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Maternal and Child Survival Program

MCSP Liberia Restoration of Health Services Project

Endline Assessment Report

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MCSP is a global USAID initiative to introduce and support high-impact health interventions in 25 priority countries to help prevent child and maternal deaths. MCSP supports programming in maternal, newborn, and child health, immunization, family planning and reproductive health, nutrition, health systems strengthening, water/sanitation/hygiene, malaria, prevention of mother-to-child transmission of HIV, and pediatric HIV care and treatment. MCSP will tackle these issues through approaches that also focus on household and community mobilization, gender integration, and digital health, among others.

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Abbreviations

ANC	Antenatal Care
ASRH	Adolescent Sexual and Reproductive Health
CHT	County Health Team
COC	Combined Oral Contraceptive
DHT	District Health Team
EPHS	Essential Package of Health Services
EPI	Expanded Program on Immunization
FP	Family Planning
HMIS	Health Management Information System
iMMR	Institutional Maternal Mortality Ratio
IMNCI	Integrated Management of Newborn and Childhood Illnesses
IPC	Infection Prevention and Control
IPT	Intermittent Preventive Treatment
IUD	Intrauterine Device
MCH	Maternal and Child Health
MCSP	Maternal and Child Survival Program
MOH	Ministry of Health
NLD	Normal Labor and Delivery
OIC	Officer in Charge
PPFP	Postpartum Family Planning
RDT	Rapid Diagnostic Test
RHS	Restoration of Health Services
RMNCAH	Reproductive, Maternal, Newborn, Child, and Adolescent Health
RMNCH	Reproductive, Maternal, Newborn and Child Health
SGBV	Sexual and Gender-Based Violence
SQS	Safe Quality Health Services
USAID	U.S. Agency for International Development

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Executive Summary

Background

The Maternal and Child Survival Program is a global U.S. Agency for International Development (USAID) cooperative agreement to introduce and support high-impact health interventions in 25 priority countries with the ultimate goal of ending preventable child and maternal deaths within a generation. Following the Ebola crisis, USAID/Liberia asked the Maternal and Child Survival Program (MCSP) to restore confidence in the health system by restoring high-quality service delivery at primary health care facilities and to support the nationwide roll-out of infection prevention and control (IPC) training and protocols through the MCSP Restoration of Health Services (RHS) project in three counties in Liberia.

RHS Project Objectives

1. *Strengthen prevention at facilities*:
   Infection prevention and control practices at 77 health facilities are strengthened through training, intensive supportive supervision, triage, improvement of waste management, and planning and management of essential IPC commodities and supplies.
2. *Increase maternal and child health (MCH) service demand and utilization through restored service delivery*:
   Demand is generated and delivery of high-quality primary health care services is restored through the implementation of reproductive, maternal, newborn, and child health (RMNCH) care as part of the Essential Package of Health Services (EPHS) in 77 facilities.

This endline assessment was designed to generate endline data upon which the effectiveness and outcomes of the USAID MCSP/RHS project on the health of Liberian families can be measured, compared to the situation at baseline. The assessment aimed to establish the endline status of all facilities after project implementation and assess the extent to which the RHS project has restored confidence, quality, and the use of reproductive, maternal, newborn, child, and adolescent health (RMNCAH) services in the targeted counties and facilities.

Methods

The endline assessment utilized a quasi-experimental design that allowed a consistent analysis of pre- and post-intervention facility readiness and quality of care in MCSP-supported facilities. This included the use of quantitative and qualitative methods: facility readiness assessment, quality of care assessment, and qualitative key informant interviews with Ministry of Health (MOH) managers and supervisors at the district and county levels.

For the facility readiness assessment, we used three tools to assess a) human resources, service provision, and infrastructure; b) commodities, supplies, and equipment; and c) implementation of health activities developed from the EPHS guide and the WHO Service Availability and Readiness Assessment tool. For the quality of care assessment, facilities were assessed using tools adapted from the 10 MOH Core Standards and an IPC standards assessment. We developed a qualitative data collection tool to collect perspectives from MOH stakeholders on the project's implementation and impact.

Thirty-nine (50%) of MCSP's supported health facilities were selected using a stratified random sampling approach. We used convenience and purposive sampling to identify key informants for interviews. Twenty-one external consultants conducted the assessment on December 4–15, 2017, after obtaining consent from the facility officer in charge or designate, or the key informant. Quantitative data were double-entered and validated in CommCare. Cleaning and analysis were conducted in Excel. Detailed notes were written for all interviews; themes were summarized in Word.

Results and Discussion

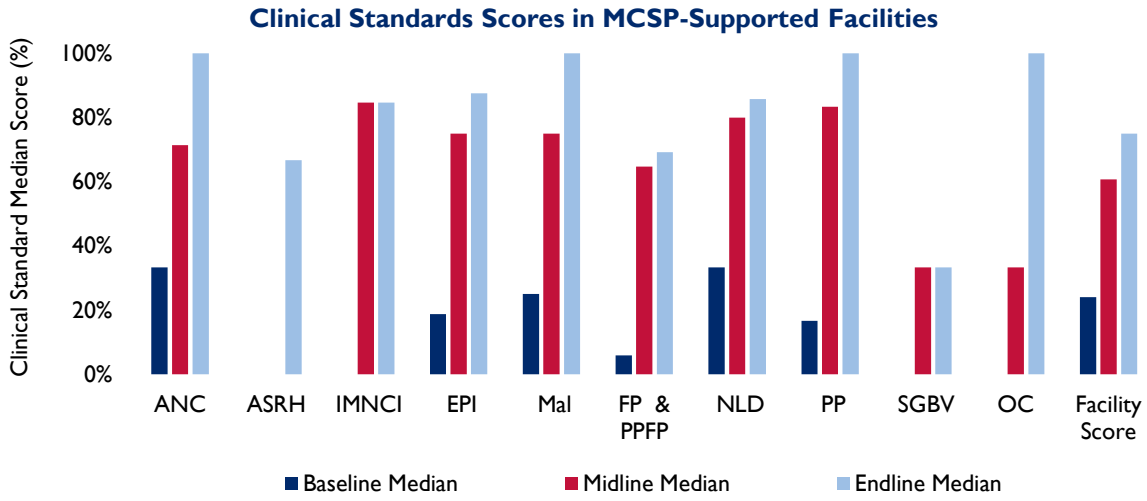
Facility Readiness

At endline, 95% of facilities had minimum staffing to provide essential RMNCAH services. Nearly all facilities were providing all services, with the exception of management of obstetric complications and care for sexual and gender-based violence. The proportion of facilities with functional and safe waste disposal, an onsite water source, and a triage infrastructure increased significantly between the baseline and endline period. Infrastructure indicators with the most remarkable improvements include: functional incinerator (57% to 87%), functional triage (41% to 74%), isolation unit (27% to 74%), isolation unit latrine (16% to 59%), and functional water source onsite (from 63% to 82%).

There was major improvement in availability of essential supplies and equipment for high-quality RMNCAH services. Most notably, the proportion of facilities with blood pressure machines and stethoscope increased from 38% at baseline to 89% at endline; with sterilized delivery kits and cord ties increased from 48% to 95%, with delivery bed and bed linen from 28% to 97%, with a newborn resuscitation table from 26% to 84%, and with hand washing facilities from 54% to 100%. While the availability of some commodities and most vaccines improved from baseline to endline (e.g., availability of pentavalent vaccine increased from 26% to 97%), stockouts of malaria rapid diagnostic tests and malaria commodities remain a major challenge.

Quality of Care

The median facility score on the clinical standards assessment was 75% at endline, compared to 24% at baseline and 61% at midline. With the exception of care for sexual and gender-based violence, standard achievement improved by more than 50% from baseline to endline for all technical areas. From the time of the midline assessment (August 2016) to the time of the endline assessment (December 2017), the greatest improvements were noted in provision of adolescent sexual and reproductive (ASRH) services (67% increase), antenatal care (ANC) (29% increase), and malaria care (25% increase). There was also significant improvement in the quality of care for obstetric complications (67% increase in standards achieved).



At endline the median score on the Safe, Quality Health Services (SQS) standards for facilities assessed increased to 82%, thus **achieving the national target of 80%**. The range of scores on SQS standards was 53% to 100%. At baseline, the facility average score on the IPC standards was 76% (range: 17% to 100%). Overall, the median facility score on six of the eight SQS categories was 100% at endline.

This demonstrates an *improvement* and *maintenance* of adherence to IPC practices long after the immediate threat of Ebola had faded. Maintaining these practices improves the facilities' ability to prevent the spread of infection among clients and staff themselves while providing RMNCAH services.

In addition, there has been a dramatic increase in the use of RMNCAH services at MCSP-supported health facilities since the inception of the project. This speaks to both the increased availability and quality of service provision, and restored confidence in the health system. For example, the numbers of women receiving IPT2+ and skilled delivery services, and the number of children receiving Penta3 vaccination and proper diagnosis and treatment for pneumonia, doubled between baseline (April–June 2015) and endline (October–December 2017).

In terms of using these data for decision-making at the facility level, 92% of facilities reported reviewing performance, based on health management information system (HMIS) data, with a district or county supervisor during supervision visits, compared to 61% at baseline. Seventy-eight percent of facilities reported making a decision based on the RMNCH data, compared to only 53% at baseline.

Stakeholder Feedback on Project Impact

Respondents described smooth and cordial coordination with MCSP, emphasizing the importance of the project's broad range of support, including supply and distribution of IPC materials, essential drugs, delivery beds and other medical equipment, improved capacity to do supervision through data validation, monthly supervision, and presentation of periodic and quality review. Respondents felt MCSP's support enhanced the level of quality of the services provided at the facilities, especially infection prevention and control practices, ambulance and referral support, and training and mentorship during the joint supportive supervision. Respondents also emphasized that the salary paid to government health workers was one of the most important aspects of the support provided. This motivated staff to stay at the facilities for service provision. Respondents noted that as a result of MCSP's work, supervisors were qualified and better equipped with required MOH supervision tools and logistics capacity to carry out high-quality, on-time supervision activities. This, in addition to conducting numerous trainings for MCH staff, in turn improved the ability of facility staff to provide maternal and child health services and address identified gaps.

Conclusions & Recommendations

This endline assessment revealed tremendous improvement in MCSP-supported facilities between baseline and endline in the key areas supported by MCSP/RHS—availability of health workers and payment of salaries, basic equipment and supplies, basic infrastructure (e.g., wells, incinerators, triage, isolation units, and latrines), service provision for essential RMNCAH interventions, and adherence to clinical standards to ensure quality of care. MOH perception of the project was also very positive.

The endline assessment results demonstrate that MCSP/RHS has remarkably restored access to and utilization of health services and has rebuilt confidence in the health systems at the facility and county levels, thereby contributing to improvements in RMNCAH outcomes in Liberia following the tremendous impact Ebola had on utilization of and confidence in the health system. The restoration of the system is evidenced by a combination of programmatic improvements in health service delivery in MCSP-supported facilities and the positive performance of key outcome indicators over the 34 months of the project.

Despite the huge improvments in the supported health facilities, one key area that needs to be critically addressed is recurrent stock outs of essential medicines. The gains made by MCSP/ RHS need to be sustained through transitioning of health facility staff to the govermnet payroll; ongoing procurement and distribution of IPC supplies; and proper use and maintenance of medical equipment and waste, water, and triage features.

Introduction

The Maternal and Child Survival Program (MCSP) is a global U.S. Agency for International Development (USAID) cooperative agreement to introduce and support high-impact health interventions in 25 priority countries with the ultimate goal of ending preventable child and maternal deaths within a generation. MCSP engages governments, policymakers, private sector leaders, health care providers, civil society, faith-based organizations, and communities in adopting and accelerating proven approaches to address the major causes of maternal, newborn, and child mortality—postpartum hemorrhage, birth asphyxia, and diarrhea—and improve the quality of health services. The program tackles these issues through approaches that also focus on health systems strengthening, household and community mobilization, gender integration, and eHealth, among others.

In light of the Ebola crisis, USAID/Liberia asked MCSP to support its commitment to restoring service delivery at primary health care facilities and to support its nationwide roll-out of infection prevention and control (IPC) training and protocols through the MCSP Restoration of Health Services (RHS) project in three counties in Liberia. Through MCSP, USAID/Liberia and the Government of Liberia aim to renew confidence in the Liberian health system by improving the quality and accessibility of reproductive, maternal, newborn, and child health (RMNCH) services. The Liberia MCSP RHS program is a 34-month project with a geographic focus on 77 health facilities in Grand Bassa, Lofa, and Nimba counties.

MCSP RHS Liberia's overarching goal is to restore confidence in the health care system by upgrading IPC practices that are critical for fighting Ebola and other infectious diseases and ensuring restoration of maternal and child health (MCH) services in target facilities.

RHS Project Goals

1. Strengthen prevention at facilities:

   Infection prevention and control practices at 77 health facilities are strengthened through training, intensive supportive supervision, triage, improvement of waste management, and planning and management of essential IPC commodities and supplies.
2. Increase MCH service demand and utilization through restored service delivery:

   Demand is generated and delivery of quality primary health care services is restored through the implementation of RMNCH as part of the Essential Package of Health Services (EPHS) in 77 facilities.

In-depth health facility readiness assessments were conducted in August 2015 to assess human resource availability per EPHS standards, availability of EPHS services, referral and community outreach activities, infrastructure needs for IPC, and availability of essential drugs, supplies, and equipment for the provision of reproductive, maternal, newborn, child, and adolescent health (RMNCAH) services. Between December 2015 and January 2016, MCSP conducted a baseline quality of care assessment in all 77 MCSP-supported facilities in Grand Bassa, Lofa, and Nimba counties. MOH Clinical Standards were adapted and used to assess the quality of services provided in each of the EPHS technical areas included in MCSP's scope of work, including maternal and newborn health, child health, reproductive health and family planning, adolescent health, and infection prevention and control. This quality of care assessment provided insight into the technical competencies of the health care providers who were working at the health facilities at the time the project began.

Together, these findings were used to design facility-specific action plans and determine priority MCSP interventions in the 77 supported health facilities in Grand Bassa, Lofa, and Nimba counties. In an effort to address the gaps identified, MCSP has implemented many interventions, including paying salaries for hired staff assigned to the facilities to fill staffing gaps in the health facilities; conducting integrated training for providers to improve their competencies; engaging providers and other health facility staff in onsite routine supportive supervision, mentoring, and coaching; renovating waste, water, and triage features; providing medical- and non-medical supplies, drugs, and Expanded Program on Immunization (EPI) outreach support; and improving data quality and use in all supported facilities.

Assessment Objective

This endline assessment was designed to generate endline data upon which the effectiveness and outcomes of the MCSP/RHS project on the health of Liberian families can be measured. The assessment aimed to establish the endline status of all facilities after project implementation and assess the extent to which the RHS project has restored confidence, quality, and use of RMNCAH services in the targeted counties and facilities.

Methods

Design

The endline assessment was designed to be as similar to the baseline assessment as possible; therefore it utilized a quasi-experimental design that allowed a consistent analysis of pre- and post-intervention facility readiness and quality of care in MCSP-supported facilities. The analysis included the use of quantitative and qualitative methods: facility readiness assessment, quality of care assessment, and qualitative key informant interview with MOH managers and supervisors at the district and county levels.

Data Collection Tools

Facility readiness assessment: The MCSP Readiness Tool incorporated three facility readiness tools to assess: a) human resources, service provision, and infrastructure; b) commodities, supplies, and equipment; and c) implementation of health activities such as immunization outreach and data use. The facility readiness tools were developed in July–August 2015 based on the Liberia MOH guide for EPHS and the WHO Service Availability and Readiness Assessment tool. MCSP added questions related to infrastructure, training, and service provision based on the scope of MCSP, thereby making the tools suitable for both performance evaluation and work planning purposes.

Quality of care assessment: Tools were adapted from the 10 MOH Core Standards, covering the following technical areas: EPI, integrated management of newborn and childhood illnesses (IMNCI), malaria, antenatal care (ANC), normal labor and delivery, obstetric complications, postpartum care, adolescent sexual and reproductive health (ASRH), sexual and gender-based violence (SGBV), and family planning (FP), including postpartum family planning (PPFP). Infection prevention and control was assessed using the MOH IPC Minimum Standards for Facility Opening at baseline and the MOH Safe, Quality Services standards assessment tool at endline. Clinical procedures were only assessed for services relevant to each facility level.

Key informant interview guide: We developed a qualitative data collection tool to collect perspectives from county, district, and national MOH stakeholders on the project's implementation and impact.

Sampling

In order to be most efficient with resources while still gathering representative data, 50% of MCSP-supported facilities were sampled for the facility readiness and quality of care assessment, using a stratified random sampling approach. Thirty-nine facilities were sampled from a total 77 MCSP-supported facilities. Sampling was stratified by county, facility type (hospital, health center, clinic), and facility ownership (government, faith-based, private/concessional), ensuring an inclusive representation of MCSP-supported facilities. To minimize opportunities for bias in the results, MCSP did not communicate the list of sampled facilities to the county health team (CHT) and facilities in advance of the assessment.

Convenience and purposive sampling were used to select key informants for interviews, targeting district health officers and county health team members, including managers, clinical supervisors, and monitoring and evaluation officers. In total, nine from the CHT level and six from the district health team (DHT) level were sampled.

Data Collection

Date, Team Composition, and Consent

Data were collected for all three components of the endline assessment from December 4 through December 15, 2017, following a data collection training. The data collectors included 21 external consultants comprising five teams of four assessors and one qualitative interviewer, with one person designated as team lead on each team. The three MOH clinical supervisors from Grand Bassa, Lofa, and Nimba, as well as two Monrovia-

based MCSP staff, supervised the data collection exercise and conducted onsite verification, spot checks, and quality assurance throughout the data collection period.

Assessment team leads obtained verbal consent from the CHT representative and from the officer in charge (OIC) of the facility or a designate. The team lead signed the consent form confirming that verbal consent had been received from the OIC on behalf of all health facility staff.

Data Collection and Verification Methods

Paper-based tools were used for primary data collection. To conduct the assessment, the team leads divided all 15 tools (12 quality of care and three facility readiness), labeled "original," between assessors. The assessor observed service providers giving care, and in areas where there were no clients, service provision was simulated. Similarly if a commodity was out of stock but the provider described proper use of the commodity, the assessors scored the criteria or standard as achieved. The team leads assessed facilities using the MCSP Readiness Tool. Following primary data collection and at each facility assessed, a copy of each assessment tool labeled "copy" was filled out with same information as the corresponding original tool. The copies of the tools were given to the facility OIC in an envelope and left as a record for the facility. The facility OIC then signed a checklist to confirm receipt of all assessment tools. The team lead reviewed all forms before leaving the facility to ensure that each question was answered, and responses were the same on the original and copy forms.

Each team lead entered the collected and verified data from the original data collection forms into CommCare, and the data were synched to a server. At the end of the assessment, a second data entry for all tools was conducted and results cross-checked to ensure the accuracy of the data entered. For the first data entry, team leads entered data from facilities their respective teams assessed. For the second data entry, team leads entered each team's data.

Key Informant Interviews

After obtaining informed consent, interviewers began the audio recording and started the interviews. The interviewers followed the structured interview guide and took notes throughout the interview. Notes were expanded following the interviews as necessary using the audio recording.

Data Quality

Data quality was ensured throughout the assessment using various measures. First, all data collectors participated in a rigorous, practical training that included practice and tool pretesting at health facilities not sampled for the assessment. Multiple checks were used throughout the data collection process, including observation to ensure adherence to standard operating procedures, team lead review of all data collected for quality and completeness before departure from facility, and double data entry into electronic data collection tool with built-in data validations.

Data Analysis

All assessment data entered into CommCare were exported to the MCSP RHS SQL database for storage and cleaning. Data were then exported to and analyzed in Excel. Descriptive statistics, including percentage distributions, means, and medians, were analyzed for the facility readiness assessment data and compared between the two periods (baseline and endline). Because the number of MCSP-supported facilities increased after the baseline facility readiness assessment, the endline sample (39 of 77) was compared to the baseline sample (52 of 61) for facility readiness. IPC standards were analyzed using MOH analysis procedure, which is the percentage of standards achieved by component and the mean score on all components.

The clinical standards were scored based on the number of verification criteria met; if all verification criteria on a clinical standard were met, that standard was achieved. Thus the score was total score on each technical area achieved divided by total number of scores. The facility overall score is the average score of all technical areas

assessed. The standards assessment scores of the 39 facilities sampled for the endline assessment were compared to the scores of same facilities at midline and baseline. Comparison was done at the technical area level.
For the RMNCAH, 37 facilities could be assessed and compared to the same facilities at baseline and midline. At two of the 39 facilities, all clinicians on staff were off-site at a training on the day of assessment. For EPI, 38 of 39 facilities were assessed and compared; one of the 39 sites does not provide vaccination services per CHT direction. Therefore, the project overall result is the median score for each technical area or median facility overall score, compared to the median scores at midline and baseline, using the endline sample as a representative sample. Qualitative data were themed, coded, and summarized in Microsoft Word.

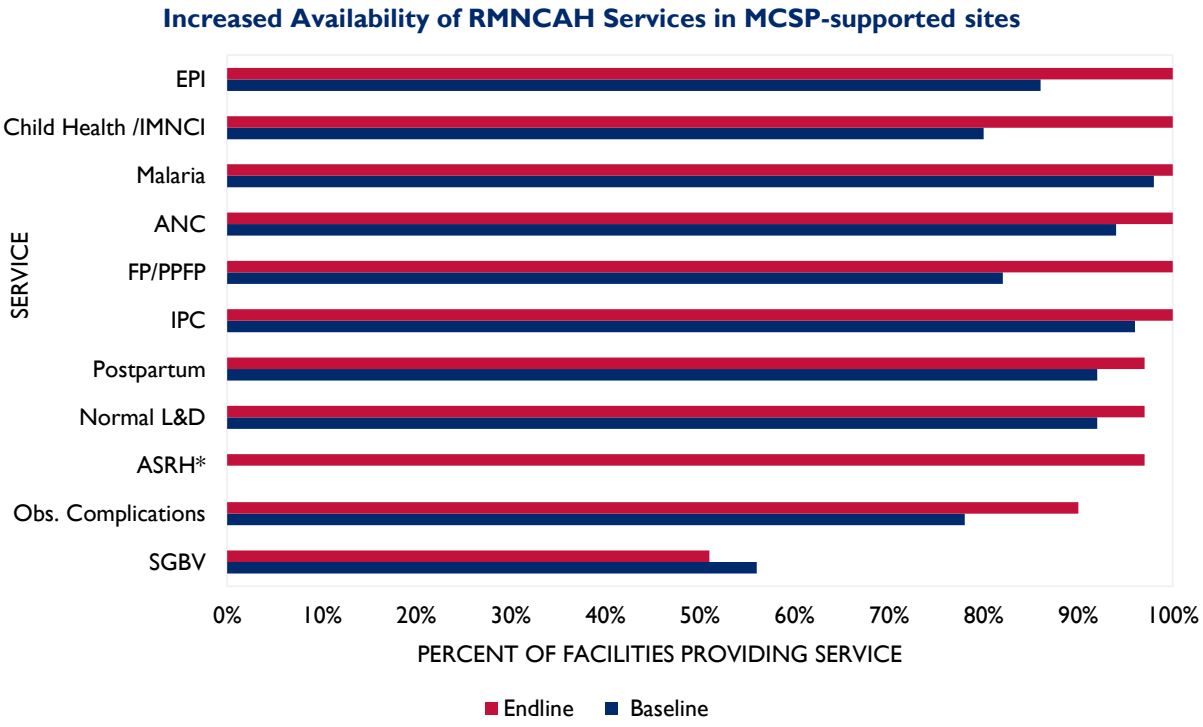
Results and Discussion

Findings from Facility Readiness Assessment

Provision of Services

The facility readiness assessment examined the types of services provided in the facilities and changes in the proportion of facilities providing these services between baseline and endline. A comparison of baseline and endline results showed minimal changes in availability of most MCSP-supported services because over 90% of facilities were already providing the RMNCAH services at the inception of the project. On average, facilities are providing 92% of these services at endline, compared to 83% at baseline. The most notable changes were observed in the following services: FP/PPFP increased from 82% to 100%; management of obstetric complications increased from 78% to 90%; IMNCI increased from 80% to 100%; and EPI increased from 86% to 100%. Figure 1 further highlights the changes in specific interventions.

Figure 1: Changes in the proportion of facilities offering RMNCAH services (baseline vs. endline)



*ASRH not assessed at baseline.

Human Resources

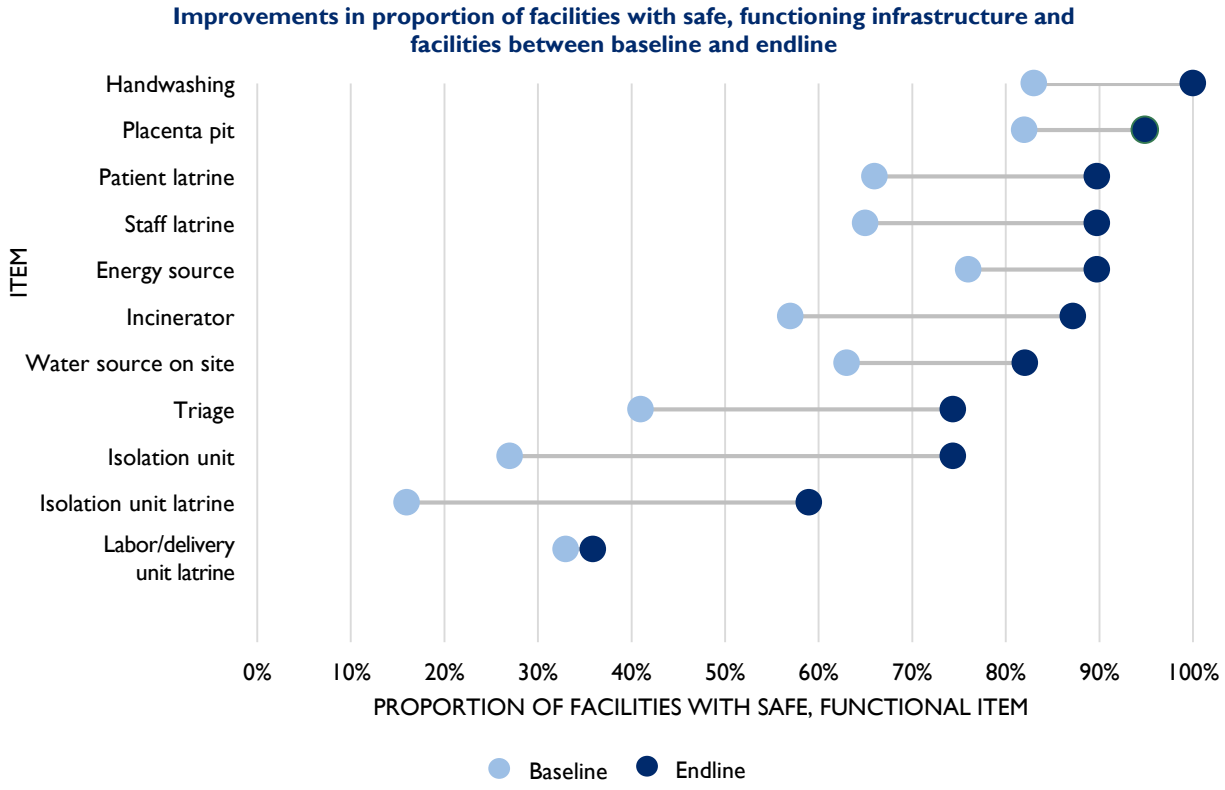
MCSP considered two full-time clinical staff (nurse, midwife, doctor, or physician assistant) and one vaccinator to be the minimum number of staff required at a health facility to provide basic RMNCAH service. The proportion of MCSP-supported facilities meeting this staffing requirement substantially increased, from 73% (38 of 52) at baseline to 95% (71 of 74)[1] at endline.

[1] Endline result from routine monitoring data. This is a quarterly key performance indicator. Target is 74 because three MCSP-supported facilities are for-profit/concessional hospitals and MCSP did not provide staffing support for these facilities.

Infrastructure

MCSP implementation has resulted in demonstrable infrastructural improvements in the majority of supported facilities. The proportion of facilities with functional and safe waste disposal, onsite water source, and triage infrastructure increased significantly between the baseline and endline periods, as shown in Figure 2 below. Infrastructure with most remarkable improvement include: functional incinerator (57% to 87%), functional triage (41% to 74%), isolation unit (27% to 74%), isolation unit latrine (16% to 59%) and functional water source on site (from 63% to 82%). Notably, at endline, 100% of facilities had a functioning handwashing station at each point of care. All of these features are essential for a facility to be able to provide safe, high-quality health services.

Figure 2: Safe, functioning infrastructure for waste, water, and triage



Essential Equipment

The availability of equipment is a reflection of facility capacity to provide quality services. The endline assessment examined availability of specific basic equipment in the sampled facilities. The findings revealed that following procurement and distribution of equipment supported by the RHS project, availability of most essential equipment improved significantly in the facilities. For some of the equipment listed—for example, vaccination refrigerators and solar light—the project did not procure directly for facilities but advocated for the equipment distribution through other partners, including UNICEF and We Care Solar. The availability of most of the basic equipment and supplies significantly increased between baseline and endline in the RHS facilities, as depicted in Figures 3a–3d. Most notably, the proportion of facilities with blood pressure machines and stethoscope increased from 38% at baseline to 89% at endline; the proportion with sterilized delivery kits and cord ties increased from 48% to 95%; the proportion with delivery bed and bed linen increased from 28% to 97%; the proportion with a newborn resuscitation table incresed from 26% to 84%; and the proportion with hand washing facilities increased from 54% to 100%. Because availability of equipment is directly related to the services that can or cannot be offered at a health facility, it is inferred that the delivery of services also improved over the period of RHS implementation.

Figures 3a–3d present the change in availability of equipment and supplies between baseline and endline in the MCSP-supported facilities.

Figure 3a: Proportion of facilities with functioning maternal and newborn health supplies and equipment at baseline and endline

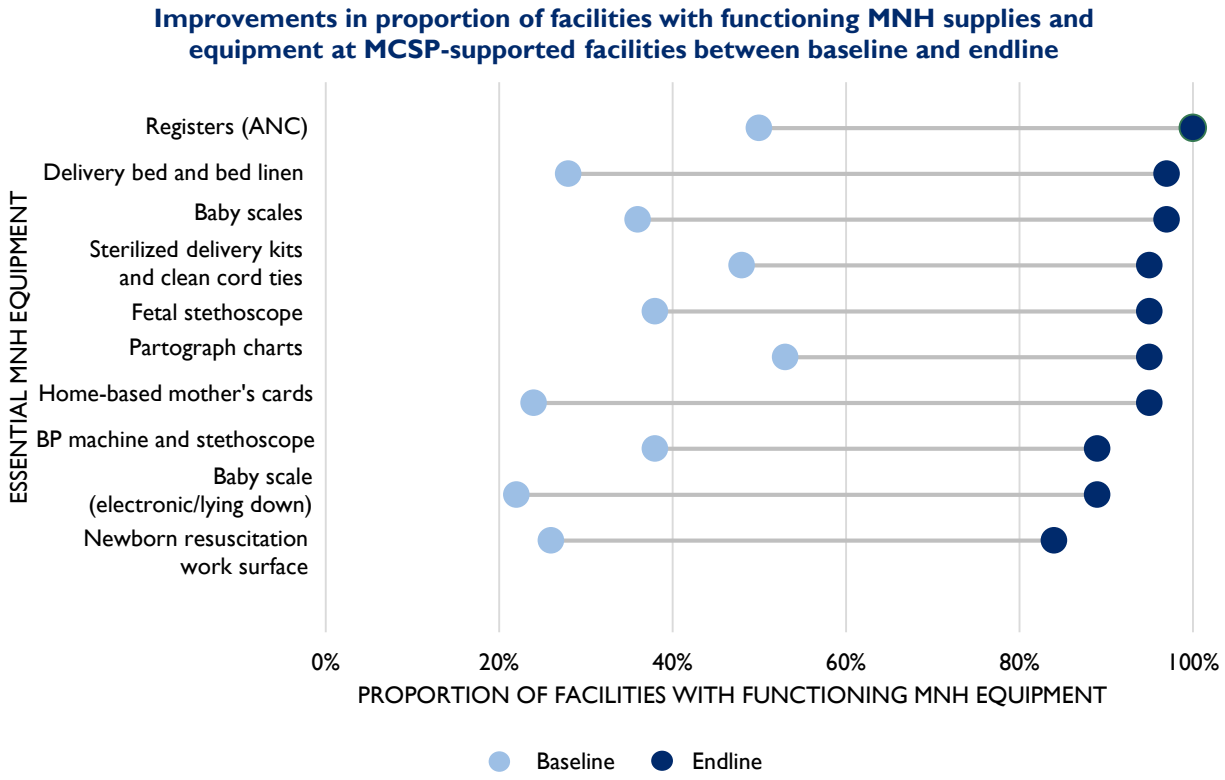


Figure 3b: Proportion of facilities with functioning family planning supplies and equipment at baseline and endline

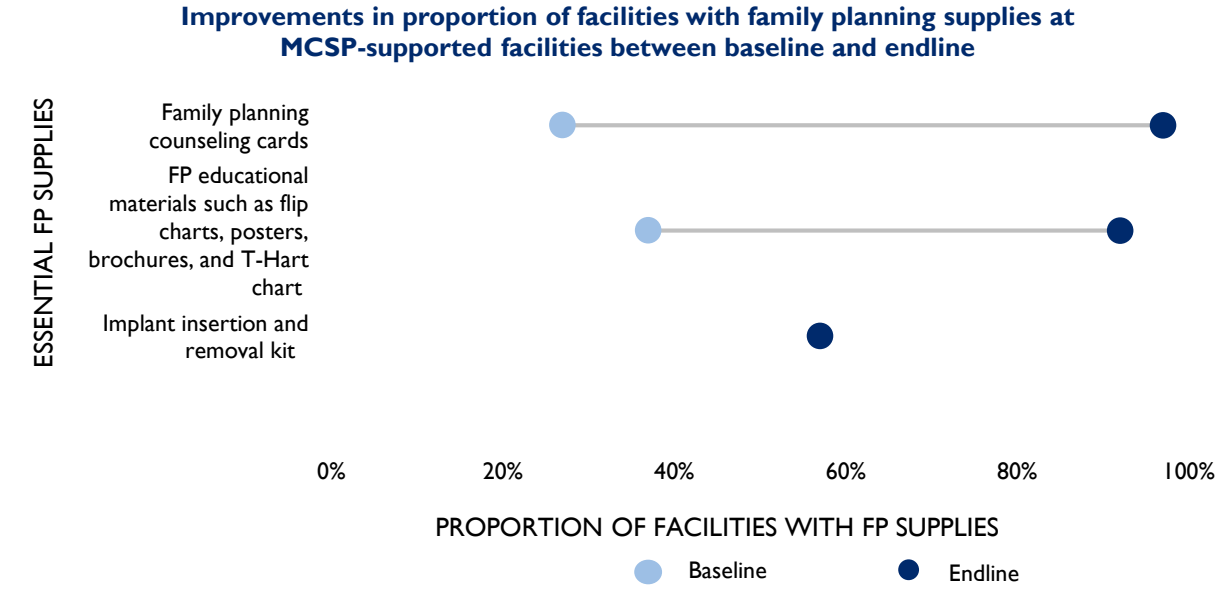


Figure 3c: Proportion of facilities with functioning child health supplies and equipment at baseline and endline

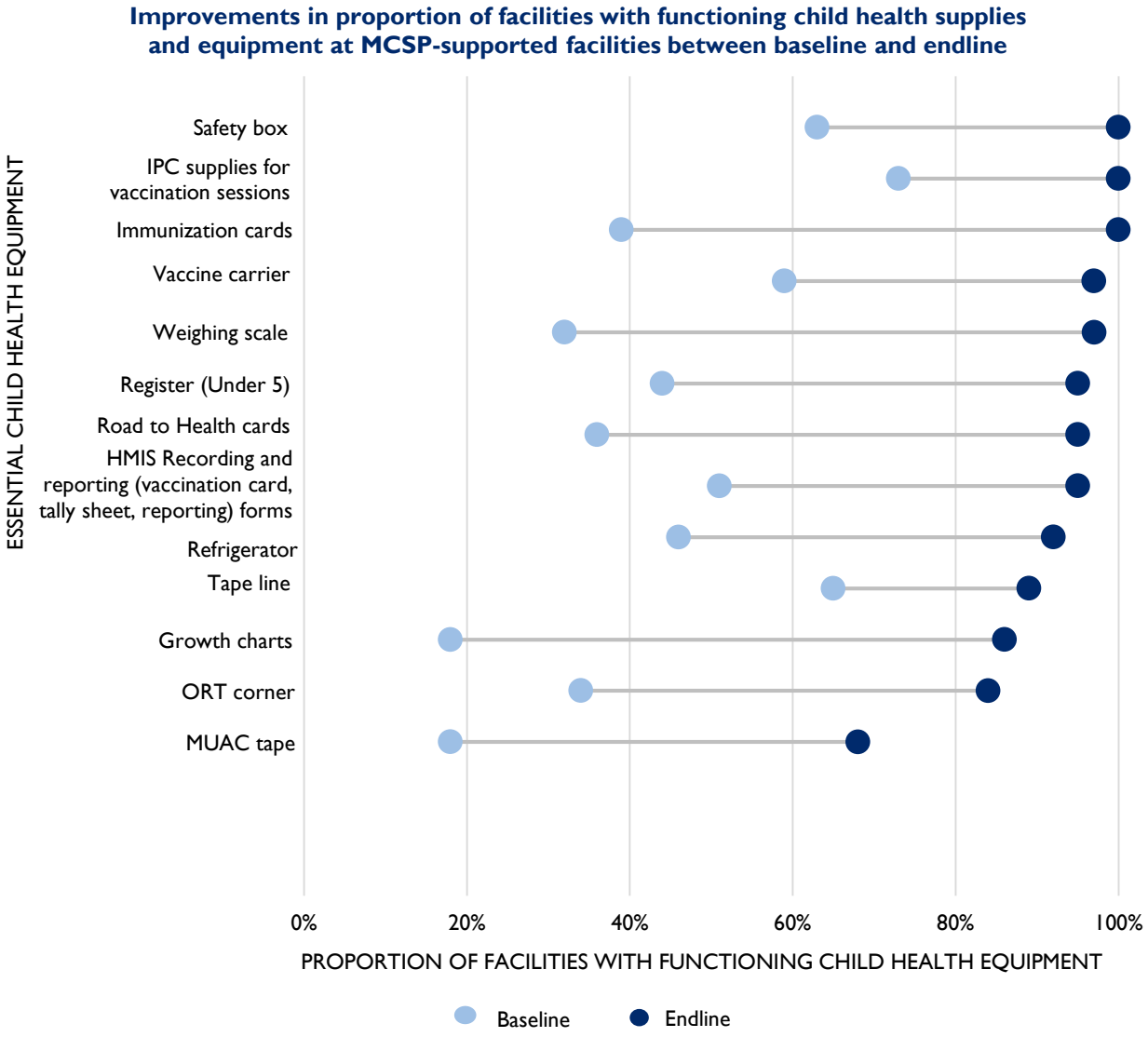
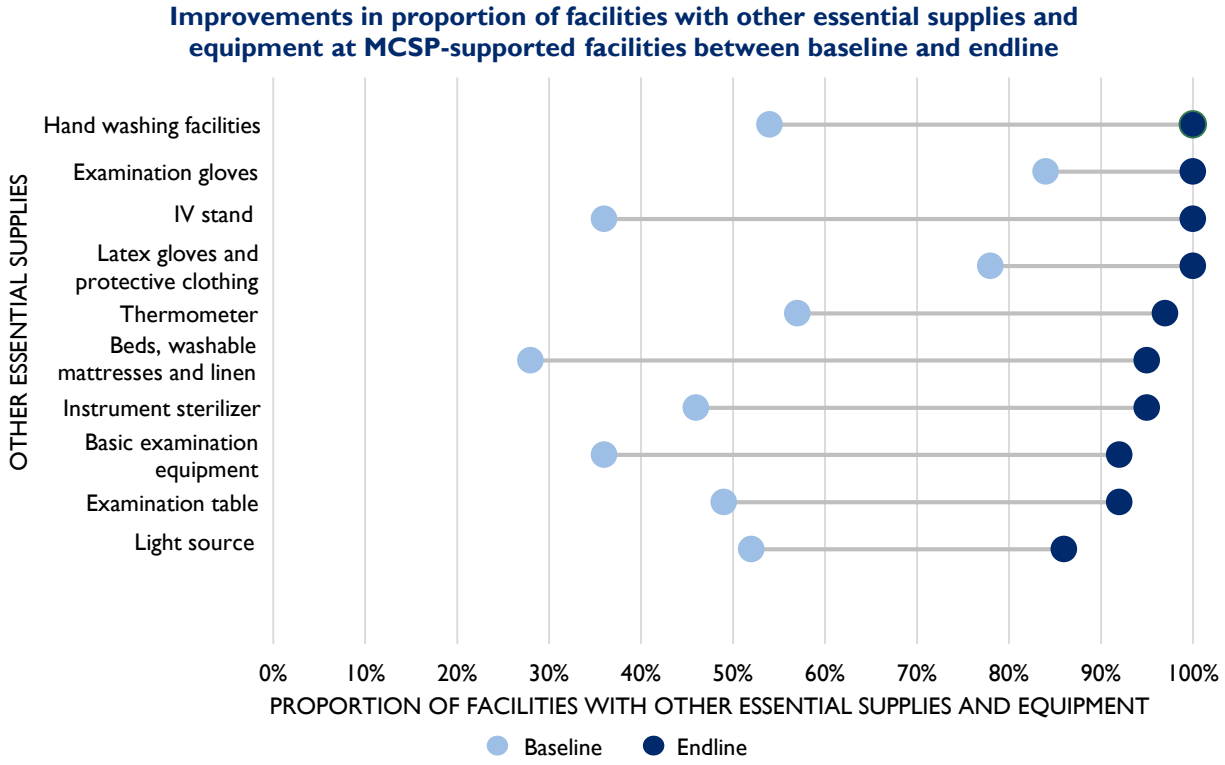


Figure 3d: Proportion of facilities with other essential supplies and equipment at baseline and endline



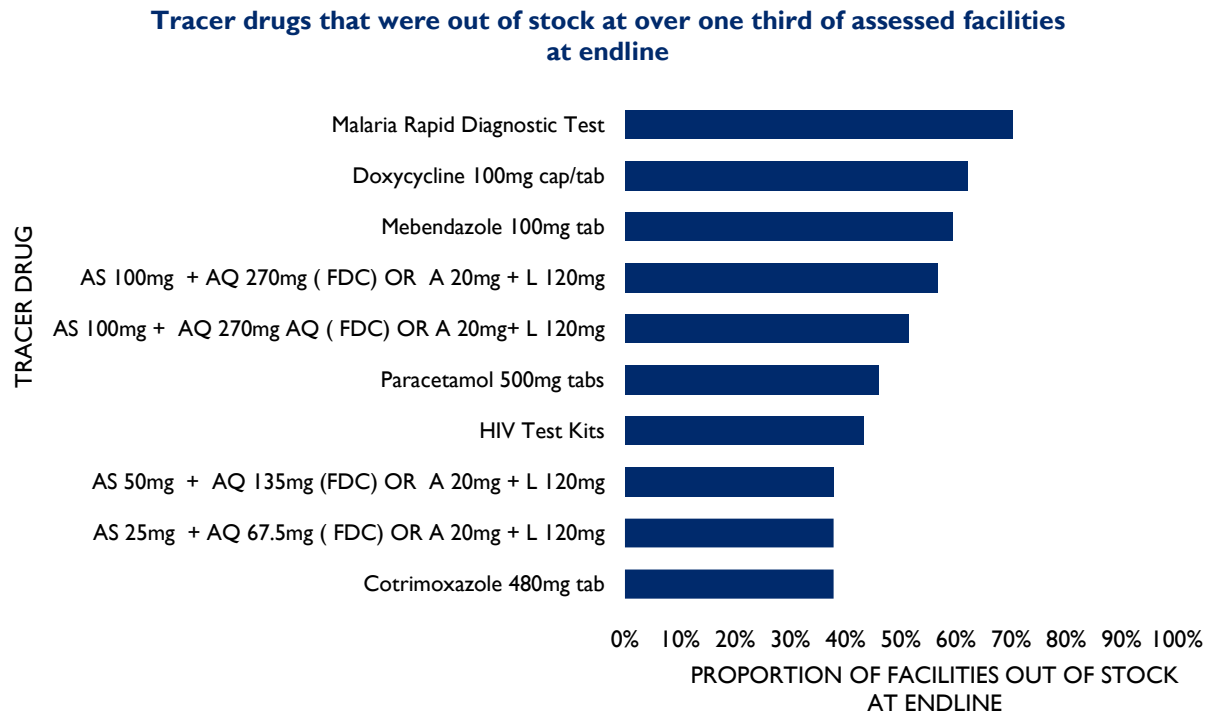
Tracer Drugs

The endline assessment examined the availability of tracer drugs at facilities as an essential component of quality service provision. The MOH list of tracer drugs differed significantly at endline compared to baseline (see Annex 1), so it is not possible to make direct comparisons for the overall availability of tracer drugs. At endline, there were no facilities that had all tracer drugs and commodities in stock. On average, facilities had 71% of the 21 tracer drugs in stock. Drugs and commodities most frequently available (see Table 1) were sulfadoxine 500 mg + pyrimethamine 25 mg (100%), pentavalent vaccine (97%), oxytocin 10 IU/mL (97%), and examination gloves (97%). Drugs and commodities most frequently out of stock (see Figure 4) included malaria rapid diagnostic tests (RDTs) (out of stock at 70% of facilities), doxycycline 100 mg cap/tab (out of stock at 62% of facilities), mebendazole 100 mg tab (out of stock at 59% of facilities), and malaria treatment regimens (AS 100 mg + AQ 270 mg AQ (FDC) OR A 20 mg+ L 120 mg, out of stock at 57% of facilities; and AS 100 mg + AQ 270 mg (FDC) OR A 20 mg + L 120 mg, out of stock at 51% of facilities). This is compared to the following percentages of stockouts at baseline: malaria RDTs, 31%; oxytocin 10 IU/mL, 26%; sulfadoxine 500 mg + pyrimethamine 25 mg, 27%; and pentavalent vaccine, 26%. There was a nationwide stock-out of malaria test kits and commodities in December 2017 which also affected MCSP-supported facilities.

Table 1: Tracer drug availability at endline

Ministry of Health Tracer Drugs	Percentage of facilities with drug in stock at endline	Median duration of current stockout (days)
Sulfadoxine 500 mg + pyrimethamine 25 mg	100%	N/A
Pentavalent vaccine	97%	>1 year (1 facility)
Oxytocin 10 IU/ml	97%	10
Examination gloves (nitrile)	97%	2
Medroxyprogesterone 150 mg (Depo-Provera), injection	95%	12
Paracetamol 100 mg tabs	92%	14
Ferrous sulfate 200 mg + folic acid 0.25 mg	92%	21
Oral rehydration solution 20.5 g/L	84%	22
Hydrochlorothiazide 25 mg tab	84%	19
Amoxicillin 250 mg tabs	73%	14
Artemether 80 mg injection	70%	30
Cotrimoxazole 480 mg tab	62%	30
AS 25 mg + AQ 67.5 mg (FDC) OR A 20 mg + L 120 mg	62%	15
AS 50 mg + AQ 135 mg (FDC) OR A 20 mg + L 120 mg	62%	14
HIV test kits	57%	90
Paracetamol 500 mg tabs	54%	16
AS 100 mg + AQ 270 mg AQ (FDC) OR A 20 mg + L 120 mg	49%	20
AS 100 mg + AQ 270 mg (FDC) OR A 20 mg + L 120 mg	43%	21
Mebendazole 100 mg tab	41%	60
Doxycycline 100 mg cap/tab	38%	90
Malaria rapid diagnostic test	30%	56

Figure 4: Tracer drugs most out of stock at endline



The assessment further noted the availability of other essential medicines to enhance the quality of services at facilities. At endline, facilities had, on average, 66% of other essential medicines in stock, compared to 57% at baseline. Notable improvements between baseline and endline include the availability of tetracycline eye ointment (55% at baseline and 95% at endline), measles vaccine (increased from 76% to 97%), Veronica buckets for handwashing (increased from 43% to 89%), and calcium gluconate (increased from 22% to 51%).

There was also an improvement in availability of FP commodities in MCSP-supported facilities. At baseline, only 80% of facilities had at least four types of FP commodities. At endline, the percentage had increased to 95% (35 of 37) of facilities. The proportion of facilities with any long-acting contraceptive method also increased, from 73% at baseline to 78% at endline. The most notable improvement in FP commodity availability was for combined oral contraceptive (COC) pills (82% and 97% at baseline and endline, respectively).

Findings from the Quality of Care Assessment

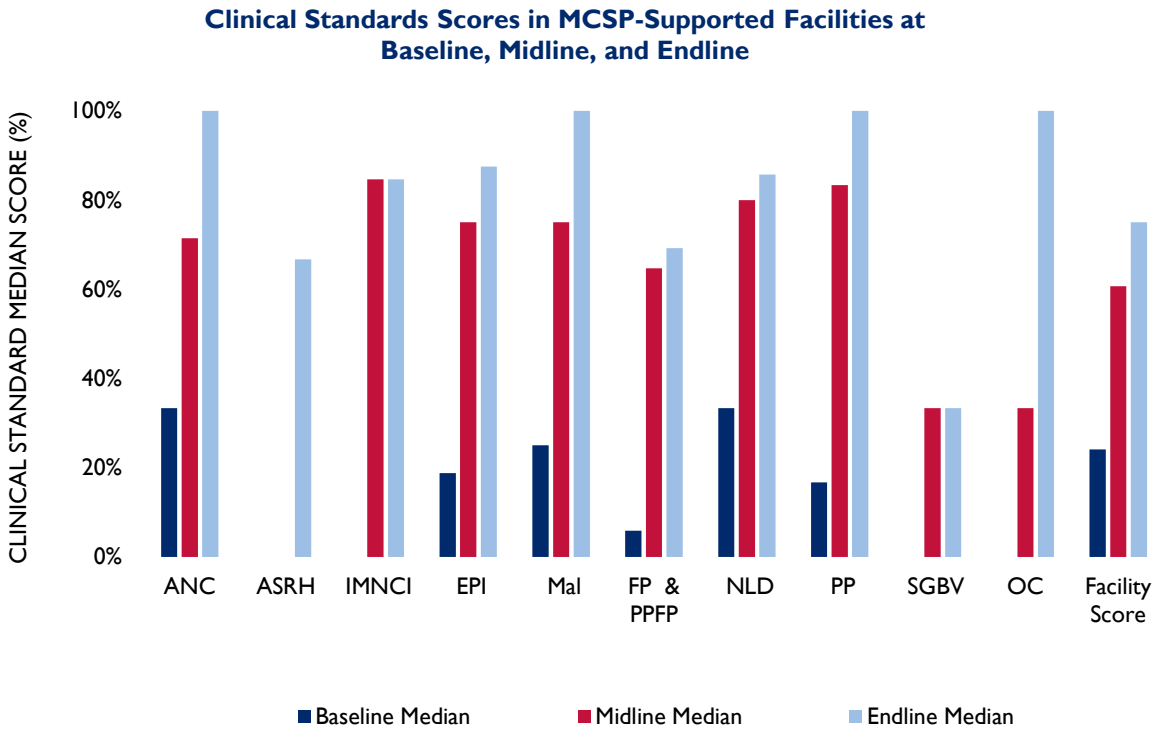
Summary of Clinical Standards Results

Supported health facilities continued to demonstrate improvement in the quality of health services provided to clients, as evidenced by scores on the clinical standards assessment. The median facility score on the clinical standards assessment was 75% at endline, compared to 24% and 61% at baseline and midline, respectively (see Figure 5). This median score compares the same facilities at each time point. There was significant improvement across nearly all technical areas from baseline to endline. With the exception of care for SGBV, standard achievement improved by more than 50% for all technical areas from baseline to endline. As shown in the graph below, the median facility score on some technical areas at baseline was 0% (ASRH, IMNCI, obstetric complications), meaning the average facility did not meet any of the standards in these technical areas at baseline. For clinical standards results by county, refer to Annex 3.

From the time of the midline assessment (August 2016) to the time of the endline assessment (December 2017), the greatest improvements were noted in provision of ASRH services (67% increase), ANC (29% increase), and malaria care (25% increase).

There was also significant improvement in quality of care for obstetric complications (67% increase). However, the verification criteria assessed at the clinic versus the hospital and health center levels were modified between assessments, so the results are not entirely comparable between assessments.

Figure 5: Overall clinical standards scores in sampled facilities



Note: ANC: antenatal care, ASRH: adolescent sexual and reproductive health, IMNCI: integrated management of newborn and childhood illnesses; EPI: immunization, FP & PPFP: family planning and post-partum family planning, Mal: malaria, NLD: normal labor and delivery, PP: postpartum, SGBV: sexual and gender based violence, OC: obstetric complications.

Findings on Clinical Quality of Care and Service Utilization by Technical Area

Infection Prevention and Control Practices

Paramount and foundational to the provision of safe, high-quality health services is adherence to IPC procedures. MCSP-supported health facilities continue to show improvement in adherence to IPC practices as evidenced by their scores on the IPC and SQS standards used during the baseline and endline assessment, respectively.

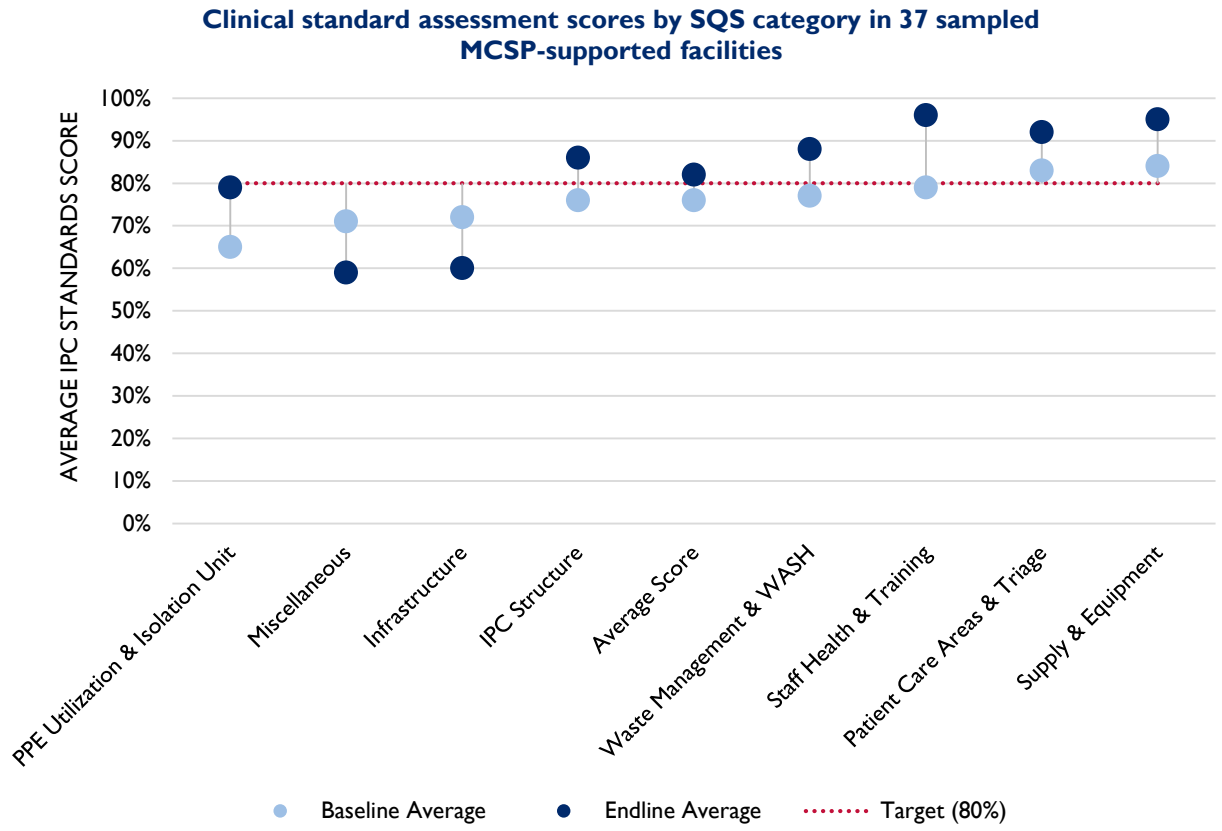
At baseline, the facilities' average score on the IPC standards was 76%. Approximately half of the facilities (52%) met the national target of 80% of IPC standards. The minimum score was 17% (one facility) and the maximum was 100% (one facility). These baseline scores are for the 31 sampled health facilities for which baseline assessments were available (out of the 37 facilities sampled at endline). At endline the median score on the SQS for facilities assessed increased to 82%, thus **achieving the national target of 80%**. The range of scores was 53% to 100%. For IPC scores by county, refer to Annex 2.

At endline, facilities' average score on supply and equipment standards was 95%, compared to 84% at baseline (see Figure 6). The provision of quarterly IPC supplies enhanced the quality of IPC practices at these facilities—particularly in the areas of hand hygiene and waste segregation. The provision of equipment enhances IPC practices, making this category essential to preventing the spread of infectious diseases.

Safe, Quality Health Services training was conducted for all facility staff. In addition, a system that checks the health of staff at the facilities was introduced. As a result, the average score on staff health/personnel/training standards increased from 76% at baseline to 96% at endline. Similarly, as a result of training and continued mentoring, standards for proper use of personal protective equipment improved from 65% at baseline to 79% at endline.

Screening is another important category of safe, high-quality health services. Screening is the process of ensuring that there are designated points of entry and screening of all persons entering a health facility, and that clients coming into the facility with infectious diseases are isolated to prevent the further spread of disease in the larger community. Throughout the assessment, facilities had systems in place for screening, as evidenced by the average score of 92% for the Patient Care Areas & Triage category.

Figure 6: IPC standards adherence



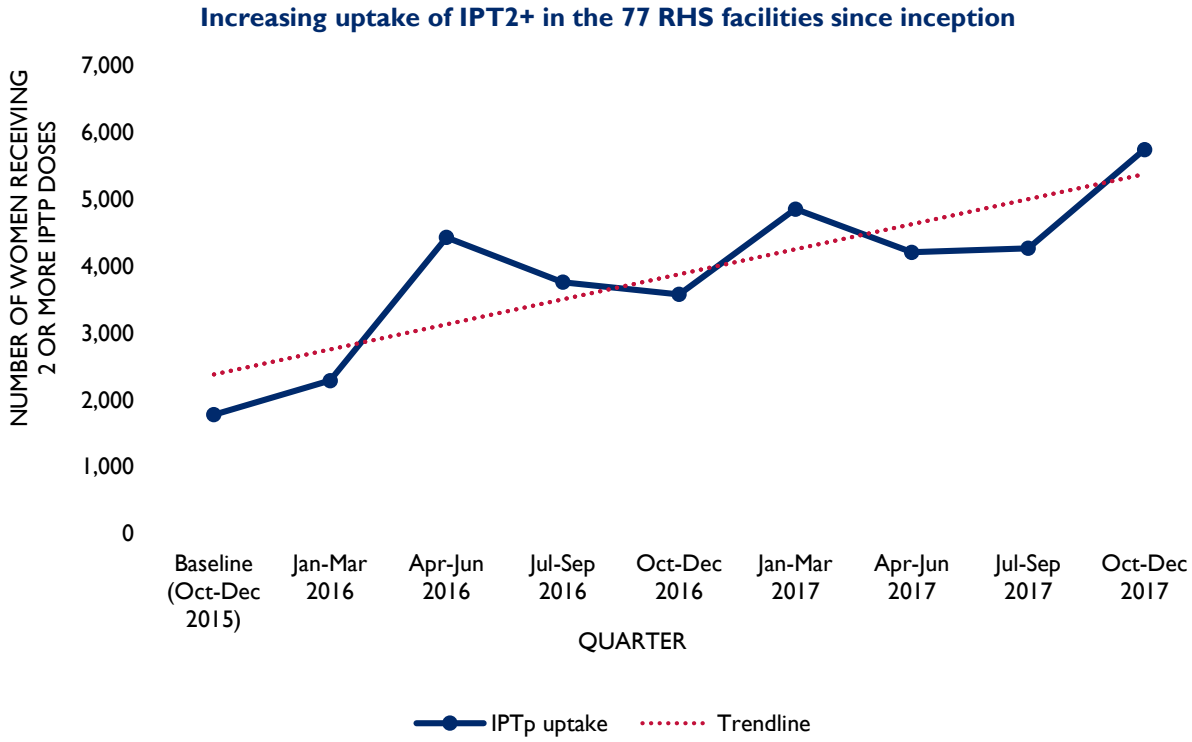
Overall, the median facility score on six of the eight SQS categories was 100%. This demonstrates an improvement and the maintenance of adherence to IPC practices long after the immediate threat of Ebola faded. Maintaining these practices improves the facilities' ability to prevent the spread of infection among clients and staff during the provision of RMNCAH services. For improvements in waste, water, and triage infrastructure to enable adherence to IPC practices, refer to the **Infrastructure** section above.

Antenatal Care

The median score on antenatal care standards increased from 33% at baseline to 71% at midline and 100% at endline. Nineteen of 37 facilities assessed scored 100% on the ANC standards at endline. At endline, all facilities properly and rapidly assessed pregnant women for danger signs, and referred as necessary, compared to only one in three facilities at baseline (see Annex 4 for complete standards results). At baseline, no facilities met the standard for birth preparedness and complication readiness planning with pregnant women and their partners, while at endline 95% (35 of 37) met this standard. In addition, the proportion of facilities providing

high-quality counseling on family planning to pregnant women increased from 54% at baseline to 97% at endline. Care for malaria in pregnancy also improved. At endline, 78% of providers correctly assessed and managed pregnant women with signs of malaria according to national guidelines, compared to only 51% at baseline. This is also evidenced by trends in uptake of intermittent preventive treatment (IPT) (see Figure 7).

Figure 7: Trend in IPT2+ uptake



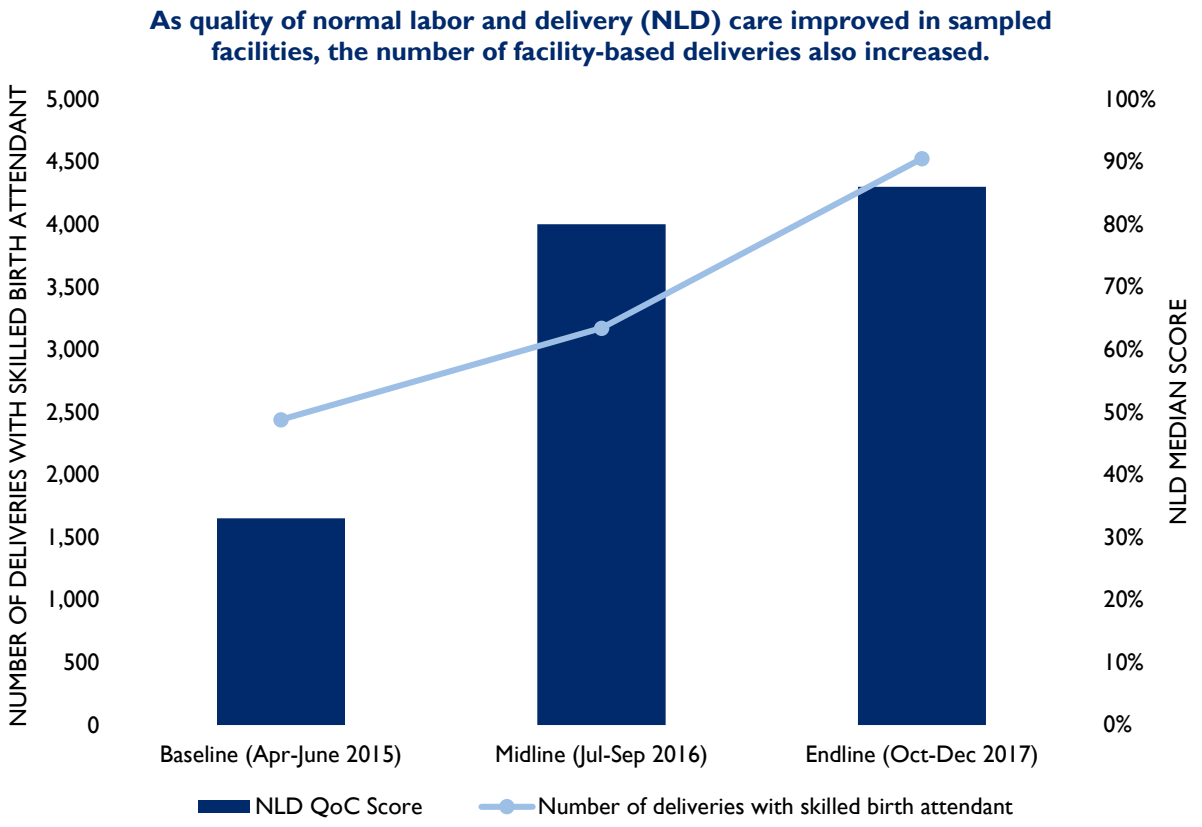
In addition to improved quality of services provided by antenatal care providers, there has been a significant increase in the number and proportion of pregnant women coming to supported health facilities since the inception of the project.

Labor, Delivery, and Postpartum Care

The number of women delivering with skilled personnel in MCSP-supported health facilities more than doubled between baseline and endline, with 2,439 delivering in April–June 2015 (baseline), compared to 4,526 in October–December 2017 (endline) (see Figure 8). This increase in deliveries is the result of increased community outreach and engagement to encourage women to deliver at facilities, improved connection to and referrals with trained traditional midwives through meetings held at the health facilities, and increased availability of skilled personnel and improved quality of care, all of which have restored the communities' confidence in the services available at their primary health care facilities.

MCSP-supported facilities demonstrated high quality of care for labor and delivery and management of obstetric complications at endline, with a median standard achievement of 86% and 100%, respectively, compared to 33% and 0%, respectively, in the same facilities at baseline.

Figure 8: Utilization and quality of normal labor and delivery care

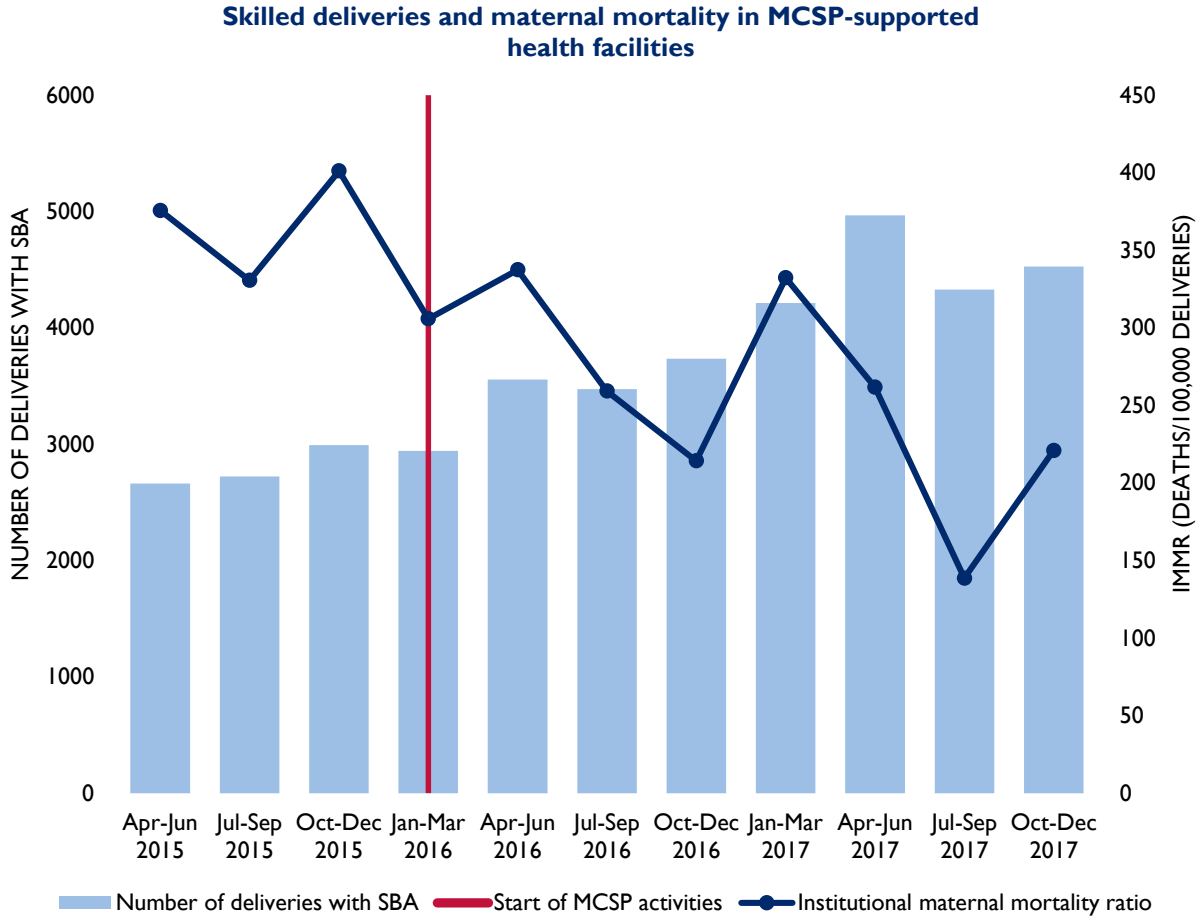


At endline, there were marked improvements in the proportion of facilities correctly monitoring and recording labor (46% at baseline compared to 70% at endline) and actively managing the third stage of labor according to national guidelines (49% at baseline compared to 78% at endline). Care for newborns also improved. At endline, most facilities (86%) were rapidly assessing newborns and providing resuscitation, if necessary, compared to only half (51%) at baseline. At endline, 84% of facilities were also providing advice on kangaroo mother care and other newborn care to mothers with low birthweight babies.

Prompt identification of, referral for, and management of obstetric complications also improved across MCSP-supported facilities. This is a result of comprehensive obstetric and newborn care training conducted at tertiary-level facilities and a focus on improving provider competencies to address the primary causes of maternal mortality. At endline, clinics were assessed for their ability to provide initial care and then promptly refer complicated cases; hospitals and health centers were assessed for the former as well as their ability to manage these cases. Most facilities (89%) appropriately managed pregnant women with bleeding complications and pre-eclampsia or eclampsia, according to protocol. Less than 10% achieved this standard at baseline. Three-quarters (76%) properly performed the general management of postpartum hemorrhage, and 84% managed shock appropriately (hospital and health centers only).

Since the start of MCSP activities at the facility level in January 2016, maternal mortality has declined in MCSP-supported facilities. Starting at a peak of 401 deaths per 100,000 deliveries in the quarter before MCSP initiated activities in health facilities, the institutional maternal mortality ratio (iMMR) in MCSP-supported sites has continually declined over the life of project. In the most recent quarter, October–December 2017, the iMMR was 221 deaths/100,000 deliveries (see Figure 9). This trend can be at least partially attributed to MCSP's joint efforts with the MOH to improve the quality of antenatal, labor, delivery, and postpartum care. Notably, the rate of decline in both maternal mortality and stillbirth was more rapid in MCSP-supported facilities than in the three implementation counties overall, and the country as a whole.

Figure 9: Trends in deliveries with skilled birth attendant and institutional maternal mortality



Some gaps remain in meeting the standards for safe, clean deliveries and essential newborn care. Only two-thirds of sampled facilities met all criteria for these two standards at endline, although the proportion meeting the standards doubled since baseline (safe, clean delivery: 38% baseline, 65% endline; essential newborn care: 19% baseline; 57% endline). In addition, while there was improvement since baseline, only two-thirds of facilities administered appropriate treatment for complicated malaria cases during pregnancy at endline.

Quality of postpartum care greatly improved over the life of the project. At baseline, less than half (41%) of women received complete immediate postpartum care and monitoring, and only one-quarter received a full postpartum examination (24%), postpartum advice and family planning counseling (27%), and counseling and health education on postpartum and newborn care and danger signs (19%). By December 2017, the proportion of facilities providing these services to new mothers had more than doubled (68%, 59%, 81%, respectively). Overall, the median score on provision of postpartum care increased from 17% at baseline to 100% at endline, demonstrating significant improvement across all MCSP-supported facilities.

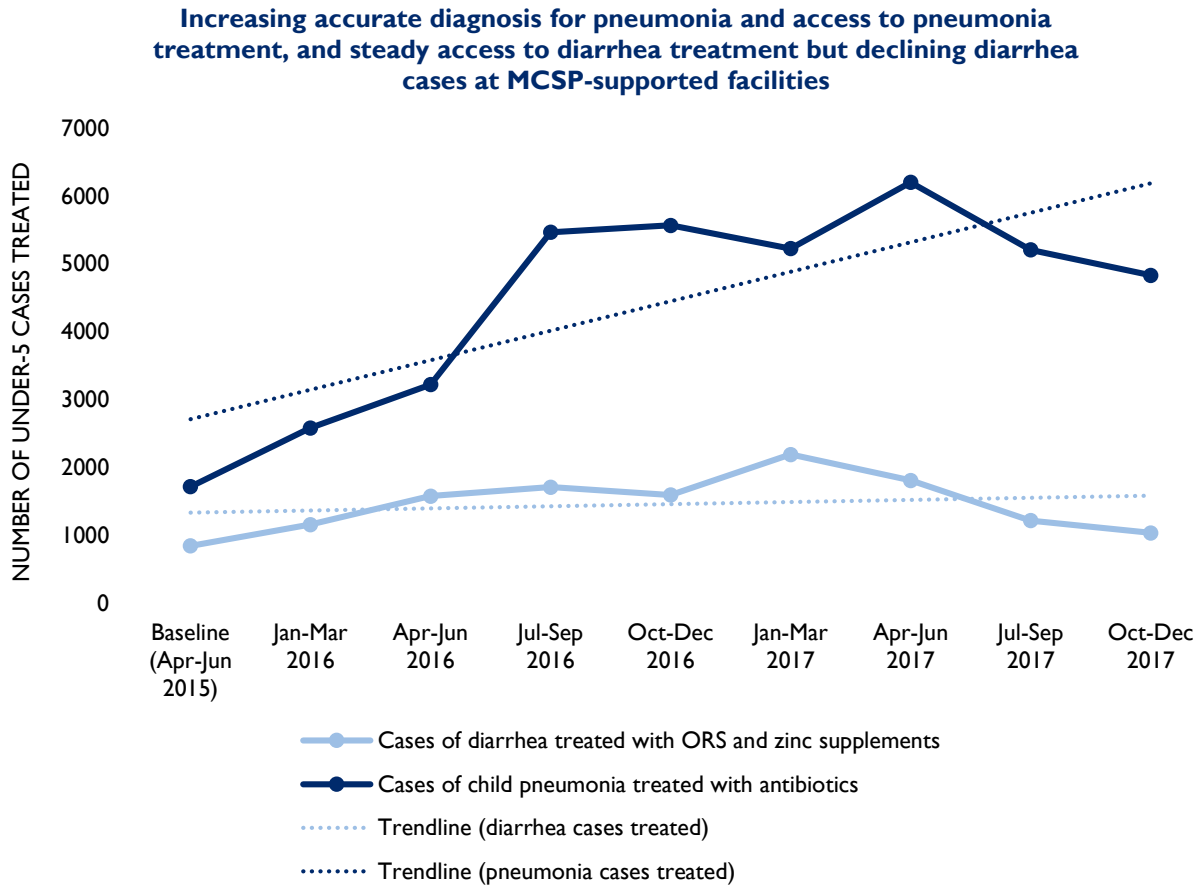
Immunization and Child Health

Two essential technical areas for reducing under-5 mortality are immunization services and IMNCI. At baseline, IMNCI was largely an unknown concept. Most providers could not be assessed because they did not know where to begin in terms of assessing children for common illnesses according to IMNCI protocol. Of the 37 facilities sampled at endline, 21 of these scored 0% on IMNCI standards at baseline (baseline median score, 0%). Following IMNCI training, provision of IMNCI charts and job aids, and intensive onsite mentoring in IMNCI, facilities met 85% of IMNCI standards at midline.

This was maintained at endline (endline median score, 85%). Most facilities missed only a few verification criteria among the 13 IMNCI clinical standards. Approximately four in five facilities met IMNCI standards for assessment, diagnosis, treatment, and referral (as needed) for possible bacterial infection, jaundice, pneumonia, diarrhea, and anemia and undernutrition (see Annex 4 for scores by standard). This is compared to approximately 10–15% of facilities at baseline.

The improved assessment, diagnosis, and treatment indicated by the clinical standards assessment corresponds with increased numbers of children diagnosed and treated across all MCSP-supported health facilities. At baseline (April–June 2015), 844 children under 5 with dehydration were treated with oral rehydration solution and zinc. The number of children treated increased to 1,034 in October–December 2017 (see Figure 10). Identification of and treatment for pneumonia in children under 5 improved dramatically. Whereas at baseline 1,716 children with pneumonia were identified and treated with antibiotics, at endline this number increased to 4,832. All (100%) of those identified with pneumonia were treated with antibiotics. This indicator demonstrates both improvement indentification and treatment of disease, and availability of commodities. Therefore, stock out at various time points had some impact on the trends observed.

Figure 10: Identification and treatment of pneumonia and diarrhea cases in children under 5



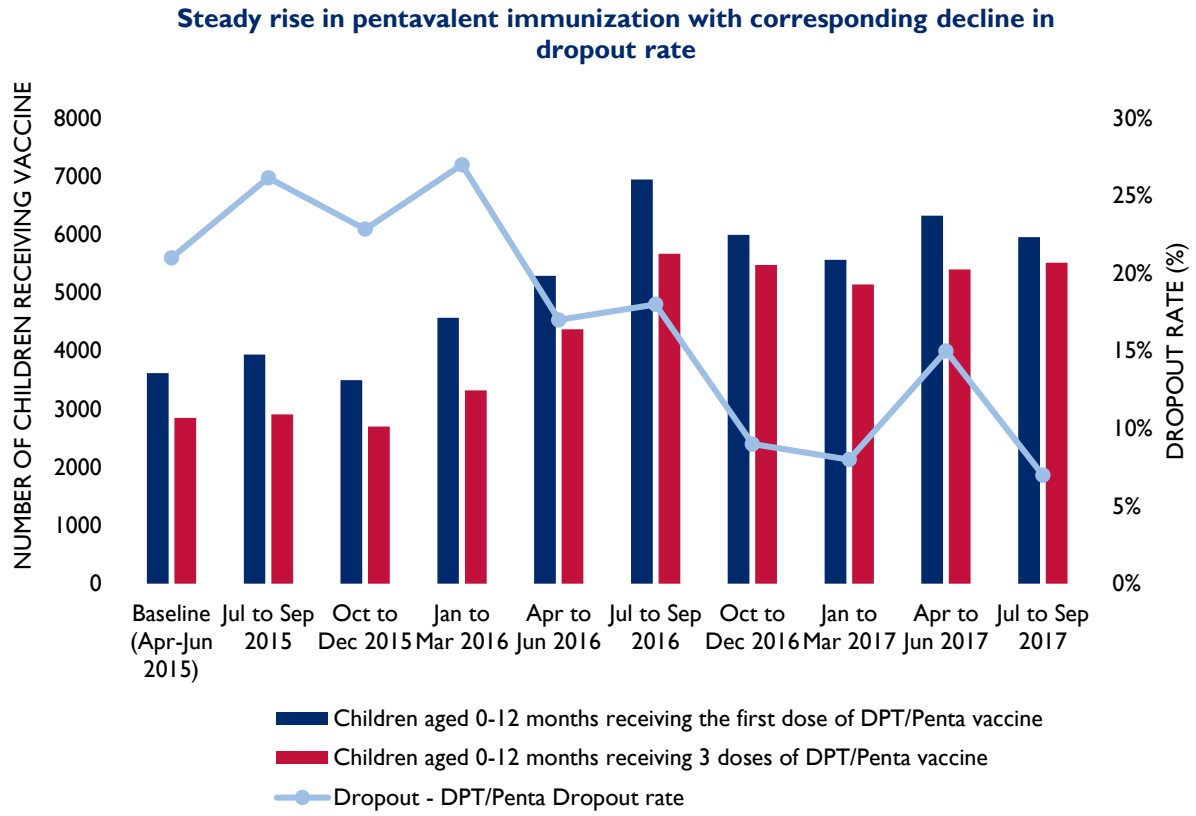
Although there was marked improvement from baseline, the two standards with the lowest scores at endline were proper assessment and treatment of sick children ages 2 months to 5 years with fever (68% at endline compared to 14% at baseline) and availability of a fully functional oral rehydration therapy corner (73% at endline compared to 11% at baseline).

Health facilities demonstrated improvement in the availability and provision of high-quality immunization services throughout the life of the project. At baseline, only 8% of the 38 sampled facilities had a vaccinator who was recently trained and regularly supervised. This improved to 87% of facilities at endline.

As a result of this training, supervision, mentorship, and advocacy by MCSP to ensure all facilities had functioning vaccine refrigerators and a regular supply of vaccines, facility achievement on EPI standards improved from 19% at baseline to 75% at midline and 88% at endline (n=38 sampled facilities). At endline, a large majority of facilities (>80%) met the standards for proper recordkeeping and registration, use of planning and monitoring tools such as wall charts and outreach service planning, proper implementation of a multidose open vial policy, administration of immunization education, and following proper injection or oral administration procedures. Less than half of the facilities met these standards at baseline.

The number of doses of tracer vaccinations such as pentavalent 3 administered each quarter more than doubled from baseline (2,848 doses administered April–June 2015) to endline (5,516 doses administered in July–September 2017 and 5,041 administered in October–December 2017) (see Figure 11). This is in part due to the emphasis placed on EPI outreach to communities. The increase can also be attributed to improvements in availability of supplies, equipment, vaccines, and trained vaccinators at each site. Of the 51 sites assessed at baseline, 20% (nine facilities) had no outreach sites. Of those with outreach sites, only 14% reported having sufficient financial resources to conduct outreach, and only two-thirds of the outreach sites were visited monthly. By the end of the project, 92% of facilities were conducting EPI outreach. The three sampled sites that were not conducting outreach were not doing so because the county health team had not allocated any catchment area for vaccination services. The median number of outreach sites per facility was five. Of those conducting EPI outreach, more than 90% visited each outreach site on a monthly basis.

Figure 11: Trends in pentavalent vaccine administration



Family Planning, including Postpartum Family Planning

Due to the low use of modern contraception in Liberia (mCPR 19% in 2013; 31% in 2016[2]), MCSP has sought to integrate family planning counseling and service provision with antenatal, labor and delivery, immediate postpartum, immunization, and adolescent care services. As a result, the quality of counseling and provision of family planning, including PPFP services, has improved across MCSP-supported facilities throughout the life of project. While at baseline facilities met on average 6% of FP and PPFP standards, at endline they met 69% of these standards. Appropriate counseling with balanced counseling cards improved dramatically, from only 14% of facilities meeting this standard at baseline to 78% at endline. The percentage of facilities providing routine PPFP counseling during antenatal care increased from 5% at baseline to 59% at endline. The proportion of facilities assessing and managing clients' satisfaction with their current FP method also doubled from baseline to endline (43% compared to 86% at endline). High-quality provision of and counseling on various FP methods such as COCs, Depo-Provera, and condoms was also evident at endline (see standards table in Annex 4).

In addition to improving the quality of family planning services, MCSP sought to improve knowledge and use of postpartum family planning by integrating PPFP counseling and messaging throughout the continuum of care. At endline, 97% of facilities were providing family planning counseling regularly during ANC visits, and 74% of vaccinators reported providing family planning messages to mothers who brought their children for vaccination and referring those interested to the FP provider for further counseling.

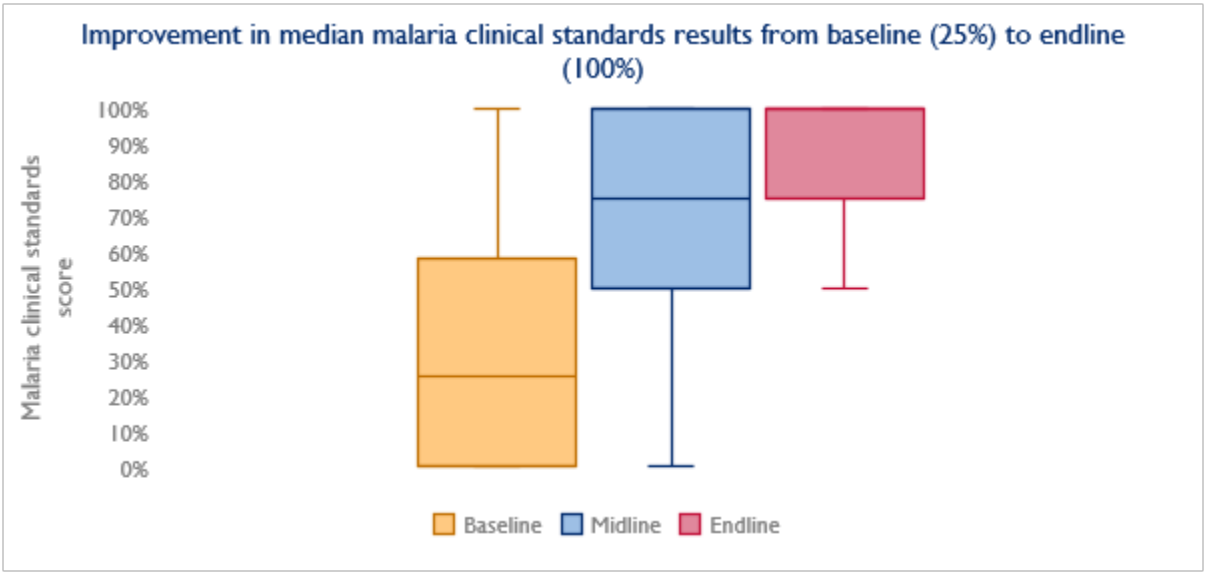
One remaining gap is in the provision of intrauterine devices (IUDs). Few facilities have a supply of IUDs and providers who are trained in how to insert and remove them. As a result, only half of the 37 sampled facilities were providing information on IUDs and assessing for medical eligibility at endline (54% and 57%, respectively), and only 30% met the standard for provision of safe, hygienic IUD insertion for clients, as few facilities even provide this service. Notably, only one of the 37 sampled facilities met this standard for IUD insertion at baseline (3%). On the contrary, postpartum IUD insertion and counseling was available at 86% (six of seven) of hospitals and health centers (where this service is expected to be performed) at endline, compared to only one facility at baseline and four facilities at midline.

Malaria

Malaria is holo-endemic in Liberia and the country has a very high burden of disease. According to the 2016 Liberia Malaria Indicator Survey, 45% of children under 5 tested positive for malaria by RDT (62% in rural areas; 40% in urban areas).[3] To reduce morbidity and mortality due to malaria, it is critical to improve the quality of malaria prevention and treatment services. MCSP sought to do this through integrated trainings in RMNCAH, and child health and immunization, as well as regular supervision, mentoring, and coaching, and an emphasis on high-quality collection and use of data at the facility and county levels. As a result of these efforts, facilities made significant improvement on malaria clinical standards during the life of the project (see Figure 12).

[2] Liberia DHS 2013; Liberia MIS 2016.
[3] Liberia MIS 2016.

Figure 12: Malaria clinical standards results



Note: 25th, 50th (median), and 75th percentile facility scores are shown within the shaded box; the line extending from the box shows the full range of scores including outliers.

While at baseline only 11% of facilities provided an appropriate physical exam and malaria diagnostic testing for patients with suspected malaria, 76% of facilities met this standard at endline. Remarkably, at endline nearly all facilities met the standard for uncomplicated (92%) and complicated (95%) malaria case management, treatment, and referral, where appropriate, compared to only 32% and 49% at baseline, respectively. Provision of preventive measures for children under 5 and pregnant women, such as information, education and communication materials on malaria, promotion and distribution of insecticide-treated nets, and administration of IPT, improved from 35% of facilities at baseline meeting all criteria in this standard to 70% of facilities at endline.

Unfortunately, even if providers know appropriate protocols for case management, without malaria rapid test kits and drugs, facilities will never meet national targets for the proportion of suspected cases tested and the proportion of confirmed cases treated. As evidenced by the tracer drug stockouts (see Table 1), only 30% of sampled facilities had RDTs in stock at the time of the assessment, and 30%–60% of facilities were stocked out of essential malaria drugs. As a result, only 60% of cases with suspected malaria were tested with an RDT or microscopy in the 77 MCSP-supported facilities in October–December 2017.

Adolescent Health

Approximately 30% of all antenatal clients and 36% of skilled delivery clients in MCSP-supported facilities are adolescents.[4] Women ages 25–29 at the time of the 2013 DHS Survey initiated sexual intercourse at an average age of 16.4 years, whereas men in the same age group initiated sexual intercourse at age 18.2 years.[5] Among rural women ages 20–49, the median age at first marriage was 17.9 years.[6] This emphasizes the importance of providing targeted, tailored health services for adolescents. However, at baseline, only three of the 37 sampled health facilities met *any* of the ASRH clinical standards. To address this need, MCSP worked with the Ministry of Health to adapt and roll out the Age and Life Stage counseling tool training to train health care workers to provide these critical counseling and health services. By endline, facilities were meeting two-thirds of the standards (endline median score, 67%). Most facilities had ASRH educational posters placed throughout their facilities (81%) and met the standard for provision of quality adolescent health care for pregnancy, labor and delivery, postpartum, and newborn care (76%), compared to only 5% at baseline on both standards. In addition, over half of facilities (57%) were providing and promoting use of adolescent-

[4] Data from 12 sampled health facilities in three MCSP-supported counties from October 2016–February 2017.
[5] Liberia DHS 2013.
[6] Liberia DHS 2013.

friendly services, such as designated days, private rooms, and counseling sessions specifically for adolescents. None of the 37 sampled facilities were providing such services at baseline.

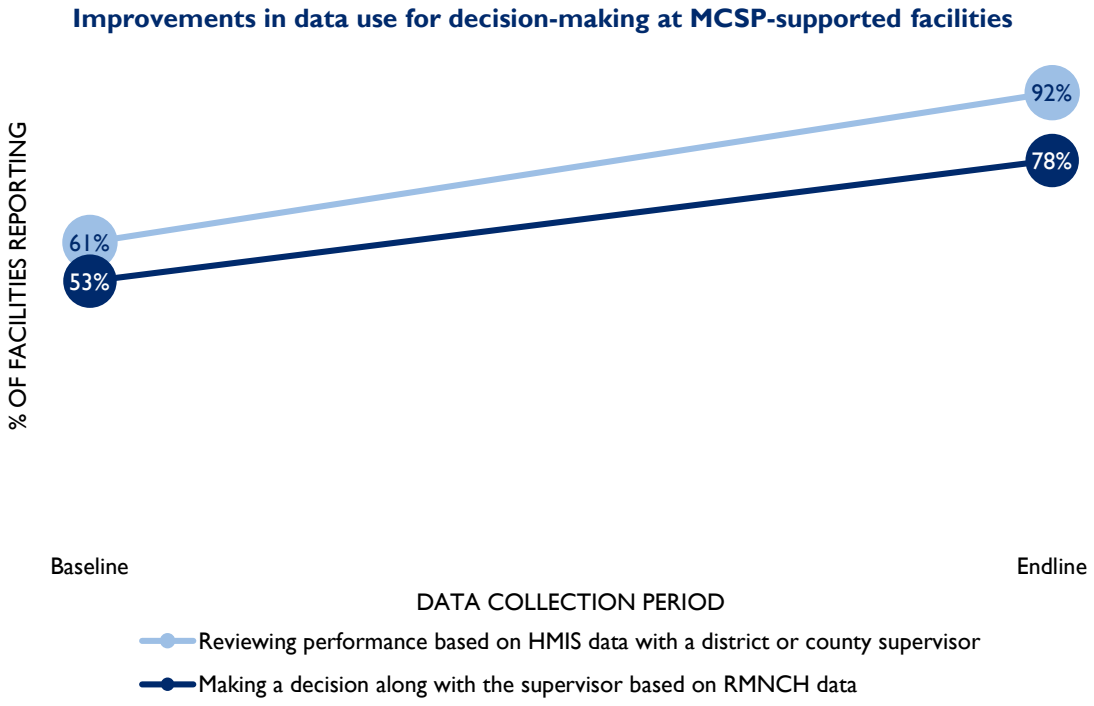
SGBV

Quality of sexual and gender-based violence care was not assessed at baseline. When the endline assessment was conducted in December 2017, facility achievement on SGBV standards was low. Only half of facilities were properly screening clients for domestic violence, and only one-third of facilities were providing appropriate services and treatment for victims or suspected victims of sexual assault, rape, or domestic or interpersonal violence. To address this known gap, MCSP conducted SGBV training for clinicians in all three MCSP-supported facilities just after the endline assessment and before the close of the project.

Data Use for Decision-Making

MCSP has emphasized data quality and use as an essential component of improving the quality of services and facility performance. Examples of MCSP's efforts in this regard include provision of HMIS ledgers and monthly reporting forms, and training and mentoring health facility staff on collection and use of service delivery data. As a result, use of data has come to the forefront at supported facilities. While at baseline only 49% of facilities had a priority list of indicators for RMNCH and monitored it on a regular basis, at endline 84% of facilities were monitoring these indicators. In addition, 60% of facilities had updated graphs displayed to monitor these indicators, and an additional 14% had indicators with targets but no graphs. At baseline, only 22% had indicator graphs and 20% had indicators with targets alone. Of the facilities with graphs at endline, nearly all were monitoring EPI data, and three-quarters were monitoring additional reproductive, maternal, newborn, and surveillance data. In terms of using these data for decision-making at the facility level, at endline 92% of facilities reported using HMIS data to review performance with a district or county supervisor during recent supervision visits, compared to 61% at baseline, and 78% of facilities reported making a decision along with the supervisor based on the RMNCH data at endline, compared to only 53% at baseline (see Figure 13).

Figure 13: Data use for decision-making at health facilities



Qualitative Findings from Key Informant Interviews

MCSP Collaboration with CHT/DHT during Implementation

All key informants in the study were familiar with MCSP activities in their respective counties. Informants described the smooth and cordial coordination and the broad range of support rendered by MCSP, including supply and distribution of IPC materials; supply of essential drugs, delivery beds, and other medical equipment; improved capacity to do supervision through data validation and monthly supervision; and periodic presentation of results and quality review discussions. Respondents felt MCSP's support enhanced the level of quality of services provided at the facilities, especially infection prevention and control practices, ambulance and referral support, and training and mentorship during joint supportive supervision. Respondents also emphasized that the salary paid to government health workers was one of the most important aspects of the support provided.

"MCSP level of collaboration has been cordial; we interact and work professionally."
–DHT Staff in Grand Bassa County

Supervisory Skills and Competencies

Respondents stressed the skills and competencies accrued over time through MCSP support. In particular, supervisors expressed confidence in mentoring and coaching in key areas such as the correct use of partograph, using data to make decisions, adolescent health and family planning, managing maternal complications (postpartum hemorrhage, pre-eclampsia, eclampsia, and severe eclampsia), data visualization by developing graphs, and techniques for in-service capacity-building for health workers as a result of capacity-building from MCSP.

"Through MCSP support, I am able to manage maternal complications (postpartum hemorrhage, pre-eclampsia/eclampsia) [and am] competent in providing those skills to MCH standards at the facility level."
–CHT Staff in Grand Bassa County

"MCSP took us from [a] struggling system to [a] much better one and help[ed] improve our system."
–CHT Staff in Grand Bassa County

Supervision and Management

Respondents noted that supervision frequency and quality has improved through MCSP's efforts. Managers and supervisors noted improvements in record and reporting systems and good clinical performance because of this supervision approach. CHTs also said that there is improved coordination within the county and in implementation of the annual county operational plan as a result of MCSP's intervention. Proper operationalization of this plan has resulted in counties achieving health indicator targets and improving the service delivery system overall.

"I now frequently use data collection tools to do evaluation on the usage of drugs."
–CHT Staff in Grand Bassa County

"Supervision conducted [with] MCSP support brought about submission of improved reports and enhanced our ability to do prompt reporting."
–CHT Staff in Nimba County

Through MCSP support at the management level, gaps are identified and strategies put in place to fill the gaps that are "low-hanging fruits"—that is, those that can be addressed at the district or county level.

Midlevel managers now analyze their staff competency and identify gaps to improve the quality of health services at the facilities.

Outcome of MCSP Support at the Health Facilities

The most commonly reported outcomes of MCSP's support were infrastructure, staffing, and improving the quality of care at the facilities through supervision. Respondents stressed the importance of infrastructure improvements at the facilities—especially triage, placenta pits, and incinerator. They also mentioned the importance of MCSP's support for the distribution of IPC supplies and efforts to ensure the availability of protocols, supplies of essential drugs, and medical equipment. Respondents noted that MCSP's hiring of additional clinical staff, capacity-building, and payment of regular salaries motivated staff to stay at their facilities for service provision and created a division of labor within health facilities such that everyone took ownership for their responsibilities. This, in turn, contributed to cutting down the time patients stayed in the facility. Respondents also mentioned that because of MCSP's work, supervisors' skills in supervision improved according to MOH standards. Improved supervision and the training provided for MCH staff in turn improved the facility staff's ability to provide high quality maternal and child health services and address identified gaps.

"The supervision and management through MCSP support helps us to check data and know where the problem is, then do 'plan, do, study, and act (PDSA)' and solve the problem."
–CHT Staff in Nimba County

"[Through MCSP's support] there is a regular supply of drugs and medication, improved MCH activities and clinics with equipment, building modern triage, and other services' quality improved."
–CHT Staff in Nimba County

"Pregnant women [are now] going for ANC visits, and patient time at the facility has been reduced."
–DHT Staff in Nimba County

Strengths & Limitations

We believe the strengths of this endline assessment include the use of independent consultants, all of whom were licensed clinicians, for data collection and the rigorous data collector training and data quality measures. In addition, assessors, MCSP staff outside the core assessment planning team, CHT staff, and facility staff did not know which facilities were sampled until the first day of the assessment. This blinding reduced the probability of bias in the assessment of sampled facilities.

While we are confident the results presented reflect the achievement of the RHS project, the assessment has some limitations. The primary limitation is that the baseline and midline assessment methods differed slightly from the endline. That is, the baseline and midline assessments were conducted by MCSP staff rather than external, independent consultants. In addition, county health team supervisors were part of the baseline and midline data collection teams, and this may have introduced some assessor bias. The assessment preparation and procedures were not as rigorous at baseline and midline, which may have resulted in lower inter-rater reliability and variation in assessment methods between sites.

In addition, for some technical areas such as obstetric complications, we modified which standards and verification criteria were used to assess clinics after the team realized that some clinical practices were not performed at the clinic level. As a result, the results for these two areas are not precisely comparable between assessments.

Conclusions

The endline assessment revealed tremendous improvements between baseline and endline in the key areas supported by MCSP/RHS: health facility readiness; quality of care; improved IPC adherence; and increase in service utilization.

- **Improved health facility readiness for RMNCAH service provision**: MCSP RHS provided needs based support based on identified gaps and priorities identified at 77 health facilities in three supported counties. The support, which included procurement of MNCH equipment; waste, water triage (WWT) upgrades; procurement and distribution of IPC supplies; and paying salaries for assigned staff brought significant improvements in facility readiness for provision of EPHS. For these standards to be maintained, the MOH will have to commit to the maintenance of the WWT features and MNCH equipment, and ensure a constant supply of IPC supplies.
- **Improved quality of care**: Quality of care is essential for continued service utilization by the community, and satisfied clients are effective for sustained promotion of services at health facilities. In addition to the support to improve facility readiness, MCSP enhanced health work force capacity through training and mentoring of staff, and monitoring the quality of care standards using the MOH approved Clinical standards. All of the supported RMNCAH technical areas, except for SGBV, showed improvement in clinical standards scores by 50 percentage points from baseline. The quality of care will need to be monitored regularly using the approved national standards while all required resources, including motivated and skilled staff, are at the facilities.
- **Improved IPC adherence**: Infection prevention and control (IPC) is a key component of quality health services delivery at all levels of the health system. Strict adherence to IPC is critical during this time and in the future, where Ebola and other emerging infections may return in Liberia and globally. MCSP's comprehensive support ensured adherence in IPC at health facilities through training and mentoring, WWT infrastructure upgrades, and distribution of IPC supplies. The high SQS scores are evidence of sustained and improved IPC adherence. IPC practices have been, to a great degree, institutionalized by all staff at facilities.
- **Increased service uptake**: MCSP RHS overall comprehensive support was aimed at restoring confidence in the health system, to enable communities to access health services. As clearly seen in the health services statics on RMNCAH, services uptake improved significantly. Facility delivery and immunization coverage doubled.

MCSP/RHS's investments, by equipping the Liberian health workforce and health system to deliver high quality evidence based maternal and child health services, restored the community's confidence in the Liberian health system.

Recommendations

The MCSP/RHS program brought marked improvements in all program support areas including improved health facility readiness, quality of RMNCAH services, and a strengthened health system. The result is a community and population with restored confidence to utilize health services. Hence, all stakeholders need to work collaboratively to sustain gains made by the program and improve further in all aspects. To sustain and build upon the gains realized by MCSP/RHS, the program provides the following recommendations.

- **Availability of both professional and non-professional staff** at every health facility is critical for EPHS provision. The project paid salaries for assigned staff at health facilities during the implementation period. MOH/CHT should transition all of these staff to the government payroll or any other alternative payment mechanism so that health facilities are staffed according to national standard to provide quality care.
- Though improvements were observed in areas of Waste, Water and Triage (WWT) features through the project renovation work on these features in 48 health facilities, some facilities still lack adequate WWT features. MOH & all stakeholders should **prioritize and mobilize resources to make sure that all health facilities have triage, latrines, waste pits, and reliable water sources**.
- The project procured and distributed medical equipment and supplies to health facilities so that health care workers were able to provide quality care. However, some health facilities still lack equipment such as the neonatal resuscitation table. MOH should to work with all stakeholders to ensure the **availability of medical equipment at each health facility as per EPHS standard**.
- Despite the efforts made at all levels to ensure availability of essential drugs at health facilities, up to one-third of the health facilities were facing stock outs of drugs including malaria RDT and antimalarials (ACT) in December 2017. Quality of health care without the availability of essential drugs at health facilities is unthinkable. Thus, MOH and partners need to work further to **ensure drugs are available at health facilities at all times**.
- Quality of care in all technical areas assessed through MOH core standards showed marked improvement over the life of project. However, scores remained low in the following technical areas: ASRH, FP & PPFP, and SGBV. In addition, there was a range of scores from the lowest to highest performing facilities, even at endline. It is expected that all health facilities meet all of the standards. Thus, MOH and other partners need to **enhance the capacity of the health workforce capacity through mentoring, coaching, & supportive supervision** and **create an enabling environment to meet all the standards** for all technical areas.
- Despite high prevalence of SGBV in Liberia, few health facilities met the MOH SGBV standards. MOH and CHT should enable health facilities and staff to **provide care for SGBV survivors through training and establishing appropriate set up to provide quality SGBV care**.
- Using data at all levels of health system for planning, reviewing performance, and implementing programmatic activities is critical. In this assessment, more than three quarters of health facilities were analyzing data and using data to make decisions at health facility level. However, this practice needs to be normalized and employed at all levels and in every health facility. Thus, MOH and partners should **reinforce and support the use of data for decision making at all levels including health facilities during supportive supervision & mentoring visits and performance review meetings**.

References

1. National Malaria Control Program Liberia, MOH Liberia, LISGIS, ICF. 2017. *Liberia Malaria Indicator Survey 2016*. Monrovia, Liberia: MOH Liberia, LISGIS, and ICF.
2. LISGIS, MOH Liberia, National AIDS Control Program Liberia, ICF International. 2014. *Liberia Demographic and Health Survey 2013*. Monrovia, Liberia: LISGIS and ICF International.
3. Ministry of Health. Health Information System of Liberia. 2018. Available with permission from: http://liberia.dhis2.org/

Annex 1: MOH Tracer Drug List at Baseline and Endline

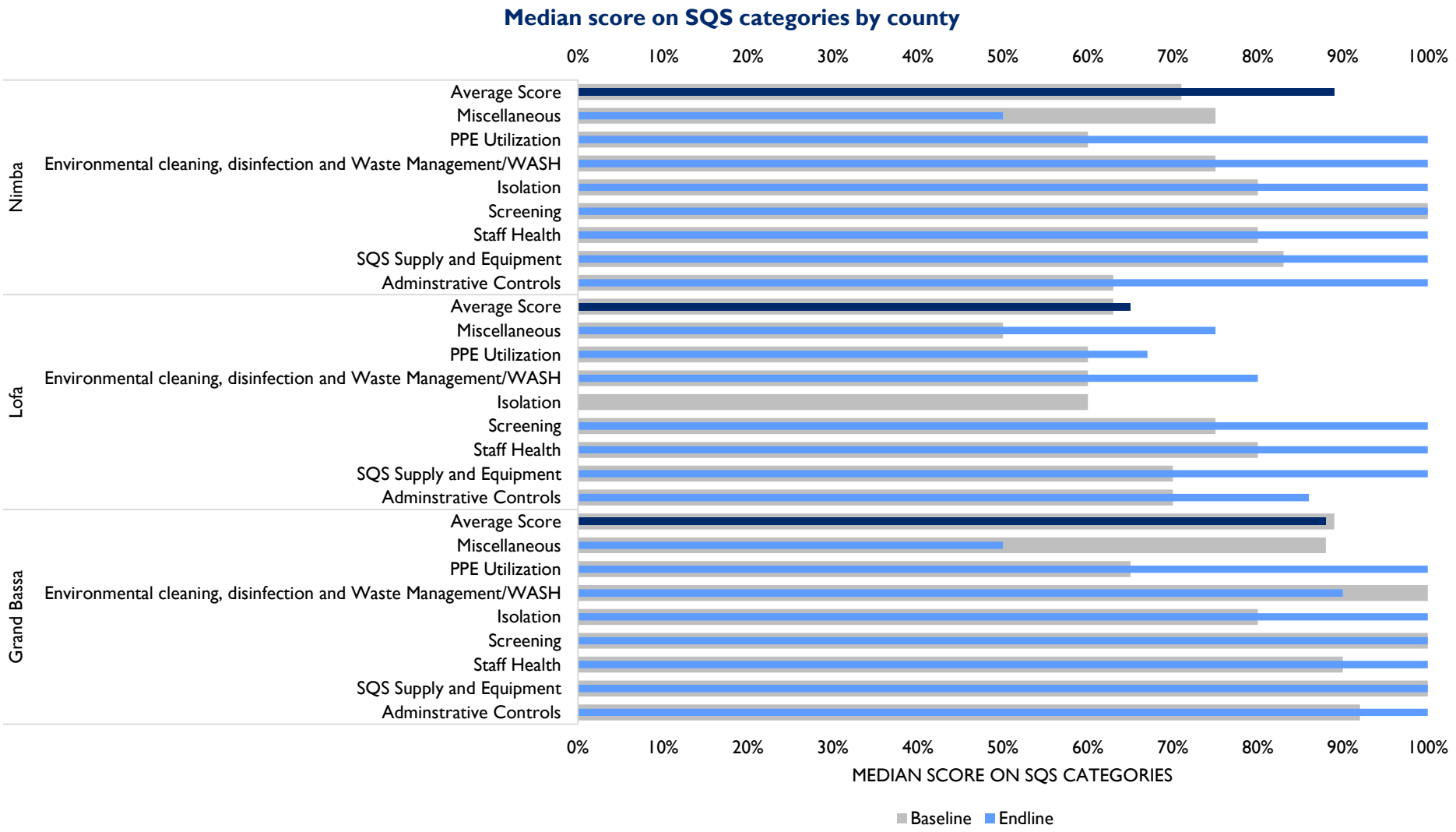
Baseline

ACT
Amoxicillin
Cotrimoxazole
Iron folate
Oral rehydration solution
Paracetamol

Endline

Amoxicillin 250 mg tabs
Artemether 80 mg, injection
AS 100 mg + AQ 270 mg (FDC) OR A 20 mg + L 120 mg
AS 100 mg + AQ 270 mg AQ (FDC) OR A 20 mg+ L 120 mg
AS 25 mg + AQ 67.5 mg (FDC) OR A 20 mg + L 120 mg
AS 50 mg + AQ 135 mg (FDC) OR A 20 mg + L 120 mg
Cotrimoxazole 480 mg tab
Doxycycline 100 mg cap/tab
Examination gloves (nitrile)
Ferrous sulfate 200 mg + folic acid 0.25 mg
HIV test kits
Hydrochlorothiazide 25 mg tab
Malaria tapid diagnostic test
Mebendazole 100 mg tab
Medroxyprogesterone 150 mg (Depo-Provera), injection
Oral rehydration solution 20.5 g/L
Oxytocin 10 IU/ml
Paracetamol 100 mg tabs
Paracetamol 500 mg tabs
Pentavalent vaccine
Sulfadoxine 500 mg + pyrimethamine 25 mg

Annex 2: IPC Results by County



The figure shows the SQS average score in each category, by county, as well as the overall average score. The baseline score is represented by the gray bar, whereas the endline score is the blue bar. Overall county average score is represented by the dark blue bar.

Annex 3: Clinical Standards Scorecard by County

County	Grand Bassa			Lofa			Nimba		
Technical Area/Assessment	**Baseline**	**Midline**	**Endline**	**Baseline**	**Midline**	**Endline**	**Baseline**	**Midline**	**Endline**
Antenatal care	33%	86%	71%	60%	86%	100%	14%	71%	100%
Adolescent sexual and reproductive health	0%	50%	100%	0%	0%	67%	0%	0%	67%
Integrated management of newborn and childhood illnesses	0%	92%	85%	23%	54%	85%	0%	77%	85%
Expanded program on immunization	38%	75%	75%	50%	79%	94%	0%	50%	88%
Malaria	50%	75%	75%	25%	75%	75%	0%	75%	100%
Family planning & postpartum family planning	6%	76%	62%	24%	59%	92%	0%	47%	69%
Normal labor and delivery	33%	83%	86%	67%	67%	86%	17%	80%	71%
Postpartum care	17%	100%	83%	83%	67%	100%	17%	67%	83%
Sexual and gender-based violence	N/A	66%	33%	N/A	25%	67%	N/A	0%	0%
Obsteric complications	0%	60%	100%	0%	0%	100%	0%	33%	80%
Average facility score	33%	70%	72%	44%	61%	83%	6%	50%	77%

N/A = Not assessed

Annex 4: Clinical Standards Results by Standard

Standard Number	Baseline	Midline	Endline	Standard Description
	% Facilities (n=37; 38 EPI)	% Facilities (n=35; 36 EPI)	% Facilities (n=37 MNH, including 7 hospitals; 36 EPI)	
ASRH-01	0%	17%	57%	Staff provide and promote utilization of adolescent-friendly services.
ASRH-02	3%	23%	N/A	Staff provide adequate information on the full range of youth-friendly sexual and reproductive health services.
ASRH-03	5%	11%	81%	There is appropriate distribution and placement of educational posters on adolescent sexual reproductive health.
ASRH-04	5%	37%	76%	Staff provide high-quality adolescent pregnancy, labor and delivery, postpartum, and newborn health care services.
ANC-01	30%	91%	100%	Pregnant women reporting to clinic are rapidly assessed for danger signs and referred if danger signs are present.
ANC-02	32%	63%	81%	Pregnant women are asked for their obstetrical, medical, and social histories.
ANC-03	27%	54%	70%	Pregnant women receive a physical and obstetrical examination.
ANC-04	27%	51%	59%	Pregnant women receive individualized care based on findings from the history, exam, and laboratory results.
ANC-05	0%	83%	95%	Pregnant women's birth preparedness and complication readiness plans are confirmed with the woman and partner.
ANC-06	54%	74%	97%	Pregnant women receive family planning counseling according to Ministry of Health guidelines.
ANC-07	51%	77%	78%	Pregnant women with signs of malaria are appropriately assessed and managed according to national guidelines.
COMP-01	0%	23%	84%	The provider manages or describes the management of shock (Hospital & HC Only).
COMP-12	14%	37%	67%	The provider administers appropriate treatment for complicated cases of malaria during pregnancy.

Standard Number	Baseline	Midline	Endline	Standard Description
	% Facilities (n=37; 38 EPI)	% Facilities (n=35; 36 EPI)	% Facilities (n=37 MNH, including 7 hospitals; 36 EPI)	
COMP-13	11%	40%	89%	Pregnant women with bleeding complications are appropriately managed according to national guideline.
COMP-15	8%	46%	89%	The provider manages pre-eclampsia or eclampsia according to protocol.
COMP-16	5%	37%	N/A	The provider follows up pre-eclampsia treatment and gives correct recommendations to the patient and husband/companion.
COMP-20	16%	54%	76%	The provider properly performs the general management of postpartum hemorrhage.
EPI-01	8%	34%	87%	The manager ensures that the health facility is well staffed with vaccinator.
EPI-02	32%	64%	58%	The provider properly keeps the cold chain system working.
EPI-03	39%	75%	89%	The provider keeps the registration materials updated.
EPI-04	45%	81%	89%	The provider implements a multidose open vial policy (for OPV, PCV, DPT+HB/Penta, TT).
EPI-05	47%	69%	84%	The provider uses planning and monitoring tools.
EPI-06	24%	72%	82%	The registration person/vaccinator uses integrated capture methods.
EPI-07	29%	69%	89%	The provider adequately administers immunization education.
EPI-08	26%	61%	87%	The provider immunizes the client, either by injection or orally.
FP-01	16%	77%	86%	The provider rules out a current pregnancy prior to the provision of family planning services.
FP-02	14%	49%	78%	Clients without a method preference receive counseling using balanced counseling cards.
FP-03	11%	51%	73%	Clients are assessed for medical eligibility for COC.
FP-04	19%	69%	81%	The client receives specific information and service about COC.
FP-05	16%	60%	78%	Women selecting Depo/POP receive relevant information and are provided safe injection of POP/Depo.
FP-06	11%	57%	57%	Clients are assessed for medical eligibility for IUD.

Standard Number	Baseline	Midline	Endline	Standard Description
	% Facilities (n=37; 38 EPI)	% Facilities (n=35; 36 EPI)	% Facilities (n=37 MNH, including 7 hospitals; 36 EPI)	
FP-07	8%	40%	54%	Clients selecting IUD are given full information about IUD.
FP-08	3%	31%	30%	Thorough, safe, hygienic IUD insertion performed for eligible clients.
FP-09	43%	57%	76%	Clients selecting condoms as their method of choice receive relevant information, counseling, and a supply of condoms.
FP-10	16%	63%	43%	Clients are provided information about male or female sterilization.
FP-11	43%	66%	86%	Client satisfaction with their current method of contraception is assessed and managed accordingly.
FP-12	24%	51%	68%	Side effects, complications, complaints and concerns related to the use of their chosen contraceptive method addressed/managed appropriately.
IMNCI-01	8%	74%	86%	Young infants from birth to 2 months are checked for possible bacterial infection.
IMNCI-02	16%	66%	78%	Young infants from birth to 2 months are correctly assesses and makes decisions on jaundice.
IMNCI-03	19%	66%	89%	Young infants from birth to 2 months with any sign of possible bacterial infection are referred.
IMNCI-04	8%	66%	86%	Young Infants under 2 months of age without any sign of possible bacterial infection are correctly assessed and counseled for feeding.
IMNCI-05	27%	83%	92%	Sick children 2 months to 5 years are assessed for general danger signs.
IMNCI-06	14%	69%	86%	Sick children 2 months to 5 years with any general danger signs are referred urgently
IMNCI-07	16%	80%	78%	Sick children 2 months to 5 years with cough and difficulty breathing are correctly assessed and treated.
IMNCI-08a	5%	66%	73%	Sick children 2 months to 5 years with diarrhea are correctly assessed and treated.
IMNCI-08b	14%	69%	68%	Sick children 2 months to 5 years with fever are correctly assessed and treated.

Standard Number	Baseline	Midline	Endline	Standard Description
	% Facilities (n=37; 38 EPI)	% Facilities (n=35; 36 EPI)	% Facilities (n=37 MNH, including 7 hospitals; 36 EPI)	
IMNCI-09	27%	66%	86%	Infants and children from birth to 5 years are correctly assessed for anemia and under nutrition.
IMNCI-11	16%	71%	89%	Infants and children from birth to 5 years are correctly classified for anemia and under nutrition.
IMNCI-12	16%	66%	81%	Infants and children from birth to 5 years are correctly treated for anemia and under nutrition.
IMNCI-13	11%	71%	73%	Oral rehydration therapy corner is established to provide initial treatment for diarrhea.
MAL-01	11%	69%	76%	Patients with suspected malaria receive the appropriate physical exam and testing to diagnose malaria.
MAL-02	32%	74%	92%	Uncomplicated malaria cases are correctly managed/treated.
MAL-03	49%	69%	95%	Complicated malaria is rapidly diagnosed and immediate treatment given, emergency referral made.
MAL-04	35%	71%	70%	Preventive measures for malaria are provided for children under 5 and pregnant women.
MAL-05	19%	N/A	N/A	Health preventive measures for malaria are provided for children under 5 and pregnant women.
NLD-01	19%	40%	51%	HIV+ women in labor receive individualized care based on findings from ANC.
NLD-02	46%	74%	70%	Labor is monitored and recorded according to national protocol.
NLD-03	38%	77%	65%	Women are assisted by skilled birth attendant to have safe and clean deliveries.
NLD-04	51%	74%	86%	Newborns receive rapid newborn assessment and resuscitation (if necessary) according to national guidelines.
NLD-05	49%	83%	78%	The third stage of labor is actively managed (AMSTL) according to national guidelines.
NLD-06	19%	29%	57%	Newborns receive essential newborn care.

Standard Number	Baseline	Midline	Endline	Standard Description
	% Facilities (n=37; 38 EPI)	% Facilities (n=35; 36 EPI)	% Facilities (n=37 MNH, including 7 hospitals; 36 EPI)	
NLD-07	N/A	N/A	84%	Mothers with low birth weight babies received advice on essential newborn care including kangaroo mother care.
PP-01	41%	71%	84%	Women receive immediate postpartum care and monitoring.
PP-02	24%	74%	68%	New mothers receive a postpartum physical examination.
PP-03	62%	77%	81%	New mothers with warning signs or postpartum complications are managed, stabilized and referred as appropriate.
PP-04	27%	66%	59%	New mothers receive postpartum advice and family planning counseling .
PP-05	27%	69%	92%	Newborns receive appropriate newborn assessment and care.
PP-06	19%	69%	81%	Parents receive counseling and health education on postpartum and newborn care and danger signs.
PPFP-01	5%	66%	59%	All pregnant clients are routinely counseled on PPFP in ANC.
PPFP-01b	3%	51%	N/A	Clients selecting PPIUD are given full information about IUD.
PPFP-02	3%	57%	86%	Thorough, safe, hygienic PPIUD insertion performed If mother requests PPIUD.
PPFP-03	5%	51%	86%	Follow-up counseling is provided for mothers who receive PPIUD.
PPFP-04	0%	57%	86%	Routine counseling before discharge is provided to mothers who do not have PPIUD.
SGBV-01	N/A	60%	54%	Clients reporting at facility for domestic violence are screened properly.
SGBV-02	N/A	46%	32%	Staff at facility conduct appropriate services for victims or suspected victims of sexual assault, rape, domestic or interpersonal violence.
SGBV-03	N/A	31%	38%	Staff offer appropriate treatment for rape victim based on findings of sexual assault.
SGBV-04	N/A	11%	N/A	Drugs and medical supplies for SGBV cases are available (hospital & health center only).

NOTE: ANC = antenatal care; ASRH = adolescent sexual and reproductive health; COMP = obstetric complications; EPI = Expanded Program on Immunization; FP = family planning; IMNCI = integrated management of newborn and childhood illnesses; MAL = malaria care; MNH = maternal and newborn health; NLD = normal labor and delivery; PP = postpartum care; PPFP = postpartum family planning; PPIUD = postpartum intrauterine contraceptive device; SGBV = sexual and gender=based violence.