

**FACTORS INFLUENCING THE UP-TAKE OF
MALARIA PREVENTIVE SERVICES FOR PREVENTING
MALARIA DURING PREGNANCY IN LIBERIA**

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Liberia**

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FACTORS INFLUENCING THE UP-TAKE OF MALARIA PREVENTIVE SERVICES
FOR PREVENTING MALARIA DURING PREGNANCY IN LIBERIA

A thesis submitted in partial fulfilment of the requirement for the degree of
Master of Public Health

By

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Declaration:

Where other people's work has been used (either from a printed source, internet or any other source) this has been carefully acknowledged and referenced in accordance with departmental requirements.

The thesis (**Factors influencing the up-take of malaria preventive services for preventing malaria during pregnancy in Liberia**) is my own work.

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List of Abbreviations

AEO	African Economic Outlook
ANC	Ante Natal Care
CDC	Center for Disease Control
CHVs	Community Health Volunteers
CHWs	Community Health Workers
EPHS	Essential Package for Health Services
FAO	Food and Agriculture Organization
HFs	Health Facilities
HMIS	Health Management Information System
IPTp	Intermittent Preventive Treatment for Pregnant Women
ITNs	Insecticide Treated Nets
LISGIS	Liberia Institute of Statistics and Geo-Information System
LDHS	Liberia Demographic and Health Survey
LLINS	Long Lasting Insecticide-treated Nets
LMIS	Liberia Malaria Indicator Survey
MOA	Ministry of Agriculture
MCPI	Malaria Control and Prevention Intervention
MPCAs	Malaria Prevention and Control Activities
MPCs	Malaria Preventive Commodities
MPI	Malaria Preventive Interventions
MPS	Malaria Preventive Services
M&E	Monitoring and Evaluation
MOA	Ministry of Agriculture
MOH&SW	Ministry of Health and Social Welfare

NHPP	National Health Policy and Plans
NMCP	National Malaria Control Program
NMSP	National Malaria Strategic Plans
NPHC	National Population and Housing Census
PMI	President Malaria Initiatives
PMI/MOP	President Malaria Initiative/Malaria Operational Plan
PW	Pregnant Woman
PWs	Pregnant Women
RCT	Randomized Control Trial
RRCs	Remote Rural Communities
SP	Sulphadoxine Pyrimethamine
SSA	Sub-Saharan Africa
TBA	Traditional Birth Attendance
TM	Traditional Midwife
UNFPA	United Nations Fund Population
UNO	United Nations Organization
WHO	World Health Organization

Abstract

Background: Liberia is a malaria endemic country, with about 8% of the maternal mortality due to malaria-related anemia. Liberia is the 8th among countries with the highest maternal mortality rates in the world. Malaria during pregnancy has an adverse effect on both PWs and their unborn babies. According to WHO, the consistent access and use of LLINs and SP protect PWs from malaria related morbidity and mortality. However, the up-take of the intervention is low in Liberia.

Objective: The study objective is to explore factors influencing the up-take of malaria preventive interventions in order to identify potential areas that need improvements for increased access and utilization by PWs in Liberia.

Methodology: The research was done using literature review. The “Andersen’s model on healthcare utilization” was used to explore factors that impede access to MPS among pregnant women in Liberia.

Findings: The study found several barriers that influence up-take of MPI among PWs. Key barriers include unavailability of malaria preventive commodities at ANC facilities, poor provider-client relationship, social and cultural beliefs that influence the behavior of PWs towards seeking MPS at ANC facilities.

Conclusion and recommendation: In order to improve the up-take of the MPI, a two-way (short and long terms) solution should be considered. In the short, the NMCP should plan and implement MPIs at community level using community resources to distribute MPCs. In the long term, plan with MOH&SW and partners on the provision of motivation package for professionals volunteering to take assignments in remote rural communities.

Key words: Liberia, malaria, utilisation, malaria in pregnancy, and ANC.

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Introduction

Over the last six years till present, I have worked as Monitoring and Evaluation (M&E) Officer for the Liberia National Malaria Control Program (NMCP). A vertical Program mandated by the Liberia Ministry of Health and Social Welfare (MOH&SW) to strategize, plan and execute malaria control and prevention interventions within its borders. Couple with being a Liberian, I have been concerned about poverty among my people compounded by tropical and communicable diseases and how they affect the population; particularly, pregnant women and mothers. The latter struggled with variety of illnesses; especially, malaria infections during pregnancy which sometimes leads to the trauma of losing their infants.

I am under obligation, as my job description dictates to design and organize field monitoring visits with other MOH&SW staffs and partners in order to assess the quality of anti-malaria interventions implemented by MOH&SW and partners and report findings (challenges or short-comings and achievements or gains) made in the delivery of planned malaria interventions in the country. Also, after such exercise, it is the responsibility of the M&E Office to provide the NMCP Management and partners expert feedbacks and advice on strategies that could improve the anti-malaria interventions in the country (NMSP 2010).

The functions of the M&E Office is to design tools and methods and use it in technically tracking all planned activities of the Malaria Program and all other partners involved in malaria control and prevention activities in the country. It notes and programmatically discusses challenges (short-comings and weaknesses) highlighting threats to successful implementation and encouraging the use of available opportunities in implementing projects. This cut-across the all planned activities of the Malaria Program and that of its implementing partners.

In view of the foregoing, the NMCP and her partners have been able to remarkably contribute to the reduction of malaria burdens in the country. However, there still exist intervention areas that need attention; one of such is the provision and administration of Intermittent Preventive Treatment during pregnancy (IPTp) and the up-take and adherence and utilization of Insecticide Treatment mosquito bed nets the medication on the other for malaria prevention purposes.

This thesis intends to search and provide an insight into the reasons for such challenges; failures of pregnant women to access and utilize IPTp Services at Antenatal Care (ANC) facilities and discuss strategies that the NMCP could adapt and use in improving the up-take of SP for IPTp in Liberia.

Malaria is a disease that is preventable and curable, but life threatening. Early diagnosis and prompt and effective treatment of the disease reduces the burden (morbidity and mortality) on the population. It is caused by a parasite from the genus plasmodium. The parasites are transmitted to uninfected people through mosquito bites after firstly biting infected people. Malaria is a global problem and poses serious burdens and threats to many low income regions including Sub-Saharan Africa (SSA). The rates of malaria mortality have fallen globally by 42% and 49% in Africa since 2000. By the end of 2013, WHO reported malaria burden to be approximately 207 million cases and 627,000 deaths with more than half of the deaths occurring among African children (WHO, 2013). High risk population of malaria includes children under 5 and pregnant women.

Malaria is endemic in SSA; where approximately 30 million women that get pregnant yearly are at risk of malaria infection. This is because the adult pregnant woman, who has over the years developed immunity against malaria due to exposure to continuous malaria infection, experienced alteration in her immune system due to the presence of the fetus. This condition leaves the pregnant woman and the fetus or her unborn child vulnerable to malaria morbidity and mortality (Marchesini et al, 2004).

Chapter One: General Background

1.0 Background

1.1 Geography

Liberia is a Sub-Saharan Africa (SSA) country bounded by Sierra Leone in the North East, Guinea in the North, Cote d'Ivoire in the East and South-East and the Atlantic Ocean in the South-West and covers 111,370 square kilometers in the West coast of Africa (LISGIS, 2001; NMSP, 2010). The country is divided into 5 regions and 15 political subdivisions called counties.

The climate and geographical location of Liberia play a significant role in the health, agricultural and socio-economic lives of the people. The natural vegetation supports agricultural activities; the humid tropical rain forest vegetation of the country with an average rainfall varying between 1800mm to 5000mm supports crops production (FAO, 2013). In spite of the foregoing, this tropical climate also provides an environment for the growth of many infectious diseases including malaria (Kenea et al, 2001).

There are two seasons in Liberia: wet or rainy season, that runs from May to October and the dry season, from November to April. Both seasons support malaria prevalence through-out the year (NMSP, 2010).

1.2 Demography, Health and Socio-Economic Situation of the population

The population of Liberia was estimated to be more than 3.5 million with an annual growth rate of 2.1% (NPHC, 2008). Due to the civil war, most people migrated from rural to urban areas thus leaving rural areas sparsely populated. This movement created imbalance in the implementation of socio-economic and health interventions in the country (NMSP, 2010). The population of the country is young with 55% being in the age group between 0-18 years. An estimated 3% of the population is above 65 years of age while about 18% is under 5 years. The average house hold size is 5 (LDHS, 2007). Table 1 provides additional information on the Liberian socio-economic and demographic characteristics.

Table 1: General Socio-economic, demographic and health characteristics of Liberia

Demographic Characteristics	Values	Sources
Population	3.47 million	NPHC 2008
Annual Population Growth	2.1%	NPHC 2008
Total Fertility rate	5.2%	NPHC 2008
Population density	93 per sq mile	NPHC 2008
Crude mortality rate	90	
Under 5 mortality rate	110 per thousand live births	WHO,UNFPA, et al., 2012
Infant mortality rate	71 per thousand live births	
Maternal Mortality Rate	770 per 100,000 births	WHO,UNFPA, et al., 2012
Average life expectancy	59 years	WHO 2012
Population: 0 to 4 years	17.7%	NPHC 2008
Population: 5 to 14 years	14.8%	NPHC 2008
Population: 15 and above	67.5%	NPHC 2008
Population: Pregnant women	5.0%	NPHC 2008
% Of PW that slept under LLINs the night before the Survey	37.0%	LMIS 2011
% Of PW taking 2 or more doses SP for IPTp.	50.0%	LMIS 2011
Average taking SP for IPTp (2011 – 2013)	93,001	Liberia HMIS 2014
Average no. of pregnant women (2011-2013)	188,898	Liberia HMIS 2014
Average no. of PW attending OPD for anti-malaria (2011-2013)	62,353	Liberia HMIS 2014
Average attending ANC (1 st to 4 th visits)	127,505	Liberia HMIS 2014

Sources: NPHC (2008), WHO/UNFPA&WBO(2013), LMIS (2011), MOH&SW/HMIS (2014), WHO (2012).

There has been some gains made in the economy of the country since the conflict; giving the estimated growth of 8.9% of the GDP to \$700 in 2012 (AEO 2013).

An estimated four-fifth of the population lives below the global poverty line of less than US \$1.25 a day (NMSP, 2010; AEO, 2013). Majority of this population live in the slums around major cities, other urban areas and rural settings. This population made up largely of unskilled, unemployed or employed but low income earners that are most vulnerable to malaria parasite infection as the slums provide good habitat for mosquitoes and other insects.

The general literacy rate among Liberian adults is estimated to be 61% (WHO, 2003). In comparison to other African countries, the education level of Liberian is low. An estimated 44% of females and 61% males attended school (LDHS, 2007).

1.3 Culture, Beliefs and Practices

The cultural beliefs and practices of Liberians are as diverse as other multicultural African societies (Rupha, 2009). Liberia is a patriarchal society- the Liberian cultural setting allows the man to take most of the decision in the home. Cultural beliefs have adverse effect of women in Liberia. The women always wait for their husbands to approve of their utilization and access of healthcare services during pregnancy. They most of the time engage in traditional medicines during pregnancy. They always delay in seeking healthcare services during the early stage of the pregnancy (Rupha, 2009).

1.4 Health Systems profile & information

The Liberian health system consists of 661 health facilities; 2 specialized tertiary hospitals, 36 hospitals located in districts of the 15 counties, secondary care services and primary care services are provided by 46 health centers and there are 577 clinics around the country. 98% of these health centers and clinics deliver free Ante-Natal Care (ANC) Services to pregnant women (MOH&SW/AR, 2012).

The 15 counties are grouped into 5 regions as mentioned above. At every regional level, there is a regional referral hospital for referring patients from the counties that make up the region. To some extent, the clinics are spread

out to cover most rural communities. Yet, there are still remote villages that are 5km or more away from the nearest clinic. Most often, such facilities are accessed by those far away communities by foot as there are no motor-able roads (MOH&SW/EPHS, 2011).

The health system is further described in line with the World Health Organization (WHO) six health system building blocks; as Service delivery, health information and research, health system and financing, health workforce, medical products and technology and leadership and governance

1.4.1 Service delivery

The Liberian health system is based on a three tier system that works closely with non-governmental institution and other stakeholders. The three tier system includes Primary (gate-keeping), Secondary and tertiary levels. The Primary level of care includes Primary Healthcare (PHC) levels 1 and 2 clinics. PHC level 1 clinics care for population up to 3,500 in isolated communities while PHC level 2 caters for 3,500 to 12,000 populations and provide community outreach services beyond 5km distance. Both PHC levels 1 and 2 provide similar services including ANC that provides IPTp services for pregnant women and is open from 8:00 AM to 4:00 PM, Monday through Friday.

The Secondary care level has two systems; Health centers which cater for population of 25,000 to 40,000. Specific services focusing maternal and child health and malaria services are integral part of the health services. The next is the district health system. This is a hospital level service that provides basic and comprehensive obstetrics care services along with other healthcare services including malaria care and treatment. ANC Services including IPTp are also included at this level for pregnant women (MOH&SW/EPHS, 2011).

There is also a tertiary level that offered specialized services. Among an estimated six tertiary hospitals, there are two that are outstanding; well equipped with modern technologies that provide specialized and standardized healthcare (MOH&SW/EPHS, 2011).

1.4.2 Health Information and Research

Liberia has a health management information system (HMIS) that has been in place since 2009. This system has a reporting channeled beginning with

the clinic, through the district, county level and on to the Central MOH&SW level (HMIS, 2009). The major challenge is that at the first two levels, data are generated and not analyzed. Preliminary data collation and analyses begin at the county and are finalized at the central level. The reporting tools have malaria component with indicators to measure anti-malaria and malaria preventive interventions (HMIS Policy, 2009). There is a feedback system at all levels. Upon completion of analysis, the national HMIS gives feedbacks to the counties. Earlier, the district peruses the information from the periphery and provides feedbacks. The county M&E Office does the same to the district Office (HMIS Policy, 2009).

1.4.3 Health System and Financing

Financing of the health system is a major challenge in Liberia; the country, in its health and malaria implementation strategies relies heavily on donors and bilateral organizations (see table 2). In 2007/2008, the total national health expenditure was US \$100,517,382.00 and the government of Liberia's contribution was 15% (MOH&SW/NHAS, 2008).

Table 2: Total Health Expenditure 2007/08

GENERAL NATIONAL HEALTH ACCOUNT 2007/08	
INDICATORS	Amount or percentages 2007/08
Total real GDP	US\$670,000,000.00
Total government health expenditure	US\$15,417,802.00
Total health expenditure (THE)	US\$100,517,382.00
THE per capita	US\$29.00
THE as % of nominal GDP	15.0%
Government health expenditure as % of total government expenditure	7.7%

Source: Liberia National Health Account Survey Report (2008).

According to the National Health Account Survey (MOH&SW/NHAS, 2008), the following table (Table 3) gives a picture, in terms of percentages, of the sectors providing funding to health works in Liberia.

Table 3: Contributors to the Total Health Expenditure 2007/08

Financing Source as a % of THE	
Public	15.0%
Private	3.0%
Donor	47.0%
Household OOP spending	35.0%

Source: Liberia National Health Account Survey Report (2008).

The Survey also noted that out of pocket (OOP) household payment for health services for all causes was spent, 85.0% at private healthcare providers which include private hospitals, clinics, pharmacies, medicine stores, mobile vendors and traditional healers, and 15.0% at government-owned public facilities. Malaria expenditure is presented in table 4 below

Table 4: Total Health Expenditure for Malaria in relation to National THE & GDP

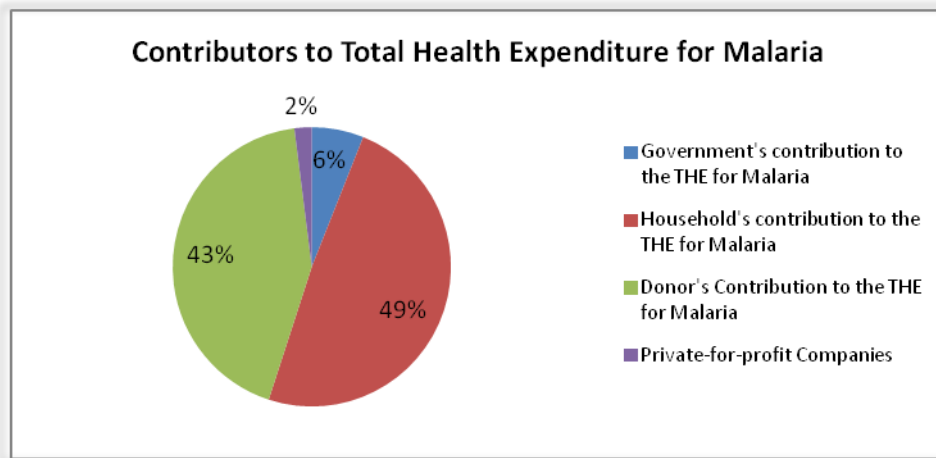
TOTAL HEALTH EXPENDITURE FOR MALARIA	
Indicators	2007/08
Total malaria health expenditure (THEMA)	\$44,311,477.87
Malaria expenditure per person	\$12.70
Malaria expenditure as a % of GDP	6.61%
Malaria expenditure as a % of general THE	44.01%

Source: Liberia National Health Account Survey (2008)

The same survey reveals that the total health expenditure for malaria (THEMA) was US\$44.3 million in 2008 representing 44.0% of the total health expenditure (THE) and 6.6% of the GDP as shown in the table 3.

Household payment for malaria services was estimated to be 49.0% (figure 1), followed by donor's payment accounting for 43.0% of the THE and 6.0% payment from the government (MOH&SW/NHAS, 2008).

Figure 1: Contributors to the Total Health expenditure for malaria



Source: Liberia National Health Account Survey Report (2008).

1.4.4 Health Workforce

Liberia still suffers limited human resource problems due to brain drain which has continuously affected staff recruitment, distribution and retention mostly in rural setting (MOH&SW/HRCR, 2010). This affects the malaria control and prevention interventions in the health facilities mainly in the rural areas. The attrition of staff trained in malaria case management creates a gap that impedes the implementation of healthcare delivery system (NMSP, 2010; MOH&SW/EPHS, 2011).

1.4.5 Medical Products and technology

The Ministry is committed to making available and delivering high quality effective, efficient life-saving medicines, other medical products and medical technology in time and at health facilities in the country in order to provide much needed healthcare to the Liberian people. With financial and technical supports from donors such as Global Funds, the USAID/PMI, GAVI, UNICEF, World Bank, WHO, etc. essential health and medical products are continuously quantified, procured and distributed for use at health facilities in the country (MOH&SW/SCMP, 2010).

1.4.6 Leadership and Governance

Leadership and governance cut across all the building blocks of a health system in terms of providing guidance or directives for the rest of the five building blocks. It also gives mandates to other health system functionalities and supports them in the implementation of those mandates.

In Liberia, basic protocols, guidelines and policies are available to ensure that all sectors of the health system function collaboratively to produce the desired goods to the population. These documents are used to monitor and regulate the workings of the health system, health information, health financing, health workforce and health products to ensure not only adherence to its mandates, but to ensure that the desired or intended results are achieved at an internationally acceptable standard (MOH&SW/NHPP, 2011).

The Central MOH&SW in her good governance efforts tries to construct health facilities around the country including remote and hard to reach terrains. Trained healthcare providers are employed and assigned in those facilities (MOH&SW/NHPP, 2011; WHO, 2014). The Ministry also coordinates with local and international partners to gather needed support for carrying out healthcare activities (WHO, 2014).

With this development, Liberia is striving to build a viable health system and as such she is pulling together and connecting loose ends to make a functional unit. The Central Ministry of Health of Liberia provides this oversight (MOH&SW/NHPP, 2011).

Chapter Two

2.0 Problem statement & Justification

2.1 Problem Statement

Malaria poses serious health challenge with major consequences for the PW. It gives rise to many maternal and birth complications (WHO, 2012). PW infected with malaria experience increased risk of anemia, placenta parasitemia, premature birth, low birth weight and high risk of mortality for herself and unborn child (WHO, 2008).

The epicenter of malaria is SSA, where the disease burden is alarming. The prevalence of malaria parasites infections, particularly in PW and children in malaria endemic developing countries is high, despite interventions (Roberts et al, 2011). Malaria related anemia in pregnant women accounts for approximately 10,000 maternal deaths in SSA annually. It also accounts for 8 to 14% of all newborns born with low birth weight in SSA (Marchesini et al, 2004). One in every four women shows signs of placental malaria infection and also estimated 100,000 infant deaths annually due to low birth-weight as a result of malaria during pregnancy in Africa (Desai et al, 2007).

It is worthwhile to use information, education and communication (IEC) messaging techniques to inform the PWs of the AMPIs before providing the interventions. This information provides the PWs with knowledge on how, when and why they are to use the LLINs. The same information helps them to know how, when and why it is important to take the SP tablets. Analyses of intervention studies on the reduction of burden of malaria during pregnancy in some SSA countries revealed that proper implementation of the MPIs reduced the risk of severe maternal anemia by 38%, low birth

weight by 43% and prenatal mortality by 27% among paucigravidae¹ (Desai et al., 2007; Binka et al, 2006; Amoran et al., 2012).

Meanwhile, the prevalence of malaria in the general population is 28% (LMIS, 2011). This prevalence is calculated from analysis of blood smears by microscopy taken from children under 5 years from selected sample of households in the Malaria Indicator Survey (LMIS, 2011). The same source reported that malaria related fever prevalence is high in children under 5 years (56%) and women (42%). Malaria prevalence varies across the regions. Below is a table that shows the regional variation in malaria prevalence in the country.

Table 5: Malaria prevalence at different regions in Liberia

Region	Malaria Prevalence due to microscopy	Number of children under 5 tested
Monrovia	7.1	589
North Western	29.0	263
South Central	26.2	538
South Eastern A	32.6	261
South Eastern B	49.2	212
North Central	35.0	952

Source: Liberia MIS (2011)

There is no prevalence calculated for PWs in Liberia. They lose immunity during pregnancy. However, the prevalence determined from children under 5 for the general population could give a rough indication about it.

Liberia is among the top 10 countries with the highest maternal mortality rates in the world (WHO et al., 2012). It is actually the 8th since 2010 (WHO et al., 2012). In Liberia, malaria during pregnancy (MIP) is a public health

¹ *Paucigravidae is a term used to describe women having first and second pregnancies.*

problem that predisposes the PW and her fetus or neonate to eminent risk. Though, no research has been done to determine the exact burden or risk of malaria among PW, all cause maternal mortality estimate is reported as 1,400 deaths per year (UNFPA, 2011; AllAfrica, 2013). It has been reported that over 8% of maternal deaths are due to malaria related anemia (MOH&SW/AR, 2012). This could mean that approximately 112 maternal deaths per year can be attributed to malaria related anemia alone. According to HMIS, as provided in the table 6 below, 33% (62,445/188,817) of the PWs are diagnosed and treated for malaria at the OPD of HFs across the country (MOH&SW/HMIS, 2014). The table below shows morbidity of the disease in PWs on regional and county levels.

In spite of the lack of precise data from Liberia, there is information on malaria burden in PW in Ghana that goes in line with the rough estimations calculated for Liberia. Ghana is a neighboring West African country with similar background to Liberia. According to Ghana's MIP Training Manual for Health Provider, 28.1% of Ghanaian PW with confirmed malaria received care at OPD, 13.7% of PWs were admitted (IPD) for malaria at facilities in Ghana and 9.0% of the PWs with confirmed malaria died of the infections (GHS, 2007).

Realizing the adverse impacts of malaria on maternal, unborn and newborn health, Liberia MOH&SW adopted the global approach of fighting MIP using the internationally acceptable best interventions (WHO, 2012).

2.2 Justification

The high malaria burden in the country, particularly among PW led the MOH&SW through the NMCP to adopted the WHO recommended preventive interventions of utilization of LLINs at all times especially during the full term

of pregnancy and the up-take of SP for IPTp during the second and the third trimesters of pregnancy (Binka et al, 2006; Amoran et al., 2012). The recommendation also includes the curative measure of effective case management of MIP and the prevention of anemia during pregnancy (WHO, 2012).

The malaria preventive services (MPS) for PW are currently being provided at the ANC. The curative measure, MIP case management services are also provided at OPD of health facilities (HFs) around the country (NMSP, 2010; MOH&SW/EPHS, 2011). At ANC, IEC messages about malaria prevention are provided by care providers. During the health talks, the messages will be given through different means, such as posters and fliers (MIP/TG, 2014). The messages will focus how and why PWs are to regularly sleep under LLINs and take a dose of the SP tablets once in the second and third trimesters (MIP/TG, 2014).

Accessing and utilizing these services by the PW; particularly, MPS which minimize the malaria associated risk factors, has been lower than intended (NMSP, 2010). Regarding table 6 below, the up-take of the second dose of SP which gives full protection to the PW is reaching almost half (79,005/188,817 or 41.8%) of the 80% target coverage demanded by policy (NMSP, 2010). This indicates the first challenge; PWs are not accessing ANC facilities. The second; those PWs in ANC consultations are reportedly not taking the SP; for instance, the dose of SP against the PWs attending ANC 3 (79,005/92,399 or 85.5%) (MOH&SW/HMIS, 2014). Why not 100%; this is the second bottleneck.

According to the national policy on malaria prevention for PWs, the following adopted Roll Back Malaria (RBM) targets were to be met in 2010 and sustain

till 2015. To date, the achievement of the RBM targets around which our national targets are based has proven to be problematic (NMSP, 2010). The targets are based on the national population projection for PWs (NPHC, 2008). The RBM targets adopted as national targets for MIP include; at least 85% of PWs owning LLINs and at least 80% of them using the LLINs while sleeping and at least 80% of the PWs receiving and taking a dose each of SP in the second and third trimesters. But the MIP/NMCP has always fallen short of meeting such targets (NMSP, 2010).

Table 6: Summary of Pregnant women attending ANC, OPD and taking SP for IPTp²

SUMMARY TABLE OF PREGNANT WOMEN ATTENDING OPD, ANC AND SP UP-TAKE FOR IPTp IN 2011 TO 2013.							
YEAR	Total projected Popn. of PWs	Total PWs accessing ANC 1	Total PWs accessing ANC 2	Total PWs accessing ANC 3	Total PW ³ accessing ANC 4	Total PWs taking SP for IPTp 1	Total PWs taking 2 nd dose of SP for IPTp 2
2011	184,935	222,790	104,786	81,030	93,631	98,705	66,171
2012	188,900	176,880	135,480	103,399	119,922	113,947	81,429
2013	192,615	157,202	120,736	92,769	121,440	108,343	89,414
AVE.	188,817	185,624	120,334	92,399	111,664	106,998	79,005

Source: Liberia HMIS (2014).

² NOTE: The reason for the difference in 2011 projected figure and the ANC 1 in the same year was due to high influx of Ivorian refugees in Liberia (MOH&SW, 2012).

³ NOTE: The high number of ANC 4th Visit is as a result of collapsing all other ANC Visits after the 3^d Visit (MOH-HMIS, 2014).

Liberia Malaria Indicator Survey (LMIS) conducted every two years in Liberia is *de facto population*⁴ based survey. This Survey reported that some of the PW are not benefitting from the AMPIs implemented in the country. Thirty-nine percent (39%) of PWs slept under LLINs the night before the survey and about half (51%) of the PWs enrolled in the survey took two doses of SP for IPTp 2 (LMIS 2011). The following table presents data from LMIS on the use of the interventions in the regions.

Table 7: Percentage of PW utilizing LLINs and taking two doses of SP for IPTp 2 in the regions

Regions	% of PWs who slept under LLINs the night before the Survey	% of PWs who took two doses of SP for IPTp 2 during their last pregnancy
Monrovia	39.5	40.1
North Western	36.2	52.4
South Central	26.0	38.8
South Eastern A	54.7	56.6
South Eastern B	50.3	64.1
North Central	41.9	58.9

Source: LMIS (2011)

Over the years, there has been limited study on malaria related maternal problems; particularly, research to address problems of access and utilization of the ANC's AMPS in Liberia. Therefore, this thesis aims is to explore and present useful information that will guide the needed improvements of the AMPS in order to promote access and utilization of the services among PWs in Liberia.

⁴ *The de facto population is a population of all people physically present in an enumeration area or household at the time of the survey, whether or not they are permanent residents of the area or household (UNO, 2013).*

The findings from this study will also be help program managers and policy makers to formulate strategies that will assist in the scale up of MPS that will eventually reduce malaria related morbidity and mortality among PWs in Liberia.

2.3 Study question

What are the factors limiting access and utilization of MPCs (LLINs and SP for IPTp) by PWs in Liberia?

2.3.1 General Objectives

Considering the Andersen's framework of access and utilization of malaria preventive commodities (MPCs), this thesis will explore factors influencing the up-take of malaria preventive interventions (MPI) in order to identify potential areas of improvement for access and utilization by PWs in Liberia and to identify potential strategies for improvements.

2.3.2 Specific Objectives

1. To describe environmental indicators including health system factors, population characteristics and, health behavioral factors influencing access and utilization of AMPIs (LLINs and SP for IPTp) by PWs.
2. To describe interventions by other countries considered universal best practices that scaled-up the delivery of AMPS and maximize the up-take of AMPS by PWs.
3. To describe and discuss potential strategies that will inform policy makers to invest and promote interventions that will increase access and use of AMPCs (LLINs and SP tablets) by PWs.

2.4 Methodology

This section will explain the methods used in establishing factors influencing the up-take of malaria preventive services (MPS) in Liberia. The narrative of the research will also use research procedure and study design that will be explained.

For the analysis of findings, the research will focus on environment, population characteristics and part of health behavior. However, summary paragraph will be provided to capture key description of outcomes.

2.4.1 Study type and design

This study is a literature review. The focus will be in published and unpublished resources from Liberia. In case information about Liberia is missing, documents describing the situation in neighboring countries will be included. Whenever suitable and available, secondary data from the Liberia HMIS will be used to illustrate the situation.

2.4.2 Search Strategy

In order to explore relevant literature to address factors influencing the utilization of AMPS for PWs at ANC, materials or information were gathered from the following: Google scholar as Search engine; Data bases such as Pubmed, Ebase, Medline and Vu Library; and Websites of UNICEF, PMI, WHO, ICF International, World Bank, African Development Bank, Liberia Ministry of Finance and Liberia MOH&SW and MOH&SW/HMIS. Majority of the searches will be done through the use of internet. However, books, reports and databases will be reviewed to gather relevant information.

2.4.3 The Conceptual Framework – Andersen’s Model of access and utilization

In 1974, Andersen and Aday, thinking about the problems of delivering better healthcare to the vulnerable population, conceptualized the healthcare delivery system and the population as process and utilization of the services and satisfaction of consumers as outcome indicators. This was intended to measure the behavior of consumers in accessing and utilizing healthcare. Andersen and Newman in 1990 developed this concept which actually

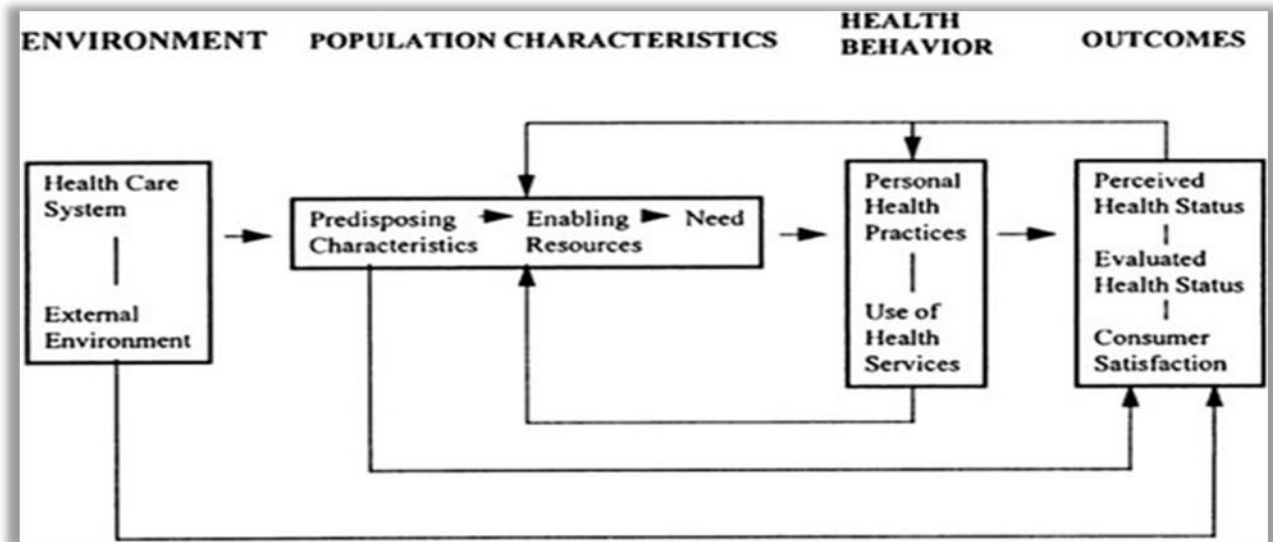
started in the 1960s into a framework that described conditions necessary to create utilization and non-utilization of healthcare services.

There were other models or frameworks that could have been selected to explore the factors that influence the up-take of AMPIs at ANC. One of such model was the Three Delay Model developed by Thaddeus and Maine in 1994. This model basically addresses factors around utilization and outcomes and is a bit restricted in scope than the Andersen's. To adequately explore and describe the following: (1) environment; the prevailing natural and political environment and healthcare system including knowledge and practices of providers (2) the population; in this I will explore the three key concepts (predisposing factors, enabling factors, and need) which directly influence access and utilization, (3) health behavior of PWs in Liberia and (4) satisfaction of the PWs due to the MPS receive.

The Andersen's conceptual framework of access and utilization of health service interventions is better suited for exploring the factors motivating high or low access and utilization in Liberia considering the diversity of issues surrounding the malaria preventive services in post conflict situation.

Regarding the nature of this research, which aims at determining factors or causes affecting access and utilization of MPS at ANC by PWs in Liberia, the "Andersen's Model" will be used to explore the findings. It clearly speaks to the method of service provision considering the providers' knowledge and skill combined with providers-clients relationship and availability of MPCs.

Figure 2: Andersen and Newman Framework of Health Services Utilization



Source: Andersen (1995).

2.4.4 Study limitation

Due to limitations of the HMIS, there was a lack of precise information about the burden of disease and in some cases about the level of utilization of health services by PWs.

2.4.5 Inclusion and Exclusion Criteria

All articles included in this thesis are those written and published in English language. Articles included were also those published after the year 2000. However, older articles containing important information that was unlikely to change over time were included.

2.4.6 Key words

A combination of the following key words was used: Liberia, Sub-Saharan Africa (SSA), Low and Medium Income Countries (LMIC), malaria in pregnancy (MIP), Long Lasting Insecticide-treated Nets (LLINs), Intermittent Preventive Treatment for Pregnant Women (IPTp), Sulphadoxine

Pyrimethamine (SP), healthcare system, malaria preventive services (MPS), malaria preventive commodities (MPCs), malaria preventive interventions (MPIs) Ante Natal Care (ANC), external environment, predisposing characteristics, education, cultural beliefs, enabling resources, needs and consumers satisfaction.

Chapter Three: Study Findings

3.1 Introduction

Based on the Andersen's Conceptual Frameworks, key findings that support or prevent the access of malaria preventive services (MPS) in Liberia will be described under headings such as environment, population characteristics, health behavior and outcomes in order to obtain and present evidence that will answer the question of improving the up-take of malaria preventive interventions (MPIs) in the country. Any adjustment in the application of key elements listed as headings and sub-headings to address the objectives of the thesis will be mentioned.

3.2 Environment

Many factors interplay at the environmental level that impede and support access and utilization of healthcare services and interventions. Under this heading, the health care system and other external environmental factors that support and prevent PW from access and utilizing MPS will be described. The environment in which pregnant women stay, how close or far away they live from a health facility influences their ability in seeking health care services. In Liberia, most PWs live in remote areas where access to health care services has been recorded to be low as mention below.

3.2.1 Healthcare System

As mentioned in the background, it is at the primary health care levels that the malaria control and prevention activities (MCPAs) are implemented in Liberia (MOH&SW/EPHS, 2011). Currently, the MPS are provided at all primary health care level in the country (NMSP, 2010; MOH&SW/EPHS, 2011).

The NMCP has the mandate of the MOH&SW to plan and execute all malaria prevention and control intervention activities nationwide. It uses a comprehensive, universally acceptable method of malaria prevention and control interventions (MCPIs) to reduce malaria burden throughout the country (NMSP, 2010; MIP/TG, 2014). The comprehensive method focuses on four main intervention areas which include; malaria case management of all malaria cases, management and prevention of malaria in pregnancy,

integrated vector management and Information Education Communication (IEC) (NMSP, 2010; MIP/TG, 2014).

The NMCP has three divisions, including; Technical Services, Finance and Administration and Monitoring and Evaluation (M&E). The divisions are subdivided into units responsible for different functions; all gear towards the planning, implementation and coordination of the MCPAs throughout the country (NMSP, 2010).

The NMCP, the Community Health Division (CHD) of MOH&SW and the local and international partners involve with malaria prevention and control (MCP) and sub-national players organize and implement MCPAs nationwide (NMSP 2010; EPHS, 2011; MIP/TG, 2014). The implementation of MPS includes:

- the training care providers on rising awareness among PWs through town hall meetings, health talks at ANC facilities on why and how to take and use the LLINs and on why and how to take the SP tablets as prescribed by the guidelines (NMSP, 2010; MIP/TG, 2014).
- Using the “dot” strategy, encourage the PWs to take the SP tablets at the HFs (MIP/TG, 2014).
- Providing health education on possible effects of SP and LLINs and what should be done when such situation arises.
- Repeat the reasons why it is good to take and complete the full dose of SP (MIP/TG, 2014).

The MCPIs are to address core MIP targets; such as PWs having access to and sleeping under LLINs, having access to and taking SP tablets and having access to malaria diagnostic and treatment and using it to reduce malaria burden in Liberia (NMSP, 2010).

PWs in their first trimester and visiting ANC for the first time are provided LLINs (NMSP, 2010). During the PWs second and third visits, they are served SP tablets for IPTp (NMSP, 2010). In Liberia, MPS are not provided at community level. However, gCHVs in Liberia are trained to deliver quality care to children under 5 years including malaria education, diagnosis and treatment.

Over 90% of the funds required to procure and distribute MPCs are provided by donors and bilateral organizations (PMI/MOP, 2013; MOH&SW/NHAS, 2008).

Bureaucratic bottlenecks in disbursement of fund for procurement and distribution often create setbacks for prompt and effective intervention (MOH&SW/ARR, 2013).

The Malaria Program's quantification for malaria preventive commodities (MPCs) follows the 5% national population projection for PWs (NPHC, 2008; SPS, 2011). The calculated quantity along with buffer are procured and brought into the country by the government and or partners on behalf of the MOH&SW or NMCP (SPS, 2011). The MPCs are stored and supplied to the HFs throughout the country periodically (SCMP, 2010; SPS, 2011).

The MPCs (LLINs and SP Tablets) are supplied to both public and private health facilities in the country at no cost to them (MOH&SW/NHPP, 2011; MOH&SW/EPHS, 2011). The private HFs signed a memorandum of understanding with the NMCP to distribute the MPCs free of charge to all PWs in Liberia (NMSP, 2010).

Over the year, there has been mal-distribution of MPCs across the country. The mal-distribution of commodities causes supplies to be stock-out ahead of appointed time (MOH&SW/ARR, 2013; PMI/MOP, 2013; Attah et al., 2010). The worst cases of shortages have been seen in LLINs supplied to ANC facilities (PMI/MOP, 2013). There has also been improper documentation of consumption records for LLINs in some HFs in the country (MOH&SW/SCMP, 2010). The improper accountability of the MPCs hindered resupply of the commodities, particularly LLINs (MOH&SW/SCMP, 2010).

The human resource (HR) problems in the country are of serious concerns (MOH&SW/ HRCR, 2010). There is a shortage of HR; particularly, certified midwives to carry out the MIP services in the HFs (MOH&SW/ HRCR, 2010).

However, the available few are not equitably distributed among all HFs around the country (Attah et al., 2010; Varpilah et al. 2011). The urban and sub-urban HFs have more skilled professionals than the HFs in RRCs (Attah et al., 2010). As a result, there are many professionals in the urban HFs who are not actually working while some HFs in RRCs have only one skilled professional or even no skilled professional (Attah et al., 2010).

Trainings are often conducted to strengthen capacity of the HRs (Varpilah et al., 2011; MIP/TG, 2014). Some are in-service and others are full term trainings at institutions around the country. These training programs are

sponsored by donor partners through the government (Varpilah et al., 2011; MOH&SW/NHPP, 2011). Besides, on a regular quarterly basis, the NMCP organize and implement training and refresher and on the job mentoring exercises to build provider's capacities in MIP activities (NMSP, 2010; MIP/TG, 2014).

Professionals become unresponsive to the needs of the PWs due to lack of motivation. This gives rise to absenteeism of providers, poor provider-client relationship, and long waiting time for the PWs (Attah et al., 2010). This results to the PWs distrusting the HF's services and opting for alternative (Attah et al., 2010).

Public-Private Partnership and Private Sector

In Liberia, public-private partnership has been developed and has meaningfully contributed to the health delivery system (WHO-AFRO, 2014). Approximately 34% of the HFs (hospitals and clinics) are owned and operated by private-for-profit organizations (MOH&SW/HMIS, 2013). The MOH&SW provide leadership and guidance to the partnerships (MOH&SW/NHPP, 2011). In Liberia, both public and private sectors HFs deliver MPS at ANC (MOH&SW/EPHS, 2011). In the private HFs, the MCPs provided by NMCP and MOH&SW's free drugs program are to be distributed free of charge to the PWs. However, private HFs procured other MCPs along with other commodities (Basu et al. 2012). The privately bought MCPs are sold for high price to the PWs accessing those (Basu et al. 2012). Besides, payments for the privately bought MPCs, other services such as registration, monitoring vital signs and screening for danger signs and general consultation provided to PWs in that private HFs are paid for (Basu et al. 2012).

Comparative analysis carried out by Basu et al (2012) in some countries in SSA including Liberia reveals that most public HFs are better staffed and equipped than many private HFs. This is similar to Liberia. In addition, in Liberia, equity and fairness are vivid in public HFs than private (Basu et al, 2012). On the contrary, provider-client relationships are better in private HFs than public HFs (Basu et al, 2012). The public HFs provide high quality MPS at no cost to the PWs than the private. In addition to the free MPS, the private HFs will order other fluids and other medicines and charge the PWs more fees (Basu et al. 2012).

The Informal Health Sector

In Liberia, there is an informal sector that some of the PWs look to in terms of seeking MPS (Basu et al. 2012). This sector may not have better MPS, but like the private sector, has better provider-client relationship that influence the PWs to turn to them for care (Lori et al., 2011; Basu et al. 2012). Secondly, there services are provided at your door (Basu et al. 2012).

3.2.2 External Environment⁵

There are several external environmental phenomena that affect the up-take of AMPS in Liberia. Few of such external factors include poor road infrastructure linking ANC facilities, climate, natural disaster or shock, cross border movement of citizens from neighboring countries, political instability and urban migration of PWs.

PWs living in remote rural communities (RRCs) have no motor-able road and so they access ANC facilities on foot for about 5 to 10 hours (NMSP, 2010). Some PWs live in RRCs with dilapidated motor-able roads where the chance of vehicle movement is slim (NMSP, 2010; MOH&SW/ARR, 2013). These situations of poor road infrastructure linking ANC facilities cause PWs from getting access to MPS at the ANC.

Changes in the climate or weather affect the up-take of MPS in Liberia (Sherman, 2013). The heavy down pour of rain in Liberia during the rainy season damage the road infrastructures making it difficult for MPCs and others supplies to reach many ANC facilities (Sherman, 2013).

Climatic changes and other natural happenings like disease outbreaks that create shock or natural disaster can cause movement of PW from their permanent resident to another where access to AMPS may be scarce (UNICEF/WCARO/AR, 2013). Currently, some PW are moving away to parts of the country where the current Ebola outbreak has not reach. This is a drive to find safety and might eventually take some PW to areas of no access to ANC and MPS (UNICEF/WCARO/AR, 2013).

⁵ Besides Sherman, NMCP's NMSP and Africare whose studies conducted in Liberia, the rest of the references were generalized in the West, Central and East African regions. But the situations presented are common in Liberia as documented.

Liberia has porous borders with Guinea, Sierra Leone and Ivory Coast permitting the free flow of migrant in and out of the country in search of ANC and MPS (IOM, 2014). These migrants mostly women and children with a good number being pregnant women come in search of free health care provided in Liberia (PBR, 2002). In Liberia, access to ANC and MPS are granted to all PW regardless of nationalities (EPHS, 2011; NHPP, 2011). This results into the depletion of MPCs earlier than expected, thus creating stock-outs of the MPCs (MOH&SW/SCMP 2010; SPS, 2011).

Political environment comprise of governments, group's or individual leader's interest in funding other areas of interest than MIP activities in the country. Currently, the MIP activities are totally funded by donor partners (PMI/MOP, 2013). Funding from Global Fund and PMI are not enough to cover all planned activities in order to improve the desired targets (PMI/MOP, 2013).

Political instability influences population movement. The movement of PWs into urban communities due to political reasons is a factor that offset supplies of MPS at the different levels in Liberia and contributes to low IPTp access (WCARO/AR, 2013).

3.3 POPULATION CHARACTERISTICS

3.3.1 Predisposing characteristics

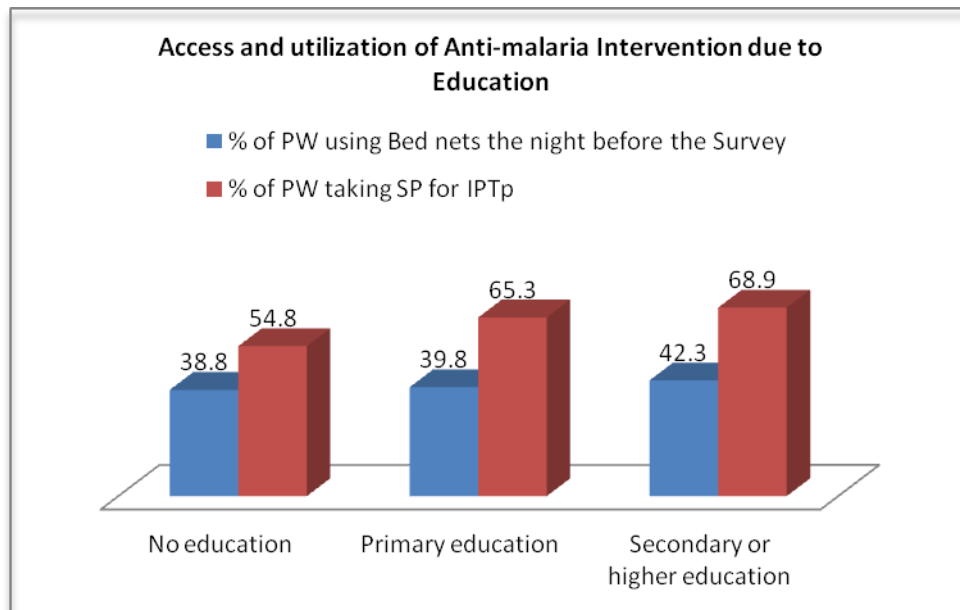
Predisposing factors are demographic or biological factors such as genetics, sex and age; social and cultural factors such as education, knowledge, employment, values and beliefs that have the capacity of influencing a PW's or the PWs' interest in accessing MPS (Babitsch et al., 2012).

3.3.1.1 Demographic characteristics

In my research, I did not find a standalone study in Liberia to determine whether or not age is a determinant for the up-take of AMPS. But qualitative study done in SSA including Liberia and her neighbors indicated that age of PW is a determinant for using LLINs and for going to ANC facilities for AMPCs (Hill et al, 2013). Besides Liberian being part of the study, neighboring countries with similar context to Liberia were included and results from the study says that older PW over 19 years of age access ANC facilities (Hill et al, 2013). The same report also mentioned that the same older PW who access ANC also received AMPS at the facilities and younger PW are more likely to stay away from the ANC and AMPS (Hill et al, 2013).

In Liberia, studies have proven that PWs with higher education are more likely to access care from ANC facilities than those with lower education. Those with lower education are more likely to use ANC services than those without education (LMIS, 2011). Seeking MPS at ANC follows the same pattern; PW with higher education received and take MPS than those with little education. PW with no education are less likely to receive and take the full dose of MPCs than those with primary education (LMIS, 2011). Figure 3 shows the effect of education on utilization of anti-malaria commodities during ANC visits in Liberia.

Figure 3: The effect of education on access and utilization of anti-malaria preventive intervention during ANC visit

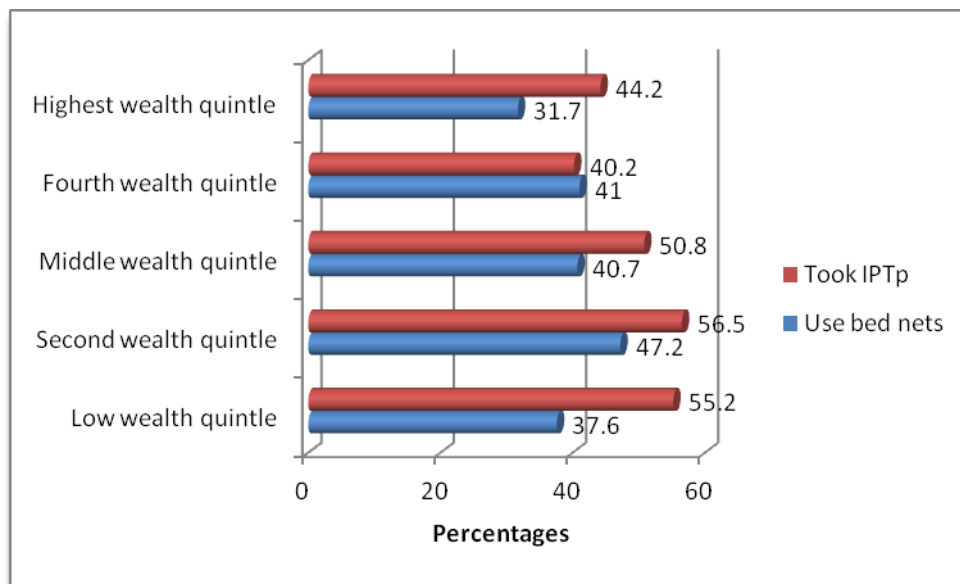


Source: LMIS (2011).

Married PWs are less likely to attend ANC and access services including MPS than unmarried PWs (Sipsma et al., 2013). In his study, Sipsma and colleagues found out that marriage in the Liberian culture suggests loss of autonomy and empowerment. Education plays little role, but many of the PWs, particularly in the rural setting of Liberia do not have the decision making power to access ANC and may not access AMPS (Sipsma et al., 2013). With no standalone report on Liberia, the study conducted by Hill et al. (2013) revealed that married PWs supported by their spouses attend ANC and opt to receive MPS unlike the unmarried PW (Hill et al, 2013).

In Liberia, many of the PWs are found within the poor quintile (LDHS, 2007). Most of the PWs live in the RRCs where accesses to MPS are subjected to several conditions (Tomczyk et al., 2007). On the other hand, the wealthier PWs, most of who reside in better neighborhoods in urban settings have little concerns about accessing MPS (LMIS, 2011). However, LDHS 2007 reveals that wealthier PWs are more likely to access MPS at ANC facilities. Figure 4, below, describes how PWs of different wealth quintiles access MPS.

Figure 4: Access and Utilization of Malaria preventive interventions at ANC by pregnant women in different wealth categories



Source: LMIS 2011

3.3.1.2 Cultural values, beliefs and practices

The cultural values or beliefs of a PW determine whether or not she will seek ANC services that include MPS. According to Lori et al. (2011), the following three factors influence the PW's quest to access MPS at ANC; secrecy surrounding pregnancy and childbirth, power and authority and distrust of the health care system.

The traditional school 'bush school' is practiced in Liberia. In these schools young girls are taught how to behave in public places and communicate in a special way. It also serves as a place where these young girls learn how traditional medicine and practices such as use of traditional birth attendants and healers in seeking care during pregnancy. Pregnancy is also regarding

as secrete. For instance, a PW will never refer to herself as being pregnant. She will rather say, "When people are pregnant, this and that happens to them" in reference to herself in a present or past condition of pregnancy. So, the PWs from this background will avoid practitioners that are hostile and this may cause them avoid accessing MPS (personal experience).

PWs who graduated from this bush school are not to have decision making power. These women cannot decide on whether or not to access ANC services including MPS (Lori et al, 2011). It is their spouses that decide and even facilitate their movement to and fro the facilities. So, the involvement of the spouses is important. In some cases, the spouses even continuously remand them to go to the facilities to access the MPS and make sure they return another time (Lori et al, 2011).

The loss of trust in the health care system by the spouse and the community automatically means the PWs' distrust in the health system. This distrust leads to acceptance of the traditional medicine; thus shutting the doors on ANC and the access of MPS (Lori et al, 2011).

All of this secrecy of pregnancy, power and distrust of the health system are the result of fear of a certain supernatural power. The PWs believe that the supernatural power of witch crafty will strike them with death during the pregnancy or at delivery, if they disobey or misbehave. They also believe that there is a more supreme power that endorses or rejects the decision of the witches and wizards in approving life and death (Lori et al, 2011). These entire cultural beliefs make accessing MPS at ANC difficult.

3.3.1.3 Social Interactions and Net-working

This describes the roles of PWs in terms of relating to basic structures and the different players in their communities regarding the traditional context. It is the description of the relationships between the PWs and their communities, families, elderly people and their spouses and how these relationships impact their access to MPS at the ANC.

The PWs live under tight social and cultural norms; most of which do not allow them to make their own decisions on issues like accessing or seeking health. Culturally, the Liberian indigenous PWs are obliged to always obey and follow instructions. Instructions, the PWs are regarded as too immature to question, propel them to accept and access the health care and MPS or

seek care from traditional practitioners. Witch crafty is common in nearly all of these traditional settings and the PWs are controlled by such supernatural forces. PWs are bewitched and die or sustain serious injuries during their pregnancy or at delivery for misconduct (Lori et al, 2011).

The elders and zoes⁶ hold the highest power in the communities. The PWs are represented by their spouses when interacting with the elders or the zoes in their communities in activities of their community. In health matter, the traditional practitioners such as traditional birth attendance (TBA) and traditional midwife (TM), who are usually the zoes, are consulted. They are consulted by the spouse who will turn her over for care. After assessment and examination, results are given to the family through the same channel (Lori et al, 2011).

3.3.7 Attitudes or behavior and Practices

The Liberian culture provides that women, whether pregnant or not must be dependent on their spouses. As a result, no matter their age, education level and income, they always depend on their spouses to cover their daily and health expenditures out of his pocket. Access to AMPS at the ANC by a PW depends on her spouse. This attitude and practice conform to the illustrations of Liberian culture by Lori et al. (2011) and Sipsma et al. (2013).

However, some PWs on their own terms, avoid accessing SP due to some preconceive notion of the drug intensifying ill feelings. Regarding this, even if the drug is offered, they will prefer taking it home at bedtime. But, some of the medicines end up as thrash due to the PW's inability to utilize it. This is as a result poverty and price rise of food on the Liberian and global market which deny the PW, her required daily food needs not being satisfied (MOA, 2008; Personal Experience). The throwing away of SP due to adverse reaction was reported in a study done in Tanzania when that country was moving from chloroquine to SP as first-line drug for anti-malaria treatment in 2001 (Nsimba, 2006).

⁶ *The Zoes are the traditional birth attendance and traditional midwives who carry out deliveries and other traditional medical services in the remote rural communities. They are the administrators of the traditional bush school called "Sande". They are feared because, they are known to possess great magical powers.*

3.3.2 Enabling Factors

Organizational and resource factors that empower the PWs to access the MPS at ANC are the enabling factors (Babitsch et al., 2012). The organizational factors describe the source of care, nature of care and the issues of accessibility and convenience in accessing care. It also takes into account location, structure and distribution of services, facilities and personnel. The resource and financial factors describe community, family and personal income that support access to MPS at ANC, other payment mechanisms and health expenditures (Babitsch et al., 2012). These factors have been highlighted in this and other sections of the thesis as they are cross cutting factors.

3.3.2.1 Accessibility and Utilization of malaria preventive Services (MPS) at ANC Facilities

In the current Liberia situation, MPS at both public and private HFs are free, except the MPCs used by the private sector are privately purchased (MOH&SW/NHPP, 2011; MOH&SW/EPHS, 2011; NMSP, 2010). However, there are payments for other services provided at the private sector (Basu et al., 2012).

Currently, there is no public health insurance scheme and so all payments (direct and indirect) are settled out of pocket (MOH&SW/NHPP, 2007). However, Liberia is finding a sustainable system, should donor support runs down. The thought is based on introduction of subsidized user fees system that will not drive the PWs and their families to poverty (IRIN-Africa, 2014).

Access is determined by several factors; the presence of an ANC facility, the availability of the commodities and the presence of trained health professionals to deliver the MPS and the capacity of the PWs to attend ANC for the MPS (MOH&SW/EPHS, 2011; Attah et al., 2010). As mentioned above, NMCP has made some gains in providing MPCs to ANC for PWs but problems still exist (MOH&SW/AR, 2012; MOH&SW/HMIS, 2014). Poor healthcare provider–client relationship, long waiting time, late enrollment and stock-out of MPCs are major hurdles that block PWs from accessing MPS at ANC (Attah et al., 2010; MOH&SW/ARR, 2012). Table 8 outlines some of the factors that impede access and utilization of healthcare for PWs in Lofa County while table 9 considers impediments in accessing health among all Liberia women.

Table 8: Barriers in accessing MPS at ANC HFs in Lofa County

REASONS PWs NOT ACCESSING ANC HFs	% OF PWs RESPONDING
No Care Provider	92.2%
Long walking distance	63.4%
Stock-out of supplies	-
Lack transportation cost	39.0%
Affordability	40.8%

Source: Lofa Reproductive Health Survey (2007).

The reproductive survey conducted in Lofa by Tomczyk et al. (2007) was conducted in Lofa county, one of 15 counties in Liberia. The questionnaire did not consider stock situation in county (Tomczyk et al., 2007).

The Liberia Reproductive Health at a Glance (2011) mentioned the following Liberia DHS 2007 data.

Table 9: Barriers in accessing HFs by all women in Liberia

Reasons for not accessing health care HFs	% OF WOMEN RESPONDING
No Care Provider	40.9%
Long walking distance	48.6%
Stock-out of supplies	51.3%
Lack transportation cost	49.8%
Affordability	53.6%

Source: Liberia DHS 2007 as cited by the Liberia Reproductive Health at a Glance (2011).

The two tables create some pictures in considering factors such as high transportation cost or long walking distance, stock-outs and no or low number of skilled care provider at ANC facility as barriers (Tomczyk et al., 2007; Attah et al., 2010; MOH&SW/LRH, 2011). Consider the impoverish nature of the population, as cited in the background, that about four-fifth (80%) of the population live on less than US\$1.25 a day (NMSP, 2010).

According to the National Census of Health Worker, in most rural facility, there is only one skilled provider, who may not even be a Certified Midwife. There are some facilities without a skilled provider and under-performance is clearly seen (Attah et al., 2010). There are also understaffed HFs in RRCs that have higher workloads (MOH&SW/HRCR, 2010).

Hill and colleagues (2013) conducted systematic literature review in SSA and showed that issues of service delivery, access and utilization of MPS are also attributed to geographical factors such as poor road infrastructure and many hours, about 8 to 10 hours, walking distance to the nearest HFs.

3.3.2.2 Community, Family and Personal Resources (Affordability: Income and Health Insurance)

According to the web's business dictionary, "any economic or productive factor required to accomplish an activity is regarded to as a resource". There are many kinds of resources but in this case, I am referring to the financial resource that may be used as direct and indirect payment for accessing anti-malaria preventive services at ANC facilities. The Government through the MOH&SW and partners provide free healthcare services to the population at all public health facilities including services at the ANC facilities (MOH&SW/NHPP, 2011). The free drugs program is extended to all private and specialized health facilities. In this regard, there is a national policy that all anti-malaria commodities supplied by the free drug program should be distributed free of charge to the population (MOH&SW/EPHS 2011, MOH&SW/NHPP, 2011). However, the private sector also procure additional anti-malaria commodities such as LLINs, SP tablets, ACTs and diagnostic test kits for ANC and other services. The privately bought products are sold to the public (MOH&SW/EPHS 2011, MOH&SW/NHPP, 2011).

Besides the free drugs and other medical supplies, indirect cost such as transportation and food and direct cost such as payment for anti-malaria preventive commodities are procured by private ANC facilities. Payment for the anti-malaria care cost in the private sector is not affordable by most of the pregnant women (Tomczyk et al., 2007).

Out of pocket payment, which constitutes 35% of the THE of Liberia, is the only viable system of payment for healthcare in Liberia. The National Social Security Corporation is a health insurance scheme that provides for the population that is employ and there is no coverage for the unemployed (MOH&SW/NHAS, 2008).

Apart from the fore-going, the community's capacity of having an ANC facility couple with the availability of a skilled professional and the availability of appropriate anti-malaria preventive commodities to implement

the services is paramount (MOH&SW/EPHS 2011, MOH&SW/NHPP, 2011). Absence of any one of the latter two results in impairment of the MPS.

3.3.3 Needs

Needs of PWs are subjective; such as feelings or thoughts of being ill that propel them to seek health care (Witter et al., 2000). This section will address the needs factors categorized into individual perceived needs for health services and a professional assessment of a person's health needs (Babitsch et al., 2012).

3.3.3.1 Perceived Health Needs.

As mentioned earlier, this element deals with how the PWs view their individual health conditions based on feeling of disabilities due to illnesses, symptoms of illness, knowledge of healthcare and willingness to seek healthcare (Babitsch et al., 2012).

Majority, about 75%, of the Liberian pregnant women are knowledgeable about the complications associated with MIP (Tomczyk et al., 2007; MIP/TG, 2014). malarial information is provided during health talks at ANC facilities around the country (MIP/TG, 2014). They are cautioned by care providers to visit ANC for AMPS (MIP/TG, 2014). However, some PWs do not adhere to the information to seek AMPS. This is due to the perception that malaria is not a serious illness and that they can easily get treated from it (Tomczyk et al., 2007; MIP/TG, 2014).

Secondly, some believe that the MPCs (both LLINs and SP tablets) have side-effects and that causes worst feelings than the malaria illness (Pell et al., 2011). Drowsiness, weakness, headache and disable feelings associated with the SP tablets comes about due to refusal of the PW not following instruction to eat and drink more fluids or negligence on the part of the health provider to give the information (Pell et al., 2011; Attah et al., 2010). Some PW also complain that LLINs can cause diarrhea, running nose, itching and burning sensation (Banek et al., 2010). Adverse reaction was also

reported from neighboring Cote d'Ivoire in an area where LLINs distributed were treated with combined pyrethroid and carbamate⁷.

3.3.3.2 Evaluated needs

Malaria infection during pregnancy doubles PWs' risk of death and quadruples their risk of malaria illness (MIP/TG, 2014). Malaria infection increased during the second and the third trimesters (MIP/TG, 2014). Malaria also increases the risk of low birth weights, placenta malaria,

Considering the consequences malaria on the PW and her unborn child, WHO developed strategies that have proven successful over the past years. The use of LLINs, up-take of SP for IPTp and treatment of malaria with appropriate. The introduction of these interventions in Liberia in 2003, the country has documented the following gains; the use of LLINs among PW has increased from 33% in 2009 to 39% in 2011. PW up-take of SP has increased from 4.5% in 2005, 45.1% in 2009 and 50% in 2011 (LMIS, 2009; LMIS, 2011). PWs in Liberia therefore need these interventions in order to have better birth outcomes.

3.4 Health Behavior

3.4.1 Personal Health Practices

Information gathered on PWs MPS seeking in Liberia suggest that there is poor personal care seeking behavior among PWs, particularly, accessing ANC (Attah et al., 2010; Tomczyk et al., 2007; MOH&W/ARR 2012; MIP/TG, 2014). This is from the perception that pregnancy is not a disease and malaria can be treated as described previously. Pregnancy is sacred and must not be shown in public places (Lori et al., 2011).

Some of the PWs have well-established cultural beliefs that breed distrust in western medication. Beliefs such as secrecy of pregnancy and childbirth, power and authority of traditional society (sande⁸), spouses and the elderly

⁷ *Combined chemicals used as insecticides to treat insecticide-treated bed nets.*

⁸ *Sande is the traditional bush schools for girls and women in Liberia. This school has great influence and power over girls and women who are initiated into it. One of the main practices of this bush is "genital mutilation".*

block some indigenous PWs from attending ANC and accessing AMPS (Lori et al., 2011).

3.4.2 Use of Health Services

Liberian PWs come from diverse background as stated in previous chapter of this thesis. This affects their use of health services. Some PWs with good financial capacity seek AMPS at private HFs (Basu et al., 2012). At the private HFs, better care in terms of human relations and mutual respect are provided to the PWs than the public HFs (Basu et al., 2012). Majority of the PWs in Liberia access AMPS at the public HFs according to the unpublished NMCP Annual Report (2012) and published MOH&SW Annual Report (2012). Many will attend ANC at the public HFs because the ANC and AMPS provided are of high quality and are free (MOH&SW/EPHS, 2011; MOH&SW/SCMP, 2010). Yet, there are others who will seek MPS through different means and channels such as private practitioners, herbalist, TBAs, drug peddlers, private pharmacies and medicine stores (Basu et al., 2012).

3.5 OUTCOMES

3.5.1 Consumers Satisfaction

In spite of cultural beliefs towards western medication and the adverse effects of MPCs, PWs in Liberia still access the MPS at ANC HFs (MOH&SW/AR, 2012; MOH&SW/HMIS, 2014). According to HMIS (2014), 86% of the PWs who attended ANC three times received and took the second dose of SP tablets for IPTp, suggesting that they are complying with the medicine. But it is yet to determine whether compliance and satisfaction are linked.

LLINs compliance study was carried out in Liberia (Banek et al., 2010). The study showed that the "Perma-Net" is user-friendly and is the choice of most Liberians including the PWs. Banek and colleagues also disclosed that Liberians including PWs do not like the BASF interceptor nets (Banek et al., 2010). They are very rough and are therefore used for fishing and some use it to scrub their body (Banek et al., 2010). An estimated 95% of PWs in Liberia who own LLINs are using them to sleep (Banek et al., 2010). This indicates that the PWs in Liberia are complying with the use of LLINs. Again, satisfaction is yet to be determined.

Chapter Four

4.1 Internationally Acceptable Best Interventions implemented in Other Countries

In an attempt to maximize the up-take of MPS to the PWs, some LMIC countries similar to Liberia have adopted and implemented several strategies geared towards improving access and utilization of MPS. The following are examples of such internationally considered best strategies used in other LMIC countries.

4.2 Environment, Health System Issues and Enabling Factors

According to the framework, there are overlapping factors between health system and enabling factors. In order to avoid duplication of evidences, most of the enabling factors will be combined with health system factors.

Anti-malaria preventive intervention provided through community-based Intervention

Studies been conducted in other sub-Saharan African countries including Gambia and Uganda on the use of community resources to deliver the AMPS to PWs at the community level. Focus was placed on a clinical trial in Mukono District, Uganda from 2003 to 2007 by Anthony Mbonye and his colleagues. This study has proven that AMPS can be successfully delivered at community level by local resources such as community health volunteers (gCHVs), traditional birth attendants (TBAs) and trained traditional midwives (TTMs). The result of this intervention was very good and successful for access and adherence to LLINs use and IPTp up-take; precisely 39.9% PWs access the ANC facility while 67.5% of the PWs took IPTp 2 at community level. This reduced prevalence of anemia and malaria in PWs, improve number of high birth weights babies and improve the poor perception of PWs regarding the use of SP for IPTp and LLINs (Mbonye et al., 2009).

The Mukono District in Uganda is rural remote district made up of several parishes with each having about 2000 populations. This district has RRCs that are far away from the nearest HF. Their intervention was carried out in

RRCs that are entrenched in traditional beliefs and male dominance or support. High cost of MPS at ANC also prevents the PW in those parishes from accessing intervention (Mbonye et al., 2009). This setting closely resembles the Liberian RRCs setting described in earlier chapter in terms of long distance to the nearest HF and strong cultural beliefs of some PWs. Lack of access to MPS due to high cost of MPS services is different from that of Liberia.

A randomized control trials (RCT) was conducted by Mbonye and colleagues using the HF as a control and the community as the intervention. The CHWs, TBAs, drugs shop vendors and village reproductive health workers were trained to deliver MPS and messages to PWs. PWs in two parishes were recruited in the study (Mbonye et al., 2009).

This strategy addressed and remedy the barriers that prevent PWs from accessing MPS such as long distance walking to ANC facility, high transportation cost to and fro facility, long waiting time at ANC facility, low male or partner involvement and issues of inequity (Mbonye et al., 2009). This study shows the increment in the acceptance and use of LLINs and the up-take of second dose of SP for IPTp 2 by PWs. Malaria episodes in PWs accessing ANC facility was higher accounting for 49.5% than those in the community intervention, 17.6%. Deaths of babies born to PWs accessing ANC facility was higher 2.7% than those enrolled in the community intervention, 1.9% (Mbonye et al., 2009).

Increase performance-based incentives, monthly 'top-up" and better social benefits for professionals in remote rural communities

In order to attract skilled professionals to take up assignments in health facilities in RRCs, some countries have adopted a policy of providing an attractive incentive and social benefit packages to volunteers (Blaauw et al., 2010). Studies conducted in Kenya [N=345], South Africa [N=377] and Thailand [N=342] show that 65.2% of the enrolled nurses in Kenya, 87.9% in South Africa and 74.7% in Thailand that took-up assignments in remote rural communities and offered 30% of their salaries as "top-up" along with other social benefits such as better housing and other immunities remained in their assignments. Regarding how long such contract was to last for,

options were provided by individual countries along with study leaves at the end of each term. Terms range from 1 year with no study leave in Kenya to 6 years with study leave. The options were tested in the discrete choice experiment (DCE) for assessing the effectiveness of policies to attract nurses to RRC. Till present, this has proven successful in retaining professionals in health facilities in these countries (Blaauw et al., 2010).

Voucher System to Improve Access to MPCs

A systematic review conducted in several SSA countries show that there were some interventions in addressing cost or affordability as an enabler or blocker to increasing up-take MPS (Pell et al., 2011). For instance, Ghana, the Ghana NMCP initiated a voucher system (Pell et al., 2011). In this approach the PWs were enrolled into a voucher scheme system to encourage them attend ANC. They were provided vouchers for the cost they incurred in transporting themselves to the HFs (Smith et al., 2010). Also, during these visits, they were given LLINs as a way of motivating them for ANC visits at which time they could received their IPT as schedule (Mubyaz et.al, 2010).

In Sudan, there was an intervention to address barriers due to high medical cost (Abdu et al., 2010). The government exempted the PWs from paying for services and medication. This approach increased the up-take of MPS, mainly IPTp (Abdu et al., 2010). The coverage of ANC attendance and IPTp up-take increased with majority of the PWs attending ANC. The PWs who attended ANC also consented to taking SP for IPTp 1 and 2 as scheduled (Abdu et al., 2010).

4.3 Intervention for predisposing factors

Improving socio-cultural and education factors

In Edo state, Nigeria, the socio-cultural beliefs and limited knowledge of the people prevented the PWs from attending ANC, thus leading to not taking MPS. The NMCP realized that there was limited information on the importance of accessing MPS, particularly, taking SP for IPTp and the consequences for the PWs and their unborn child, failure to taking SP (Enato et al., 2009). The program took an approach of peer education program to improve knowledge about MPS, mainly the up-take of SP for IPTp (Enato et al., 2009). They targeted PWs and their families in RRCs and public places such as markets, churches, and video centers. They educated people on the importance of attending ANC and taking MPS, focusing on the up-take of SP (Enato et al., 2009). In addition to peer education, mass media campaigns

were conducted using the electronic and print media such as television, advertisements on billboards and brochures were used (Enato et al., 2009). This was proven to be effective and increase knowledge regarding the importance of MPS, mainly SP for IPTp (Enato et al., 2009).

5.1 DISCUSSIONS

This study is about exploring the factors that influence the up-take of MPS by PWs in Liberia. It focuses on analysis of gaps identified in the findings and how these gaps are mitigated through implementation of best strategies from other countries with similar setting.

There are factors that influence the up-take of MPS in Liberia. The major part of these factors prevents PWs from visiting ANC facilities that are currently providing MPS to PWs in Liberia. The problems that block PWs from accessing MPS have several dimensions. Some are health system issues that can be addressed directly by health system intervention, some are environmental and can be addressed indirectly by health system interventions implemented at the community level and others are individual or personal issues that can also be remedy directly and indirectly by health system interventions. Yet, there are others that cannot be solved by health system intervention. The major concerns are those that can be taken care of either directly or indirectly by health system interventions. In so doing, findings on strategic interventions implemented in other countries that yielded better results will be analyzed considering Liberia's situations. Those that fit our context will be proposed for adoption.

To proceed, there are two potential bottle-necks for the provision, access and utilization of MPIs to PWs that should be considered:

1. Poor ANC attendance by PWs in Liberia and
2. Conditions that prevent PWs from taking MPS (LLINs and SP) once at the ANC consultation.

The rest of the factors (both enablers and blockers) are tailored around one or both of the two bottlenecks. According to Liberia HMIS report, the main bottleneck is the first one, "the reason why PWs in Liberia are not attending

ANC facilities". However, factors that influence the up-take of MPS as described in the findings will be discussed and recommendations will be presented to mitigate such factors.

Some key factors that have the propensity of influencing up-take of MPS by PWs at ANC facilities include: unavailability of MPCs, irresponsiveness of professional to the needs of the PWs, high transportation fares, long walking distance between residence and nearest ANC HFs, Education levels and perceptions of PWs and Cultural Norms and Beliefs of PWs.

The findings show that PWs will not attend ANC facilities due to all of the above listed key factors except the education levels. But, once at ANC consultation, only unavailability of MPCs will prevent the PWs from receiving the MPS. The perceptions of PWs may stop them from accessing MPS as well. However, crucial to receiving the optimum two doses of SP is dependent upon time of enrollment. Late presentation at ANC for whatever reason will not permit PWs to have access to the optimum dose of SP for full coverage.

To mitigate the most crucial of these, community-based MPI for PWs and strategies to increase and improve availability of MPCs at all levels are to be considered.

Community-based Malaria Preventive Interventions (MPIs)

The use of this strategy is ideally the best way to deliver health care services to any group of people. This is because health largely deals with one's conscience. Delivering MPS to PWs in their own setting by one of their kind breaks the first barrier of trust and secondly, ownership of the intervention can be guaranteed.

Unfortunately such intervention is not in place in Liberia. However, there are policy documents in place for rolling out such interventions. Currently, the pilot project that commenced since 2007 in few districts of three out of fifteen counties has not yielded enough support to skill up. In fact, it is only the portion concerning diagnosis and treatment of children under 5 that is constantly discussed.

The MPS has to be fully implemented at community level along with the HFs. The zoes who are TBAs and TMs along with the gCHVs can be up-graded or

trained to deliver the MPCs and share MIP messages to PWs in those communities. This is crucial because there is a strong bond between the volunteers and the PWs and as such refusal will be reduced. Factors such as irresponsiveness of health professionals, high transportation fares, long walking distance between residence and nearest ANC HFs, late presentation or enrollment and Cultural Norms and Beliefs of PWs will be controlled.

Perceptions and education levels of PWs may not be influenced by this intervention. The intervention will be supported by the PWs in the RRCs and NMCP but might not be supported by some politicians and some heads of the Health and Finance Ministries.

The community-based MPI for PWs is an intervention based on the first bottleneck. It tends to alleviate health system, external environmental and individual factors that impede PWs from accessing MPS at ANC facilities. It is important as it blends together health system, community and individual efforts in increasing access to PWs in the communities.

The adoption of the community-based strategy will increase the delivery system of the MPCs to the communities. This delivery system requires a strong supply chain system to support the intervention in order increase the access and utilization of MPS to PWs.

Increase incentives, monthly "top-up" and better social benefits for professionals in remote rural communities (RRCs).

As presented in the findings, the countries that invested in this venture have an improved health system. This is a big achievement as this intervention will yield healthy population ready to contribute to national development. A nation with healthy workforce is bound to flourish.

Some of the problems in Liberia stems from not being able to invest in the livelihood of our population. The situation of "brain drain", particularly in the human resource for health exists in the country. This doesn't mean that there is no skilled profession to cover one facility. As it stands, there are HFs without a skilled professional while there are so many in few HFs. It is so because the further away from the city a professional goes, the little is his/her salary. Before the receiving the salary, more than quarter of it will be spent. So, those skilled professionals who cannot leave the country, will find other jobs and leave the health system.

The problem of irresponsiveness to the needs of the PWs will persist if the issue of motivation package is still being kept under the carpet. The situation of abandoning rural services will increase. Those who cannot find other jobs, stay on but choose to be absent most of the time and become very unfriendly to their clients.

The way out of this is to provide motivation package to attract skilled professionals to take-up assignments in RRCs. Varpilar et al. (2011) proposed a plan to add US\$50.00 to the salaries of volunteers but never came light. Another way out is adopt other good strategies carried out in other countries and return this issue later.

This is really not easy for most of the country's politicians, particularly, some heads of the ministries of health and finance. But there's a need to rise above all odds to make this intervention a reality. There is more to benefit than to lose. The PWs and their families, the rest of the inhabitants of the RRCs and the health workforce will all benefit.

This intervention has a lot to contribute to the country. The country's dream of providing quality healthcare services to all her citizens and strangers within her borders will be realized with the use of this intervention. Implementation of this strategy of providing attractive motivation package to professionals volunteering to take-up assignment and stay in the RRCs will yield the following; there will be skilled providers at all levels of the health system, there will also be motivated skilled professionals to administer the MPS at all ANC HFs, professionals will not leave their duties for other jobs.

The implementation of this strategy will only benefit the immediate beneficiaries, it develop a disease-free society with workforce ready to contribute to the development of the country.

Few more best strategies implemented in Ghana, Kenya and Nigeria

In Ghana, the voucher scheme system is better. This allows for the PWs to be reimbursed on expenditures incurred when visiting ANC. So, a PW will worry about how far away her residence is and how much it cost to get to the ANC and back. In Kenya, the salaries of the professionals were standard and disbursements were timely. The professionals were trained counseling skills to put their patients first and counsel them even before listening to them. This created stronger provider-client relationship. In the case of

Nigeria, the PWs didn't know of the MPS and did not access. The Nigeria NMCP stepped in and used peer education approach to reach PWs and their families and friends to change the mindset and embrace the ANC and MPS.

In Liberia, there no voucher system and don't it will be possible in the very near future. Counseling has not been highlighted in our training. It is mentioned but implementation is lacking. For peer education, Liberia is highly in practicing that method of creating awareness.

These strategies are good for the Liberian health system. Indeed, they will benefit the Liberian public and bring improvements in the health of Liberian people. However, since they are part of the national development agenda, incorporating them will be block by decision makers.

Many limitations were found to be associated with the preparation of this thesis. To highlight a few, there were difficulties in getting relevant information to discuss the situation pregnant women faced in Liberia and make recommendations that will represent the full picture. For example, the issue of satisfaction cannot be determined. Since compliance to taking SP or to sleep under LLINs does not necessary mean satisfaction. There is a need for a study to determine whether the pregnant women are satisfied with the malaria prevention services provided in the country. Another weakness is the authenticity of the HMIS data used for projection. Though, it is a national dataset, it needs careful verification and analysis before being used for decision.

Chapter Six

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

In order to improve the up-take of the Malaria Preventive Services (MPS), a two-way (short and long term) solution should be considered. In the short, the NMCP should plan and implement Malaria Prevention Interventions (MPIs) at remote rural communities about that are about 10 to 15 KM away from a nearest health facility using general community health volunteers (gCHVs), undertake capacity building exercises at all levels, continuously procure and distribute Malaria Prevention Commodities (MPCs) at all levels, plan and implement regular supportive supervision and monitoring and evaluation at all levels.

In the long term, plan with MOH&SW and partners on the provision of motivation package for professionals volunteering to take assignments in remote rural communities.

6.2 RECOMMENDATIONS

The analysis of findings and some best strategies carried out in some SSA countries suggest short-comings and presented way forward in the delivery of MPIs that will increase up-take of the MPS in Liberia. In order remedy such gaps, the following proposed interventions and strategies need to be considered:

The government through the MOH&SW and NMCP has to step forward to ensure that all planned projects are implemented timely and with available resources. Ensure that all resources for implementing these projects are disbursed in a timely fashion. All projects should be fully supervised and monitored.

On findings and best practices based on environment, health system and enabling factors where bock of the problems are, it is recommended to use community-based intervention using community resources. To go forward with this, the following should be considered; training of those community

volunteers, a sustainable supply chain system, prepare and set aside a sustainable motivating package (both in cash and kind) and supervision and reporting system.

In the interest of promoting a better health system sensitive to the needs of all her citizens and workforce, the motivation package to improve the relationships between the HFs and communities particularly the RRCs.

The continuous process of awareness creation among the PWs on the importance of using LLINs and taking the SP should be prioritized. This has to be blended with more counseling and the provision of education through the use of peer educators to encourage and always remind them to visit the ANC and subsequently take the MPS.

REFERENCES

Abdu, Z, Mohammed, Z, Bashier, I & Eriksson, B (2004) 'The impact of user fee exemption on service utilization and treatment seeking behaviour: the case of malaria in Sudan'. *The International Journal of Health Planning and Management* vol. 19, pp. S95–S106.

African Economic Outlook (2013), Liberia – African Economic Outlook. [Online]. Available at <http://www.afdb.org/countries/west-africa/liberia/liberia-economic-outlook/> [Accessed on 21 March 2014].

All Africa Malaria Report (2014), *Liberians At Risk of Malaria*. Available at <http://allafrica.com/stories/201403102053.html> [Accessed on 4 July 2014].

Amoran OE, Ariba AA & Iyaniwura CA (2012), Determinants of intermittent preventive treatment of malaria during pregnancy (IPTp) utilization in a rural town in Western Nigeria. *Reproductive Health* 2012, **9**:12 doi:10.1186/1742-4755-9-12. [Online]. Available at <http://creativecommons.org/licenses/by/2.0> [Accessed 8 August 2014].

Andersen (1995), [Andersen and Newman Framework of Health Services Utilization.pdf](#). Available at http://www.umanitoba.ca/faculties/medicine/units/mchp/protocol/media/Andersen_and_Newman_Framework [Accessed 20 April 2014].

Attah, R, Lievens, T, Vujicic, M & Brown, AJ (2010), 'Health worker attitudes toward rural service in Liberia: Results from Qualitative Research' pdf. [Online] Available at <http://www.opml.co.uk/paper/health-worker-attitudes-toward-rural-service-liberia> [Accessed on 10 April 2014].

[Babitsch](#), B, [Gohl](#), D, & [Von, LT](#) 2012, 'Re-revisiting Andersen's Behavioral Model of Health Services Use: a systematic review of studies from 1998–2011'.

Banek K, Kilian, A & Allan, R 2010, 'Evaluation of Interceptor long-lasting insecticidal nets in eight communities in Liberia'. *Malaria Journal* 2010, vol. no. 9 pp. 84 doi:10.1186/1475-2875-9-84

Basu S, Andrews J, Kishore, S, Panjabi, R & Stuckler D (2012), 'Comparative Performance of Private and Public Healthcare Systems in Low- and Middle-Income Countries: A Systematic Review'. *PLoS Med* 9(6): e1001244. doi:10.1371/journal

Binka, F & Akweongo, P (2006), 'Prevention of malaria using ITNs: potential for achieving the millennium development goals'. *Current Molecular Medicine*. 2006 March, Vol. 6, no. 2, pp.261-7.

Blaauw D, Erasmus E, Pagaiya N, Tangcharoensathein V, Mullei K, Mudhune S, Goodman C, English M & Lagarde M (2010), 'Policy interventions that attract nurses to rural areas: a multi-country discrete choice experiment' [Online]. Available at <http://www.who.int/bulletin/volumes/88/5/09-072918/en/> [Accessed on 19 July 2014].

Center for Disease Control, USAID (2012), Successes and challenges for malaria in pregnancy programming: a three-country analysis. [Online].

Available at http://www.jhpiego.org/files/MIP%20Brief_Three%20Country_Final.pdf [Accessed on 15 May 2014].

Desai, M, Ter Kuile, FO, Nosten, F, McGready, R, Asamoah, K, Brabin & B, Newman, RD. (2007) 'Epidemiology and burden of malaria in pregnancy' *Lancet Infectious Diseases*, 2007, February Vol. 7, no.2, pp:93-104.

Enato, E, FO, Mens, PF, Okhamafe, AO, Okpere, EE, Schallig, HD & Pogoson EE (2009), 'Plasmodium falciparum malaria in pregnancy: Prevalence of peripheral Parasitaemia, anaemia, and malaria care-seeking behavior among Pregnant women attending antenatal clinics in Edo State, Nigeria', *Journal of Obstetrics and Gynecology*, Vol. 29, PP. 301-306

FAO (2013), [FAO Liberia Visitor's Info Sheet \[Online\]](http://coin.fao.org/coin-static/cms/media/13/13553291051480/13_fao_liberia_visitors_info_sheet...). Available at http://coin.fao.org/coin-static/cms/media/13/13553291051480/13_fao_liberia_visitors_info_sheet... [Accessed on 5 April 2014].

Farlex Partner Medical Dictionary (2012). [Online]. Available at <http://medical-dictionary.thefreedictionary.com/health+behavior> [Accessed on July 17 2014].

Ghana Health Service (2007), MALARIA IN PREGNANCY: Training manual for health providers. [Online] Available at <http://www.ghanahealthservice.org/includes/upload/publications/MALARIA%2520IN%2520PREGNANCY.pdf> [Accessed 10 July 2014].

Hill, J, Hoyt, J, Van Eijk AM, D'Mello-Guyett L, Ter Kuile FO & et al. (2013), 'Factors Affecting the Delivery, Access, and Use of Interventions to Prevent Malaria in Pregnancy in Sub-Saharan Africa: A Systematic Review and Meta-Analysis'. *PLoS Med*, vol.10, no. 7, pp. e1001488. doi:10.1371/journal.pmed.1001488

IOM (2014), [International Organization for Migration: Border crossing. \[Online\]. Available at http://www.iom.int/](http://www.iom.int/) [Accessed on 8 August 2014].

IRIN-Africa (2014), 'LIBERIA: Post-conflict dilemma – should health care be free?' [Online]. Available at <http://www.irinnews.org/report/74776/liberia-post-conflict-dilemma-should-health-care-be-free> [Accessed 8 August 2014].

Kenea, O, Balkew, M & Gebre-Michael, T. (2011), 'Environmental factors associated with larval habitats of anopheline mosquitoes (Diptera: Culicidae) in irrigation and major drainage areas in the middle course of the Rift Valley, central Ethiopia' *Journal of Vector Borne Diseases*, 2011, June, Vol. 48, No. 2, pp. 85-92.

NHPC (2008), National Housing and Population Census 2008. Monrovia, Liberia: Liberia Institute of Statistics and Geo-Information Services (LISGIS).

Liberia Institute of Statistics and Geo-Information Services (LISGIS) [Liberia], Ministry of Health and Social Welfare [Liberia], National AIDS Control Program [Liberia], and Macro International, Inc. (2008), *Liberia Demographic and Health Survey (2007)*. Monrovia, Liberia: Liberia Institute of Statistics and Geo-Information Services (LISGIS) and Macro International. [Online]. Available at http://www.emansion.gov.lr/doc/census_2008provisionalresults.pdf [Accessed 20 April 2014].

LISGIS (2001), [LISGIS - Republic of Liberia - TLC Africa](http://www.tlcafrica.com/lisgis/lisgis_geography.htm). Monrovia, Liberia: Liberia Institute of Statistics and Geo-Information Services (LISGIS). [Online]. Available at http://www.tlcafrica.com/lisgis/lisgis_geography.htm [Accessed on 4 March 2014].

Lori, JR & Boyle, JS. (2011), 'Cultural childbirth practices, beliefs, and traditions in post-conflict Liberia'. *Health Care Women International*, 2011 June, vol. 32, no.6, pp. 454-73. doi: 10.1080/07399332.2011.555831.

Marchesini, P & Crawley, J. (2004), [WHO | Reducing the burden of malaria in pregnancy \(archived\)](http://www.who.int/malaria/publications/atoz/merajan2003/en/) [Online]. Available at <http://www.who.int/malaria/publications/atoz/merajan2003/en/> [Accessed on 21 May 2014].

Mbonye, A, K, Bygbjerg, I, C & Magnussen, P (2009), 'Intermittent preventive treatment of malaria in pregnancy: a new delivery system and its effect on maternal health and pregnancy outcomes in Uganda'. [Online]. Available at <http://www.who.int/bulletin/volumes/86/2/07-041822/en/> [Accessed on 18 July 2014].

Ministry of Agriculture (2008), [Response Of Liberia to Global Food Price Increases](http://www.moa.gov.lr/doc/GOL%2520Response%2520to%2520Global%2520Price%2520Increases_June08.pdf). [Online]. Available at http://www.moa.gov.lr/doc/GOL%2520Response%2520to%2520Global%2520Price%2520Increases_June08.pdf [Accessed on 27 July 2014].

MOH&SW/AR (2012), Annual Report 2012. Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

MOH&SW/ARR (2013), Annual Review Report 2013. Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

MOH&SW/EPHS (2011), Essential Package of Health Services 2011. Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

MOH&SW/EPHS (2007), Essential Package of Health Services 2007. Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

MOH&SW/HMIS (2014), Health Management Information System 2014. Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

MOH&SW/HMIS (2013), Health Management Information System 2013. Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

MOH&SW/HMIS (2009), Health Management Information System: Policy 2009. Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

MOH&SW/HRCR (2010), The National Census of Health Workers in Liberia 2010, Monrovia, Liberia. Available at http://liberiamohsw.org/Policies%2520%26%2520Plans/HR%2520Census%2520Report%2520draft_May%2520%2 [Accessed on 28 June 2014].

MOH&SW/LRH (2011), Liberia Reproductive Health Survey 2011. Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

MOH&SW/NHAS (2007), Liberia National Health Accounts 2007/08. Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

MO&SW/NHPP (2011), National Health Policy and Plan 2011–2021. Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

MOH&SW/NSCS (2008), National Strategy for Child Survival in Liberia 2008-2011, pdf. Monrovia, Liberia: Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

MOH&SW/SCMP (2010), Supply Chain Master Plan 2010. Monrovia, Liberia: Ministry of Health and Social Welfare (MOH&SW).

Mubyazi, G, Bloch, P, Magnussen, P, Olsen, O, Byskov, J & et al. (2010) 'Women's experiences and views about costs of seeking malaria chemoprevention and otherantenatal services: a qualitative study from two districts in rural Tanzania'. *Malaria Journal* vol.9, no. 54.

Mutulei, ACN (2013), 'Factors Influencing the Uptake of Intermittent Preventive Treatment for Malaria in Pregnancy: Evidence from Bungoma East District, Kenya' *American Journal of Public Health Research*, 2013. Vol. 1, no. 5, pp 110-123. DOI: 10.12691/ajphr-1-5-2

National Malaria Control Program (NMCP) [Liberia], Ministry of Health and Social Welfare (MOHSW), Liberia Institute of Statistics and Geo-Information Services (LISGIS), and ICF International. 2012. *Liberia Malaria Indicator Survey 2011*. Monrovia, Liberia: NMCP, LISGIS, and ICF International. [BOOK].

National Malaria Control Program (NMCP) [Liberia], Ministry of Health and Social Welfare (MOHSW), Liberia Institute of Statistics and Geo-Information Services (LISGIS), and ICF Macro. 2009. *Liberia Malaria Indicator Survey 2009*. Monrovia, Liberia: NMCP, LISGIS, and ICF Macro.

NMCP/MIP/TG (2014) *Malaria In Pregnancy: Technical Guidelines*. Monrovia, Liberia: National Malaria Control Program (NMCP).

NMCP/NMSP (2010) *National Malaria Strategic Plan 2010 – 2015*. Monrovia, Liberia: National Malaria Control Program (NMCP).

Nsambi, SE (2006), 'How sulfadoxine-pyrimethamine (SP) was perceived in some rural communities after phasing out chloroquine (CQ) as a first-line drug for uncomplicated malaria in Tanzania: lessons to learn towards moving from monotherapy to fixed combination therapy' *Journal of Ethnobiology and EthnoMedicine*

Owusu-Addo, E & Owusu-Addo, SB (2014), 'Effectiveness of Health Education in Community-based Malaria Prevention and Control Interventions in sub-Saharan Africa: A Systematic Review. *Journal of Biology, Agriculture and Healthcare*, www.iiste.org. ISSN 2224-3208 (Paper) ISSN 2225-093X Vol.4, No.3, 2014. [Online]. Available <http://www.iiste.org/Journals/index.php/JBAH/article/download/10976/11277> [Accessed on 20 July 2014].

PBR (2002), Malaria Basics: Global Impact and Actions. [Online]. Available at <http://www.prb.org/Publications/Articles/2002/MalariaBasicsGlobalImpactandActions.aspx> [Accessed on 25 July 2014].

Pell, C, Straus L, Andrew, EVW, Menaca, A & Pool R (2011), 'Social and Cultural Factors Affecting Uptake of Interventions for Malaria in Pregnancy in Africa: A Systematic Review of the Qualitative Research'. *PLoS ONE*, vol. 6, no.7 pp- e22452. doi:10.1371/journal.pone.0022452

PMI/MOP (2013), [Liberia Malaria Operational Plan - President's Malaria Initiative](http://www.pmi.gov/docs/default-source/default-document-library/malaria-operational-plans/fy14/), pdf. [Online]. Available at <http://www.pmi.gov/docs/default-source/default-document-library/malaria-operational-plans/fy14/> [Accessed on 9 June 2014].

Roberts, T, Gravett, CA, Velu, PP, Theodoratou, E, Wagner, TA, Zhang, JS, Campbell, H, Rubens, CE, Gravett & MG, Rudan, I (2011), 'Epidemiology and aetiology of maternal parasitic infections in low- and middle-income countries', 2011, December, Vol. 1, no. 2, pp. 189-200.

Rupha, S (2009), *Ethnicity*. [Online]. Available at <http://ruphastevens.efoliomn.com/5> [Accessed 10 April 2014].

Sherman R (2013), A Descriptive Analysis of Intervention Coverage Scale Up for Malaria Prevention in Pregnancy and Equity of Services, pdf. [Online]. Available at https://digital.lib.washington.edu/researchworks/bitstream/handle/1773/23781/Sherman_washington [Accessed on 13 May 2014].

Sipsma, H, Callands, TA, Bradley, E, Harris, B, Johnson, B & Hansen, NB. (2013), 'Healthcare utilisation and empowerment among women in Liberia', 2013, November, vol. 1;67, no. 11, pp. 953-9. doi: 10.1136/jech-2013-202647. Epub 2013

Smith L, Jones C, Adjei R, Antwi G, Afrah N and et al. (2010), 'Intermittent Screening and treatment versus intermittent preventive treatment of malaria in pregnancy: user acceptability' *Malaria Journal*, vol 9, no.18.

Strengthening Pharmaceutical Systems (2011), Manual for Quantification of Malaria Commodities: Rapid Diagnostic Tests and Artemisinin-Based Combination Therapy for First-Line Treatment of Plasmodium Falciparum Malaria. Submitted to the US Agency for International Development by the Strengthening Pharmaceutical Systems Program. Arlington, VA: Management Sciences for Health. [Online] Available at <http://www.mmv.org/sites/default/files/uploads/docs/publications/Quantification%2520Manual.pdf> [Accessed 4 May 2014].

Thiam, S, Kimotho, V & Gatonga, P (2013), 'Why are IPTp coverage targets so elusive in sub-Saharan Africa? A systematic review of health system barriers', *Malaria Journal*, 2013, vol. **12**, no. 353. doi:10.1186/1475-2875-12-353. PMID: PMC 3850646 <http://creativecommons.org/licenses/by/2.0>

Tomczyk, B, Goldberg, H, Blanton, C, Gakuba, R, Saydee, G, Marwah, P, Rowley, E, and collaboration from CDC, JSI, USAID, IRC, ARC, LISGIS & UN Pop. Fund (2007), 'Women's Reproductive Health in Liberia: The Lofa County Reproductive Health Survey'. [Online]. Available: http://www.africare.org/our-work/where-we-work/liberia/Resources/5Liberia_ResourceDoc.pdf [Accessed: 16 July 2014].

UNFPA-Liberia (2011), 'The state of the world's midwifery 2011' [Online]. Available at http://www.unfpa.org/sowmy/resources/docs/country_info/profile/en_Liberia_a_SoWMy_Profile.pdf [Accessed on 30 June 2014].

UNICEF/WCARO Annual Report (2013), Regional analysis report : East and west Africa. [Online]. Available at http://www.unicef.org/about/annualreport/files/WCARO_AR_2013.pdf [Accessed on 27 July 2014].

UNO (2013), Issue of the Population and Vital Statistics Report. [Online]. Available at <http://unstats.un.org/unsd/demographic/products/vitstats/serANotes.pdf> [Accessed on 3 August 2014].

USAID-Liberia (2013), MCHIP-Maternal and Child Health Integrated Program, 2013. [Online]. Available at <http://www.mchip.net/liberia>. [Accessed on 5 March 2014].

Varpilah, ST, Safer, M, Frenkel, E, Baba, D, Massaquoi, M & Barrow, G (2011), 'Rebuilding human resources for health: a case study from Liberia', *Human Resources for Health*, 2011, vol. 9, no.11. Published online 2011 May 12. doi: 10.1186/1478-4491-9-11

WHO (2003) Reducing the burden of malaria in pregnancy *Roll Back Malaria Department* Available at <http://www.who.int/malaria/publications/atoz/merajan2003.pdf> [Accessed on 4 August 2014]

WHO (2005), WHO Country Cooperation Strategy (2005 – 2010). [Online]. Available at http://www.who.int/countryfocus/cooperation_strategy/countries/ccs_lbr_final_en.pdf [Accessed on 8 June 2014].

WHO (2012), Malaria Policy Advisory Committee: Evidence Review Group on Intermittent Preventive Treatment (IPT) in Pregnancy. [Online]. Available at http://www.who.int/malaria/mpac/mpac_ipt_erg.pdf [Accessed on 24 May 2014].

WHO-Liberia (2012), Country Cooperation Strategy: At a glance, 2012. [Online]. Available at http://www.who.int/countryfocus/cooperation_strategy/ccsbrief_lbr_en.pdf. [Accessed on 22 May 2014].

WHO (2014), leadership & governance. [Online] Available at <http://www.who.int/healthsystems/topics/medicines/en/> [Accessed on 8 May 2014].

WHO-AFRO (2014), Analytical Summary: Partnership for Health Development. [Online]. Available at http://www.who.int/profiles_information/index.php/Liberia:Analytical_summary_-_Partnerships_for_health_development [Accessed on 5 August 2014].

WHO/UNFPA&WBO (2013)

WHO, UNICEF, UNFPA and The World Bank (2012), Trends in maternal mortality: 1990 to 2010 WHO, UNICEF, UNFPA and The World Bank estimates [Online]. Available at http://www.unfpa.org/webdav/site/global/shared/documents/publications/2012/Trends_in_maternal_mortality_A4-1.pdf [Accessed on 12 August 2014].

World Health Organization. Evidence Review Group. (2012), Intermittent Preventive Treatment of malaria in pregnancy (IPTp) with Sulfadoxine-Pyrimethamine (SP). WHO Headquarters, Geneva, 9-11 July 2012. Meeting Report. Geneva, World Health Organization. [Online]. Available at http://www.who.int/malaria/mpac/sep2012/iptp_sp_erg_meeting_report_july2012.pdf [Accessed on 13 May 2014].

Witter, S, Ensor, T, Jowett, M & Thompson, R 2000, Health Economics for Developing Countries, Netherlands. [BOOK REF.]

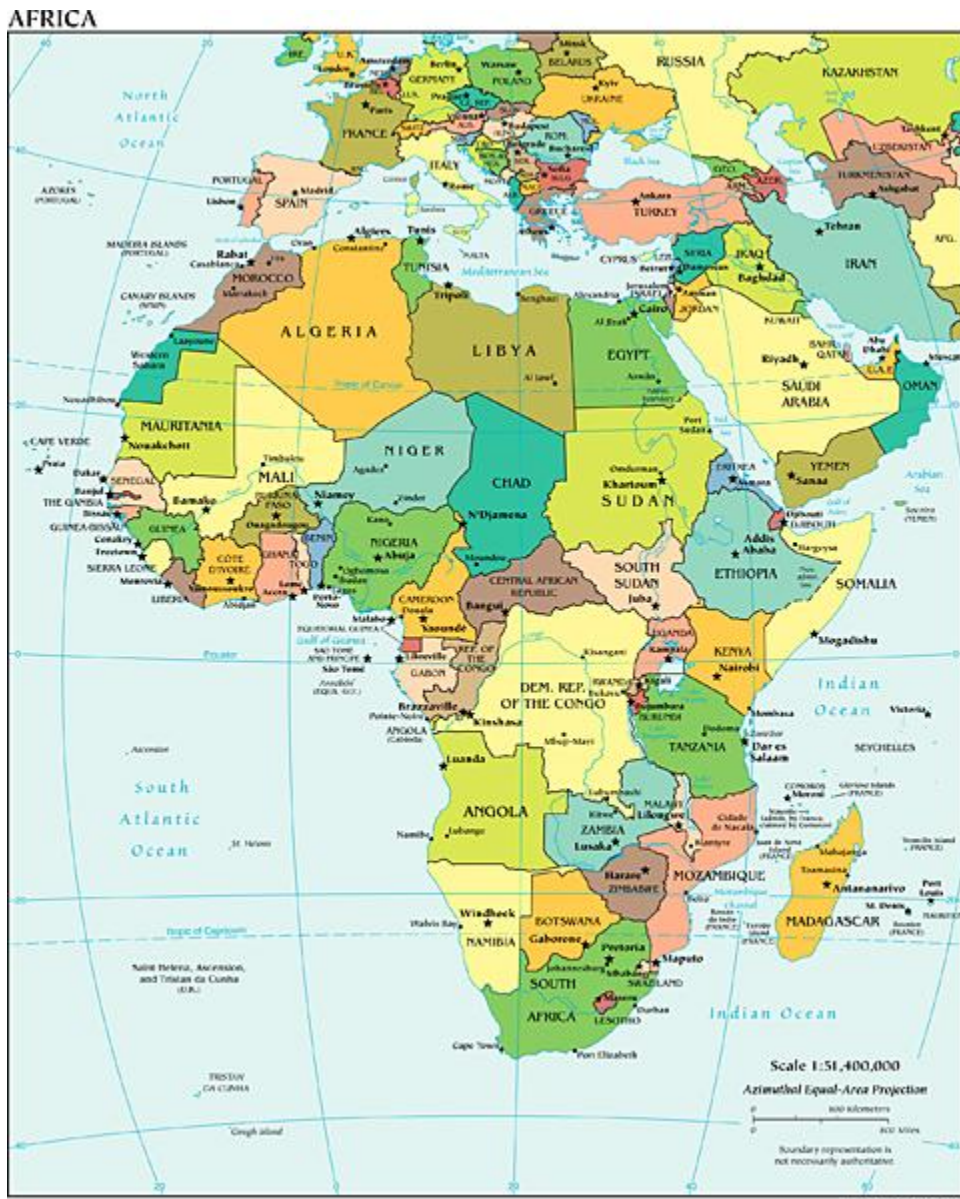
ANNEXES

Annex 1: Map of Liberia



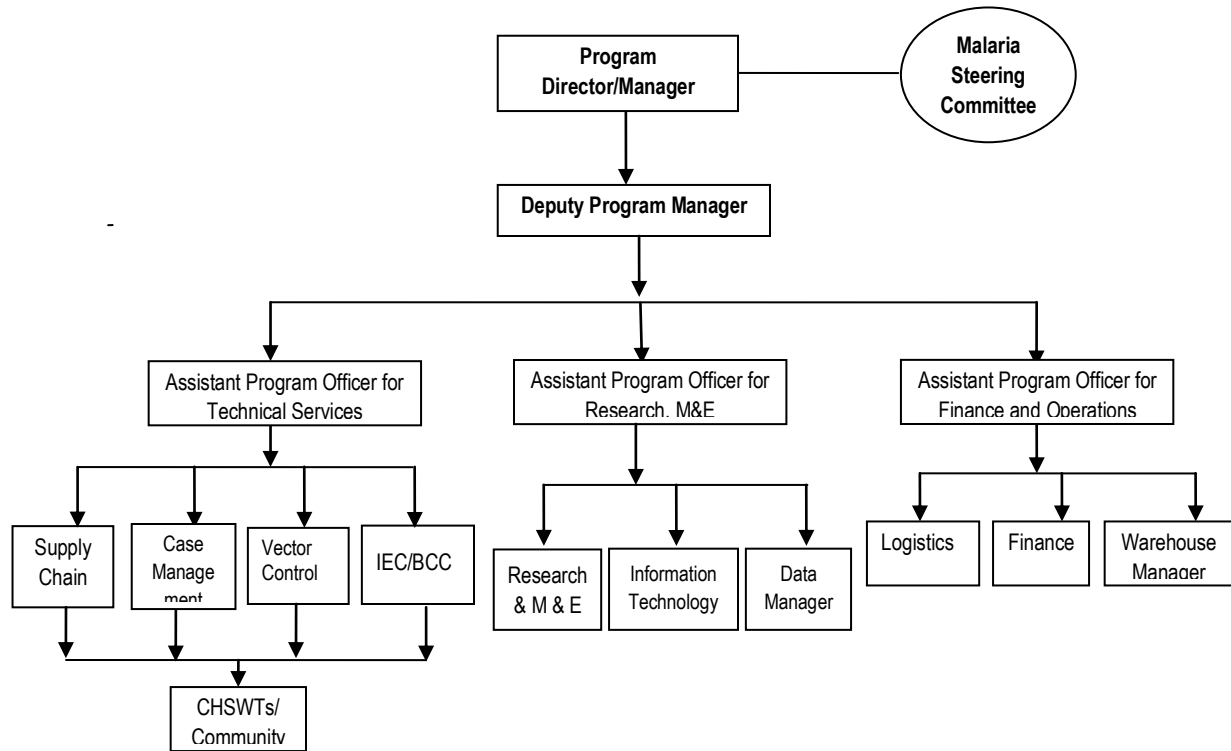
Source: UNDP (2009).

Annex 2: Map of Africa showing Liberia



Source: World Factbook (2010)

Annex 3: The Organogram of the NMCP



Source: NMSP (2010)

Annex 3: Tables of Information on ANC Access and Up-take of IPTp by Pregnant women in Liberia during the periods 2011 to 2013.

LIBERIA MOH&SW - HMIS 2011 MALARIA INFORMATION - PREGNANT WOMEN											
	Population	Population of Pregnant Women	Popn. of 1st ANC Visit	Popn. of 2nd ANC Visit	Popn. of 3rd ANC Visit	Popn. of 4th ANC Visit	Popn. of PW taking IPTp 1	Popn. of PW taking IPTp 2	Popn. of PW taking IPTp 3	Popn of PW accessing OPD for Malaria Treatment	
Bomi	89,491	4,475	5,999	3,295	2,569	3,127	3,066	2,159		608	
Bong	354,778	17,739	17,506	13,238	9,723	13,664	9,555	8,011		2,047	
Gbarpolu	88,713	4,436	2,131	1,532	1,274	1,617	1,772	1,130		528	
Grand Bassa	235,851	11,793	13,493	7,294	5,512	6,060	6,612	4,394		2,763	
Grand Cape Mount	135,191	6,760	6,996	3,942	2,904	3,031	3,828	3,509		938	
Grand Gedeh	133,258	6,663	5,617	4,034	2,799	3,276	3,772	2,125		1,424	
Grand Kru	61,611	3,081	3,006	1,580	1,358	1,603	1,749	1,197		222	
Lofa	294,544	14,727	15,336	10,501	8,890	11,354	8,063	5,756		2,005	
Margibi	223,329	11,166	13,724	6,350	4,509	5,026	5,553	2,886		2,174	
Maryland	144,620	7,231	6,815	3,921	3,059	5,024	3,730	2,215		781	
Montserrado	1,189,655	59,483	84,647	23,720	19,279	17,460	29,156	15,300		8,198	
Nimba	491,532	24,577	37,922	19,724	14,578	16,030	15,775	13,381		2,358	
River Gee	71,054	3,553	2,018	1,585	1,342	2,364	1,836	1,385		480	
Rivercess	76,076	3,804	3,359	2,275	1,823	2,545	2,174	1,384		515	
Sinoe	108,930	5,447	4,221	1,795	1,411	1,450	2,064	1,339		460	
NATIONAL	3,698,635	184,932	222,790	104,786	81,030	93,631	98,705	66,171	-	25,501	

LIBERIA MOH&SW - HMIS 2012 MALARIA INFORMATION - PREGNANT WOMEN											
	Population	Population of Pregnant Women	Popn. of 1st ANC Visit	Popn. of 2nd ANC Visit	Popn. of 3rd ANC Visit	Popn. of 4th ANC Visit	Popn. of PW taking IPTp 1	Popn. of PW taking IPTp 2	Popn. of PW taking IPTp 3	Popn of PW accessing OPD for Malaria Treatment	
Bomi	91,411	4,571	5318	4226	3435	3457	3,511	2,499		2,311	
Bong	362,388	18,119	18079	14350	10306	10918	12,022	8,747		7,218	
Gbarpolu	90,616	4,531	2213	1878	1566	2230	1,973	1,607		943	
Grand Bassa	240,910	12,046	10997	7953	6283	6987	7,691	5,233		2,678	
Grand Cape Mount	138,091	6,905	5309	4404	3446	3125	4,326	4,458		2,480	
Grand Gedeh	136,116	6,806	4747	4326	3333	4603	3,281	2,327		1,961	
Grand Kru	62,933	3,147	2152	1745	1361	1919	1,550	953		915	

Lofa	300,862	15,043		13520	11019	9239	11166		9,667	6,053		5,616
Margibi	228,120	11,406		9821	7550	5715	7156		6,358	3,670		5,323
Maryland	147,722	7,386		5566	4558	3507	5050		3,956	2,953		1,445
Montserrado	1,215,174	60,759		65009	45545	33973	39743		39,184	24,832		37,751
Nimba	502,076	25,104		26221	21476	16124	17609		14,233	13,566		13,031
River Gee	72,578	3,629		1699	1515	1315	1694		1,642	1,340		1,377
Rivercess	77,708	3,885		3007	2513	2145	2488		2,163	1,763		1,571
Sinoe	111,267	5,563		3222	2422	1651	1777		2,390	1,428		1,413
NATIONAL	3,777,972	188,899		176880	135480	103399	119922		113,947	81,429	-	86,033

LIBERIA MOH&SW - HMIS 2013 MALARIA INFORMATION - PREGNANT WOMEN												
	Population	Population of Pregnant Women		Popn. of 1st ANC Visit	Popn. of 2nd ANC Visit	Popn. of 3rd ANC Visit	Popn. of 4th ANC Visit		Popn. of PW taking IPTp 1	Popn. of PW taking IPTp 2	Popn. of PW taking IPTp 3	Popn. of PW accessing OPD for Malaria Treatment
Bomi	93,331	4,667		5,204	4,057	3,528	3156		3,303	2,505		2,142
Bong	369,998	18,500		17,624	13,464	9,806	11230		11,887	10,820		6,438
Gbarpolu	92,519	4,626		1,868	1,607	1,398	1602		1,461	1,275		876
Grand Bassa	245,969	12,298		9,216	7,469	5,264	8881		7,826	5,950		2,398
Grand Cape Mount	140,991	7,050		4,714	3,790	3,151	3644		3,338	4,101		1,890
Grand Gedeh	138,974	6,949		4,081	3,610	2,778	4269		3,241	2,815		2,171
Grand Kru	64,255	3,213		2,294	1,925	1,559	1923		1,590	1,096		1,121
Lofa	307,180	15,359		12,136	9,899	8,530	10324		8,368	8,267		4,378
Margibi	232,911	11,646		8,669	6,898	5,213	7078		6,168	4,246		4,868
Maryland	150,824	7,541		5,010	4,437	3,624	5063		3,708	3,457		1,386
Montserrado	1,240,693	62,035		54,663	37,620	28,382	37963		36,005	24,226		32,276
Nimba	512,620	25,631		23,858	19,524	14,681	19885		15,309	14,957		11,494
River Gee	74,102	3,705		1,977	1,857	1,465	1796		1,703	1,811		1,430
Rivercess	79,340	3,967		2,707	2,167	1,661	2317		2,025	1,807		1,215
Sinoe	113,604	5,680		3,181	2,412	1,729	2309		2,411	2,081		1,442
NATIONAL	3,857,309	192,865		157,202	120,736	92,769	121,440		108,343	89,414	-	75,525

Source: Liberia HMIS (2014)

