achieving the Millennium Development Goals of increase access to effective malaria treatment through the provision of effective antimalarials in the form of ACTs, consequently discouraging the use of monotherapies cannot be overemphasized. In addressing complex and difficult challenges such as this, the public and private sector have roles to play to enable them serve the people better. The private sector in health includes for-profits (both informal and formal) and not for profit (NGOs and Faith Based Organizations) entities as well as a range of for-profit financial institutions (Harding, 2009).

The success of the AMFm in making affordable ACTs available, acceptable, increase in usage, and also accessible can be attributed to the contribution made by large participation of the private sector. From the manufacturers of AMFm ACTs, to the eligible first line buyers which are the pharmaceutical companies, and then the health care providers through their

various outlets. Outlets/premises of health care providers are mostly the first point of call in health seeking behavior of people (WHO, 2010). The public private sector however in partnership was able to address the challenge posed by health issue of access to effective malaria treatment by partnering together through health care payment subsidies (O'Connell *et al*., 2011).

In Ghana, the success of the implementation of the pilot phase 1, making AMFm ACTs available, accessible and ensuring its rationale use for the Ghanaian population can be attributed to a large extent, to the participation of the private sector, where over 10,000 Licensed Chemical Sellers played an essential role in the distribution of quality assured ACTs and 66 % of Ghanaians access Licensed Chemical Sellers as their first point of care (Seiter & Gyansa-Lutterodt, 2009).

2.10. The challenges of AMFm

Changing to the new malaria treatment guideline as recommended by the WHO from the inexpensive, available chloroquine and sulphadoxine/pyrimethamine usage to the effective ACTs yielded a slow response in policy changes in the public sector particularly the Ministry of Health (Amin *et al*., 2007). The committee set up to spearhead this change had to grapple with the challenges of prolonged accessibility of effective antimalarials to those who needed them and protecting the ACTs against the emergence of resistance to preserve the compound ingredients (Laxminarayan & Gelband, 2009). Other challenges anticipated include procurement of effective ACTs, particularly the subsidized ones, their circulation and supply into different healthcare facilities owned by the ministry, their inventory control, practitioners' awareness to its availability and prescribing and translating the policy into practice ensuring that these policies affected quality patient care (Nanyunja *et al*., 2011). Another notable challenge was the gradual discouragement of monotherapy usage and counterfeit products which in most cases resulted in ineffective treatment of malaria and

replacing counterfeit products with effective and subsidized ACTs. With respect to the fact that these ACTs were subsidized, getting these subsidized ACTs to the right people was a challenge. For instance, facing health technical and logistic problems in marketing (Mangham & Hanson, 2010).

In addition, putting regulatory measures in place to enforce the strict adherence to WHO treatment guidelines and use of effective combination therapies in malaria cases was also identified as a challenge. Quality of subsidized ACTs with people's perception, the quality of healthcare received for malaria infection in both private and public sector also pose a threat (Alba *et al.*, 2010)

However, Sabot and colleagues (2009) argued that the cost-effectiveness of the AMFm would likely depend on the level of malaria endemicity in the pilot country. Countries with low burden of malaria infection will more likely yield low AMFm ACTs cost effectiveness. Comparing other malaria interventions such as the use of long lasting insecticides treated nets, use of rapid diagnostic kits for malaria infection diagnosis to AMFm, monitoring the progress of the AMFm implementation towards the objectives especially in the endemic countries where it was piloted was a measurable challenge. Hence, the AMFm was created as a means to work around and develop poor health systems, not to replace them (Laxminarayan & Gelband, 2009).

In Ghana, Malm *et al.,* (2013) have identified the challenges faced by the private first line buyers as difficulties in adjusting their existing operational systems to accommodate the principles and practice of the AMFm program, continuity of the program after completion of the phase1 pilot, budget increase and tailored towards construction of the additional warehouses and hiring personnel to manage the AMFm components. Allocation of funds to purchase AMFm ACTs while still maintaining their line of products and its distribution, loss

of opportunity to increase brand equity of non AMFm drugs and loss of freedom of doing business as usual were also identified as challenges. In addition, loss of companies' credibility towards the public and their potential customers, generally losing revenues with difficulty complying with recommended prices (Malm *et al*., 2013). Others include delay in public sector procurement of ACTs following the national treatment guideline for malaria treatment, perception of AMFm ACTs ('subsidized' in nature), hence more efforts were put in place to ensure acceptability by both public sector, private sector and the general community, geographical access of these medicines especially in remote places and its availability.

CHAPTER THREE

3.0.METHODS

This study made use of quantitative data collection techniques. Data collection was done using structured questionnaires. Quantitative data was entered into the computer and analyzed using Stata version12 software.

3.1. Study design

This was a cross sectional study aimed at assessing the implementation of the Affordable Medicine Facility for malaria (AMFm) at Kpone-on-sea 2 years after implementation. The Licensed Chemical Sellers/Community Pharmacists at Kpone-on-sea were given a structured questionnaire to elicit information on their perception of the AMFm initiative program, challenges encountered during implementation and malaria case training management. This study also assessed the outcome of the AMFm initiative program.

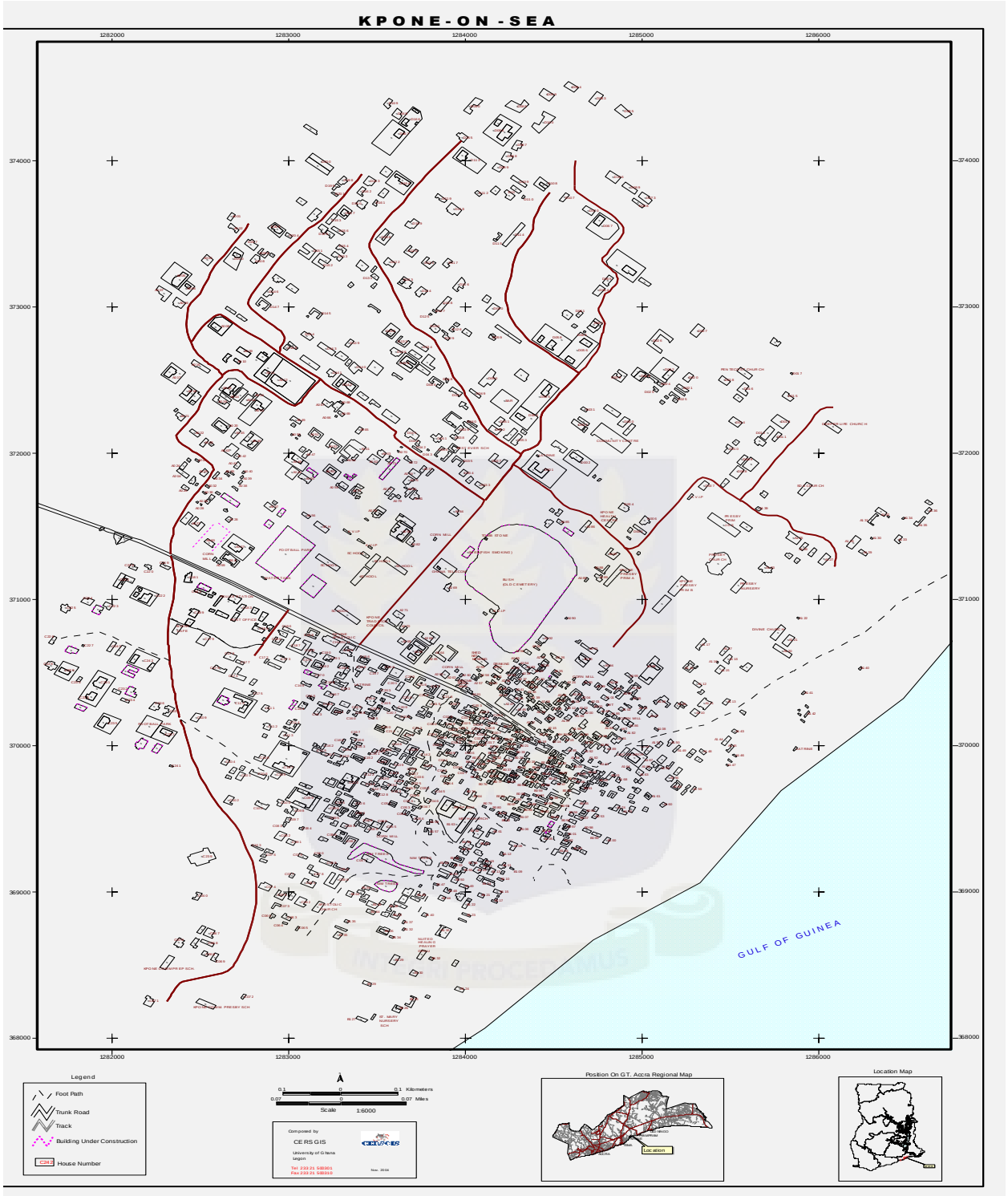
3.2. Study period and location

This study was conducted from May 25, 2014 to June 13, 2014 at Kpone-on-sea. The implementation study was conducted at the Kpone-Katamanso District, a GIS mapped study site developed by the School of Public health (Quakyi *et al.,* 2004). Kpone-on-Sea is a well-demarcated fishing village situated in the Kpone-Katamanso Municipality in the Greater Accra Region of Ghana. It is bordered to the east by Prampram, to the south by the Gulf of Guinea, to the west by Tema, and to the north by the Industrial Free Zone (Figure 3.1). The village is surrounded immediately by shrub land except for the southern aspect that is bounded by the sea. Most residents speak Ga (local language) and English, the official language of Ghana. The main occupation of residents is fishing, although a sizable proportion is engaged in agriculture and animal husbandry. There is a centrally located clinic founded in 1992 by the Rotary Club of Tema. The clinic is currently working under the

direction of Ghana's Ministry of Health, supervised by a Medical Assistant, and is staffed by several nurses and orderlies. Records available in the clinic indicate that malaria accounts for about 70% of all outpatient visits. Malaria transmission is perennial although the intensity varies throughout the year. Maximum transmission occurs during and after two distinct rainy seasons (April to July, September to October) and declines during the dry seasons (November to March, August).

The Kpone-on-sea District was among the randomly selected districts in the Greater Accra region during the implementation process. It has about 34 licensed chemical seller shops who participated during the implementation process. There were no community pharmacies. However, during data collection, 16 new Licensed Chemical Sellers were available as well as 2 new Community Pharmacies. The variables such as knowledge on AMFm and its perception is defined and found in Appendix II.

Figure 3.1: GIS Map of Kpone-on-sea



3.3. Study population

The study population comprised of Licensed Chemical Sellers (LCS) and community pharmacists in the Kpone-Katamanso District. Studies conducted during the implementation

period in the year 2011indicated that the district had a population of 34 Licensed Chemical Sellers, with no community pharmacies.

3.4. Sampling and sampling procedure

All the Licensed Chemical Sellers and Community Pharmacies at Kpone on sea that participated during the implementation of the facility were included in the assessment process. Due to the geographical distribution of Licensed Chemical Sellers in the area, recruitment was done by delineating the area into 4 subareas and in each area; the Licensed Chemical Sellers within this subdivision was identified and enumerated. These delineated areas were Kpone Kokompe, Golf City, Saki, Tema-Manhean, Gbetsele and Kakasunaka 1 & 2.

3.5. Sample size calculation

The list of existing Licensed Chemical Sellers was verified for completeness and updated where necessary. Only a representative of each of this licensed chemical seller shops was selected for the interview. However, during the assessment process, 16 new Licensed Chemical Sellers were available, and 6 were randomly selected to participate and 2 new Communities Pharmacies also participated. Thus, a total of 42 LCS/CP took part in the assessment interview process.

3.6. Data collection and tools

All data on the implementation of the AMFm in line with objectives of this study were collected during a five day visit performed within the study period. Data was collected during shop visits performed within the study period. Shop visits were pre-arranged and lasted between 20 to 40 minutes. After getting approval from the participants through informed consent, the trained research assistants administered the questions to the respondents, one at a

time, face to face and in their preferred language. Response from the respondents was documented manually by writing on the questionnaire sheets.

Data collection consisted of structured questionnaire interview after obtaining approval from the participants through informed consent and with a signature on the volunteer agreement (Appendix III). The questionnaire generally comprised of well structured questions which were administered to the representative of the each participated premise. The questionnaire gathered information on the educational status, years of working experience at the premise, relationship with the owner of the premises, characteristics of the premises in terms of daily operational hours, number of staff, educational level of staff, rate of customer patronage, stocking co-paid ACTs during and after the AMFm pilot implementation phase, malaria case management training and lessons learnt, awareness of the AMFm, challenges encountered in each activities and generally during the implementation of the program (Appendix IV).

Outcome of the AMFm program assessed by respondents in the questionnaire was towards activities involved during implementation such as awareness creation and malaria management. Outcome was general based on publicity about co-paid ACTs identification, availability, accessibility and affordability, adherence to the training received during malaria case management and reduction monotherapy usage and challenges encountered were identified also by respondents (Appendix IV).

3.7. Data processing and analysis

Data collected from the field in the form of answered questionnaires was stored in files whilst awaiting analysis. Statistical Package for Social Science (SPSS) version 20 was used for the data entry and analysis was done using Stata software version 12 (Stata Corporation, College Station, Texas, USA). The data from the questionnaire was coded and entered into the computer for onward analysis based on the study objectives and the main study variables.

Frequency tables and bar charts were used to represent and indicate characteristics of Licensed Chemical Sellers and Community Pharmacists in the district, their premises, proportion of assessment by respondents on knowledge on AMFm initiatives with respect to the awareness and malaria case management, perception of the activities prior to and during AMFm implementation, challenges encountered during the implementation of the program.

3.8. Quality control

The structured questionnaire was created and revised based on reference materials and recommendations from supervisors. Data collection tools were pretested for reliability. The following steps were carried out prior to the collection of the data:

a. Training of research assistants to become interviewers for the study:
b. After completing the training of the interviewers, questionnaires were administered to individual respondents and checklists were used for inspection of premises.

All returned questionnaires were checked for mistakes and completeness. Questionnaires that had unclear responses or many missing information that could not be clarified were excluded. Double entry of data was done to reduce data entry errors and validate authenticity of data.

3.9. Ethical considerations

Ethical approval for permission to proceed with the study was sought from the Ethical Review Committee of the Health Research Unit of the Ghana Health service (Appendix I). Permission was sought from the opinion leaders and head of the licensed chemical sellers at Kpone-on-sea. Informed consent was sought from respondents after explaining the purpose of the study, its benefits and its risks, confidentiality, privacy and voluntary participation. The potential risks of the project were the respondent's time and privacy. The study would be beneficial to the participants since information from them will improve on health intervention and promotion activities in the area and also add up to existing knowledge. There was no

compensation for participants. Privacy and confidentiality of participants was assured by analyzing the data collected at the aggregate level to ensure anonymity. The data collected was used for analysis and stored in locked cabinets. Only the researcher had access to the data.

3.10. Pre-testing

Before the actual data collection, the data collection tools-questionnaires were pre-tested at a pharmacy located at East Legon to determine the clarity of questions and changes were made where necessary to improve upon the reliability of the results that were obtained.

CHAPTER FOUR

4.0.RESULTS

Data was obtained from all the facilities that participated in the implementation of the AMFm initiative program and results are arranged according to the objectives.

4.1. Personal characteristics of the Licensed Chemical Sellers/Community Pharmacists

Majority of the respondents were Licensed Chemical Sellers (95.2%) while the rest were community Pharmacists (4.8%). Respondents that had completed Senior High School were 57.1%, about 33.3% had obtained tertiary education, and 9.6% had basic education up to Junior High School level (Table 4.1). This number of respondents (19/42, 45.2%) had practiced for 24 months or less. Majority of the respondents (71.4%) rated the customer's patronage as average, 16.7% rated their customer's patronage as high while a few (11.9%) rated the patronage as low. In addition, there were averagely 2 workers per facility. Most working hours per weekdays and weekends was 13 and 8 hours respectively (details are shown in table 4.1).

Table 4.1: Background characteristics of Licensed Chemical Sellers and Community Pharmacists and their shops/pharmacies

Characteristics	Frequency (N=42)	Percentage (%)
Designation of respondents		
Licensed chemical sellers	40	95.2
Community Pharmacists	2	4.8
Highest level of education		
None	0	0
Primary	0	0
Middle/JSS	4	9.6
SHS	24	57.1
Tertiary	14	33.3
Relationship with the owner of respective premise		
Employer	18	56.2
Father	2	6.2
Mother	3	9.4
Sibling	6	18.8
Other family relative	13	9.4
How long have you practiced in this community		
Less or equal to 24 months	19	45.2
More than 24 months	17	40.5
Others	6	14.3
Customer patronage within premises		
Low	5	11.9
Average	30	71.4
High	7	16.7
Reasons for customers' patronage		
Location	12	28.6
New in business	4	9.5
Shortage of drugs	5	11.9
Good customer relationship	7	16.7
Presence of close premises (competition)	14	33.3

4.2. Awareness of AMFm initiatives and the co-paid ACTs

Out of the 42 respondents, 16 (38.1%) were aware of the program. Awareness channels was through publicity by the media (31.3%), officials of the AMFm initiative program (18.7%), colleagues (18.7%), pharmaceutical representatives (18.7%), publicity materials (such as T-

shirts, danglers, posters) and customers' enquiries at premises (6.3% respectively). However, duration of awareness creation mostly lasted for days with a few campaign activities lasting for weeks and months (Table 4.2).

Table 4.2: Awareness of the AMFm initiatives and the co-paid ACTs by the LCS/CP

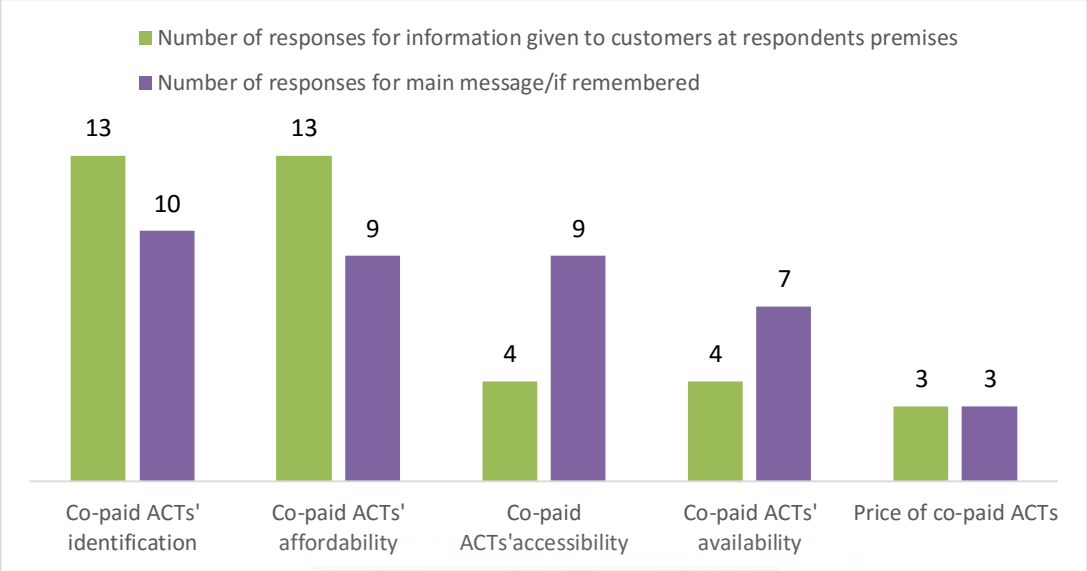
Question	Responses	Frequency (N=42)	Percentage (%)
Awareness of the AMFm program/co-paid ACTs that took place at Kpone-on-sea	Yes	16	38.1
	No	26	61.9
Information channels used during awareness creation	Media (radio and television stations)	5	31.3
	Program officials	3	18.7
	Colleagues	3	18.7
	Pharmaceutical representatives	3	18.7
	Publicity materials such as T-shirts, danglers, posters	1	6.3
	Customers demand/ information	1	6.3

4.2.1 Main message of the AMFm initiative and its influence on the general public

Messages emphasized during the AMFm awareness creation as stated by respondents were availability of the co-paid ACTs, affordability of the co-paid ACTs, accessibility of the co-paid ACTs and identification of the co-paid ACTs (green leaf logo). Likewise, information given to customers at respondents' premises about the AMFm program were the same as received from the awareness program (as shown in Figure 4.1).

All the respondents (16/42, 38.1%) who were aware of the AMFm initiative explained that there was an influence of the awareness on the general public. This was in terms of high purchase of the co-paid ACTs as observed at their individual premises as a result of increase demand from customers and higher patronage.

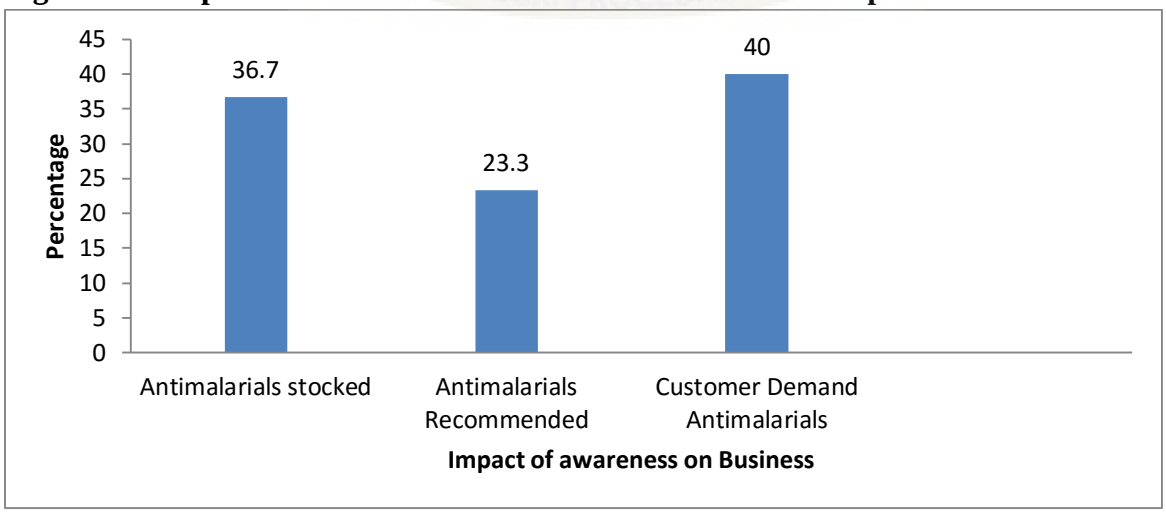
Figure 4.1: Main message of the AMFm initiative and its influence on general public



4.2.2 Impact of awareness of AMFm initiative on respondents' business

Almost all the respondents (14/16), (87.5%) explained that the awareness had an impact on their individual business due to customers' upward demand for antimalarials and the type of antimalarials stocked on shelves. A few of the respondents explained that it influenced their recommendation on the different types of antimalarials. However, a very low percentage of Community Pharmacists and Licensed Chemical Sellers (2/16, 12.5%) said the awareness did not impact their businesses (Figure 4.2).

Figure 4.2: Impact of awareness of AMFm initiatives on the respondents business



4.2.3 Assessment of the awareness creation of AMFm initiative by the respondents

Assessing the effectiveness of the awareness of the AMFm program, all the respondents explained that it was very effective. They all explained that the awareness campaigns were well organized; campaign activities were carried out effectively and message well communicated (Table4.3).

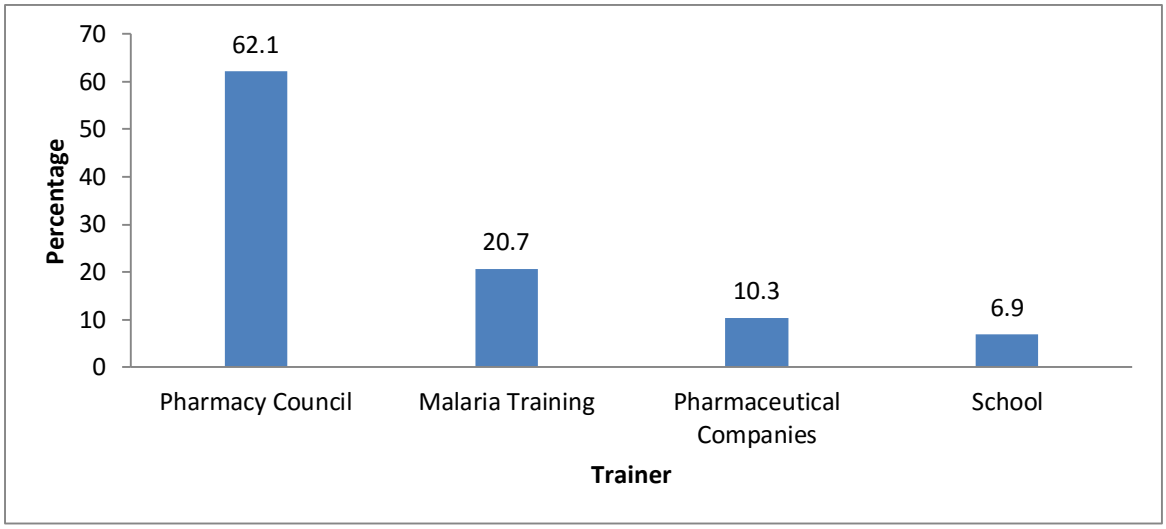
Table 4.3: Assessment of the awareness creation of AMFm initiative by the respondents

	Frequency (N)	**Percentage (%)**
Effectiveness of the awareness of co-paid ACTs		
Yes	16	100.0
Total	16	100.0
Further explanation	Frequency (N)	Percentage (%)
Awareness: effective.	16	100.0
Total	16	100.0

4.3. Malaria Case Management Training

Out of the total LCS/CP sampled in this assessment study, 69% (29/42) of them stated that they have participated in training on malarial case management, in which several recorded participation through the collaboration of the Pharmacy Council (62.1%) and the National Malarial Training Program (20.7%), as shown in Figure 4.3

Figure 4.3: Training of the Licensed Chemical Sellers/Community Pharmacists of Kpone-on-sea on malaria case management



4.3.1 Information received by LCS/CP and its application after the malaria case management training

Information received by the community pharmacists and licensed chemical sellers during the malaria case management training were prevention and control of malaria (86.2%), signs and symptoms of malaria infection (68.9%) effective treatment of uncomplicated malaria infection (51.7%) and referral of complicated/severe case of malaria infection as provided in the Table 4.4.

Out of the 29 respondents who had participated in malaria training, about 96.6% (28/29) explained that they applied the knowledge received at the training in malaria suspected cases by asking customers particularly in suspected malaria case, signs and symptoms, counseling on dosage regimen where antimalarial was prescribed or demanded, recommending a combination therapy preferably an ACT in instances where customers presented with signs and symptoms of malaria, enlightening customers about the AMFm initiative and the co-paid ACTs and prevention and control of malaria infection (Table 4.4).

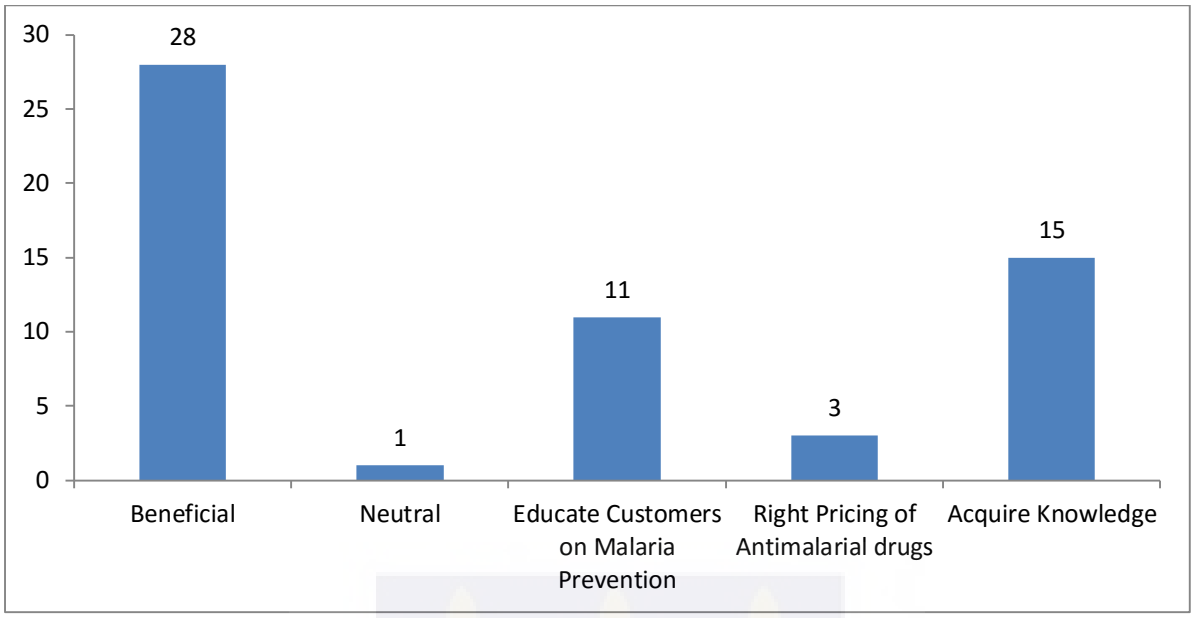
Table 4.4: Information received by LCS/CP and its application after the malaria training

Training on malaria case Management	**Response**	**Frequency (N=29)**	**Percentage (%)**
Lessons learnt from the malaria management case training	Prevention and control of malaria infection	25	86.2
	Signs and symptoms	20	68.9
	Effective treatment of uncomplicated malaria infection	15	51.7
	Referral of complicated/severe case of malaria infection	14	48.3
	Other	1	3.4
Application of knowledge received from the malaria management training?	Yes	28	96.6
	No	1	3.4
		Frequency (N=28)	Percentage (%)
Explain	Signs and symptoms	22	78.6
	Counseled/discouraged monotherapy use	8	28.6
	Recommended a combination therapy preferably an ACT	14	50
	Informed the customer about the AMFm initiative/co-paid ACTs.	10	35.7
	Advised on malaria prevention and control	9	32.1
	Counseled on dosage regimen	20	71.4

4.3.2 Assessment of the Malaria case management training by the LCS/CP

A large proportion of the respondents (96.6%) said the training was very beneficial, and mentioned the benefits as shown in Figure 4.4.

Figure 4.4: Assessment of the Malaria Case Management Training by the LCS/CP



4.4.Stock management of co-paid ACTs during AMFm initiative program

Respondents explained that they generally restocked weekly, monthly or when out of stock. Category of medicines that were mostly restocked especially on weekly basis/when out of stock was antimalarials followed by over-the-counter medicines. AMFm ACTs was among bulk of medicines mostly stocked during the implementation process with the following reasons; some of the respondents (67.6%) emphasized AMFm/green leaf ACTs' affordability, increase in demand was mentioned by 50% of the respondents, quality of co-paid ACTs by41.2% of the respondents, availability of the co-paid ACTs was mentioned by 32.3% of the respondents and 17.6%of the respondents mentioned that the co-paid ACTs was readily accessible. Reasons given for re-stocking co-paid ACTs after program implementation were: affordability (64.7%), quality of the co-paid ACTs (41.2 %), increase in demand (38.2%), availability of the co-paid ACTs (32.3%) and accessibility (5.9%). Details are provided in Table 4.5

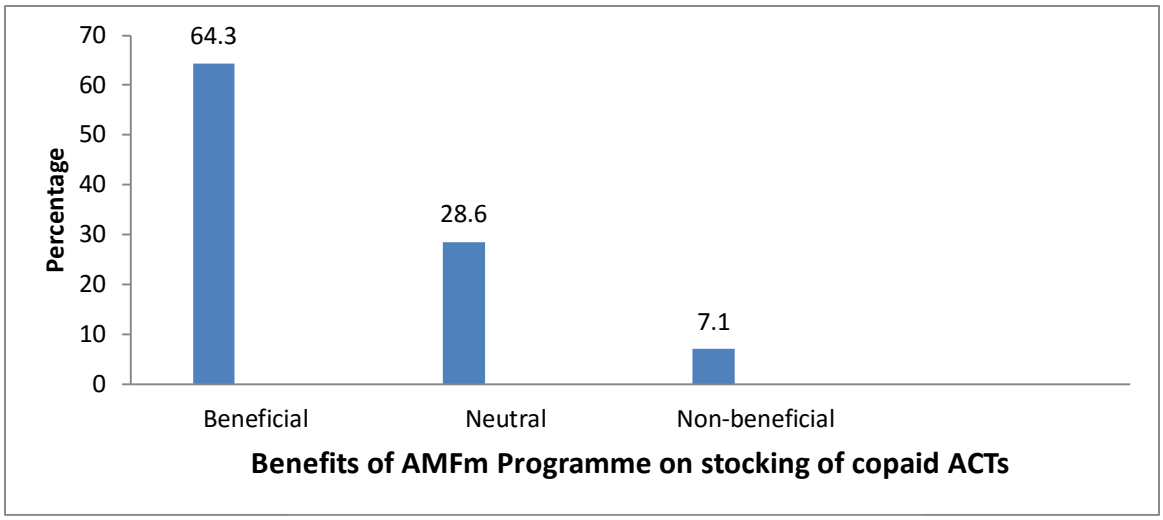
Table 4.5: Stock Management of co-paid ACTs during AMFm implementation

Question	Response	Frequency (N=42)	Percentage (%)
Stocking of your medicines (how often)	Daily	5	11.9
	Weekly	22	52.4
	Monthly	8	19
	When out of stock	7	16.7
	Total	42	100
Medicines often restocked	Antimalarials	35	83.3
	Over the counter	26	61.9
	Antihypertensive	3	7.1
	Antidiabetics	2	4.8
Further to the above question, when do you restock these Medicines mentioned	Daily	6	14.3
	Weekly	23	54.8
	Monthly	5	11.9
	When out of stock	8	19
	Total	42	100
Does the AMFm/co-paid ACTs belong to the category of the most stocked up medicines	Yes	34	81
	No	8	19
	Total	42	100
		Frequency (N=34)	Percentage (%)
Reason(s) during the program (reference to the above stocking co-paid ACTs question)	Affordability	23	67.6
	Increase in demand	17	50
	Availability	11	32.3
	Accessibility (location)	6	17.6
	Quality of the co-paid ACTs	14	41.2
Reason(s) after the program (reference to the above co-paid ACTs question)	Affordability	22	64.7
	Increase in demand	13	38.2
	Availability	11	32.3
	Accessibility	2	5.9
	Quality of the co-paid ACTs	14	41.2

4.4.1 Benefits of the AMFm implementation program on stocking co-paid ACTs

Some of the Licensed Chemical Sellers and Community Pharmacists (64.3%) explained that the AMFm program through stocking of co-paid ACTs had beneficial impact on profit (improvement in profit) while a few (7.1%) made mention of non-beneficial (reduction in profit) as in Figure 4.5.

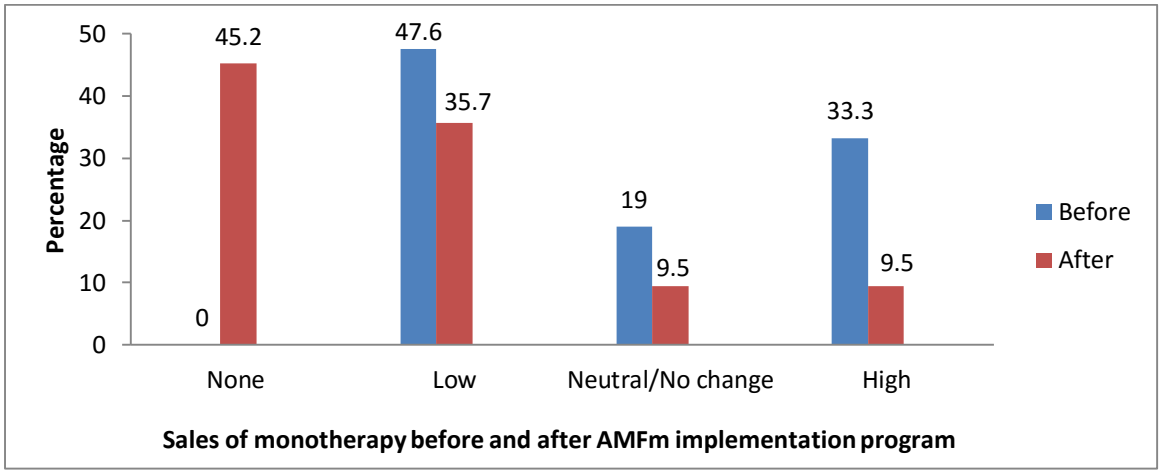
Figure 4.5: Benefits of the AMFm implementation program on stocking Co-paid ACTs



4.4.2 The sales of Monotherapy before and after the implementation of the AMFm

Some of the Licensed Chemical Sellers and Community Pharmacists (47.6%) observed that there was reduction in sales and purchase of monotherapy before the implementation of the AMFm program. On the other hand, 33.3% observed a high sale of monotherapy before the AMFm implementation. However, after the implementation of the program, larger percentage of the respondents recorded no sale of monotherapy, 35.7% recorded a reduction in sale of monotherapy while very few respondents recorded a high sale of monotherapy, as shown in Figure 4.6.

Figure 4.6: The sales of monotherapy before and after the implementation of the AMFm



On the other hand, table 4.6 showed that 71.4% (30/42) of the respondents said sales of monotherapy had no effect on stocking co-paid ACTs. A few of the respondents (28.6%, 12/42) explained that there was an effect of sales of monotherapy on stocking co-paid ACTs. Respondents (50%, 6/12) who observed effect of monotherapy sales on stocking co-paid ACTs explained a reduction in the stocking of the co-paid ACTs while 25% (3/12) noticed an increase in stocking of the AMFm/co-paid ACTs and 25% (3/12) were neutral (Table 4.6)

Table 4.6: Benefits of sales/purchase of monotherapy on the stocking of the co-paid ACTs

Question	Response	Frequency	Percentage (%)
Any effect of monotherapy purchase on purchase/sale of the co-paid ACTs?	Yes	12	28.6
	No	30	71.4
	Total	42	100
If yes, how?	Increased	3	25
	Reduced	6	50
	Neutral	3	25
	Total	12	100

4.5. Challenges encountered during the implementation of the AMFm program

Beginning with stock management of the co-paid ACTs, majority of the respondent (76.2%, 32/42) identified no challenge in stocking of the co-paid ACTs during the implementation of the program while a few (23.8%, 10/42) identified challenges. Among those who identified challenges in stocking co-paid ACTs, 30% of respondents explained that the co-paid ACTs were not always available at designated places of purchase, 50% had complaints from customers (quality issue) while others spoke on demand of co-paid ACTs exceeding supply and profit margin too small (Table 4.7).

In addition, other challenges mostly encountered and mentioned by respondents during implementation of the program while responding to the general question on challenges are identification, inaccessibility, unavailability of AMFm co-paid ACTs, insistence on

monotherapy purchase, affordability of the co-paid ACTs, and others are stock management and small profit margin of the co-paid ACTs (Table 4.7).

Table 4.7: Challenges encountered during the implementation of the AMFm program

Challenges	Response	Frequency	Percentage (%)
Any challenges encountered in stocking up co-paid ACTs during the implementation of the AMFm	Yes	10	23.8
	No	32	76.2
	Total	42	100
Challenges (encountered in stocking co-paid ACTs)	Profit margin too small	1	10
	Unavailability at point of sales	3	30
	Customers' complain	5	50
	High demand versus low supply of co-paid ACTs	1	10
Other challenges during program (for respondents who were aware)	Complaints on identification of co-paid ACTs by Respondents	5	31.3
	Stocking of co-paid ACTs	1	6.2
	Unavailability of co-paid ACTs by respondents	3	18.8
	Inaccessibility of co-paid ACTs by respondents	5	31.3
	Unaffordability of co-paid ACTs by respondents	2	12.5
	Insistence for monotherapies	3	18.8
	Small profit margin of the co-paid ACTs	1	6.3

4.6.General Assessment of the implementation of the AMFm program by the LCS/CP

All the respondents that were aware of the implementation of the AMFm initiative program described the program as very effective, well organized and impactful as shown in Table 4.8.

Respondent's suggestion for improving malaria treatment in Ghana were, the government should continue to subsidize antimalaria cost (59.9%), more implementation programs such as the AMFm for pharmacies and Licensed Chemical Sellers (26.2%), more education on prevention and control of malaria (11.9%) and increase in the effectiveness of operation of National Health Insurance Scheme policy (2.4%) as illustrated in Table 4.8.

Table 4.8: General assessment of the implementation of the AMFm initiatives

Assessment	Response	**Frequency**	**Percentage (%)**
Assess the implementation of the AMFm.	Implementation was well organized and effectively deployed	16	100
	Total	16	100
In one sentence, what is the most important action for improving malaria treatment in Ghana?	Government should subsidize the cost of antimalaria drugs	25	59.5
	More Implementation Programmes for LCS and Pharmacies	11	26.2
	Educating the Public on prevention of malaria	5	11.9
	Effectiveness of the National Health Issuance Policy	1	2.4
	Total	42	100.0

CHAPTER FIVE

5.0.DISCUSSION

Knowledge about the Affordable Medicines Facility for malaria (AMFm) initiative at Kpone-on-sea was assessed via the awareness of the program which took place during the implementation of the pilot phase and the malaria case training management which also took place prior to the implementation. The main objectives of the AMFm were to increase the use of effective antimalarials in the form of ACTs and phase out ineffective antimalaria medicines from the market by reducing end user prices to an affordable level. Indirectly, the co-paid ACTs were produced and subsidized in order to make them affordable, accessible, and available to the end users and to discourage the use of monotherapy.

5.1. Demographic characteristic of respondents

This study found out that respondent has some basic formal education up till tertiary level. This basic formal education created an opportunity for them to relatively understand the content of any training better organized. Also, having some basic technical knowledge/training particularly in drug dispensing would enhance their performance in general drug dispensation. A Literature reviewed suggested that private retail sector should be continually supported and empowered such as providing education to help in correct treatment with drugs they are allowed to dispense(Hetzel *et al*., 2007). Majority of the respondents were observed to be employees.

From this study, respondents' years of experience as LCS/CP were mostly 24 months or less and they are anticipated to be knowledgeable about the AMFm initiative program during its implementation. In addition, majority of the respondents (71.4%) rated customers' patronage as average given reasons such as presence of competitors, location of premises and good customer relationship.

5.2 Awareness of the AMFm

The awareness about the AMFm initiative is not so high among the respondents as found out in this study. This may be due to the fact that most of the respondents had worked at the licensed chemical sellers facilities and pharmacies for less than or equal to 24 months. A few of the respondents (38.1%) had experience of more than 24 months and were knowledgeable about the program's objectives and goals. They further explained that the channels of communication used during publicity/campaign for the program at the study site were the media, from officials of the program, pharmaceutical representatives and professional colleagues and the publicity mostly lasted for days. This finding on awareness was consistent with a study conducted in some of the piloted countries such as Tanzania, Nigeria and Uganda where awareness creation using talk shows, stop-gap soft launch, media were cited as sources of information on AMFm and lasted likewise for days and months (Tougher *et al*., 2012). Contrary to the findings of this study, another study conducted on awareness of AMFm ACTs in Kumasi metropolis of Ghana, revealed that awareness was high among the respondents despite similarities in channel of communications (Djangmah & Esena, 2013).

After two years post implementation, this study found out that respondents that were aware of the AMFm initiative program were able to remember all information given during the implementation process and also explained that they were able to pass it across to their customers. This was not so in the Kumasi study where some of the respondents could not remember the message provided. Reasons suggested may be due to level of formal education (Djangmah & Esena, 2013). Furthermore, this study also found out that there was an upward demand/increase in purchase of the co-paid ACTs which was as a result of the effect of awareness on the public. This was similar to a study conducted in 2013 on processes, challenges, and achievement of the AMFm implementation in Ghana where extensive awareness creation resulted to a high demand of the co-paid ACTs and its easy acceptability

(Malm *et al.*, 2013). A behavioral change towards monotherapy purchase was also observed (reduction in purchase of monotherapy).

It can therefore be emphasized that respondents' assessment of the awareness creation during the implementation process as revealed by this study was effective and campaign messages were maximally communicated.

5.3 Malaria Case Management Training

Before the introduction of subsidized ACTs in Ghana, literatures reviewed showed that studies were conducted to explore the knowledge, attitudes and perception in prevention and control of malaria. Likewise, a collaborative monitoring study between the Global Fund/AMFm Initiative, the National Malaria Control Programme (NMCP), the Pharmacy Council and the Ministry of Health during the implementation of the AMFm pilot phase in Ghana showed that a large proportion of healthcare providers were trained specifically on malaria case management. This backs the study's findings as 69% of respondents participated in malaria case management training mainly by collaboration with the Pharmacy Council, National Malaria control program, pharmaceutical companies and others.

Clinical manifestations of uncomplicated and complicated malaria infection (referral in complicated cases), prescribing combination drugs such as ACTs, giving appropriate dosage regimen and prevention and control of malaria were all emphasized in diagnosing malaria infection during the training. The trained respondents said they applied this knowledge received. However, it was noted that there was no discussion by the trainers to the respondents' about proposed AMFm initiatives and its co-paid ACTs and the use of rapid diagnostic test kits (RDTs) to confirm clinically suspected case before treatment. Comparing this to a study on the assessment of provider training on the use of AMFm ACTs in private drug outlets, in Kumasi metropolis of Ghana, similarities were observed in the lessons learnt,

no use of RDTs to confirm clinically suspected cases and little/no emphasizes made on proposed AMFm initiatives and co-paid ACTs (Djangmah & Esena, 2013). Hence, subsequent training must emphasis on the need of correct diagnosis of complicated and uncomplicated malaria using RDTs before treatment. Objectives of the AMFm initiatives/co-paid ACTs should be incorporated also into further malaria training management. Both studies revealed an improved knowledge in the diagnosis and management of malaria infection.

5.4. Assessing the outcome of the AMFm program

Supporting interventions of the AMFm mechanism (malaria case management training, marketing of the AMFm to consumers to ensure awareness and increase in demand) aimed to ensure take up, acceptability and use of co-paid ACTs. Assessing these 2 indicators, respondents perception about co-paid ACTs affordability, co-paid ACTs availability, co-paid ACTs accessibility, discouragement of monotherapy usage were positive. A high demand for co-paid ACTs was observed influencing stocking of co-paid ACTs and reduced monotherapy purchase/sales. All these benefits of positive awareness creation and effective malaria case management was found consistent with a reviewed study which described a positive performance for the co-paid ACTs availability, affordability and accessibility (Alba *et al.*, 2010).

Other reasons for stocking co-paid ACTs and its effective take up as assessed from respondents were affordability of the co-paid ACTs (67.6%), higher demand by customers (50%), co-paid ACTs' quality (41.2%), co- paid ACTs' availability (32.3%) and co-paid ACTs accessibility (17.6%). These reasons were similar to a study done by Sesay and Esena in 2013 on the utilization of co-paid ACTs, giving reasons such as low price (affordability), effectiveness, awareness and good quality. Another similar study reviewed on the increased stocking of co-paid ACTs emphasized a high customers demand (Sabot *et al.*, 2009).

On the other hand, accessibility and availability of the co-paid ACTs problems were observed from few respondents and was similar to studies mentioned above. These problems may be financial, geographical, unhealthy policies/decisions, inconsistency in supply chains from lack of inherent incentives to distribute to remote outlets.

5.5. Challenges encountered during the implementation of the AMFm program.

The aim of the AMFm program was not only to increase the use of quality assured ACTs through subsidization but also to make them available and accessible. This has the potential of increasing usage and discouraging the less effective monotherapies from the market. This study found out that the co-paid ACTs were neither readily accessible nor available especially at point of sales. A similar study reported the same problem of unavailability and inaccessibility of the co-paid ACTs (Sesay & Esena, 2013).

No challenges were reported on co-paid ACTs stocking by majority of the respondents (76.2%). A few who encountered challenges (23.8%) in stocking co-paid ACTs indicated unavailability at point of sale, supply not meeting up to demand, small profit margin and customers' complaints. The challenges faced in the study conducted at the Ho Municipality, Ghana, mentioned availability and accessibility in stocking AMFm ACTs (Sesay & Esena 2013).

Assessing the two year implementation of the AMFm initiative at Kpone-on-sea has shown that the AMFm initiative was effectively coordinated.

5.6. Key Findings

The main findings from this study are that about 61.9% of the LCS/CP was not aware of the program after two years post implementation, there was positive behavioral change towards monotherapy purchase as reduction in purchase of monotherapies was observed, there was

also increase in demand of co-paid ACTs. Appropriate malaria case management among healthcare providers was very high, as much as 96.9% was recorded. Challenges encountered were mostly inaccessibility and unavailability of co-paid ACTs especially at points of sale. Respondents at Kpone-on- sea after two years of post implementation are of the opinion that the AMFm was well implemented and effectively coordinated.

5.7. Limitations of the study

Limitations of this study includes absence of some of the respondents and facilities which participated during the implementation process of the AMFm initiative program and date of malaria case management training organized by the different organizations was also not available. These could have provided additional information to support the implementation of AMFm initiative program during that period. However, enough information was obtained to answer the objectives.

CHAPTER SIX

6.0.CONCLUSION AND RECOMMENDATION

Marketing of the AMFm initiative to ensure awareness about the co-paid ACTs yielded a high demand of the co-paid ACTs. The implementation of the AMFm program resulted in increased purchase of co-paid ACTs at point of sales, higher patronage by customers and greatly influenced types of antimalaria stocked. The type of antimalarials recommended by the LCS/CP and antimalaria dosage regimen indicated they were knowledgeable and aware of the AMFm initiative program. Hence, knowledge and perception about AMFm mechanism showed a successful awareness at Kpone-on-sea.

Malaria case management training organized prior to AMFm implementation was also beneficial. This important knowledge acquired broadened the knowledge of respondents in malaria prevention and control and on antimalarial drug dispensation. Although, the AMFm initiatives and the co-paid ACTs objectives were not really emphasized during the malaria training. Therefore, it can be said that technical knowledge gained via training enhanced personnel performance of healthcare providers in general drug dispensation.

The affordability of the co-paid ACTs and high demand from customers resulted to a regular stocking of the co-paid ACTs indirectly impacting their individual businesses. Unexpectedly, stocking of the co-paid ACTs was not among the main challenges mentioned. The major challenge was that co-paid ACTs were not readily available and accessible. The training received prior to the implementation of the AMFm program and the awareness greatly reduced both purchase and sales of monotherapy.

In general, the AMFm initiative/co-paid ACTs implementation was effectively organized and well implemented.

Recommendation

The accessibility and the availability of the co-paid ACTs particularly at point of sales should be improved upon in subsequent phases of the AMFm innovative programs. This could be done by ensuring a sustainable finance mechanism, increasing the financing mechanism and strengthening the reliable supply system. It will keep the demand/supply chain of the co-paid ACTs at a constant pace. Also, if this medicine is readily available and accessible, it makes purchase very easy and will prevent stock outs.

The identification and authentication of the co-paid ACTs should be worked upon before supplying the market via various channels. An authenticated code should be encouraged to be designed on the blisters of the co-paid ACTs as this would further help in proper identification and authentication of the medicine.

Subsequent malaria case training management should lay emphasizes on the objectives of the AMFm innovative mechanisms in its continuous phases as this would further strengthen the awareness of the initiative and more people would be reached via this means.

Further studies should be done at Kpone-on-sea, taking into consideration a larger sample size consisting of the target groups which are the parent of children of less than 5 years, the health care officials at the government hospital that were involved during the implementation and the companies involved in co-paid ACTs supply at the Kpone-on-sea.

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APPENDICES

Appendix 1

GHANA HEALTH SERVICE ETHICAL REVIEW COMMITTEE

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

My Ref. :GHS-ERC: 3
Your Ref. No.

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

2nd July, 2014

Woranola Ibukunoluwa Olatoyosi,
School of Public Health
University of Ghana
Legon

ETHICAL APPROVAL - ID NO: GHS-ERC 27/04/14

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

"Evaluation of the Implementation of the Affordable Medicines Facility for Malaria (AMFm) Project at Kpone-on-Sea, Ghana"

This approval requires that you inform the Ethical Review Committee (ERC) when the study begins and provide Mid-term reports of the study to the Ethical Review Committee (ERC) for continuous review. The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Please note that any modification without ERC approval is rendered invalid.

You are also required to report all serious adverse events related to this study to the ERC within seven days verbally and fourteen days in writing.

You are requested to submit a final report on the study to assure the ERC that the project was implemented as per approved protocol. You are also to inform the ERC and your sponsor before any publication of the research findings.

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

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

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

Appendix 2: Variables and functional definition

Knowledge on AMFm

- Assessed based on the marketing of the program to create awareness through information, education and communication ofthe main objectives of the AMFm which are the co-paid ACTs identification, co-paid ACTs affordability, co-paid ACTs accessibility and availability and discouragement of monotherapy usage.
- Assessed based on the training on malaria case management. This was a training prior to the implementation AMFm, aimed at training dispensers and prescribers on how to effectively manage complicated and uncomplicated cases of malaria.

Perception on AMFm

- Explored the views and thoughts of the licensed chemical sellers/community pharmacists on the awareness and malaria training of the AMFm. This was towards co-paid ACTs identification, co-paid ACTs affordability, co-paid ACTs accessibility co-paid ACTs availability and discouragement of monotherapy usage.

a. Identification: it was based on the AMFm green leaf-logo placed on the co-paid ACTs.
b. Affordability: it was based on the amount of co-paid ACTs and the ability of the licensed chemical sellers and community pharmacists to be able to purchase it.
c. Availability: it was based on the constant presence of the co-paid ACTs at designated point of sales.
d. Accessibility: it was based on the geographical location of premises selling co-paid ACTs and financial ability of the licensed chemical sellers/community pharmacists to get the co-paid ACTs.
e. Adherence to malaria case management: it was based on how the licensed chemical sellers and community pharmacists strictly adhere to the treatment guidelines provided during malaria case management.
f. Monotherapy usage: it was based on reduction of purchase of artemisinin monotherapy with respect to that premises.

Appendix 3: Sample Informed consent Form

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Email: ibuksibk@yahoo.com.au

General information about the research

The research seeks to evaluate the implementation of the Affordable Medicines Facility for malaria (AMFm) as carried out in your community 2 years ago. The pilot phase of the AMFm project was implemented in Ghana in 2010. It was designed to run for 2 years. The objective of the program was to ensure the availability and affordability of the Artemeter combination therapies in both public and private sector, and to discourage the use of monotherapy. The private sector was the Community Pharmacies and the Licensed Chemical Sellers. It was gathered during the preliminary findings on the impact of the private sector in implementing the AMFm as majority of the people deals with the private first before the public. The achievements made during the implementation as recorded by the Pharmacy Council monthly monitoring reports indicated that the cost of adults ACTs decreased considerably from the pre-AMFm prices. Awareness of the availability of the AMFm ACTs also increased while the availability of the medicine achieved a higher percentage.

Challenges faced during the implementation was to adjust the existing operational systems to accommodate the principles and practice of the AMFm program towards achievement of its goals, fear of continuity of the program, lost of usual profit from business, low purchase of non-AMFm ACTs medicines and so on.

However, there is need to assess the pilot phase after 2 years of implementation by assessing the various activities/interventions of the program and its outcome.

Possible risks and Discomforts

Description of risks

This study poses minimum risk to participants. Interviews will relate to the knowledge and experience of the participants as it relates to the AMFm program.

Description of measures to minimize risks

Participants may decline to answer any question or discuss any topic that they do not wish to discuss. In addition, the researcher will continuously remind the participant of their ability to decline participation at any point. The person conducting the interview will be trained in moderating and interviewing skills when dealing with such topics.

Possible benefits

Description of possible benefits

There will be no direct benefit to respondents. However, the information they provide will contribute to the furtherance of the AMFm initiative.

Confidentiality

Data Security

All study materials (questionnaire, informed consent form, key informant interview guide) will be locked in the office of the investigator. Data that will be electronic files will be made accessible only to the researcher.

Plans for Record Keeping

Study materials (questionnaire, informed consent form, key informant interview guide) will not be labeled and interviews will be given a unique study identification number for each study participant.

Person Responsible and Telephone Number

The person responsible for data storage will be Woranola Ibukunoluwa Olatoyosi, Investigator, of the School of Public Health, Legon. Tel: 0236700678

Where Data Will Be Stored For Security

During data collection, all materials related to the study will be stored in locked cabinet in the Investigator's office.

Who will have Access to the Data?

Only members of the research team (Investigator, and assistants) will have access to the data.

Compensation

Eligible persons who consent to participate in this study will not be given any monetary compensation.

Voluntary Participation and Right to Leave the Research

Potential study participants will be told that participating in the study is entirely voluntary, and that declining to enter the study, declining to answer a question or terminating the interview will have no negative consequence.

Contacts for Additional Information

Please call the person responsible for this study in your community, Woranola Ibukunoluwa Olatoyosi, 0236700678, if you have questions about the study.

ERC ADMINISTRATOR

HANNAH FRIMPONG

02423235225

Volunteer agreement

The above document describing the benefits, risks and procedures for the research title (Evaluation of the Implementation of Affordable Medicine Facility for malaria at Kpone-on-sea) has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I consent voluntarily to participate as a subject in this study and understand that I have the right to withdraw from the study at any time. I agree to participate as a volunteer.

_____ _____

Date Signature or mark of participant

If volunteer cannot read the form themselves, a witness must sign here:

I was present while the benefits, risks and procedures were read and explained to the volunteer. All questions were answered and the volunteer has agreed to take part in the research.

_____ _____

Date Signature of Witness

I certify that the name of the nature and purpose, the potential benefits, and possible risks associated with participating in this research have explained to the above individual.

_____ _____

Date Signature of Person Who Obtained Consent

Appendix 4: QUESTIONNAIRE FOR THE LICENSED CHEMICAL SHOPS (LCS) AND COMMUNITY PHARMACIES AT KPONE-ON-SEA

1. Personal Characteristics of Licensed Chemical Seller/Pharmacist			
NO	**QUESTION**	**RESPONSE/CODING**	
Q1	Name of the premise		
Q2	Designation of respondent	1 Licensed Chemical Seller 2 Pharmacist 3 Other/Specify_____	
Q3	Highest Level of education attained	1 None 2 Primary 3 Middle/JSS 4 Tertiary 5 Others/specify……	
Q4	Do you own this shop?	1 Yes 2 No	
Q5	How long have you worked as a LCS/pharmacist in this community?	[…….] Days […….] Months […….] Years	
Q6	What is your relationship to the owner of this shop? ***(If not the owner of the shop)***	1 Employer 2 Father 3 Mother 4 Sibling 5 Other family relative 6 Other _____	
Q7	How long have you been employed in this shop?	[…….] Days […….] Months […….] Years	
2. Characteristics of LCS/Pharmacy Shop			
Q8	Hoursofdailyoperation	**Weekdays**……Hours**Weekends**…. Hours	
Q9	How many people work in your premise?	Number of workers ……	
Q10	What is the highest level of education of your staff?	1 None 2 Primary 3 Middle/JSS 4 Tertiary 5 Other/Specify……	
Q11a	Is this shop registered with the National Health Insurance Scheme?	1 Yes 2 No***(if no, skip to Q12)***	
Q11b	When did they register with NHIS?	1 …….. Day …….. Month …… Year 2 Don't remember	
Q12	How would you rate your customer patronage in this community?	1 Low (How, please explain?.....	

		..... 2 Medium (How, please explain?..... ..... 3 High (How, please explain?.....	

3. Stock Management			
Q13	How often do you stock your medicines (during the programme and now)?	1 Daily 2 Weekly 3 Monthly 4 When out of stock 5 Other/specify	
Q14	Which of these medicinesdo you restock often/ mostly?	1 Antimalarials 2 Over the counter 3 Antihypertensive 4 Antidiabetic 5 Others/Specify…… …	
Q15	With respect to the above question, when do you restock these 'medicines' you have mentioned?	1 Daily 2 Weekly 3 Monthly 4 When out of stock 5 Other/specify……	
Q16	For the antimalarials, does the AMFm/green leaf logo ACTs belong to the category of the most stocked up medicines in your facilities (during the program and presently)	1 Yes 2 No**If No skip to Q18**	
Q17	Based on your experience, what do you think are the reasons for re-stocking of the green leaf or AMFm co-paid ACTs?	**Before** **(Tick all that apply)** 1 Affordability(due to the reduced price) 2 Increase in demand 3 Availability (readily available) 4 Accessibility (location of purchase) 5 Effectiveness of the co-paid ACTs (treat malaria and no complain from the customers) 6 If other/specify…… … **During** **(Tick all that apply)** 1 Affordability(due to the reduced price)	

		2 Increase in demand 3 Availability (readily available) 4 Accessibility (location of purchase) 5 Effectiveness of the co-paid ACTs (treat malaria and no complain from the customers) 6 If other/specify…… … **After** **(Tick all that apply)** 1 Affordability(due to the reduced price) 2 Increase in demand 3 Availability (readily available) 4 Accessibility (location of purchase) 5 Effectiveness of the co-paid ACTs (treat malaria and no complain from the customers) 6 If other/specify…… …	

Q18	Were there challenges you encountered in 'stocking up these green leaf logo 'during the implementation of the AMFm?	1 Yes 2 No**If No Skip to Q20**	
Q19	What were the challenges?	**(Tick all that apply)** 1 Price margin 2 Not always available at designated places of purchase 3 Complain from customers as a result of ineffectiveness 4 Demand from the people exceeds supply from sponsors of the program 5 Others/specify	
Q20	Generally, how would you rate the influence of AMFm implementation program with regards to your stock management with respect to the antimalaria	1 beneficial (improvement in profit due to increase in stocking up) 2 non beneficial (reduction in profit) 3 neutral	
Q21	In the case of the monotherapy, how would you rate its purchase?	**Before the implementation Program** 1 Low 2 neutral/no change	

		3 High 4 Others/Specify…… **After the implementation Program** 5 Low 6 neutral/no change 7 High 8 Others/Specify……	
Q22	Do you think the purchase of monotherapy affected the stocking or purchase of the green leaf logo ACTs?	1 Yes 2 No***(if no skip to Q24)***	
Q23	If yes, how?	1 Increased 2 Reduced 3 Neutral	

8.1 Malaria case Management Training			
Q24	Have you ever participated in any malaria training program?	1 Yes 2 No***(if no, skip to Q31)***	
Q25	Who took you through the training?	1 Collaboration of Pharmacy Council 2 National Malarial Control Program 3 My Boss 4 Some companies. 5 The one organized while in school 6 Others/specify	

Q26	What did you learn during the training program?	***(tick all that apply)*** 1 prevention and control of malaria infection 2 signs and symptoms of malaria infection (complicated and uncomplicated) 3 effective treatment of uncomplicated malaria infection 4 referral of complicated/severe case of malaria infection, 5 Others/specify…… ……	
Q27	Did you correctlyapplytheknowledgerecei vedfrom themalaria management trainingeachtime youhave amalaria case tohandle?	1 Yes 2 No***(if no, skip to Q29)***	
Q28	If yes, how would you explain it	***tick all that apply*** 1 I ask(ed) for the signs and symptoms the customer has 2 I counsel(ed) on discouragement of	

		monotherapy use 3 I recommend(ed) a combination therapy preferably an ACT 4 I inform(ed) the customer about the AMFm initiative and the co-paid ACTs. 5 I counsel(ed) on dosage regimen 6 I advised on prevention and control of malaria infection 7 Others ……	
Q29	How would you assess the malaria case management training?	1 Beneficial 2 Neutral 3 Not Beneficial	
Q30	In one sentence explain your answer in Q29		

4.2 Awareness of AMFm initiatives and co-paid ACTs			
Q31	Were you aware of the AMFm program and the co-paid ACTs that took place in your area?	1 Yes 2 No***(if no end the interview)***	
Q32	What was your source of awareness?	***Tick all that apply*** 1 advertisement from the media (radio and television stations) 2 the officials of the program themselves 3 my colleague (another shop owner/pharmacist) 4 Pharmaceutical representative 5 publicity materials such as T-shirts, danglers, posters 6 customers demand/ information 7 Others/specify……	
Q33	How long did the awareness last?	1 Days 2 weeks 3 months 4 Others/specify……..	

Q34	Do you think the awareness of the program or initiative influenced the public on antimalaria purchase particularly the co-paid AMFm ACTS or ACTs with green leaf logo (in your premise)	1 Yes 2 No	
Q35	How did it influence it?	**(Please tick all that apply)** 1 higher patronage 2 higher stocking of ACTs with green leaf logo 3 inquiry of antimalaria by customers especially the green	

		leaf logo ACTs 4 Others specify…… ……	
Q36	Whatinformation do you give to your customers about the AMFminitiative and co-paid ACTs (In your premise)	***(please tick all that apply)*** 1 co-paid ACTs identification (the green leaf logo) 2 Price 3 Affordability 4 co-paid accessibility 5 co-paid availability 6 others/specify	
Q37	What do you remember from the awareness or the main message of the awareness?	1 co-paid ACTs identification (the green leaf logo) 2 Price 3 Affordability 4 co-paid accessibility 5 co-paid availability 6 others/specify	
Q38	Do you think the awareness has impacted your business?	1 Yes 2 No***(if no, skip to Q41)***	
Q39	If yes, how has awareness impacted your business?	***Tick all that apply*** 1 What antimalarials I stock at my shop 2 What antimalarials I recommend 3 Customer demand of antimalarials 4 Price tagged on the antimalarials 5 Where I get the antimalarials 6 None of the above 7 Other/specify_____	
Q40	Do you think the awareness on the AMFm initiatives and the co-paid ACTs was very effective?	1 Yes 2 No	
Q41	How would you assess or evaluate the implementation of the AMFm initiatives towards achieving its objectives generally?	1 Implementation was well organized and effectively deployed 2 Implementation was poorly organized and ineffective 3 Indifferent 4 others/specify	
Q42	What were the challenges you encountered during the implementation of the program?(in general terms)	***Tick all that apply*** 1 Complaints about identification of co-paid ACTs 2 Stock management 3 Unavailability of co-paid ACTs	

		4 Inaccessibility of co-paid ACTs 5 Affordability of co-paid ACTs 6 Poor product packaging 7 Poor patronage 8 Insistence by customer for monotherapies due to ineffectiveness of the green leaf logo ACT 9 Profit margin of the co-paid ACTs 10 Others/specify……..	
Q43	In one sentence, what do you think is the most important action for improving malaria treatment in Ghana?		

Thank You