

**EVALUATING ACCESS TO ANTI-MALARIA MEDICINES AND QUALITY OF
SERVICE DELIVERY BY COMMUNITY PHARMACIES AND LICENSED CHEMICAL
SHOPS IN ASHANTI REGION, GHANA.**

By

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DECLARATION

The field work described in this thesis was carried out at the stated study area in the Ashanti region. This work has not been submitted for any other degree.

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ABSTRACT

In Ghana, most people seek primary healthcare from either their families, relatives or from the private pharmaceutical service providers (ie community pharmacies and licensed chemical shops) rather than from hospitals and clinics initially. Private pharmaceutical facilities are the main port of call for the management of uncomplicated in sub-Saharan Africa. However, often the course of treatment given is sub-optimal.

The objectives of the study were to assess the stocks of anti-malarials in private pharmaceutical service provider' facilities and their operating hours, the quality assurance procedures available in the facilities, their knowledge in malaria control and to evaluate the study communities'(Kumasi Metropolitan (KMA) and Obuasi Municipal (OMA) Assemblies) health seeking behavior and their level of awareness in malaria control.

Two complementary studies, the Drug Availability Study (DAS) and the Drug Use Study (DUS) were employed to determine the degree to which the medicines recommended for the treatment of malaria are available and used.

Four data collection techniques were used namely; structured interviews, simulated client interviews, Focus Group Discussions (FGDs) and document reviews.

The mystery clients posed either as caretakers of children under-5 years, pregnant women, or adults all presenting signs of clinical malaria in all the fifty (50) pharmaceutical facilities sampled. In addition, key informant semi-structured interviews were conducted to ascertain their views about the study.

The knowledge and practices of staff of pharmacies and LCS shops in malaria control was generally acknowledged to be inadequate and not consistent with the current Anti-Malaria Drug Policy (AMDP). Ninety four (94%) percent of community pharmacies and 28% of LCS shops had the recommended anti-malaria medicines available in their facilities. 53% of LCS shops had Sulphadoxine-Pyrimethamine (SP) as the only anti-malaria medicine in their facilities. None of the LCS Shops managed mystery client with uncomplicated malaria according to the policy whilst 47% of community pharmacies did manage according to policy. Only 25% and 28% of LCS shops and community pharmacies respectively discussed malaria prevention with mystery clients. Also, 19% of LCS shops and 6% of community pharmacies respectively promoted ITNs use to mystery clients. However, only 3% of LCS and none of the community pharmacies gave instruction on the use of the ITNs offered to the client. Besides, none of the facilities enquired about the malaria immune status of the client. Regular and comprehensive training of all staff of pharmacies and licensed chemical shops in malaria control presents a feasible strategy for achieving significant improvements in malaria control considering their large numbers and extensive distribution in almost every community or village in Ghana

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TABLE OF CONTENTS

DECLARATION	II
ABSTRACT	II
ACKNOWLEDGEMENT	IV
TABLE OF CONTENTS	V
LIST OF TABLES.....	VII
LIST OF FIGURES	VIII
ABBREVIATIONS	IX
CHAPTER 1	1
INTRODUCTION.....	1
1.1 PREVALENCE OF MALARIA	2
1.2 OVERVIEW OF MALARIA IN GHANA	3
1.3 ACCESS TO ANTI-MALARIA MEDICINES	5
1.4 QUALITY OF PHARMACEUTICAL SERVICE DELIVERY IN MALARIA CONTROL	6
1.5 DESCRIPTION OF PHARMACEUTICAL SERVICE PROVISION IN GHANA	7
1.6 JUSTIFICATION OF RESEARCH.....	9
1.7 AIM.....	9
1.8 OBJECTIVES.....	9
1.9 RESEARCH QUESTIONS.....	10
CHAPTER 2 METHODOLOGY	11
2.1 STUDY DESIGN	11
2.2 DEVELOPMENT OF QUESTIONNAIRE	11
2.3 INTERVIEWER SELECTION AND TRAINING	12
2.4 SAMPLING METHODOLOGY	12
2.5 METHODS AND ASSESSMENT COMPONENTS	14
2.6 DATA COLLECTION, PROCESSING AND ANALYSIS	16
2.7 ETHICAL ISSUES.....	18
CHAPTER 3 RESULTS AND ANALYSIS	19
3.1 DISTRIBUTION AND CHARACTERISTICS OF RESPONDENTS	19
3.2 ACCESS TO ANTI-MALARIA MEDICINES.....	20
KEY	21
3.3 QUALITY OF SERVICE DELIVERY IN MALARIA CONTROL	22
3.3.1 REGRESSION ANALYSIS OF THE QUALITY OF SERVICE DELIVERED	23
3.4 QUALITY ASSURANCE	24
3.5 REGULATION AND MONITORING	26
3.6 KEY INFORMANT SEMI –STRUCTURED INTERVIEW	29
3.7 FOCUS GROUP DISCUSSION ANALYSIS	31
CHAPTER 4 DISCUSSION	35
4.1 ACCESS TO ANTI-MALARIA MEDICINES.....	35
4.2 QUALITY OF PHARMACEUTICAL SERVICE DELIVERY IN MALARIA CONTROL	36
4.2.1 Knowledge of pharmaceutical service providers in malaria control	36
4.2.1.1 <i>Apropriate indication</i>	37
4.2.1.2 <i>Adequacy of information to clients</i>	37
4.2.1.3 <i>Preventive care</i>	38
4.2.1.4 <i>Test for Significance of Estimates</i>	38
4.2.2 <i>Quality assurance procedures existing in the facilities</i>	39
4.2.2.1 <i>Participation in training programmes</i>	40
4.2.3 <i>Regulation and monitoring</i>	41
4.3 STUDY LIMITATIONS	42

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS	43
5.1 CONCLUSION	43
5.2 RECOMMENDATIONS	44
REFERENCES	45
APPENDIX	49
I. <i>PHARMACEUTICAL SERVICE PROVIDER SIMULATION GUIDE</i>	49
II. <i>PHARMACEUTICAL SERVICE PROVIDER STRUCTURED INTERVIEW TOOL</i>	51
III. <i>FOCUS GROUP DISCUSSION GUIDE</i>	56
IV. <i>KEY INFORMANT SEMI STRUCTURED INTERVIEW GUIDE</i>	57

LIST OF TABLES

Table 1-1 Distribution of pharmacies and licensed chemical shops in Ashanti Region as at December, 2007.....	8
Table 2-1 Distribution of pharmaceutical facilities in the study populations.....	12
Table 2-2 Sample Size Distribution.....	13
Table 2-3 Frequency distribution of scenarios in facilities.....	14
Table 2-4 Indicators used to evaluate access to quality pharmaceutical services.....	17
Table 3-1 Number and type of facility that took part in the study.....	19
Table 3-2 Regression Coefficients.....	23

LIST OF FIGURES

Figure 1-1 Private sector licensed pharmaceutical service facilities in Ghana, regional distribution as at December, 2007	8
Figure 3-1 Proportion of facilities providing adequate access to anti-malarials.....	20
Figure 3-2 Anti-malarials available in facilities	21
Figure 3-3 Quality of service delivered by facilities	22
Figure 3-4 Quality assurance preparedness of facilities	24
Figure 3-5 Type of complaints received by facilities	25
Figure 3-6 Institutions supervising activities in facilities	26
Figure 3-7 Institutions supplying complaint forms to facilities	27
Figure 3-8 Frequency of supervisory visits to facilities.....	28

ABBREVIATIONS

LCS.....	Licensed chemical seller
MCA.....	Medicine Counter Assistant
PC.....	Pharmacy Council
FDB.....	Food and Drugs Board
NMCP.....	National Malaria Control Programme
PH/MHB.....	Private Hospitals and Maternity Homes Board
KATH.....	Komfo Anokye Teaching Hospital
AA.....	Artesunate-Amodiaquin
AL.....	Artemether-Lumefantrine
DHAP.....	Dihydroartemisinin-Piperaquine
Q.....	Quinine
AM.....	Amodiaquin
AT.....	Artesunate
DHA.....	Dihydroartemisinin
AR.....	Arthemeter
HF.....	Halofantrine
CQ.....	Chloroquine
SP.....	Sulphadoxine-Pyrimethamine
ITNs.....	Insecticide Treated Nets
GHS.....	Ghana Health Service
GPRS.....	Ghana Poverty Reduction Strategy

WHO.....World Health Organization
OPD.....Out Patient Department
AMDP..... Anti-Malaria Drug Policy
GDP.....Gross Domestic Product
DALYs.....Disability Adjusted Life Years
DAS.....Drug Availability Study
DUS.....Drug Use Study
ACTs.....Artemisinin based Combination Therapies
KMA.....Kumasi Metropolitan Authority
OMA.....Obuasi Municipal Assembly
CE.....Continuing Education
CPD.....Continuous Professional Development
NPC.....National Pharmacovigilance Centre

Chapter 1

INTRODUCTION

The sixth goal of the Millennium Development Goals is to combat HIV/AIDS, malaria and other diseases by 2015¹. These infectious diseases often overburden public health care services, and also poor access to facilities is a recognized impediment to the provision of early treatment in developing countries, especially in sub-Saharan Africa².

Malaria is a major public health problem, killing at least one million people each year, mostly in sub-saharan Africa³. Given the high global burden of young childhood disease and deaths attributed to malaria^{4,5}, early effective treatment of childhood fevers has become a main focus within global and national malaria control strategies⁶⁻⁸. Therefore current strategies to combat malaria, led by the World Health Organization's "Roll Back Malaria" initiative, include early and effective treatment⁹.

Such strategies highlight the role of private medicine retailers to promote early effective home treatment of childhood malaria in endemic settings⁷. More recently, the introduction of Artemisinin-based Combination Therapy (ACT) as first line treatment for malaria in many countries in sub Saharan Africa has led to debate on the role of community-based mechanisms for delivery of malaria treatments^{7,8}. Community-level interventions to strengthen home management of children with fever are gaining importance as part of efforts to improve access to prompt treatment, particularly in isolated rural areas. However the coverage of these malaria control strategies have been constrained by limited geographical and financial access to basic health services, inadequate quality of health services in both public and clinical care services, inadequate funding of health services, and

poor community, intersectoral and private sector participation¹⁰. Treatment is further compromised by the widespread use of anti-malarial drugs for all fevers and by incorrect dosing.

Pharmaceutical “access” is the timely availability within varied physical and economic conditions of quality pharmaceuticals to those patients that need them. Many factors determine the level of access: appropriate use, supply management, infrastructure conditions, economic issues, legislation and regulation, manufacturing and research and development decisions.

Access is determined by:

- Accessibility (Physical or geographical access)
- Affordability (financial access which is linked to equity)
- Acceptability (Linked to health seeking behavior)
- Appropriate use of a drug for a defined condition (linked to rational drug use)

Expanding access to essential medicines is a process that requires the participation and support of a range of stakeholders beginning with the government and extending to the private sector.

1.1 PREVALENCE OF MALARIA

Malaria is a public health problem in more than 90 countries. Each year, between 300 and 500 million new cases are reported worldwide¹¹. According to the Roll Back Malaria Campaign of the World Health Organization (WHO), 90 percent of the more than one

million deaths worldwide caused by malaria every year take place in Africa, and malaria constitutes 10 percent of the continent's overall disease burden^{11,12}. In Africa south of the Sahara, malaria accounts for approximately 15% of deaths in children under five years of age and most of these occur in rural areas which have poor access to health care services^{12,13}.

1.2 OVERVIEW OF MALARIA IN GHANA

Malaria is hyper-endemic in all parts of Ghana with all the twenty two million population at risk. Transmission occurs all year round with slight seasonal variations during the rainy season from April to July. There is marked seasonal variation in the northern parts of Ghana where there is a prolonged dry season from September to April. Over the period 2003 to 2006 between 3.1 and 3.5 million cases of clinical malaria were reported in public health facilities each year, of which over 900,000 cases were of children under-five years¹⁴

The malaria burden is a challenge to human development. It is both a cause and consequence of under-development. In Ghana, malaria is the number one cause of morbidity accounting for about 37.5% of all outpatients (OPD) attendance¹⁴. It is estimated to cause the loss of about 10.6% Disability Adjusted Life Years (DALYs) costing an equivalent of about 3% of Gross Domestic Product (GDP) annually in economic burden¹⁴. Therefore, the Ghana Poverty Reduction Strategy (GPRS II) identifies malaria control as one of the key health sector interventions¹⁵.

Since 1998, Ghana has committed itself to the Roll Back Malaria (RBM) Initiative of the WHO which builds on the Global Malaria Strategy with a focus on Africa and the goal to reduce the world's malaria burden by fifty percent by 2010.

Ghana has also committed itself to the Abuja Declaration on Roll Back Malaria in Africa, which similarly seeks to achieve specific targets on malaria prevention and control. In 2005, Ghana adopted and implemented the WHO recommendation on the use of combination therapies containing artemisinin derivatives for all countries experiencing resistance to monotherapies in the treatment of *falciparum* malaria¹⁴.

Fixed dose artemisinin-based combinations were recommended for use in Ghana to encourage compliance. The recommended ACTs are; Artesunate-Amodiaquine, Artemether-Lumefantrine and Dihydroartemisinin-Piperaquine to provide a wider range of options for the management of uncomplicated malaria in Ghana.

In spite of these initiatives and programmes, malaria remains hyperendemic in Ghana and is the single most important cause of mortality and morbidity especially among children under five years, pregnant women and the poor.

In 2006, malaria accounted for 44.5 % of all outpatient illnesses, 36.9 % of all admissions, 9.4 % of pregnant women die from malaria and 13.2 % of all deaths in health facilities in Ghana¹⁴.

1.3 ACCESS TO ANTI-MALARIA MEDICINES

Medicines are essential to the delivery of health care in any given population or country. The absence or inadequate supply of medicines has always led to a loss of confidence in the health care system. Medicines are useful in promoting health, preventing and managing diseases but can be harmful when used inappropriately. The inappropriate use of medicines has medical and social implications and may exert undue financial burden on the health care system as well as on patients.

In regions of sub-Saharan Africa where malaria is endemic and public health facilities are not very accessible, about 50% to 80% of people first visit private drug outlets or practitioners for malaria treatment^{16,17} because private outlets are so numerous and are often unregistered, they are outside most governments' capacity to inform, update, monitor and regulate.

A baseline survey conducted by Health Partners Ghana titled Mobilise Against Malarial (MAM) in five districts in Ashanti Region found that the commonest anti-malarial medicines sold in the LCS shops were all mono-therapies¹⁸; Sulphadoxine-Pyrimethamine was reported as the most commonly held medicine by 82% of LCS, followed by Amodiaquine syrup (73.9%), and then Artesunate tablets (50.9%). Combination therapy of any form was sold less frequently in the LCS shops (Artemether-Lumefantrine in 37.9%); Artesunate –Amodiaquine (19.9%).

1.4 QUALITY OF PHARMACEUTICAL SERVICE DELIVERY IN MALARIA CONTROL

Monitoring and influencing the quality of private services is now recognized as a key component of effective malaria treatment¹⁹. However, as noted by a World Health Organization (WHO) study group, achieving rational prescribing in the private sector is "notoriously difficult" due to influences from patient demand, drug advertising and profit margins²⁰. In addition, the level of technical knowledge of private Clinics, Pharmacies and Licensed Chemical shops is often low.^{20, 21}

Even communicating new standards of diagnosis and treatment to private practitioners in developing countries poses immense challenges to governments with limited resources. Innovative approaches are needed to achieve higher quality private services without increasing significantly the burden or cost to governments.

In a study conducted by Buabeng et al (2007) on self-reported use of anti-malarial drugs and health facility management of malaria in Ghana²² 500 patients were diagnosed with malaria (17% had severe malaria, 8% had moderate to severe malaria and 75% had uncomplicated malaria). Furthermore the study found out that forty three percent (43%) of the respondents had taken anti-malarial drugs within two weeks prior to hospital attendance. Also the most commonly used anti-malarials by these patients were chloroquine (76%), sulphadoxine-pyrimethamine (9%), herbal preparations (9%) and amodiaquine (6%). The sources of these medicines were licensed chemical sellers (50%), pharmacies (21%), neighbouring clinics (9%) or "other" sources (20%) including left-

over medicines at home. One hundred and sixty three (77%) of the 213 patients who had used anti-malarial drugs prior to attending the health facilities, used the drugs inappropriately.

1.5 DESCRIPTION OF PHARMACEUTICAL SERVICE PROVISION IN GHANA

Pharmaceutical service delivery in Ghana is carried out by both the public and private sectors. The public sector pharmaceutical service is delivered mainly through the Ghana Health Service (GHS) which is responsible for the provision of health services throughout the country.

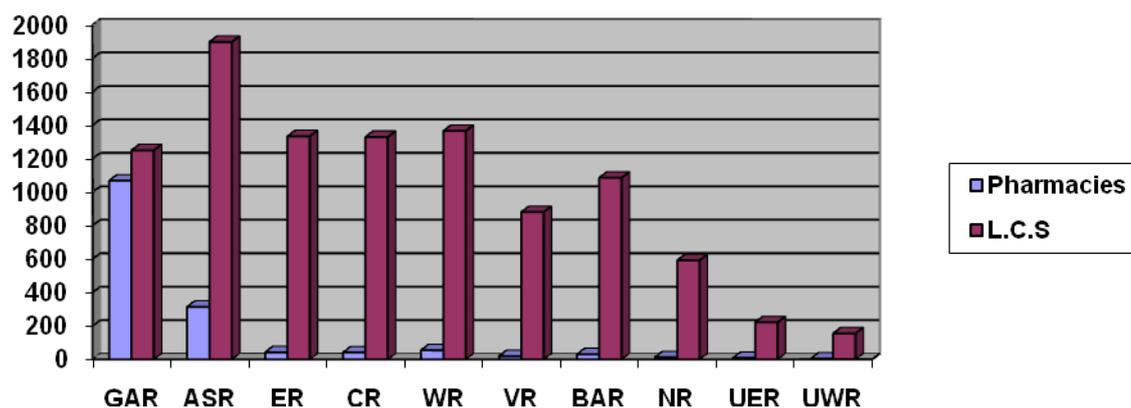
The private sector provides pharmaceutical services mainly through pharmacies and licensed chemical shops which are licensed and regulated by the Pharmacy Council.

The pharmaceutical care team comprises;

1. Pharmacists
2. Pharmacy Technicians
3. Licensed Chemical Sellers
4. Medicines Counter Assistants

By law, there are only two types of facilities where pharmaceutical services could be accessed in Ghana; namely pharmacies and LCS shops.²³

Ghana has an estimated 10,106 licensed chemical shops and 1,592 pharmacies (Figure 1-1) distributed throughout the country and account for over 50% of pharmaceutical services in Ghana²⁴.



Source: Pharmacy Council, December, 2007

Figure 1-1 Private sector licensed pharmaceutical service facilities in Ghana, regional distribution as at December, 2007

Table 1-1 Distribution of pharmacies and licensed chemical shops in Ashanti Region as at December, 2007

ASSEMBLY/ DISTRICT	NO. OF LCS	NO. OF P'CIES	ASSEMBLY/ DISTRICT	NO. OF LCS	NO. OF P'CIES
Adansi East	30	2	Atwima	194	7
Obuasi (OMA)	104	8	Bosomtwe/Atwima/Kwa	114	1
Afigya sekyere	82	1	Ejisu Juaben	90	3
Ahafo Ano North	35	1	Ejura /Sekyere Dumasi	34	1
Ahafo Ano South	45	1	Kumasi (KMA)	510	274
Amansie East	78	1	Kwabre	123	5
Amansie West	69	-	Offinso	68	1
Asante Akim North	68	4	Sekyere East	66	2
Asante Akim South	41	-	Sekyere West	64	2
SUBTOTAL	634	18	SUB TOTAL	1,263	296
TOTAL				1,897	314

(Source: Pharmacy Council Gazette for pharmaceutical facilities as at December, 2007)

1.6 JUSTIFICATION OF RESEARCH

In Ghana, most people seek primary healthcare from their families and relatives or from the private pharmaceutical service providers (ie pharmacies and licensed chemical shops) rather than from hospitals and clinics initially²⁵. To date, little research has been done to document the extent to which the services provided results in effective medication dispensing with accurate counselling free of provider biases and provider-imposed barriers hence the need for this study to evaluate access to anti-malaria medicines and service quality in pharmacies and licensed chemical shops.

1.7 AIM

To evaluate access to anti-malaria medicines and the quality of services provided by pharmacies and licensed chemical sellers

1.8 OBJECTIVES

1. To evaluate access to anti-malaria medicines by the general public.
2. To evaluate the pharmaceutical skills possessed by the service providers
3. To identify and assess regulatory gaps in-order to make appropriate recommendations to the relevant drug regulatory bodies. (Pharmacy Council and the Food and Drugs Board)

1.9 RESEARCH QUESTIONS

Access to anti-malarial medicines and services

- ◆ Where does the general public obtain their anti-malarial medicines?
- ◆ How long does it take the general public to obtain their anti-malarials when needed?
- ◆ What types of medicines are being used for the treatment of malaria?
- ◆ Are medicines supplied and/or used according to approved and appropriate indication?
- ◆ Are the doses, frequency, duration and routes of administration appropriate for the indication stated?

- ◆ Does the public receive adequate information on the possible side effects, precautions and warnings on the medications received and used?
- ◆ Are consumers receiving counselling and appropriate guidance regarding preventive care?
- ◆ Are medicines dispensed appropriately labelled?

Chapter 2

METHODOLOGY

2.1 STUDY DESIGN

A descriptive study design was adopted and focused on both consumers and the pharmaceutical service providers. The study took place in two assemblies in the Ashanti Region of Ghana as follows; Kumasi Metropolitan Assembly (KMA) and Obuasi Municipal Assembly (OMA)

2.2 DEVELOPMENT OF QUESTIONNAIRE

Two sets of questionnaires were designed; a standardized questionnaire used to interview the respondents and another questionnaire filled by mystery clients immediately after simulation. Both questionnaires were made up of various sections designed to gather data on access to anti-malarials, service providers' knowledge of malaria, their treatment practices and the anti-malarials they give to clients based on their clinical presentations.

There are also sections on safety monitoring and evaluation, health promotion and disease prevention that pharmacies and chemical sellers provide to clients who come to them complaining of malaria.

2.3 INTERVIEWER SELECTION AND TRAINING

A two day training programme was held in Kumasi to train five research assistants recruited for data collection

During the training, the research assistants were taken through the objectives of the study, facts about malaria, seriousness of the malaria disease burden and its link to development, basic research skill and techniques of interviewing. The questionnaires were thoroughly reviewed during the training and translated into the various Ghanaian languages (ie. Twi and Hausa) spoken by the people in study area. On the second day of the training, a pre-test of the questionnaire was done after which the tools were modified.

The pre-test provided the opportunity for coding some of the open ended questions based on the responses received, it also brought to light the difficulty in locating the selected facilities.

2.4 SAMPLING METHODOLOGY

The two metropolitan assemblies (KMA and OMA) were purposively chosen because of the relatively high no of both pharmacies and licensed chemical shops. The other assemblies and districts had fewer or no pharmacies but only licensed chemical shops.

Table 2-1 Distribution of pharmaceutical facilities in the study populations

ASSEMBLY	NO OF P' CIES	NO OF LCS	TOTAL NO. OF FACILI.	POPULATION	FACILITY/ POPULATION RATIO
KMA	274 ^b	510 ^b	784	1,170,270 ^a	1:1,492
OMA	8 ^b	104 ^b	112	238,440 ^a	1:2,128
TOTAL	282	614	896		

(SOURCE: a = Ghana Statistical Service 2000 Housing and Population Census

b = Pharmacy Council 2007 Gazette for Pharmaceutical Facilities)

A compiled list of pharmacies and licensed chemical shops in the assemblies selected was made available by the Pharmacy Council for sampling and interviews.

Facilities within the study population in each metropolis were stratified into “urban”, “peri urban” or rural based on their proximity to regional or municipal hospitals.

This stratification was intended to identify whether distance from regional or municipal hospitals had an effect on supply of medicines and the quality of pharmaceutical services provided.

In each stratum, a minimum of five facilities were selected randomly using the random numbers method. However, where the total number of each facility type was less than five all the facilities were selected to make a total sample size of fifty for the two assemblies.

Table 2-2 Sample Size Distribution

STRATUM	KMA		OMA	
	P'cies	LCS Shops	P'cies	LCS Shops
‘Urban’	5	5	4	5
‘Peri-Urban’	5	6	2	5
‘Rural’	2	7	-	4
SUB TOTAL	12	18	6	14
TOTAL SAMPLE SIZE			50	

2.5 METHODS AND ASSESSMENT COMPONENTS

a. *In-Depth Structured Interview*

Structured interviews were conducted with service providers, as well as people who dispensed or sold medications on their behalf.

The interviews sought to elicit information on the skills and knowledge of service providers in diagnosis, management, health promotion and disease prevention and also the availability of the requisite anti-malarial medicines in pharmacies and licensed chemical shops.

b. *Mystery Client study*

A mystery client study was conducted to provide information on the responses of pharmaceutical service providers when approached by patients.

Five mystery patients were trained and deployed to visit the sampled facilities in the study areas. They were given three clinical malaria scenarios and observed what the service providers did in each instant. Each of the sampled facilities had the opportunity to manage only one mystery client with one of the three scenarios.

Table 2-3 Frequency distribution of scenarios in facilities

Scenario	Facility Type		Total
	P'cies	LCS	
Child less than 5years with a history of 2 days fever and ear pain,	5	11	16
A pregnant woman with persistently raised body temperature which is not responding to paracetamol or	10	12	22
An adult with headache, chills and rigors.	3	9	12

Recruitment of the mystery clients took into account that mystery clients were credible, spoke the local language and had characteristics of the people in the study area.

c. ***Key informant interviews with stakeholders:***

In-depth interviews were conducted with selected stakeholders regarding their concerns and views on the following;

1. Access to anti-malaria medications and services
2. Opinion on services provided by pharmacies and licensed chemical shops
3. Perceived effect or impact on malaria control in Ghana
4. Lessons learnt and challenges identified.

Those interviewed included the Ashanti Regional Manager of the Pharmacy Council, the Ashanti/Brong Ahafo Zonal Head of the Food & Drugs Board, the Northern Zonal Head-NMCP and the Director of Pharmacy- KATH.

d. ***Focus Group Discussions (FGDs)***

The participants, predominantly females (aged between 25 – 50yrs) were purposively selected from the immediate communities where the service providers were sampled to include pregnant women and mothers with children less than 5yrs because of their role in under-5 mortality, malaria in pregnancy and home-based care in general. There was one adult male in each group

The sample size for each FGD was eight (8)

A FGD was held in each district at a location which provided much privacy and comfort as possible. A female facilitator whose age was within the sample age group was recruited and trained for the exercise.

2.6 DATA COLLECTION, PROCESSING AND ANALYSIS

Data collection started in October, 2008 in the two assemblies. The interviewers were instructed to conduct simulations before administering the structured interview in the same sampled facility.

Data collection took two months to complete because of the difficulty in locating the licensed chemical shops and also because of the fact that interviewers were to wait for mystery clients to visit the facility before they conducted the interview.

Qualitative data from interviews was transcribed after recording and data coding was used to capture the needed information. Basic frequencies were used to analyze the data generated to create a baseline data for further analysis.

The quality of service delivered by pharmacies and LCS shops was compared using regression analysis. The significance of estimates obtained were tested using the Standard Error Test $\{S(B_i)\}$ and the Coefficient of Determination (R^2).

1. Standard Error Test $\{S(B_i)\}$

$$H_0: B_i = 0$$

$$H_1: B_i \neq 0$$

Where H_0 is the null hypothesis, H_1 is the alternate hypothesis and B_i is the coefficient of the explanatory variable (Quality of service indicators used).

If $\{S(B_i)\} < B_{i/2}$ Reject H_0 Which implies that B_i is statistically significant

If $\{S(B_i)\} > B_{i/2}$ Do not reject H_0 Which implies that B_i is not statistically significant.

A result is statistically significant if it is unlikely to have occurred by chance.

2. Coefficient of Determination (R^2)

R^2 is a statistic which indicates the strength of fit between two variables. It is such that

R^2 is greater than zero and less than one ($0 < R^2 < 1$)

R^2 judges the explanatory power of the model used for the regression analysis. It also shows the percentage of the total variation in the dependent variable (Facility type) that can be explained by the variation in the independent variable (Quality of service indicators used)

Indicators for Evaluating Access to Anti-Malarial Medicines

Facilities with the requisite anti-malarials available

Facilities opened to the public throughout the week

Facilities with the responsible person present at the time of study.

Table 2-4 Indicators used to evaluate access to quality pharmaceutical services.

Objectives	Indicator	Method of measuring
Quality of service delivery by practitioners in malaria control.	Appropriate Indication = Percentage of pharmaceutical service providers referring mystery client with severe malaria in children less than five and malaria in pregnant women to the hospital and managing uncomplicated malaria cases according to the anti-malaria drug policy.	Simulated client interview
	Adequacy of information = Percentage of pharmaceutical service providers providing information on how and when medications should be taken, possible allergies, need for completion of full course of treatment and appropriate labelling	Simulated client interview
	Preventive care = Percentage of pharmaceutical service	Simulated client interview

	<p>providers providing counselling on malaria prevention, ITNs promotion and instruction on use of ITNs</p> <p>Quality Assurance = Percentage of pharmaceutical service providers who have copies of the revised Anti-Malaria Drug Policy (AMDP) and Adverse Drug Reactions (ADRs) forms or are even aware of the policy change.</p>	<p>Structured client interview</p>
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2.7 ETHICAL ISSUES

The sampled pharmaceutical service providers were formally written to informing them about the study and seeking their consent. They were assured that under no circumstances would their names be linked to the data during the analysis and reporting of study findings.

Chapter 3

RESULTS AND ANALYSIS

3.1 DISTRIBUTION AND CHARACTERISTICS OF RESPONDENTS

A total of fifty facilities took part in the structured interviews and simulations studies. Out of these, sixty percent (60%) were in the KMA and forty percent (40%) were from the OMA all in the Ashanti Region.

Table 3-1 Number and type of facility that took part in the study

Assembly	Frequency	Percent
KMA	30	60.0
OMA	20	40.0
Total	50	

Type of facility	Frequency	Percent
Licensed Chemical shops	32	64.0
Pharmacies	18	36.0

3.2 ACCESS TO ANTI-MALARIA MEDICINES

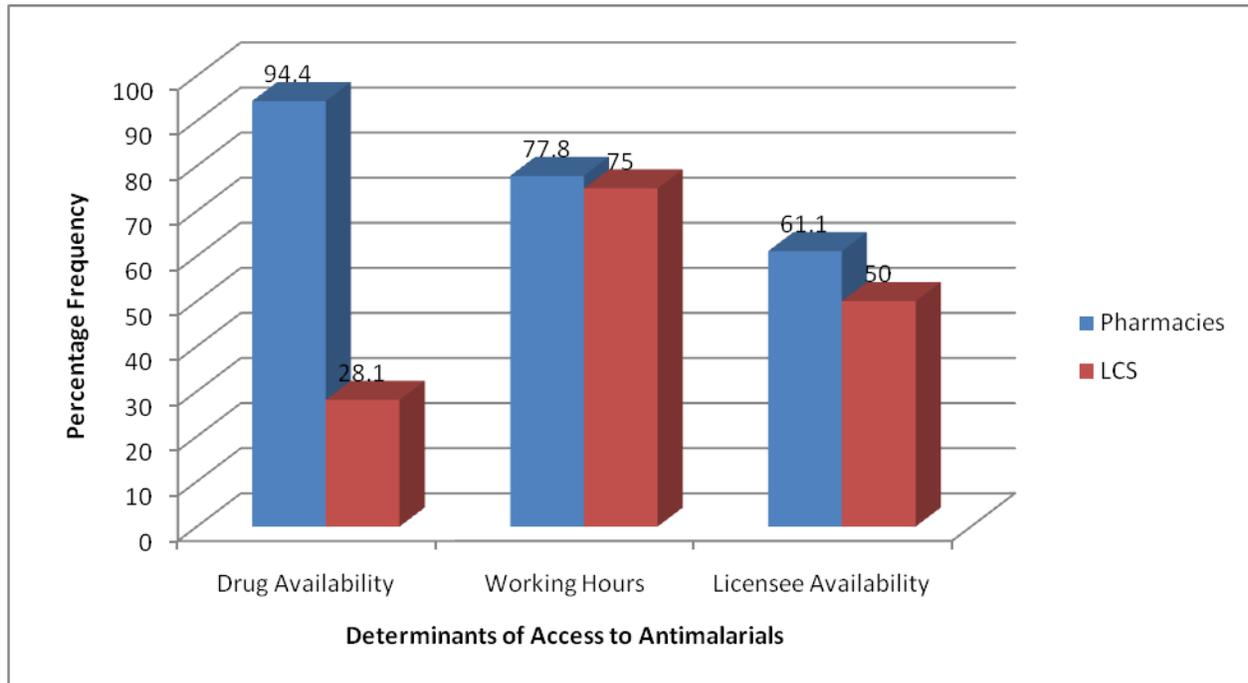


Figure 3-1 Proportion of facilities providing adequate access to anti-malarials

Majority of pharmacies (94.4%) had the recommended anti-malaria medicines available in their facilities whereas 28.1% of LCS shops did not. Most pharmacies (77.8%) and LCS shops (75%) were opened daily to the public and the availability of both pharmacist and the LCS was 61.1% and 50% respectively.

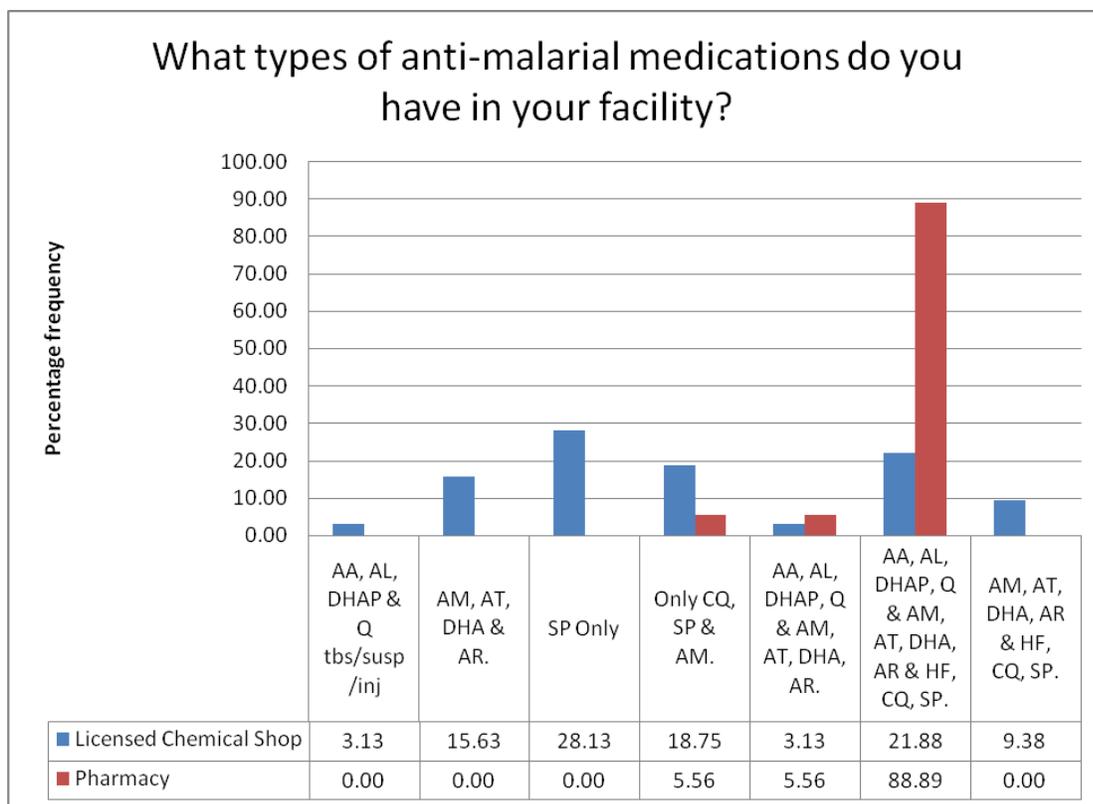


Figure 3-2 Anti-malarials available in facilities

KEY

AA - Artesunate-Amodiaquin, AL - Artemether-Lumefantrine, DHAP - Dihydroartemisinin-Piperaquine, Q – Quinine, AM – Amodiaquin, AT – Artesunate, DHA – Dihydroartemisinin, AR – Arthemeter, HF – Halofantrine, CQ – Chloroquine, SP - Sulphadoxine-Pyrimethamine.

All the pharmacies and 96.9% of LCS shops had stocks of anti-malaria monotherapies. Majority of LCS shops (72%) and minority of pharmacies (5.6%) had only monotherapies.

3.3 QUALITY OF SERVICE DELIVERY IN MALARIA CONTROL

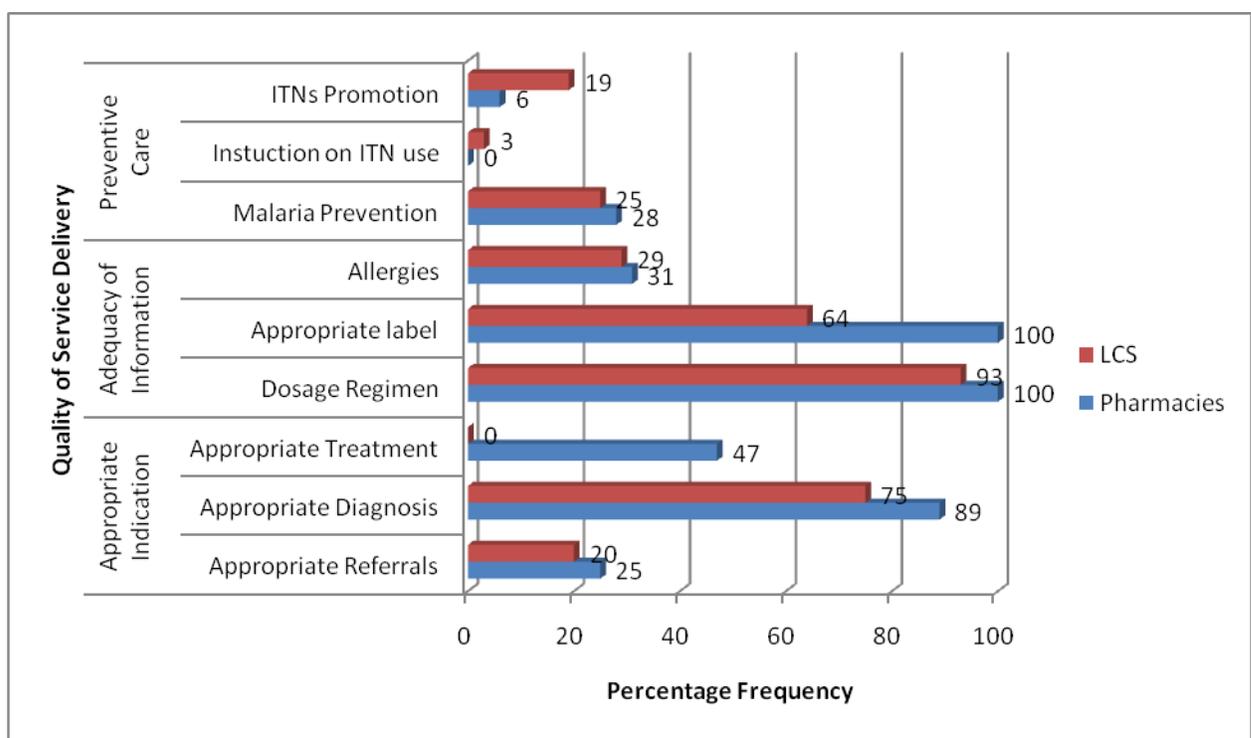


Figure 3-3 Quality of service delivered by facilities

47% of pharmacies treated simulated clients according to the anti-malaria drug policy whilst none of the LCS shops treated simulated clients according the AMDP.

All the pharmacies gave the simulated client appropriate dosage regimen and labeled their medications appropriately whilst 93% and 64% of LCS shops gave appropriate dosage regimen

and labeling respectively. 31% of pharmacies and 29% of LCS shops enquired about allergies in simulated client.

28% of pharmacies and 25% of LCS shops discussed malaria prevention with client whilst 6% of pharmacies and 19% of LCS shops promoted ITNs use to the client. However, only 3% of LCS shops gave instructions on the use of the ITNs whereas none of the pharmacies did.

3.3.1 REGRESSION ANALYSIS OF THE QUALITY OF SERVICE DELIVERED

Table 3-2 Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	Beta/2 (c)	Remarks If [a < c] = Sig [a > c] = Not Sig
	B	Std Error (a)	Beta (b)		
Did the provider ask about allergies?	0.218	0.148	0.391	0.1955	Sig
Were medicines dispensed appropriately labeled?	-0.267	0.128	-0.546	-0.273	Sig
Was malaria prevention discussed?	-0.356	0.206	-0.325	-0.1625	Not Sig
Were bed nets promoted for malaria prevention?	0.488	0.275	0.353	0.1765	Not Sig
Were instructions on bed net use offered?	0.365	0.516	0.106	0.053	Not Sig

The adequacy of information that a client received in terms of service provider asking about allergies experienced by the client and being able to label medications supplied correctly was statistically significant and hence could not have occurred by chance. However, the extent to which a client was counseled on malaria preventive, ITNs promotion and instructions on use was not statistically significant and hence could have occurred by chance.

The coefficient of determination (R^2) was calculated from Table 3-2 to be 16.8% and it is used to determine how well the regression model used truly represents the set of data obtained.

3.4 QUALITY ASSURANCE

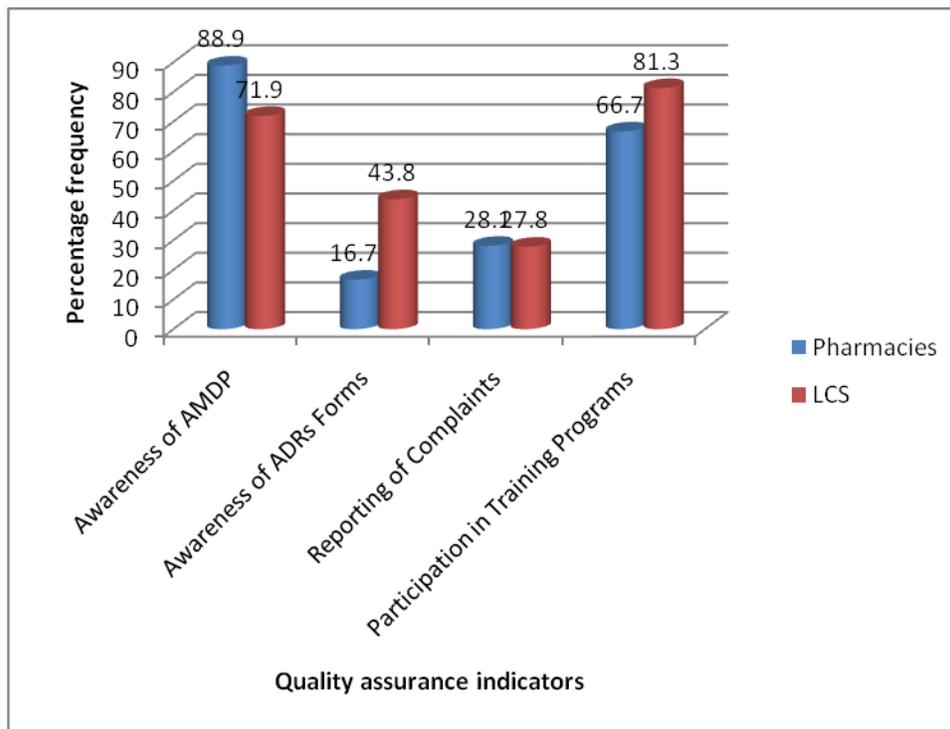


Figure 3-4 Quality assurance preparedness of facilities

Facilities level of awareness of the AMDP was high (Pharmacies 88.9%, LCS shops 71.9%) whilst their awareness of ADRs forms was relatively low (Pharmacies 16.7%, LCS shops 43.8%) hence the low reporting of complaints by facilities (Pharmacies 28.1%, LCS shops 27.8%). Participation in training programs however was quite good (Pharmacies 66.7%, LCS shops 81.3%).

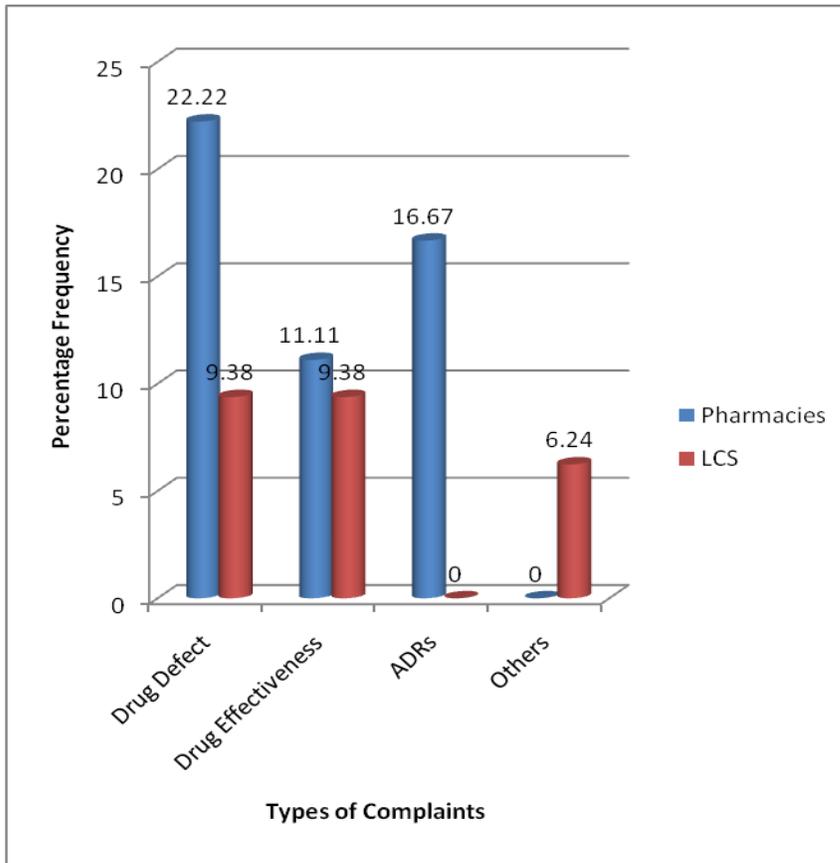


Figure 3-5 Type of complaints received by facilities

The common complaints received by facilities were drug defects (Pharmacies 22.22%, LCS shops 9.38%), drug effectiveness (Pharmacies 11.11%, LCS shops 9.38%) and ADRs (Pharmacies 16.67%, LCS shops 0%).

3.5 REGULATION AND MONITORING

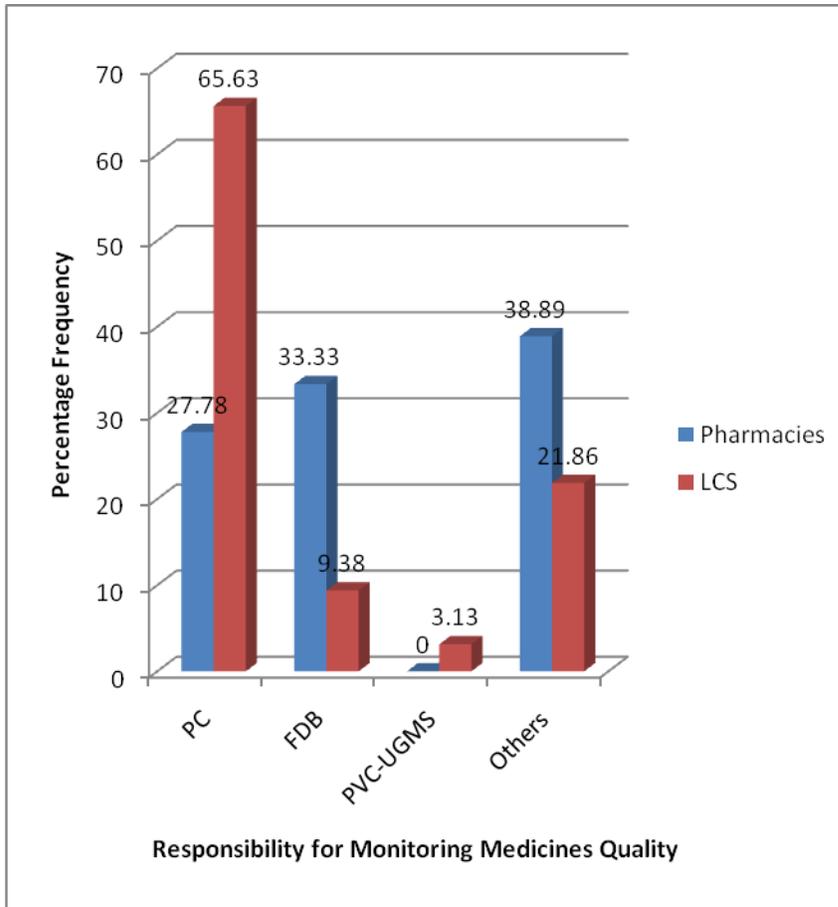


Figure 3-6 Institutions supervising activities in facilities

Facilities perception of who is monitoring medicines quality were as follows; PC (Pharmacies 27.78%, LCS shops 65.63%), FDB (Pharmacies 33.33%, LCS shops 9.38%), PVC-UGMS (Pharmacies 0%, LCS shops 3.13%) and others represented by manufacturers and pharmaceutical wholesalers (Pharmacies 38.89%, LCS shops 21.86%).

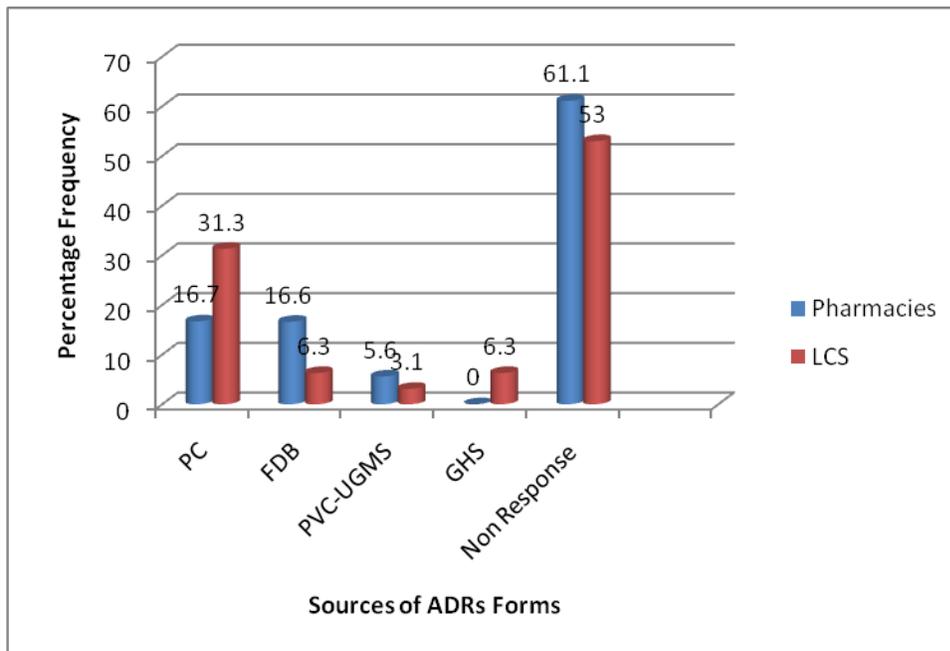


Figure 3-7 Institutions supplying complaint forms to facilities

Facilities perception of institutions supplying ADRs forms for monitoring medicines quality were as follows; PC (Pharmacies 16.7%, LCS shops 31.3%), FDB (Pharmacies 16.6%, LCS shops 6.3%), PVC-UGMS (Pharmacies 5.6%, LCS shops 3.1%), GHS (Pharmacies 0%, LCS shops 6.3%) and non response (Pharmacies 61.1%, LCS shops 53.0%).

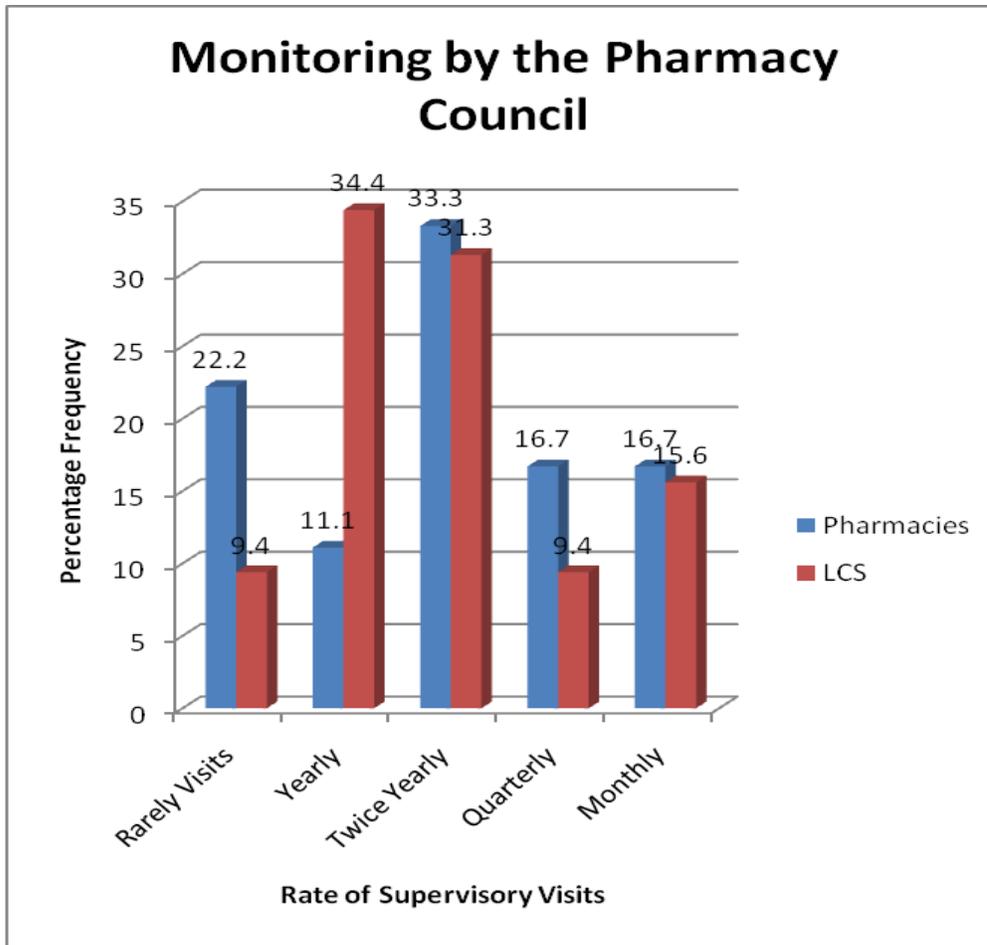


Figure 3-8 Frequency of supervisory visits to facilities

Facilities perception of the frequency of supervisory visits by the Pharmacy Council were as follows; Rarely visits (Pharmacies 22.2%, LCS shops 9.4%), once yearly (Pharmacies 11.1%, LCS shops 34.4%), twice yearly (Pharmacies 33.3%, LCS shops 31.3%), quarterly (Pharmacies 16.7%, LCS shops 9.4%) and monthly (Pharmacies 16.7%, LCS shops 15.6%).

3.6 KEY INFORMANT SEMI –STRUCTURED INTERVIEW

Findings

All the stakeholders interviewed before the study acknowledged the importance of the role of pharmaceutical service providers in community pharmacies and licensed chemical shops particularly in rural areas where public health facilities are inadequate. They acknowledged the fact that pharmacies and licensed chemical sellers treat most diseases that occur in the rural areas.

When asked about their opinion on access to anti-malaria medicines especially in the private pharmaceutical sector in Ghana they all indicated that access to anti-malarial medicines in the communities is generally low.

On whether in their opinion services provided by pharmacies and licensed chemical shops were adequate with special reference to malaria management and prevention they all indicated that the services were inadequate. One had this to say;

“When the access is low, the services will also be affected and this will have a negative impact on services provided by the pharmacies and licensed chemical shops”.

They further affirmed that most of the service providers especially in the private sector were not adequately trained on the new policy.

In addition most of the facilities do not even have the basic working tools such as thermometers and weighing scales on their premises.

Respondents described the impact of the services provided by pharmacies and licensed chemical shops with respect to malaria control in Ghana as inadequate and one respondent had this to say; *“A lot could have been done. Some of the service providers do not even have ITNs. We also do not know the extent to which the general public is educated on the management and control of malaria”*.

In the opinion of the respondents, there are lessons learnt and challenges identified during the introduction of the new anti malarial drug policy.

The NMCP inability to train major stakeholders such as pharmacists and licensed chemical sellers on the new policy for them to believe and accept the new policy change was a challenge to effective implementation of the policy.

Government intervention should have been sought to possibly address the accessibility problem in the private sector.

Respondents were also of the opinion that the quality assurance and safety monitoring procedures available to pharmacies and licensed chemical shops are woefully inadequate. The following recommendations were made for the way forward in malaria control by pharmacies and licensed chemical sellers;

1. There should be regular education of the general public on disease prevention and health promotion especially on malaria and other diseases that threatens our development as a nation.
2. There should be a rather more effective training of service providers on diseases of common occurrence, disease prevention and health promotion annually.

3. In addition, service providers should be trained on quality assurance and safety monitoring to enhance their ability and performance in safety monitoring and reporting.

3.7 FOCUS GROUP DISCUSSION ANALYSIS

Knowledge of causes and symptoms of Malaria

In all the FGDs held, participants had heard of and had had malaria themselves before. Though people knew of malaria they were not aware of the cause of malaria and were basically not aware of the name *Plasmodium falciparum* and could only identify it when it was explained to them.

In all the discussions held, participants knew of the mode of transmission of malaria, they stated that it was gotten through the bite of a mosquito.

However, some participants had misconceptions about the mode of transmission. Some had the view that malaria could be transmitted through contact with faeces, or excessive intake of oily foods and lack of proper personal hygiene.

In addition, a participant mentioned that he had his infection through hand shake. He stated

“Sometime ago a doctor made me understand that I had malaria but I realized that I had not being bitten by any mosquito so it meant that I acquired it from the funerals I have been attending. If somebody has malaria and you shake hands with and you do not wash your hands before eating you can also have malaria.”

With all the misconceptions of participants on the mode of transmission of malaria, participants however were very knowledgeable when it came to identifying symptoms of malaria.

Malaria Prevention

Only 10% of the participants knew that sleeping in ITNs to avoid mosquito bites is a way of preventing malaria.

There were serious misconceptions about food safety and clothing as a way of preventing malaria which emphasises the lack of proper understanding of the causes and the mode of transmission of malaria.

First port of call for people with malaria

In all the discussions, we wanted to know where people with malaria visit first. Participants stated that people visit chemical sellers, pharmacies and clinics/hospitals however the first port of call for most people is the pharmacies and licensed chemical shops.

They mentioned that the chemical shops are the most convenient place to visit because they easily accessible.

When asked why they do not go to the hospital, participants gave various reasons why the hospital is not the first port of call:

“When you go to the hospital, there is always a long queue, sometimes you don’t even know which room you are supposed to enter so you will join a queue for a long time and when it gets to your turn they will tell you that you joined the wrong queue and therefore you have to start all over again.”

Another reason why people resort to the use of chemical sellers and pharmacies is that they are able to send children or other people to buy the medication on their behalf.

Though participants mentioned the hospitals as places that people go to when they have malaria, they mentioned that they go to the hospital when the situation becomes serious or had tried other medications which did not cure their condition.

Medicines used for the treatment of malaria

In all the focus group discussions held, participants mentioned different types of medicines used for the treatment of malaria. The medicines commonly mentioned for the treatment of malaria were Fansider, chloroquine, amodiaquine and artemos. They stated that, they are sometimes given injections, pain relievers like paracetamol and hematinics in the facilities.

Participants added that sometimes if a friend had malaria and went to the hospital and still has some of the drugs remaining, they will just ask for it and use it. If the person does not have the drugs and has the prescription they will take it to a chemical shop or pharmacy and buy.

In addition to the orthodox medicines, people normally use herbal mixture for the treatment of malaria.

Health promotion and Malaria prevention

Education of people seeking medication for malaria from pharmaceutical service providers is very low. In all the discussions held, the majority of participants said chemical sellers and pharmacies do not normally provide education except in a few instances where they provide education on ITNs use and sometimes refer them to the hospital.

Adequacy of treatment

As part of the discussion, participants were asked if the treatment they received from licensed chemical sellers and pharmacies cured their ailment. Participants said sometimes the symptoms go away completely. They added that sometimes the symptoms go and come back and that is when the person goes to the hospital or clinic.

Most of the respondents were satisfied with the services received from the pharmacies and licensed chemical shops because instructions on how the drugs should be taken are written on the bottles or containers of the medicines and even illiterate who can not read are taught how such drugs should be taken.

Participants were also satisfied because medications are sometimes provided to them on credit when they do not have money to pay depending on your relationship with the pharmacy or licensed chemical shop attendant. However, some complained of the high cost of treatment and said they were sometimes not affordable.

Recommendations by participants to Service Providers

Service providers should check the expiry dates of medicines before dispensing it to their clients. They should have proper storage of medicines and also, mention the name(s) of the medicine(s) they dispense to clients.

They should listen to patient when they complain that certain drugs are not good for them.

Service providers should probe their clients further and find out more about the disease or illness because most patients present with the basic symptoms of all ailments, e.g. Headache.

In addition, service providers should counsel patients adequately and educate patients on preventive health care.

Chapter 4

DISCUSSION

4.1 ACCESS TO ANTI-MALARIA MEDICINES

Geographical accessibility of the licensed pharmaceutical facilities where the recommended anti-malarials could be sought and the availability of these medicines in the licensed premises are key determinants for access to anti-malaria medicines.

The ratio of pharmaceutical facilities to the population in the study area was 1:1,492 and 1: 2,128 for KMA and OMA respectively (Table 2-1). It was observed from the study that 77.8% of pharmacies and 75% of LCS shops (Figure 3-1) were opened to the public throughout the week.

Geographical accessibility of licensed pharmaceutical facilities in both districts is therefore fairly adequate with at least one facility in each town or village. However, the physical availability of the recommended anti-malarials in these premises and the presence of the responsible person in the premises are also crucial for access to prompt and effective malaria treatment.

The study revealed that, 94.4% of pharmacies and 28.1% of LCS shops (Figure 3-1) had the recommended anti-malarials available in their premises. However only 47% of pharmacies treated simulated clients according to the Anti-Malaria Drug Policy (AMDP) and none of the LCS shops did. (Figure 3-2).

It can therefore be inferred that physical availability of the recommended anti-malarials in the premises alone does not guarantee access to effective therapy.

It was also observed that only 61.1% of pharmacies and 50.0% of LCS shops (Figure 3-1) had the responsible person present at the time of the study. The responsible person is the one licensed

and trained to effectively supervise the operations of the facility. The absence of the responsible person therefore could be one of the reasons why 50% of the pharmacies who had the recommended anti-malarials still treated simulated clients with monotherapies.

71.9% of LCS shops had only monotherapies amongst which 28.1% (Figure 3-2) had only SP as the available anti-malaria medicine.

4.2 QUALITY OF PHARMACEUTICAL SERVICE DELIVERY IN MALARIA CONTROL

The quality of pharmaceutical service delivery in malaria control granted the availability of the recommended anti-malaria medicines in the facilities, depends on the knowledge and skills of pharmaceutical service providers, quality assurance procedures existing in facilities and effective regulation and monitoring by all stakeholders.

4.2.1 Knowledge of pharmaceutical service providers in malaria control

The study revealed that the knowledge of malaria disease burden among pharmaceutical service providers was very high. However the quality of knowledge and practices of staff of pharmacies and LCS shops in malaria control was inadequate and generally not consistent with the revised anti-malaria drug policy. The following indicators were used to evaluate the knowledge of pharmaceutical service providers;

4.2.1.1 *Appropriate indication*

Malaria diagnosis among pharmaceutical service providers is weak coupled with the non compliance with the Anti-Malaria Drug Policy (AMDP). Thirty nine percent (39%) of pharmacies and fifty two percent (52%) of LCS shops said during structured interview that they will refer severe malaria cases in children less than five years and malaria in pregnant women to the hospital. However in the simulation study only 25% of pharmacies and 20% LCS shops referred severe malaria in children less than five years and malaria in pregnant women to the hospital (Figure 3-3).

47% of pharmacies managed uncomplicated malaria according to the Anti-Malaria Drug Policy (AMDP). None of the LCS shops managed uncomplicated malaria according to the AMDP (Figure 3-3). This trend of non compliance to policy could be due to the absence of pharmacists in the pharmacies and the lack of adequate training for the Medicine Counter Assistants (MCAs) whilst the non compliance in LCS shops is partly due to the classification of the ACTs as prescription medicines and the lack of adequate training for LCS.

4.2.1.2 *Adequacy of information to clients*

63% of pharmacies and 64% of LCS shops indicated to their clients the importance of purchasing and completing the full course of treatment. Also, all the pharmacies and 64% of LCS shops appropriately labeled all medicines dispensed (Figure 3-3). These are good indicators for compliance to therapy by the clients and will subsequently reduce the use of suboptimal doses of anti-malarials with its attendant development of resistance by the *Plasmodium* parasites leading to increased treatment failures and the resultant increase in mortality due to malaria. All the pharmacies and 93% of the LCS shops counseled their clients on how and when to take their medications. However, only 31% of pharmacies and 29% of LCS shops asked about allergies

(Figure 3-3). This is worrying because clients are more likely to stop taking their medication whenever they experience unexpected side effects. Therefore, it is clinically and economically prudent to ascertain whether the individual client has reacted to any of the recommended anti-malaria medicines. Adequate counseling must be done before the commencement of therapy to minimize the negative perception towards the recommended anti-malarials especially Artesunate-Amodiaquine to improve compliance to its therapy.

4.2.1.3 Preventive care

In Ghana an estimated 4.6 million nets have been distributed since 2003 while 11.2 million nets would be required to achieve the universal access of two nets per household²⁶. To achieve this there is the need to improve efficiency of distribution and promotion of safe use of ITNs by targeted populations through behavioural change communications programs. However the study revealed that the contribution of the private sector in malaria prevention, promotion, distribution and use of ITNs is woefully inadequate since only 28% of pharmacies and 25% of LCS shops discussed malaria prevention (Figure 3-3) with their clients of which only 6% and 19% respectively actively promoted ITNs to their clients (Figure 3-3). Furthermore, none of the pharmacies instructed their clients on the use of ITNs, whilst only 3% of LCS shops did instruct their clients (Figure 3-3).

4.2.1.4 Test for Significance of Estimates

The Coefficient of Determination (R^2) was equal 0.168 (Table 3-2) which means that only seventeen percent (17%) of the variability in facility type (Y) can be explained by variation in the quality of service delivery (X_i). The low value of the statistic (R^2) obtained depicts the weakness of the fit between the two variables Y and X_i .

Also from the Standard Error Test (Table 3-2) the type of facility (i.e. Pharmacy or LCS shop) that one accesses his or her anti-malaria medicines from determines the adequacy of information one receives on the use of the medications supplied whereas the quality of preventive care services in terms of malaria prevention, ITNs promotion and instruction on ITNs use did not depend on the type of facility.

4.2.2 Quality assurance procedures existing in the facilities

Quality assurance is a planned, systematic approach for continuously assessing, monitoring and improving quality of health services with available resources to meet the expectations of the clients and providers. Improving quality of healthcare is a priority in the health sector of Ghana.

The quality assurance and safety monitoring procedures available at pharmacies and licensed chemical shops were woefully inadequate (Figure 3-4). All the key informants interviewed recommended that all service providers should be trained on quality assurance and safety monitoring to enhance their ability and performance in safety monitoring and reporting.

Even though 89% of pharmacies and 72% of licensed chemical shops were aware of the anti-malaria drug policy (Figure 3-4) none of the facilities had the policy on their premises. Also most pharmacies and licensed chemical shops did not use any specific treatment guidelines in the management of malaria on their premises. Moreover 50% of the facilities did not know of any formal system for reporting anti-malaria medicines complaints (Figure 3-4). These tendencies and lapses pose a challenge to policy adherence and compliance.

Pharmacovigilance is the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem. It seeks to

check if medicines on the market fulfil their intended role in society. Post-marketing surveillance is essential because the safety database on newly licensed drugs is limited by both the number and characteristics of the patients involved. There is therefore the need to have a workable pharmacovigilance infrastructure for malaria and effectively train all service providers on its appreciation and usage. The study revealed that forty four percent (44%) of LCS shops and seventeen percent (17%) of pharmacies had ADRs forms (Figure 3-4). However, only twenty eight percent (28.0%) of pharmacies and LCS shops had ever reported ADRs to the relevant authority (Figure 3-4). This is also evident in the 2008 National Pharmacovigilance Center (NPC) report²⁸ which indicated that the centre relied mainly on reports from hospitals such that out of the one hundred and twelve (112) ADRs reports received in 2008, only three (3) came from community pharmacies. This could be due to lack of awareness of the staff in pharmacies about the existence of adverse reaction reporting system or a complete absence of a standardised adverse event reporting and learning systems as it exist in all GHS facilities.

4.2.2.1 Participation in training programmes

As part of the Continuous Professional Development (CPD) of pharmaceutical service providers, the Pharmacy Council (PC) organizes Continuing Education (CE) programme for all pharmacists and a national training programme for LCS annually. The PC 2007 and 2008 annual CE reports showed 76.2% and 77.4% participation in CE programmes²⁷. Similarly the participation by LCS in 2007 was 82.4%. This study however revealed 66.7% of pharmacies and 81.3% of LCS indicated attending training programmes in the last two years (Figure 3-4). It could be inferred that about 33% of pharmacists and 20% of LCS have not been trained for the past two years.

Notwithstanding the high training participation rate among service providers particularly LCS, their contribution to malaria control has not been the best. The reasons for the low performance could be due to the following;

1. Training topics not addressing emerging challenges
2. Unsuitable training methodology and
3. Ineffective delivery by facilitators

4.2.3. Regulation and monitoring

Monitoring is the routine tracking of the key elements of a programme performance through record keeping, regular reporting, surveillance systems and periodic surveys.

Monitoring is vital in the determination of areas which require greater effort and may pinpoint areas that might contribute to an improved response.

All the pharmacies and 93.75% of LCS shops (Figure 3-6) mentioned the Pharmacy Council (PC) as the main organization that supervises their activities and 66.7% of pharmacies indicated Food and Drugs Board (FDB) as the agency responsible for monitoring drug quality whilst 65.6% of LCS indicated PC as the agency responsible for monitoring drug quality (Figure 3-6). According to the anti-malaria drug policy's monitoring and evaluation strategies, the FDB is responsible for post market surveillance to ensure quality and safety of the recommended anti-malarials on the market as well as the detection of counterfeit or substandard anti-malaria medicines and also monitor suspected Adverse Drug Reactions (ADRs) to anti-malarials in Ghana.

Frequency of visits by the supervising agency

Inspecting officers of the supervising agency inspect pharmacies and LCS shops routinely and by scheduled inspections to determine the extent to which service providers are complying with agreed standards and also enforce these standards if not being adhered to by service providers.

Most facilities (90%) said the Pharmacy Council do not inform them before visiting while 10.0% said they give prior notice before paying supervisory visits (Figure 3-8). However, only 17% of pharmacies and 16% of LCS shops were visited monthly. 22% of pharmacies and 6% of LCS shops were rarely visited (Figure 3-8). The above observation depicts a weak monitoring system by the regulatory authority

4.3 STUDY LIMITATIONS

The study excluded herbal medicines in all the data collection methods used.

Chapter 5

CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

The awareness of malaria disease burden among pharmaceutical service providers and the general public was quite high. However the quality of knowledge and practices of staff of pharmacies and LCS shops in malaria control was inadequate and not generally consistent with the revised anti-malaria drug policy. Differences were observed between services provided by pharmacies and LCS shops on types and brands of anti-malarials sold, dosages given and client counseling services.

Prevalence of inappropriate use of anti-malarials among pharmaceutical service providers and the general public is high. There is need for enhanced public health education on home-based management of malaria and training for all staff of pharmacies and LCS shops workers to ensure effective use of anti-malaria drugs in the Ghana. However, these campaigns will be of limited value if consumers are sold ineffective drugs in the wrong doses. For this reason, strengthening the capacity of private pharmacies and licensed chemical shops to provide the recommended anti-malarial drugs with appropriate information is important. Equally important is the de-classification of the recommended ACTs and the compulsory recall of all anti-malaria monotherapies from the market.

5.2 RECOMMENDATIONS

1. The Food and Drugs Board (FDB) should de-classify all the recommended ACTs to improve access, recall all anti-malaria monotherapies and properly regulate the distribution and use of monotherapies recommended for specific programs such as Intermittent Preventive Treatment (IPT).
2. The Pharmacy Council, FDB and NMCP should collaborate effectively and comprehensively train all staff working in community pharmacies and LCS shops in malaria prevention and control.
3. The NMCP should undertake effective public education programs in malaria control including sanitation and disease prevention.
4. The Pharmacy Council must step-up its monitoring visits to the facilities and sanctions offending providers.

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APPENDIX

I. PHARMACEUTICAL SERVICE PROVIDER SIMULATION GUIDE

(TO BE FILLED ONLY AFTER SIMULATION HAS BEEN DONE)

DISTRICT.....

TOWN.....

NAME OF FACILITY.....

NAME OF INTERVIEWER.....

TIME INTERVIEW BEGUN..... DATE

PLEASE CIRCLE THE APPROPRIATE CODE

HISTORY: DID THE SERVICE PROVIDER:		
REFERRALS		
1	Tell you to see a	(Multiple response allowed) Doctor/clinic 1. Yes 2. No Pharmacist 1. Yes 2. No Laboratory 1. Yes 2. N None 1. Yes 2. No
SIGNS AND SYMPTOMS: DID THE PHARMACEUTICAL SERVICE PROVIDER		
2	Ask about symptoms?	1. Yes 2. No
3	If yes, what did you say	
4	Ask about onset/ duration of symptoms?	1. Yes 2. No
5	Did he/she ask if you are returning after six month in a non-endemic country?	1. Yes 2. No
6	Did the pharmaceutical service provider tell you that you had malaria?	1. Yes 2. No
CASE MANAGEMENT		
7	Were you given any medicines?	1. Yes 2. No
8	If yes, name the medicines	
9	If no, why	1. Referred 2. Not enough money 3. Other specify.....
10	Were you advised on how and when to take them?	1. Yes 2. No
TREATMENT/COUNSELLING		
	Did he/she instruct you on the	1. Yes 2. No

11	importance of completing the full course of treatment?		
12	Were you asked to take the medicine(s) before or after meals	1. Before meals 2. After meals 3. Not told	
13	Was he/she willing to sell part of the treatment?	1. Yes 2. No	
14	Did he say that part of the drugs was okay for your treatment?	1. Yes 2. No	
15	Did he/she ask about allergies?	1. Yes 2. No	
16	Were the medicines dispensed appropriately labelled	1. Yes 2. No	
PREVENTION			
17	Was malaria prevention discussed?	1. Yes 2. No	
18	Were ITNs promoted for malaria prevention?	1. Yes 2. No	
19	Were instructions on bed net use offered?	1. Yes 2. No	

WHAT DRUGS WERE OFFERED /PRESCRIBED:
LEAVE BOX WITH * FOR SUPERVISOR

<p><i>DRUG 1 name</i> * <input type="checkbox"/></p> <ul style="list-style-type: none"> • Strength:..... • Dosage: • Route: 1. im 2.oral 3. topical 4.anal <p>Duration of treatment (days):</p>
<p><i>DRUG 2 name</i> * <input type="checkbox"/></p> <ul style="list-style-type: none"> • Strength:..... • Dosage: • Route: 1. im 2. oral 3. topical 4) anal <p>Duration of treatment (days):</p>

Remarks/ observations by simulated client:

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- Artesunate tablet
- Dihydroartemisinin tablet
- Dihydroartemisinin suspension
- Amodiaquin tablet
- Amodiaquine suspension
- Chloroquin
- Halofantrin tablets
- Halofantrin suspension
- Quinine tablet
- Quinine syrup
- Quinine Injection
- Artemether Injection
- Artemether suspension
- Artemether capsules
- Pyrimethamine/ sulfadoxine
- Artesunate/Amodiaquin
- Artemether/ Lumefantrine tablet
- Artemether/Lumefantrine suspension
- Dihydroartemisinin/ Piperaquine tablet
- Dihydroartemisinin/Piperaquine suspension
- Others specify -----
- None of the above

8. How much does it cost to treat malaria using each of the following anti-malarial medications in your facility if any?

- Artesunate tablet.....
- Amodiaquin tablets.....
- Amodiaquin suspension.....
- Chloroquin tablets.....
- Chloroquin syrup.....
- Halofantrin tablets.....
- Halofantrin syrup.....
- Quinine tablets.....
- Quinine syrup.....
- Pyrimethamine/ sulfadoxine tablets.....
- Artesunate/Amodiaquin (Paediatric Dose).....
- Artesunate/Amodiaquin (Adult Dose).....
- Artemether/ Lumefantrine tablets.....
- Dihydroartemisinin/ Piperaquin tablets.....

9. Have you ever dispensed medication to treat malaria?

- Yes
- No

10. If a pregnant woman were to come to you complaining of persistently increased body temperature which is not responding to paracetamol, what will you give her?

- Artesunate
- Amodiaquin
- Chloroquin
- Halofantrin
- Quinine
- Pyrimethamine/ sulfadozine
- Artesunate/Amodiaquin
- Artemether/ Lumefantrine
- Dihydroartemisinin/ Piperaquine
- Others specify -----
- Nothing, refer to hospital/clinic

11. DRUG NAME.....

- Strength:
- Dosage:
- Route: 1. im 2.oral 3. topical 4. anal

Duration of treatment (days):

12. If an adult were to come to you complaining of headache, chills and rigors, what would you give him/her?

- Artesunate
- Amodiaquin
- Chloroquin
- Halofantrin
- Quinine
- Pyrimethamine/ sulfadozine
- Artesunate/Amodiaquin
- Artemether/ Lumefantrine
- Dihydroartemisinin/ Piperaquine
- Others specify -----
- Nothing, refer to hospital/clinic

13. DRUG NAME

- Strength.....
- Dosage
- Route: 1. im 2.oral 3. topical 4. anal

Duration of treatment (days):

14. If a woman were to come to you with a 3-years old daughter with a history of 2 days fever and ear pain, what would you give her?

- Artesunate

- Amodiaquin
- Chloroquin
- Halofantrin
- Quinine
- Pyrimethamine/ sulfadoxine
- Artesunate/Amodiaquin
- Artemether/ Lumefantrine
- Dihydroartemisinin/ Piperaquine
- Others specify -----
- Nothing, referred to hospital/clinic

15. DRUG NAME

- Strength:

- Dosage:

- Route: 1. im 2.oral 3. topical 4. anal

Duration of treatment (days):

ANTI-MALARIAL SERVICE QUALITY ASSURANCE			
No	Questions and filters	Coding categories	Skip no.
16.	Are you aware of any policy and programme aimed at ensuring anti-malarial medicines quality in Ghana?	1. Yes 2. No	If no please skip 17
17.	List the policies and practices that ensure anti-malarial medicines quality	1. Anti malarial Drug policy 2. Good Dispensing Practices 3. Good Wholesale Practices 4. Others, specify.....	
18.	Who is responsible for monitoring drug quality?	1. FDB 2. NMCP 3. GHS 4. GNDP 5. Pharmacy Council 6. Pharmacovigilance centre, UGMS 7. Pharmaceutical service providers 8. General public	
19.	Have you received any complaint on the use of any anti-malarial medicine for the past one year?	1. Yes 2. No	If no please skip 20
20.	What was the complaint?	1. Product defect	

		2. Product effectiveness 3. ADR 4. Product expiry 5. Adulteration 6. Others specify,	
21.	Is there any formal system for reporting anti-malarial medicines quality complaints?	1. Yes 2. No	If no please skip 22
22.	Do you have any of such forms?	1. Yes 2. No	If no skip 23
23.	Which institution provided the complaint forms?	1. FDB 2. NMCP 3. GHS 4. GNDP 5. Pharmacy Council 6. Pharmacovigilance centre, UGMS	
24.	Have you made any formal reporting on any anti-malarial medicine to the relevant agency/authority	1. Yes 2. No	If no please skip 25
25.	Which agency/organization supervises your activities?	1. Pharmacy Council 2. FDB 3. Medical & Dental Council 4. PH/MHB	
26.	How often do they pay supervisory visits?	1. Monthly 2. Once every three months 3. Twice a year 4. Yearly 5. Others, please specify	
27.	When was the last time they visited?	1. Month ago 2. Four months ago 3. A year ago 4. Others, please specify	
28.	Do they always inform you about when they will visit?	1. Yes 2. No	
29.	Who is in-charge of this facility?	1. Pharmacist 2. Pharmacy Technician 3. MCA 4. LCS 5. Others, specify	Prompt
30.	Is the person in-charge present or absent	1. Yes 2. No	

Mailing Address	Premises/ Location Address
Telephone	Email.....

III. FOCUS GROUP DISCUSSION GUIDE

1. What are the causes of malaria?
2. Can anyone explain the symptoms of malaria?
Allow participants to explain the symptoms of malaria and also give personal experience.
3. How can malaria be prevented?
4. When you get malaria where do you normally seek care first? Explain that you want to know the first port of call of people with Malaria. If they do not mention Pharmacies and Licensed Chemical shops, please probe to find out if they treat at all.
5. Does anyone know the type of treatment that Pharmacies and Licensed Chemical shops provide when someone goes to them with malaria?
Discuss at length with them the form of treatment, adequacy in terms of getting cured and affordability, the nature of treatment (ie.injection, tablets, creams etc)
6. Are you satisfied with the services/counseling you received from pharmacies and licensed chemical shops?
7. Could you give some recommendations/expectations on the quality of service delivery by pharmacies and licensed chemical shops in malaria control in Ghana?

IV. KEY INFORMANT SEMI STRUCTURED INTERVIEW GUIDE

Topic: Evaluating Access to Anti-Malarial Medicines and Quality of Service Delivery in Pharmacies and Licensed Chemical Shops in the Ashanti Region.

Name of Stakeholder:

Rank/position of Stakeholder:

Number of years in that position:

Name of Interviewer:

Date of Interview:

Time of Interview:

Introduction

Good morning/afternoon. My name is I am assisting the Department of Clinical and Social Pharmacy, Faculty of Pharmacy and Pharmaceutical Sciences - KNUST to conduct the above-mentioned research. First of all I would like to thank you for your time for this interview.

The aim of this study is to assess the availability of anti-malarial medicines in the private pharmacies and licensed chemical shops and the quality of service delivered by these facilities.

The study will also appraise the anti-malarial service quality assurance and safety monitoring procedures in private pharmaceutical facilities.

Question 2: What is your opinion about access to anti-malaria medicines especially in the private pharmaceutical sector in Ghana?

Question 3: What is your opinion on services provided by pharmacies and licensed chemical shops? Focus on anti-malarial services i.e. prevention, treatment and health promotion.

Question 4: what do you think has been the impact of services provided by pharmacies and licensed chemical shops on malaria control in Ghana

Question 5: In our opinion are there any lessons learnt and or challenges identified?

Think about Anti-malarial Drug Policy change, accessibility and affordability.

Question 6: Could you perhaps give some recommendations for the way forward in the role of pharmacies and licensed chemical shops in malaria control in Ghana?

Question 7: What is your opinion on the quality assurance and safety monitoring procedures available in pharmacies and licensed chemical shops?

Question 8: Do you have anything to add to this interview regarding this topic?