



RESEARCH AND EVALUATION REPORT

Analysis of ASSIST program activities for improving the quality of services for PMTCT, 90-90-90 targets, and malaria in Uganda

MARCH 2020

This research report describes the results of quality improvement interventions to prevent mother-to-child transmission of HIV (PMTCT), increase testing for HIV and linkage to care, and improve diagnosis and treatment of malaria in Uganda. It was prepared by University Research Co., LLC (URC) for review by the United States Agency for International Development (USAID) and authored by Simon Sensalire, Esther Karamagi Nkolo, Juliana Nabwire, Martin Muhire, and Astou Coly of URC and Jacqueline Calnan of USAID through the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project. The USAID ASSIST Project is made possible by the generous support of the American people through USAID. The project's support for improving PMTCT and HIV program performance was supported by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR).

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The views expressed in this document do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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For more information on the work of the USAID ASSIST Project, please visit www.usaidassist.org or write assist-info@urc-chs.com.

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Table of Contents

List of Figures.....	i
Abbreviations.....	ii
Executive Summary.....	iii
I. Introduction.....	1
II. Evaluation Goal and Objectives.....	3
III. Methods.....	3
A. Evaluation Design.....	3
1. PMTCT.....	3
2. 90-90-90.....	3
3. Malaria.....	4
B. Data Analysis.....	4
IV. Results.....	5
A. PMTCT.....	5
B. 90-90-90.....	6
1. Factors related to delayed HCT and delayed ART initiation.....	7
C. Malaria.....	8
1. Percentage of suspected malaria cases that have complete and accurate records in the OPD register.....	8
2. Percentage of patients treated for malaria who had a positive malaria test in a given month.....	8
IV. Conclusion.....	10
Appendix: Description of Data Sources, Study Population, and Measurement Period.....	11

List of Figures

Figure 1. Cascade for viral load suppression among pregnant and lactating mothers in all 12 sites between October 2017 and May 2018.....	5
Figure 2. Number of male partners of female index clients tested for HIV (Oct-Dec 2017 and Jan-Mar 2018).....	6
Figure 3. Percentage of HIV-positives clients referred to a treatment facility.....	6
Figure 4. Factors related to delayed HCT.....	7
Figure 5. Factors related to delayed ART initiation.....	7

Figure 6. Percentage of suspected malaria cases that have complete and accurate records in the OPD register in all sites	8
Figure 7. Percentage of malaria cases with a positive malaria test who were treated in six sites	9
Figure 8. Percentage of mothers at 28 weeks who received three or more doses of IPT at clinic visits for eight sites (Jun 2017- Feb 2018).....	9
Figure 9. Percentage of patients who were prescribed and dispensed ACT at the pharmacy in all sites	10

Abbreviations

ASSIST	USAID Applying Science to Strengthen and Improve Systems Project
ACT	Artemisinin Combination Therapy
ANC	Antenatal Care
ART	Antiretroviral Therapy
DREAMS	Determined Resilient Empowered AIDS-free Mentored and Safe
DHIS2	District Health Information System
EID	Early Infant Diagnosis
EPI	Expanded Program on Immunization
HC	Health Center
HCT	HIV Counseling and Testing
HIV	Human Immunodeficiency Virus
HTS	HIV Testing Services
IP	Implementing Partner
IPT3	Intermittent Preventive Therapy, Third dose
LC1	Local Council
MOH	Ministry of Health
MRDT	Malaria Rapid Diagnostic Test
NMCP	National Malaria Control Program
OPD	Outpatient Department
PMTCT	Prevention of Mother-to-child Transmission
QI	Quality Improvement
RCA	Root Cause Analysis
RHITES-E	Regional Health Integration to Enhance Services, East
RHITES-N	Regional Health Integration to Enhance Services, North
URC	University Research Co., LLC
USAID	United States Agency for International Development
VL	Viral load

Executive Summary

Introduction: In the last year of the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project in Uganda, from October 2017 to Dec 2018, ASSIST oriented five USAID implementing partners and their coaches on quality improvement concepts and methods. With ASSIST support, partners established a collaborative to implement change packages to improve prevention of mother-to-child transmission of HIV (PMTCT), 90-90-90, and malaria services in Uganda. ASSIST's support to partners and their coaches specifically focused on supporting teams to identify gaps, testing changes and measuring improvements and addressing gaps related to the availability of commodities such as medicines, malaria test kits (including rapid diagnostic tests), and lab reagents.

Methodology: We conducted a secondary analysis of routine program data abstracted from facility records by quality improvement teams over the intervention period to assess improvements in key indicators. We analyzed indicator data for ASSIST PMTCT, 90-90-90, and malaria programs.

Findings: This analysis of ASSIST program activities showed improvements in the cascade for viral load suppression despite remaining gaps in HIV testing and treatment initiation. More male partners identified and followed up for HIV testing services following the implementation of the quality improvement intervention. For the malaria program, there was an increase in the number of suspected malaria cases at the outpatient department who had complete and accurate records, the number of patients who were treated for malaria and had a positive malaria test and the number of patients who were prescribed and given Artemisinin Combination Therapy.

Conclusion and recommendations: PMTCT, 90-90-90, and malaria quality improvement interventions implemented by the USAID ASSIST Project in Uganda led to improvements in the cascade for viral load suppression, number of men testing for HIV, and diagnosis and treatment of malaria. Although findings suggest that QI interventions can have a great impact on interventions for PMTCT, 90-90-90, and malaria, evaluations using a prospective design and a comparison group should be encouraged as they would establish stronger evidence for the effect of programs on key indicators.

I. Introduction

The USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project provided support for the implementation of prevention of mother-to-child transmission of HIV (PMTCT), activities to reach 90-90-90 targets, and malaria improvement activities in Uganda during Fiscal Year 2018. PMTCT improvement activities were implemented in 12 sites in Northern, Central, and Eastern Uganda, and 90-90-90 activities were implemented in eight sites in Northern Uganda from October 2017 to September 2018. Malaria activities were implemented in five sites in Central and Eastern Uganda from October 2017 to May 2018. This analysis assesses changes in key improvement indicators for PMTCT, 90-90-90, and malaria following the implementation of ASSIST-supported improvement activities. We provide below a description of the implementation of PMTCT, 90-90-90, and malaria improvement activities.

ASSIST PMTCT activities: ASSIST provided above-site technical support for PMTCT in all regions of Uganda from 2012 to 2017. In the project's close-out year, from October 2017 to September 2018, ASSIST scaled down its operation but continued providing support to 12 sites in Northern and Central Uganda through support to implementing partners (IPs). In both situations, ASSIST supported IPs with a quality improvement (QI) approach, including setting up QI teams and supporting teams to identify gaps, test changes, and measure improvements. In October 2018, ASSIST set up a collaborative of six health facilities under the Regional Health Integration to Enhance Services (RHITES)-North (N), Acholi, three under RHITES-N Lango, and three under RHITES-East (E) aimed at improving viral load (VL) suppression among pregnant and lactating women. ASSIST rolled out the viral load screening tool with the aim of improving the process of identifying pregnant women and lactating women eligible for VL screening and to support unsuppressed patients to reach viral suppression. Learning meetings were then conducted for supported sites to share key lessons on improving access to VL tests and supporting unsuppressed patients to get suppressed. In addition, following the dissemination of MOH guidelines for Early Infant Diagnosis (EID)/Expanded Program on Immunization (EPI) integration, ASSIST, the MOH, and RHITES-E jointly supported the integration of PMTCT, EID, and EPI using improvement methods in three sites in Eastern Uganda. At each of the immunization sessions, teams conducted process flow mapping to ensure steps for triage, HIV pretest and post-test counselling, and recording of results in the child health card and child register. Each site was supported to start a project on improving HIV testing for all the eligible mothers attending the static and outreach immunization clinics at the pilot sites.

ASSIST 90-90-90 activities: In July 2017, ASSIST started working with selected communities and health facilities in Northern Uganda to improve the identification of HIV-positive males. Facilities and communities tested three main changes: use of lay testers to identify HIV-positive males in the community in Nwoya district; use of peer facilitator groups in the fishing communities of Apac and Amolator to serve as QI teams testing changes to identify HIV-positive males and provide support to HIV-positive individuals; and provision of HIV testing services (HTS) for male sexual partners of female index clients in care (through facility-based HTS and community outreaches).

ASSIST supported IPs to test changes in health facilities in Northern Uganda for three months to reduce the 90-90-90 gaps by improving linkage to HIV care for children and adolescents and improving the identification, initiation, and linkage of HIV-positive males among fisher folks and male partners of HIV-positive female index clients. Based on this learning, ASSIST developed and shared change packages with IPs to support the spread of lessons learned to close gaps in

the third 90 for children. ASSIST engaged focal persons at the MOH to identify priority areas and supported the referral and coordination of HIV care between HIV testing points and treatment centers, forecasting of essential HIV testing and care commodities, and monitoring progress of activities. IPs provided support to eight facilities in Northern Uganda to implement the change package to reach high-risk men and support the identification of male sexual partners of female index clients. ASSIST conducted a root cause analysis (RCA) in March-April 2018 and rolled out the RCA approach to IPs. The RCA aimed to understand reasons for delayed HIV diagnosis and delayed antiretroviral therapy (ART) initiation in four regions of RHITES East, East Central, South West, and Acholi. ASSIST shared the results with each IP to support their surge plans for improving HIV identification and ART initiation. In addition, ASSIST facilitated a district QI team meeting with 20 District Health Officers during which action plans to test changes were developed to improve the identification of new HIV-positive individuals.

ASSIST malaria activities: Despite many efforts to control malaria over the past 10 years in Uganda, it remains persistently high in most areas, contributing to 20-45% of outpatient visits and about half of the deaths of pediatric admissions. ASSIST implemented a malaria collaborative in five health facilities in the Kayunga district in Central Uganda with the aim of improving the completeness and accuracy of malaria data (i.e., ensuring that all components of the data tools are filled in as prescribed by the national guidelines), synchronizing health facility malaria data tools, and increasing adherence to the test and treat policy for malaria. A change package for improving the quality of data for the management of malaria was developed in January 2017, using lessons learned from this work.

ASSIST supported the National Malaria Control Program (NMCP) of the Ministry of Health to roll out the malaria change package and institutionalize best practices through a national malaria collaborative and supported the MOH to implement best practices with emphasis on the quality of malaria data and adherence to test and treat guidelines. ASSIST engaged the NMCP monitoring and evaluation technical working group to create an understanding about the best practices from the malaria change package and recommendations on how such change packages can inform national guidelines. As a result, ASSIST supported the incorporation of the change package into the national malaria training materials and developed a summary slide deck and guide to the malaria change package, including key best practices to improve adherence to guidelines for test and treat for all staff members in Kayunga district's health facilities (i.e., volunteers, nurses, clinicians, dispensers, laboratory staff, facility in-charge, and coach). A national collaborative of 18 sites including at least two sites from each region was established, and best practices were included in national documents as a scope of work for health workers and a measure for the district league table which tracks district performance. The summary slide deck and guide were shared with partners, districts, and health facilities to support the implementation of improvement activities. The change package was also shared at national meetings, such as the implementing partners quarterly review meetings and the national malaria monitoring and evaluation planning meeting in January 2018.

In addition, ASSIST provided technical support to the USAID Malaria Action Program for Districts regional staff through a one-day orientation on quality improvement with the aim of enabling them to integrate QI methodology in project work plans and interventions and to share the malaria change package and other lessons learned from previous ASSIST malaria work. ASSIST supported the USAID Malaria Action Program for Districts to start an improvement collaborative in 15 health facilities to address identified gaps.

ASSIST conducted three rounds of coaching visits in December 2017, January 2018, and March 2018 in 28 sites, 15 of which were part of the national collaborative under direct support of ASSIST and 13 indirectly supported sites. Teams started improvement projects to improve the completeness and accuracy of malaria data, adherence to test and treat guidelines, concordance of malaria data, and uptake of the third dose of Intermittent Preventive Therapy (IPT) among mothers in antenatal care.

II. Evaluation Goal and Objectives

The objective of this study is to assess changes in key improvement indicators following the implementation of the ASSIST PMTCT, 90-90-90, and malaria improvement activities in Uganda using existing data. Objectives and specific objectives for each activity are described below:

PMTCT: Assess changes in viral suppression among lactating and pregnant women following the implementation of the ASSIST intervention. The specific objective for PMTCT services is to determine changes in viral load suppression among a cohort of lactating and pregnant mothers.

90-90-90: Assess changes in 90-90-90 gaps following the implementation of the ASSIST intervention. The specific objectives for 90-90-90 activities are to determine changes in the identification, initiation, and linkage of HIV-positive males and to determine changes in the number of newly identified HIV-positive individuals who were referred for antiretroviral therapy (ART).

Malaria: Assess changes in the quality of malaria services following the implementation of the ASSIST intervention. The specific objectives for malaria activities are to determine changes in the documentation and notification of malaria cases, determine changes in malaria treatment, and determine changes in dispensing of Artemisinin Combination Therapy at the pharmacy.

III. Methods

A. Evaluation Design

We analyzed retrospective data abstracted from facility records over the intervention period. The evaluation question and scope of the evaluation for each activity are described in the **Appendix**.

1. PMTCT

For PMTCT, the assessment was conducted for the viral load suppression cascade for the period October 2017 to September 2018. The cascade measures the following indicators:

- Number of HIV-positive mothers (pregnant and lactating) eligible for viral load testing who received it each month
- Number of pregnant and lactating mothers who receive a viral load test each month
- Number of pregnant and lactating mothers who achieved viral suppression

2. 90-90-90

The analysis of secondary data for 90-90-90 covered the period from October 2017 to September 2018 and included:

- Number of male partners of female index clients who were tested for HIV
- Percentage of clients referred from testing to treatment facilities
- Factors for delayed HIV Counseling and Testing (HCT) using root cause analysis (results of root cause analysis)

Root cause analysis was a facility- and outreach-based rapid analysis of the factors underlying delayed testing for HIV (396 clients) and initiation on ART (193 clients). Data was collected among eligible clients until saturation was reached. Recruitment was based on defined criteria (HIV-positives who had never tested for HIV and those who had not enrolled on ART). Pareto analysis was used to determine the root causes and apply the 80:20 rule (i.e., recognizing that for many events, roughly 80% of the effects come from 20% of the causes).

3. Malaria

All five sites were evaluated for each of the indicators measuring quality of malaria services. Data was abstracted following the intervention to determine the effect of improvement activities. The analysis covered the period October 2017 to May 2018 and included the following indicators:

- Percentage of suspected malaria cases that have complete and accurate records in the outpatient department (OPD) register
- Percentage of malaria cases treated with a positive malaria test in six sites
- Percentage of mothers at 28 weeks who receive three or more doses of IPT at every clinic visit for eight sites
- Percentage of patients treated for malaria who had a positive malaria test in a given month at all sites
- Percentage of patients who were prescribed ACT who were dispensed ACT at the pharmacy at all sites

B. Data Analysis

The secondary data used for this analysis were collected by trained ASSIST coaches and health care providers using paper-based Health Management Information System forms. Data included eligibility for VL testing, VL testing, VL suppression, and malaria testing and treatment. Data from the information system forms were electronically captured in ASSIST's Indicator Improvement Database and routinely updated by ASSIST for each site.

Univariate analysis was conducted for each set of indicators related to a specific intervention (PMTCT, 90-90-90, or malaria). Data was analyzed in the ASSIST Indicator Improvement Database and exported to Excel to generate additional graphs and charts. In cases where the changes tested were documented in QI team records, such information was extracted and used to further explain the observed patterns in the results.

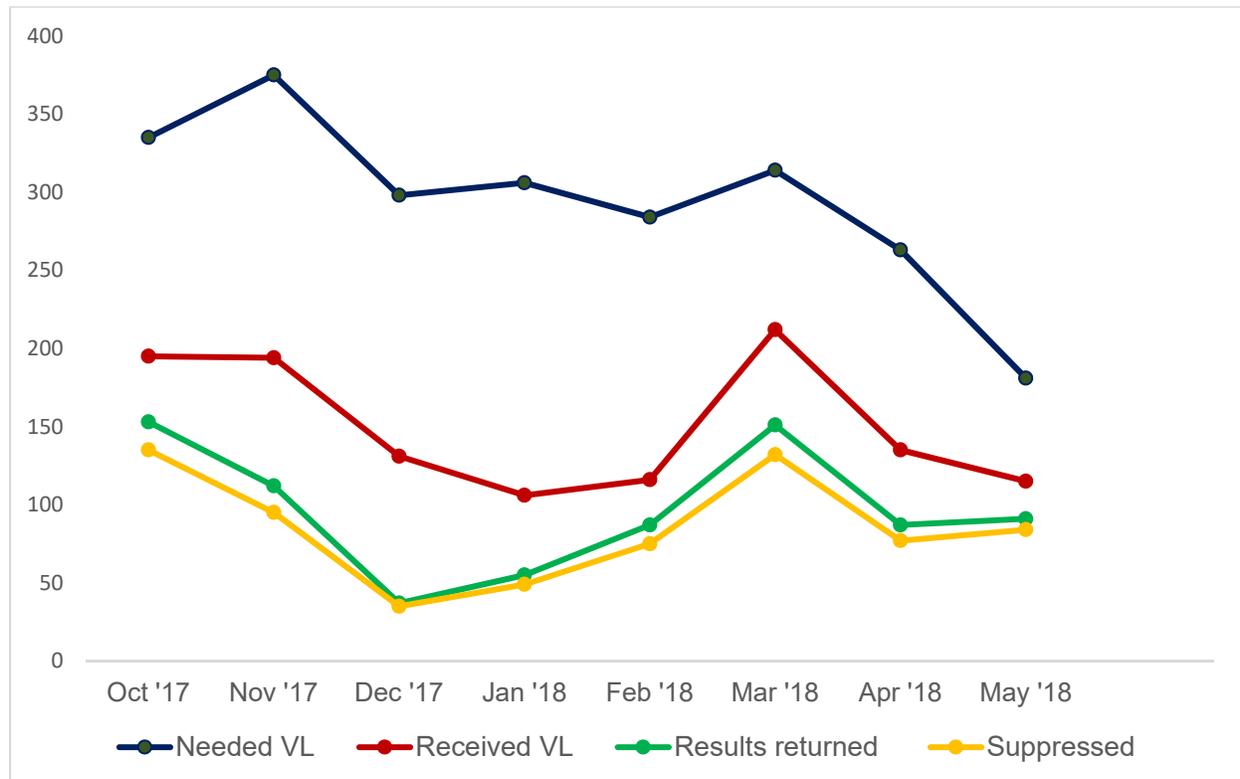
IV. Results

A. PMTCT

Objective: Determine changes in viral load suppression among a cohort of lactating and pregnant mothers

Figure 1 shows the different components of the cascade for viral load suppression among pregnant and lactating mothers in all 12 sites that participated in the PMTCT quality improvement collaborative. Data show variations in eligibility for viral load testing among pregnant and lactating mothers over the period of October 2017 to May 2018. The number peaked in October (335) and November (375) but declined in the subsequent months. Overall, VL testing varied consistently with eligibility for VL. However, the number of mothers who received VL tests peaked in March 2018 (212). The number of pregnant and lactating mothers who achieved viral suppression varied over time and was highest in October and March 2018 (135 and 132, respectively). These months also had the highest numbers of eligible mothers receiving VL (195 and 212, respectively). Overall, findings show that changes in viral suppression follow the same trends as changes related to the number of women eligible for VL and the number of VL tests conducted in a given month. Although gaps remained during the intervention, differences narrowed gradually over time.

Figure 1. Cascade for viral load suppression among pregnant and lactating mothers in all 12 sites between October 2017 and May 2018

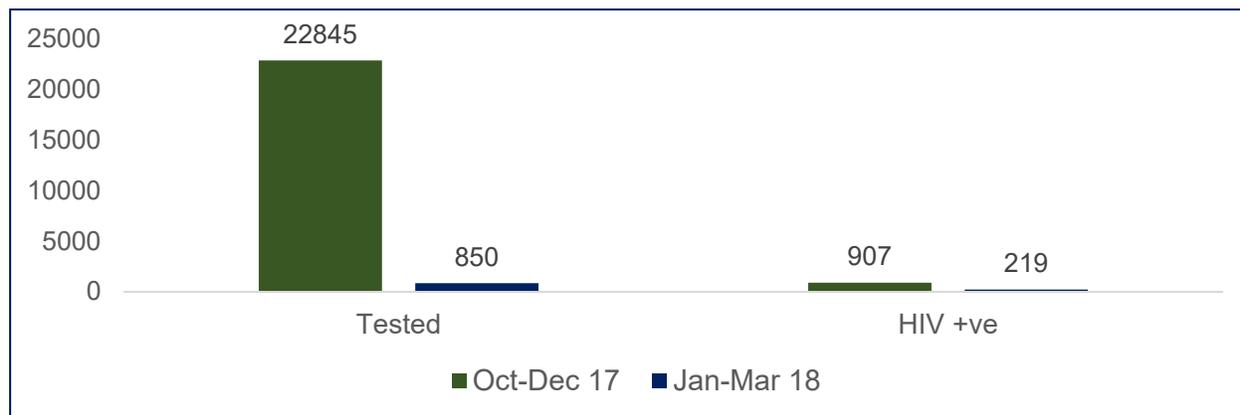


B. 90-90-90

Objective: Determine changes in the identification, initiation and linkage of HIV positive males

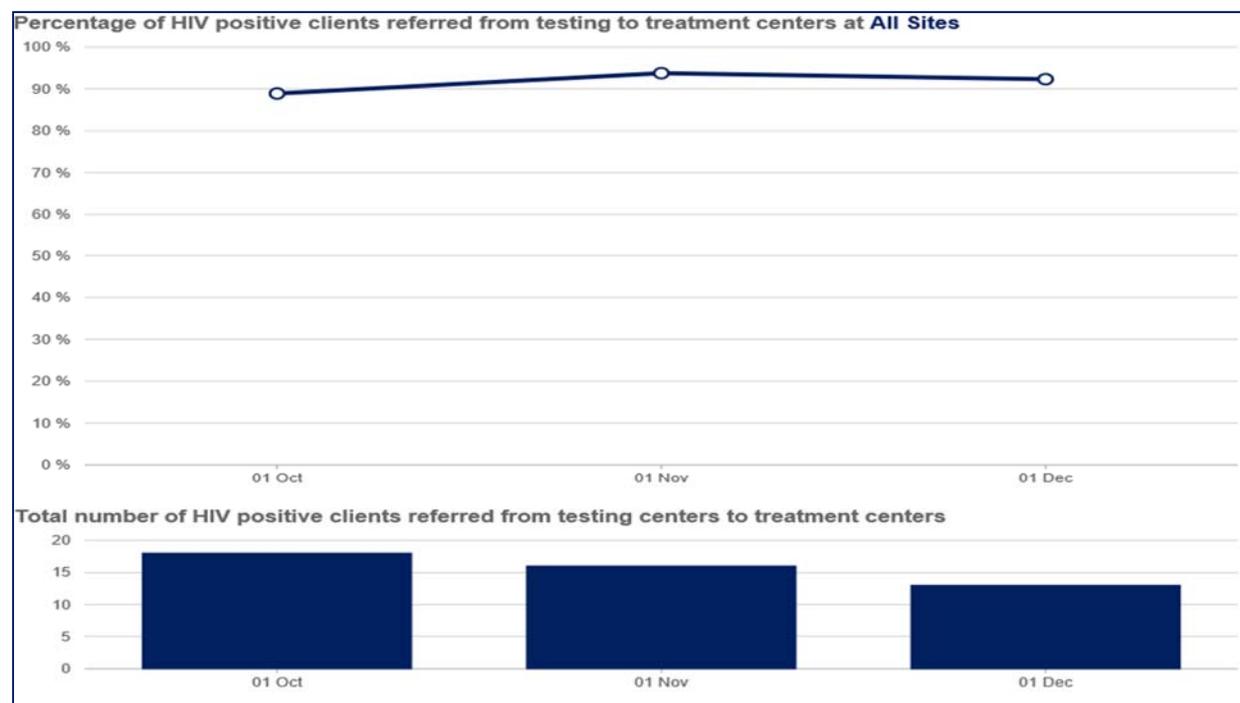
Figure 2 shows the percentage of male partners of index clients tested for HIV during two periods: October to December 2017 and January to March 2018. The two periods represent the reporting quarters for the intervention. The vast majority of male partners were tested during the first period (22845), and 4% were found to be HIV-positive. During the second period, a small number of high-risk men were identified and tested, resulting in a high HIV prevalence (25%).

Figure 2. Number of male partners of female index clients tested for HIV (Oct-Dec 2017 and Jan-Mar 2018)



More than 90% of HIV-positive patients were referred to a treatment center between October 2017 and December 2017 (see **Figure 3**).

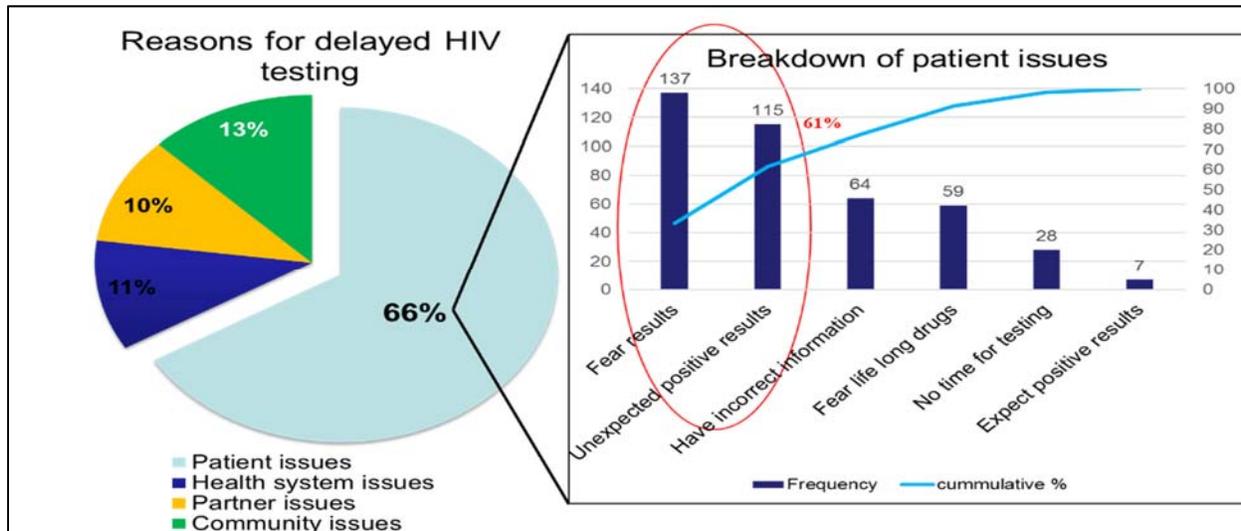
Figure 3. Percentage of HIV-positives clients referred to a treatment facility



1. Factors related to delayed HCT and delayed ART initiation

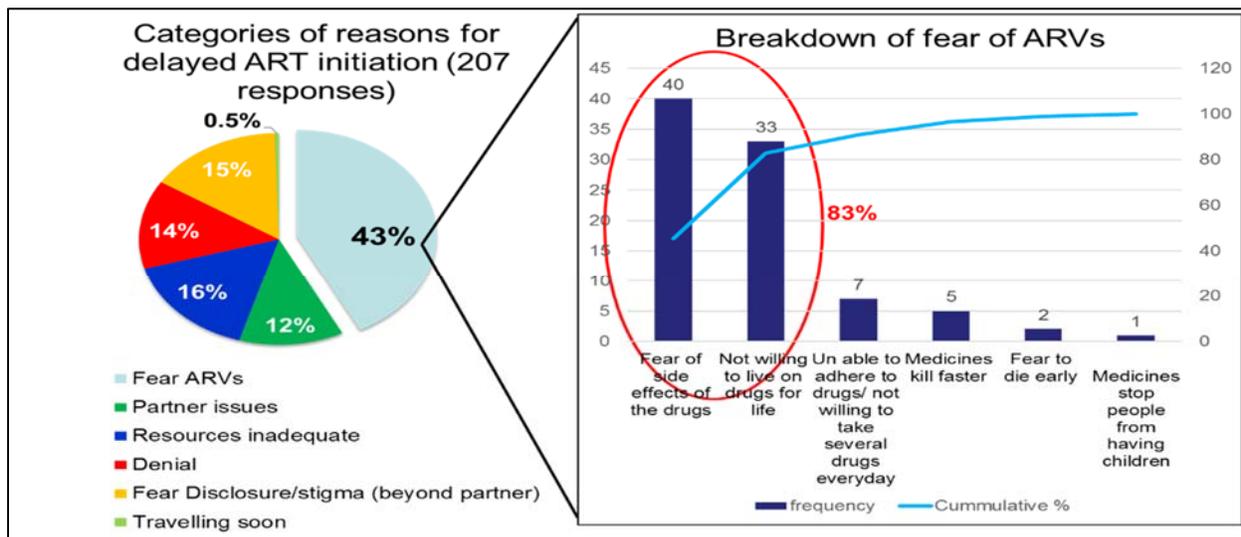
Findings from the root cause analysis revealed that factors leading to delayed HIV diagnosis and delayed ART initiation in the four regions of RHITES East, East Central, South Western, and Acholi included factors related to patients (66%), those related to patients' partners (10%), the health system (11%), and the community (13%). Patient-level factors included fear of discovering HIV-positive status, fear of living on drugs for life, and lack of time for testing (see **Figure 4**).

Figure 4. Factors related to delayed HCT



Delayed ART initiation is often reported. The root cause analysis revealed that fear of ARVs was the most important reason for delayed ART initiation (43%). Denial, fear of disclosure, upcoming travel, and partner issues were also reported as reasons for delayed ART initiation (see **Figure 5**). Reasons for fearing ARVs include fear of side effects, fear of having to take life-long drugs, and not being able to adhere to treatment.

Figure 5. Factors related to delayed ART initiation



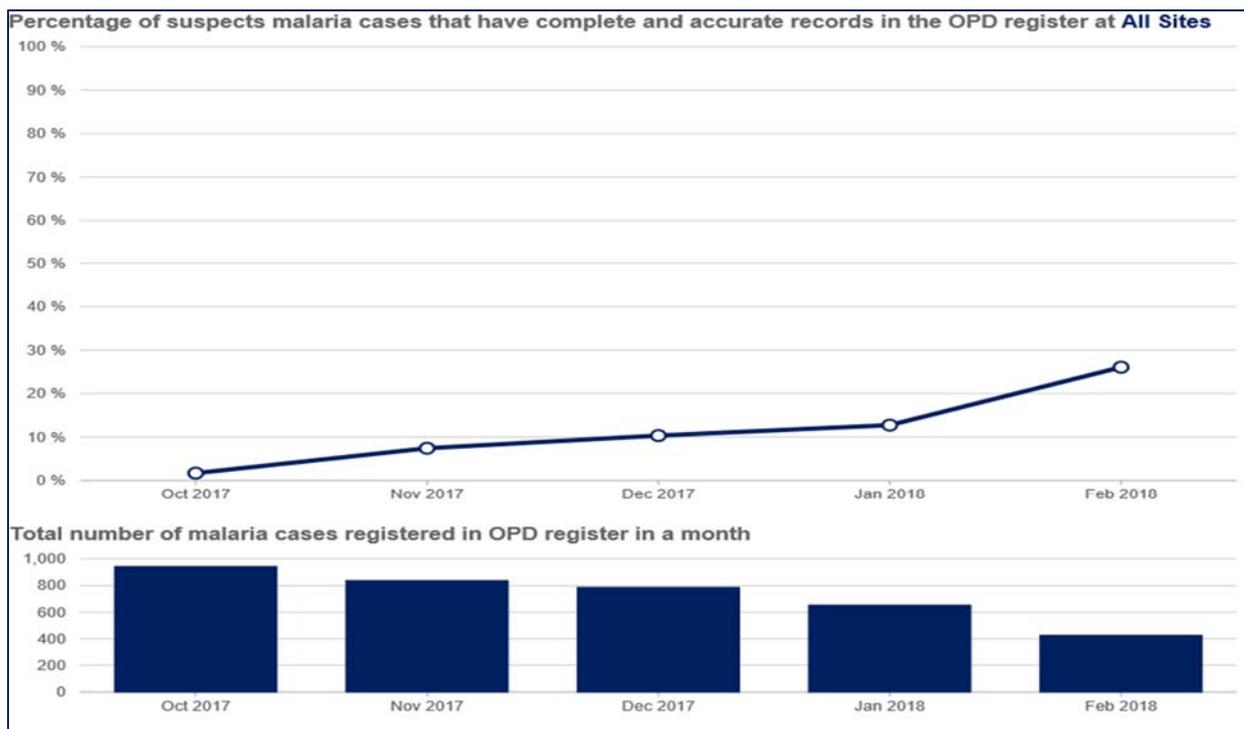
C. Malaria

The evaluation assessed changes in the documenting and notification of malaria cases, changes in malaria treatment, and changes in dispensing of ACT at the pharmacy.

1. Percentage of suspected malaria cases that have complete and accurate records in the OPD register

Between October 2017 and February 2018, there was an improvement in the percentage of suspected malaria cases that had complete and accurate records in the OPD register from 0% in October 2017 to 28% in February 2018 (see **Figure 6**).

Figure 6. Percentage of suspected malaria cases that have complete and accurate records in the OPD register in all sites



2. Percentage of patients treated for malaria who had a positive malaria test in a given month

The percentage of patients treated for malaria who had a positive malaria test in a given month in all sites remained constant except for a slight increase in January. However, in the six sites in that received direct coaching support, the percentage decreased from June 2017 to August 2017 then increased consistently from October 2017 to December 2017 followed by a decrease in January 2018 and sharp increase from January (40%) to March 2018 (99%). By March 2018, nearly all patients with a positive malaria test were treated compared to 62% at baseline (see **Figure 7**).

Figure 7. Percentage of malaria cases with a positive malaria test who were treated in six sites

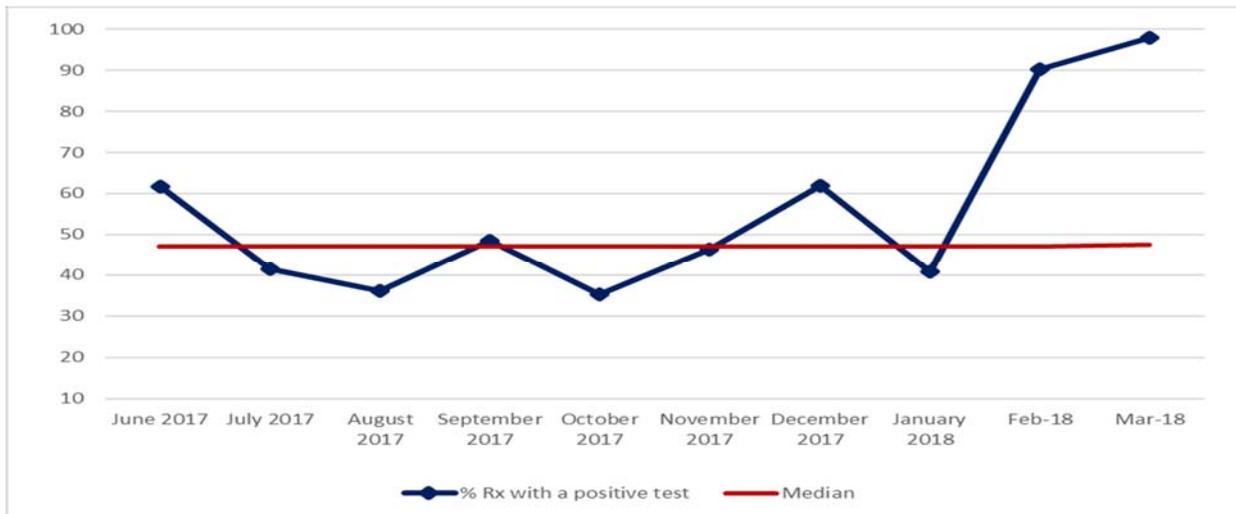


Figure 8 shows improvement in the proportion of pregnant women at 28 weeks of gestation who had received three or more doses of IPT in eight sites (from 40% to 80%).

Figure 8. Percentage of mothers at 28 weeks who received three or more doses of IPT at clinic visits for eight sites (Jun 2017- Feb 2018)

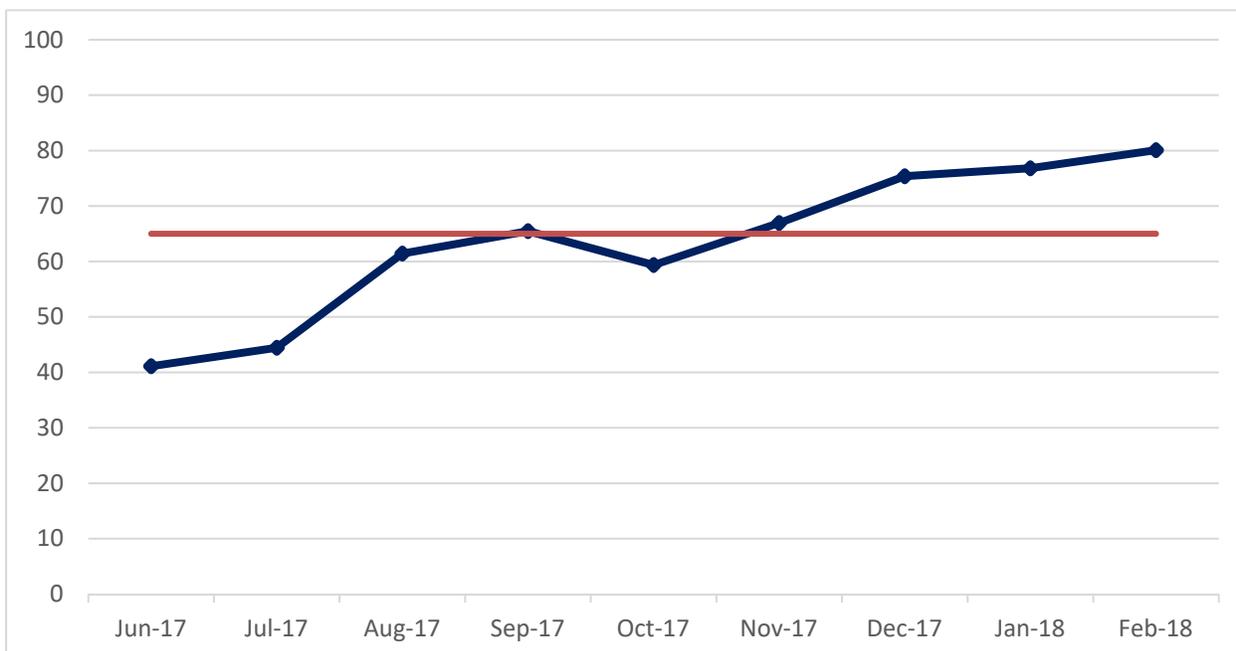
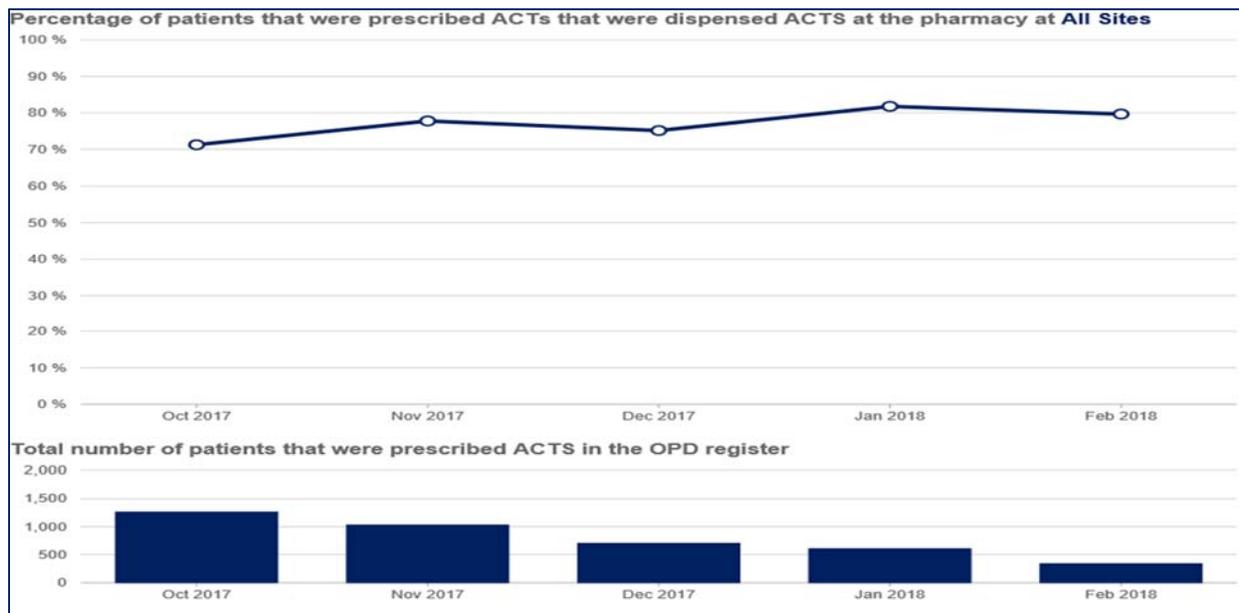


Figure 9 shows a relatively high baseline value (70%) and a gradual increase in the percentage of patients who were prescribed and dispensed ACT at the pharmacy in all sites (from 70% to 80%).

Figure 9. Percentage of patients who were prescribed and dispensed ACT at the pharmacy in all sites



Changes that were tested during the period included having diagnostic test kits on the wards which enabled testing patients for malaria even when the laboratory was closed and during weekends and at night.

IV. Conclusion

The analysis of ASSIST program data for PMTCT, 90-90-90, and malaria improvement in Uganda revealed that there were improvements in the cascade for viral load suppression despite remaining gaps in HIV testing and treatment initiation. More male partners were identified and followed up for HIV testing services following the implementation of the quality improvement intervention. A general trend of improvement was noted in terms of treatment of positive malaria cases, completion of records for suspected malaria cases at the OPD, and dispensing of ACT at the pharmacy for patients prescribed ACT.

Although this analysis provided insights on the improvement achieved by the PMTCT, 90-90-90, and malaria programs implemented by the USAID ASSIST Project in Uganda, future evaluations using a prospective design and a comparison group should be encouraged as they would establish stronger evidence for the effect of the interventions on key indicators.

Appendix: Description of Data Sources, Study Population, and Measurement Period

Type of data	Purpose of evaluation	Measurement period	Evaluation population and sample size	Sources of data
PMTCT	Determine changes in viral load suppression among a cohort of lactating and pregnant mothers	October 2017 to May 2018	Pregnant and lactating mothers and their infants	USAID ASSIST Indicator Improvement Database Program reports Change packages Changes tested
90-90-90	<ul style="list-style-type: none"> Determine changes in the identification, initiation and linkage of HIV-positive males Determine changes in the number of newly identified HIV-positive individuals who were referred for treatment 	October 2017-March 2018	Pregnant and lactating women Male partners	USAID Improvement Database Program reports
Malaria	<ul style="list-style-type: none"> Determine changes in the documentation and notification of malaria cases Determine changes in treatment of malaria among patients who have malaria Determine changes in dispensing of ACT at the pharmacy 	October 2017-May 2018	Malaria cases	USAID Improvement Database Program reports

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