Using the Problem Tree and Results Chain to Improve Uptake of Intermittent Preventive Treatment in Pregnancy Services—Case Study of the Malaria Action Program for Districts in Uganda

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Abstract

Malaria in pregnancy contributes considerably to poor pregnancy outcomes. The U.S. Agency for International Development's Malaria Action Program for Districts project in Uganda used the Problem Tree and Results Chain tool to identify demand and supply barriers responsible for the low uptake of intermittent preventive treatment of malaria in pregnancy (IPTp) in 52 districts of Uganda. The key supply-side barriers identified were related to leadership/governance, health financing, medicines and technologies, health information systems, human resources, service delivery, and users. The project used the results to plan and implement interventions targeting the barriers. As a result, from October 2018 to September 2019, the project reported an apparent improvement in uptake of three or more doses of IPTp (49–67%). Malaria in pregnancy cases and stock out of sulfadoxine-pyrimethamine (SP) did not change considerably. The Problem Tree and Results Chain tool is a useful and complementary project management tool to identify root causes and their solutions during planning and implementation. Projects using this tool should periodically re-assess performance of IPTp policy implementation and develop appropriate solutions to address the key bottlenecks identified to increase the likelihood of sustained improvement. Further evaluation of the utility of the tool in other settings is recommended.

Background

The global burden of malaria remains enormous with an estimated 229 million cases and 409,000 deaths worldwide in 2019; 94% of the cases were reported in Africa, where climatic and other conditions favor transmission [1]. Malaria in pregnancy (MIP) is a major public health problem in low- and middle-income countries (LMICs) in the tropical regions of Africa, Asia, and Latin America where malaria parasites can lead to placental malaria with negative consequences for pregnant women, fetuses, and newborns. The effects of MIP include intrauterine fetal growth retardation, low birth weight, preterm delivery, abortion, still births, and fetal and maternal anemia. MIP thus increases the risk of death for both the mother and fetus [2]. To prevent malaria infection and its ill-effects in pregnancy, the World Health Organization (WHO) recommends consistent and correct use of insecticide treated nets (ITNs), intermittent preventive treatment (IPTp) using sulfadoxine-pyrimethamine (SP), and prompt and proper treatment of malaria and anemia. IPTp using SP is cost effective in reducing the burden of malaria among pregnant women. For IPTp, three tablets of SP are administered to a pregnant woman monthly starting from 13 weeks of gestation until delivery. For prevention of anemia, the recommended dose of iron and folic acid supplementation is 30–60mg of elemental iron (equivalent to 150–300mg FeSO₄) plus 0.4mg of folic acid daily [3].

Evidence from systematic reviews and meta-analysis of studies conducted in sub-Saharan Africa identifies the inconsistent provision of IPTp and ITNs services compounded by unclear policy and guidance on IPTp as key barriers to the control of MIP [4–12]. Other factors that contribute to the problem include weak healthcare systems, frequent stock-outs of essential medicines and commodities, high user fees, and sub-optimal quality of services [10, 13]. Surprisingly, there continues to be confusion over the timing of each IPTp dose in relation to pregnant women's antenatal care (ANC) attendance, which effects

IPTp uptake. Key determinants of IPTp coverage have been identified as level of education, knowledge about malaria/IPTp, socio-economic status, parity, and number and timing of antenatal clinic visits [5].

In 2014, the Uganda Ministry of Health (MOH) developed a strategic plan for malaria reduction [14], which adopted the WHO 2012 guidance on IPTp that recommended three or more doses of SP starting as early as the 13th week of pregnancy. Beginning in 2017, and in line with the 2015 guidance on sexual and reproductive health rights, the strategic plan was rolled out to health facilities [15]; the roll-out was completed by September 2018. The 2019 Malaria Indicator Survey reported that only 41% of the pregnant women surveyed had received three or more doses of SP for IPTp [16], however, this was an improvement from the 17% coverage reported in the 2016 Uganda Demographic and Health Survey [17].

The U.S. President's Malaria Initiative (PMI), which supports malaria control and prevention activities in Uganda [18], began assisting prevention and control of MIP in 52 districts in 2016 through the Malaria Action Program for Districts (MAPD) project. The activities implemented included providing technical assistance to the MOH, district local governments, and health facilities with the aim of improving service delivery and supporting community interventions to increase malaria prevention practices and create demand for MIP services and interventions.

The MAPD project

To improve MIP intervention implementation in general at national and sub-national levels, and IPTp uptake in the 52 supported districts, the MAPD project used the United States Agency for International Development's (USAID's) Problem Tree and Results Chain (PTRC) analysis [19] approach to: 1) better identify, understand, and document barriers that undermine MIP program implementation and develop interventions and solutions for sustained improvement; and 2) document lessons learned about using the PTRC tool that can be applied by other projects seeking to improve IPTp uptake in LMICs with similar contexts. This paper reports on the process MAPD followed to conduct the PTRC through consultative meetings, the barriers identified, lessons learned, and actions developed to address barriers within the scope of the project's mandate.

Methods

Setting

The MAPD project works with the MOH at different levels (i.e., national/ central, regional, and district). At the central and regional levels, the project work with the National Malaria Control Division (NMCD), Reproductive and Infant Health Division, other relevant divisions, and technical and thematic working groups (TWGs). At district level, the activities are implemented through the district health team led by the district health officer.

Selection of participants

Out of the 52 districts supported by the project, 10 districts were selected for the pilot of the PTRC tool. Districts were purposively selected using the maximum variation sampling method based on District Health Information Software–2 (DHIS2) performance data on three doses of IPTp (IPTp3); half of the districts reported IPTp3 uptake of 50% and above and the other half had less than 50% IPTp3 uptake. Purposive selection of respondents was based on the following criteria: playing a major role in MIP programs; knowledge and understanding of the MIP program; at least three years' experience of working in the MIP program; involved in design, planning, implementation and monitoring and evaluation of the MIP program; and being influential in improving the MIP program by virtue of the position the respondent held.

Design, data sources, and participants

Data were collected cross-sectionally using a mixed-method approach to collect quantitative and qualitative data in the 10 districts in the MAPD project implementation area. The PTRC tool was used to gather qualitative data through one-on-one interactions with individuals and from groups of people as part of program implementation consultative meetings.

Overall, 87 purposively sampled individuals participated at all levels. At each of the meetings, the facilitator introduced the tool, presented IPTp performance data, and facilitated problem analysis guided by pre-set categories based on the WHO health systems strengthening building blocks and previous studies of IPTp programs in Uganda and countries with similar context. The PTRC tool is comprised of three sections: the root cause analysis supply side, the root cause analysis demand side, and the PTRC analysis. In both the root cause analysis for the demand side and supply side, issue categories are derived from the WHO health systems building blocks and from previous studies on the performance of IPTp programs across the world. Under each of these categories, barriers and/or problems affecting program performance are identified and subsequently analyzed using the “why question” until the root cause is identified. In the PTRC analysis section, the six columns, which include, impact, outcome, problem, solution, outputs, and inputs, are populated using the project activity monitoring and evaluation plan. A retrospective secondary analysis was also conducted of aggregate health facility data reported through the DHIS2 for the three-year implementation period of the MAPD project (2016–2018, inclusive).

Qualitative data collection and analysis

Using the PTRC tool, the national MIP focal person coordinated five consultative meetings with key staff at NMCD, including the MIP lead, the MIP specialist, head of case management, monitoring and evaluation officer, and supply chain officer. One full-day consultative meeting at the project's central level, convened by the senior malaria technical advisor, was attended by the project's senior management, advisors, and technical specialists. At the regional level, five two-day consultative meetings at the project regional offices were convened by the regional coordinator; each meeting had 10 participants, including project specialists, coordinators, and technical officers based in the region. Additionally, one-day consultative meetings were conducted in the 10 districts, primarily with the district health team members comprising the district health officer, assistant district health officer, in-charge of maternal child health

services, a biostatistician, malaria focal person, surveillance focal person, supplies officer, and district health educator.

Data verification was done prior to analysis through content analysis and identification of common themes. Transcripts were created by populating the PTRC tool during key informant interviews and focus group discussions. The transcripts were checked for consistence and errors by the project lead. Demand and supply barriers at national, regional, district, and health facility levels and at the user level were identified. Data were analysis in stages. First, the transcripts were examined for dominant themes and a coding structure developed to guide the qualitative analysis. Thereafter, the transcripts were analyzed thematically until saturation of responses around themes was reached. The responses were summarized on paper using key words that participants were familiar with and ranked in the order of influence on the program. The facilitator led a session to help participants identify and agree on key actions to be implemented to address the barriers using the available resources and to identify areas where other programs could be leveraged. Summaries of the discussions were captured on flip charts and later synthesized by the MIP specialist identifying common and recurring themes or problems. The actions agreed upon and undertaken are shown in Tables 1 and 2. Transcripts were stored on the project OneDrive and were only accessible to authorized personnel.

Table 1
Supply Side: Barriers, Root Cause, and Action Taken

Category	Identified barrier or challenge	Root cause	Actions taken
Supply-side barrier analysis			
<i>A. Leadership/Governance</i>			
	Poor integration of services	Inadequate coordination between the relevant MOH divisions	Convened monthly meetings of the MIP TWG
	Poor accountability		
	Policy factors	Inadequate dissemination of policies	Disseminated policies through on-site training and mentoring
	Slow decentralization processes for program management	Project-based programming	Held annual district planning sessions with NMCD participation
<i>B. Financing</i>			
	Low budgetary allocation	Inadequate advocacy for budget support to malaria programs	No action taken
	High out-of-pocket expenditure	No social health insurance	No action taken
<i>C. Health Information systems</i>			
	Poor recording— incomplete, inaccurate	Inadequate supervision	Facilitated district health teams to conduct quarterly supportive supervision
	Poor reporting in the HMIS 105 (Health Unit Outpatient Monthly Report)	HMIS 105 lacks the IPTp3+ (3 or more doses of IPTp) indicator	Held quarterly data review meetings Facilitated data cleaning and feedback to health facilities
	Non reporting in the DHIS2	Lack of a data quality assurance system	Facilitated data quality assessments and supportive supervision
	Poor data use	Lack of a data-use culture	Conducted mentoring of health facility and district health team on data use
<i>D. Human resources</i>			
Provider knowledge	Poor knowledge of IPTp strategy, timing, and dosage of SP	Poor adherence to MOH guidelines	Trained and mentored health workers on MOH IPTp guidelines

Category	Identified barrier or challenge	Root cause	Actions taken
	Imprecise estimation of gestational age	Lack of gestational age estimation tools	Trained and mentored health workers on use of tools
	Confusion about when to give IPTp in relation to treatment of malaria, HIV, etc.	Lack of job aids and non-use of the job aids	Provided IPTp job aids to all health facilities
	Perception that women will not or should not take SP on an empty stomach	Lack of information on SP	Mentored health workers to improve client education and counselling
Provider attitudes	Information and instructions on IPTp not given to pregnant women	Poor interpersonal communication by health workers	Mentored health workers to improve client education and counselling
	Providers do not offer IPTp	Poor adherence to MOH guidelines	Trained and mentored health workers on MOH guidelines
	Providers treat women with lack of respect	Inadequate skills by health workers in respectful care of clients	Trained and mentored health workers on respectful care
Health facility organization	Restrictive ANC hours	Fixed clinic opening hours	No action taken
	Frequent provider absence from work	Weak human resources management system	No action taken
	Ineffective staff rosters	Inadequate internal supervision	Mentor health facility managers on internal supervision
<i>E. Service delivery</i>			
Inadequate guidance on IPTp	No guidelines available at the facility	Weak leadership/management	Distribute guidelines
	Lack of supervision and monitoring of IPTp	Weak supervision and monitoring of IPTp	Mentored health facility managers on internal supervision
	Lack of updated training on IPTp	Inadequate financing for training	Trained and mentored of health workers
	Private facilities following different practices	Lack of capacity building strategy and funding for private health facilities	Trained and mentored private facility health workers
Fees for ANC services	ANC registration fees	Cost recovery in private health facilities	No action taken

Category	Identified barrier or challenge	Root cause	Actions taken
	Cost of SP	Limited health facility medicines budgets	Advocated for free SP for public health facilities
	Unofficial penalties	Inadequate monitoring	Mentored health facility managers on internal supervision
Supply of SP	SP unavailable	Limited funding for SP procurements from the National Medical Stores	Advocated for free SP for public health facilities
	Poor stock control	Poor stock management systems	Trained and mentored health workers using the Supervision Performance and Recognition Strategy
Health facility organization	Restrictive ANC hours	Fixed clinic opening hours	No action taken
	Lack of cups or drinking water	Weak advocacy for malaria funding	Provided water purifiers and cups
	Frequent provider absence from work	Weak human resources management system	No action taken
	Ineffective staff rosters	Inadequate internal supervision	Mentor health facility managers on internal supervision

Table 2
Demand Side: Barriers, Root Cause, and Action Taken

Category	Identified barrier/problem	Root cause	Action taken
<i>A) User/pregnant woman</i>			
Pregnant women's knowledge	Lack of knowledge of benefits of IPTp	Lack of funding for IPTp social behavior change communication (SBCC)	Integrated MIP messages into routine SBCC at health facility and community
	Belief that SP is unsafe	Lack of funding for IPTp SBCC	
	Perceived fear of side effects	Lack of funding for IPTp SBCC	
Access to ANC	Poor access	Long distance to health facilities	Supported outreaches
	Lack of awareness on importance of ANC	Lack of funding for ANC SBCC	Supported health facilities to educate clients on importance of ANC
Affordability of ANC services	ANC registration fees	Cost recovery in private health facilities	No action taken
	Laboratory fees	Cost recovery in private health facilities	
	Cost of SP	Cost recovery in private health facilities	
Quality of ANC	Providers do not offer IPTp	Health workers not following standard operating procedures and job aids	Mentored health workers on MOH IPTp guidelines
	SP unavailability	Limited funding for SP procurements from the National Medical Stores	Advocated for free SP for public health facilities
	Lack of water or cups for directly observed treatment	No funding for directly observed treatment	Provided water purifiers and cups
	Poor attitudes of health workers	Training design missing behavioral aspects	Mentored health workers on interpersonal communication
	Lack of information or instructions given by health workers regarding IPTp	Health workers not following standard operating procedures and job aids	Mentored health workers on to use MOH IPT standard operating procedures and use job aids
<i>B) Pregnant woman's partner</i>			

Category	Identified barrier/problem	Root cause	Action taken
	Intimate partner violence	Limited awareness of benefits of ANC	Conducted community dialogues focusing on partner support
	Inadequate financial support	Sociocultural influence	
	Decision-making	Sociocultural influence	
C) Peers			
	Peer influence	Lack of a 360-degree SBCC approach	Conducted community dialogues to address myths and misconceptions

Quantitative data collection and analysis

Malaria prevention services utilization aggregate data for the period 2016–2019 were downloaded from the DHIS2 by a project officer. Data cleaning and quality checks were done using a set of validation rules. Data from the DHIS2 was exported to Excel and analyzed using the STATA statistical package. Health facility IPTp data for the period between 2016 to 2019 were analyzed based on the aggregate quarterly IPTp data obtained from the DHIS2, which are publicly available. To obtain estimates of relative change in IPTp uptake, the 24-month period (October 2016 to September 2018) prior to the implementation of the PTRC by the MAPD project was designated as “pre-intervention” and the period covering the last 15 months of the intervention (October 2018 to December 2019) as “post-intervention.”

The MAPD project has memorandum of understanding with the MOH and districts that allow it to work with the staff, including interviewing them, to improve the malaria program management. The use of PTRC tool was done in the context of quality improvement. DHIS2 data are publicly available; access is granted after creating an account.

Results

The MAPD team gathered data from the respondents using the PTRC tool, reviewed MIP literature from Uganda, and shared experiences from the MAPD project to identify the key barriers/problems that affect access to MIP services, covering both the supply side and demand side. The PTRC analysis identified leadership and governance, health financing, human resources, medicines and technologies, health information systems, and service delivery as the key barriers. The analysis also identified the root causes of these barriers, which informed the development of appropriate actions to address the barriers.

Table 1 summarizes the key supply-related barriers and their root causes at national and sub-national levels. They are categorized into five domains: leadership/ governance, financing, health information system, human resources, and service delivery. Examples of issues reported include: an inefficient or broken supply chain, inconsistent guidelines for IPTp provision, lack of training and supervision

opportunities for health workers, inconsistencies in ANC services offered in health facilities, and inaccuracies in data capture and reporting. Table 2 shows the demand-related barriers, challenges, and their root cause, which are categorized in three domains: user or pregnant women, the partner, and peers. Appropriate remedial actions proposed and taken are also presented in the two tables. In some situations, no action was taken as it was not possible to effect changes at that level, for example, increasing budget allocations or reducing out-of-pocket expenses for the services users.

(INSERT Table 1 and 2 HERE)

Addressing national-level barriers

The results of the PTRC process were presented to the MIP TWG, which developed action plans to address the barriers identified, such as frequent stock-outs of SP, inadequate accountability, and weak integration of MIP in reproductive health program. The action plans included increasing advocacy to include SP on the non-credit line items so that SP is not charged on the health facility budget and inviting district health officers to participate in the MIP TWG meetings to increase accountability at all levels. Progress on IPTp interventions was presented during the management and data review meetings attended by district health teams, staff of the NMCD, and implementing partners. In addition, the maternal and child health cluster TWG adapted integration checklists and ensured that the MIP program was incorporated into ANC policy guidelines, which contributed to improved planning, implementation, and monitoring.

Addressing district-level barriers

The project conducted a leadership and management capacity assessment of 52 district health management teams. The results of the assessment informed the project's interventions to improve their leadership and management skills. These included adding district and facility-level performance reviews, incorporating data use in district planning, and holding joint supportive supervision visits with the districts and health facilities. The district health teams were facilitated to make quarterly follow-ups on progress, review data, and provide further guidance and feedback to health facility staff and managers. This intervention has resulted in increased interest by the district leadership in the performance of the malaria program, and districts have allocated locally generated resources toward malaria control and prevention.

Addressing health facility-level barriers

To address health facility barriers, the project conducted on-the-job mentoring to health workers. The project trained 30 master mentors and 238 district-based mentors in malaria clinical services mentoring. The district mentors conducted sessions for 10,864 ANC health workers, out of 13,627, with the aim of equipping them with knowledge about MIP service delivery and improving their skills, attitudes, and practices. This intervention involved conducting a standards-based pre-mentorship assessment, mentoring sessions (up to four per health facility), and a post-mentorship assessment. The sessions were tailored to address gaps in knowledge, skills, attitude, and practice identified in the facility assessment.

District health teams were facilitated to conduct supportive supervision and mentoring in 1,155 health facilities. All health facilities were supported once every three months for a period of 12 months. At each of these health facilities, MIP quality improvement activities, including on data quality, were implemented as this approach has been reported to yield results [21]. The health workers were mentored on quality data and logistics management including recording, reporting, and data use. To increase pregnant women's knowledge of MIP, health workers in these facilities were mentored on providing interpersonal communication through the SBCC component and given MIP counselling charts and job aids.

By the end of the project in 2018, there was an observed improvement in some key indicators, such as health worker competency in delivering IPTp services, increased IPTp3 uptake, and improved SP supply chain management. Figures 1–3 summarize the changes observed.

Improved health worker competence to deliver IPTp services

Pre- and post-test score. The project implemented training and mentoring activities in the 52 districts reaching 1,645 health workers in 470 health facilities. On a scale of 0 to 5, health workers were tested on various MIP management standards before and after the mentorships. Analysis of pre- and post-test scores in a sample of health facilities showed an increase in the average score of health workers from 2.3 in 2017 to 4.3 in 2019. Figure 1 shows changes in the average score of a sample of health facilities where mentoring was conducted.

Improved uptake of IPTp3 in intervention districts

Figure 2 shows that in project sites, the proportion of pregnant women who attended ANC and obtained three or more doses of IPTp increased from 0% in Jan–Mar 2017 to 44% in Jul–Sep 2018 and from 49% in Oct–Dec 2018 to 67% in Oct–Dec 2019. Health facility reporting of the IPTp3 indicator (not shown) improved from 50% in the period of October 2017 to September 2018 to 93% in October 2018 to September 2019.

Improved SP supply chain management

The project used the Supervision Performance and Recognition Strategy (SPARS) to improve the quality of SP ordering and reporting, storage and stock management, dispensing, and prescribing.

A performance assessment indicated that there was improved performance in all the five domains of the SPARS framework as a result of the MAPD project's capacity building interventions. The assessment was based on 25 indicators across the five domains, with a score of five being the highest. This improvement in performance resulted in improved availability of SP stocks as shown in Figure 4 below.

Discussion

Overview

This study aimed at improving our understanding of and demonstrating how the PTRC process can be used to identify barriers, challenges, and root cause of low IPTp uptake in Uganda and document lessons learned from using the PTRC tool. The lessons learned contribute to the body of knowledge on contextual factors effecting IPTp uptake and how they can be addressed.

The results reported in this paper from the implementation of the MAPD project show an increase in IPTp update over the three-year project period. Overall, uptake of the IPTp in Uganda is encumbered by several barriers categorized under the six building blocks of the health system, namely leadership/governance, health financing, medicines and technologies, health information system, human resources, and service delivery and health service user-related barriers. Use of the PTRC analysis tool provided the MAPD team with systematic insights into the barriers effecting program implementation and possible solutions to address them to close the efficacy-effectiveness gap for IPTp [22]. Use of the PTRC analysis tool identified similar barriers in a narrative synthesis by Olaleye and Walker (2020), which found that factors effecting the supply and demand for IPTp services involve all pillars of the health system across sub-Saharan Africa [23].

The MAPD project's use of the PTRC increased surveillance and interest in the performance of the MIP program, and systematic analysis of the results of MIP interventions increased ownership and contributed to improved MIP services utilization [20]. Additionally, there was increased coordination between the NMCD and Reproductive Health Division through the MIP thematic working group and maternal and child health cluster TWG. MIP has been integrated in the national ANC guidelines as a core lifesaving intervention. At the national level in Uganda, it is critical that the NMCD continue to coordinate with reproductive health programs on policy and service delivery to realize the benefits in MIP intervention.

Lessons learned from using the PTRC tool to improve program performance

- To conduct sound PTRC analysis, consultative meeting should be held at national level with key program implementers and at sub-national level with groups that manage program interventions and are responsible for performance of the program.
- To gain meaningful insights into the barriers to a specific program and develop action plans, the participants should be interested in improving program performance with deep understanding of the particular program, capacity to influence interventions and outcomes, and able to monitor interventions and results.
- To promote an open, honest, and constructive exchange of ideas at consultative meetings, discussions should be guided by the PTRC tool and a facilitator who maintains a non-judgmental attitude and limits their personal opinions.
- A good way to synthesize the results of multiple consultative meetings is to use thematic analysis looking out for recurring themes in addition to engaging participants in a feedback meeting to share findings and develop workable actions.
- The PTRC tool can be improved by assessing issues beyond the health systems building blocks and digging deep into local contextual factors effecting program implementation and service utilization.
- The challenges of translating PTRC findings into feasible action plans include inadequate financial resources, inflexibility of project scope, and inadequate intersectoral collaboration.
- Using the PTRC tool had other unexpected benefits, for example increased coordination/commitment among stakeholders, shared understanding of barriers, and better communication about how to overcome these barriers.

Conclusions

The PTRC analysis is a useful and complementary program management tool to identify barriers, their root causes, and actionable solutions. It can contribute to improved healthcare service delivery as demonstrated in the case of IPTp delivery in the USAID/PMI-funded MAPD project. The case study illustrates how PTRC tool facilitated multiple stakeholders working alongside each other at different levels to achieve improvement in the performance of the MIP intervention across the 52 supported districts over the project period. The lessons learned from use of the PTRC tool can inform the design and implementation of related programs in LMICs with health system contexts that are similar to Uganda's. Projects using this tool should periodically re-assess performance of IPTp policy implementation and develop appropriate solutions to address the key barriers identified to increase the likelihood of sustained improvement. Further evaluation of the utility of the PTRC analysis tool in other settings is recommended.

Declarations

Disclaimer: The findings and conclusions of this case study are those of the authors and do not necessarily represent the views of the President's Malaria Initiative.

Ethics approval and consent to participate: Not applicable

Consent for publication: Not Applicable

Availability of data and materials: All data presented here are available.

Competing interests: The authors declare they have no competing interests.

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Authors' contributions

TN developed the concept, reviewed literature, conducted the problem tree analysis and results. JN, RK, and ML reviewed the methods and wrote the results and recommendations. JO, SG, JKT, and GT provided technical guidance and oversight. All authors read and approved the publication.

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Figures

Figure 1

Average pre- and post-mentoring competency test scores for health workers, by health facility

Figure 2

Proportion of pregnant women attending ANC1 who received three or more doses of SP (IPTp3+), project and non-project districts Source: DHIS2 Uganda December 2019

Figure 3

SPARS assessment in 52 districts Source: MOH Pharmaceutical Information Portal

Figure 4

Proportion of health facilities with stock-outs of SP in MAPD focus districts