Sustainable Drug Sellers Initiative Liberia

Evaluation Report

Lloyd Matowe
Ezekiel Hallie
Thomas B. Kokulo

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Center for Pharmaceutical Management
Management Sciences for Health
4301 North Fairfax Drive, Suite 400
Arlington, VA 22203 USA
Phone: 703.524.6575
Fax: 703.524.7898

48 Aldridge Court
Sterling, VA 20165
Phone: 571.201.7415

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About SDSI

The Sustainable Drug Seller Initiatives (SDSI) is a program that builds on Management Sciences 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, Uganda and Liberia.

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Acronyms

AMFm	Affordable Medicines Facility-malaria
ADDO	Accredited Drug Dispensing Outlet
AMS	Accredited Medicine Store
AS/AQ	Artesunate/Amodiaquine
CQ	Chloroquine
EADSI	East African Drug Sellers Initiative
HAI	Health Action International
IPT	Intermittent Preventive Therapy
IMCI	Integrated Management of Childhood Illnesses
LISGIS	Liberia Institute for Statistics and Geo-Information Services
LMHRA	Liberia Medicines and Health Products Regulatory Authority
M&E	Monitoring and evaluation
MOHSW	Ministry of Health and Social Welfare
MSH	Management Sciences for Health
NDA	National Drug Authority
PAL	Pharmaceutical Association of Liberia
PBL	Pharmacy Board of Liberia
PHC	Primary health care
SEAM	Strategies for Enhancing Access to Medicines
SDSI	Sustainable Drug Sellers Initiative
SP	Sulphadoxine-pyrimethamine
STGs	Standard treatment guidelines
URTI	Upper Respiratory Tract Infections
USAID	U.S. Agency for International Development
WHO	World Health Organization

Executive Summary

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's Initiative (SDSI) program builds on MSH's Strategies for Enhancing Access to Medicines (SEAM) and East African Drug Seller's Initiatives (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 program's goal was to ensure the maintenance and sustainability of these public-private drug seller initiatives in Tanzania and Uganda and to introduce and rollout the initiative in Liberia.

In Liberia, SDSI developed a strategy for adapting Tanzania's Accredited Drug Dispensing Outlet (ADDO) model for Liberia and the concept was introduced successfully in Montserrado County, the largest of the 15 Liberian counties by population. Results from the project evaluation showed that the community embraced the Accredited Medicine Store (AMS) initiative. The objective of SDSI was to improve services in medicine stores and enhance the program's long-term sustainability thereby contributing to increased access to quality medicines and services by the communities. To evaluate the effectiveness of this program, a comprehensive evaluation was conducted before and after the intervention. This report presents the findings of this evaluation.

Methodology

The evaluation sought to collect quantitative data in three main areas. These were product prices, availability, and quality of pharmaceutical services. Thirty-five price and availability tracer items were used to collect the required information, while a mystery shopping exercise was conducted to assess quality of services. Management of malaria and upper respiratory tract infections were used to assess services in AMS and non-accredited medicines stores. In addition, key informant interviews were conducted with policy makers, medicine stores owners, dispensers, and the communities using the services of medicine stores.

Results

Availability

Overall, the availability of the majority of the medicines decreased after the intervention. However, this decrease in medicines availability was also observed in shops which were not accredited. The overall

reduction in the availability of commodities may have resulted from changes that the regulatory authority, LMHRA, was undertaking. These changes included multi-pronged interventions.

Prices

In general, prices were higher at the end the program compared to the beginning. Prices in accredited shops were marginally higher than those in non-AMS shops at the end of the program. This appears to indicate that price increases were a result of the program rather than other activities occurring during the implementation period. Price increases following a quality improvement process is not unexpected. In both Tanzania and Uganda, price increases were reported in the original SEAM program and the EADSI program in Singida, Tanzania, and in Kibaale District in Uganda.

Quality of Services

The average number of medicines sold for the management of malaria decreased from 4.2 to 3.0. This seems to indicate that AMS shops had reduced the number of medicines they sold for the management of malaria. A decrease was also recorded in the number of medicines sold for pneumonia. In general, the pattern of antimalarial medicines usage did not seem to change with the advent of the AMS intervention. However, the management of pneumonia seemed to have improved. At baseline, 60 percent of medicine stores attendants sold the correct antibiotic for the management of pneumonia. The percentage increased to 78% following the implementation of the AMS program, but the increase was observed in both in AMS and non-AMS stores.

Stakeholder's perception of the AMS Program

Key stakeholders had positive things to say about the program. Most stated that the program was timely and much needed, and lamented the fact that the SDSI program was exiting the system so soon after it had catalyzed the massive changes observed in the private medicine stores business. Owners and dispensers appreciated the training they had received and stated that training program should continue beyond the life span of the SDSI program. Most owners stated that the program has increased their visibility and profitability.

Conclusion

The AMS intervention improved shop appearance and the cleanliness of the vicinity around medicine stores. With regard to availability, contrary to the results reported in Tanzania and Uganda, the AMS intervention appeared to have led to a decrease in product availability. This however, appears to be related to concurrent efforts by the LMHRA and PBL to register medicines in the country and to stringently inspect and regulate medicines store practice. The decrease in availability is thus not unexpected under the circumstances. This observation is supported by the fact that the decrease in product availability was seen in both AMS and non-accredited medicine stores.

The AMS intervention appeared to have led to marginal increases in medicines prices in accredited stores. The increase in prices appears to be a direct response to expenses incurred in improving infrastructure, training dispensers, improving quality of services, and increasing stock levels.

Overall, the program appeared to have improved dispensing services. During a mystery shopping exercise for malaria and pneumonia, the number of dispensers who sold the correct medicines increased from baseline to endline, the number of dispensers who gave correct dosage instructions also increased, and the number of dispensers who gave a number of patient-counseling information related to the conditions also increased. However, these improvements were observed in both accredited in non-accredited stores, which seem to indicate that the intervention led to improved services across the system.

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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's Initiative (SDSI) program builds on MSH's Strategies for Enhancing Access to Medicines (SEAM) and East African Drug Seller's Initiatives (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 programs goal was to ensure the maintenance and sustainability of these public-private drug seller initiatives in Tanzania and Uganda and to introduce it as a new initiative to Liberia.

Through their work in the three countries, SDSI expects not only to expand access to quality and services in additional geographical areas, but to validate the global view that targeting medicine stores and the private sector in general to improve access to quality medicines is feasible, effective, and sustainable.

Liberia, a country emerging from a debilitating civil war, offered an opportunity to demonstrate that that initiative is not only sustainable but transferable. The private pharmaceutical system in Liberia, which consists of pharmacies, medicine stores, and medicines peddlers, which are loosely regulated, was seen as 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 (but the pilot phase would begin in the capital, Monrovia). 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 made the situation suitable for the initiative's immediate implementation and accelerated institutionalization.

The SDSI project in Liberia was 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 conducted the following key activities to adapt and implement the accredited drug shop model in Liberia—

- Built partner and key stakeholder consensus for a Liberian accredited drug seller model.
- Determined the needs and expectations of the implementing population (including regulators, medicine store owners, and the communities that would benefit from the intervention).
- Developed practice standards for Liberia (not only for medicine stores but for pharmacies and pharmaceutical wholesalers).
- Developed and trialed consumer education strategies.

- Completed mapping, sensitization, and initial inspection exercise for Montserrado County. The inspections were later scaled up to other counties with SDSI resources, but with the LMHRA taking the lead.

- Trained medicine stores attendants on providing quality medicines and services.

- Accredited qualified medicine stores as a new class of service providers.

- Increased the frequency and improved the quality of inspections to enhance adherence to new practice standards. (One-week training for inspectors, both from the LMHRA and from the Pharmacy Board of Liberia (PBL), was conducted.)

- Evaluated the success of the model in Liberia and made recommendations for scaling-up the interventions to other counties in the country.

To evaluate if the program achieved its objectives, a comprehensive evaluation plan was developed. The evaluation sought to collect quantitative data in three main areas. These were product prices, availability, and quality of pharmaceutical services. Thirty-five price and availability tracer items were used to collect the required information, while a mystery shopping exercise was conducted to assess quality of services. Management of malaria and upper respiratory tract infections were used to assess services in AMS and non-accredited medicines stores. In addition, key informant interviews were conducted with policy makers, medicine stores owners, dispensers, and the communities using the services of medicine stores.

Objective

The objective of this exercise was to conduct an evaluation with an aim of determining the extent to which AMS improved access to essential medicines in Liberia. In broad terms, SDSI was interested in carrying out an evaluation of whether the model would continue to meet the public health goals of increasing access to essential medicines and pharmaceutical services in a region other than West Africa. Pharmaceutical Systems Africa, a Liberia-based organization with expertise in pharmaceutical monitoring and evaluation (M&E), were contracted to conduct the evaluation. The evaluation entails a baseline and endline data collection exercises in the implementation county, Montserrado. This report is the final evaluation report, which includes data from both the baseline and endline data collection exercises.

Methodology

The evaluation sought to collect data in three main areas of medicine store practice. The three areas were:

1. Product price and availability
2. Quality of services provided in medicine stores (both accredited and non-accredited). Services would be compared between accredited and non-accredited stores and also before and after the implementation of the intervention.
3. Key stakeholders' perception of medicine store practices

Price and Availability

The exercise sought to measure the two indicators below:

1. Median price to patients for a set of the tracer items (35 tracer items were selected using a consensus process. A list of the tracer items used for this exercise is presented in availability collection tool in Annex 1)
2. Percentage of medicine stores (both AMS and non-AMS) with tracer items in stock

The methodology used for this exercise required a sample of 60 medicine stores (30 AMS and 30 non-AMS). During the exercise, data collectors introduced themselves to the attendant in the store and explained the purpose of their visit. Where there was reluctance to cooperate a letter from LMHRA was presented. After introducing themselves, the data collectors asked the attendant if they had any of the medicines on the tracer list. If the attendant responded yes, the data collectors would request to see the medicines. When it was determined that a product was in stock and not expired, it would be recorded as available. In addition to availability, the cheapest and most expensive brands of products on the tracer list were collected. However, in most cases, only one brand was available in the majority of medicine stores at any one time, which gave us only one price for each item from a shop. Data were collected on paper tools and entered into an Excel spreadsheet at the end of each data collection day. Samples of the tools used for the entire exercise are presented in the annexes.

Quality of Pharmaceutical Services

Management of uncomplicated malaria

To collect the information above, a "mystery" shopping exercise was conducted in shops randomly selected for the exercise. Our data collectors visited pre-selected shops (both AMS and non-AMS) 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, were recorded upon exiting the store.

This exercise sought to collect information on the following indicators:

- Percentage of encounters in which the antimalarial medicine given was consistent with the Liberia standard treatment guidelines
- Percentage of store attendants who dispensed an antimalarial that is no longer recommended
- 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 encounters in which 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

Management of non-severe pneumonia in children

To collect information on the indicators above, a "mystery" shopping exercise was conducted in randomly selected stores. Data collectors visited the shops masquerading as caregivers of a four-year-old child presenting with signs of a simple 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 were recorded immediately upon exiting the store.

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 attendant asked about the symptoms of the child

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

Key Informant Interviews

To gauge key stakeholders' perceptions of the AMS program, interviews were conducted with a selection of implementers. These were program regulators, including LMHRA, the Ministry of Health and Social Welfare, the Pharmacy Board of Liberia, and the Pharmaceutical Association of Liberia, medicine stores owners and dispenser (both AMS and non-AMS), and members of the community.

Results

Study Demographics

Number of drug shops surveyed

Table 1 gives a summary of drug shops visited for price and availability and for the mystery shopping exercise. Because only 48 shops had received AMS accreditation at the time of the evaluation, the number of shops visited for the exercise was adjusted accordingly.

Table 1: Number of drug shops visited

Store Category	Price and Availability		Management of Malaria		Management of Pneumonia	
	Before	After	Before	After	Before	After
Non-accredited stores	66	30	80	22	79	23
AMS	N/A	30	N/A	21	N/A	21
Total	66	60	80	43	79	44

Price and Availability

Availability of Medicines in Stores

Table 2 presents the availability of 35 tracer items in Montserrado Country before and after the AMS intervention. To facilitate comparison, availability was measured in non-accredited medicine stores before and after the intervention and in AMS after the intervention. Differences were then compared pre-AMS and post-AMS. Overall, the availability of the majority of the medicines decreased after the intervention. However, this decrease in medicines availability was also observed in shops which were not accredited.

The overall reduction in the availability of commodities may have resulted from changes that the regulatory authority, LMHRA, was undertaking. For a start, while this intervention was being implemented, LMHRA and the Pharmacy Board of Liberia introduced the registration of medicines in Liberia. Substandard medicines thus began to decrease gradually and with that their general availability. Another possibility for the reduction of the availability of medicines is that the LMHRA started an intervention to confiscate medicines purchased for the public sector that were being sold in private medicine stores. Finally, the LMHRA and Pharmacy Board also began carrying out stringent inspections to enforce regulations to prevent medicines stores, both AMS and non-AMS, from selling products that they were legally prohibited from stocking.

Table 2 below demonstrates that there were no injections available in medicine stores (both AMS and non-AMS). It is possible that these stores may have had these products in stock but because of fear could not openly admit it. If regulators, such as the LMHRA, are keen to find out more on whether items are indeed not being stocked in medicines stores, then a mystery shopping exercise might be the best approach to achieve this.

With respect to medicines availability, there were no differences observed between AMS and non-AMS stores. In general, the AMS intervention seems to have affected medicine stores uniformly, those that were accredited and those that were not accredited. This may be due to the setting for this intervention being an urban center where medicine stores are in close proximity to each other. An intervention such as this is likely to affect those openly participating and those in the immediate vicinity.

Table 2: Percentage of medicine stores that had tracer items in stock (before and after the AMS intervention)

Tracer medicines	Before (n=66)	After: Non-AMS (N=30)	After: AMS (N=30)	Difference between before and after (AMS)
Albendazole 200mg tablets	23%	7%	26%	3%
Amoxicillin 250mg capsules	89%	53%	74%	-15%
Amoxicillin 125mg/5ml suspension	88%	80%	77%	-11%
Artesunate + Amodiaquine (100+270 mg)Tablets	40%	23%	13%	-27%
Aspirin (Acetyl Salicylic Acid)300mg tablets	94%	87%	77%	-17%
Benzyl Benzoate 25% lotion	17%	7%	13%	-4%
Benzyl Penicillin 5MU vial	5%	0%	0%	-5%
Bisacodyl 5mg tablets	72%	47%	55%	-17%
Chlorpheniramine 4mg tablets	68%	67%	55%	-13%
Chloroquine Phosphate 300mg tablets	65%	23%	61%	-4%
Male condoms{3's}	89%	70%	58%	-31%
Clotrimazole cream 1% 15g Tube	59%	53%	61%	2%
Cotrimoxazole 480mg tablets	88%	93%	90%	2%
Cotrimoxazole 240mg/5ml suspension	97%	90%	84%	-13%
Doxycycline 100mg capsules	83%	77%	81%	-2%
Erythromycin 250mg capsules	79%	57%	55%	-24%
Ferrous sulphate 200mg tablets	92%	87%	90%	-2%
Folic Acid 5mg tablets	91%	90%	81%	-10%
Gentamycin 0.3% eye/ear drops	91%	67%	61%	-30%
Gentian violet 50ml	55%	23%	19%	-36%
Ibuprofen 200mg tablets	71%	67%	77%	6%
Hydrocortisone cream	8%	0%	6%	-2%
Magnesium trisilicate tablets	94%	93%	94%	0%
Mebendazole 100mg tablets	80%	93%	71%	-9%
Metronidazole 200mg tablets	95%	97%	94%	-1%
Multivitamins tablets	85%	83%	94%	9%
Nystatin Pessaries 100,000 IU {each pessary }	80%	67%	74%	-6%
Nystatin suspension 100,000 IU	78%	67%	68%	-2%
ORS	94%	100%	97%	3%
Paracetamol 500mg tablets	100%	100%	97%	-3%

Tracer medicines	Before (n=66)	After: Non-AMS (N=30)	After: AMS (N=30)	Difference between before and after (AMS)
Procaine penicillin fortified 4MU vial	15%	0%	0%	-15%
Quinine injection 300mg/ml ampoule	15%	0%	0%	-15%
Quinine 300mg tablets	75%	27%	29%	-46%
Sulfadoxine +pyrimethamine 525mg tablets	68%	70%	87%	19%
Tetracycline eye ointment 1% 3.5g	58%	43%	29%	-29%

Availability of Antimalarial Medicines

Figures 1 and 2 below show the availability of antimalarials.

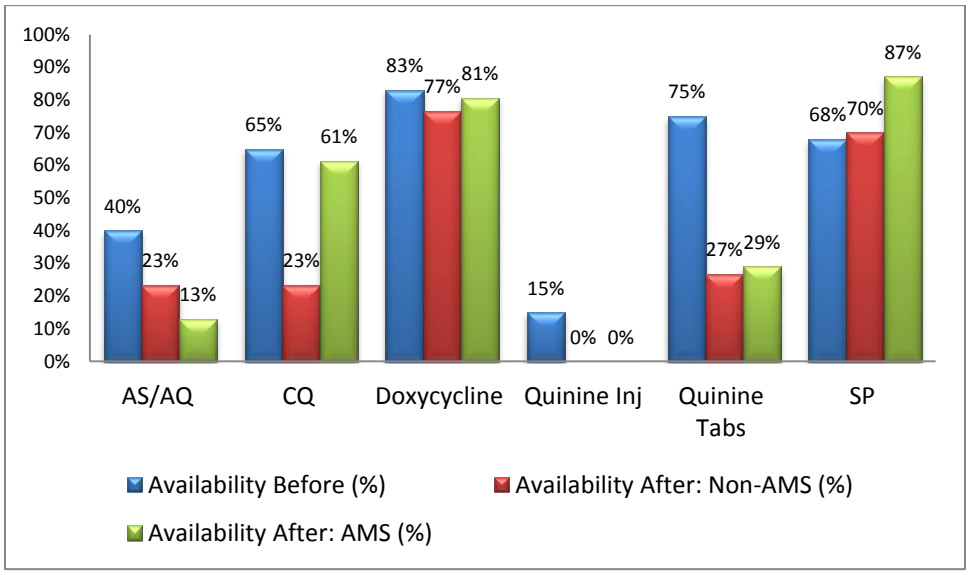

Figure 1: Availability of antimalarials in medicine stores in Montserrado County before and after the implementation of AMS program

Artesunate/Amodiaquine (AS/AQ) is the recommended drug for the management of uncomplicated malaria in Liberia. From Figure 1 above it can be seen that its availability decreased with the advent of the AMS intervention. Whereas this may be viewed as a negative effect, in fact, all of the medicines reported at baseline were pilfered from the public sector. The AMS intervention coupled with the strengthening of inspections discouraged medicine stores from purchasing medicines which were leaking out of public hospitals and clinics. A reduction in the availability of AS/AQ is thus not necessarily a negative event. Because of the reduction in the availability of AS/AQ, the availabilty of undesirable

antimalarial products such as chloroquine (CQ) and sulphadoxine-pyrimethamine (SP) remained high or increased marginally from baseline to endline.

Availability of antimicrobials

Figures 2 below show the availability of antimicrobials.

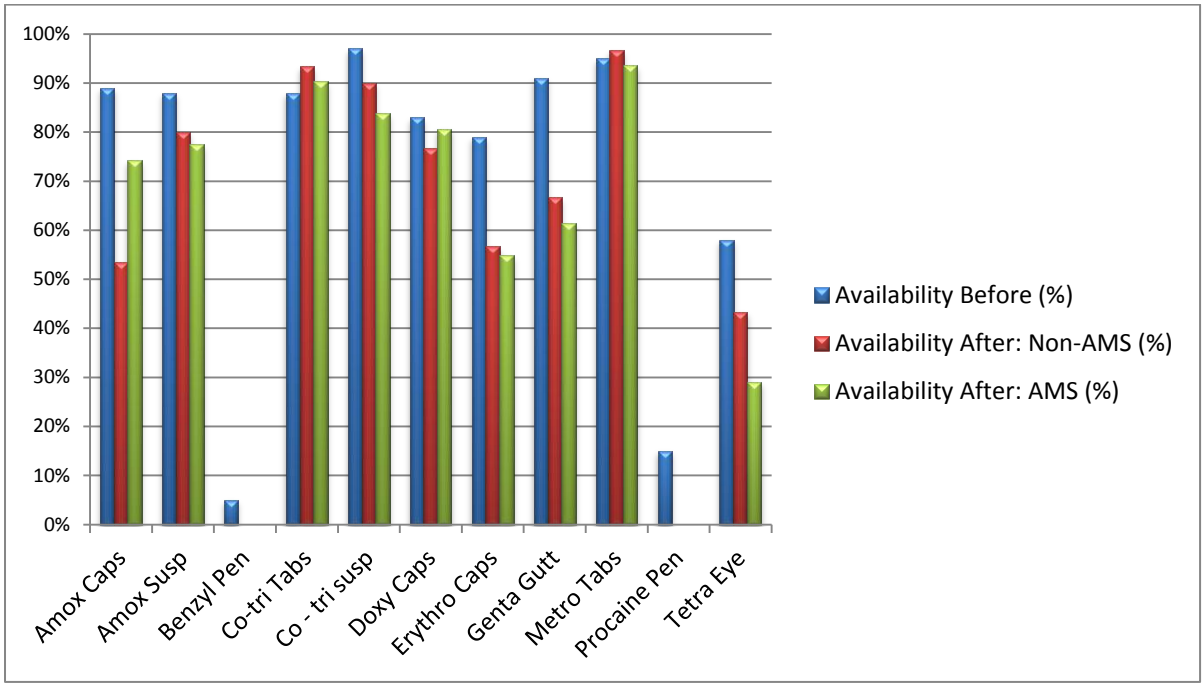

Figure 2: Percentage of availability of antimicrobials in medicine stores in Montserrado County

The availability of most antimicrobials decreased from baseline to endline. The decrease was similar in both accredited and non-accredited stores.

Availability of injectables

Injectables, by law, are not supposed to be sold in either medicine stores. Yet, at baseline, a number of medicine stores had these in stock. At endline, no medicine store reported that they had injectables in stock. This could indicate significantly improved practice or that they medicine stores would dispense injections from concealed places.

Prices

During the exercise to collect availability data, prices were also recorded for the 35 tracer items. When different brands of the same product were available in a particular store, the median price from that shop was recorded. Table 3 presents median prices for each product in Montserrado County before and after intervention. In Liberia, most medicines, except those that come in specified blister doses, such as AS/AQ or Albendazole 200mg (2 tablets), are sold in units of 10s. There is no rationale for this practice, but this is how prices are normally quoted and for the purpose of this project we present medicine prices in units of 10s. All prices reported are in Liberian dollars. At the time of preparing this report, US$1 is equivalent to approximately 85 Liberian dollars on the local market. Table 3 presents price comparisons before and after the AMS intervention.

Table 3: Median prices for tracer items in Montserrado County before and after the AMS intervention

Tracer medicines	Unit	Before (n=66)	After: Non-AMS (N=30)	After: AMS (N=30)	Difference between before and after (AMS)
Albendazole 200mg tablets	2	15	20	40	25
Amoxicillin 250mg capsules	10	35	40	40	5
Amoxicillin 125mg/5ml suspension	1	75	80	100	25
Artesunate + Amodiaquine (100+270mg) tablets	6	125	35	35	-90
Aspirin (Acetyl Salicylic Acid)300mg tablets	10	15	15	15	0
Benzyl Benzoate 25% lotion (100ml)	1	100	125	150	50
Benzyl Penicillin 5MU vial	1	50	N/A	N/A	N/A
Bisacodyl 5mg tablets	10	20	20	40	20
Chlorpheniramine 4mg tablets	10	15	15	20	5
Chloroquine Phosphate 300mg tablets	10	15	15	20	5
Male condoms {3's}	4	25	30	50	25
Clotrimazole cream 1% 15g tube	1	75	75	75	0
Cotrimoxazole 480mg tablets	10	20	25	25	5
Cotrimoxazole 240mg/5ml suspension (100ml)	1	75	75	90	15
Doxycycline 100mg capsules	10	40	35	40	0
Erythromycin 250mg capsules	10	70	75	100	30
Ferrous sulphate 200mg tablets	10	10	10	10	0

Tracer medicines	Unit	Before (n=66)	After: Non-AMS (N=30)	After: AMS (N=30)	Difference between before and after (AMS)
Folic Acid 5mg tablets	10	10	10	10	0
Gentamycin 0.3% eye/ear drops	1	60	75	75	15
Gentian violet 50ml	1	40	50	80	40
Ibuprofen 200mg tablets	10	20	20	20	0
Hydrocortisone cream	1	100	N/A	150	50
Magnesium trisilicate tablets	10	15	20	20	5
Mebendazole 100mg tablets	6	25	20	20	-5
Metronidazole 200mg tablets	10	15	15	20	5
Multivitamins tablets	10	1	10	10	9
Nystatin Pessaries 100,000 IU {each pessary}	14	75	90	120	45
Nystatin suspension 100,000 IU			100	125	125
ORS	1	15	15	15	0
Paracetamol 500mg tablets	10	10	10	10	0
Procaine penicillin fortified 4MU vial	1	40	N/A	N/A	N/A
Quinine injection 300mg/ml ampoule	1	40	N/A	N/A	N/A
Quinine 300mg tablets	10	75	85	100	25
Sulfadoxine +pyrimethamine 525mg tablets	3	10	35	50	40
Tetracycline eye ointment 1% 3.5g	1	40	40	50	10

*All currencies are in Liberia dollars

In general, prices were higher at the end the program compared to the beginning. Prices in accredited shops were marginally higher than those in non-AMS shops at the end of the program. This appears to indicate that price increases were a result of the program rather than other activities occurring during the implementation period. Price increases following a quality improvement process is not unexpected. In both Tanzania and Uganda, price increases were reported in the original SEAM program[1] and the EADSI program in Singida, Tanzania, and in Kibaale District[2] in Uganda.

[1] Management Sciences for Health. 2006. Strategies for Enhancing Access to Medicines Evaluation Report.
[2] Management Sciences for Health. 2011. East Africa Drug Seller Initiative (EADSI) Evaluation Report.

Quality of Services

Management of Malaria

The appropriateness of malaria management was assessed based on the treatment guidelines for Liberia. The recommended first-line medicine for the management of uncomplicated malaria in Liberia is artesunate/amodiaquine (AS/AQ). This product is available in three different strengths: 25/67.5mg, 50/135mg, and 100/270mg.

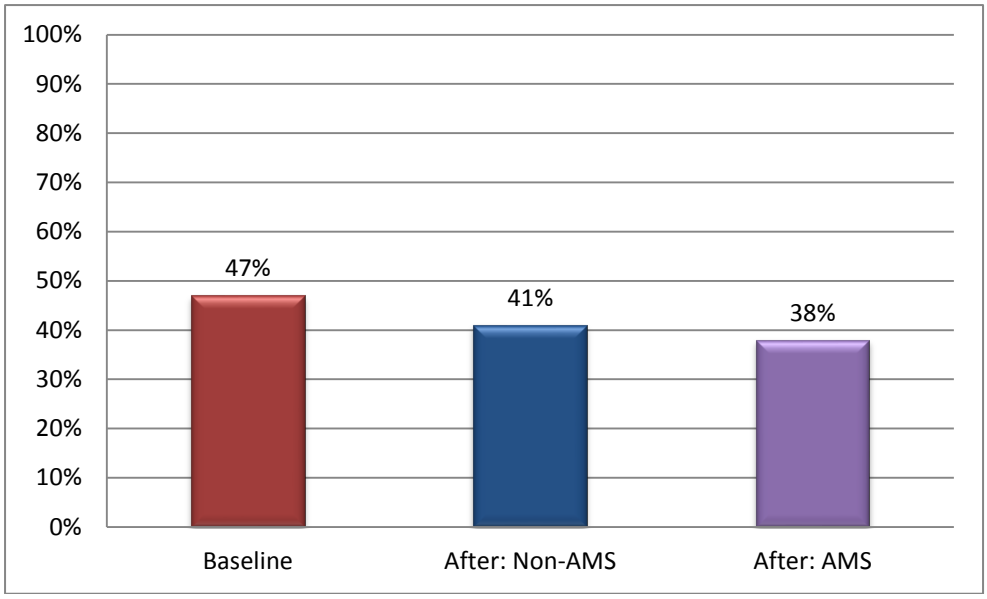

Figure 3: Percentage of mystery shopping encounters that received AS/AQ

The percentage of medicine stores that sold AS/AQ decreased slightly from baseline to endline. The decrease in the percentage of the recommended treatment was similar in accredited shops versus the non-accredited stores. The reason why AS/AQ sales decreased could be due to the fact that the drug was not readily available. Even where the drug was available the brand that was purchased by the mystery shoppers was the brand that is provided free of charge in government hospitals. A reduction in this product may therefore not necessarily the result of poor management on the part of the medicines stores.

The recommended dosage for children between the ages of one and five is 50/135mg once daily for three days. Figure 3 shows the percentage of clients presenting with malaria who were managed with AS/AQ, before and after the intervention.

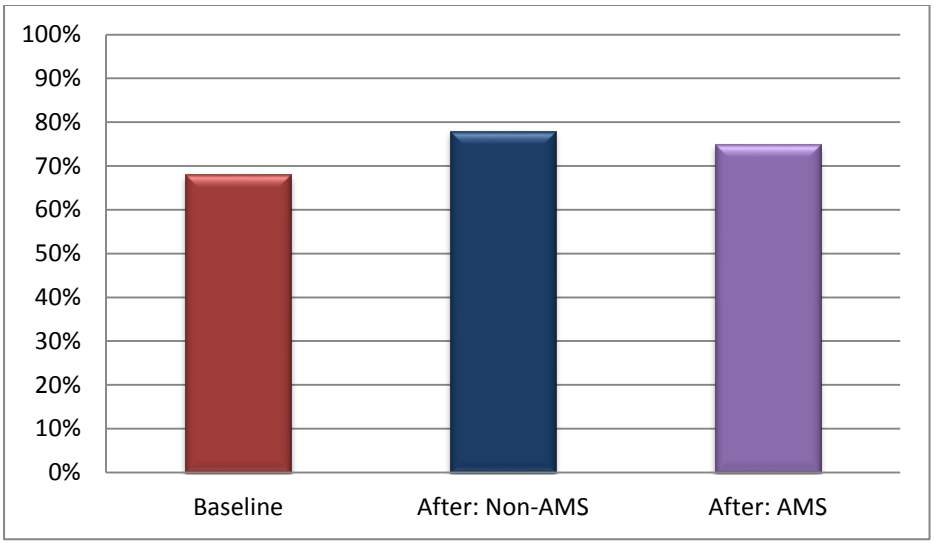

Figure 4: Percentage of dispensers that sold AS/AQ and gave the correct dosage instructions

Average number of medicines given for the management of malaria

Before the AMS intervention an average of 4.2 medicines were sold for the management of a child with fever. After the AMS intervention the average number of medicines given for the management of malaria was 3.8 for non-AMS store and 3.0 for AMS shops. This seems to indicate that AMS shops had reduced significantly the number of medicines they sold for the management of malaria.

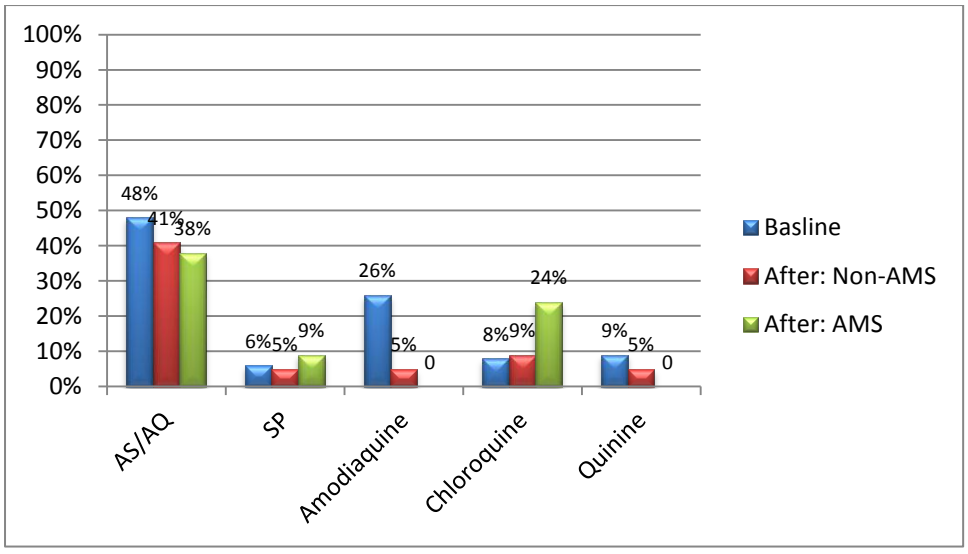

Figure 5. Frequency of antimalarial medicines dispensed in medicine stores in Montserrado County

In general, the pattern of antimalarial medicines usage did not seem to change with the advent of the AMS intervention. Even though AMS's were considered the model outlet, the percentage of chloroquine

dispensed in these shops increased following the intervention. Having said this, none of the other non-recommended medicines seemed to increase in an unexpected manner, so the chloroquine increase may be purely coincidental.

Table 4: Frequency of medicines sold for the management of uncomplicated malaria

Medicines Sold	Baseline	After: Non-AMS	After: AMS
Albendazole 400mg Tablets	3%	0	0
Amodiaquine 200mg tabs	18%	5%	0
Amodiaquine 50mg/5ml syrup	9%	0	0
Amoxicillin 250mg caps	10%	9%	5%
Ampicillin 250mg caps	1%	0	0
AS/AQ (100/270mg or AS/AQ 25/67.5mg or AS/AQ 50/135mg) tabs	48%	41%	38%
Aspirin 300mg tabs	11%	14%	5%
Chloramphenicol	1%	0	0
Chloroquine 250mg tabs	5%	9%	24%
Chloroquine 80mg/5ml syrup	1%	0	0
Ciprofloxacin	1%	0	0
Cotrimoxazole 240mg/5ml susp	1%	0	5%
Cotrimoxazole 480mg tabs	11%	9%	19%
Diclofenac 25mg tablets	0	5%	5%
Dihydroartemisinin 160mg/5ml susp	1%	5%	0
Erythromycin 125mg/5ml susp	1%	0	0
Ferrous Sulphate 200mg tabs	21%	14%	9%
Folic Acid	8%	9%	5%
Ibuprofen 200mg tabs	1%	0	0
Levamisole 40mg tabs	1%	0	0
Mebendazole 500mg tabs	11%	9%	9%
Multivitamins tabs	5%	5%	14%
None/Referred	4%	9%	9%
ORS	15%	14%	0
Paracetamol 120mg/5ml syrup	9%	9%	5%
Paracetamol 500mg tabs	56%	68%	76%
Quinine 100mg/5ml susp	4%	0	0
Quinine Sulphate 300mg tabs	5%	0	0
Sulphadoxine-pyrimethamine tabs	6%	5%	9%
Vitamin B. Complex	15%	0	9%

At baseline, 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. This pattern did not change much following the implementation of the AMS program.

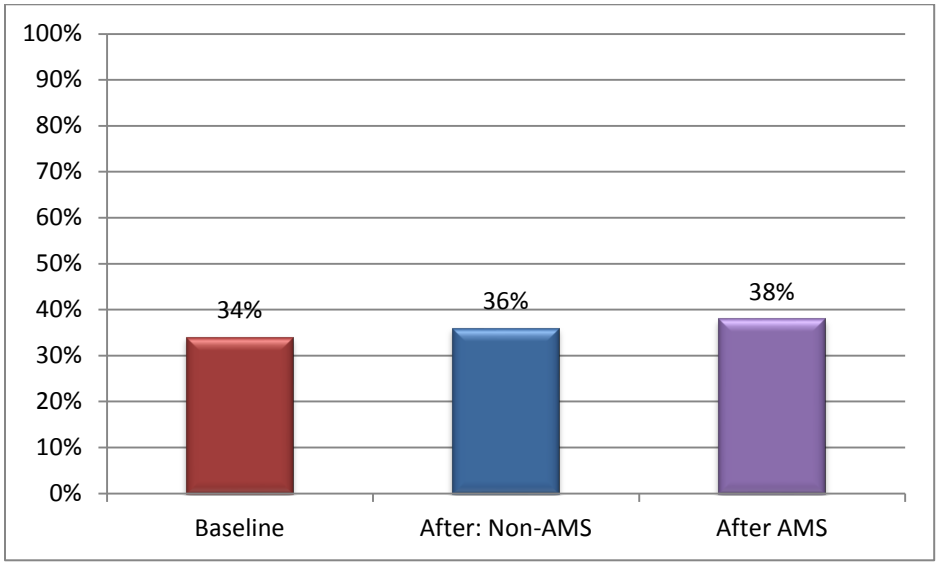

Figure 6: Percentage of encounters where attendant asked for more information about the symptoms presented

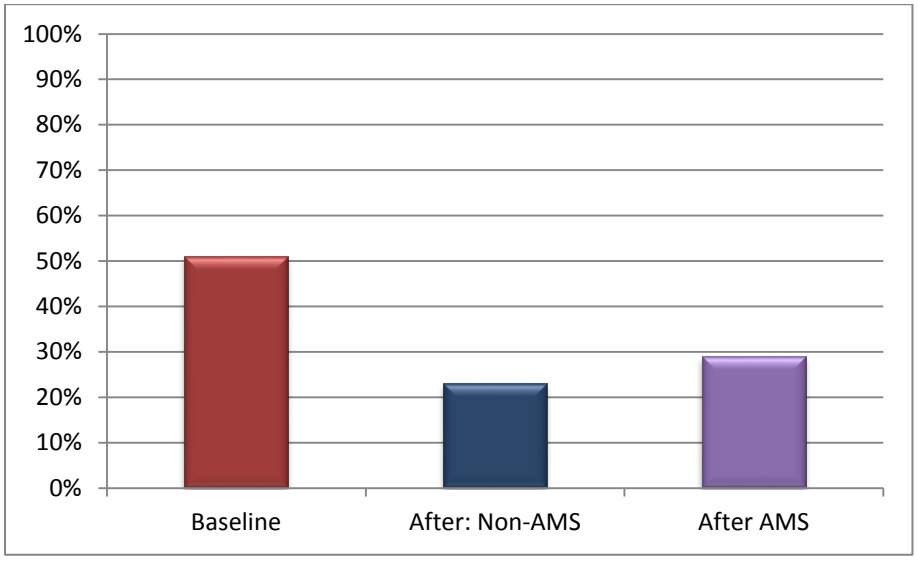

Figure 7: Percentage of encounters in which attendant asked about other medicines the child was taking

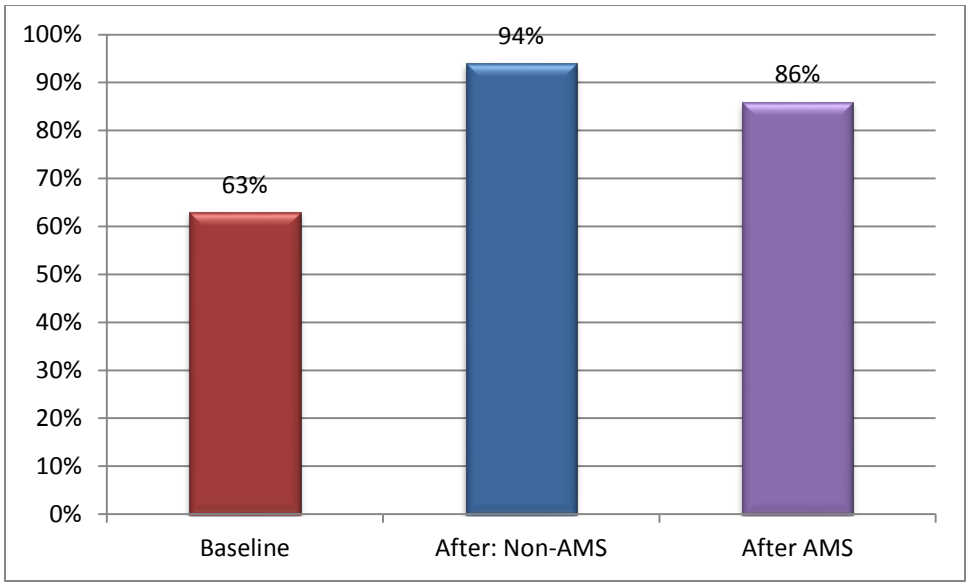

Figure 8: Percentage of encounters in which attendant provided information on dosage and frequency of taking the medicines

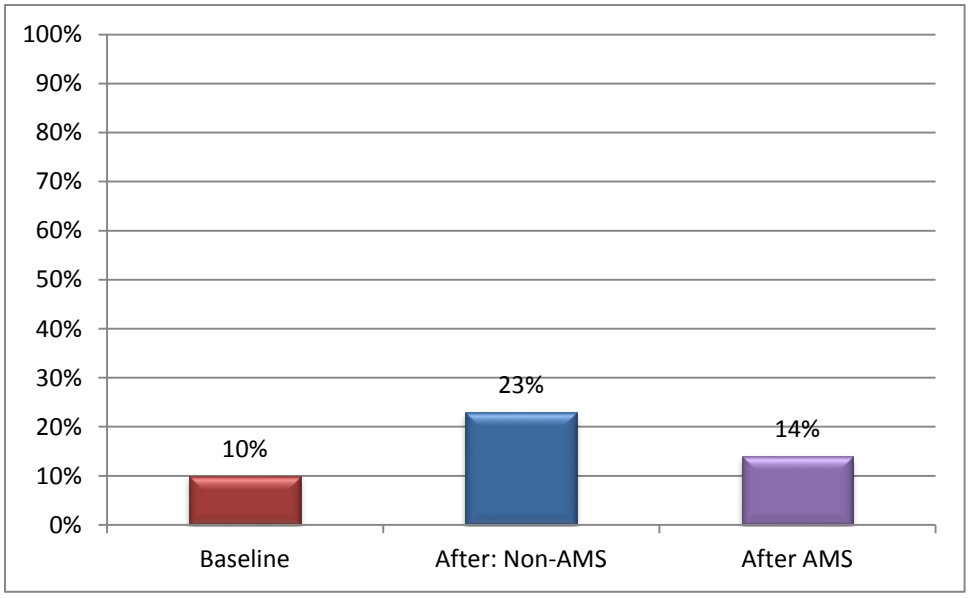

Figure 9: Percentage of attendants who provided information on the duration of treatment

Management of Pneumonia

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

Option A:

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

Option B:

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

Option C:

- Paracetamol 125-250mg every 8 hours for 3 days
- PPF 50,000 IU daily for 3 days

At baseline, 60 percent of medicine stores attendants sold the correct antibiotic for the management of pneumonia. The percentage increased following the implementation of the AMS program, but the increase was both in AMS and non-AMS stores. This supports the fact that the intervention seems to have improved services across all medicine stores, whether they were accredited or not.

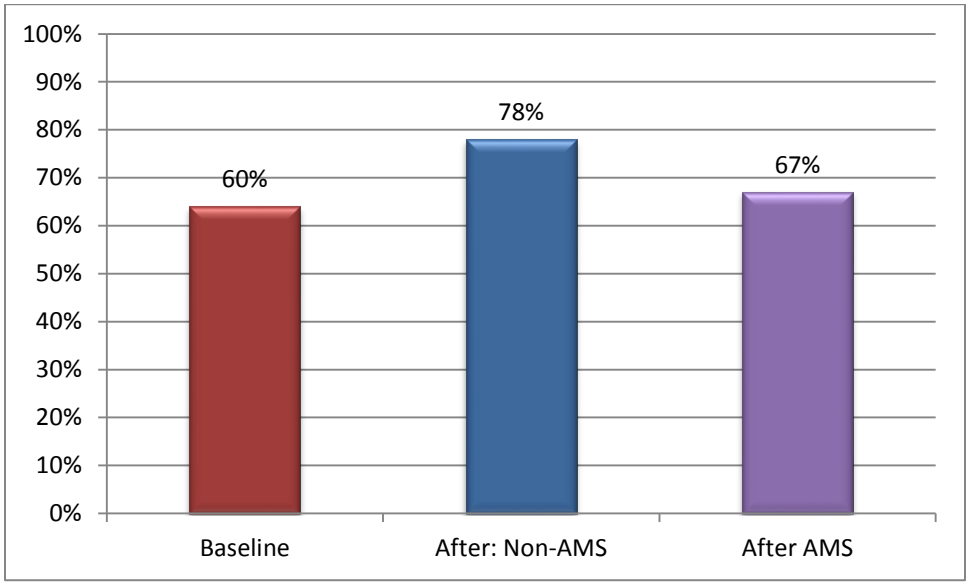

Figure 10: Percentage of encounters where the correct medicine was sold

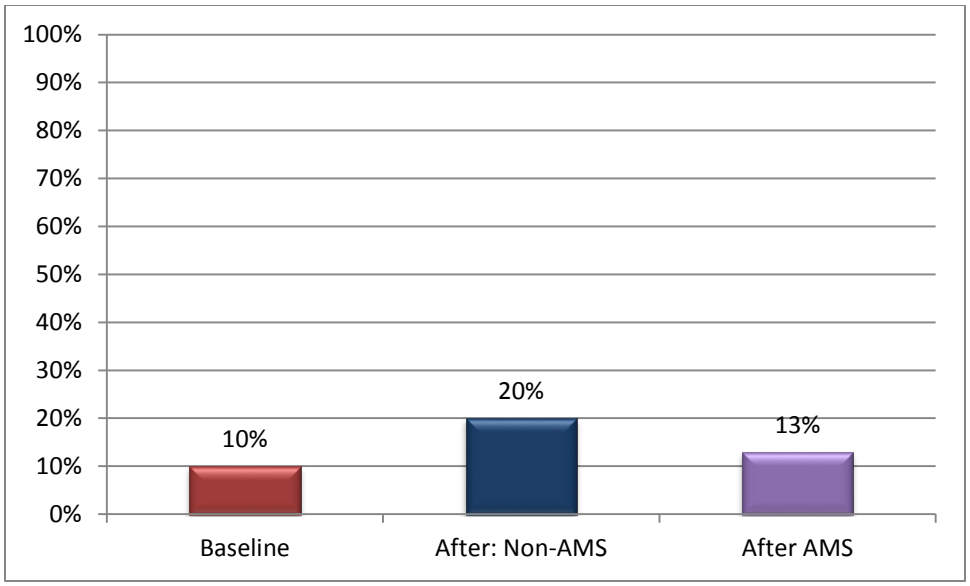

Figure 11: Percentage of encounters where the correct dose of amoxicillin was given[3]

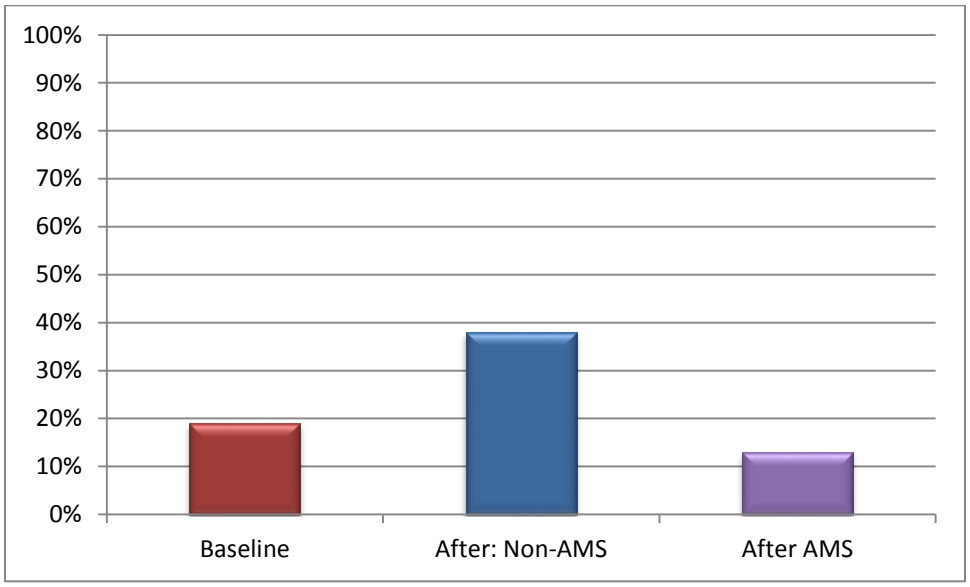

Figure 12: Percentage of encounters where the correct dose of cotrimoxazole was given

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

Frequency of medicines given for the management of pneumonia

The pattern of managing a suspected pneumonia case was similar before and after the intervention. However, the choice of the correct medicines, cotrimoxazole or amoxicillin, seems to have improved following the implementation of the AMS program. The improvement could have been a result of the dispenser training that was conducted. Table 5 gives a comprehensive list of all the medicines suggested for the management of pneumonia.

Table 5: Frequency of medicines sold for the management of pneumonia

Medicines suggested	Baseline	After: Non-AMS	After: AMS
Aminophylline 100mg tabs	1%	0	0
Amodiaquine 200mg tabs	8%	9%	5%
Amoxicillin 125mg/5ml susp	6%	0	0
Amoxicillin 250mg caps	20%	13%	24%
Ampicillin 125mg/5ml susp	3%	0	0
AS/AQ 100/270mg tabs	13%	0	0
AS/AQ 50/135mg tabs	6%	9%	9%
Aspirin 300mg tabs	4%	9%	0
Chlorpheniramine 5mg tabs	3%	0	0
Chloroquine 250mg tabs	1%	5%	5%
Cotrimoxazole 240mg/5ml susp	3%	0	0
Cotrimoxazole 480mg tabs	33%	65%	38%
Diclofenac 50mg tabs	3%	0	0
Erythromycin 250mg caps	9%	13%	5%
Ferrous sulphate 200mg tabs	6%	0	5%
Flu and Cold Medicine	58%	0	5%
Folic Acid tabs	4%	0	5%
Ibuprofen 200mg tabs	3%	0	5%
Mebendazole 100mg tabs	6%	22%	24%
Metoclopramide 5mg tabs	1%	5%	5%
Multivitamins Syrup	1%	9%	0
Multivitamins tabs	4%	5%	0
ORS	4%	5%	0
Paracetamol 500mg tabs	48%	70	90%
Quinine sulphate 300mg tabs	3%	24%	9%
Salbutamol 4mg tabs	17%	9%	5%
Sulphadoxine-pyrimethamine tabs	3%	13%	5%
Vitamin B. Complex	4%	0	5%

Dispensers appeared more inclined to ask for more information regarding pneumonia after the intervention. However, this increase was also observed, and more extensively, in non-AMS stores.

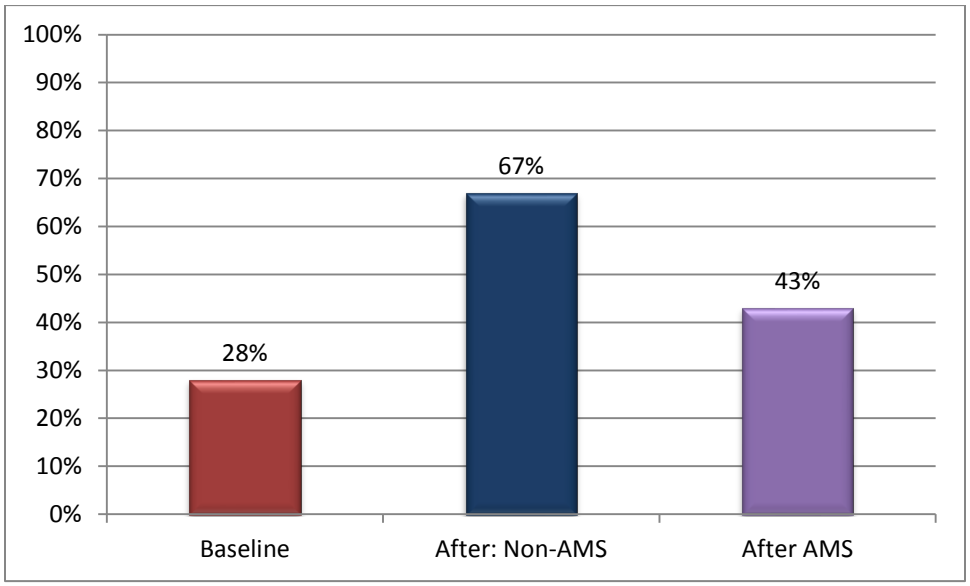

Figure 13: Percentage of encounters where attendant asked for more information about the pneumonia symptoms presented

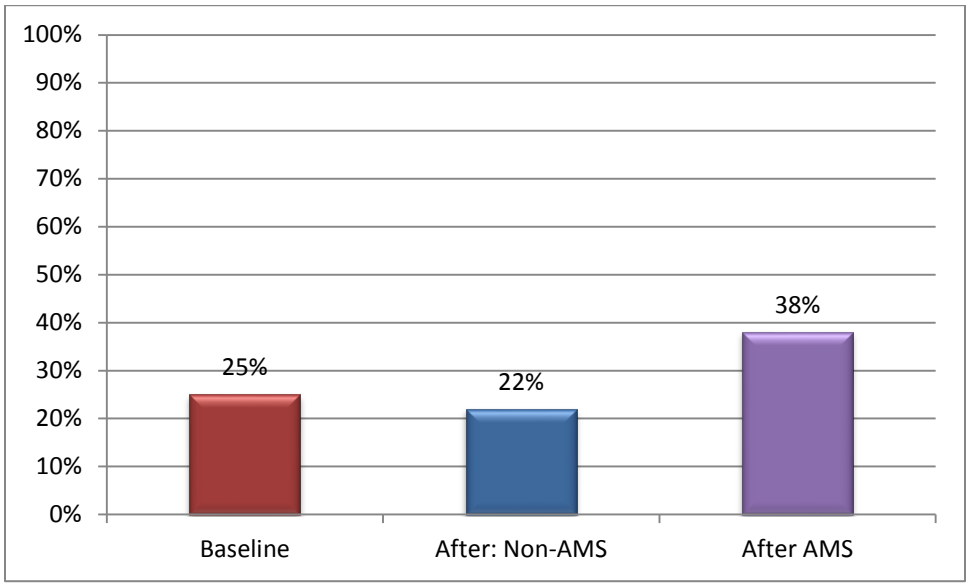

Figure 14: Percentage of encounters in which attendant asked about other medicines the child was taking

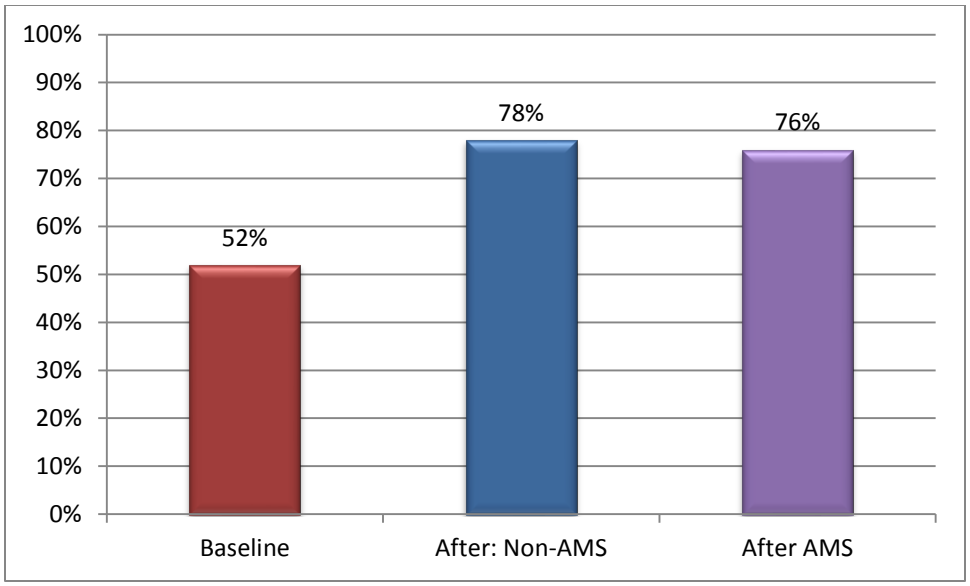

Figure 15: Percentage of encounters in which attendant provided information on dosage and frequency of taking the medicines

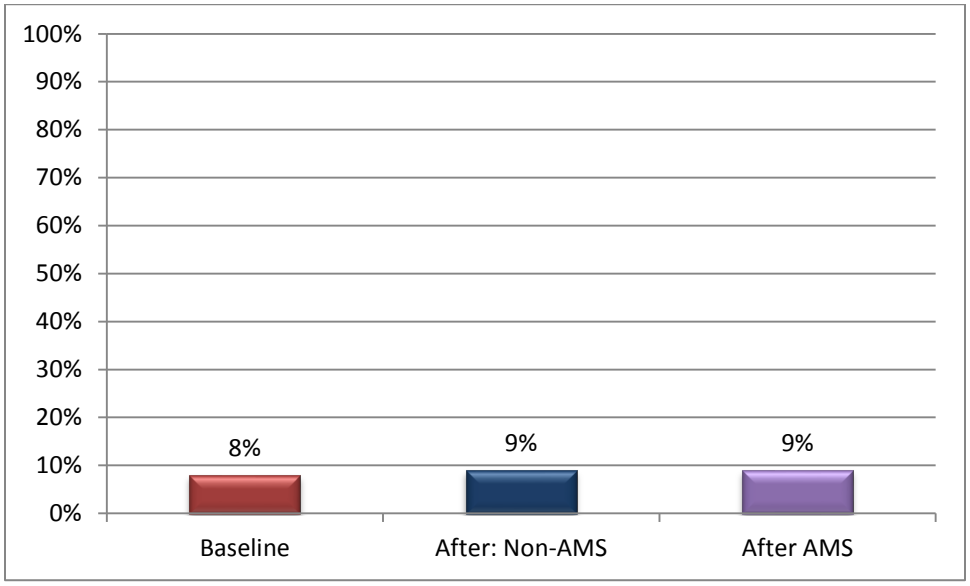

Figure 16: Percentage of attendants who provided information on the duration of treatment

Stakeholders' Perceptions of AMS

Regulators

Findings from the qualitative survey on the SDSI

Methodology

The qualitative component of the SDSI evaluation conducted in-depth interviews with key stakeholders. Voices of the subjects were recorded and transcribed for analysis. The key informants were divided into two major groups. Group 1 was comprised of policy makers and regulatory personnel. Group 2 included the owners of the AMS shops. The exercise targeted 13 key stakeholders in the pharmaceutical sector of Liberia and was able to recruit 11 policy makers. The candidates were from the MOHSW, the LMHRA, the PBL, MSH, and shop proprietors of the AMS program.

Overall impressions gathered from policy makers about the AMS program in Montserrado County

Generally, both the policy makers and the AMS shop owners expressed their satisfaction on the implementation of the AMS program in the county. Many of the interviewees stated that the program has made a tremendous impact in the pharmaceutical sector of Liberia. This is evidenced by the outlook of the AMS shops, the improvement of services, and the communication skills exhibited by the dispensers in those shops.

Liberia, being the third country in Africa, after Tanzania and Uganda, to benefit from the SDSI program, has made a great impact on the implementation of the AMS program. The Assistant Minister, Mr. Tolbert G. Nyenswah, responded by saying, "I think it was a very good program because it has done a lot of great job. We had it collaborated with the Gates Foundation, the sustainable drug seller initiative (SDSI), MSH and the Liberian Government. So I think it was a very successful program."

The Managing Director of the LMHRA, Mr. David Sumo, concurred with the Assistant Minister and said, "I think the intervention itself is welcoming, because it has an intent. And the expected outcome of that intent will benefit the Liberian people generally."

The Chief Pharmacist of Liberia, Rev. Tijli Tartee Tyee, partially concurred with both the Assistant Minister and the Managing Director about the impact made by the AMS program implementation in the county. In his view, he mentioned that it is difficult to see the impact of the program for a number of reasons. He said, "It will take a great deal of work before you will see exactly what picture the program has created."

The Registrar of the PBL, Mr. Joseph S. Weah, revealed that the AMS program started as a pilot project in Montserrado County. Its outcome will determine either to continue to other counties or stop in

Montserrado. He said, "There has been much impact made relative to the improvement of medicine stores in Montserrado County."

One of the AMS shop owners, Mrs. Kadiatu Johnson, said "Well, I am very impressed about the AMS program because we were having a lot of drug stores around where you can see people get dishes behind and under the counter. Because of this program, people started taking care of their places." She continued to mention that cleanliness has been maintained in the stores and malpractices are abolished.

Changes brought by the AMS program in the retail medicine stores

The general views expressed by the respondents indicate that there are great changes in the AMS shops. Key to these changes are improvements in the infrastructure of these stores, quality of services provided by the AMS-trained dispensers, improvement in the communication skills by dispensers with customers and increased inspection by the LMHRA and the PBL, have made great impact.

Mr. David Sumo, the Managing Director of the LMHRA, affirmed that some basic training of shop owners has improved basic management of these shops. He said "I think that has also stimulated the public to now see that there is a need to improve more stores by going through the AMS program. I think those are all plus to the system."

Supporting the views of the Managing Director of the LMHRA Mr. Sumo, the Technical Advisor for MSH/SDSI, Mr. Arthur Loryoun, said, "The program has helped to increase inspection, which is a great achievement. We are of the opinion that inspection and increased monitoring will improve the program."

For his part, the president of the Medicine Stores Association of Liberia, and the proprietor of the Tuazama Medicine Store, said, "I have seen max improvement in our performances. Professionalism is being exhibited now." He was trying to confirm the level of understanding the AMS shop owners and dispensers have gained. Mr. Tuazama indicated that, as the association's president, he was identified and appointed on the AMS program implementation in Liberia. He disclosed that he was part of the medicine stores mapping exercises in Montserrado County.

Perceptions about the logo

The general view gathered from the study subjects shows three basic changes in the stores bearing the AMS logo. These changes are: (1) the logo serves as a point of attraction from the population, (2) confidence building and morale boost up in those shops, and (3) increase in the volume of sales.

Attraction, as a change, was observed by the Chief Pharmacist, Rev. Tyee and the PBL Senior Inspector, Mr. Jefferson Piah Harris. Rev. Tyee declared, "The logo has the tendency to change the perception of the people. Logo serves as a number one point of attraction for both customers and professional people."

The owner of Irene Medicine Store (an AMS shop), Mrs. Kadiatu Johnson, concurred with both Rev. Tyee and Mr. Harris. In her response, Mrs. Johnson said, "The display of the logo in the medicine stores clearly indicates to the community that quality drugs are sold thus attracting the customers."

The Managing Director of the LMHRA, Mr. David Sumo, admitted that the first thing the logo depicts is the morale boost in the AMS shops. Bearing of the logo in the medicine stores gives the public a clear picture that the owner/dispenser has gone through the exercises and that the Liberian Government is satisfied with them. He said, "The public have better confidence buying from them than to go to non-accredited shops."

Three of the interviewees (AMS Liaison Officer, Mr. Joseph Somwarbi, Proprietress of Van Medicine Store, Madam Naomi Kiazolu, and Proprietor of Kesselly Medicine Store, Mr. Moses Kesselly) revealed that the display of the logo has increased their daily sales. Naomi mentioned, "The logo has increased the daily sale of drugs."

Major challenges incurred in implementing the AMS program

The challenges in the implementation of the AMS program are diverse. These include the political will from stakeholders, limited financial support, program sustainability, remuneration of dispensers, change in the system of shop owners, and limited manpower for inspection and monitoring. Responses from the subjects were gathered as follow.

Limited resources, especially funding, are major challenges in the implementation of the AMS program, as grieved by both the Assistant Minister of MOHSW, Tolbert Nyenswah and the Managing Director of the LMHRA, Mr. David Sumo, respectively.

The PBL Registrar, Mr. Joseph and the shop owners (Naomi Kiazolu and Kadiatu Johnson) said that the demand by the AMS program to restructure the shops and the confiscation of the already purchased medicines brought about capital loss and the fall in the revenue of those shops.

The PBL senior inspector, Mr. Jefferson Piah Harris, outlined the challenges faced as difficulty in mapping of the stores and identifying the personnel for the training. He also stated that the AMS-trained dispensers are no longer in those shops for which they were trained due to low salary given them by the store owners.

Another challenge identified by the Technical Advisor for MSH/SDSI, Mr. Arthur Loryoun, was the lack of improvement/renovation of the shops. He said, "Shop owners are using buildings that are not theirs, so building owners are refusing to improve their structures thereby limiting the operators to meet up with the standards required by the AMS program."

Overcoming the challenges

The enormous challenges identified above were overcome by a number of interventions, such as advertisement, the establishment of multi-sectorial task force, facilitation of the joint inspection team comprising of the LMHRA and the PBL, regulation enforcement, and buy-in from the ministry or government, and training enabled the policy makers to overcome the challenges.

The Assistant Minister/DCMO-P revealed that challenges were overcome by involving all the stakeholders and trying to encourage the Global Fund to provide needed resources for the AMS program implementation.

The Managing Director of the LMHRA, Mr. David Sumo, indicated that the implementation of the AMS program, alongside the Liberia Institute for Statistics and Geo-Information Services (LISGIS), was able to initiate the mapping process of all medicine stores in Montserrado County. He said, "It was a major challenge because, for many years we have had the PBL as regulatory agency to monitor the retail sector but they were never able to determine how many shops and where they were located or the condition of the shops."

The Technical Advisor for MSH/SDSI, Mr. Arthur Loryoun, cited four vital points employed to overcome the challenges. He said that continuous engagement with people, sharing of information, community awareness through airway (radio), education, and regulatory enforcement were used.

For his part, the proprietor of Tuazama Medicine Store affirmed that challenges were overcome through awareness and training.

Sustainability of gains achieved through the AMS program

Sustainability is very crucial to the Liberia AMS program. General responses from the policy makers and regulators have shown that the government should be in the position to possess and maintain this noble sector.

Mr. David Sumo, Rev. Tyee, and Mr. Arthur Loryoun, responded by saying that the National Government and the regulatory institutions should oversee the pharmaceutical sector and take ownership of the program that has been initiated.

Mr. Sumo affirmed that a steering committee has already been constituted to plan strategies that would take the program forward after the donors providing the current funding start to phase out. "So it is a binding responsibility of all the regulatory authorities (PBL and LMHRA) to take the program where it stops and take ownership of it," he concluded.

The Assistant Minister, Mr. Tolbert Nyenswah said, "The thing is, we need money. This program needs to contribute to the malaria case management in our country. So the provision of appropriate medicines of assured quality is much more important."

For their part, Liaison Officer, Joseph Somwarbi and the PBL Senior Inspector, Jefferson Piah Harris, both said that continuous training of dispensers will sustain the program. "The program should be institutionalized in order to sustain it", Mr. Somwarbi concluded.

"The implementation of the AMS program is the sole responsibility of the PBL as a regulatory body. When the donors have phased out, its sustenance should be carried out by the PBL from the point the donors will leave it", said the Registrar/CEO of PBL, Mr. Joseph S. Weah.

For the AMS shop owners (Kadiatu Johnson, Moses Kesselly and William Tuazama) and the PBL Senior Inspector, Jefferson Piah Harris, pointed that constant inspection and training will make the program sustainable.

Completing the AMS roll-out process in Montserrado and scaling-up the program to other counties

General views from the respondents show that the roll-out process of the program and scaling-up to the rest of Montserrado and beyond require regulatory enforcement.

Mr. Nyenswah declared that to scale-up this program, there is a need for the policy makers to begin to talk to the philanthropic organizations, such as the Bill and Melinda Gates Foundation or the Mandela Foundation, so that the program can solicit help and funding from them. He said, "What we try to do, to ensure that this program goes forward, is to play the advocacy role to encourage these partners, like Gates Foundation, that started it, to give us more financial and technical support."

The scaling-up of this program requires increasing manpower through training so that the program can be rolled-out to the entire country. Mr. Tuazama remarked, "Going to the other parts of the country is long overdue. We need to recruit more manpower and mobilize more funding to maintain the program."

The Managing Director of the LMHRA and the Registrar of the PBL stated that the tools that have already been developed can be used to continue the program. The Chief Pharmacist, Rev. Tyee and the Proprietress of Irene Medicine Store, Kadiatu Johnson, recommended that increased regulation on every medicine store and the use of the AMS training serve as prerequisite for yearly registration.

Mobilization of resources to scale-up the AMS program

Generally, the majority of the policy makers interviewed responded by asking both the government and development agencies to support the program through budgetary allocation. But the view of shop owners, Naomi Kiazolu and Moses Kesselly, is that the taxes paid to government and the yearly

registration fees for medicine stores be used to run the program. Mr. William Tuazama suggested that the AMS program funds allocated to Liberia be used for the scaling-up of the program. He said, "The share given to Liberia by the Gates Foundation, if not all used, should be utilized to mobilize the program."

The chief pharmacist responded that this program is too soon to leave us abruptly. He affirmed, "There has to be some degree of top-up and some regulatory mechanism and some reward system, that is, reduction in tariff if required standards are met by shop owners for yearly registration."

According to the Liaison Officer of the AMS program in Liberia, Mr. Joseph Somwarbi, the scaling-up of this AMS training program should be institutionalized. Moreover, he said that the trainees should pay for the training in order to continue this great endeavor.

The Chief Executive Officer of the PBL has confirmed that this program is not only executed in Liberia. It was also carried out in other countries. Therefore, the manner in which they scaled-up in those countries can also be applied to Liberia.

Concluding comments and recommendations on the AMS program

In their concluding statements, the respondents commended the program owners and encouraged them to do more to see that it works for the good of the Liberian people. It was highly recommended that continuous training and inspection be conducted in those shops for its sustenance.

For his part, the Assistant Minister, Mr. Tolbert G. Nyenswah, encouraged all the stakeholders to generate more interest among themselves, so that they can all come together and have ownership of the program. He noted that a scale-up plan should be developed. He said, "We should have a good concept and have the program sustainable. This is where the ministry wants to see it going so that government takes over the program and it is not donor-driven." He concluded that the AMS program is an eye opener because the standard that it brought to the industry was great.

The Chief Pharmacist, Rev. Tyee, encouraged regulators and policy makers to work harder to improve the services of our people. He affirmed that these stores are the first and primary institutions for receiving patients. So if more is done through policy and regulation, we will have a better result.

Owners and Dispensers

Findings from the interviews conducted with the owners and dispensers of both the AMS and non-AMS shops in Montserrado County

The survey recruited a total of 23 (15 AMS and eight non-AMS) shop owners/dispensers who responded to 13 questionnaires. The data was analyzed and results are given below.

Overall impression from owners/dispensers of the AMS and non-AMS shops

The responses gathered from the participants recruited from both the AMS and non-AMS shops clearly indicate that the implementation of the AMS program in Montserrado is highly appreciated. This was ascertained by 20 of the 23 AMS and non-AMS shop owners. They said that the program has enlightened their minds and increased knowledge in dispensing medicines. Three of the non-AMS shop owners declared having no idea about the program.

The owners reported that the number of customers they receive per day has increased as a result of the training acquired and providing quality of services to the customers in those shops. Many of them hope that the program will be expanded and reach other parts of Liberia.

Changes brought by the AMS program in the retail medicine business

Both the AMS and non-AMS shop proprietors/dispensers have cited some pronounced changes since the AMS program implementation, such as an increase in the revenue, proper arrangement of medicines on the shelves, maintenance of clean environment, improved services, improved dispenser-customer relationship, and identifying cases that require referral to clinics. The sale of appropriate recommended dosages has been implemented by the dispensers due to their knowledge acquired from the training.

Community perception about the AMS program

The general perception of the community about the AMS program, as noticed by both the AMS and non-AMS shop owners, is good. Confidence has increased among the community residents in the shops that are accredited by the AMS program. The community is impressed and highly appreciative of the efforts exerted by the LMHRA and the PBL. One of the non-AMS shop owners indicated that the program has brought relief and sanity into our primary health services and he is looking forward to benefit from the program by going through the training and obtaining accreditation.

Changes noticed based on the AMS logo displayed in the shops

The views gathered from all the AMS shop owners/dispensers have shown that the logo builds confidence in the customers that the medicines in those shops are genuine and of good quality. The logo also serves to attract more customers and increases the daily revenue in their shops. However, the responses from three of the non-AMS shop owners/dispenser are quite different, stating they still maintain their same customer load and are praised for the services rendered irrespective of not having the logo.

Views about the efforts of the LMHRA and PBL to improve inspection of medicine stores

Many of the respondents from both the AMS and the non-AMS shop owners highly applauded the efforts of the LMHRA and the PBL for safeguarding the effective drug services in the medicine stores. It

was revealed that while the inspection on the medicine stores was good, there are still drug peddlers roaming around the country, who are not affected by the inspection exercises conducted by the LMHRA and the PBL. Some recommendations regarding the inspection exercises were made by almost all of the respondents, which include: (1) inspections be extended to the drug peddlers, (2) no biasness in the inspection, (3) observance of distance between medicine stores, and (4) ridding the market of counterfeit and substandard medicines.

Views about the efforts by the LMHRA and PBL on the availability of safe, effective and good quality medicines

Many respondents praised the efforts of the regulatory bodies for ensuring that safe, effective, and good quality medicines are sold. But both the AMS and non-AMS shop owners lamented the failure by these bodies to curtail the proliferation of drug peddlers from the streets. They said that much needs to be done by the LMHRA and the PBL to have the quality drugs in the market.

Changes experienced in the dispenser as a result of participation in the AMS training

Fourteen of the 15 AMS shop owners/dispensers affirmed that the AMS training has increased dispensing knowledge and brought empowerment to the owners/dispensers. Proper arrangement of medicines in categories on the shelves is a clear evidence of that knowledge acquired from the training. Also, the improvement in dispenser-customer relationship has been maintained, thus, improving the business. A majority of the non-AMS shop owners/dispensers said that they have not undergone the AMS training exercises. Some of them declared that they have some level of training, other than the AMS program, which enables them to work in the medicine stores.

The costs of upgrading the shops and the kind of upgrade

Generally, the upgrading of the shops was observed by both the AMS and non-AMS shop owners/dispensers.

The costs of upgrading the AMS shops ranged from as low as USD 80.00 to as high as USD 6,000.00, and the kind of upgrade in these shops included: renovation of roof, ceiling, interior expansion, painting, changing of counters, and reconstruction of the buildings to meet the AMS shop standards.

For the non-AMS shops, the costs of upgrade ranged from as low as USD 20.00 to as high as USD 3,000.00. Some of the upgrades included painting, reconstruction, and renovation of roof and ceiling.

Added value to the shops as a result of participating in the AMS program; requirements accrued for the accreditation to improve business

Generally, participation in the AMS program has added value to the businesses of both the AMS and non-AMS shop owners/dispensers. Nineteen of the 23 participants affirmed that their businesses are

flourishing greatly as a result of the training acquired from the AMS program. Four of the 23 participants confessed to having no idea about the AMS program being initiated in Liberia.

Some of the respondents said that they did not pay any money to acquire AMS accreditation while a good number of them said that they paid between $L 4,000.00 and $L 7,370.00 as requirement for the AMS accreditation.

Self-evaluation as the AMS dispenser and meeting the owners/proprietors' expectations

All of the 15 AMS shop owners/dispensers are highly impressed with the level of services they render. The AMS training has upgraded their performance and the proprietors' expectations are adequately met. Some dispensers indicated that due to their high performance, their monthly salaries have increased, making them satisfied. Most of the respondents reported seeing themselves as a help to the society.

The views from the non-AMS shop owners/dispensers have clearly shown that the proprietors' expectations are met and that all of them are impressed with their services in the medicine stores.

Adherence to regulations, collaboration with authority and identifying counterfeit and government products

Participation in the AMS program has helped the owners/dispensers of both the AMS and non-AMS shops to adhere to the regulatory policy on how to operate the medicine stores in Liberia.

All of the AMS shop owners/dispensers are adhering to and collaborating with the LMHRA and PBL to ensure that every policy made by the policy makers is observed and that counterfeit and government medicines are taken off the market.

Some of the non-AMS owners/dispensers expressed that even though they have not participated in the AMS training, they are adhering to the regulation from the LMHRA and PBL.

Owners/dispensers' awareness about the AMS program in Montserrado

The awareness about the AMS program has reached many parts of Montserrado through radio jingles and dramas. Eleven out of 15 AMS shop owners/dispensers said that they got the message concerning the program on the radio. Four of them said they had not heard any message about the AMS program on the radio or elsewhere. Four of the eight non-AMS shop owners/dispensers answered that they have heard about the program, while four said they had not.

According to those who received the message, it was through radio jingles emphasizing that medicines should only be purchased from stores bearing the AMS logo; that the AMS dispenser should be behind the counter; and the store should be clean and neat.

Consumers

Findings from the interviews conducted with consumers using both AMS and non-AMS shops in Montserrado County

The survey gathered views from 17 consumers who have different educational, social and occupational backgrounds in the communities that were identified for the research. The classes of interviewees recruited were students, hair dressers, petty traders, businessmen, community residents as well as drivers. They were asked to give their views about the AMS program and medicines stores operation in Liberia.

Where consumers routinely obtain or buy medicines

The consumers from both the AMS and non-AMS stores, totaling 17 respondents that were interviewed, stated that they often obtain medicines from the medicine shops. They said medicine shops were their first points of contact in terms of purchasing medicines or seeking medication. According to them, this is because the shops are located in close by, service is quick, and medicines are easy to access. Waiting time to buy medicines in medicines shops is greatly minimized compared with clinics and hospitals where there are longer wait times, and sometimes most of the medicines are not available.

Awareness of the AMS program to improve medicine stores

Generally, there is no awareness among the consumer population about the AMS program. Only two of the 17 (both the AMS and non-AMS shop) consumers acknowledged awareness of the program. The two consumers that responded being aware of the program, heard about it on the radio or saw the logo in a shop.

Overall impression of the AMS program in Montserrado

The majority of the consumers responded not being aware of the AMS program in Montserrado. They could not state anything about the overall impression of the program. But the two respondents who had said they were happy with the initiative and vowed to support it fully by promoting the efforts of the program. They also explained that the public has confidence in the AMS shops because they sell safe and effective drugs.

Changes noticed in the services or outlook of the local medicines stores

The respondents were divided on views with respect to this question. The bulk of the consumers said that they have seen changes in some of the medicine stores. The evidence is shown by the expansion of the structures and the decency of these shops. Improved quality of services rendered and good communication skills by the sellers or dispensers are also observed in the stores. More essential

medicines are now available in these shops. However, three of the respondents said that they have not seen changes in the medicine stores.

Indicating when the changes were noticed, if there were any

The consumers who acknowledged observing changes in the medicine stores indicated that they noticed changes about a year ago, especially in 2013. One of the respondents said the changes were observed two years ago.

Changes brought by the AMS program in the retail medicine stores

The consumers interviewed from both the AMS and non-AMS shops expressed not knowing about the AMS program. They therefore could not point to any changes that have been brought by the AMS program in the retail medicine stores. Few respondents said that they have seen changes in the structures of some stores, and dispensers' communication skills have greatly improved with their consumers. But they could not explain whether or not it was the AMS program responsible for the changes.

Community perception about the AMS program

The majority of the consumers from both AMS and non-AMS shops exerted that they could not clearly state the community's perception about the AMS program, because they are not sure whether or not the community is aware of the program. The few respondents (two consumers), who claimed being aware of the program, responded by saying, they believe that the community is impressed about the AMS medicines stores services and the entire AMS program.

Changes noticed since medicine shops became accredited and if it has affected where they buy medicines

The majority of the consumers explained that they can buy medicines from the nearby medicine store. They further stated that they do not know about any AMS program. Two out of the 17 consumers (from both the AMS and non-AMS shops) said they are fully aware of the AMS program and that they only buy medicines from stores that bear the AMS logo, because they believe those are the stores that contain quality and safe medicines.

Consumers' awareness about the AMS program in Montserrado

Generally, the awareness among the consumers population about the AMS program in Montserrado through the radio or elsewhere is poor. Out of the 17 study subjects, only three consumers admitted hearing the message on the radio. Fourteen consumers said that they have not heard any information concerning the AMS program. Those who claimed listening to the radio jingles said that the messages

listened to were: (1) don't buy medicines from non-registered medicine stores and (2) only purchase medicines from the AMS shops for quality medicines and good services.

Conclusion

Despite the fact that the implementation of the AMS program has by and large led to some owners/dispensers of medicine shops in Montserrado, the consumers are not practically aware of its presence in their communities. This indicates that the perceptions borne by consumers relative to the quality of medicines and services provided by medicine shop owners need redirection.

The consumers' preference for medicine stores is due to the provision of affordable medicines, easier access, and availability of medicines in those shops.

Another very important observation that came out is the need to remove counterfeit, adulterated and poor quality medicines as well as street peddlers from the market in Liberia. This is apparent at all levels as a limitation to the implementation of AMS.

Most respondents believed that community awareness through radio jingles and dramas was the most effective means of educating the public and promoting the AMS program.

Conclusions and Recommendations

The AMS intervention improved shop appearance and the cleanliness of the vicinity around medicine stores. With regard to availability, contrary to the results reported in Tanzania and Uganda, the AMS intervention appeared to have led to a decrease in product availability. This however, appears to be related to concurrent efforts by the LMHRA and PBL to register medicines in the country and to stringently inspect and regulate medicines store practice. The decrease in availability is thus not unexpected under the circumstances. This observation is supported by the fact that the decrease in product availability was seen in both AMS and non-accredited medicine stores.

The AMS intervention appeared to have led to marginal increases in medicines prices in accredited stores. The increase in prices appears to be a direct response to expenses incurred in improving infrastructure, training dispensers, improving quality of services, and increasing stock levels.

Overall, the program appeared to have improved dispensing services. During a mystery shopping exercise for malaria and pneumonia, the number of dispensers who sold the correct medicines increased from baseline to endline, the number of dispensers who gave correct dosage instructions also increased, and the number of dispensers who gave a number of patient-counseling information related to the conditions also increased. However, these improvements were observed in both accredited in non-accredited stores, which seem to indicate that the intervention led to improved services across the system.

Key stakeholders had positive things to say about the program. Most stated that the program was timely and much needed, and lamented the fact that the SDSI program was exiting the system so soon after it had catalyzed the massive changes observed in the private medicine stores business. Owners and dispensers appreciated the training they had received and stated that training program should continue beyond the life span of the SDSI program. Most owners stated that the program has increased their visibility and profitability.

Annex 1: Price and Availability Data Collection Form

This form is used for the indicators listed below:

- Proportion (%) of medicine stores with items on the tracer list in stock
- Approximate price of items on the tracer list to clients in Montserrado County

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 brand in stock.

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, 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: _____

Accredited by PBL (Y/N): (*Note Accreditation is not the same as registration***) _____**

Dispenser Trained by SDSI/LMHRA (Y/N): _____

Community: _____

Name of person interviewed: _____

Position of person(s) interviewed: _____

Data Collector(s): _____ 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 200mg	Lowest					
2	Amoxicillin capsule 250mg	Lowest					
3	Amoxicillin suspension 125mg/5ml 100ml	Lowest					
4	AS/AQ 100mg/270mg [6s]	Lowest					
5	Aspirin (Acetyl Salicylic acid) tablet 300mg	Lowest					
6	Benzyl Benzoate Lotion 25%	Lowest					
7	Benzyl Penicillin injection 1MU	Lowest					
8	Bisacodyl 5mg tablets	Lowest					
9	Chloroquine phosphate tablet 300mg base	Lowest					
10	Chlorpheniramine tablets 4mg	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
11	Condoms	Lowest					
12	Clotrimazole cream	Lowest					
13	Co-trimoxazole suspension 240mg/5ml 60ml	Lowest					
14	Co-trimoxazle tablet 480mg	Lowest					
15	Doxycycline capsule/tab 100mg	Lowest					
16	Erythromycin tablet 250mg	Lowest					
17	Ferrous sulfate 200mg tablets	Lowest					
18	Folic acid 400ug tablets	Lowest					
19	Gentamycin eye/ear drops 0.3%	Lowest					
20	Gentian violet 50ml	Lowest					
21	Ibuprofen tablet 200mg	Lowest					
22	Hydrocortisone cream	Lowest					
23	Magnesium trisilicate tablets	Lowest					
24	Mebendazole tablet 100mg	Lowest					
25	Metronidazole tablet 200mg	Lowest					
26	Multivitamin tablets	Lowest					
27	Nystatin pessary 100,000 iu	Lowest					
28	Nystatin suspension 100,000 iu	Lowest					
29	ORS	Lowest					
30	Paracetamol tablet 500mg	Lowest					
31	Procaine Penicillin Fortified 4MU	Lowest					
32	Quinine injection 300mg/ml	Lowest					
33	Quinine tablets 300mg	Lowest					
34	Sulfadoxine + Pyrimethamine tablet 525 mg	Lowest					
35	Tetracycline eye ointment 1%, 3.5g	Lowest					

Annex 2: Simulated Client Data Collection Form for Malaria

Scenario for Simulated Client 1: *Uncomplicated Malaria*

Present yourself as the caregiver of a 4 or 5 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 the indicators below:

- % of encounters in which appropriate first-line antimalarial medicine was sold for malaria treatment
- % of encounters in which appropriate first-line antimalarial medicine was dispensed consistently with standard treatment guidelines (STGs) for treatment of malaria
- % of encounters in which attendant provided instructions on how to take the medication
- % of encounters in which attendant asked about the symptoms of the child
- % encounters where attendant asked for more information about the condition presented e.g. ask age of child, duration of fever, danger signs, and previous treatment.
- % of dispensers who warned caregivers about any danger signs [progressive illness]
- % of dispensers who recommended a referral visit to a doctor or clinic if the danger signs appear
- % of dispensers who prescribed an ineffective antimalarial (one which 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 were recommended by the attendant 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 3: Simulated Client Data Collection Form for Pneumonia

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

Present yourself as the caregiver of a 4-year-old child who has had a cough, fever, and is breathing faster than usual. Also 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 3 day 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 the indicators below:

- % of encounters in which medicine was dispensed according to STG for ARI management in children under 5 years
- % of encounters in which attendant provided instructions on how to take the medication
- % 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 5

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 were recommended by the attendant 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/ you took? **Yes** ☐ **No** ☐

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

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

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

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

Annex 4: Simulated Client Data Collection Form for Pneumonia

Key Informant Interviews

Date: _____ **Time:** _____

Name of Person Interviewed:
_____

Position/Designation:
_____

Name of Interviewer: _____ **Date:** _____

Stakeholder's Interviews
Interviews should be conducted with officials in the institutions listed below. Please record the name of the person interviewed and their position within the institution. All questions related to the SDSI/LMHRA/PBL program and the interviewer should probe around each question. Each response should be recorded accurately and quotations cited where possible. It should not take more than 30 minutes to interview each of the persons.

Stakeholders' Interviewers Guiding Questions

Questions for Legislative Authorities

1. What is your overall impression of the AMS program in Montserrado?

2. What changes have been brought by AMS program in retail medicine business?

3. What are community perceptions about AMS?

4. What changes have you noticed since medicine shops became accredited/obtained the AMS logo?

5. What were the major challenges in implementing the AMS program?

6. How were these challenges overcome?

7. What should be done to sustain the gains achieved through the AMS program?

8. What should the responsible authorities do to facilitate the completion of the AMS roll out process to the rest of Montserrado County and to scale the program up to other counties?

9. How can the resources needed to scale up the AMS program be mobilized?

10. Any other comments on the AMS program

Target: for either FGD or Key Informant interview:

- MOHSW, LMHRA, PBL officials
- Select AMS/medicines stores dispensers and proprietors
- Clients/consumers around the vicinity of the shop
- County-Level Political and Civic Leaders

Stakeholders' Interviewers Guiding Questions

Questions for AMS dispensers/proprietors

1. What is your overall impression of the AMS program in Montserrado?

2. What changes have been brought by AMS program in retail medicine business?

3. What are community perceptions about AMS?

4. What changes have you noticed since medicine shop became accredited/obtained the AMS logo? Has that affected your choice of where to buy medicines?
5. What are your views on the efforts by LMHRA and LPB as part of AMS program to improve inspection of medicine stores?
6. What are your views on the efforts by LMHRA and PBL to ensure the availability of safe, effective, and good quality medicines?
7. Has your understanding of the quality of medicines currently in the market changed as results of LMHRA/ AMS program?
8. What has changed since dispenser's training? How has participation in the AMS training improved your work?
9. How much did it cost to invest in order to meet the upgrade costs? What kind of upgrade did the shop do?
10. Has participation in the AMS program added value to your business? OR How much have you invested in accreditation requirements and has that been good for your business?
11. How do you see your job as AMS dispenser? Are you able to meet owners/proprietors expectations? Has that changed as a result of accreditation?
12. How has your participation in the AMS program helped your understanding of the following:
    a. importance of regulatory adherence
    b. close collaboration with the Authority/Board
    c. Stocking of counterfeit medicines or those that are for government of Liberia?
13. Over the past months, did you hear any message or information in the radios or elsewhere about AMS program in Montserrado? What was the message all about?
14. Any other comments regarding medicines stores in Liberia.

Questions for Consumers

1. Do you routinely buy medicines from medicines stores?

2. Are you aware of the program to improve medicine stores (the AMS program)?

3. If you are aware what is your overall impression of the AMS program in Montserrado?

4. If you are not aware of the program have you noticed any changes, in services or outlook of your local medicine stores?

5. If you noticed any changes, please indicate when you began to notice these changes.

6. What changes have been brought by AMS program in retail medicine business?

7. What are community perceptions about AMS?

8. What changes have you noticed since medicine shop near you became accredited/obtained the AMS logo? Has that affected your choice of where to buy medicines?
9. Over the past months, did you hear any message or information in the radios or elsewhere about AMS program in Montserrado? What was the message all about?
10. Any other comments regarding medicine stores in Liberia

End of Report