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CHANGE PACKAGE

Improving Antiretroviral Therapy Services in Tanzania

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JANUARY 2019

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DISCLAIMER

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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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Acronyms

ART	Anti-Retroviral Therapy
ARV	Anti-Retroviral
ASSIST	USAID Applying Science to Strengthen and Improve Systems Project
CHMT	Council Health Management Team
CTC	Care and Treatment Clinic
FP	Family Planning
HBC	Home-Based Care
HCI	USAID Health Care Improvement Project
HEI	HIV Exposed Infants
HEID	HIV Early Infant Diagnosis
HMIS	Health Information Management Systems
HIV	Human Immunodeficiency Virus
HTC	HIV Testing and Counseling
IP	Implementing Partner
IPD	In-Patient Department
LTFU	Lost to follow up
MOHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MVC	Most Vulnerable Children
PDSA	Plan, Do, Study, Act
PEPFAR	Presidential Emergency Plan for AIDS Relief
PLHIV	People Living with HIV
QI	Quality Improvement
RHMT	Regional Health Management Team
SES	Standard Evaluation System tool
TA	Technical Assistance
URC	University Research Co., LLC
USAID	United States Agency for International Development

I. Introduction

In 2012 the USAID Applying Science to Strengthen and Improve Systems (ASSIST) project began supporting Tanzania Ministry of Health, Community Development, Gender, Elderly and Children (MOHCDGEC), implementing partners (IPs), Regional and Council Health Management Teams (R/CHMT), Health Management Teams (HMTs), and service providers by applying improvement science to improve the quality of HIV care services. ASSIST aimed at strengthening and increasing access, retention, and effectiveness of ART/prevention of mother to child transmission of HIV (PMTCT); pediatric ART care; protection and support to most vulnerable children (MVC); and community-based services including community-facility linkage activities.

ASSIST's work was built on activities that begun under Quality Assurance Project (QAP) in 2003/4, passed over to the USAID Health Care Improvement (HCI) project from 2008 to 2012 when ASSIST continued with quality improvement (QI) activities in the country. ASSIST has supported MOHCDGEC, structures, Ips, health facilities, and communities strengthening QI knowledge and skills at all levels of the health system. ASSIST also worked to improve the supportive system such as supply chain management (SC) and Health Information Management Systems (HMIS) through development of a QI guideline, training package, and improvement monitoring tools. ASSIST also supported MOHCDGEC in revising and updating QI guidelines in pace with changing World Health Organization (WHO) ART guidelines from CD4 and WHO staging reference to diagnose and treat strategy in 2016.

II. Aims and Objectives

The aims and objectives of this activity were:

- To increase to 90% the percentage of people living with HIV (PLHIV) (adults and children) accessing ART services through analysis of ART delivery processes and testing changes to optimize access by September 2017.
- To reduce the percent of PLHIV who are lost to follow up to less than 20% by September 2017 through strengthening community linkages and incorporating community groups with facility interventions.
- To strengthen efficiency of ART delivery through increasing integration of ART delivery with other essential services programs to more than 50% by September 2017.
- To increase adherence to treatment for adults and children on ART in two districts in Morogoro region to 80% by September 2015 through optimizing family support, improving self-management skills, and improved patient/client partnership.
- To improve to 80% the percentage of PLHIV screened for TB and opportunistic infections by September 2015 through strengthening systems for TB screening; increase the number of diagnosed TB and Opportunistic Infections managed according to protocols.

III. Improvement Scale

This document focuses on QI activities implemented to improve ART services during ASSIST from 2012 to 2017. Improvement work began during HCI in 37 districts in Tanga (8), Morogoro (8), Mtwara (5), Lindi (6), Iringa (4), and Kilimanjaro (6) regions. HCI trained regional Ips providing health services, and R/CHMTs on QI and supported them to train service providers on QI and provide onsite training during coaching and mentoring visits to facility QI teams. From the six HCI regions in 2012, ASSIST gradually increased the scale of QI improvement support to 30 regions by 2017. Concurrently the number of supported IPs increased from 8 in 2012 to 18 by 2017 and supported sites from 41 to 781 facility QI teams and 260 community QI teams in 2017.

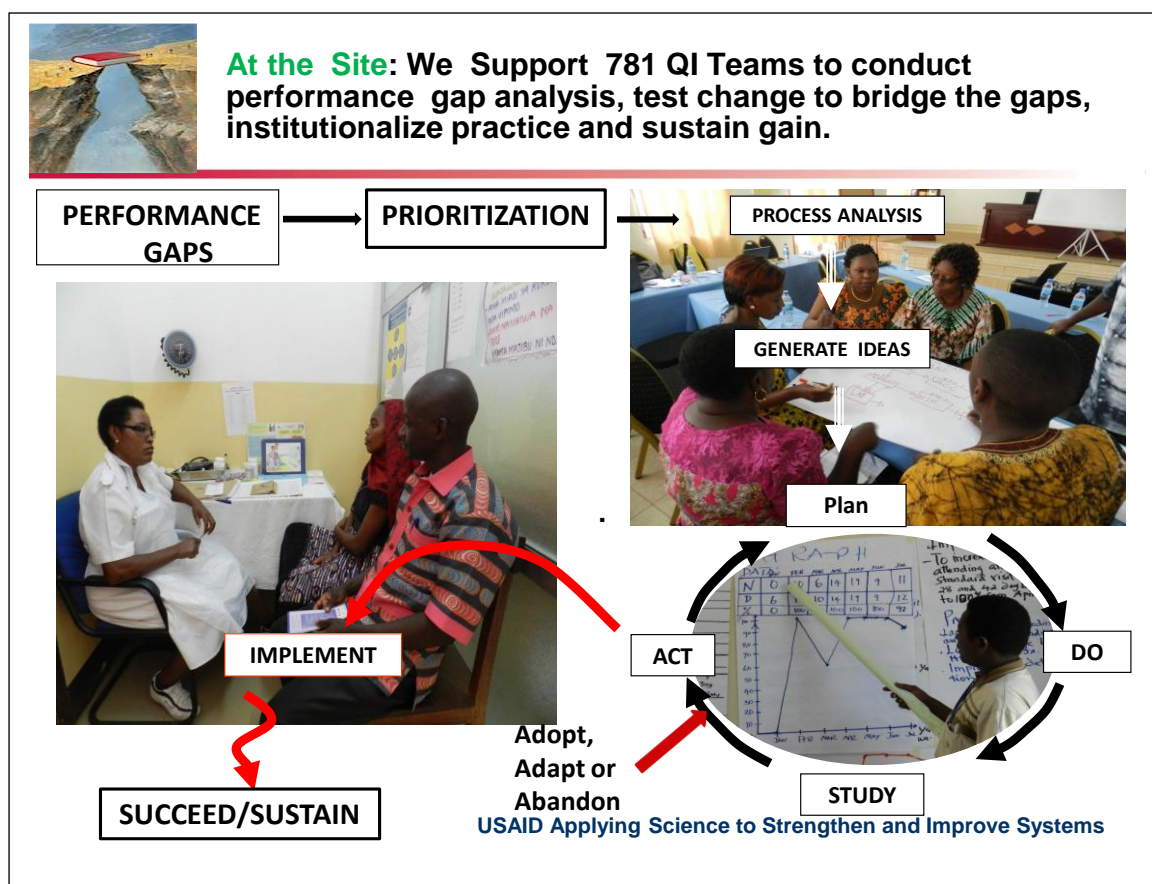
IV. Implementation process

At the project's inception, performance gaps in ART program were: low enrollment to HIV care, significant retention gaps due to morbidity and loss to follow up, PLHIVs on ART not keeping scheduled appointments, and delay in starting ART among HIV/TB co-infected patients. At the time, the MOHCDGEC had embarked on integrating ART and PMTCT services, switching from Option A to PMTCT Option B+, and the program was thus challenged with a sudden increase in demand for ART for pregnant women.

The initial approach, from 2012-2014, involved focusing QI activities to one high volume district in which all hospitals, high volume health centers, and dispensaries were co-opted as learning sites. The initial step was to obtain buy-in for QI at national and regional levels and MOHCDGEC structures in the implementation process. The National AIDS Control Program (NACP) provided a lead role in line with national guidelines. At regional level, RHMT members, were oriented on the QI process. ASSIST staff teamed up with RHMT members to conduct a baseline assessment for HIV services in the selected learning district of the intervened region. The baseline assessment was followed by capacity building to CHMT and service providers. In each learning district, IPs, CHMTs, and selected service providers from HIV services delivery points in the facilities were trained in QI with application of the collaborative approach. QI training covered: sharing baseline assessment results; introduction to QI concepts, dimensions of quality, principles of QI (focusing on systems and processes, client's needs and expectations, team work, measurement, and communication); application of the Standard Evaluation System tool (SES Journal) to plan, test changes through PDSAs, and monitor QI progress; and implementing the collaborative approach for rapid scaling of best practices. QI teams were supported to review processes of HIV care including enrolment in service following positive HIV test, ART uptake, assessment of adherence status, retention, uptake of family planning methods, follow up CD4 count, and caring of TB/HIV patients. Already proven best practices like service integration and linkages of various actors and programs were instituted to bridge the identified performance gaps. In Morogoro, teams built on experiences gained from the Patient Self-Management (PSM) initiative and continued testing changes to build an effective patient centeredness ART program.

Following QI training, ASSIST provided technical support to MOHCDGEC, R/CHMTs and IPs in conducting quarterly coaching and mentoring visits to QI teams of the participating health facilities. During coaching and mentoring visits, teams were supported on verification of collected QI data and plot data on run charts of the SES tool. Best practices and learning from the demonstration sites were spread to new QI sites in the same or other regions as shown in **Figure 1**.

Figure 1: Summary of interventions conducted to support QI teams



A. Community linkages

At the community level, ASSIST involved community home based care (CHBC) and leaders from local government authorities, religious groups, community-based organizations (CBOs), community groups, and opinion leaders to create awareness on importance of getting tested for HIV enrolment into care and remaining in care. The community leaders and community groups played the role of health promotion agents for utilization of HIV services. ASSIST supported formation of community QI teams (CQIT). These were formed with representatives from community leaders and community groups. ASSIST supported them through coaching and mentoring, collecting HIV service data, referring lost to follow-up clients back to care, and encouraging patients to keep appointments. PLHIV group members supported new clients referred to the community through peer mentoring, with emphasis on adherence to ARVs from the facility to home based care (HBC) service providers for follow-up and support.

B. Addressing gender disparities

ASSIST supported R/CHMT and facility QI teams to collect and analyze sex-disaggregated data to identify inequalities in access to ART or retention in care among females or males. Teams were also supported to identify and test changes in response to gaps pertaining to male and female access and retention to care. Men were also involved through community groups and local government authorities to include reproductive child health (RCH) agenda at village meetings, community groups' meetings, prayer houses, and at households to solicit male involvement to RCH services including male HIV testing at RCH.

V. Summarized Change Package for ART services in Tanzania

This change package is based on the experience in four of the ASSIST-supported regions: Arusha (12 sites), Morogoro (15 sites), Dar es Salaam (10 sites), and Pwani (4 sites). The purpose of the change package is to provide guidance to other facilities that are seeking to improve ART services.

A. Change Package summary for ART services from ASSIST-supported regions of Tanzania (2012 – 2017)

The change package table had been derived from documented tested changes in the health facilities QI files as observed during coaching visits. It was a progressive compilation of changes by coaches who visited the health facilities on quarterly basis.

Gap being addressed	Change tested	How the change was implemented
Improving HIV testing and counseling (HTC) through provider initiated testing and counseling (PITC)		
Inadequate knowledge on PITC among service providers	On job training on PITC among service providers	<ul style="list-style-type: none"> Trained HCWs conducted on job training and supervision to HCWs from OPD and IPD with inadequate PITC knowledge
Improper/ inadequate documentation of HIV testing through PITC	Document all clients tested at OPD, IPD and other testing points	<ul style="list-style-type: none"> Distribute testing kits and PITC register to all departments as per needs. Assigned PITC focal person at each department to ensure all clients tested through PITC are documented
Inadequate identification of clients knowing their HIV status to determine the percent of those tested	Mark clients who know their HIV status on OPD register	<ul style="list-style-type: none"> Doctor enquired clients on their HIV status to identify those who have tested and know their HIV status and have proof of testing for HIV Mark clients who know their HIV status in the OPD/IPD register Deduct clients who know HIV status from total attended in the month - the difference was used as the denominator for calculating percent tested through PITC
Inadequate testing through PITC at OPD	OPD in charge to involve all clinicians in PITC	<ul style="list-style-type: none"> Assign OPD register to every clinician PITC focal person reviewed the registers for documentation and supported the clinicians
	Set target for PITC for each clinician	<ul style="list-style-type: none"> Ask every clinician to conduct PITC for at least three children every time they are on duty Document information of every adult who received PITC PITC focal person to review by comparing PITC register and OPD register to confirm if every child performed PITC has been registered
Improving Enrollment of new adult HIV+ clients to CTC from HTC Points		
Clients diagnosed HIV+ at HTC get lost before reaching CTC	Medical attendants to escort all clients diagnosed HIV + from HTC points to CTC for enrollment	<ul style="list-style-type: none"> Medical attendants were oriented on confidentiality and friendly care to assist with escorting newly diagnosed HIV + clients from test points to CTC
	Prioritize escorted clients	<ul style="list-style-type: none"> All new clients were given priority for

Gap being addressed	Change tested	How the change was implemented
	for enrolment at CTC	registration to CTC either by allocating a provider to attend new clients as they arrive or putting new clients on a separate room different from other clients
Clients diagnosed HIV + at HTC points move to other facilities without referral letters	Provide clients with a list of other nearby facilities with CTC	<ul style="list-style-type: none"> New clients were introduced to facilities in their neighborhoods and were allowed to select for their continued care They were given referral letters to introduce them to facilities of their choice Facilities sent feedback to the referring facility through counter referral form
	Allocate focal person to HTC points	<ul style="list-style-type: none"> HTC focal person was identified for health facilities to facilitate HIV testing, to help clients enroll in CTC and to provide referrals to clients wishing to attend CTC at other facilities and document the data
Improving appointment keeping for PLHIV (adult and pediatric) ART clients' attendance		
CTC clients not keeping appointments	Continued group and individual health talk	<ul style="list-style-type: none"> Service providers include agenda of keeping appointment during group and individual health talk
	Giving flexible appointments	<ul style="list-style-type: none"> Provider discuss and agree with the client on client's availability for the appointment day
	Clients allowed to postpone appointment through phone call	<ul style="list-style-type: none"> A provider is identified as a focal person to keep a facility phone and respond to patient calls for postponing, rescheduling appointment and respond/ advise for any other question
	Identify and follow up clients missing their appointment	<ul style="list-style-type: none"> CTC HBC focal person makes a weekly list of clients missing their appointments and give it to HBC providers for follow up according to residential areas
Reduce loss to follow up rates among clients attending CTC		
CTC clients getting lost to follow up	Tracking CTC clients missing scheduled appointment	<ul style="list-style-type: none"> CTC HBC focal person makes weekly list of clients missing appointments and gives it to HBC providers for tracking by residential areas before they qualify for lost to follow-up (LTFU)
	Clients support through Peer mentors	<ul style="list-style-type: none"> Service providers identify capable PLHIV and support them to become lay counselors on supporting others on continuation of care Peer mentors share experience of their health to other clients as role models
	Clients support through community groups and home support	<ul style="list-style-type: none"> Involving community groups to include HIV follow up in their group meetings and home support of relatives who have disclosed their HIV status on importance of continued care through opening up health discussions at household levels
Improving TB diagnosis among HIV clients at CTC		
Inadequate knowledge on use	On the job training	<ul style="list-style-type: none"> All new CTC staff were oriented to the TB screening tool and importance of screening

Gap being addressed	Change tested	How the change was implemented
of TB screening tool among new CTC service providers		<ul style="list-style-type: none"> all clients at all visits Providers reminded to document in TB screening tool during service delivery Stacking TB screening tool to each CTC 2 so that the clinician can easily access the TB screening tool
Service providers skipping TB screening	Reminding providers on screening all clients each visit Task shifting of TB screening	<ul style="list-style-type: none"> Nurses checking clients' files for TB screening at end of the week to determine those not documented (screened) Triage nurse to conduct TB screening instead of clinician
Stock out of TB screening tools	Keeping a stock of screening tools at CTC	<ul style="list-style-type: none"> Facility making extra copies of screening tool
Increasing CD4 testing for PLHIV attending CTC		
Service providers not checking baseline and 6 months CD4 to all eligible clients	Ongoing reminder of staff and clients about CD4 test	<ul style="list-style-type: none"> Providers were reminded on importance of checking CD4 for baseline and follow up clients
Providers not identifying clients eligible for 6 months CD4 testing thus missing opportunities for CD4 testing	Identify clients eligible for CD4 test each month	<ul style="list-style-type: none"> Providers sorted and marked all files eligible for CD4 test by sticking a colored tape or label CD4 Introduced a register and created a list of PLHIV on ART eligible for CD4 count test
Clients not empowered to demand services	Share date of CD4 testing with the client	<ul style="list-style-type: none"> Documenting date for CD4 testing on client CTC1 card at important information section Share this date with the client and encourage them to remind provider of the test
Inadequate awareness of community members on services for PLHIV	Include information on the importance of CD4 testing at group health talk	<ul style="list-style-type: none"> HBC were given the list of clients who missed CD4 testing for home tracking or used phone to call/send messages to clients who need CD4 testing one week before their appointment date Appointment date for 6 months CD4 count testing were given to newly enrolled clients on the same day of enrollment
Shortage of reagents	On job training on proper requisition of CD4 reagents	<ul style="list-style-type: none"> Laboratory staff were oriented on the importance of CD4 testing and ordering on time the CD4 reagents Laboratory staff also oriented on proper ordering using Request & Reorder forms
	Introduce WhatsApp group for site networking	<ul style="list-style-type: none"> Facilities used WhatsApp messages to inform the group on shortage or overstocking of CD4 reagents CHMT redistributed reagents from overstocked to sites running low or having stock outs Clients were linked to nearby facilities with enough reagents for CD4 testing, when there is machine breakdown

Gap being addressed	Change tested	How the change was implemented
Long waiting time	Allocate special day in a week for CD4 count testing	<ul style="list-style-type: none"> One day a week was allocated for CD4 count and PLHIV eligible for CD4 count were asked to come on that day for CD4 testing
	Collect CD4 specimens at CTC	<ul style="list-style-type: none"> Lab staff collect CD4 test samples at CTC instead of clients going to queue at laboratory OR CTC staff collect CD4 specimens and submit to laboratory
Providers forgetting to document CD4 results on CTC 2 card Improper documentation	Sort out CD4 results as they are received	<ul style="list-style-type: none"> Attach CD4 count test results with client CTC 2 card/file, and give CD4 results as soon as results were back Medical attendants were supported to put CD4 results on respective CTC2 card
Improving retention to care for PLHIV		
Clients on ART missing appointment	Use appointment book to track clients who missing appointment	<ul style="list-style-type: none"> Names of clients missing appointment were listed for follow up and list given to HBC coordinator for tracking by HBC providers
	Continued group and individual health talk	<ul style="list-style-type: none"> Service providers include agenda of keeping appointment during group and individual health talk
	Giving flexible appointments	<ul style="list-style-type: none"> Provider discuss and agree with the client on client availability for the appointment day
	Clients allowed to postpone appointment through phone call	<ul style="list-style-type: none"> A provider is identified as a focal person to keep a facility phone and respond to patient calls for postponing, rescheduling appointment and respond/advise for any other question
	Identify and follow up clients missing their appointment	<ul style="list-style-type: none"> CTC HBC focal person makes a weekly list of clients missing their appointments and give it to HBC providers for follow up according to residential areas
Clients forgetting their appointment date	Educate clients to involve treatment supporter to remind them on their appointment date	<ul style="list-style-type: none"> Discussed with clients if they had people who they can involve in supporting them in treatment process and they were asked to come with their treatment supporter Clients and their treatment supporter were educated on the importance of keeping appointment and where to look on the client card information on their appointment date
Ignorance on the need to keep their appointment for ARV pick-up also lacking adherence	Ask client to bring their remaining ARV to the clinic when coming for refill	<ul style="list-style-type: none"> Clients were supported on how to use ARV given and the number of tablets they have in a container versus the number of days between appointments Clients were given appointment that will leave them with 1-2 days stock of ARVs
Clients felt better and stopped taking medication	Health education	<ul style="list-style-type: none"> Adherence health education sessions were given daily Counselling by the ART nurse and pharmacist were done each time the client was given ARVs Psychosocial peer support by peer mentors
Improving CTC index client family HIV testing		

Gap being addressed	Change tested	How the change was implemented
Inadequate knowledge on HIV testing among index client family members and service providers	Providers reminded to ask clients on HIV testing status among their family members and sexual partners	<ul style="list-style-type: none"> • Counselling to index clients at CTC on importance of HIV disclosure and family members involvement into HTC services was done during every visit • Provider recorded in CTC 2 card each family member getting tested
	Give health talk on importance of disclosure and family involvement into HTC	<ul style="list-style-type: none"> • HBC providers were asked to visit and encourage index clients' family members to test for HIV
Index clients not tested for HIV	Sort CTC2 cards or files of index clients for tracing family members not tested	<ul style="list-style-type: none"> • Names of index clients whose family members were not tested for HIV were listed and index clients whose family members had not tested for HIV were asked to bring them for testing • Providers checked the section for index case testing • Members of the immediate family tested for each index client were enrolled on a continuous basis to HIV care if found HIV positive and also recorded in specific local register and on CTC 2
Improving clients on ART lost to follow up 6 months cohort		
Inadequate knowledge on the importance of taking ART	Community sensitization on importance of attending clinics	<ul style="list-style-type: none"> • HBC, village AIDS coordinators and influential leaders were assisted to send message to community during village meetings on the importance of using ART and ART adherence
Inadequate documentation of client information	Updating client information on CTC 2 card	<ul style="list-style-type: none"> • Health care workers were coached to ask clear addresses and contacts including phone numbers even for clients with prior registration the contacts and other information was documented on clients' files and CTC 2 cards
Self-referrals	Communicate with other CTCs on self-referrals on quarterly basis	<ul style="list-style-type: none"> • Linkage to other facilities for exchanging information list of clients who make self-referrals disclosing their previous site was done through WhatsApp • Names of clients lost to follow up at facility were documented in a list for follow up and mobile phones used to contact nearby facilities to track clients lost to follow up
Missed appointment	Link all PLHIV with HBC volunteers routinely and on initial encountered	<ul style="list-style-type: none"> • Clients were counselled during the initial encounter on the importance of ART adherence • Consenting clients on initial encounter were linked with HBC for follow up
	Use appointment and tracking register for early identification of lost to follow up	<ul style="list-style-type: none"> • Names of all clients scheduled for next visit were listed three days before clinic • Mobile phone messages were used to remind clients about their appointment three days before the clinic visit • Appointment registers were used to identify

Gap being addressed	Change tested	How the change was implemented
		<ul style="list-style-type: none"> clients who have missed appointment and are LTFU HBC were given names of clients missed appointment for tracking on a weekly basis
	Encourage treatment supporter to report deaths of clients	<ul style="list-style-type: none"> Treatment supporters were counselled to report death of clients
	Call clients three days after missing appointment	<ul style="list-style-type: none"> To document reason for missing appointment in the missed appointment register, clients were contact after missing their expected appointment
Heavy workload	Encourage clients to come on the day of their appointment	<ul style="list-style-type: none"> Clients were educated on the importance of attending clinic on their appointment date
	Clients who are progressing well are given 2 months ARV	<ul style="list-style-type: none"> ARVs were dispensed on a 2-monthly basis for clients without complications
Seasonal factory workers missing their routine visit	Assign clients to HBC	<ul style="list-style-type: none"> For new clients, consent was requested to link them to specific HBC person Clients were then given specific forms for referral to the HBC focal person and health workers filled in the HBC mobile number After the filling of the form, HBC focal person usually returned the form to CTC completing the link between client, HBC focal person and the CTC
	Get clients mobile number or treatment supports mobile number	<ul style="list-style-type: none"> Treatment supporter mobile number were collected from client and filled into the CTC 2 as an exercise to improve documentation of the CTC 2 cards Verification of the mobile numbers were done by calling the treatment supporter before the client leaves the clinic to minimize wrong recordings
Self-stigma	Health education on adherence to services	<ul style="list-style-type: none"> Health education on importance of adherence was provided as part of the daily messaging and health education to clients Audio and video messaging were given at the health facility to enhance HIV testing, use of ARV and adherence messages
Local/religious beliefs and alternative therapies (local medicines) preventing use of ART	Provide health education on importance of adherence	<ul style="list-style-type: none"> Health education on importance of adherence was integrated in health facility messages during every clinic day to address cultural beliefs and discourage use of alternative medication
Congestion of clients at waiting area	Distribute clients to dates	<ul style="list-style-type: none"> Distribute different dates basing on number of clients Providers were flexible to giving appointment suitable for the client

B. Change package as a follow-up of gaps identification through validation process

To ensure teams were working according to improvement processes, an internal validation process of 25% of the 48 indicators were done as a proxy for ensuring that QI activities were done as planned. The validation used a QI data quality assessment checklist that had been pre-designed to assess field implementation. The goal was to determine areas of improvement in indicator data collection, documentation, analysis, and reporting by the QI teams; and to review QI team performance to identify gaps and work together with the teams in addressing challenges encountered. A list of changes was created to address the gaps (**Table 2**).

Pretesting of validation tools was done in Arusha City Council and Morogoro Municipal Council. Having completed the tools, the actual validation was conducted in Arusha City Council, Moshi District Council, Mbeya District Council, Rukwa, Ruvuma and Morogoro regions in a total of 45 health facilities. For the ART program in Tanzania, the validation process was used to authenticate the results of QI implementation in the field. This change package was justified by the activities in the validation process. A summary of the validation process is found in the Annex 1 of this document.

Four out of eleven (36%) health facilities had the same indicator values in the SES journals as verified data. Five of the 11 (45%) facilities had 1-2 similar values among the 3 months of data collection, and 2 (18%) of the facilities had differences in terms of data recorded in the journals to verified data in all parameters. In one facility there was discrepancy between the log forms for HEI testing and MTUHA 6 registers as well as gaps in documentation in the recording of tools. Verification was done together with the teams and the appropriate corrections was done by the teams at the health facilities.

Ten files were selected at random at each health facility and the different sections of the cards were assessed for filling of information as appropriate for each of the sections of the cards. Generally, the spaces that were not filled were less than 35% for all areas and some spaces for example the treatment given was as high as 98% in Mount Meru and 100% for TPC Hospital for that section. Filling for the demographic section was as high as 94% in Kaloleni Health Center, Mount Meru Hospital, and Saint Elizabeth Hospital (SEHA) and was 95% in Kibosho Hospital and TPC Hospital. Treatment eligibility sections reached more than 90% in Kibosho, Mwika, Kilema and TPC Hospital.

Table 2: Gaps and tested changes identified through validation process

Identified Gaps	What was done	Details of the Changes
Facilities that have not started QI activities	Started QI activities through formation of a QI team	<ul style="list-style-type: none"> Select the QI leadership followed by submission of the names of leaders to the supervisors at the district Start documenting QI activities using the meeting guide. Review and select few indicators to start the process until further coaching activities. Organize a QI file and guide them to design and follow tested changes for improvement.
SES journal with unclear documentation, inconsistent graphs from the planned objectives.	Re-training of health workers on the SES journals	<ul style="list-style-type: none"> Health care workers were mentored to improve documentation in the SES journal by teaching them how to interpret objectives into activities and changes during QI monthly meetings
Some journals have no tested changes and other have non-specific tested changes and not	Mentoring the teams on QI methods and documentation	<ul style="list-style-type: none"> Documentation of all the changes in the SES journal the way they are implemented was done. The QI team re-planned in the follow up

updated for example continue with health education while the indicator is dropping	Conducted process mapping to identify tested changes	meetings so that QI activities can be better organized. <ul style="list-style-type: none"> Health care workers were trained to re-fill all the journals and give feedback during the mentoring visits
Different values of data in the QI journals, registers, showing a need for data verification	Review some of the indicators	<ul style="list-style-type: none"> File minutes in the QI file and discuss the indicators during the QI meetings on how to improve the indicators Harmonize the information in the CTC 2 cards, registers and monthly reports during each monthly QI meeting Assess the percentages, during QI team meetings, improve documentation in quarterly reports and send to the district level so as to be entered into the DHIS after verification.
Annotation of graphs was not proper, the graphs were not completed with the title, numerator and denominator names	Mentor the QI teams on documentation of SES journal from objective, tested changes to graphs for monitoring	<ul style="list-style-type: none"> Annotate graphs accordingly, write the indicators, use one meeting to work on the indicators which are not doing well and draw the process map and formulate tested changes.
Some of the CTC2 cards were not completely filled	Mentoring on filling of CTC 2 cards	<ul style="list-style-type: none"> Remind all health workers on the importance of filling in all the needed spaces in the CTC 2 cards during clinical meetings Discussion with the clinicians on the importance of completeness of CTC2 cards information.
CTC cards information is not entered into the database	Discussion with the site data clerks to mentor them on their work-planning	<ul style="list-style-type: none"> Discussed with data clerks that, when the health workers have completed providing care to the patients the data clerk collects the files and enters the data on a daily basis and for a large facility on a weekly basis
File arrangement was poor, CTC2 cards showed some missing documentation	<p>Arrangement of files done including writing of journals on the tested changes, and orientation of how to trace data</p> <p>New QI file organized with clear names of QI team including the chairperson and secretary, and well-documented minutes of meetings</p>	<ul style="list-style-type: none"> Create a file flow at the facility for example, use the list of appointment to predict next day expected attendance, select the files then send to the ART nurse, who will send the files to the doctor then to the database and back to RCH for storage Arrange the file with separators and file numbers categorized in groups, while re-organizing in the events of deaths, LTFU or transfer of clients by taking the files and arranging them in a separate space.
Poor adherence to ARVs medication by pregnant women	Give the women monthly appointments for harmonization of medicines and information	<ul style="list-style-type: none"> ART drugs should be given as a complete tin and should avoid opening the tin when dispensing. RCH personnel to work on adherence counselling for women on ART Address LTFU through different initiatives such as the use of HBC and Expert patients to conduct education on adherence.

VI. ANNEX

Definition of Indicators that were validated in 45 health facilities in Tanzania

Validation used QI data quality assessment checklist that had been pre-designed to assess field implementation. ASSIST validated 25% of 48 indicators that the project is supporting to a total of 14 indicators. In order to ensure teams were working according to improvement processes, an internal validation process of 25% of the 48 indicators was done as a proxy for ensuring that QI activities were done accordingly.

Indicators Validated	Indicator Name	Numerator Definition	Denominator Definition
Indicator 1	HIV Exposed Infants (HEI) testing for DNA/PCR within 4-6 weeks	Number of HEI testing for DNA/PCR within 4-6 weeks of birth	Total number of HEI enrolled in a given month
Indicator 2	Percentage of male partners tested and counselled for HIV	Number of male partners tested and counselled for HIV	Total number of women booking ANC
Indicator 3	Percentage of clients picking ART each month	Number of clients picking ART	Number of clients expected to attend (clinical appointment that month)
Indicator 4	Percentage of clients assessed and categorized for nutritional status	Number of clients assessed and categorized for nutritional status	Number of clients who attend reproductive and child health clinics
Indicator 5	Percentage of clients categorized as MAM/SAM	Number of clients categorized as MAM/SAM	Total number of clients assessed for nutritional status
Indicator 6	Percentage of pregnant and lactating women receiving life-long ART	Number of pregnant and lactating women receiving life-long ART	Number of pregnant and lactating women found to be HIV positive
Indicator 7	Percentage of mother-baby pair attending RCH services	Number of mother-baby pair attending RCH services	Total number of HIV positive mother - baby pair eligible to attend RCH
Indicator 8	Percentage of HIV positive children under 15 years on ART	Number of HIV positive children below 15 years on ART	Total number of HIV positive children below 15 years eligible for ART (Minus Death and transfer outs)
Indicator 9	Percentage of mothers alive and on ART 12 months after initiation of ART	Number of mothers alive and on ART 12 months after initiation of ART	Total number of HIV positive pregnant and lactating women initiated ART 12 months ago
Indicator 10	Percentage of PITC conducted in the in-patient department	Number of PITC conducted in the in-patient department	Total number of eligible clients for HIV testing admitted that month
Indicator 11	Percentage of clients screened for TB	Number of clients screened for TB	Total number of clients who attended CTC during that

			month
Indicator 12	Percentage of women booking ANC by 12 weeks of gestation	Number of women booking ANC by 12 weeks of gestation	Total # of pregnant women booking for ANC that month
Indicator 13	Percentage of women at family planning clinics tested for HIV in their 1st clinic visit	Number of women at family planning clinics tested for HIV in their 1 st clinic	Total number of women attending their first family planning visit
Indicator 14	Percentage of HEI receiving second HIV test 6 weeks after cessation of breast-feeding	Number of HEI receiving second HIV test 6 weeks after cessation of breast-feeding	Total number of HEI attaining 15 months after birth

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