President's Malaria Initiative Support to Controlling Malaria in Liberia
Distribution of Subsidized Acts Through the Private Sector

Situational Analysis of the Pharmaceutical Sector and Access to Antimalarial Medicines in Liberia

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About SPS

The Strengthening Pharmaceutical Systems (SPS) Program strives to build capacity within developing countries to effectively manage all aspects of pharmaceutical systems and services. SPS focuses on improving governance in the pharmaceutical sector, strengthening pharmaceutical management systems and financing mechanisms, containing antimicrobial resistance, and enhancing access to and appropriate use of medicines.

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CONTENTS

ACRONYMS AND ABBREVIATIONS

ACT	artemisinin-based combination therapy
AQ	artesunate
AS	amodiaquine
EML	essential medicine list
LRD	Liberian dollars
MoHSW	Ministry of Health and Social Welfare
MSH	Management Sciences for Health
NDS	National Drug Services
NMCP	National Malaria Control Program
NTG	National Therapeutic Guidelines
PMI	President's Malaria Initiative
SP	sulfadoxine/pyrimethamine
SPS	Strengthening Pharmaceutical Systems [Program]
USAID	U.S. Agency for International Development
USD	U.S. dollar

INTRODUCTION

Liberia Country Overview

The 2008 national housing and population census[1] reported a total population of 3.4 million, with a growth rate of 2.1%. Population distribution is very uneven, with 6 out of 15 counties, Montserrado, Nimba, Bong, Lofa, Grand Bassa and Margibi, containing 75.2% of the total population. Of those six, Montserrado, Nimba, and Bong have 56% of the population.

Liberia is considered one of the world's poorest countries, with 80% of the population living in poverty.[2] The 2009 Human Development Report[3] indicates that based on Liberia's Human Development Index it ranks 169 out of 182 countries. Table 1 lists other socioeconomic indicators from the report.

Table 1. Socioeconomic Indicators for Liberia (2007)

Indicator	Value
Gross domestic product per capita (USD)	362.0
Life expectancy at birth (years)	57.8
Probability of not surviving to age 40 (%)	23.2
Adult literacy rate (% ages 15 and above)	55.5
Combined gross enrollment (in education) ratio (%)	57.6
People not using improved water source (%)	36.0
Children underweight for age (% under age 5)	26.0

Mortality and Morbidity

Years of civil wars have devastated Liberia's health system, which has resulted in high rates of morbidity and mortality. The infant mortality rate estimated at 138.25/1,000[4] live births is among the highest in the world[5], with a maternal mortality ratio of 994/100,000 live births[6]. The crude death rate is also among the highest in the world at 20.7 deaths per 1,000 population and life expectancy at birth is only 42 years[7].

Malaria, diarrhea, acute respiratory infections, tuberculosis, sexually-transmitted infections, worms, skin diseases, malnutrition, and anemia are the most common causes of morbidity. According to the 2007–2011 National Health Policy of Liberia[8], malaria accounts for over 40%

[1] 2008 National Population and Housing Census: Preliminary Results. http://www.emansion.gov.lr/doc/census_2008provisionalresults.pdf
[2] CIA World Fact Book. 2010. Liberia. https://www.cia.gov/library/publications/the-world-factbook/geos/li.htmL.
[3] Human Development Report 2009. http://hdrstats.undp.org/en/countries/country_fact_sheets/cty_fs_LBR.htmL
[4] USAID Country Health Statistical Report Liberia May 2009. http://dolphn.aimglobalhealth.org
[5] https://www.cia.gov/library/publications/the-world-factbook/geos/li.htmL
[6] USAID Country Health Statistical Report Liberia May 2009. http://dolphn.aimglobalhealth.org
[7] Ibid
[8] National Health Policy, National Health Plan 2007-2011. http://liberiaMoHSW.org/Policies%Plans/

of outpatient attendance and up to 18% of inpatient deaths. Diarrheal diseases are the second leading cause of morbidity and mortality in Liberia, and the HIV prevalence rate is estimated at 5.2%. Moderate and severe underweight rates of children under five years are 27% and 7%, respectively, and only 24% have access to safe water and 26% have access to proper sanitation.

Health Care Delivery

The overall goal of the 2007–2011 National Health Policy[9] is to improve the health status of an increasing number of citizens on an equal basis through expanded access to effective basic health care, backed by adequate referral services and resources. The policy concentrates on several overarching priorities, including expanding access to a basic package of health care through investments in infrastructure, and human resources and through decentralized management and by establishing the building blocks of an equitable, effective, lean, responsive, and sustainable decentralized health care delivery system.

The County Health and Social Welfare Service Administration is the operational management structure for health, which includes the County Health and Social Welfare Teams. While the teams are responsible for overall management of health activities and services at the county level, the central level focuses on policies, aggregate planning, and standards settings. However, poor coordination, lack of human and financial resources, and information exchange have been identified[10] as some of the challenges to the decentralized system.

Liberia has a three-level health delivery system: primary (health clinics), secondary, (health centers and county hospitals), and tertiary (John Fitzgerald Kennedy Medical Center and regional hospitals). According to the National Health Policy and Plan, the government has identified 354 functional health facilities, including 286 clinics, 50 health centers, and 18 hospitals. The health workforce consists of approximately 4,000 full-time and 1,000 part-time staff, including 168 physicians, 273 physician assistants, 453 registered nurses, and more than 4,000 nurse aides and other health professionals.

Pharmaceutical Sector

The framework to manage and coordinate the pharmaceutical sector in Liberia is contained in the 2001 National Drug Policy[11]. The overall goal for the policy is to use available resources to develop pharmaceutical services to meet Liberia's requirements in the prevention, diagnosis, and treatment of diseases by using efficacious, high quality, safe, and cost-effective pharmaceutical products. The policy objectives include—

[9] Ibid

[10] Peercy, C. & Shepherd-Banigan, M. (2009) Assessment of Decentralized health Service Management During Post- conflict Transition in Liberia. Arlington, Va., USA: Basic Support for Institutionalizing Child Survival (USAID/BASICS) for the United States Agency for International Development (USAID).

[11] Republic of Liberia, Ministry of Health and Social Welfare, National Drug Policy(2001)

- Ensuring the constant availability of safe and effective drugs at all segments of the population

- Providing drugs through the government, private, and nongovernmental sectors at affordable prices

- Facilitating rational use of drugs through correct diagnosis, sound prescribing, good dispensing practices, and appropriate usage

- Ensuring that the quality of drugs manufactured in Liberia and those imported into Liberia meet internationally accepted quality standards

- Encouraging self-sufficiency through local manufacture of drugs of acceptable quality for consumption and export

- Ensuring the provision of drugs for veterinary use

The Ministry of Health and Social Welfare (MoHSW) has an essential medicines list (EML) modeled after the World Health Organization's generic list, which the MoHSW last updated in 2007[12]. However, contrary to the current malaria treatment policy, chloroquine and other monotherapies appear in the EML. Although the malaria treatment guidelines have undergone several revisions, the national therapeutic guidelines (NTG) document has not been updated since 1986; the document is under revision, and the final draft is expected in fall 2010.

The government's pharmaceutical sector in Liberia is comprised of the Pharmacy Division, Pharmacy Board of Liberia, the Liberia Medicine Regulatory Committee, which is not fully functional, and the National Drug Services (NDS). The Pharmacy Division is responsible for developing policy and coordinating the pharmaceutical sector overall. The Pharmacy Board is responsible for regulating professionals and institutions. The Liberia Medicine Regulatory Committee is supposed to take on some duties of the Pharmacy Division and the Pharmacy Board, including product registration and quality assurance. The terms of references for the Pharmacy Division and Pharmacy Board are listed in Annexes 1 and 2 respectively.

The NDS is operated by an independent general assembly/board of directors. It is responsible for procurement, storage, and distribution of pharmaceuticals to public and humanitarian organizations that provide health care delivery in the country. It is also responsible for storing and distributing pharmaceuticals and commodities for the Global Fund for AIDS, Tuberculosis and Malaria, President's Malaria Initiative (PMI), and other health stakeholders. The NDS manages one central warehouse and nine regional depots.

[12] Essential Medicines List for the Republic of Liberia(2007)

Malaria Control and Prevention

In 2004, the MOHSW introduced a policy for malaria control and prevention, which prompted funding from the Global Fund, U.S. Agency for International Development (USAID)/PMI, and other key partners. The policy has been transformed into strategic plans that are in line with Abuja declaration targets of reducing malaria morbidity and mortality by 50% by the year 2010 and with the Millennium Development Goal of halting and beginning to reverse the incidence of malaria by 2015.

Because of the new policy, malaria control activities have resulted in significant improvements; for example, 47% of households owned long-lasting insecticide-treated nets in 2009 compared with 18% in 2005; 45% women reported receiving intermittent preventive treatment of malaria in pregnancy in 2009 compared to 4.5% in 2005; and 85% of public health facilities had antimalarials in stock compared to 48% in 2005 [13]. Despite the achievements from 2005 to 2009, Liberia still faces significant challenges for delivery of quality malaria control and prevention services. These include low access to health services, poor care-seeking behaviors, reluctance of health professionals to use amodiaquine (AQ) in the artesunate (AS)- AQ blister pack because of concerns about adverse effects, and high circulation of chloroquine coupled with limited supply of artemisinin-based combination therapies (ACTs), especially in the private sector.

In recent discussions with the National Malaria Control Program (NMCP), the Strengthening Pharmaceutical Systems (SPS) Program learned that the MOHSW banned the importation of chloroquine into the country; however, the ban has not been implemented yet. In addition to massive public campaigns and health worker training programs to improve adherence to ACTs, the NMCP is planning to introduce the recently prequalified fixed-dose combination of artesunate-amodiaquine as a first-line treatment for malaria. The NMCP is also working to increase access to ACTs through the private sector and distribution channels.

[13] 2010-2015 National Malaria Strategic Plan

SITUATIONAL ANALYSIS

Rationale

Liberia changed its malaria treatment policy in 2003 and adopted ACTs as the first-line treatment for uncomplicated malaria (Annex 3). With support from Global Fund malaria grants, PMI, and other donors, the new policy has been widely implemented in the public sector including training health workers on new treatment guidelines, creating community awareness, and supplying all public facilities with ACTs. In spite all this, access to effective treatment remains low because the use of ACTs is limited to public health facilities only. Because only 41%[14] of the population has access to these facilities, the majority of the population does not get the recommended first-line treatment for malaria.

Early treatment of fever in most developing countries occurs through self-medication with antimalarial medicine bought from the formal and informal private retail sector. Literature on treatment-seeking for malaria and fever in sub-Saharan Africa demonstrates that medicine sellers[15] are a widely used source of drugs for fever and malaria in both rural and urban areas, among children and adults, and across socioeconomic groups[16]. However, treatments dispensed by private retail shops are not always adequate, appropriate, or effective for treating malaria[17].

Currently, 46% of the population in Liberia accesses antimalarials through the private sector[18]. ACTs, however, are generally more expensive than older antimalarials, such as chloroquine; therefore, the majority of these outlets still stock chloroquine and other monotherapies. As per the 2010–2015 National Malaria Strategic Plan, the MoHSW is committed to increasing access to prompt and effective treatment to 80% of the population by 2010. The NMCP realizes that the only way to achieve such access is by working with the private sector. Management Sciences for Health's (MSH) Strengthening Pharmaceutical Systems (SPS) Program, with support from PMI funding, is helping the NMCP design mechanisms to involve the private sector in implementing its ACT policy. In this context, the private sector includes retail pharmacies and licensed medicine stores.

[14] 2010–2015 National Malaria Strategic Plan

[15] In Africa, medicine sellers are variously known as drug sellers, chemical sellers, and patent medicine vendors, and operate in specialist drug shops, general shops, kiosks, and market stalls, as well as operating as itinerant hawkers. Such outlets are not permitted to stock prescription-only medicines, but are allowed to sell over-the-counter products. No professional consultation is required for purchase, and staff are not required to be fully qualified pharmacists.

[16] Catherine Goodman, William Brieger, Alasdair Unwin, Anne Mills, Sylvia Meek, and George Greer. Medicine Sellers and Malaria Treatment in Sub-Saharan Africa: What Do They Do and How Can Their Practice Be Improved? *Am. J. Trop. Med. Hyg.*, 77(Suppl 6), 2007, pp. 203–218.

[17] Manuel W Hetzel, Angel Dilip, Christian Lengeler et al. Malaria treatment in the retail sector: Knowledge and practices of drug sellers in rural Tanzania. *BMC public health 2008, 8: 157.*

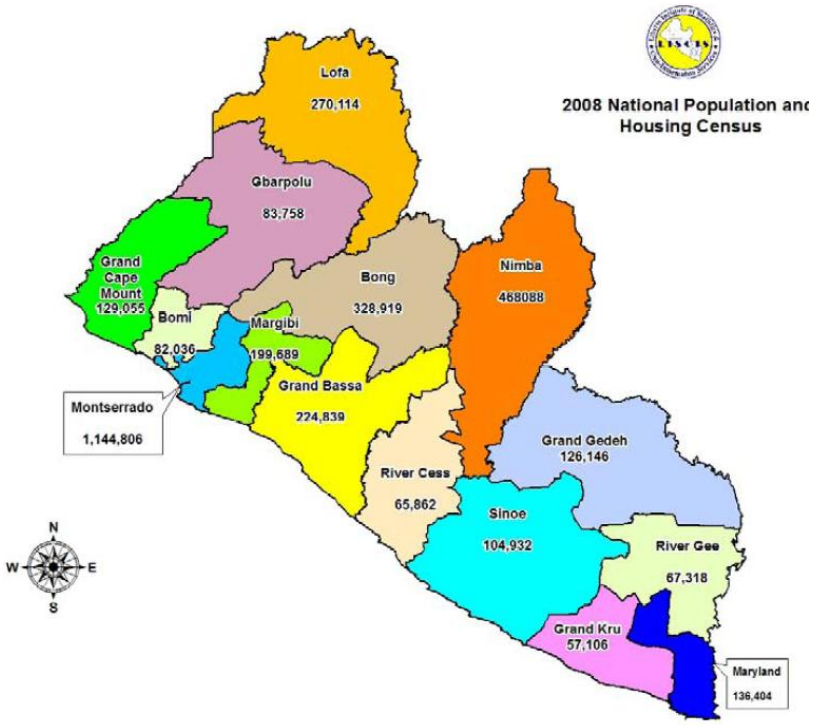
[18] 2010–2015 National Malaria Strategic Plan

Objectives

It takes a significant amount of data collection and analysis, options mapping, and stakeholder involvement to successfully introduce a private sector delivery program that improves access to medicines. The main objective of this assessment was to explore the feasibility of distributing subsidized ACTs through the private sector, specifically by—

- Mapping out private pharmacies and medicine stores in Montserrado County
- Measuring availability of antimalarial medicines at different outlets
- Assessing trends in the affordability and price of antimalarial medicine at different outlets
- Assessing the quality of services provided by different outlets
- Assessing the private sector supply chain
- Assessing inventory management procedures

Methodology



Montserrado County was selected to pilot the project due to its large number of pharmacies and medicine stores compared to other counties. Located on the coast in the northwestern third of Liberia and home to the capital of Monrovia, Montserrado is the smallest county by size, but largest by population, with about 33% of Liberia's total population of 3,489,073[19] . The map at left shows the counties with their 2008 populations. The population density of Montserrado is 599.7 inhabitants per square kilometer, which is the highest in Liberia[20].

[19] Government of the Republic of Liberia. 2008 National Population and Housing Census: Preliminary Results
[20] Ibid

SPS collected data by reviewing documents regarding the health sector and surveying retail pharmacies and medicine stores. All 95 registered (retail and wholesale) pharmacies in the county for 2009 were included (annex 4). In addition, pharmacies not listed in 2009 were also included (i.e., new and unregistered pharmacies). Data was collected from March 10–16 through interviews with providers at pharmacies and medical stores using structured questionnaires (annex 5) and simulated client surveys, which were adapted from tools used for similar assessments in Uganda and Tanzania. The questions addressed the five dimensions of access described in the Strategies for Enhancing Access to Medicines access framework[21], including acceptability, accessibility, availability, affordability, and quality of services.

The availability and price survey was limited to the following list of antimalarials, which came from the Liberia's 2007 EML. The list also included antimalarials not on the EML, but which were listed in the national treatment guidelines for malaria.

Antimalarial Medicine List

1. Artesunate 50 mg tablets + amodiaquine 153 mg
2. Amodiaquine 200 mg tablets
3. Amodiaquine 50 mg/5 mL syrup
4. Artemether 20 mg/mL injection
5. Artemether 80 mg/mL injection
6. Artesunate 50 mg tablets
7. Artesunate rectal caps 100 mg
8. Artesunate rectal caps 50 mg
9. Chloroquine phosphate 150 mg tablets
10. Chloroquine phosphate 50 mg/5 mLsyrup
11. Chloroquine sulfate 40 mg/mL injection
12. Quinine sulfate 200 mg tablets
13. Quinine dihydrochloride 300 mg/mL injection
14. Quinine sulfate 300 mg tablets
15. Sulfadoxine/pyrimethamine (SP) 500 + 12.5 mg suspension
16. SP 500 + 25 mg tablets

Data collectors (pharmacists, pharmacy students, and interns from Liberia's school of pharmacy) attended a one-day training to review the questionnaires and field-testing protocol. There were four groups to cover the main geographical areas in Montserrado. Using the list of registered pharmacies, data collectors visited all listed and unlisted pharmacies in the defined area. Each group had a supervisor responsible for ensuring data collection consistency through daily checks. Data entry and analysis were done using a custom Excel workbook. Results were presented at a stakeholders' workshop in Monrovia.

It is important to note that the primary target for the analysis was retail pharmacies only; however, given the number and location of medicine stores in Montserrado, the team decided to include them in the survey. Medicine stores are authorized to sell over-the-counter medicines

[21] Developed by the Strategies for Enhancing Access to Medicines (SEAM) Program. http://www.msh.org/seam.

only, and their dispensers must be a registered midwife or nurse or a trained nurse aide. The medicine stores were randomly selected from different communities targeted by the data collectors. Each team planned to visit a total of 50 facilities—all retail pharmacies in the area plus a selection of medicine stores to add up to 50.

The MoHSW approved the survey, and the NMCP provided an introductory letter for the teams to present at each outlet. The teams obtained verbal informed consent before the interviews.

FINDINGS

Overview

Overall, 192 outlets participated in the survey; 106 were pharmacies and 86 were medicine stores. On average, each outlet had two employees. Over 60% of pharmacies and medicine stores had started their business within the past five years (figure 1).

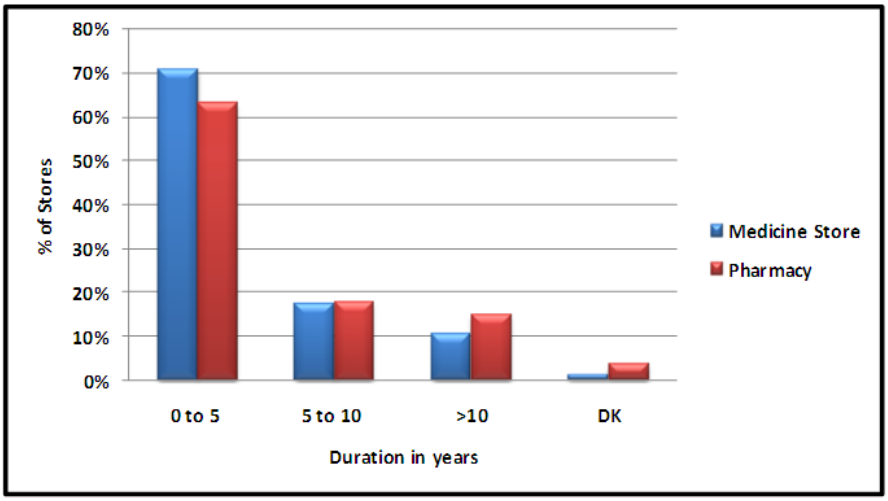


Figure 1. How long has the facility been operating?

The law requires that pharmacies be owned by Liberian pharmacists and medicine stores by a licensed dispenser. The law also allows for pharmacists to supervise up to three pharmacy premises. Most surveyed pharmacies (70%) are owned by either business people or those in other nonmedical professions. While 69% of medicine store owners are either clinicians or other health care personnel, only 30% of pharmacies are owned by a similar group (table 2). Thirty-six percent and 25% of those interviewed at medicine stores and pharmacies were owners. The majority of those interviewed were employees selling medicines (figure 2).

Table 2. Owner's Profession

Profession	Medical Store, N=86 (%)	Pharmacy, N= 106 (%)	Total
Business	23 (27)	59 (56)	82
Clinician[a]	51 (59)	31(29)	82
Other medical personnel[b]	9 (10)	1(1)	10
Others	3 (4)	15(14)	18

[a] Dispensers (7%), physician (5%), nurse aide (7%), physician's assistant(35%), pharmacist (15%), and nurse/midwife (30%)
[b] First aid personnel, lab technician and students in medical, pharmacy or physician's assistant schools.

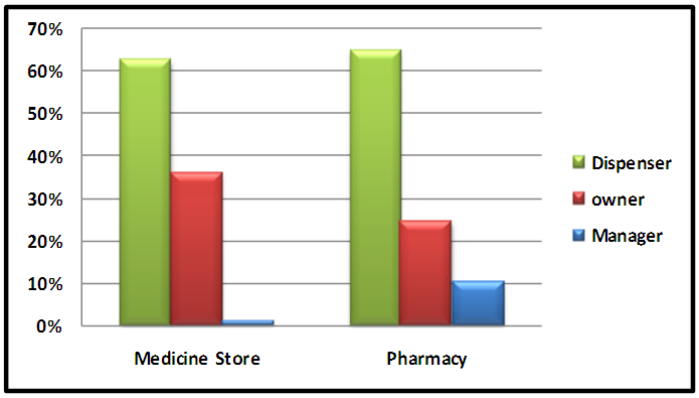


Figure 2. Position of person interviewed

Most of medicine stores (61%) reported seeing fewer than 10 malaria patients daily; a similar number was reported in 40% of pharmacies. Almost 40% of pharmacies reported seeing 11 to 20 malaria patients daily (table 3). Malaria was the leading cause (38%) of all consultations (figure 3), and chloroquine was among the top five medicines selling in these outlets (figure 4).

Table 3. Estimated Number of Malaria Patients per Day

Number of patients	Medicine Store, N=83 (%)	Pharmacy, N=104 (%)	Total
<10	51 (61)	42 (40)	93
11 to 20	22 (27)	41 (39)	63
21 to 30	7 (8)	11 (11)	18
> 30	3 (4)	10 (10)	13

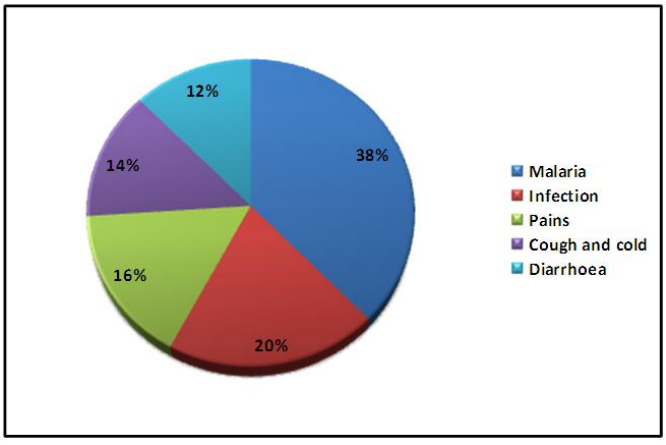


Figure 3. Most common disease condition reported in pharmacies and medicine stores

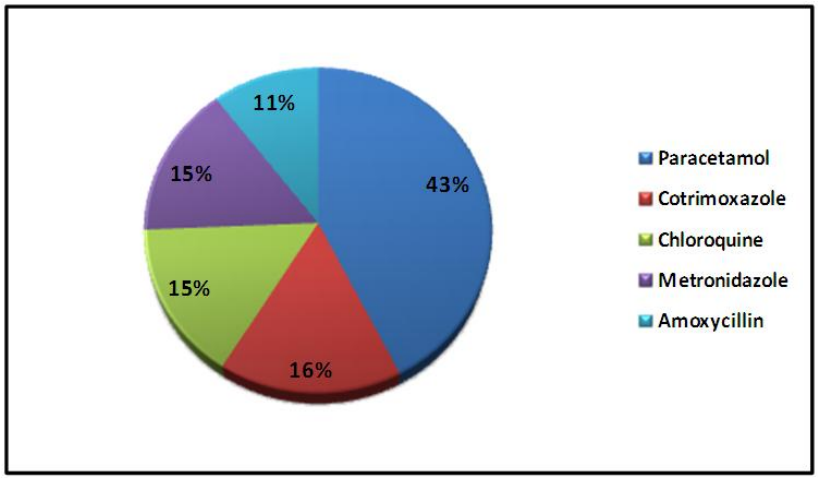


Figure 4. Most selling products in pharmacies and medicine stores

Licensing and Inspection

Data collectors reviewed licensing and registration documents to determine status. Because license renewals and registration for 2010 were ongoing, 2009 licenses and registration status were considered valid. The majority of pharmacies (95%) and medicine stores (90%) were registered businesses and had valid licenses to sell medicines. Participants were asked if their facilities had been inspected within the previous year, and 95% of both medicine stores and pharmacies reported that they had. The most commonly reported inspecting agencies were the Pharmacy Board and Department of Commerce and Finance (figure 5).

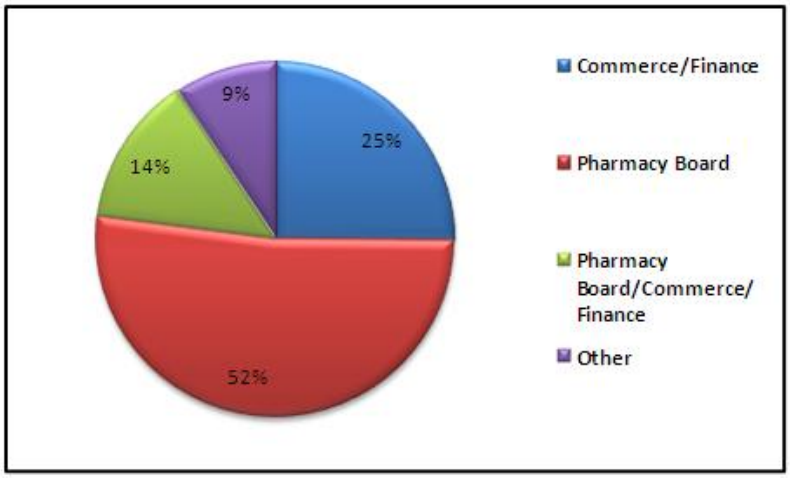


Figure 5. Frequency of inspection by inspecting agency

Accessibility

Montserrado is densely populated and outlets are well dispersed across the county. Most pharmacies are located along major highways, while medicine stores are clustered within communities. Accessibility to antimalarials was measured by the number of working hours the facilities operate. From Monday through Saturday, 64% of pharmacies stay open for 8 to 12 hours, while 76% of medicine stores stay open more than 12 hours (figure 6). However, over 60% of pharmacies and about 50% medicine stores remain closed on Sundays and public holidays.

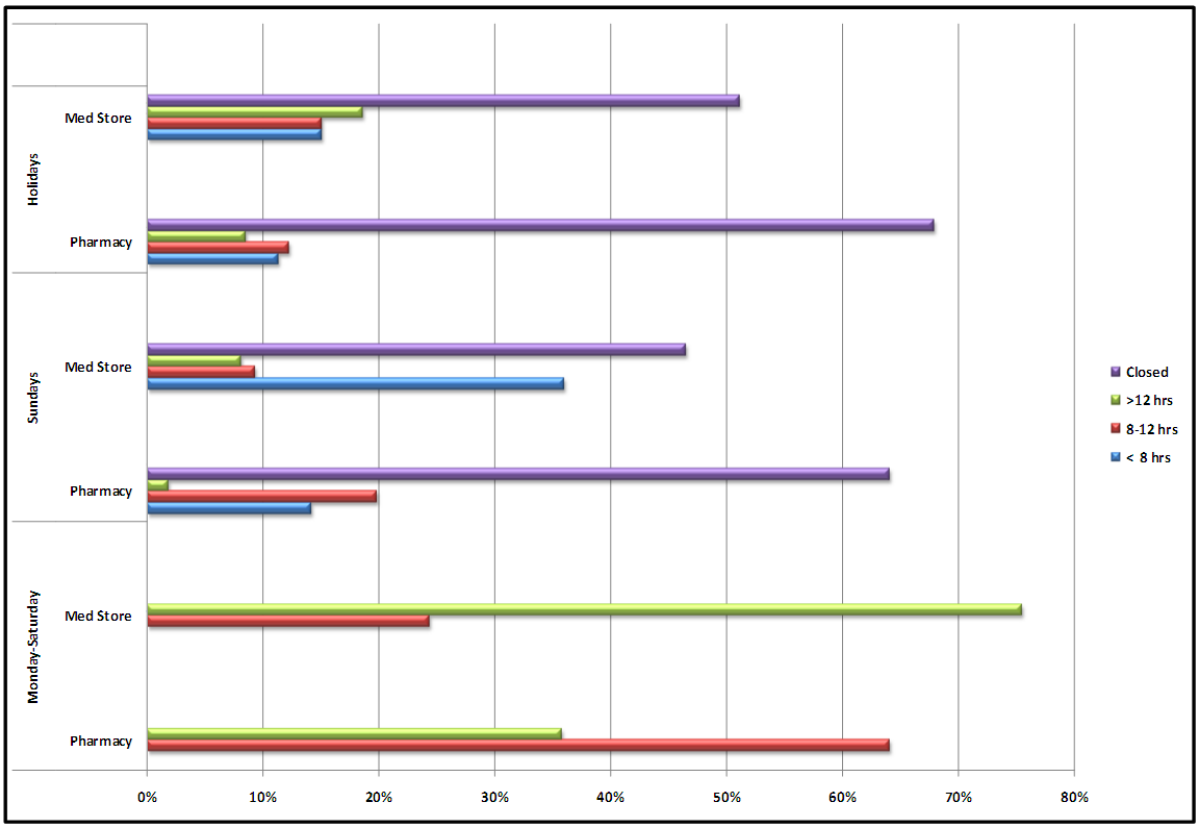


Figure 6. Working hours per day

Availability

Figure 7 shows that most outlets had antimalarials available: chloroquine tablets (74%), SP tablets (67%), AS/AQ tablets (65%), chloroquine syrup (62%), and AQ tablets (61%). Overall, adult formulations were more available than those for children. AS suppositories, the recommended pre-referral treatment for severe malaria was found in two (1%) outlets only. Other artemisinin-containing antimalarials available in outlets were artemether-lumefatrine (2%), artemisinin-naphtoquine (3%), and dihydroartemisinin syrup (1%). None of the antimalarials had expired. Figure 8 shows common antimalarials found in stores.

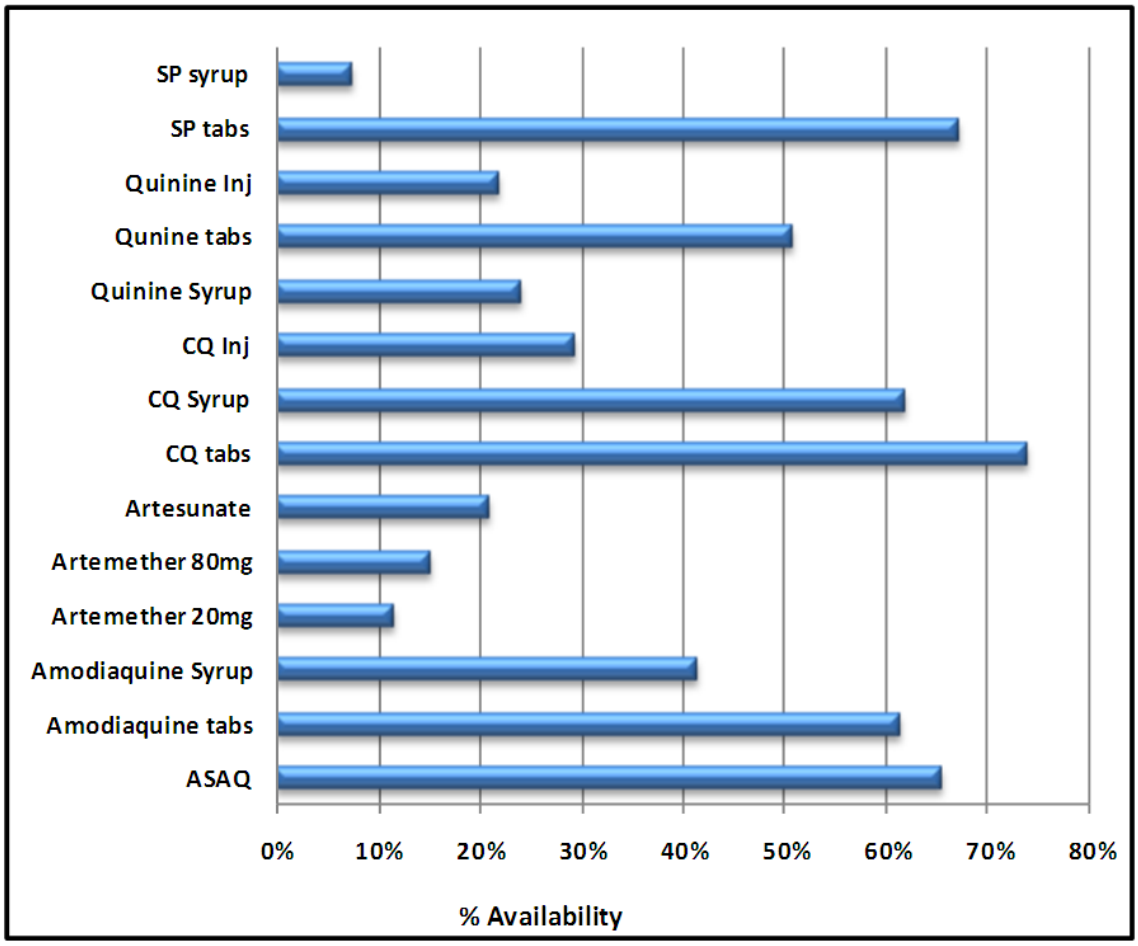


Figure 7. Percentage of outlets with antimalarials available on the day of visit (N=192)

Most common antimalarials available on the day of the visit

Affordability and Price

Almost 70% of providers thought their clients could afford the medication sold to them (table 4). However, over 60% of them admitted to selling the medicines based on the amount of money the clients had (figure 8). Only 16% (30) of providers sell on credit.

Table 4. Providers' Perception of Clients' Ability to Pay

Affordable	Medicine Store (%)	Pharmacy (%)	Total
No	15 (17)	38 (36)	53
Sometimes	2 (2)	3 (3)	5
Yes	69 (80)	65 (61)	134
Total	86	106	192

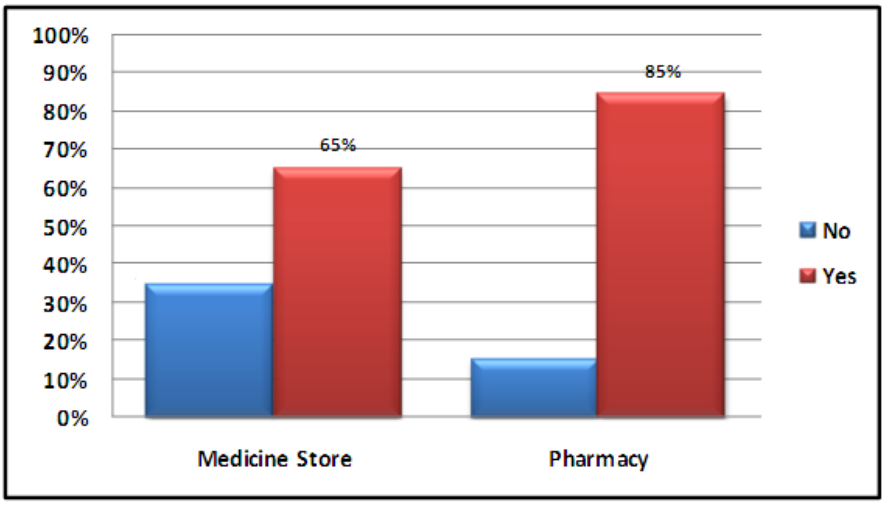


Figure 8. Do you sell based on the amount of money the client has?

The prices shown in figures 9 and 10 below reflect the price for treating one episode of malaria in adults and children respectively. The median price for treating malaria using the currently recommended AS/AQ is 100 Liberian dollars (LRD) (range 25 to 300), which is almost 1.50 U.S. dollars (USD). The median price of AS/AQ is more than five times higher than that of chloroquine (median LRD 15), which was the previously recommended first-line treatment for malaria. The median price differences in treatments for children were smaller.

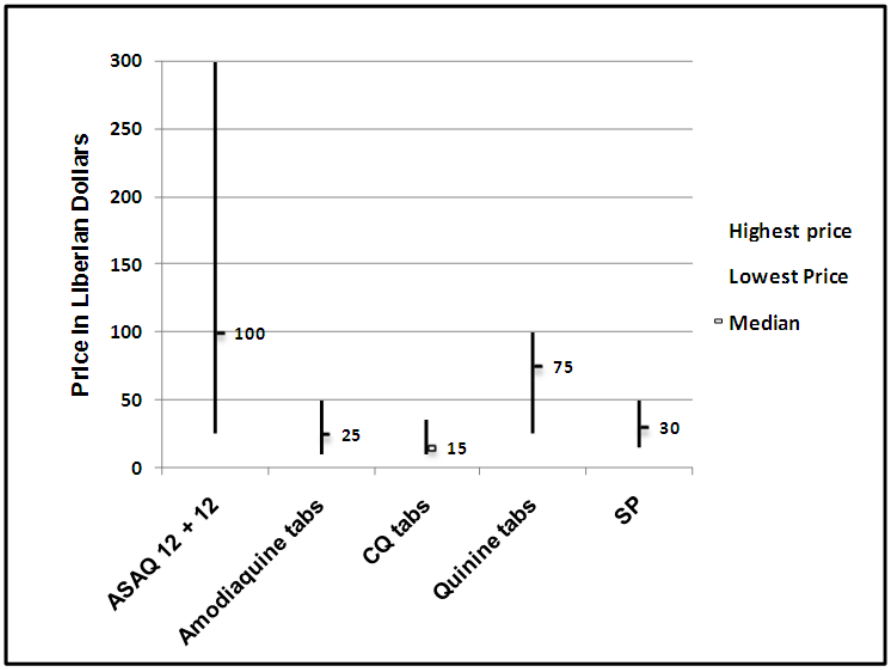


Figure 9. Median price for treating one malaria episode for adults

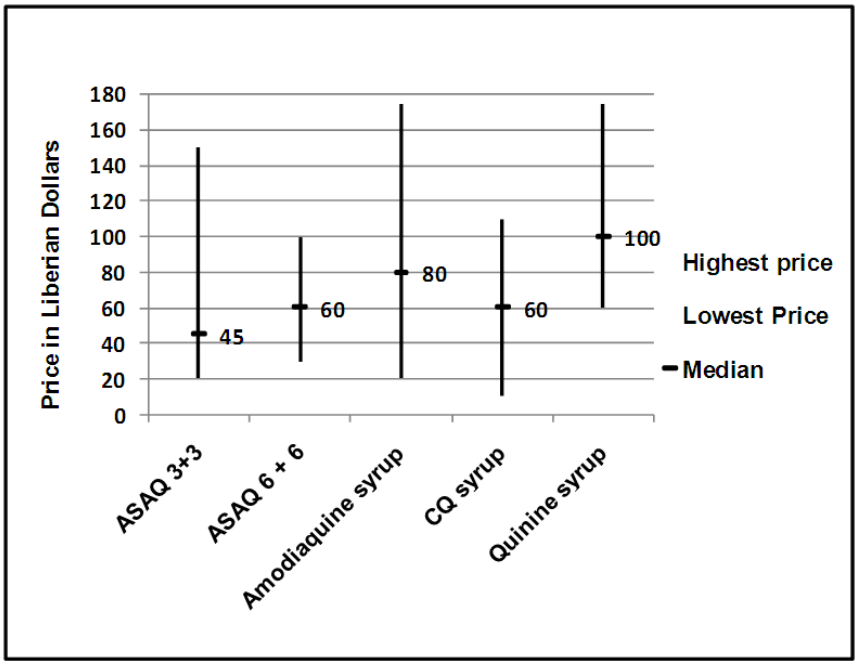


Figure 10. Median price for treating one malaria episode for children

Some of the pharmacies sell products at both wholesale and retail prices. The median percent differences between wholesale and retail prices varied from 56% with AQ to 178% for AS/AQ (Figure 11).

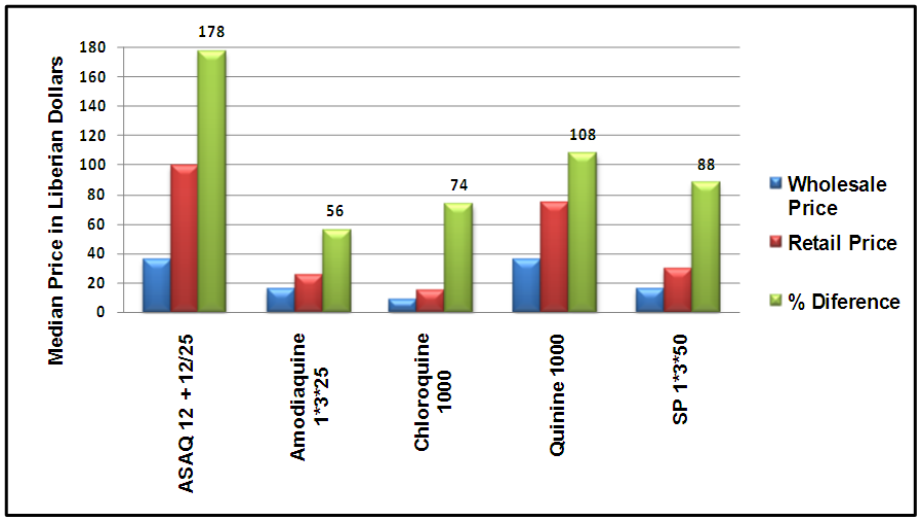


Figure 11. Median wholesale vs retail prices of antimalarials in pharmacies and medicine stores

Quality of Services

Provider Qualification

Most providers fell into the qualified dispenser category, which entails one year of training (39% in pharmacies and 31% in medicine stores). Qualifications also included nurses, nurse aides, physician assistants, and pharmacists. The "other" category of responses included managers or supervisors, college students and no qualification provided (figure 12). The team did not ascertain proof of qualification during the interview.

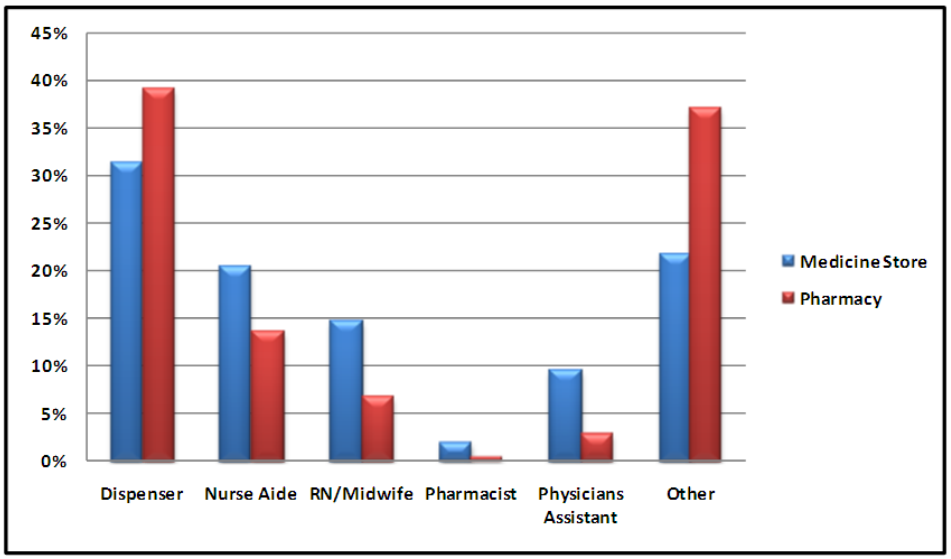


Figure 12. Provider qualification

Participants were asked if they have attended any training in the past three years. Of 170 respondents, 41 (60%), had attended training on malaria 12 (18%) on pharmaceutical management, and 15 (22%) on other topics. These trainings were conducted by the NMCP and the Pharmacy Board. The duration of the trainings varied, and none of the respondents could show certificates for trainings attended. The survey team could not determine the contents of the trainings.

Services Provided by Pharmacies and Medicine Stores

In addition to selling medicines, some pharmacies and medicine stores offered other services such as clinical diagnosis/laboratory services, injections, and wound dressing (figure 13). None of these services are allowed by law.

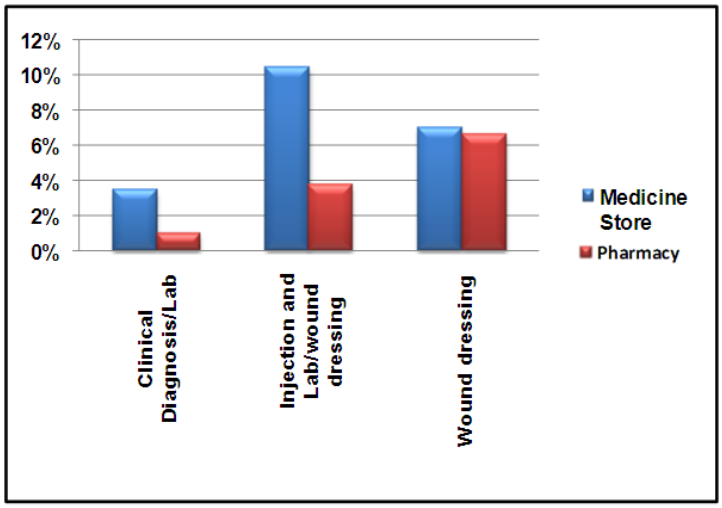


Figure 13. Proportion of facilities providing other services

Investigators asked to see any reference materials the dispensers reviewed to provide information on medications and treatments (figure 14).

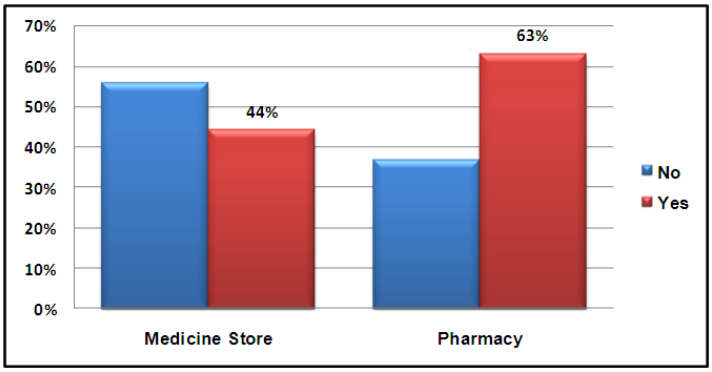


Figure 14. Availability of reference materials by facility

Management of Malaria

The data collection teams conducted simulated client exercises in 14 facilities; the client pretended to be a parent of a six-year-old child with complaints of fever and headache. The dispensers sold chloroquine and other monotherapies in most encounters, while AS/AQ was dispensed in 20% of medicine store encounters and 22% in pharmacy encounters (table 4). Quality of service provided was also measured by the appropriateness of treatment provided in terms of dose, frequency, and duration of treatment for a given age group. Figure 15 shows the proportion of encounters where treatment was appropriate.

Table 4. Medicines Dispensed in Simulated Client Exercise

Name of Drug	Medicine Store, N =5	Pharmacy, N=9
AQ	1	1
AS/AQ	1	2
Chloroquine	2	3
Fansidar	0	2
Quinine	1	1

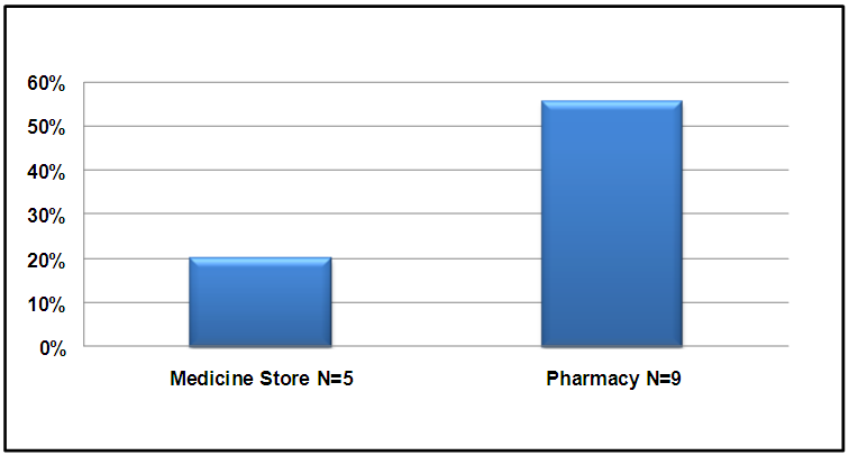


Figure 15. Appropriate dispensing practices by facility

Inventory Management and Storage Conditions

The survey also looked at storage conditions and inventory management procedures. Most medicine stores (79%) did not have extra storage space on the premises, while almost half of the pharmacies had extra storage space (figure 16). Other storage conditions included general cleanliness of the floors, shelves, and walls. Most facilities had neat and clean shelves (Figure 16).

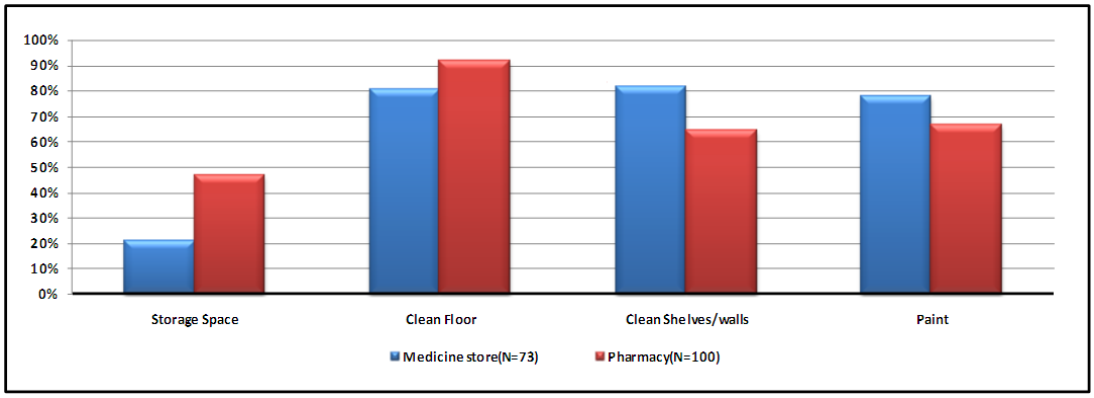


Figure 16. Storage conditions

Storage Conditions in Pharmacies and Medicine Stores

Only 29% of pharmacies and 62% of medicine stores keep sales records (figure 17). Also, very few facilities keep stock records, but of these, 81% were up-to-date.

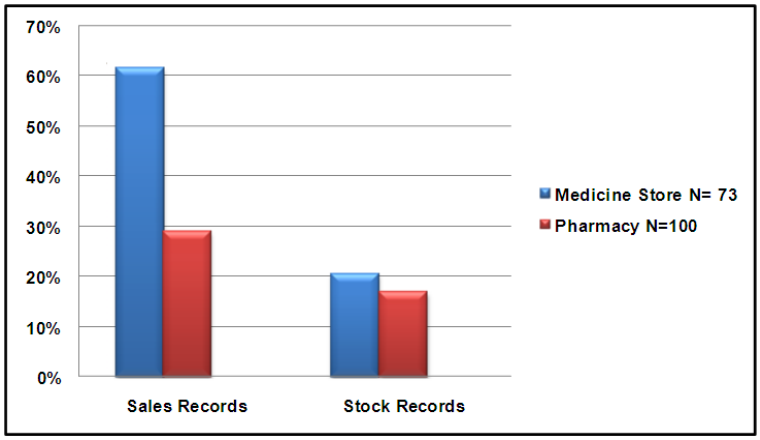


Figure 17. Inventory management procedures

Many facilities (97%) practice first expiry first out (FEFO) inventory management to prevent expiry. Others donate (2%) or return to supplier (1%). Once expired, medicines are mostly discarded through dumping and burning (table 5). The assessment team did not find any expiries at the time of the assessment; however, none of the medicines were tested for quality.

Table 5. Expiry Disposal

Disposal	Medicine Store, N= 73 (%)	Pharmacy, N=100 (%)
Burn	20 (27)	15 (15)
Bury	5 (7)	2 (2)
Dump	34 (47)	27 (27)
Return	2 (3)	9 (9)
Other	2 (3)	4 (4)
No Expiry	10 (14)	43 (43)

All facilities used plastic or paper envelopes to dispense medicines, and 128 (74%) of the facilities had a dispensing tray or spoon for dispensing as seen in the picture below.

Other Supply Chain Issues

Providers were asked to mention five suppliers for their pharmaceuticals. Figures 18 and 19 below show the top 10 suppliers that were commonly mentioned by medicine stores and pharmacies.

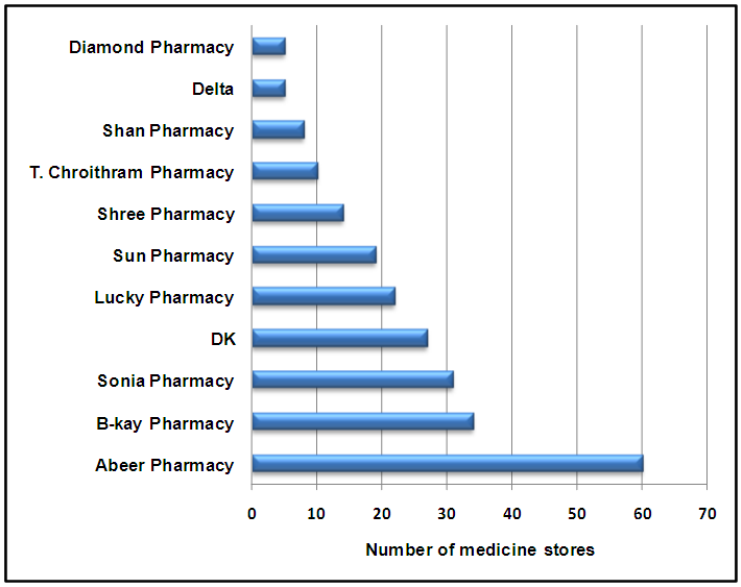


Figure 18. Ten common suppliers for medicine stores (N=86)

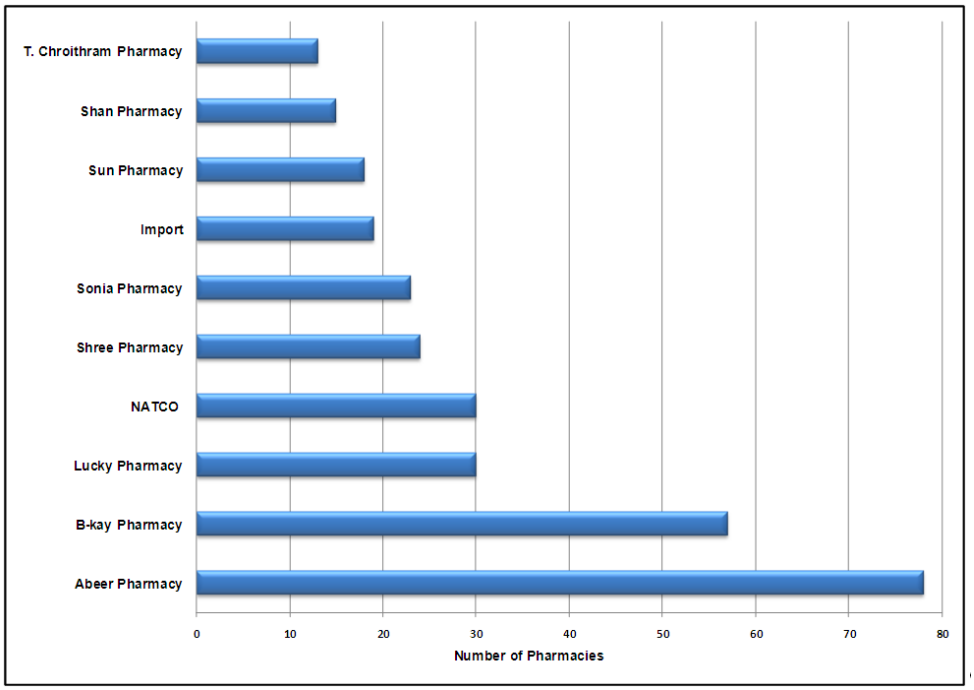


Figure 19. Ten common suppliers for pharmacies (N=106)

Most facilities place their orders in person (table 6), and when they need supplies (table 7).

Table 6. Pharmaceutical Ordering

Ordering	Medicine Store, N = 73	Pharmacy, N =100
Contact with sale person	3	4
In Person	65	75
Phone/email	4	13

Table 7. Ordering Frequency

Frequency	Medicine Store, N = 73	Pharmacy, N = 100
Daily	2	1
Weekly	22	31
Monthly	4	14
When needed	45	49

KEY OBSERVATIONS AND RECOMMENDATIONS

Policy and Legal Framework to Facilitate Private Sector Initiatives

In its regulatory capacity, the Pharmacy Board maintains the inspectorate unit which conducts routine annual inspections of pharmaceutical businesses. Most of the surveyed facilities had valid licenses to sell medicines and have had a routine inspection at least once in the previous year. However, these inspections were limited to checking the registration status of the premises, enforcing minimum standard for shop size and storage conditions; and did not address other irregularities in practice. The role of the Pharmacy Board in ensuring success of the NMCP's private sector initiative cannot be understated. The inspectorate unit needs to be strengthened so that inspections are more systematic and target different aspects of private sector operations, including how they are implementing the ACT initiative.

All participating pharmacies and medicine stores must be registered by the Pharmacy Board

Phasing out monotherapies is critical to the successful uptake of ACTs in the private sector. As mentioned previously, in early 2010, MoHSW and the Pharmacy Board banned the importation of chloroquine and other monotherapies in Liberia; however, the ban has not been put into effect yet. Strategies to phase out monotherapies will need to be put into place to avoid wastage, and the NMCP and private sector providers will need to collaborate on those strategies.

With the introduction of fixed-dose combinations of AS/AQ, policy considerations include revising medicine regulations, such as changing the legal status of ACTs to over-the-counter status, registering the fixed-dose combinations, and updating and disseminating the EML and standard treatment guidelines. MSH published an implementation guide with details on actions to take when introducing a new treatment, such as ACTs[22].

[22] RPM Plus Program. 2005. *Changing Malaria Treatment Policy to Artemisinin-based Combinations: An Implementation Guide*. Arlington, VA: Management Sciences for Health.

Antimalarials Availability and Price

Montserrado County has many pharmacies and medicine stores, most of which stock antimalarials. However, not all of the available medicines are the recommended first-line treatment for uncomplicated malaria. In addition, the cost for treating one episode of malaria varied greatly; treatment for an adult episode of malaria ranged from LRD 25 to 300 for AS/AQ and LRD 10 to 35 for chloroquine. These variations, especially in AS/AQ, could be due to brand differences and medicine sources as seen in the pictures below .The survey team observed that the cheaper AS/AQ had leaked from the public sector. In addition, anecdotal evidence suggests that unlike other antimalarials that are sold per dose, AS/AQ is sometimes sold per tablet depending on what the client can afford.

The Liberia Malaria Indicator Survey of 2009[23] estimated the mean cost of malaria treatment (including provider fees and costs for drugs and tests) at pharmacies and medicine stores to be LRD 161 and 142, respectively.

ACTs for the private sector should be subsidized to make them available at an affordable price and to help push older, cheaper medicines out of the market. PMI and other international partners are committed to procuring and delivering ACTs for the private sector by using the same mechanisms applied to the public sector. Without international distributor, transportation, and customs and clearance costs, the cost for ACTs would be significantly reduced. The NMCP, private providers, and other partners should agree on reasonable price ranges that can compete with cheaper antimalarials in the market at different levels of the supply chain. A profit mark-up should be added along the supply chain for providers to make modest profit while keeping the price affordable to patients.

Once finalized, ACT price information should be available to providers and consumers using a variety of channels, including but not limited to local newspapers, television, radio, cell phones, pharmacies and medicine stores, and community groups or influential people.

[23] National Malaria Control Program (NMCP)[Liberia], Ministry of Health and Social Welfare, Liberia Institute of Statistics and geo-Information Services(LIGSIS), and IFC Macro. 2009. *Liberia Malaria Indicator Survey 2009*. Monrovia Liberia; NMCP, LISGIS and IFC MACRO

Quality of Services

Most of the people working at pharmacies and medicine stores referred to themselves as dispensers, however, the assessment team did not determine whether they were actually certified as dispensers. In addition, a good proportion of providers did not have any kind of healthcare or medical training.

Because the most commonly dispensed antimalarial (chloroquine) is not recommended for treatment, providers need to be trained on the national treatment guidelines for malaria, and in particular, the appropriate use of the new fixed-dose combination ACT, good dispensing and storage practices, and patient counseling.

Inventory Management and Reporting

Most facilities do not keep sales or stock records. Record-keeping will need to be strengthened with the distribution of subsidized ACTs in the private sector. The NMCP should set up a monitoring and supervision system to ensure that ACT sales and stock status records are kept up-to-date.

Procurement and Supply Chain

There are eight wholesale pharmacies that import pharmaceuticals. These pharmacies also have subsidiaries in different locations in the city. Overall, most pharmacies and medicine stores procure their products from the same suppliers. They order mostly in person when they need supplies.

The current supply chain mechanism should be maintained, and the NDS should be the custodian of procured ACTs. Selected wholesalers would buy ACTs from the NDS and distribute to the rest of the pharmaceutical retail system.

ANNEX 1. PHARMACY DIVISION OF LIBERIA TERMS OF REFERENCE

- Advises the Honorable Minister of Health on Pharmaceutical affairs

- Ensures the equitable distribution of medical and pharmaceutical supplies to all government owned health institutions nationwide. This supervisory mandate extends to private as well as religious health/medical institutions.

- Ensures the issuance of permits for the importation of therapeutic medicines and controlled substances (narcotic and psychotropic substances) and medical supplies into the country.

- Maintains an inspectorate unit aimed at regulating and maintaining uniform pharmaceutical practice in the country and plays a supervisory role in the distribution and administration of all categories of vaccines in collaboration with the Expanded Programme on Immunization of the MoHSW.

- Collaborates with the Pharmacy Board of Liberia in maintaining appropriate registry of both pharmaceutical institutions and practicing Pharmacists nationwide.

- Assures the quality if drugs imported into the country in line with the World Health Organization protocol on quality assurance of pharmaceuticals

- Writes and directs pharmaceutical policies as exemplified in the publication of major policy documents such as the National Drug Policy, EML, National Formulary, and the Standard Treatment Guidelines

- Represents the Ministry of Health and Social Welfare on international conferences on pharmaceutical affairs and drug regulation

ANNEX 2. PHARMACY BOARD OF LIBERIA TERMS OF REFERENCE

1. Serves as the advisory arm to the Honorable Minister of Health, Ministry of Health Social Welfare, and Republic of Liberia.

2. Promulgates appropriate rules and regulations that are in line with the public Health and Safety Law of Liberia. These rules and or regulations are used as yard stick to regulating the practice of the pharmacy profession in Liberia.

3. Licenses professional pharmacists to practice the pharmacy profession in Liberia.

4. Accredits training institutions for pharmaceutical science/discipline.

5. Issues permits of operation to all pharmaceutical businesses operating in Liberia.

6. Regulates all pharmaceutical business institutions such as medicine stores, retail pharmacies, wholesale pharmacies, and pharmaceutical manufacturing plants/companies

7. Promotes the idea of regional cooperation in the west African sub-region.

8. In line with its regulatory authority as the Drug Regulatory Authority of Liberia established a quality assurance laboratory in 1999.

9. Maintains, for the propose of regulation, the following units:

    a. **Inspectorate unit** which conducts annual inspection, routine inspection investigative institution, inspection of new pharmaceutical business institutions.

    b. **Quality Assurance unit** which conducts quality assurance analysis of all pharmaceutical products imported into Liberia.

    c. **Drug Registration unit** which handles the issues of products registration companies' registration and pharmaceutical plants registration

10. **Advises the Minister** of Health and Social Welfare on pharmaceutical affairs.

11. Ensures the equitable distribution of medical and pharmaceutical supplies to all government owned health institutions nationwide. This supervisory mandate extends to private as well as religious health/medical institutions.

12. Ensures the issuance of permits.

ANNEX 3. LIBERIA'S MALARIA STANDARD TREATMENT GUIDELINES

Condition	Medication	Strength	Formulation
Uncomplicated malaria	First-line: AS/AQ (co- blistered)	50 mg AS + 153 mg AQ	Tablets
	Second-line: Quinine sulfate	200 mg 300 mg	Tablets
	Children <5 kg: Quinine sulfate	200 mg	Tablets
	Pregnancy, first trimester: Quinine sulfate 2nd and 3rd trimesters: AS/AQ or quinine sulfate	300 mg 50 mg AS + 153 mg AQ	Tablets
Severe malaria (IV/IM phase + continuation phase)	Quinine dihydrochloride injection (IV) Quinine sulfate (continuation)	600 mg/2 mL 200 mg 300 mg	Vials Tablets
	Artemether injection (IM) Artesunate amodiaquine (continuation)	20 mg/mL pediatric 80 mg/mL adult 50 mg aAS + 153 mg AQ	Vials Tablets
Intermittent preventive treatment in pregnancy	S/P	500 mg sulfadoxine + 25 mg pyrimethamine	Tablets
Pre-referral treatment	Artemether injection (IM)	20 mg/mL pediatric 80 mg/mL adult	Vials
	AS rectal caps	100 mg or 400 mg	Suppositories

ANNEX 4. MONTSERRADO COUNTY, REGISTERED PHARMACIES, 2009

No	Name of Pharmacy	Type	Location
1	A.D. Pharmacy	Retail	Matadi SOS Junction
2	A.O. Pharmacy	Retail	Air Field Shortcut
3	Abeer Pharmacy	Retail & Wholesale	Red-Light, Paynesville
4	Abeer Pharmacy	Retail & Wholesale	Randall Street
5	Abi Jasudi & Aza Trading Corp.	Retail & Wholesale	Randall Street
6	Abi Pharmacy	Retail & Wholesale	Kakata City
7	Age Pharmacy	Retail	Benson & Lynch Streets
8	Alsam Pharmacy	Retail	Plumkor, Sinkor
9	Anatah Pharmacy	Retail	Broad Street
10	B-Kay Pharmacy	Retail & Wholesale	Waterside, UN Drive
11	B-Kay Pharmacy	Retail & Wholesale	Wood Camp, Paynessville
12	B-Kay Pharmacy	Retail & Wholesale	Broad Street
13	Blojae Pharmacy	Retail	Gurley Street
14	Care Pharmacy	Retail	Plunkor, Sinkor
15	Cent's Pharmacy	Retail	Capitol Bye-Pass
16	Charif Pharmacy	Retail & Wholesale	Randall Street
17	Christine Pharmacy	Retail	Paogeot Garage, Bushrod Island
18	Christoma Pharmacy	Retail	11th Street, Sinkor
19	Country Retail Pharmacy	Retail	20th Street, Sinkor
20	Delta Pharmacy	Retail & Wholesale	Red-Light, Paynesville
21	Destiny Pharmacy	Retail	Duport Road Junction
22	Dream Pharmacy	Retail	Capitol Bye-Pass
23	Eamamah Pharmacy	Retail	Newport Street
24	Fidson Healthcare Pharmacy	Wholesale	Madonna & Broad Street
25	Future Medicine Int'l Pharmacy	Wholesale	Gurley Street
26	G.K. Pharmacy	Retail	Red-Light, Paynesville
27	G.K. Pharmacy	Retail	Red-Light, Paynesville
28	G-2 Pharmacy	Retail & Wholesale	Opp. Stephen Tolbert Estate
29	Gentle Pharmacy	Wholesale	Logan Town
30	George's Pharmacy	Retail	Ashmun Street
31	Graceland Pharmacy	Retail	4th Street & Jallah Town
32	Great Physician Pharmacy	Retail	16th & 17th Streets
33	Hangee Pharmacy	Retail	Lynch Stree
34	Hi-Way Pharmacy	Retail	Robertfield Highway
35	Ikay Pharmacy	Retail	Barnersville opp. The Market
36	Indo-Lib. Pharmacy	Retail	Red-Light, Paynesville
37	Indo-Lib. Pharmacy	Retail	Carey Street
38	Itter Pharmacy	Retail	Benson Street

No	Name of Pharmacy	Type	Location
39	Jack-Zu Pharmacy	Retail	Johnson Street Market
40	Jai Govinda Pharmacy	Retail	Benson Street
41	Jecaine Pharmacy	Retail	Chicken Soup Factory
42	Joy Pharmacy	Retail	Jamaica Road Junction
43	Just Two Pharmacy	Retail	Bassa Community, Bye-Pass
44	Kenneh & Son Pharmacy	Retail	Broad Street
45	Konkpama Pharmacy	Retail	Newport Street
46	Laxmi Pharmacy	Retail & Wholesale	Caldwell Junction
47	Leela Pharmacy	Retail	20th Street, Sinkor
48	Lifeline Pharmacy	Retail	Rehab Junction
49	Love Pharmacy	Retail	Buzzy Quarter, UN Drive
50	Lucky Development Corp. Pharmacy	Retail	Opp. JFK Hospital, Sinkor
51	Lucky Development Corp. Pharmacy	Retail	Red-Light, Paynesville
52	Lucky Development Corp. Pharmacy	Retail & Wholesale	Old Road, Sinkor
53	Lucky Development Corp. Pharmacy	Retail	Duala, Bushrod Island
54	Lucky Development Pharmacy	Retail	New Georgia Junction
55	Mak Pharmacy	Retail & Wholesale	Benson St. & Capitol Bye-pass
56	Mak Pharmacy	Retail & Wholesale	Sayon Town, Bushrod Island
57	Makemeh Pharmacy	Retail	Red Hill, Virgina
58	Malag Pharmacy	Retail	Mechlin Street
59	Miracle Pharmacy	Retail	Gurley Street
60	Model Pharmacy	Retail	Old Road, Sinkor
61	New Life Pharmacy	Retail	Old Road, Sinkor
62	Onikee Pharmacy	Retail	Congo Town
63	Osiwato Pharmacy	Retail & Wholesale	Red-Light, Paynesville
64	Port Pharmacy	Retail	Opp. Freeport of Monrovia
65	Poutal Pharmacy	Retail	Mechlin Street
66	R. Itter Pharmacy	Retail	Broad & Johnson Streets
67	Rami Pharmacy	Wholesale	Broad Street
68	Rotaco Pharmacy	Retail	Broad Street
69	Sadura Pharmacy	Retail	Benson & Center Streets
70	Safari Pharmacy	Wholesale	Sayon Town, Bushrod Island
71	Salman Pharmacy	Retail & Wholesale	Beson Street
72	Samansu Pharmacy	Retail	Shoe Factory, Gardnersville
73	Sana Pharmacy	Retail	Logan Town, Bushrod Island
74	Shala Pharmacy	Retail	Dolo Town, Margibi County
75	Shan Pharmacy	Retail & Wholesale	Camp Johnson Road
76	Shan Pharmacy	Retail	Super Market, Gardnersville
77	Shree Pharmacy	Retail & Wholesale	Logan Town Cenima, Bushrod Island
78	Shree Pharmacy	Wholesale	Broad Street

No	Name of Pharmacy	Type	Location
79	Sonia Pharmacy	Retail & Wholesale	Point Four
80	Sonia Pharmacy	Retail & Wholesale	Clara Town
81	Sonia Pharmacy	Retail & Wholesale	Vai Town, Bushrod Island
82	Stanks Pharmacy	Retail	Clay Street
83	Subba Pharmacy	Retail	New Kru Town
84	Sun Pharmacy	Retail & Wholesale	Waterside, UN Drive
85	Sun Pharmacy	Retail	Somalia Drive
86	Swaray Pharmacy	Retail	Mechlin Street
87	T. Chorithran & Son (Nato Phar)	Retail & Wholesale	Red-Light, Paynesville (Zone 1)
88	T. Chorithran & Son (Nato Phar)	Retail & Wholesale	Vai Town, Bushrod Island(Zone 3)
89	Trence Pharmacy	Retail	11th Street, Sinkor
90	Trinity Pharmacy	Retail	Matadi SOS Junction (Zone 4)
91	Tropical Pharmacy	Retail	Ashmun & Nelson Streets (Zone-4)
92	T's Pharmacy	Retail	Saye Town, Sinkor (Zone 4)
93	Wsbily Pharmacy	Wholesale	Benson Street (Zone-4)
94	Zoe Pharmacy	Retail	Duport Road, Paynesville (Zone 1)
95	Zula Pharmacy	Retail & Wholesale	Wroto Town, Airfield (Zone 1)

ANNEX 5. DATA COLLECTION TOOLS

Tool 1: General Survey

Instructions: This survey is to be applied to pharmacies and medicine shops. Ask to speak to the person in charge of the medicine shop or the drug seller. Present the letter of introduction from MSH and the Ministry of Health and Social Welfare (MOHSW). Explain the purpose of the study and the amount of time required to complete the questionnaire (about one to one and a half hours). Respond to any questions or concerns about confidentiality and obtain permission to carry out the survey.

1. **Name of the facility : _____**
   a. Pharmacy ( )
   b. Medicine shop ( )

2. **County: _____**

3. **District: _____**

4. **Location: _____**

5. **Name of person interviewed: _____**

6. **Contact number: _____**

7. **Position of person(s) interviewed:**
   a. Seller ( )
   b. Owner ( )

8. **Data Collector: _____ Date: _____**

General Information

10. How many people work in the shop?_____

11. What is the highest qualification of the dispenser working in the shop?

Qualification	Drug seller 1	Drug seller 2	Drug seller 3
Pharmacist			
Dispenser			
Physician Assistant(PA)			
Nurse			
Midwife			
Nursing aide			
Other (specify)			

12. What is the profession of the owner?_____

13. How long has the owner been in business? _____

14. What days and hours is the shop open?

    a. Monday to Friday _____
    b. Saturday _____
    c. Sunday _____
    d. Public Holidays _____

15. Does the SHOP have a valid business license?
    a. Yes (*Ask to see a copy of business license)*
    b. No

16. Does the SHOP have a valid license to sell medicines?
    a. Yes (*Ask to see a copy of the license)*
    b. No

17. Do you know if there are any other medicine shops in this Community?
    a. Yes If yes, how many? _____
    b. No

18. Approximately, how many customers come each day to buy malaria \medicines? _____

19. When was the last time the shop was inspected by a government authority?
    a. Within the last year
    b. Within the last two years
    c. Never
    d. Don't know

20. Which organization conducted the inspection? _____

Services

21. Does the shop dispense drugs from prescriptions?
    a. Yes
    b. No

    If yes, specify the origin of the majority of the prescriptions.
    a. Government/public health facility
    b. Private clinic
    c. Mission/NGO health facility

22. Does the shop provide the following services?
    a. Patients injections
    b. Clinical diagnosis/ Lab services
    c. Immunization and vaccination
    d. Wound and burn treatment/dressing

23. What are the five most common health problems?
    a. _____
    b. _____
    c. _____
    d. _____
    e. _____

24. What are your most popular pharmaceutical products (the high volume sales items)? List the items (by generic or brand name or by therapeutic category, where not possible by name).
    a. Name: _____ strength and price_____
    b. Name: _____ strength and price_____
    c. Name: _____ strength: and price_____
    d. Name: _____ strength and price_____
    e. Name: _____strength and price_____

25. Are clients/patients able to afford full dose of antimalarials?
    a. Yes
    b. No

26. If no, do you do you offer loan/credit to pay for the drug?
    a. Yes
    b. No

27. If yes, do they pay back the credit?
    a. Yes.
    b. No

28. Do you sell drugs based on the amount the client/patients has (not full dose)?
    a. Yes
    b. No

29. Do you have any reference materials for information on drug in your shop? *List all sources below. If documents are mentioned, ask to see them. Note the title and the year they were published*.
    _____
    _____

Procurement

30. List your five main suppliers and where they are located:
    a. _____
    b. _____
    c. _____
    d. _____
    e. _____

31. How do you place your orders to suppliers? *(tick all that apply)*
    a. In person
    b. By telephone (land line or cell)
    c. Contact with sales person
    d. Other: _____

32. How often do you place an order with your main supplier?
    a. Daily
    b. Weekly
    c. Monthly
    d. When needed
    e. Other: _____

33. Once you place an order with your main supplier, how many days do you generally have to wait until you receive your supplies?
    a. Less than one day
    b. 1 to 7 days
    c. 7 and 15 days
    d. 15 to 30 days
    e. More than 30 days

34. How does the shop receive supplies?
    a. Supplier transportation
    b. Commercial transportation
    c. Someone picks up supplies
    d. Other: _____

Storage

35. Does the shop have a separate room for storage of drugs and supplies?
    a. Yes
    b. No

36. Is the floor swept and tidy?
    a. Yes
    b. No

37. Are walls and shelving clean?
    a. Yes
    b. No

Inventory Management

38. Does the shop keep any record of the drugs that are sold? (tick all that apply)
    a. Book of sales
    b. Book of prescriptions
    c. Patient Register
    d. None
    e. Other: _____

39. Does the shop keep stock records of drugs?
    a. Yes
    b. No
    If answer is yes, request to see the stock records

40. Are the stock records up to date?
    a. Yes
    b. No

41. How do you dispose of expired drugs?
    a. Burn
    b. Bury
    c. Dump
    d. Return to Supplier
    e. Sell
    f. Other: _____

42. How do you prevent drugs from expiring in your shop?
    a. Practice first expiry, first out
    b. Sell bulk to other shops
    c. Return near expiry to supplier
    d. Other (Specify): _____

43. How do you dispense/package tablets and capsules?
    a. In ordinary paper
    b. In plastic/paper envelopes
    c. Others (Specify): _____

44. Does the shop have a dispensing tray or any other alternative to avoid handling of medicine with bare hands?
    a. Yes
    b. No

If yes, specify _____

45. Do you decant suspensions and liquids into small containers for customers?
    a. Yes
    b. No

Training

46. Have you had any of the following training within the last two years?

Training	Yes/ No	Date (Year)	Duration Of Training (# Of Days)	Training Organisation
Malaria				
Drug Management				
Other training (specify):				

47. Did you pay to attend the training?
    a. Yes.
    b. No

48. Were you given a certificate?
    a. Yes
    b. No

Note: Follow this survey with the availability and price survey form no. 02

Tool 2. Availability and Price Form

This form is used for the indicators listed below.

- Average % of tracer list items in stock
- Average % difference in price to patients between facilities in county for a list of tracer items selected
- Average number of days that a salaried worker needs to work to pay for a standard treatment of tracer conditions
- Average number of days that a resident of county needs to work to pay for a standard treatment of tracer conditions

Important: *the medicines and supplies on the list are for treating malaria. The list has been generated basing on the standard treatment guidelines.*

Data Summary

Where to Go	Whom to Ask	What to Get
All Facilities	Inform the attendant of the purpose of the survey and obtain permission to collect the data. This should be done during the main survey	Ask to see the items on the list that are in stock. Note the pack sizes and prices for the cheapest and most expensive brands.

Instructions for completing the forms:

1. Introduce yourself to the attendant at the shop and explain the purpose of your visit. You may wish to present the letter of introduction or authorization to conduct the survey.
2. **Name and location of the shop**: Explain that the information that will be gathered will be kept confidential. The name of the shop and location will be used only for reference only.
3. **Availability.** Ask the attendant to show you the drugs on the list, one by one. You may offer various name brands if the generic names are not known. When you have seen the item and determined that it is not expired, check that it is available.
4. **Cheapest and Most Expensive Prices.** Ask the attendant to see the most expensive and least expensive product, and the least expensive brand. Note the number of units in the pack and the pack price.

Name of Facility:

Use this form to collect information on stock availability and prices.
Note: *If product is sold by individual units (e.g., tablet) rather than packs, note unit price and mark "1" for number of units per pack.*

Generic name, dosage form, strength	Price	Available Y/N	Brand name(s)	No. of units per pack	Price of pack found	Unit price (4 digits)	Expired Y, N, DK
Amodiaquine 153 mg +Artesunate 50 mg tablets	Lowest						
	Highest						
Amodiaquine 200 mg tablets	Lowest						
	Highest						
Amodiaquine 50 mg/5 mL syrup	Lowest						
	Highest						
Artemether 20 mg/mL injection	Lowest						
	Highest						
Artemether 80 mg/mL injection	Lowest						
	Highest						
Artesunate 50 mg tablets	Lowest						
	Highest						
Artesunate rectal caps 100 mg	Lowest						
	Highest						
Artesunate rectal caps 50 mg	Lowest						
	Highest						
Chloroquine phosphate 150 mg tablets	Lowest						
	Highest						
Chloroquine phosphate 50 mg/5 mL syrup	Lowest						
	Highest						
Chloroquine sulphate 40 mg/mL injection	Lowest						
	Highest						
Quinine sulphate 200 mg tablets	Lowest						
	Highest						
Quinine dihydrochloride 300 mg/mL injection	Lowest						
	Highest						
Quinine sulphate 300 mg tablets	Lowest						
	Highest						
Sulphadoxine/ pyrimethamine 500+12.5 mg suspension	Lowest						
	Highest						
Sulphadoxine/ pyrimethamine 500+25 mg tablets	Lowest						
	Highest						

Tool 3. Simulated Client

This form is used for the indicators listed below—

- Percentage of encounters where patient is prescribed an antimalarial consistent with STGs
- Percentage of encounters where patient is prescribed an antimalarial consistent with STGs in sufficient quantities to complete a full course of treatment
- Percentage of dispensers that provided [some] information to patients/caregiver on how to take/give recommended drug(s)
- Percentage of encounters where attendant asked for more information about the condition presented, e.g., asked age of child, duration of fever, danger signs, and previous treatment.
- Percentage of dispensers who told caregivers about any signs of progressive illness
- Percentage of dispensers who recommended a referral visit to a doctor or clinic if the signs appear
- Percentage of dispensers who prescribed an ineffective antimalarial (one which is no longer recommended)

Background

The simulated client case is based on the National Guidelines for malaria diagnosis and treatment in Liberia for health centre level for health care delivery. The client is a parent or relative of a six-year-old child with classic symptoms of uncomplicated malaria. The ideal scenario would be for the shop keeper to ask the client questions about the symptoms and medication history. On the basis of this, the attendant may refer the parent/relative to a health care professional or may recommend Artesunate/amodiaquine in doses appropriate for a six-year-old child. No antibiotics or injections of any kind are indicated.

Data Summary

Where to Go	Whom to Ask	What to Get
Drug shops	Data collection is done as a simulation. Seller should be unaware of the process so no permission is needed.	Determine the prescribing practices in Drug shops for a case of uncomplicated malaria for a child Determine the cost of treatment as prescribed in the Drug shops.

For detailed instructions, see Scenario for Simulated Client.

*The data collection form should be completed immediately **after** the simulated client.* Doing so will facilitate remembering the interactions during the purchase. It will also help ensure that the attendants do not realize that they are being evaluated.

Which drugs were recommended for purchase by the drug seller?
Record information on each drug recommended for purchase during the simulated purchase encounter. The name of each column on the data form is in **bold** below. The numbers correspond to the column numbers on the data form.

1. **Name, Strength, and Dosage Form**: Write the name, strength, and dosage form of each purchased drug. Write the name of the drug that the retail drug seller gives, for example, SP (generic name) or Orodar (commercial name). Also, write in the strength of the drug prescribed by the drug seller, for example, 500/25 mg. If strength is not mentioned, write N/A (not available) after the name of the medication. Write the dosage form of the prescribed drug, for example, tablet, liquid, ampoule, vial, etc. If the drug seller does not mention dosage form, write N/A (not available). Use a new row for each drug purchased. An example of a complete record is Fansidar 500 mg/25 mg tablet.

2. **Total Quantity:** For the quantity or unit of each drug purchased, write exactly what the drug seller dispensed. For example, 5 mL, 1 tablet, etc. Use a new row for each drug.

3. **Dosage Quantity**: For each drug purchased write the number of units to be taken at one time. . If this is not mentioned, write N/A (not available) in Column 3. Use a new row for each drug.

4. **Frequency**: For each drug purchased, write the number of times a day that the drug seller told you the dose was to be taken, for example, once a day, twice a day, three times a day, etc. If frequency is not mentioned, write N/A (not available) in Column 4. Use a new row for each drug.

5. **Duration of Treatment (days):** Write the number of days the purchased drug is to be taken for a full course of treatment. Write exactly what the drug seller says. The duration could be expressed as 3 days, 7 days, etc. If duration is not mentioned, write N/A (not available) in Column 4. Use a new row for each drug.

6. **How to take (administration):** For how to take the drug, write exactly what the drug seller says to the patient/caregiver. Administration can be expressed as after meals, with water, etc. If instructions are not mentioned by the drug seller, write N/A (not available) in Column 5.

7. **Price Paid:** For each drug sold by the drug seller, record the total price paid for the drug.

Scenario for Simulated Client: Uncomplicated

Present yourself as the caregiver of a 6 year-old child who has had a fever on and off for a week. Use local terms to describe the symptoms of the child (which may be a boy or a girl). Request advice regarding which products to give to the child. *Do not provide any additional information unless directly asked for more information.* Purchase the drugs recommended by the retail drug seller and leave the shop.

If the drug seller asks these questions, reply as follows—

- **The condition of the child:** In addition to the fever the child has complained of a headache and aches and pains since last week. He/she has been feeling generally unwell for a week.

- **If the child took medication:** Say that the child was given some Panadol a week ago. The fever went away after this, but returned three days later.

- **Can the child take food and/or liquids:** Say he/she is able to take both liquids and food.

Notice and remember the following:

1. What are the name(s) of the product(s) that were recommended but not purchased?

2. Were any of the drugs that were recommended injections?

3. Did the drug seller ask about the symptoms of the child?

4. Did the drug seller ask about the medication history of the child?

5. Did the drug seller give instructions on how to take the medication?

6. Did the drug seller recommend that the child be seen by a health care professional?

This information should be written on data form after exiting and leaving the area, but before conducting the next simulated purchase.