Liberia Baseline Evaluation Report

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SDSI
Sustainable Drug Seller Initiatives

msh
Management Sciences for Health

pharmaceutical systems africa

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About SDSI

The Sustainable Drug Seller Initiatives (SDSI) is a program that builds on Management Science for Health's Strategies for Enhancing Access to Medicines (SEAM) and East African Drug Seller Initiatives (EADSI) programs. The program's goal is to ensure the maintenance and sustainability of the public-private drug seller initiatives in Tanzania and Uganda and to introduce and roll out the initiative in Liberia.

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ACRONYMS AND ABBREVIATIONS

ARI	acute respiratory infection
ASA	acetylsalicylic acid
AS/AQ	artesunate + amodiaquine
EADSI	East African Drug Sellers Initiative
LMHRA	Liberia's Medicines and Health Products Regulatory Authority
MOHSW	Ministry of Health and Social Welfare [Liberia]
MSH	Management Sciences for Health
ORS	oral rehydration solution
SDSI	Sustainable Drug Seller Initiatives
SEAM	Strategies for Enhancing Access to Medicines
SP	sulfadoxine-pyrimethamine
STG	standard treatment guideline

BACKGROUND

The Bill & Melinda Gates Foundation provided Management Sciences for Health (MSH) with a three-year grant to continue its efforts in Africa to involve private drug sellers in ensuring access to essential medicines. The Sustainable Drug Seller Initiatives (SDSI) program builds on MSH's Strategies for Enhancing Access to Medicines (SEAM) and East African Drug Seller Initiative (EADSI) programs. Those programs focused on creating and implementing public-private partnerships, using government accreditation to increase access to quality pharmaceutical products and services in underserved areas of Tanzania and Uganda. The new program's goal is to ensure the maintenance and sustainability of these public-private drug seller initiatives in Tanzania and Uganda and to introduce and roll out the initiative in Liberia.

Through its work in the three countries, SDSI expects not only to expand access to medicines and treatment in additional geographical areas, but also to solidify the global view that initiatives to strengthen the quality of pharmaceutical products and services provided by private sector drug sellers are feasible, effective, and sustainable in multiple settings. Liberia, a country emerging from a debilitating civil war, offers further opportunity to demonstrate that the initiative is a transferable and sustainable model. The private pharmaceutical system in Liberia, which consists of pharmacies, medicine stores, and medicine peddlers that are loosely regulated, is ideal for the implementation of the SDSI intervention to improve access to quality essential medicines and basic health care and services both in the more remote areas of the country and in more populated urban areas. Based on the success of the drug seller initiatives in Tanzania and Uganda, Liberia's Medicines and Health Products Regulatory Authority (LMHRA) and the Ministry of Health and Social Welfare (MOHSW) welcomed the initiative. In addition, the political commitment in Liberia makes the situation suitable for the initiative's immediate implementation and accelerated institutionalization. Moreover, the U.S. Agency for International Development Mission in Liberia committed its support through MSH's Strengthening Pharmaceutical Systems Program to help explore options to increase access to antimalarials through the private sector.

The SDSI project in Liberia is being implemented in Montserrado County. This county contains 75 percent of the retail pharmaceutical outlets as well as the highest population density in the country. Working with the LMHRA and other stakeholders, SDSI is embarking on the following key activities to adapt and implement the accredited drug shop model in Liberia—

- Build partner and key stakeholder consensus for a Liberian accredited drug seller model
- Determine needs and expectations of target populations
- Develop standards for the Liberian model
- Develop consumer education strategies
- Complete mapping, sensitization, and initial inspections for the implementation county
- Train store attendants on providing quality medicines and services
- Accredit stores as a new class of service providers
- Increase and improve inspection to enhance adherence to new practice standards
- Implement and evaluate the accredited drug seller model in Montserrado County

OBJECTIVE

The objective of this exercise is to conduct a baseline assessment of systems, perceptions, and practices of medicine stores and medicine store clients to determine the extent to which the intervention will improve outcomes in Liberia. The scope of work included the following—

- Reviewing the SDSI Liberia evaluation matrix adapted from the EADSI evaluation framework and providing comments and suggestions on the proposed set of indicators for the evaluation, data sources, and data collection methods and estimated sample size
- Developing and adapting data collection and data entry tools
- Pretesting and refining data collection tools
- Collecting data from selected medicine stores in Montserrado County
- Analyzing data and providing a baseline evaluation report

METHODOLOGY

The baseline evaluation data collection exercise sought to collect data in three main areas of medicine store practice—

- Product price and availability
- Client perception of medicine store practices
- Quality of services provided in medicine stores

Price and Availability

The exercise sought to measure the following two indicators—

- Median price to patients for a set of tracer items (a list of the tracer items used for this exercise is presented in annex 2)
- Percentage of medicine stores with tracer items in stock

The methodology used for this exercise required a sample of 60 medicine stores. Because different teams were involved in the data collection process, data collection teams were asked to collect data from a few more shops than the number assigned to them. This approach resulted in visits to 66 randomly selected medicine stores in Montserrado County. During the exercise, data collectors introduced themselves to the attendant in the store and explained the purpose of their visit. Where stores were reluctant to cooperate, a pre-prepared letter from the LMHRA was presented.

The data collectors asked the attendant to show them the medicines on their lists, one by one. When the data collectors determined that a product was in stock and not expired, they would record it as available. In addition to availability, information was collected on the cheapest and most expensive brands of products on the tracer list. In practice, only one brand was available in the majority of medicine stores at any one time, making the endeavor to collect both the cheapest and highest prices academic. For future iterations of this exercise, collecting one price per item should suffice. Data were collected on paper tools and entered into both Excel spreadsheets and Access databases at the end of each data collection day. Annexes 2, 3, 4, and 5 present samples of the paper tools used for the entire exercise.

Quality of Pharmaceutical Services

Management of uncomplicated malaria

This exercise sought to collect information on the following indicators—

- Percentage of encounters in which the antimalarial medicine given was consistent with standard treatment guidelines (STGs)

- Percentage of store attendants who dispensed an antimalarial that is no longer recommended

- Percentage of encounters in which the 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 encounters in which the attendant asked about other medicines the child was taking

- Percentage of encounters in which attendant provided information on dosage and frequency of taking the medicines

- Percentage of attendants who provided information on the duration of treatment

- Percentage of attendants who warned caregivers about any danger signs

- Percentage of attendants who recommended immediate referral to a doctor or clinic

To collect the information above, a "mystery" shopping exercise was conducted in randomly selected shops. The data collectors visited preselected shops, masquerading as a caregiver of a five-year-old child presenting with fever. Management of the condition, including the selection of medicines and advice on how to take them, was recorded immediately upon exiting the store. Eighty shops were visited for this exercise.

Management of nonsevere pneumonia in children

This exercise sought to collect information on the following indicators—

- Percentage of encounters in which appropriate treatment for a simple case of pneumonia was given

- Percentage of encounters in which the attendant asked about the child's symptoms

- Percentage of encounters in which the attendant asked for more information about the condition presented (e.g., child's age, duration of fever, danger signs, and previous treatment)

- Percentage of encounters in which the attendant asked about other medicines the child was taking

- Percentage of encounters in which the attendant provided information on dosage and frequency of taking the medicines

- Percentage of attendants who provided information on the duration of treatment

- Percentage of attendants who warned caregivers about any danger signs

- Percentage of attendants who recommended immediate referral to a doctor or clinic

To collect information on the indicators above, a "mystery" shopping exercise was conducted in randomly preselected stores. The data collectors visited the shops, masquerading as caregivers of a four-year-old child presenting signs of a nonsevere case of pneumonia—cough, fever, and breathing faster than usual. Management of the condition, including the selection of the medicines and advice

on how to take them, was recorded immediately upon exiting the store. The data were entered into both Excel and Access at the end of each day. Eighty stores were randomly selected for this exercise. However, because of an inadvertent reassessment of one shop by two different mystery shoppers, the total number of shops visited was 79.

Client Exit Interviews

The exit interviews sought to collect information for the following indicators—

- The percentage of clients who claim they obtain most of their medicines from accredited medicine stores
- Client perceptions about medicine availability in medicine stores
- Client perceptions about medicines store dispensers' and attendants' knowledge
- Client perceptions of medicine stores' cleanliness
- Client perceptions of prices and affordability
- Client perceptions of medicines' quality
- Client ability to secure credit

According to the terms of reference of this exercise, 120 clients were required for the client exit interviews. To collect this information, data collectors spoke to the first two customers who visited the medicine store where they collected data for the price and availability survey. In instances where no customers were present, data collectors were instructed to move on to the next store. The actual number of clients interviewed was 125.

RESULTS

The baseline survey involved 225 medicine stores sampled randomly across Montserrado County. This is approximately 30 percent of the total number of medicine stores in the county. The exercise was broken into price and availability, client exit interviews, and mystery shopping. Table 1 gives the number of medicine stores targeted for each exercise and the actual number visited.

Table 1: Samples of SDSI Baseline Data Collected in Liberia

Exercise	Target number of samples	Actual number of samples
Price and availability	60	66
Client exit interviews	120	125
Management of malaria	80	80
Management of pneumonia	80	79

Price and Availability

Availability

Most of the items on the tracer list were available in the Montserrado County medicine stores. Most of the medicines available on the Liberian market are generics. Table 2 shows the average availability of each tracer item.

In addition to the full table showing the availability of tracer medicines, figures 1 and 2 show the availability of antimalarials and antimicrobials, respectively.

Table 2: Percentage of Medicine Stores with Tracer Items in Stock

Tracer medicines	Availability (%) (n = 66)	Stores with expired product (%)
Albendazole 200 mg tablets	23	0
Amoxicillin 250 mg capsules	89	2
Amoxicillin 125 mg/5 mL suspension	88	2
Artesunate + Amodiaquine (100 + 270 mg) tablets	40	4
Aspirin (acetylsalicylic acid) 300 mg tablets	94	0
Benzyl benzoate 25% lotion	17	0
Benzyl penicillin 5 MU vial	5	0
Bisacodyl 5 mg tablets	72	0
Chlorpheniramine 4 mg tablets	68	0
Chloroquine phosphate 300 mg tablets	65	7
Male condoms {package of 3}	89	0
Clotrimazole cream 1% 15 g tube	59	0
Co-trimoxazole 480 mg tablets	88	0
Co-trimoxazole 240 mg/5 mL suspension	97	0
Doxycycline 100 mg capsules	83	0
Erythromycin 250 mg capsules	79	0
Ferrous sulfate 200 mg tablets	92	0
Folic acid 5 mg tablets	91	0
Gentamycin 0.3% eye/ear drops	91	0
Gentian violet 50 mL	55	0
Ibuprofen 200 mg tablets	71	0
Hydrocortisone cream tube	8	0
Magnesium trisilicate tablets	94	0
Mebendazole 100 mg tablets	80	0
Metronidazole 200 mg tablets	95	0
Multivitamin tablets	85	0
Nystatin pessaries 100,000 IU {each pessary}	80	2
Oral rehydration solution (ORS)	94	0
Paracetamol 500 mg tablets	100	0
Procaine penicillin fortified 4 MU vial	15	0
Quinine injection 300 mg/mL ampoule	15	0
Quinine 300 mg tablets	75	0
Sulfadoxine-pyrimethamine (SP) 525 mg tablets	68	0
Tetracycline eye ointment 1% 3.5 g tube	58	0

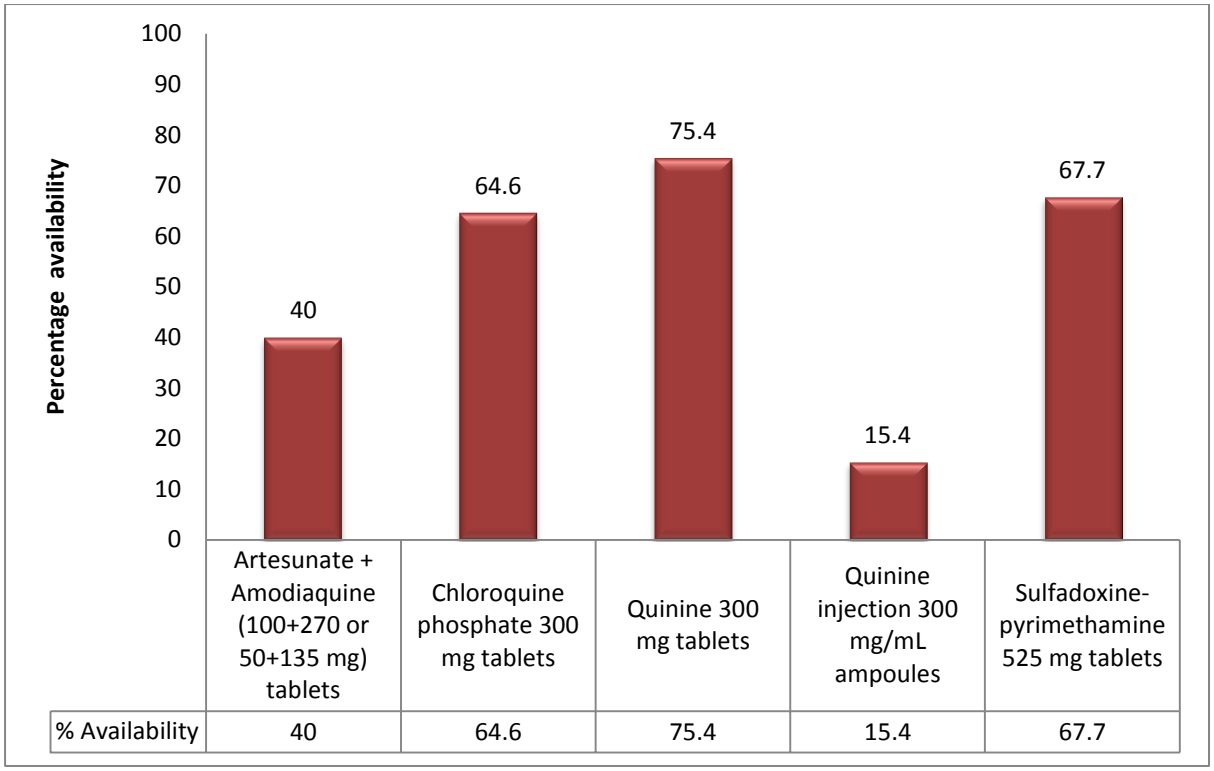

Figure 1: Availability of antimalarials in medicine stores in Montserrado County (n = 66)

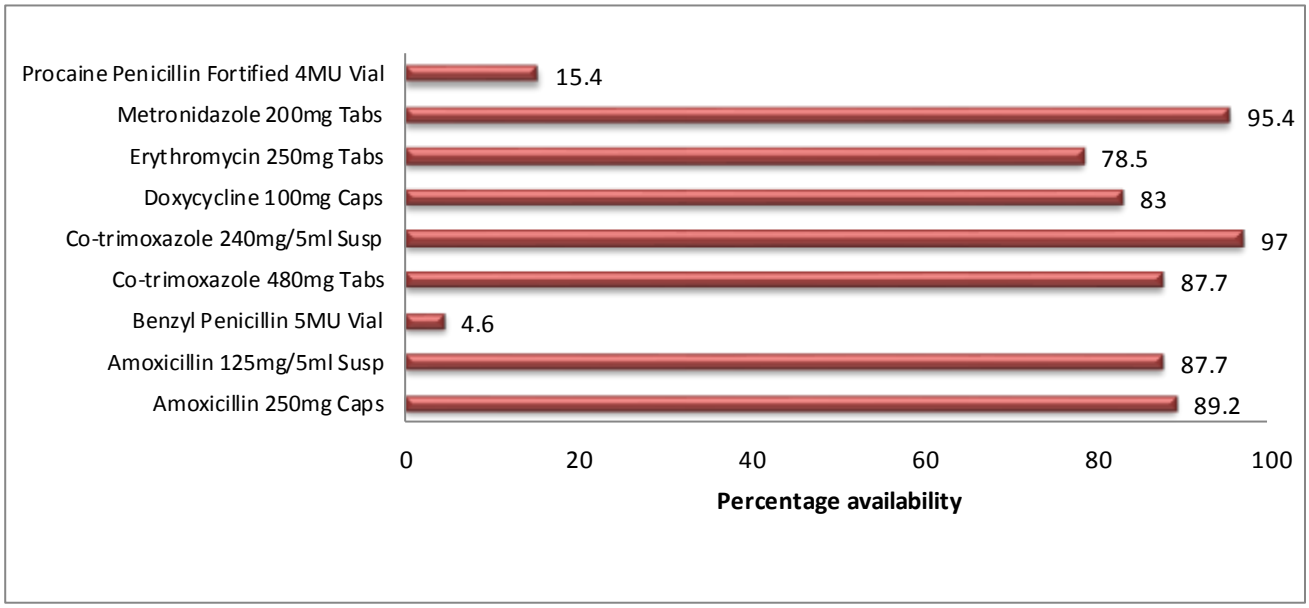

Figure 2: Availability of antibiotics in medicine stores in Montserrado County (n = 66)

Prices

Prices varied significantly from one medicine store to another. Table 3 gives the average median prices for tracer items. The standard deviation, also given in the table, shows the level of variability between prices.

Table 3: Median Prices for Tracer Items

Tracer medicines	Median unit price (LRD[a])	Standard deviation (LRD)
Albendazole 200 mg tablets	15	6.4
Amoxicillin 250 mg capsules	3.5	0.74
Amoxicillin 125 mg/5 mL suspension	75	17.6
Artesunate + Amodiaquine (100 + 270 mg) tablets	12.5	6.7
Aspirin (acetylsalicylic acid) 300 mg tablets	1.5	0.35
Benzyl benzoate 25% lotion	100	35.3
Benzyl penicillin 5 MU vial	50	7.5
Bisacodyl 5 mg tablets	2.1	1.2
Chlorpheniramine 4 mg tablets	1.6	0.63
Chloroquine phosphate 300 mg tablets	1.5	0.44
Male condoms {3's}	2.5	3.7
Clotrimazole cream 1% 15 g tube	75	24
Co-trimoxazole 480 mg tablets	75	13
Co-trimoxazole 240 mg/5 mL suspension	2	0.3
Doxycycline 100 mg capsules	4	0.9
Erythromycin 250 mg capsules	7	1.7
Ferrous sulfate 200 mg tablets	1	0.3
Folic acid 5 mg tablets	1	0.3
Gentamycin 0.3% eye/ear drops	60	17.2
Gentian violet 50 mL	40	31
Ibuprofen 200 mg tablets	2	0.5
Hydrocortisone cream tube	100	38
Magnesium trisilicate tablets	1.5	0.4
Mebendazole 100 mg tablets	2.5	1
Metronidazole 200 mg tablets	1.5	0.4
Multivitamin tablets	1	2
Nystatin pessaries 100,000 IU {each pessary }	7.5	14
ORS	15	3.3
Paracetamol 500 mg tablets	1	0.3
Procaine penicillin fortified 4 MU vial	40	17
Quinine injection 300 mg/mL ampoule	40	14
Quinine 300 mg tablets	7.4	10
Sulfadoxine-pyrimethamine 525 mg tablets	10	3.3
Tetracycline eye ointment 1% 3.5 g tube	37.5	13.3

a. LRD 75 = USD 1

Quality of Services

Management of malaria

The appropriateness of malaria management was based on the treatment guidelines for Liberia. The first-line medicine for the management of uncomplicated malaria in Liberia is artesunate + amodiaquine (AS/AQ). In Liberia this product is available in three different strengths: 25/67.5 mg, 50/135 mg, and 100/270 mg. The recommended dosage for children between the ages of one and five years is 50/135 mg once daily for three days. Figure 3 shows the percentage of clients presenting with malaria who were managed with AS/AQ, while figure 4 gives the dosage recommended for the child by the attendant.

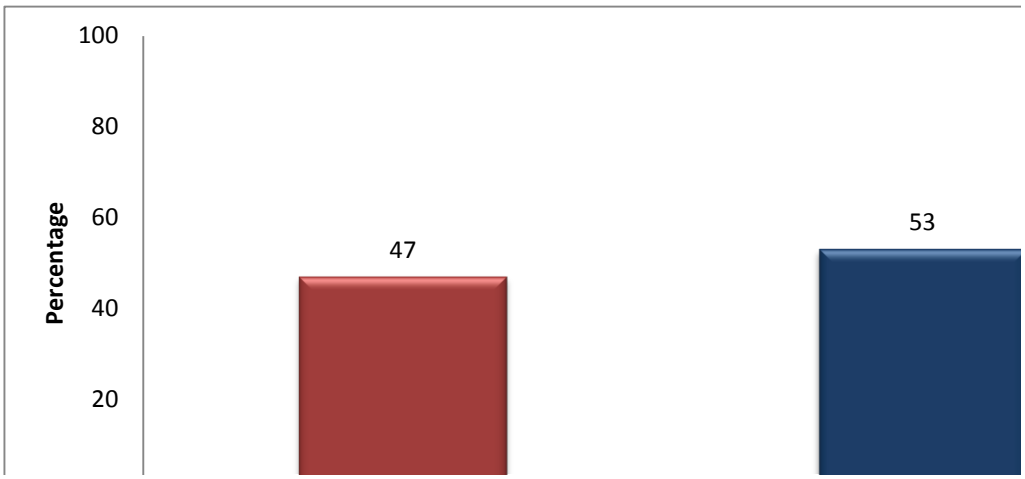

Figure 3: Type of medicine sold for the management of uncomplicated malaria

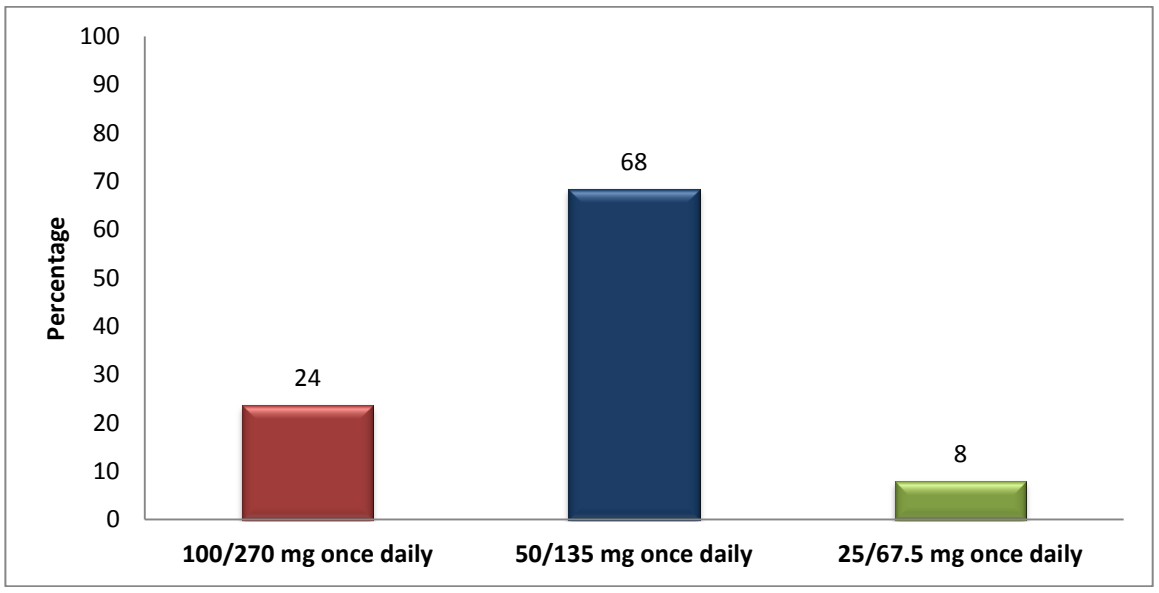

Figure 4: Dosage instructions given for AS/AQ

Frequency of medicines given for the management of malaria

For malaria "mystery" shopping encounters, paracetamol was the medicine given most frequently (figure 5). This was followed by AS/AQ, the recommended drug for uncomplicated malaria. However, the frequency of AS/AQ was below 50 percent, indicating that undesirable products are still prevalent in medicine stores in Liberia.

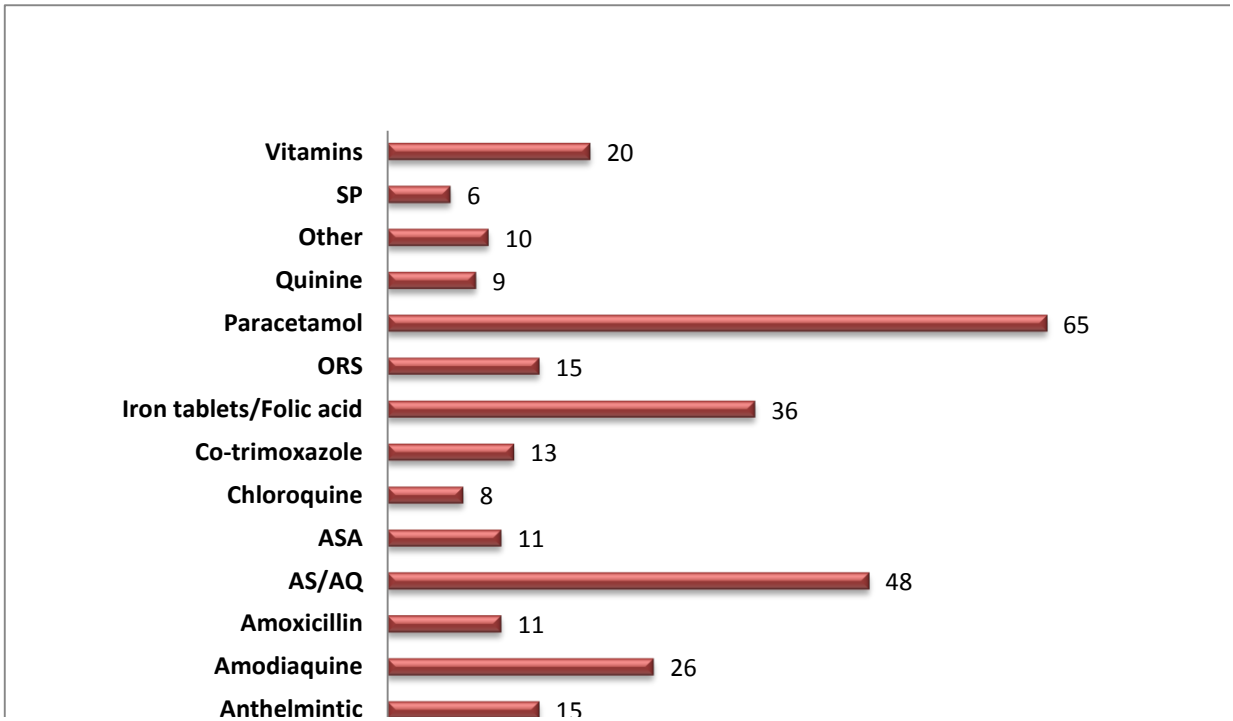

Figure 5: Frequency of medicine given for the management of malaria

Table 4: Frequency of Medicines Sold for the Management of Uncomplicated Malaria (N = 80)

Medicines sold	Frequency	Percentage
Albendazole 400 mg tablets	2	3
Amodiaquine 200 mg tablets	14	18
Amodiaquine 50 mg/5 mL syrup	7	9
Amoxicillin 250 mg capsules	8	10
Ampicillin 250 mg capsules	1	1
AS/AQ (100/270 mg or 25/67.5 mg or 50/135 mg) tablets	38	48
Aspirin 300 mg tablets	9	11
Chloramphenicol	1	1
Chloroquine 250 mg tablets	4	5
Chloroquine 80 mg/5 mL syrup	1	1
Ciprofloxacin 500 mg tablets	1	1
Co-trimoxazole 240 mg/5 mL suspension	1	1
Co-trimoxazole 480 mg tablets	9	11
Dihydroartemisinin 160 mg/5 mL suspension	1	1
Erythromycin 125 mg/5 mL suspension	1	1
Ferrous sulfate 200 mg tablets	17	21
Folic acid 5 mg tablets	6	8
Ibuprofen 200 mg tablets	1	1
Levamisole 40 mg tablets	1	1
Mebendazole 500 mg tablets	9	11
Multivitamin tablets	4	5
None/Referred	3	4
ORS	12	15
Paracetamol 120 mg/5 mL syrup	7	9
Paracetamol 500 mg tablets	45	56
Quinine 100 mg/5 mL suspension	3	4
Quinine sulfate 300 mg tablets	4	5
Sulfadoxine-pyrimethamine tablets	5	6
Vitamin B complex	12	15

Few store attendants asked for more information about the symptoms of the child as a follow-up to the information volunteered by the mystery shopper. In addition, only a small number gave information on dosage, frequency of dosing, or duration of therapy. Figures 6 through 9 give more information on these criteria.

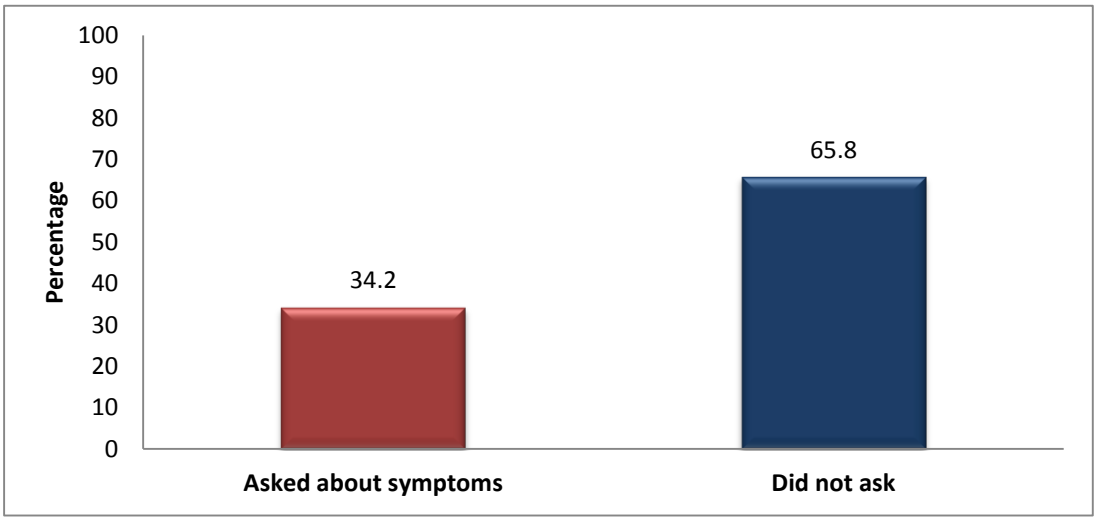

Figure 6: Percentage of encounters in which attendant asked for more information about the symptoms presented

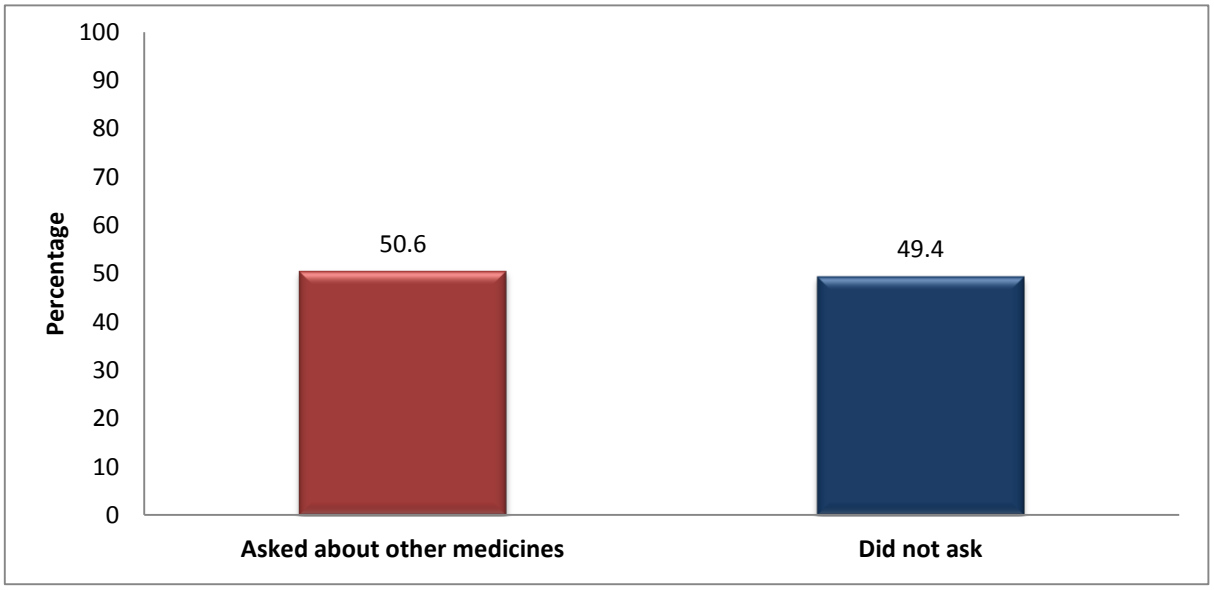

Figure 7: Percentage of encounters in which attendant asked about other medicines the child was taking

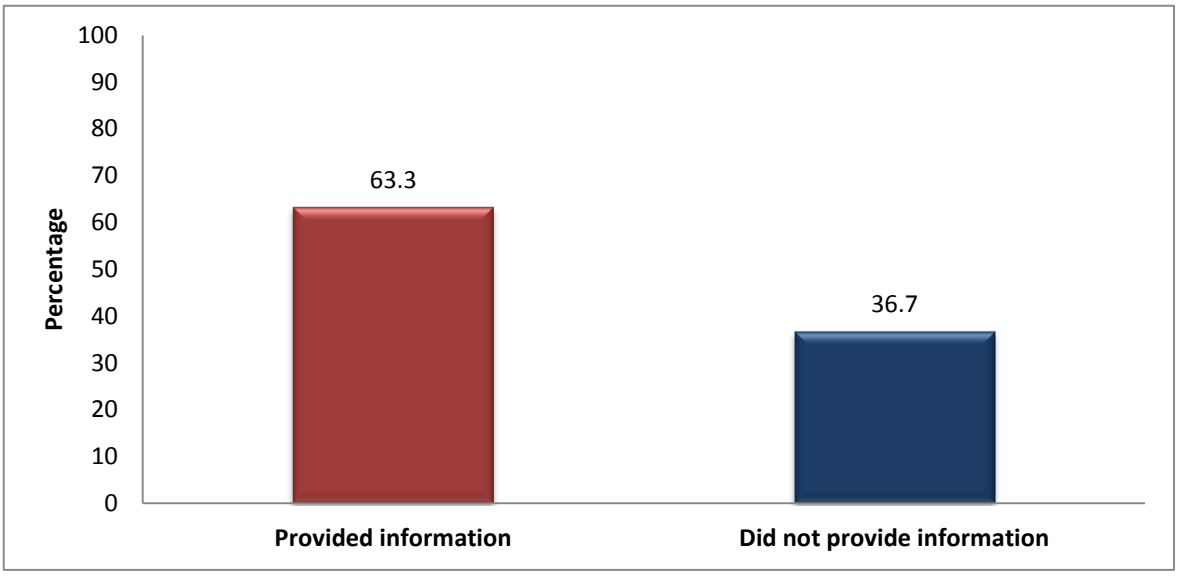

Figure 8: Percentage of encounters in which attendant provided information on dosage and frequency of taking the medicines

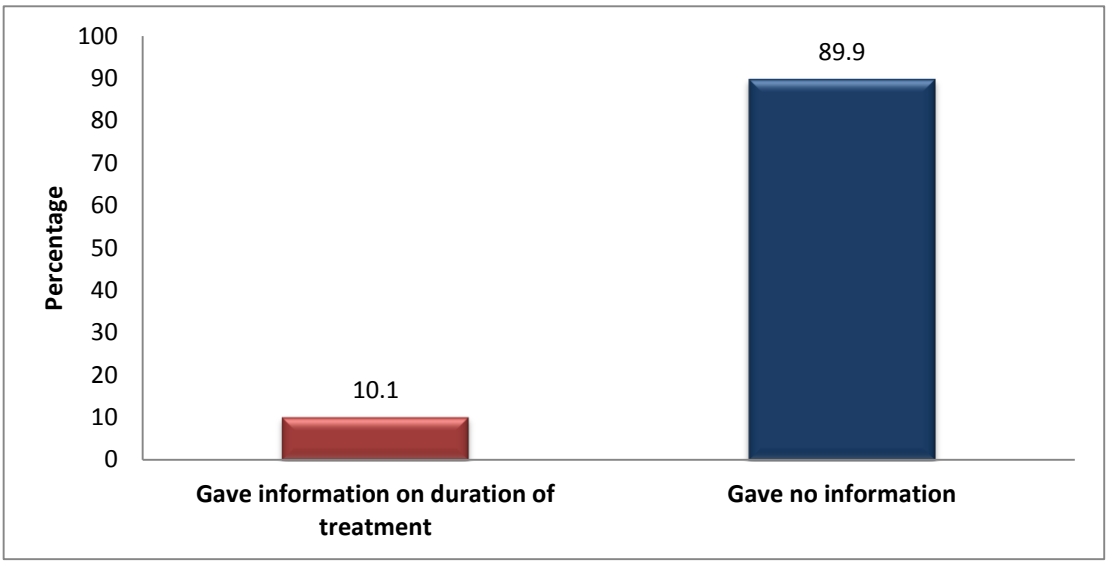

Figure 9: Percentage of attendants who provided information on the duration of treatment

Management of Pneumonia

The appropriateness of pneumonia management was based on the National Therapeutic Guidelines for Liberia. For nonsevere pneumonia in a four-year-old, the guidelines recommend the following—

Option A:

- Vitamin A, 200,000 IU, single dose
- Paracetamol 250 mg every 8 hours for 3 days
- Co-trimoxazole 240 mg every 12 hours for 5 days

Option B:

- Paracetamol 125–250 mg every 8 hours for 3 days
- Amoxicillin 250 mg every 8 hours for 5 days

Option C:

- Paracetamol 125–250 mg every 8 hours for 3 days
- Procaine penicillin fortified 50,000 IU daily for 3 days

Based on these guidelines, over 36 percent of medicine store attendants did not provide the correct medication for the management of pneumonia. Figure 10 shows the results of those who gave amoxicillin or co-trimoxazole compared to those who chose other medications. Figures 11 and 12 give an indication of the appropriateness of the dosing schedule for amoxicillin and co-trimoxazole, respectively.

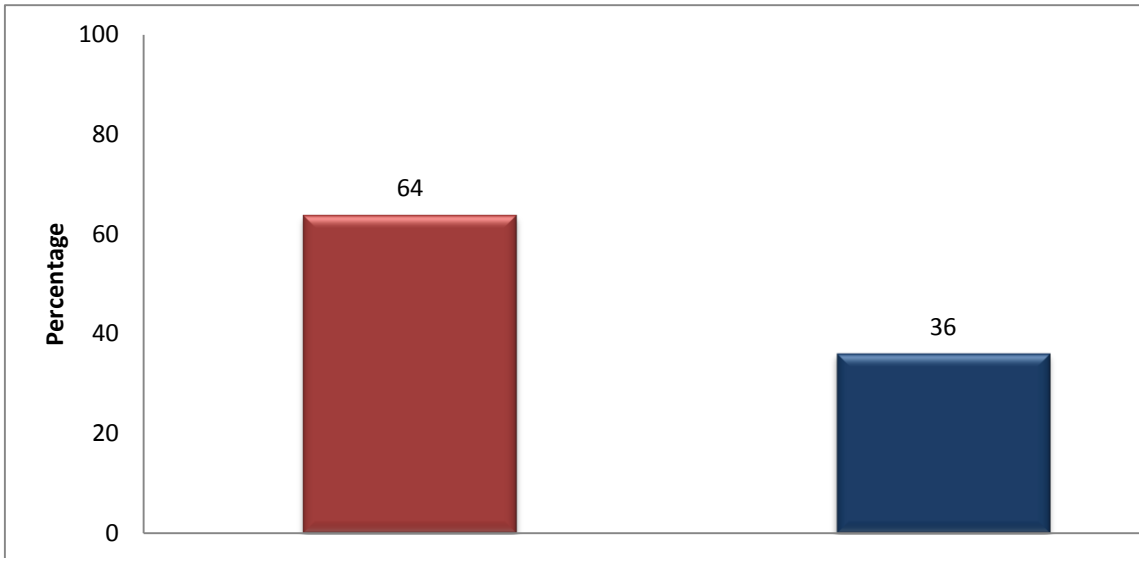

Figure 10: Management of pneumonia in medicine stores

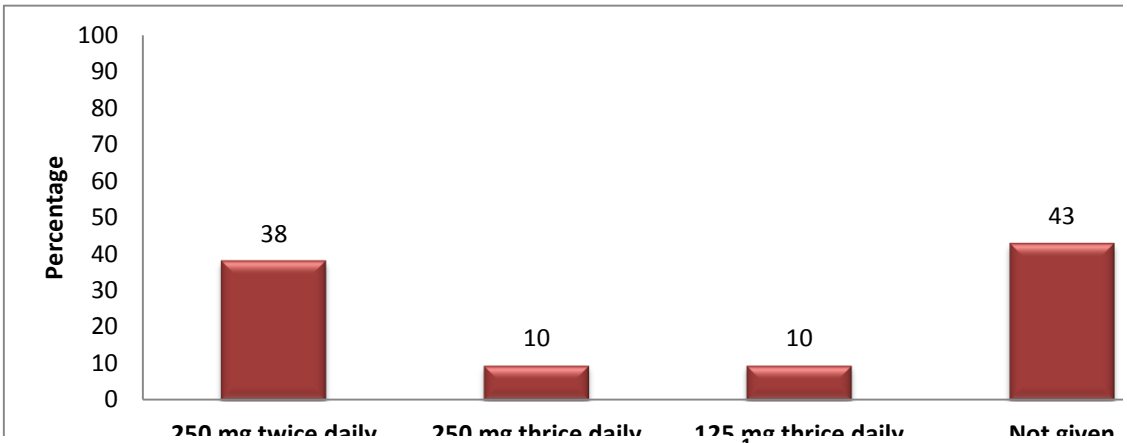

Figure 11: Amoxicillin dosage information[1] given for the management of pneumonia in a child

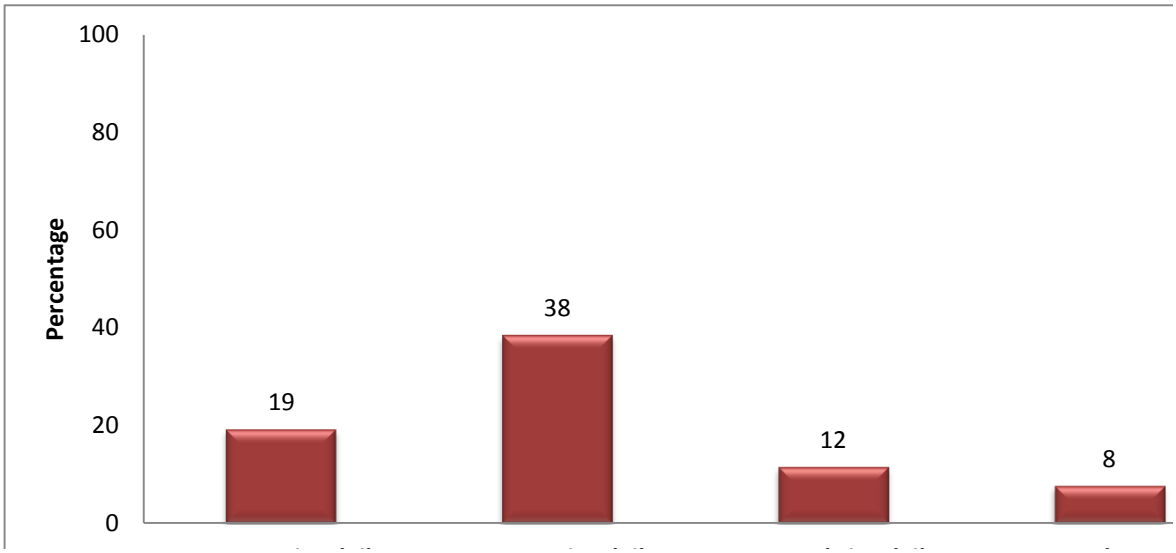

Figure 12: Co-trimoxazole dosage information given for the management of pneumonia in a child

Frequency of medicines given for the management of pneumonia

The majority of the medicines suggested for the management of pneumonia were flu and cold medicines. These were followed by paracetamol and co-trimoxazole. Figure 13 summarizes the frequency of medicines used for the management of pneumonia; table 5 gives a comprehensive list of all the medicines suggested for the management of pneumonia.

[1] Most medicines in Liberia are sold in packs of 10. For most antibiotics, this number would be inadequate to complete the course. For the purpose of this exercise, only the dosage suggested and the frequency of dosing were evaluated.

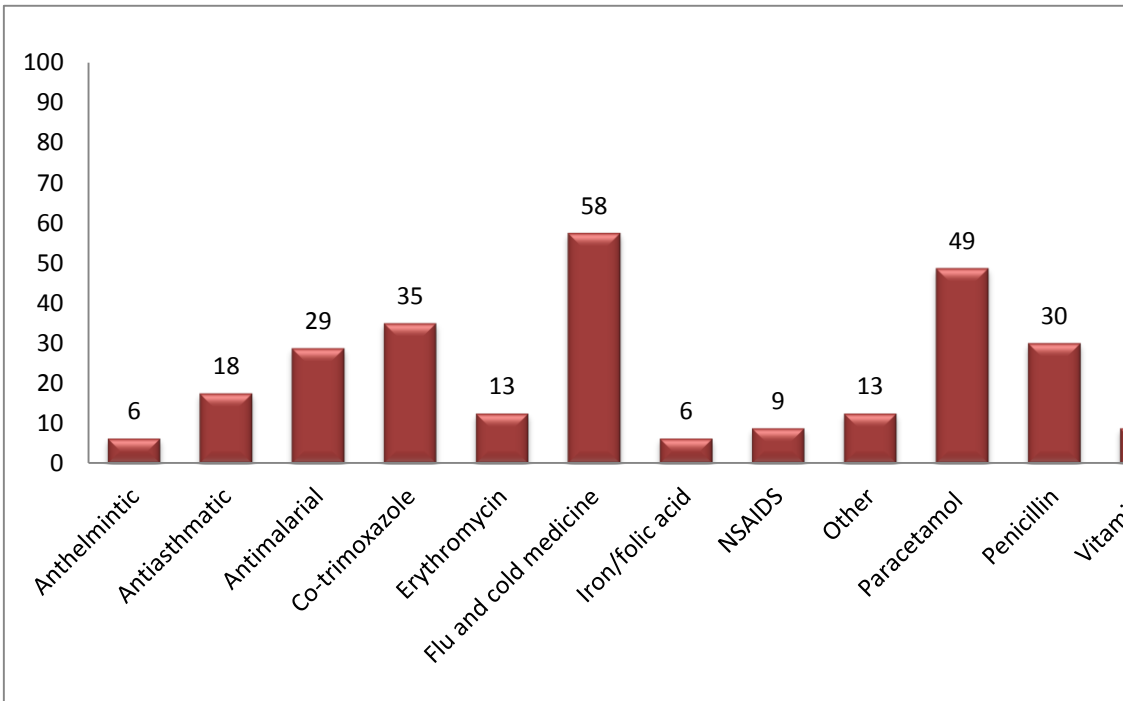

Figure 13: Frequency of medicines given for the management of pneumonia

Table 5: Frequency of Medicines Sold for the Management of Pneumonia (N = 79)

Medicine suggested	Frequency	Percentage
Aminophylline 100 mg tablets	1	1
Amodiaquine 200 mg tablets	3	4
Amodiaquine 50 mg/5 mL suspension	3	4
Amoxicillin 125 mg/5 mL suspension	5	6
Amoxicillin 250 mg capsules	16	20
Ampicillin 125 mg/5 mL suspension	2	3
AS/AQ 100/270 mg tablets	10	13
AS/AQ 50/135 mg tablets	5	6
Aspirin 300 mg tablets	3	4
Chlorpheniramine 5 mg tablets	2	3
Chloroquine 250 mg tablets	1	1
Co-trimoxazole 240 mg/5 mL suspension	2	3
Co-trimoxazole 480 mg tablets	26	33
Diclofenac 50 mg tablets	2	3
Erythromycin 250 mg capsules	7	9
Ferrous sulfate 200 mg tablets	5	6
Flu and cold medicine	46	58
Folic acid 5 mg tablets	3	4
Ibuprofen 200 mg tablets	2	3
Mebendazole 100 mg tablets	5	6
Metoclopramide 5 mg tablets	1	1
Multivitamin syrup	1	1
Multivitamin tablets	3	4
Nasohist DM	1	1
None	3	4
ORS	3	4
Paracetamol 120 mg/5 mL syrup	1	1
Paracetamol 500 mg tablets	38	48
Phenoxymethylpenicillin suspension	1	1
Quinine sulfate 300 mg tablets	1	1
Quinine syrup	1	1
Salbutamol 2 mg/5 mL syrup	3	4
Salbutamol 4 mg tablets	10	13
Sulfadoxine-pyrimethamine tablets	2	3
Vitamin B complex	3	4

As with malaria, few store attendants asked for more information about the symptoms of the child as a follow-up to the information volunteered by the mystery shopper. Figures 14 through 18 give more information on in-store management of the condition.

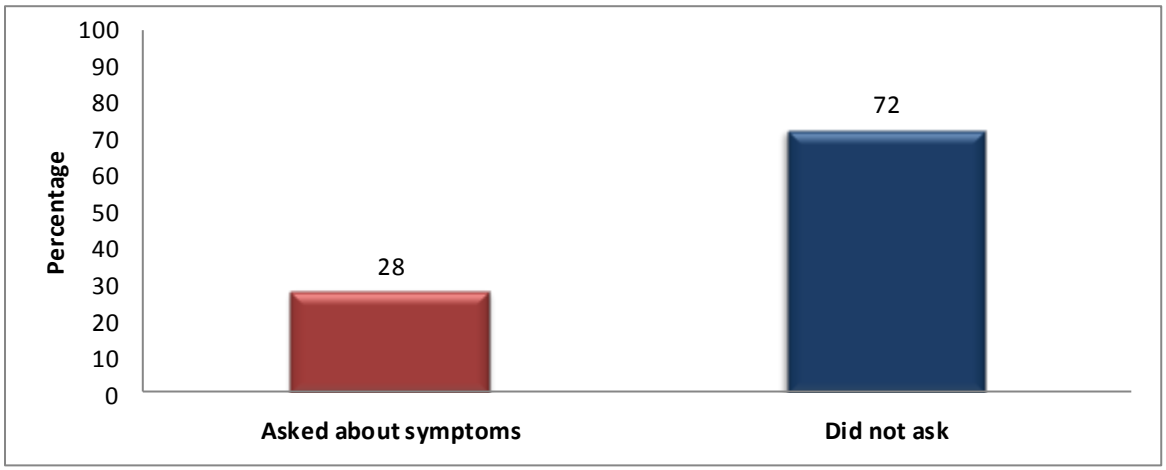

Figure 14: Percentage of encounters in which attendant asked for more information about the pneumonia symptoms presented

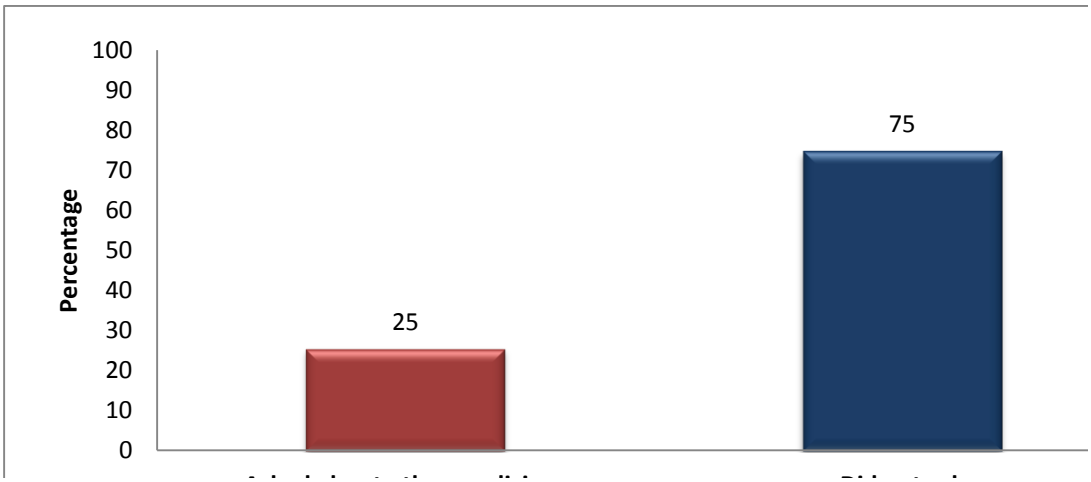

Figure 15: Percentage of encounters in which attendant asked about other medicines the child was taking

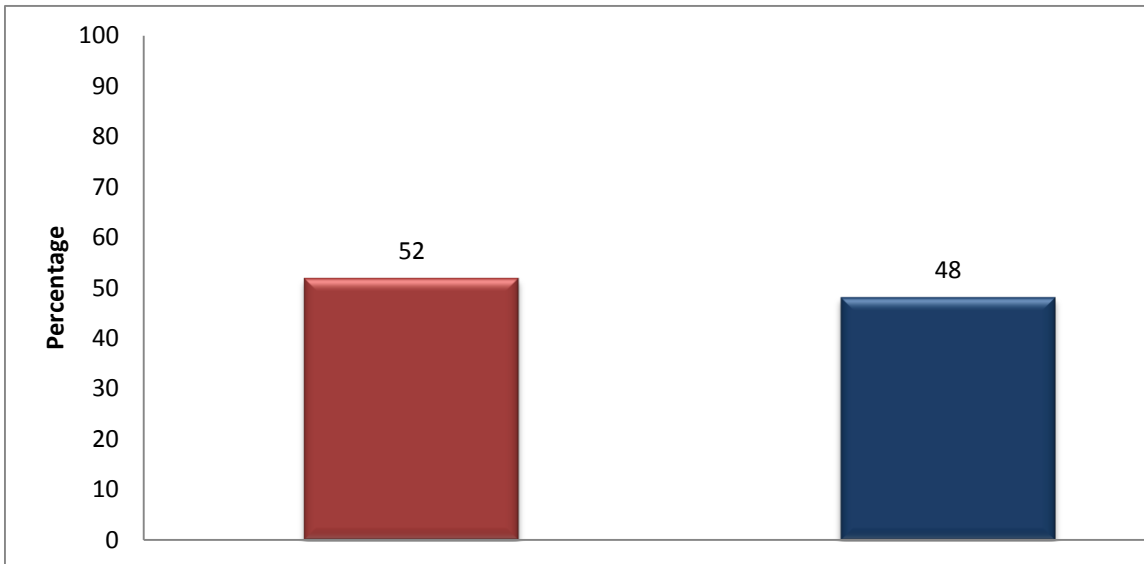

Figure 16: Percentage of encounters in which attendant provided information on dosage and frequency of taking the medicines

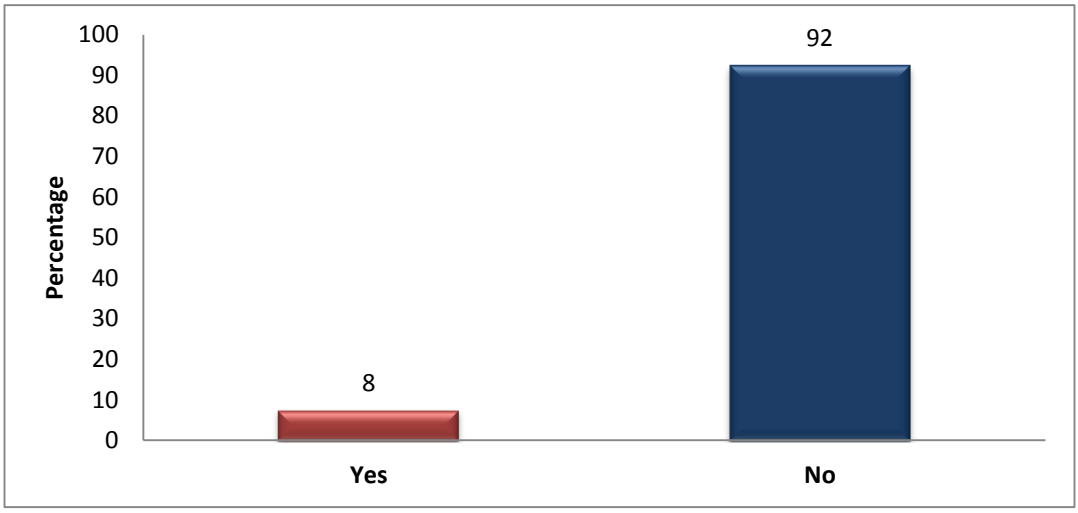

Figure 17: Percentage of attendants who provided information on the duration of treatment

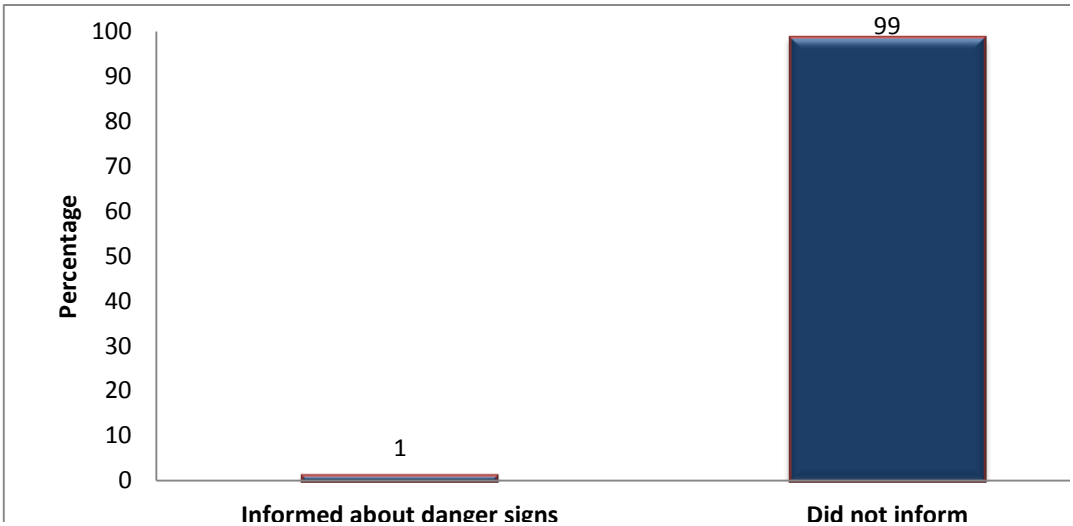

Figure 18: Percentage of attendants who informed the client on how to look for danger signs

Client Exit Interviews

The client exit interviews revealed a number of perceptions about medicine store facilities and practices. The majority of the 125 clients interviewed reported that they fill most of their medicine needs from medicine stores and that they are generally satisfied with services. Figures 19 through 24 show different client perceptions about services within medicine stores.

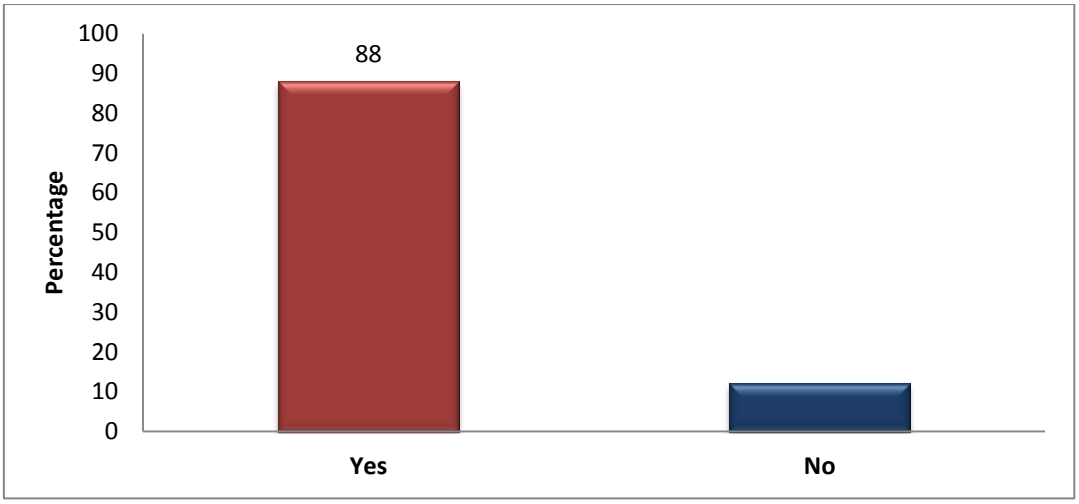

Figure 19: Percentage of clients who regularly obtain medicines from medicine stores

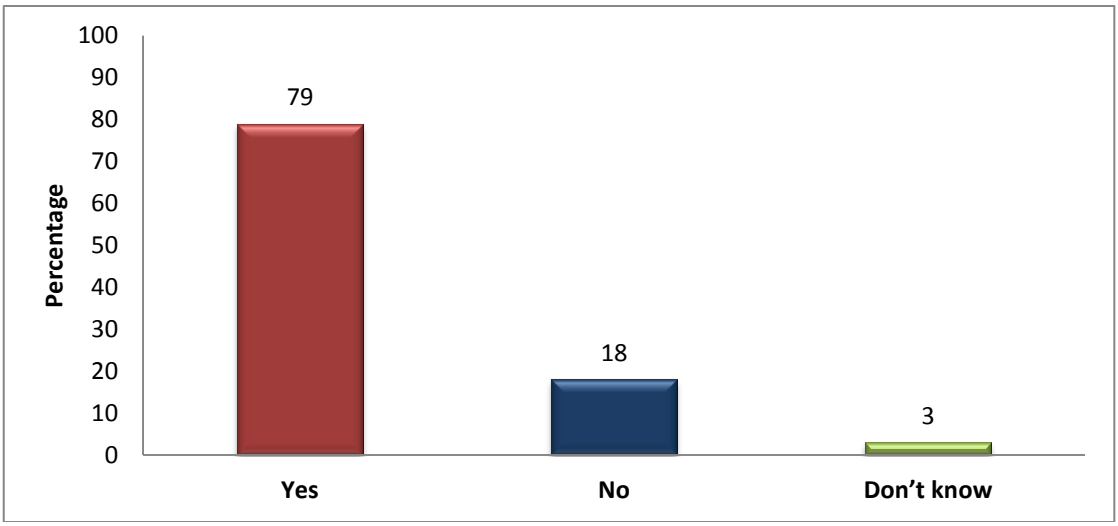

Figure 20: Percentage of clients who concur that medicine stores are well stocked

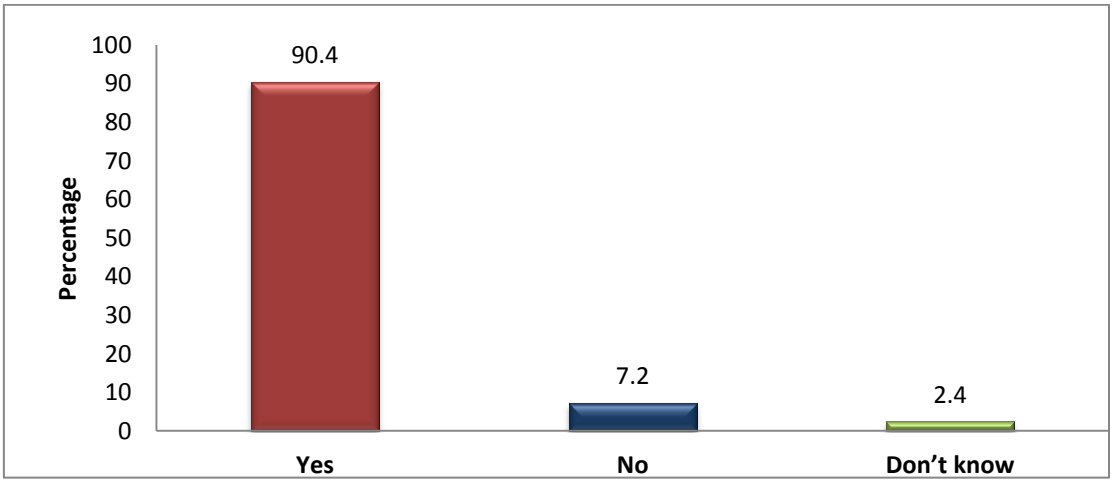

Figure 21: Percentage of clients who regard medicines store attendants as knowledgeable

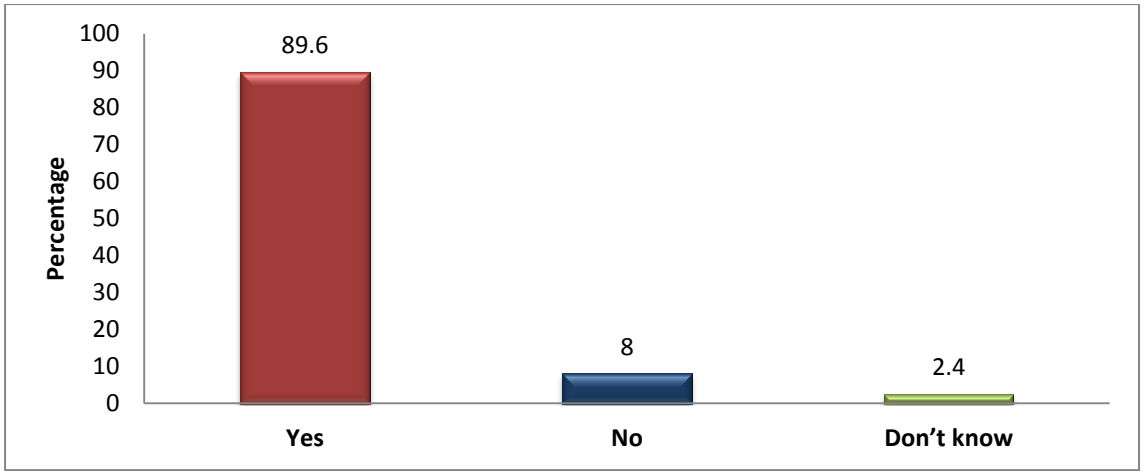

Figure 22: Percentage of clients who consider prices in medicine stores reasonable

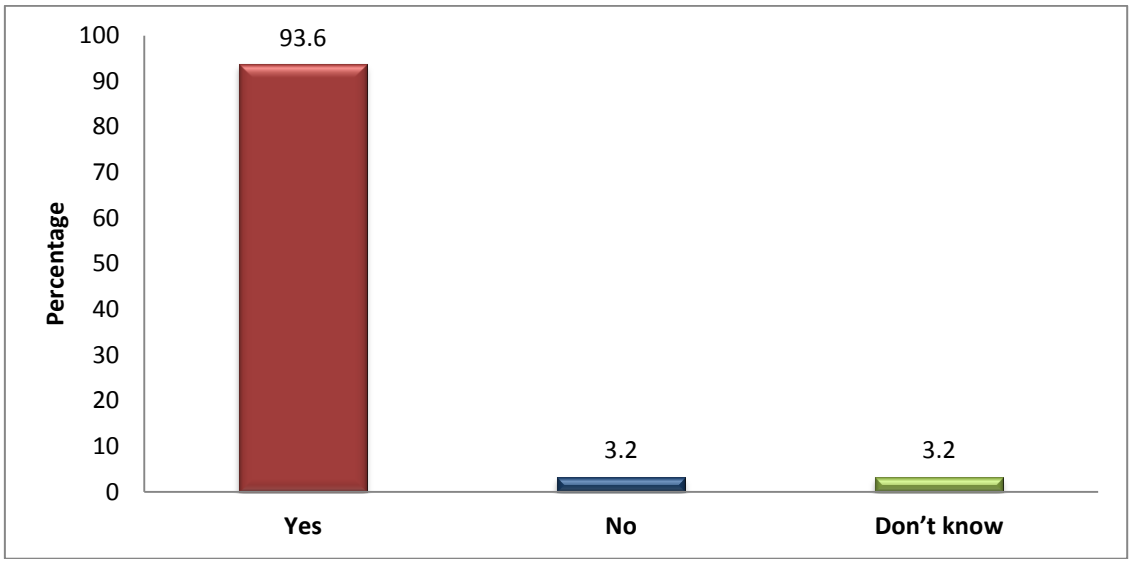

Figure 23: Percentage of clients who consider medicines from medicine stores of good quality

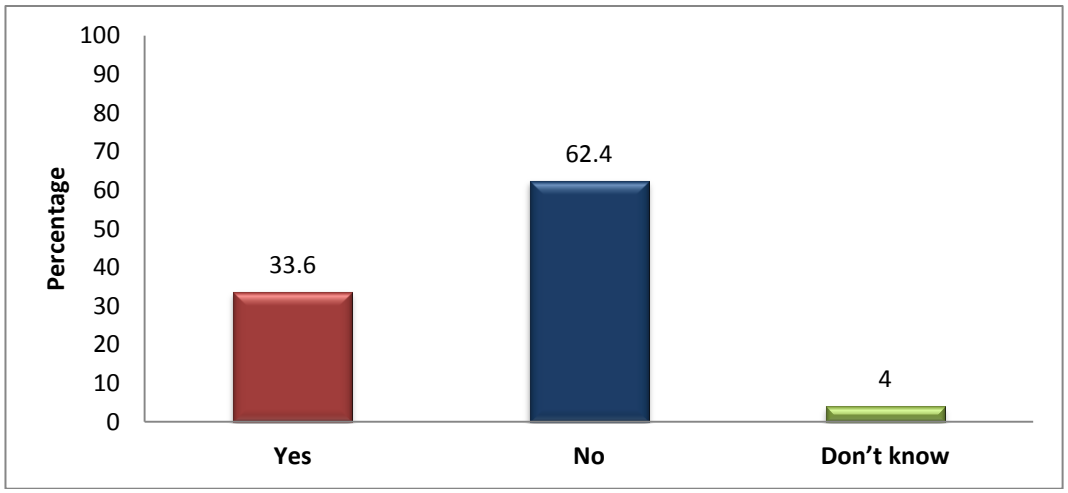

Figure 24: Percentage of clients who can get medicines on credit

CONCLUSION

Because the design of the evaluation of the Liberia SDSI program did not use a control region, the approach entailed working with a larger sample size for these types of evaluation. Therefore, unlike the usual sample size of 30 for price and availability and 60 for mystery shoppers, the evaluation used samples of 66 for price and availability and 80 for each of the mystery shopping exercises. This larger sample should enable the project to detect any unusual trends between the baseline and the final evaluation.

With regard to the quality of services for both malaria and pneumonia, the practices in Liberia leave much room for improvement. SDSI training in Liberia may need to emphasize case management more than was necessary in Tanzania and Uganda. Medicines prescribed for both malaria and pneumonia follow no discernible pattern; an average of four medicines was given for each pneumonia encounter and three for each malaria episode. The advent of SDSI at this time is thus warranted and timely.

Annex 1: Sustainable Drug Sellers Initiative Liberia: Monitoring & Evaluation Framework

Objective: Improve access[2] to medicines and pharmaceutical services in Montserrado County

Evaluation questions: (NOTE—No comparison against control population; baseline/endline comparison only)

(1) Does accreditation of medicine stores increase availability of quality pharmaceutical products?
(2) Does accreditation improve the quality of dispensing services?
(3) Is there an associated price change for pharmaceutical products following accreditation?
(4) Are consumers satisfied with the products and services provided by accredited medicine stores?

Variables	Indicators	Methodology
Quality of pharmaceutical products	• Percentage of tracer items sampled that fail quality testing	Samples will undergo tests of the labeled strength. Product identity and test analysis will be performed to evaluate whether the amount of active ingredient corresponds to the product label; dissolving and disintegration tests will be performed. At least eight drugs[3] will be sampled [total number of samples to be tested will be 110 randomly sampled from medicines collected at 45 outlets sampled for price and availability survey].

[2] **Accessibility**: Extent that intervention improves access to quality medicines and pharmaceutical services

[3] Pending availability of funding, medicines to be tested will include amoxicillin, co-trimoxazole, metronidazole, erythromycin, paracetamol, mebendazole/albendazole, tetracycline, and acetylsalicylic acid. To obtain a snapshot of quality of products circulating in the market, a minimum of 40 units of each product in whole pack or blisters or sealed tin of uncompromised product needs to be purchased. In addition, 10 different samples are needed for each medicine tested; for example, 10 different amoxicillin products (40 units each) from different locations will be needed.

Variables	Indicators	Methodology
Product price	• Average percentage difference in median price to patients between accredited medicine stores/medicines stores and international reference prices for a set of tracer items (prescription and nonprescription medicines)	Medicine store data collection in 45 outlets randomly selected in Montserrado County. Product price and product availability collected on 30 tracer drugs using availability and price data collection tool based on SEAM and Health Action International methodologies.
Product availability	• Percentage of a set of tracer items in stock • Percentage of selected items in the tracer list that show decreased availability [all injectable, antimalarial such chloroquine, SP, artesunate monotherapy]	
Quality of pharmaceutical services—malaria	• Percentage of encounters in which appropriate first-line antimalarial medicine was dispensed consistent with STGs for malaria treatment • Percentage of encounters in which attendant provided instructions on how to take the medicine • Percentage of encounters in which attendant asked about the symptoms of the child • Percentage of encounters in which attendant asked about any medications the child may have taken • Percentage of encounters in which the attendant asked about general danger signs in children under five years of age[4]	"Mystery" shopper visits to selected medicine stores in Montserrado County to determine quality of pharmaceutical services for malaria and acute respiratory infection (ARI) for simulated clients. 80 randomly selected shops for each disease scenario before and after (160 shops per county total for both baseline and endline data collection).

[4] Danger signs are refusal/inability to drink or breast-feed, vomiting, lethargy, convulsions, unconsciousness.

Variables	Indicators	Methodology
Quality of pharmaceutical services—ARI[5]	• % of encounters in which medicine was dispensed according to STG for ARI/pneumonia treatment in children under five years of age • % of encounters in which attendant provided instructions on how to take the medicine • % of encounters in which attendant asked about the symptoms of the child • % of encounters in which attendant asked about any medications the child may have taken • % of encounters in which the attendant asked about general danger signs in children under five years of age	
Consumer satisfaction	• % of consumers whose perception is that medicine store dispensers are knowledgeable about medicines • % of consumers whose perception is that medicines from medicine stores are affordable • % of consumers who choose medicine stores as first-choice facility to obtain medicines • % of consumers who report they can buy medicines on credit from the medicine store • % of consumers who prefer going to accredited medicine stores rather than unaccredited medicine store to buy their medicines	Exit interview with consumer attending the medicine store on the day of the survey. About 500–600 consumers from 100 medicine stores randomly selected to participate.

[5] UNICEF/WHO Child Survival Survey-Based Indicators TWG (June 2004), recommended that ARI be described as "presumed pneumonia" to better reflect the probable cause and the recommended interventions. The definition of ARI used in the Multiple Indicator Cluster Surveys (MICS) was chosen by the group and is *based on mother's perceptions of a child who has a cough, is breathing faster than usual with short, quick breaths or is having difficulty breathing, excluding children that had only a blocked nose.* [http://www.who.int/whosis/whostat2006Under5WithARI.pdf] Since 2004, all Demographic and Health Surveys in 28 countries have used this ARI definition for pneumonia during household surveys.

Matrix

	Component	Number of outlets	Number of data collectors	Estimated number of days
1	Availability and price survey and, if funding available, sample collection for product quality testing	45	10 (4 shops each)	Average 4 shops per day per data collector, add travel time between shops, should take 1 day
2	"Mystery" shoppers—malaria case scenario	80	5 (16 shops each)	Average of 6 shops per day per data collector, should take 3 days (16 shops per mystery shopper)
3	"Mystery" shopper—pneumonia case scenario	80	5 (16 shops each)	Average of 6 shops per day per data collector, should take 3 days (16 shops per mystery shopper)
4	Consumer satisfaction—exit interview	100	10 (same as previously listed data collectors, 10 shops each)	To follow mystery and availability surveys. Average of 10 customers per shop (500 interviews total for 5 days)

Notes:

1. Mystery shopper survey (concurrently) with two scenarios will be the first followed by price and availability survey and finish with exit interview.
2. Ten data collectors will be needed.
3. Estimated total number of days for the entire survey is 9 days [3 days for mystery shopper, 1 day for availability , and 5 days for exit interview].

Annex 2: Price and Availability Data Collection Tool

This form is used for the indicators listed below:

- Percentage of medicine stores with of tracer list items in stock
- Average lowest price to clients in Montserrado County for a list of tracer items selected

Summary of data collection procedure:

Where to Go	Whom to Ask	What to Get
Medicine stores selected for the exercise	Inform the attendant of the purpose of the survey and obtain permission to collect the data.	Ask to see if the items on the list are in stock. Note the pack sizes and prices for the cheapest 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 gathered will be kept confidential. The name of the shop and location will be used for reference only.
3. **Availability:** Ask the attendant to show you the medicines 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, mark that it is available.
4. **Cheapest prices:** Ask the attendant to see the least expensive brand. Note the number of units in the pack and the pack price.

AVAILABILITY AND PRICE FORM – SDSI LIBERIA

Use this form to collect information on stock availability and prices.

Name of drug shop: _____

District: _____

Community: _____

Name of person interviewed: _____

Position of person(s) interviewed: _____

Collector: _____ Date: _____

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 category	Brand name(s)	Available Y/N	No. of units per pack	Unit price	Expired Y, N, DK
1	Albendazole tablet 200 mg	Lowest					
2	Amoxicillin capsule 250 mg	Lowest					
3	Amoxicillin suspension 125 mg/5 mL 100 mL	Lowest					
4	AS/AQ 100 mg/270 mg [6s]	Lowest					
5	Aspirin (acetylsalicylic acid) tablet 300 mg	Lowest					
6	Benzyl benzoate lotion 25%	Lowest					
7	Benzyl penicillin injection 1 MU	Lowest					
8	Bisacodyl 5 mg tablet	Lowest					
9	Chloroquine phosphate tablet 300 mg base	Lowest					
10	Chlorpheniramine tablet 4 mg	Lowest					
11	Condoms	Lowest					
12	Clotrimazole cream	Lowest					
13	Co-trimoxazole suspension 240 mg/5 mL 60 mL	Lowest					
14	Co-trimoxazole tablet 480 mg	Lowest					

	Generic name, dosage form, strength	Price category	Brand name(s)	Available Y/N	No. of units per pack	Unit price	Expired Y, N, DK
15	Doxycycline capsule/tablet 100 mg	Lowest					
16	Erythromycin tablet 25 0mg	Lowest					
17	Ferrous sulfate 200 mg tablet	Lowest					
18	Folic acid 400 mcg tablet	Lowest					
19	Gentamycin eye/ear drops 0.3%	Lowest					
20	Gentian violet 50 mL	Lowest					
21	Ibuprofen tablet 200 mg	Lowest					
22	Hydrocortisone cream tube	Lowest					
23	Magnesium trisilicate tablet	Lowest					
24	Mebendazole tablet 100 mg	Lowest					
25	Metronidazole tablet 200 mg	Lowest					
26	Multivitamin tablet	Lowest					
27	Nystatin pessary 100,000 IU	Lowest					
28	Nystatin suspension 100,000 IU	Lowest					
29	ORS	Lowest					
30	Paracetamol tablet 500 mg	Lowest					
31	Procaine penicillin fortified 4 MU	Lowest					
32	Quinine injection 300 mg/mL	Lowest					
33	Quinine tablet 300 mg	Lowest					
34	Sulfadoxine-pyrimethamine tablet 525 mg	Lowest					
35	Tetracycline eye ointment 1%, 3.5 g tube	Lowest					

Annex 3: Client Exit Interview Data Collection Tool

Patient Exit Interviews: Perceptions about medicine store services

Indicators

The patient exit interviews are used to collect information for the following indicators:

- Percentage of clients who claim they obtain most of their medicines from accredited medicine stores
- Client perceptions about medicine availability in medicine stores
- Client perceptions about medicine store dispenser's or attendant's knowledge
- Client perception of medicine store cleanliness
- Client perceptions on prices and affordability
- Client perceptions of medicine quality
- Client perceptions about ability to secure credit

Patient Exit Interviews: Perceptions about medicine store services

Name of Drug Shop: _____

District: _____

Community: _____

Collector: _____ Date: _____

Client Perception about Medicine Stores

Read the series of opinions below about medicine stores. For each opinion, please ask if the client agrees or disagrees. Do not read the option "Do not know." Check it only if the respondent does not want to answer or is unable to choose between "agree" and "disagree." Read statements and check one box for each.

#	Statement of perception	Yes	No	Do not know
1	Do you obtain most of your medicines from medicine stores?			
2	Does the medicine store you use the most have most of the medicines you need?			
3	Is the attendant(s) at the medicine store you use the most knowledgeable about medicines and diseases?			
4	Is the medicine store you use the most clean and tidy?			
5	Does the medicine store you use the most sell medicines at reasonable prices?			
6	Are the medicines you buy from medicine stores of good quality?			
7	Does the medicine store you use allow you to purchase medicines on credit?			
80	Can you usually afford to buy the medicines that you need?			

Annex 4: Simulated Client Form for Malaria

Scenario for Simulated Client 1: *Uncomplicated Malaria*

Present yourself as the caregiver of a four- or five-year-old child who has had a fever on and off for a week. Use local terms to describe the symptoms of the child. The child may be a boy or a girl. Ask which products to give the child. *Do not provide any additional information unless the drug seller directly asks you 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 symptoms of the child:** In addition to the fever, the child has complained of a headache, and aches and pains since last week. She or he has been feeling generally unwell for a week.

- **If the child took medication:** Say that he or she took 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 or she is able to take both liquids and food.

Actions

Notice and remember the following:

1. What are the name(s) of the product(s) that you purchased?

2. Did the drug seller ask about the child's symptoms?

3. Did the drug seller ask about what other medications the child took?

4. Did the drug seller tell you how to give the child the medication (how much and when and for how long)?

5. Did the drug seller provide any advice on watching out for danger signs in the child (refusal to eat/drink, vomiting, convulsion, lethargy, unconsciousness)?

Indicators

The case scenario is used to collect information for the following indicators:

- Percentage of encounters in which appropriate first-line antimalarial medicine was sold for malaria treatment
- Percentage of encounters in which appropriate first-line antimalarial medicine was dispensed consistently with STGs for treatment of malaria
- Percentage of encounters in which attendant provided instructions on how to take the medicine
- Percentage of encounters in which attendant asked about the child's symptoms
- Percentage of encounters in which 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 warned caregivers about any danger signs [progressive illness]
- Percentage of dispensers who recommended a referral visit to a doctor or clinic if the danger signs appear
- Percentage of dispensers who prescribed an ineffective antimalarial (one that is no longer recommended)

Simulated Client Form for Malaria

Name of Drug Shop: _____

District: _____

Community: _____

Collector: _____ Date: _____

1. What are the name(s) of the product(s) that you purchased? For all drugs sold to you, write the following information:

	Name of drug, strength	Dosage instructions given	Quantity
i.			
ii.			
iii.			

2. What are the name(s) of the product(s) that the attendant recommended but you did not purchase?

i.	
ii.	

3. Did the attendant ask about symptoms? **Yes** ☐ **No** ☐

4. Did the attendant ask about other medications the child was taking/took? **Yes** ☐ **No** ☐

5. Did the attendant tell you the dosage and frequency of taking the medication? **Yes** ☐ **No** ☐

6. Did the attendant tell you the duration of the treatment? **Yes** ☐ **No** ☐

7. Did the attendant give information on how to look for danger signs? **Yes** ☐ **No** ☐

8. Did the attendant recommend immediate referral to a doctor or clinic? **Yes** ☐ **No** ☐

9. Did the drug seller recommend referral to a doctor or clinic if danger signs arose? **Yes** ☐ **No** ☐

Annex 5: Simulated Client Form for Pneumonia

Scenario for Simulated Client 2: *Acute Respiratory Infection (ARI)/Pneumonia*

Present yourself as the caregiver of a four-year-old child who has had a cough, is running a fever, and is breathing faster than usual. In addition, the child seems to be having difficulty in breathing. The child has been complaining of muscle pain and has vomited a few times over the past couple of days . The child may be a boy or a girl. Ask which products to give the child. *Do not provide any additional information unless the attendant directly asks you for more information.* Purchase the drugs recommended by the retail attendant and leave the store.

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

- **The symptoms of the child:** In addition to the above, the child has not been eating well. The child has been having these symptoms for the last three days, and he or she has been feeling generally unwell.

- **If the child took medication:** Say that he or she took some Panadol two days ago. Nothing much changed after this dose of Panadol.

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

Actions

Notice and remember the following:

1. What are the name(s) of the product(s) that you purchased?

2. Did the attendant ask about the child's symptoms?

3. Did the attendant ask about what other medications the child took?

4. Did the attendant tell you how to give the child the medication (how much and when and for how long)?

5. Did the attendant provide any advice on watching out for danger signs in the child (not able to drink, convulsions, lethargic or unconscious, vomiting everything)

Indicators

The case scenario is used to collect information for the following indicators:

- Percentage of encounters in which medicine was dispensed according to STG for ARI management in children under five years of age
- Percentage of encounters in which attendant provided instructions on how to take the medicine
- Percentage of encounters in which attendant asked about the symptoms of the child
- Percentage of encounters in which attendant asked about any medications the child may have taken
- Percentage of encounters in which the attendant asked about general danger signs in children under five years of age

Simulated Client Form for ARI/Pneumonia

Name of Drug Shop: _____

Location: _____

Collector: _____ Date: _____

1. What are the name(s) of the product(s) that you purchased? For all drugs sold to you, write the following information:

	Name of drug, strength	Dosage instructions given	Quantity
i.			
ii.			
iii.			

2. What are the name(s) of the product(s) that the attendant recommended but you did not purchase?

i.	
ii.	

3. Did the attendant ask about symptoms? **Yes** ☐ **No** ☐

4. Did the attendant ask about other medications the child was taking/took? **Yes** ☐ **No** ☐

5. Did the attendant tell you the dosage and frequency of taking the medication? **Yes** ☐ **No** ☐

6. Did the attendant tell you the duration of the treatment? **Yes** ☐ **No** ☐

7. Did the attendant give information on how to look for danger signs? **Yes** ☐ **No** ☐

8. Did the attendant recommend immediate referral to a doctor or clinic? **Yes** ☐ **No** ☐