KINGDOM OF CAMBODIA

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Ministry of Health

Standard Operating Procedure (SOP) For the Continuous Quality Improvement of HIV Care and Treatment Services in Cambodia

Third Revision 2023

National Center for HIV/AIDS, Dermatology

PREFACE

Cambodia is one of only seven countries worldwide to have achieved the 90-90-90 targets in 2017, three year ahead of the global target. Cambodia has gone even further by setting a national goal of getting 95% of PLHIV diagnosed, 95% of diagnosed PLHIV on treatment, and 95% of PLHIV on treatment virally suppressed by 2025.

At the end of 2021, there were 62,838 patients access to 71 ART clinics countrywide. Although the estimated annual number of new infections seems to be stable, 4,202 patients reported newly registered and started ART in care and treatment in 2022. National Center for HIV/AIDS, Dermatology, and STD in collaboration with development partners working on HIV area in Cambodia assure the provisions of all HIV-related services with high quality. The quality of care at ART facilities, the quality of laboratory services, the quality of HIV-related data, and the uses of the quality data to continuously improve the quality of the continuum of care at all levels and point of service delivery are the main focus of the standard operational procedure.

Taking this opportunity, the Ministry of Health congratulates NCHADS and all development partners who were actively participating in developing and updating this Standard Operational Procedure (SOP) for Continuous Quality Improvement for Continuum of Care for PLHIV

Ministry of Health officially approves the SOP and expects that all stakeholders will implement the continuous quality improvement effectively to improve quality of life of PLHIV and help the country moving toward reaching 95-95-95 goals by 2025.

Phnom Penh, 01../..08../2023

Minister of Health

Prof. MAM BUNHENG

ACKNOWLEDGEMENT

The National Centre for HIV/ AIDS, Dermatology and STD (NCHADS) closely collaborated with development partners to develop and update the SOP for implementing Continuous Quality Improvement (CQI) for CoC services. This updated SOP is the result of the contributions from the experiences of OI/ART sites during the implementation. This document has been revised and updated regularly to reflect and align with the evolving of the treatment guidelines, laboratory testing, and indicators to monitor as parts of quality improvement for HIV care and treatment service delivery level. This revision was built up on the 1st version of CQI-SOP for CoC services in 2012, which was established under the strong leadership of HE Mean Chhi Vun, former director of NCHADS and advisor to MOH, Prof. Sophonn Vonthanak, former head of NCHADS research unit, and now Rector of the University of Health Sciences and Advisor to Ministry of Health, and then 2nd Version (2017) was revised under the leadership of Dr. Ly Penh Sun, former director of NCHADS.

Now, on behalf of NCHAD's management team, we would like to thank all experts in the working group who actively participated in all the process of revising and updating of this very important document. In particular, I wish to record our special thanks to:

- Minister of Health for overall guidance, leadership and supports for strategic responses to HIV program in the health sector, especially to re-enforce on HIV prevention and improve quality of care for PLHIV in Cambodia.
- Research Unit, Data Management Unit and other Units of NCHADS, Municipality and provincial HIV/AIDS and STD Program Officers for their efforts and coordination with all development partners; and for their active participation in development of the SOP.
- Continuous Quality Improvement Technical Working Group members for their support, technical expertise, and experience in developing the SOP.

We also thank especially the medical doctors, medical assistants, nurses, midwives, counselors, drug and logistics management officers, data management officers, working at ART sites and TB services for their active participation and sharing experiences in the revision of this valuable document.

Phnom Penh, 24../..07.../2023

Director of National Center for HIV/AIDS
Dermatology and STD

Dr. OUK VICHEA

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ABBRVIATIONS

ACU	AIDS Care Unit
ART	Antiretroviral Therapy
CAA	Community Action Approach
CENAT	Centre National Anti-Tuberculosis
COC	Continuum of Care
CQI	Continuous Quality Improvement
FEW	Female Entertainment Workers
HBC	Home-Based Care
M&S	Monitoring and Supervision
MCH	Maternal and Child Health
NMCHC	National Center for Maternal and Child Health Center
MMD	Multi-Months Dispensing
MMM	Mondul Mith Chuoy Mith (Friend Help Friend Center)
MSM	Men who have Sex with Men
NCHADS	National Center for HIV/AIDS, Dermatology, and STD
OD	Operational District
OD-CoC-CC	Operational District- Continuum of Care-Coordination Committee
OI	Opportunistic Infection
PASP	Provincial AIDS and STI program
PDCA	Plan Do Check Act
PHD	Provincial Health Department
PLHIV	People Living With HIV
PMTCT	Prevention of Mother-to-Child Transmission (of HIV)
PSF	Patient Satisfaction Feedback
PWID/PWUD	People Who Inject Drugs/People Who Use Drugs
SDART	Same-day ART
SOP	Standard Operating Procedure
TG	Transgender
TLD	Tenofovir Lamivudine Dolutegravir
TPT	TB Prophylaxis Therapy
TWG	Technical Working Group
VCCT	Voluntary Confidential Counselling and Testing

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1. Background and Rationale

Cambodia was congratulated for reaching the global target of 90-90-90 in 2017 three years before the world's deadline. Reaching the global 90-90-90 targets is an import feature of Cambodia's national AIDS response: that's 90% of people knowing their HIV status, 90% of people who know their status accessing treatment and 90% of people on treatment being virally suppressed.

Given the promising national progress in scale-up of treatment services, Cambodia has set a national goal of getting 95% of PLHIV diagnosed, 95% of diagnosed PLHIV on treatment, and 95% of PLHIV on treatment virally suppressed in order to eliminate new HIV infections as a public health problem by 2025.

Preparing to reach the 95-95-95 targets, NCHADS employs a strategy that has already had proved in the HIV response for more than two decades – uniting diverse stakeholders, integrated approach, and using quality data to ensure accountability for results. Various essential guidelines, protocols, and standard operational procedures were developed, updated, or adopted from WHO or other international guidelines such as, but not limited to following documents:

- National HIV clinical management guidelines for adults and adolescents (2015, revised 2020)
- Same-day ART guidelines (2019),
- Operational guidelines for implementation of HIV viral load routine testing (2017),
- Guidance to enhance ART adherence, viral load monitoring, and regimen optimization to improve HIV viral suppression among PLHIV on ART (2017),
- Standard operational procedure for data quality assurance (2019),
- Standard operating procedure for Clinical mentoring (2014),
- Standard operating procedure for the continuous quality improvement for continuum of care for people living with HIV in Cambodia (2012, revised 2018),
- User guides for CQI dashboard indicators.

So far, the implementations of these various guidelines/SOPs are undertaken by NCHADS and partners. Some new initiations and updated tools, guidelines and implementation guidance have recently taken place. Therefore, the update of roles and responsibilities for all components involve are needed; and update the list of indicators will facilitate all stakeholders to implement and measure successes of HIV program in providing quality services to reach the 95-95-95 goals.

Continuous quality improvement provides an opportunity to ART team at ART clinic to review their service performance, to identify problem and its causes, then the team can effectively resolve the problem. Continuous quality improvement is also a forum where the data are used for a decision-making.

2. Origin of Continuous Quality Improvement from W. Edwards Deming

W. Edwards Deming began working in Japan in 1950 and was instrumental in building the Japanese industry into an economic world power. His strongly humanistic philosophy is based on the idea that problems in a production process are due to flaws in the design of the system, as opposed to being rooted in the motivation or professional commitment of the workforce. Under

Deming's approach, quality is maintained and improved when leaders, managers and the workforce understand and commit to constant customer satisfaction through continuous quality improvement (CQI).

Deming and his colleague, Shewhart, promoted the PDCA cycle -- Plan, Do, Check and Act.

PLAN to implement a policy to improve quality and/or decrease the cost of providing services. After the plan is developed, we ***DO*** it by putting the plan into action and then ***CHECK*** to see if our plan has worked. Finally, we ***ACT*** either to stabilize the improvement that occurred or to determine what went wrong if the gains we planned for did not materialize. PDCA is a continuous cycle; any improvement realized by carrying out one PDCA cycle will become the baseline for an improvement target on the next PDCA cycle. The process of improvement (PDCA) is never ending, although the dramatic improvements of initial PDCA efforts may be hard to sustain.

Figure 1: The PDCA Cycle

CQI is a problem-solving method.

CQI focuses on system problems, rather than people problems.

CQI examines processes to identify areas for improvement; defects are analyzed using statistical principles and, when identified, are opportunities for improving the process.

In CQI, standards are based on best-practice models and national guidelines that are emulated throughout the system.

3. Objectives

Overall objective

To maintain high quality of HIV program services across the continuum of care for PLHIV in Cambodia.

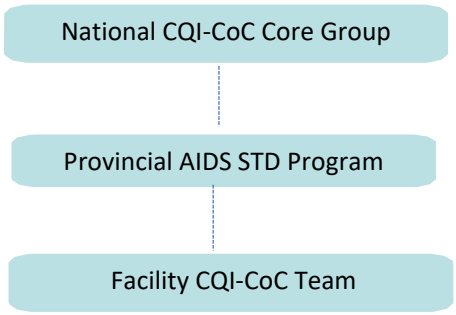
Specific objectives:

1. To improve quality data of HIV care and treatment services,
2. To assure the quality of HIV care and treatment services including related laboratory services,
3. To assure high proportion of the whole cascade from case detection to connection and receiving of quality HIV care and treatment services,
4. To build the culture of using of quality data to improve the quality of services,
5. To maintain high performance of ART clinics to provide care and treatment services effectively.

4. Structure, Role and Membership

4.1 Structure of CQI-CoC

Figure 2: Structure of CQI-CoC



There are three levels for the implementation of the CQI-CoC activities – the National Core Group, the Provincial AIDS and STD Program (PASP), and the onsite CQI-CoC team (Figure 2). The National CQI-CoC Core Group builds the capacity of facility CQI-CoC Team to implement CQI and provide quality services to PLHIV; and PASP such that PASP can continuously and directly support, monitor, facilitate and coordinate the facility CQI-CoC teams. The facility CQI-CoC team members are the critical players responsible for implementing CQI such that the full P-D-C-A cycle occurs and translates into improved quality of care.

The skills at all three levels necessary to implement CQI include but are not limited to:

- Clinical skills, clinical competency, and understanding of patient care and treatment services including viral load, CD4 and other necessary laboratory tests.
- Knowledge on obtaining and producing quality data,
- Knowledge and skills on data management, data analysis, and use of data,
- Knowledge and skills on problem solving, and planning.

4.2 Members and Responsibility of CQI Team at each level

4.2.1 Members and Responsibility of National CQI-CoC Core Group

4.2.1.1 Members of National CQI-CoC Core Group

- Director of NCHADS
- Deputy Director of NCHADS
- Head of Technical bureau, NCHADS
- Chief of Data Management Unit, NCHADS
- Chief of AIDS Care Unit, NCHADS
- Chief of Research Unit, NCHADS
- Chief of Surveillance Unit, NCHADS
- Chief of laboratory Unit, NCHADS
- Representative from PLHIV
- Representatives from development partners
- Representative from CENAT
- Representative from NMCHC who is responsible for PMTCT.

4.2.1.2 Responsibilities of National CQI-CoC Core Group

- Develop and review the annual plan for CQI
- Develop and amend the Standard Operation Procedure (SOP) of the CQI
- Monitor and evaluate the implementation of CQI
- Support sub-national level include PASP and ART teams to solve any problems or issues encountered
- Builds capacity of PASP and train PASP to train sub-national teams through teaching sessions, onsite coaching, or peer-learning
- Analyze data collected from sub-national level, generate results and provide feedback to the PASP, ART sites for quality improvement on a timely and regular basis
- AIDS Care Unit (ACU)/NCHADS is the point of contact of the National CQI COC Core Group to oversight the implementations of the national guidelines, concept notes, and all other national documents related to HIV care and treatment in Cambodia to assure the quality of care and treatment and its efficacy by building, maintaining, updating, or improving the clinical capacity and clinical competency of ART teams in a regular manner.
- Research Unit (RU)/NCHADS is the point of contact of National CQI COC Core Group to oversight the development of culture of uses of up-to date evidence-based, to document the advantages or disadvantages of the newly introduced interventions/regimens in the healthcare settings. RU also reports patients' satisfactions of quality of HIV care and treatment services to the National CQI COC Core Group.
- Data Management Unit/NCHADS is the point of contact of the National CQI COC Core Group to oversight the data management and quality of HIV program data, to keep up to date the CQI dashboards according to the update of care and treatment guidelines.

4.2.2 Members and Roles of OD-CoC-CC (Onsite CQI-CoC Team)

4.2.2.1 Members of OD-CoC-CC (Onsite CQI-CoC Team)

- Director of OD
- Chief of ART site
- ART team
- Representative from laboratory unit
- Representative from TB unit
- Representative from MCH unit

- Representative from Drug unit
- Data person
- CAA team
- Representative from development partners, Civil Society Organizations
- Case Management Coordinator (CMC)
- Case Management Assistant (CMA).

4.2.2.2 Responsibilities of OD-CoC-CC

- Ensures the quality of B-IACM and ART data so that they are complete, accurate, consistent, and timely
- Supports the implementation of CQI and Interlink Active Case Management and Continuous Quality Improvement (IACM-CQI) for HIV program
- Conducts quarterly IACM-CQI meetings (see Annex 2, point 2) to monitor and update the team on HIV program performance and follows the cycle of P-D-C-A to assure high percentage of new cases found are connected to the quality of care and treatment services.
- Conducts supportive supervisions to low performance sites (if OD has more than one ART sites) to respond, follow-up and support the implementation of the improvement plan developed during the quarterly meetings
- Attends technical forums, meetings, and CQI-related trainings…etc
- Collaborates with the National CQI-CoC Core Group to document the outcomes of any initiatives or interventions as required.

4.2.2.3 Responsibilities of onsite CQI-CoC Team

- Ensures the quality of data so that they are complete, accurate, consistent, and timely
- Collects, enters, and sends the data, to the PASP on a regular basis and in a timely manner
- Regularly monitors and reviews site performance through use of CQI dashboards and team meetings
- Collaborates with PASP to conduct supportive supervisions to identify problems, causes of the problems, develop, or modify improvement plan as appropriate following the processes of P-D-C-A
- Attend technical forums, meetings, and CQI-related trainings…etc
- Collaborates with the National CQI-CoC Core Group to document the outcomes of any initiatives or interventions as required.

4.2.3 Coordination Roles of PASP

PASP has an important role in coordination of the onsite CQI-CoC and BIACM teams to develop CQI/IACM-CQI plans and to implement CQI/ IACM-CQI smoothly.

The coordination role of PASP is as follows, but not limited to:

- Incorporates the CQI/IACM-CQI plan from each site into the PASP's CQI plan at provincial/city level
- Coordinates with the national program and all ART sites in their province to solve problems or issues such as poor data quality, lack of supplies, or resource issues
- Ensures data collected and sent to province from site level are correct and timely to national level
- Assists and builds capacity of staff at ART sites (include B-IACM team) to use ART data or CQI dashboards to analyze and interpret results data for both program

improvement and individual patient care improvement

- Advocates and facilitates stakeholder collaboration to ensure evidence-based technical and resources allocation to IACM-CQI activities
- Facilitates in conducting technical forum or meetings, such as IACM-CQI quarterly workshops, IACM-CQI TWG monthly meetings…etc., to promote the use and triangulation of CQI data with other data sources (e.g., B-IACM, TB program, etc.) for programmatic improvement
- Provides appropriate supports for data management to HIV program staff at OD level to ensure the quality of data management (data collection, data entry, and data analyzes) and data use for CQI/IACM-CQI implementation
- Collaborates with and facilitates the national CQI-CoC Core Group to document the outcomes of any initiatives or interventions as needed.

5. Implementation of Continuous Quality Improvement

The standard operational procedure defines continuous quality improvement (CQI) and describes how to implement it in HIV care and treatment program, particularly in the ART sites, at operational district, at PASP, and at the national program levels. Continuous quality improvement of the continuum of care is very important not only for the quality of life of PLHIV, but also to limit ARV drugs resistance, to prevent new infection, and to maximize the retention of patients in care across the whole HIV cascade.

ART sites in Cambodia have been implementing CQI concepts in order to maintain and improve quality health care services, and these practices become a routine practice for all health care providers.

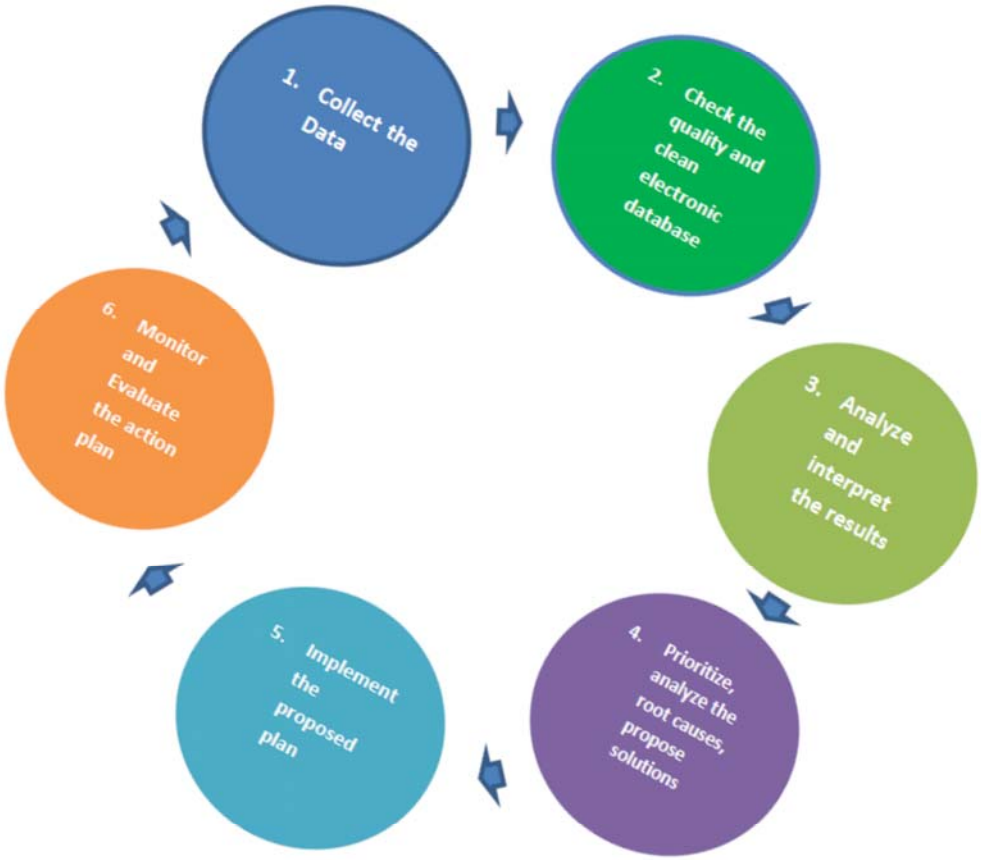
The implementation of CQI follows the concept of P-D-C-A. P – Plan: health care providers plan their intentions (objectives), indicators, and targets of what they want to achieve; and activities of what they will do to reach the targets they plan. D – Do: health care workers do activities they planned. C – Check: after implemented the activities, health care workers have to check whether the targets in their objectives reached or not. To be able to check, health care workers have to document the outcomes from their activities by collecting, recording, entering, and analyzing the data from their documentations. A – Act: health care workers take necessary actions to improve the outcomes. To be able to take the right actions, health care workers identify the problems, prioritize them (section 4.4) and do the root cause analyze. Figure 3 outlines steps in implementation of CQI activities.

5.1 Data collection

Patient information including general information, clinical information and laboratory information are routinely collected by health care providers from each individual patient visits the ART clinic, then the data are entered and saved in the ART database. Health care providers who collect the data include clinicians, nurses, counselors, laboratory technicians, and CAA team that works in the health facilities.

Data of all patients that the health care providers collect during the day should be daily computerized (entered) by the data entry clerk at ART site.

Figure 3: Steps in implementing continuous quality improvement



5.2 Quality check and clean electronic database

5.2.1 Data quality assurance by data entry clerk

Data entry clerk should enter all information for all patient records on the day of ART service provision into the database. Data quality control can be done at this stage by the data entry clerk. At a minimum, she/he should perform the following activities in order to ensure data quality:

- Before starting to enter the data, the data entry clerk should count the number of patients charts the service completed that day and compares with the list of appointments on that day. The number of patient charts can be:
  - The same as number of appointments,
  - More than number of appointment if some patients come for visit earlier,
  - Less than number of appointment if some patients did not come for visit.
- Enters all required fields according to data entry guidance stated in the Data Quality Assurance SOP.
- During data entry, if noting any missing data (i.e., not ticked, blank, etc.), unclear script, or inconsistent data, she/he must note all of these in a notebook and get clarifications immediately, or at the any convenient times as soon as possible. These corrections should

be made immediately before starting data entry of the next cohort of patients.

- After completing entry all patient charts of the day, she/he should check the completeness of the records and some selected required variables as discussed with the ART team, for example, clinic ID, ART number, date of confirmatory test, date start ART, date of visit, date of next appointment, and viral load test.

In addition, the ART team will meet on a weekly basis to discuss problems that arise while entering data containing in patient records into the database, such as unclear script, unclear number, no data were recorded/written in the patient file, etc. These problems will be recorded in the notebook of data entry clerk, with a comment about how the problems encountered were overcome.

The weekly meeting is important to ensure that the highest quality data are gathered, processed, maintained, and used.

The data entry staff will save the dataset on a regular basis on an external hard drive as a backup file following the instructions from the Data Management Unit of NCHADS.

5.2.2 Validation of electronic data using patients' charts

The site managerial team should perform the following steps to validate the data quality:

- Obtains a 5% random samples of patient records in the database.
- Checks the data against the charts.
- For each field, check the number of discrepancies between the paper record and the electronic record.
- Records the discrepancies, verifies, finds out the cause and make correction so that they reflect the actual information in the patient files and prevent repeated errors in the future.

The data quality validation should be done on a regular basis (for example, monthly) by comparing the data in the electronic file and data in patient files.

The PASP officer should control the quality of data at least quarterly basis following the DQA SOP. The Team should perform the data quality check, including completeness (make sure there is no missing data for each variable of interest in each patient record and there is no missing records), code consistency (make sure the entered code is the same as the one recorded on paper), and accuracy (for example, date when IPT is stopped should never be the same as date when IPT is started). The data should be collected and reported in timely manner.

5.2.3 NCHADS will check the data quality while compiling data sets from all ART sites, looking for missing or illogical or the completeness and accuracy of selected key CQI variables, such as clinic ID, ART number, date of confirmatory test, date start ART, date of visit, date of next appointment, and viral load tests.

5.3 Analysis and interpretation of the CQI indicators

Data analysis is a process of transforming data into information. Data analysis does not necessarily mean using a complicated computer analysis package such as STATA, SAS, Excel, or other software. It means taking the data that we collect and looking at them in the context of the questions that we need to answer. For example, ART team may ask what is the percentage of same-day ART among today's patients? Or how many patients are dispensed ART for 6 months

of the total patients today? There are several different simple methods that CQI data should be routinely reviewed.

ART sites should review their daily performance on key CQI indicators routinely, for example, the number of patients who need viral load test, number of new patients enrolled, number of patients putting on MMD (for example, 6 months by verifying the date of visit and date of next appointment), number of patients receive same-day ART, etc. since this is just a count number.

The summary analysis of CQI indicators should be also done on a regular basis, at least every quarter. The onsite CQI-CoC team is encouraged to analyze, interpret and use the results from their own data to monitor their services quality with appropriate supports from PASP and development partners in the province. At a minimum ART site should monitor their own performance on some important indicators, including:

- % of ART patients who died
- % of ART patients who were lost to follow-up
- % of ART patients come for visits "on time"
- % of ART patients completed TPT course
- Retention rate
- % of people receiving antiretroviral therapy receiving a viral load test in the past 12 months
- % of people receiving antiretroviral therapy who have suppressed viral loads
- % of ART patients have received MMD ≥3 months
- % of ART patients are on TLD regimen
- % of people living with HIV newly initiating ART on same-day as HIV diagnosis

CQI dashboard can also be used by the province (PASP), and relevant Units at NCHADS, for example, Research Unit, and AIDS Care Unit to review sites' performance, develop action plans, or identify relevant interventions to support sites to continuously improve the quality of HIV care and treatment services.

5.4 Problem Analysis, Prioritization, Proposed Solution and Action Plan

5.4.1 Identify problems indicated by key indicator analysis

Using the daily report generated by data entry clerk and the team as mentioned early, each week the onsite CQI-CoC team should generate a list of patients who require immediate follow-up. For example, patient who did not initiate ART within 07 days, patients who missed last appointment, patients who missed viral load testing appointment, patients with viral load greater than 1,000 copies/ml, or patient with missing critical data, etc. These lists can be reviewed to determine if it is a data-related problem, a problem related to the facility system, a problem related to health providers' practices, or a problem related to the patients. An action plan should then be developed accordingly for improvement purposes (see examples in Annex 4).

Each quarter, after reviewing the CQI quarterly onsite dashboard, the facility director, site manager and PASP will organize a meeting to review the results and identify "alarm points" for flagging problems when there is a failure to meet a pre-defined threshold for a desired outcome or when a pre-defined threshold for a negative outcome has been exceeded.

It is important to improve the communication between clinician team, other health service provider team, CAA team and data management team to ensure productive participation in this CQI

process.

5.4.2 Problem analysis and development of the action plan to solve the identified problems

The onsite CQI-CoC team will work together to identify the root causes of problems and identify appropriate solutions to solve these problems. There may be many problems occurring during the quarter, so the team should prioritize them based on such as magnitude of the problem, how strong it impacts on the quality of services, potential to cause death, potential to result in another problem, or feasibility of solving the problem, etc. Three minimum criteria have been used in prioritizing a problem: **important, urgent, and feasible**.

After selecting the most prioritized problem(s), the team will further analyze to look for its causes by simply asking what caused the problem. Onsite CQI-CoC team with technical support from PASP and/or appropriate partners will then develop an action plan to address the causes of the problem. The action plan should be developed based on criteria below:

- Relevance to the defined problem
- Feasibility of implementation
- Integration with existing activities
- Effectiveness
- Ease in targeting
- Cost effectiveness
- Ease in evaluation.

The action plan should be specific about the steps necessary to ensure improvement in the indicator in question and should give a timeline for the sequence of actions planned. The team is encouraged to use the problems solving matrix attached in Annex 3 (see examples in Annex 4). Below are several examples of the causes associated with a particular problem.

> **Example 1:** If low percentage of patients are on MMD for 6 months, the team should ask if it is due to a lack of understanding the SOP for MMD implementation or a lack of drugs in stock at site, site has plan for MMD or not, for example. Depending on the findings of investigation, staff from PASP can provide targeted refresher training or on-site coaching, or logistics management, staff can review where the forecasting and supply processes could be improved, or ART team meets to develop a work plan for MMD.
>
> **Example 2:** If poor client appointment keeping is identified, the team should discuss whether this is due to poor adherence counseling, or healthcare providers set the appointment date by error, or this is really from patient side, for example. Training of facility counsellors or set up a system/flow to ensure the appointment date is correct, can then be conducted as indicated.
>
> **Example 3:** If a low percentage of patients receiving viral load testing is identified, then the team should discuss the possible causes, such as failure of the physician to be aware when to request the test, VL test supply chain interruption, etc. Similarly, the first case would benefit from refresher training, or clinical mentoring, whereas the second issue would respond better to addressing supply chain barriers.

At any situation that needs support from the PASP or the National CQI-CoC Core Group should be brought to their attention as soon as possible to guide a more in-depth analysis of the CQI indicators and related problems, and together with the PASP and site team develop action plan to address the identified problems.

5.5 Implementation of the proposed action plan

Once the action plan is developed, the onsite CQI-CoC team shall implement the plan accordingly with facilitation, coordination, and appropriate support from PASP and involved stakeholders.

5.6 Monitoring and evaluation of action plan

The onsite CQI-CoC team, PASP and involved partners should monitor the implementation of the action plan (improvement plan) to see whether they have had an impact on the identified problem(s).

- The impact of the action plan should be reflected in the following quarters. If the plan and its proposed activities are effective, the CQI team at site should note improvements in the indicators of concern.
- If the action plan was not effective, and if the indicators continue to show a plateau or a deteriorating trend, it may be necessary to share the concerns with national CQI-CoC Core Group and to modify the action plan in consultation with the team accordingly (see Annex 5: Follow-up report).
- Onsite CQI-CoC team should record and report the outcomes of action plan routinely every quarter.

5.7 Key Indicators

The following list of indicators will be used to assess and monitor the quality of the Continuum of Care (CoC) services being provided to PLHIV at ART clinics.

5.7.1 Mortality indicators and re-engage into care indicators

1 Percentage of ART patients who died

2 Percentage of ART patients who were lost to follow-up

3 Percentage of ART patient with no clinical contact or ARV pick up for within 28 days since their last expected contact reengaged in care.

4 Percentage of ART patient with no clinical contact or ARV pick up for more than 28 days since their last expected contact reengaged in care.

5.7.2 Visit status indicators

5a Percentage of late visits beyond ARV supply buffer date

5b Percentage of late visits within ARV supply buffer date

5c Percentage of visits on schedule among ART patients

5d Percentage of early visits among ART patients

5.7.3 Treatment and preventive therapeutic indicators

6 Percentage of patients newly initiating ART on same-day as diagnosed date (disaggregate: 0 day, 1-7 days, >7 days)

7 Percentage of HIV infected patient who received a baseline CD4 count before starting ART

8a Percentage of patients with CD4 count less than 350 receiving prophylaxis with Cotrimoxazole

8b Percentage of patients with CD4 counts less 100 c/mm3 receiving prophylaxis with Fluconazole

9 Percentage of ART patients have received MMD ≥ 3 months (disaggregated: <3m, 3m, 4m, 5m, ≥ 6m)

10a Percentage of patients newly initiating ART with TLD as 1st line regimen

10b Percentage of ART patients using TLD as 1st line regimen (cumulative)

11a Percentage of ART patients received TPT (cumulative including those who completed TPT)

11b Percentage of ART patients completed the TPT course (cumulative).

5.7.4 Viral load indicators

12a Percentage of people receiving antiretroviral therapy receiving a viral load test in the past 12 months (the coverage of viral load testing)

12b Percentage of people receiving antiretroviral therapy who had viral load monitored at six months [WHO VLS.6]

12c Percentage of people receiving antiretroviral therapy tested for viral load at <1000 copies/mL at 12 months after initiating antiretroviral therapy [WHO: VLS.1]

12d Percentage of people living with HIV and receiving antiretroviral therapy who have suppressed viral load [WHO VLS.3]

12e Percentage of viral load tests results received at sites within 10 days of sample taken (Note: WHO within one month)

5.7.5. Enhance adherence counseling indicators

13a Percentage of PLHIV receiving ART with a viral load ≥1000 copies/mL who received enhanced adherence counselling

13b Percentage of PLHIV receiving ART with viral load ≥1000 copies/mL who received a follow-up viral load test within six months after enhance adherence counselling

13c

5.7.6 Switching regimen and Retention indicators

14a Percentage of PLHIV receiving first line ART with two consecutive documented viral load test results ≥1000 copies/mL switching to second line

14b Percentage of PLHIV receiving second line ART with two consecutive documented viral load test results ≥1000 copies/mL switching to third-line ART regimen

15 Retention rate (quarterly, annually)

5.7.7 Patient Satisfaction feedback indicators

16 Percentage of clients reported satisfied with service they received

17 Percentage of clients reported the waiting time is acceptable

18 Percentage of clients reported they received adequate counseling

19 Percentage of providers rated their health facility's services for KPs with low and very low.

5.7.3 Indicators for Interlink Active Case Management and Continuous Quality Improvement (IACM-CQI)

At regular IACM-CQI workshop, PASP or NCHADS team together with Onsite CQI-CoC team will review 19 CQI indicators plus four indicators. The "Plus indicator" (PI) do not substitute the current indicators used in the B-IACM approach at all. All activities and indicators of the Boosted Integrated Active Case Management remain valid.

The Plus indicators are:

PI1. Number of new reactive cases

PI2. Number of new reactive cases confirmed HIV infection

PI3. Percentage of HIV recency test positive

PI4. Percentage of new confirmed HIV infection enrolled at ART services

PI5. Percentage of PLHIV newly enrolled at ART services initiating ART.

5.8 Update or revision of CQI indicators

- National CQI-COC working group is responsible for updating or revising CQI indicators.
- Any indicator that is no longer be calculated from the patient records should either be removed, or patient databases and data collection tools should be modified.
- New indicators or revision of indicator definitions should be defined as necessary and

regularly to ensure that CQI reflects current national or international standards and guidelines/policies.

6. Link with other services

Although Continuous Quality Improvement for ART patients is primarily focused on the quality of services for patients registered within these clinics, it can also be applied to other aspects of the Continuum of Care, for example, active case management approach, hospitalization, VCCT, Community Action Approach (CAA), TB, PMTCT, Laboratory and Drug store. Below are several examples of linkages:

6.1 Boosted Integrated Active Case Management (B-IACM)

All new cases, whether found in the community or at a health facility, should be linked from the initial reactive testing to the HIV-confirmatory test then immediately enrolled at the ART service and obtain quality care and treatment. Onsite CQI-CoC Team meets regularly to review the Interlink Active Case Management and Continuous Quality Improvement (IACM-CQI) cascade to ensure the high rate of retention in HIV program services from reactive to confirmatory test through the enrollment and receive ART.

6.2 Community action providers

ART clinic sees nearly all identified PLHIV on a periodic basis. However, community action providers can collaborate with ART to provide feedback and improvement in these services. Collaboration with community action providers can address problems with:

- Loss to follow-up: CAA team is needed to gather data on what has happened to the individuals who missed clinical appointment or lost, and to help carrying out interventions to reduce this missing or loss to follow-up.
- Adherence to treatment: Some measures to improve adherence can take place at the ART clinic, but others may require CAA team to assess and organize household and community support for better adherence.

6.3 Hospitalizations

An investigation of the rate of hospitalization of ART patients may require data from in-patient services if this is not routinely recorded in ART patient charts, for example, cryptococcus meningitis. In addition, review of hospital records may reveal gaps in HIV testing services. It may find, for example, that many patients had a hospitalization or TB treatment in several years prior but no HIV test. In this case the provider-initiated counseling and testing in the hospital may need strengthening.

6.4 VCCT

Recency testing provides insight into the timeline of an individual's HIV infection. This information is important to public health because of the ability to use such data from VCCT services for targeted interventions and connect to ART clinic to start treatment earlier and have viral load suppressed that can prevent new infections and intervene before HIV is transmitted further.

6.5 PMTCT

All pregnant women newly identified as HIV+ under the PMTCT program should be registered and placed quickly on ART. These services may best be evaluated in ANC and delivery facilities.

7. Coaching, Supervision, Reporting and Training workshop

7.1 Coaching and Supervision:

The main objective of coaching is to assure the data at ART clinic have high quality, to support ART clinic to use their own data to review their performance, to assure that ART clinic can identify the problem(s), to do root cause analysis, and develop relevant improvement plan. Supervision is to support the onsite CQI-CoC team to maintain the quality of data and quality of health services.

PASP should schedule supervision at least once every quarter to the onsite CQI-CoC team at the early stage of CQI implementation. Once the onsite CQI-CoC team is more familiar with the process e.g., has participated in a CQI orientation workshop, and is knowledgeable about how to use the quality data at site, PASP should conduct supportive supervision for every six months.

The national CQI-CoC Core Group should schedule joint supervision with PASP and development partners working in the area needed basis.

During the supervision, the team should provide necessary support, including:

- Ensure completeness of data: all required data from each patient are collected, and they are collected from all registered patients at every visit,
- Ensure consistency of data between the patient paper record and the electronic database,
- Ensure availability and use of logbooks for problems faced during data entry,
- Ensure that each level can analyze, interpret and use the data.

7.2 Reporting:

The Team Leader at the ART site should send electronic data to the PASP who checks and analyzes the data from all ART sites in the province. PASP should perform analysis of the indicators that are needed for the quality improvement at site and send the feedback to site on a quarterly basis prior quarterly workshop.

PASP sends data to the Data Management Unit/NCHADS, who regularly shares the data with AIDS Care Unit (ACU) for the following-up and quality of care purposes, and other relevant units within NCHADS. Providing feedback about the analysis results to onsite CQI-CoC team is necessary to promote data uses by local health care providers.

On a quarterly basis, the onsite CQI-CoC team should report to PASP on the progress of selected CQI indicators, follow-up activities for problem solving in the preceding quarter, problems and challenges, and an action plan for the next quarter. The progress reports should be posted on the NCHADS website, so that all relevant stakeholders can learn from CQI implementation, and sites can learn from each other.

Sites are encouraged to print out and post in a prominent place the progress of their CQI performance, problem analyses, and follow-up activities.

7.3 Interlink Active Case Management and Continuous Quality Improvement (IACM-CQI) Regional training workshop

At a quarterly basis AIDS Care Unit collaborates with Research Unit, Technical Bureau, and Data Management Unit, organizes regional training workshops in which all ART clinics in the country participate. The inputs, processes, and expected outcomes of the regional training workshop is separately developed by AIDS Care Unit in consultation with other Units of

NCHADS. The aim of the training workshop is to continuously improve the capacity of Onsite CoC Team to implement Plan-Do-Check-Act cycle and data use to ensure the high rate of retention in the HIV program services from reactive to confirmatory test through the enrollment and receive quality ART services.

7.4 Evaluating the Effectiveness of the Continuous Quality Improvement Program

- PASP will meet with the members of the CQI-CoC team from each ART site in a joint yearly meeting to evaluate the overall progress of the CQI program at each site.
- Each site will present the performance of CQI indicators from the preceding four quarters, a quality overview of the action plans developed and the outcomes and effectiveness of the action plans.

In the light of this overall report from the sites, PASP will evaluate how the accomplishments of the program compare with the overall and specific objectives of the CQI-CoC. They will discuss any quality issues that arise with implementation of the CQI plan, such as data collection, data entry and aggregation, calculation and appropriateness of the indicators used for monitoring quality as well as any modifications or additions to indicators that may become necessary. PASP will communicate with the national core CQI-CoC team about any issues they cannot resolve without national engagement.

Research Unit of NCHADS will document best practices of CQI nationwide focusing on cycle of PLAN-DO-CHECK-ACT: do ART clinics have proper plan to achieve CQI indicators? Do ART sites implement their plan? Do ART site use data to analyze the results of their performance and determine whether it made a difference? Do ART clinics take actions to maintain or improve their performance? In addition, the documentation should include qualitative information on enabling and hindering factors to implement CQI routinely at ART clinics.

7.5 Training & Capacity Building

Human resource is the most important resource to implement CQI program. The workforce can be ***empowered*** and ***enabled*** to develop and use their full potential to achieve their local agency and regional or nationwide system vision for the future. For this to occur, the organization must provide opportunities for performance excellence, as well as for personal, professional, and organizational growth.

7.5.1 SOP orientation workshop

To implement CQI-CoC effectively, relevant staff members who involve with CQI activities at all levels, must take a 2-day training about the Standard Operational Procedures of the CQI. At the end of the training, participants will be able to:

- Understand the objectives of the CQI program,
- Understand the cycle of CQI and steps to implement CQI,
- Apply the procedures stated in the SOP,
- Develop provincial site specific plan for the implementation of the CQI following the P-D-C-A cycle.

7.5.2 Data management training

Selected members of the CQI-CoC teams whose work associating with data shall take a 3-day training which will provide the basic knowledge and skill for them to work with data. At the end

of the training, participants will be able to:

- Understand the key elements of data quality include completeness, accuracy, consistency, timeliness, precision, integrity, and confidentiality.
- Apply the concepts of data quality in collecting, processing, analyzing, and using the data,
- Use the set database layout to entry and backup the data,
- Know how to protect the data,
- Cite the rules, regulations and/or policies related to the use of data, or working with data,
- Understand advantages and disadvantages of using quality data,
- Analyze the data to get the answer for their queries related to their daily activities at the ART site,
- Develop a plan to manage their own data,
- Develop a data quality control mechanism for their own dataset,
- Develop PPT presentation, present and discuss results of each indicator confidently.

ANNEX I: CQI Indicators

I. The Mortality, re-engagement into care and treatment Indicators

1. Percentage of ART patients who died	
Definition	Number of patients on ART who died divided by total number of patients on ART at the clinic in the reporting period and multiplied by 100.
Purpose	To monitor the mortality rate of patients who are on ART
Method of Measurement	Count all PLHIV who died in the reporting period and compute for percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Total number of patients on ART who are known to have died as of the end of the reporting period
Denominator	Total number of patients registered in care as of the end of the reporting period (active patients + LTF + died + transfer out)
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female ART status: non-ART, on ART
Source of data	The facility ART electronic database
Interpretation	Action point. National average figure will be used as a reference for the comparison purpose, as well as trends over time for each facility. Appropriate actions should be taken to understand the cause of the death, and then preventing them accordingly when the analysis result exceeds the national average figure or if mortality is increasing. PLHIV mortality rate should be as low as 0.3% per quarter. Interpretation. The goal of HIV management is to preserve the lives of the patients. While not all patients can be saved, facilities should strive to provide good quality care to minimize the mortality rate. Intervention. The facility should review the reasons for mortality among ART patients, what changes in the health system could reduce the chance of death and implement those that appear feasible.

2. Percentage of ART patients who were lost to follow-up	
Definition	Number of patients in the reporting period who were classified as "Lost to follow up" according to the national definition divided by total number of patients on ART at the clinic in the reporting period and multiplied by 100. The patients are not classified as dead, transferred out, or stopped.
Purpose	To monitor the proportion of HIV infected patients on ART who were lost to followed-up, and actively follow up by ART clinics.
Method of Measurement	Count number of registered patients at the ART site in the reporting period who lost to follow-up, then compute for percentage using numerator and denominator below. "Lost to follow up" is defined by the National HIV Program as all PLHIV who come for a visit late more than 28 days after appointment date.
Frequency	Quarterly
Numerator	Total number of patients who were lost to follow up during the reporting period.
Denominator	Total number of patients on ART at the end of the reporting period (active patients + LTF + died + transfer out)
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	The facility ART electronic database
Interpretation	Action point. National average figure will be used as a reference for the comparison purpose, as well as trends over time for each facility. Appropriate actions should be taken to understand the cause of the lost, and then preventing them accordingly when the analysis result exceeds the national average figure or is increasing over time. Percentage of LTFU should not exceed 2.5% per quarter. Interpretation. The goal of HIV management is to preserve the lives of the patients. While not all patients can be saved, facilities should strive to provide good quality care that keeps loss to follow up to a minimum. Intervention. The facility should review the reasons for loss among ART patients, what changes in the health system could keep the patients adhere to the treatment.

3. Percentage of ART patient with no clinical contact or ARV pick up within 28 days since their last expected contact reengaged in care	
Definition	Number of ART patients who did not come for the visit or ARV pick up within 28 days since their last expected contact then who were re-engaged/returned in care divided by total number of ART patients who did not come for the visit or ARV pick up within 28 days since their last expected contact date, multiplied by 100.
Purpose	To monitor the proportion of HIV infected patients on ART who were re-engaged into care after missing clinical appointment.
Method of Measurement	Count number of patients who missed clinical appointment within 28 days, and those who returned into care after their missing, then compute for percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of patients who were missed clinical appointment within 28 days then re-engaged into care during the reporting period.
Denominator	Total number of patients on ART who missed clinical appointment within 28 days in the reporting period.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database or "Tracing and Re-engagement" tool.
Interpretation	Action point. National average figure will be used as a reference for the comparison purpose, as well as trends over time for each facility to re-engage missing clinical appointment patients. In average, 85% of patients who missed clinical appointment were reengaged per quarter. Appropriate actions should be taken to understand the cause of the missing, and then preventing them accordingly. Intervention. The facility should review the reasons for missing among ART patients, and re-engagement rate. If the re-engagement rate far below the missing, review what changes in the system could keep the patients adhere to the treatment.

4. Percentage of ART patient with no clinical contact or ARV pick up for more than 28 days since their last expected contact reengaged in care	
Definition	Number of ART patients who did not come for the visit or ARV pick up for more than 28 days since their last expected contact then who were re-engaged/returned in care divided by total number of ART patients who did not come for the visit or ARV pick up for more than 28 days since their last expected contact date, multiplied by 100.
Purpose	To monitor the proportion of HIV infected patients on ART who were re-engaged into care after lost to follow-up.
Method of Measurement	Count number of patients who missed clinical appointment for more than 28 days, and those who returned into care after their missing, then compute for percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of patients who were missed clinical appointment for more than 28 days then re-engaged into care during the reporting period.
Denominator	Total number of patients on ART who missed clinical appointment for more than 28 days in the reporting period.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database or "Tracing and Re-engagement" tool.
Interpretation	Action point. National average figure will be used as a reference for the comparison purpose, as well as trends over time for each facility to re-engage missing clinical appointment patients. In average, 60% of lost to follow-up patients were reengaged per quarter. Appropriate actions should be taken to understand the cause of the missing, and then preventing them accordingly. Intervention. The facility should review the reasons for missing among ART patients, and re-engagement rate. If the re-engagement rate far below the missing, review what changes in the system could keep the patients adhere to the treatment.

II. Visit status indicators

5a. Percentage of late visits beyond ARV supply buffer date	
Definition	Number of all visits that came late beyond ARV drug supply buffer date divided by total visits in the reporting period and multiplied by 100.
Purpose	To promote counseling services and encourage patients to follow the physician's recommendations to avoid care and treatment interruption. This indicator is to be used as a proxy for measuring adherence to ART.
Method of Measurement	Count number of visits that are beyond ARV buffer supply date. Calculate for the percentage using numerator and denominator below. ARVs buffer should be given for 5 days (Ref. NCHADS letter 0146)
Frequency	Quarterly
Numerator	Total number of visits beyond ARV buffer supply date during the quarter.
Denominator	Total number of visits during the quarter.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	Facility ART electronic database
Interpretation	Action point. Facilities should limit the late beyond ARV buffer supply date to less than 2.5% per quarter. Interpretations. High percentage of late beyond ARV buffer supply shows that the adherence of the patients to ART is not good and likely lead to drug resistance. Interventions. The facility should review the cause of late beyond buffer, what problems may exist in the system and how these can be corrected to reduce the rate of missed appointments.

5b. Percentage of late visits within ARV supply buffer date	
Definition	Number of all visits that came late but still in ARV drug supply buffer date divided by total visits in the reporting period and multiplied by 100.
Purpose	To promote counseling services and encourage patients to follow the physician's recommendations to avoid care and treatment interruption. This indicator is to be used as a proxy for measuring adherence to ART.
Method of Measurement	Count number of appointments that are within ARV buffer supply date. Calculate for the percentage using numerator and denominator below. ARVs buffer should be given for 5 days (Ref. NCHADS letter 0146)
Frequency	Quarterly
Numerator	Total number of visits within ARV buffer supply date during the quarter.
Denominator	Total number of visits during the quarter.
Source of data	Facility ART electronic database
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Interpretation	Action point. Facilities should limit the late within ARV buffer supply date to 5% or less per quarter. Interpretations. High percentage of late within ARV buffer supply likely lead to late beyond buffer and show that the adherence of the patients is not good, and this type of visit also add additional burden for daily work of health care providers. Interventions. The facility should review the cause of late within buffer, what problems may exist in the system and how these can be corrected to reduce the rate of missed appointments.

5c. Percentage of visits on schedule among ART patients	
Definition	Number of all visits that came on schedule divided by total visits in the reporting period and multiplied by 100.
Purpose	To promote counseling services and encourage patients to follow the physician's recommendations to avoid care and treatment interruption. This indicator is to be used as a proxy for measuring adherence to ART.
Method of Measurement	Count number of visits that are on schedule. Calculate for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Total number of visits on schedule during the reporting period.
Denominator	Total number of visits during the reporting period.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	Facility ART electronic database
Interpretation	Action point. Facilities should encourage the visits on schedule more than 85%. Interpretations. High percentage of visit on schedule is likely to keep the patients on adherence. Interventions. The facility should encourage patients to keep their visit on schedule.

5d. Percentage of early visit among ART patients	
Definition	Number of all visits that came earlier than schedule divided by total visits in the reporting period and multiplied by 100.
Purpose	To promote counseling services and encourage patients to follow the physician's recommendations to avoid care and treatment interruption. This indicator is to be used as a proxy for measuring adherence to ART.
Method of Measurement	Count number of visits that are early than the appointment date. Calculate for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Total number of visits that are earlier than the appointment date during the quarter.
Denominator	Total number of visits during the quarter.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	Facility ART electronic database
Interpretation	Action point. Facilities should limit the early visits at 7% or less per quarter. Interpretations. High percentage of early visits will burden daily work of health care providers. Interventions. The facility should encourage patients to keep their visit on schedule.

III. Treatment and preventive treatment indicators

6. Percentage of ART patients newly initiating ART on same-day as diagnosed date	
Definition	Number of new ART patients who have ART initiated on the same day as their HIV confirmatory test divided by the total number of new ART patients at the ART clinic in the reporting period, multiplied by 100.
Purpose	To monitor the timeliness of the initiation of ART treatment and to ensure that this is in line with the national guidelines on ART.
Method of Measurement	Count the number of patients who have ART initiation date the same as HIV confirmatory test date, then compute for percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number ART patients who have ART initiation date the same as HIV confirmatory date in the reporting period.
Denominator	Total number of newly initiating ART patients in the reporting period.
Disaggregation(s):	0 days (same-day) 1-7 days >7 days
Source of data	ART electronic database
Interpretation	Of the total patient load, how many percentages of clients have initiated same-day ART?

7. Percentage of newly initiating ART patients who had a baseline CD4 count before starting ART.	
Definition	Number of newly initiating ART patients who had a CD4 baseline divided by total of newly initiating ART patients in the reporting period multiplied by 100.
Purpose	To measure the coverage of CD4 baseline.
Method of Measurement	Count the number of HIV infected patients newly initiating ART in the reporting period who received baseline CD4 cell count before starting ART. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of HIV infected patients newly initiating ART in the reporting period who received a baseline CD4 cell count before starting ART.
Denominator	Total number of patients who newly initiating ART in the reporting

	period.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database
Interpretation	Failure to comply with national guideline (baseline CD4 testing) by health care providers, may lead to difficulty to monitor the effectiveness of the treatment. Sites should monitor their performance and improve it accordingly.

8a. Percentage of patients with CD4 count less than 350 cells per cubic millimeter of blood receiving prophylaxis with cotrimoxazole	
Definition	Number of HIV infected patients with CD4 cell counts < 350 cells/mm^3 received cotrimoxazole divided by number of all patients whose CD4 < 350 cells/mm^3, multiplied by 100.
Purpose	To monitor the appropriate management of patients registered for OI/ART care in terms of OI prophylaxis
Method of Measurement	Count number of patients whose most recent CD4<350 cells/mm^3 and who receive a new or ongoing prescription for cotrimoxazole. Compute for percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of patients with most recent CD4 levels of less than 350 c/mm^3 who received a new or ongoing prescription for cotrimoxazole at the most recent visit in the reporting period.
Denominator	Total number of patients whose most recent CD4 count was below 350 cells/mm^3 and had a patient visit during the reporting period.
Disaggregation(s):	Sex: Male, Female
Source of data	The electronic database
Interpretation	Action point. All patients with CD4<350 cells/mm^3 must receive cotrimoxazole for opportunistic infections prophylaxis. Interpretation. Failure to provide prophylaxis significantly increases the risk that patients will suffer from opportunistic infections and so is an indicator of sub-optimal quality of care. Interventions. The facility should review reasons for not starting prophylaxis, determine what interventions would help to reduce these delays, and adopt program changes to correct the problem.

8b. Percentage of patients with CD4 count less than 100 cells per millimeter of blood **receiving prophylaxis with fluconazole**	
Definition	Number of HIV infected patients with CD4 cell counts < 100 c/mm^3 received fluconazole divided by number of all patients whose CD4 < 100 c/mm^3, multiplied by 100.
Purpose	To monitor the appropriate management of patients registered for OI/ART care in terms of opportunistic infections prophylaxis
Method of Measurement	Count actual number of patients whose most recent CD4<100 c/mm^3 and who receive a new or ongoing prescription for fluconazole. Compute for percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of patients with most recent CD4 levels of less than 100 c/mm3 who received a new or ongoing prescription for fluconazole at the most recent visit in the reporting period.
Denominator	Total number of patients whose most recent CD4 count was below 100 c/mm^3 and had a patient visit during the reporting period.
Disaggregation(s):	Sex: Male, Female
Source of data	The electronic database
Interpretation	Action point. All patients with CD4<100 c/mm3 must receive Fluconazole for OI prophylaxis. Interpretation. Failure to provide prophylaxis significantly increases the risk that patients will suffer from opportunistic infections and so is an indicator of sub-optimal quality of care. Interventions. The facility should review reasons for not starting prophylaxis, determine what interventions would help to reduce these delays, and adopt program changes to correct the problem.

9. Percentage of ART patients receiving multi-months dispensing ≥ 3 months	
Definition	Number of ART patients dispensed ARV and next clinical appointment for ≥3months divided by all active ART patients at the end of reporting period, multiplied by 100.
Purpose	To monitor the coverage of MMD among all active ART patients in the clinic.
Method of Measurement	Count actual number of patients who have next clinical appointment for ≥3 months. Compute for percentage using the numerator and denominator below.
Frequency	Quarterly
Numerator	Number of patients who have been dispensed ARV and next clinical appointment for ≥3 months at the end of reporting period.
Denominator	Total number of active ART patients at the end of reporting period.
Disaggregation(s):	< 3 months 3 months 4 months 5 months ≥ 6 months
Source of data	ART electronic database
Interpretation	MMD ≥3 months should be 90%. Higher percent of ART patients on MMD means more patients are stable with less complex medical needs; more medical resources are free up for people who are sicker, those starting treatment and those with more complex needs.

10a. Percentage of new ART patients prescribed TLD as 1st line regimen	
Definition	Number of new ART patients prescribed TLD as 1st line regimen divided by total number of new ART patients in the reporting period, multiplied by 100.
Purpose	To monitor the use of TLD regimen as the first line regimen among new ART patients according to the national guidance.
Method of Measurement	Count number of new ART patients who were prescribed TLD during the reporting period. Compute for percentage using numerator and denominator below.

Frequency	Quarterly
Numerator	New ART patients who were prescribed TLD as the first line regimen in the reporting quarter
Denominator	All new ART patients in the reporting quarter
Source of data	ART database.
Interpretation	Action point. There should be 100% of new ART patients prescribed TLD regimen as 1st line regimen. Site should review reasons for low rate of TLD prescription for new ART patients and solve the problem accordingly.

10b. Percentage of ART patients using TLD as 1st line regimen (cumulative)	
Definition	Number of ART patients have been on TLD regimen through the end of reporting period divided by total number of all first line ART patients in the reporting period, multiplied by 100.
Purpose	To monitor the use of TLD regimen as the first line regimen among all ART first line regimen patients according to the national guidance.
Method of Measurement	Count number of all ART patients who have been prescribed TLD at the end of reporting period. Compute for percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	All ART patients who have been using TLD as the first line regimen through the end of reporting quarter
Denominator	All first line ART patients in the reporting quarter
Source of data	ART database.
Interpretation	Action point. There should be 90% of ART patients prescribed TLD regimen as 1st line regimen. Site should review reasons for low rate of TLD prescription as 1st line ART regimen and solve the problem accordingly.

11a. Percentage of PLHIV received TB preventive therapy (TPT) (cumulative)	
Definition	Number of PLHIV have received TPT through the end of reporting period divided by total PLHIV at the end of reporting period, multiplied by 100.
Purpose	To monitor the proportion of registered PLHIV who received TPT to prevent the development of active TB which is the leading cause of dead among HIV patients.
Method of Measurement	Count the number of registered patients at ART site at the end of reporting period who have received TPT (ongoing or completed). Compute for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of PLHIV patients who have received TPT (ongoing or completed) at the end of reporting period.
Denominator	Total number of PLHIV patients at the end of reporting period.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database
Interpretation	Action point. All HIV infected patients have to receive one course of TPT. Higher TPT coverage lower expected rate of active TB. Interventions. The facility should review reasons for not providing TPT for preventing active TB, determine what interventions would help to optimize TPT, and adopt program changes to correct the problem.

11b. Percentage of PLHIV completed the TPT course (cumulative)	
Definition	Number of PLHIV have completed TPT course through the end of reporting period divided by total PLHIV at the end of reporting period, multiplied by 100.
Purpose	To monitor the successful completion rate of patients taking a TPT course.
Method of Measurement	Count number of patients who have completed a course of TPT at the end of reporting period. Compute for the percentage using numerator and denominator below.

Frequency	Quarterly
Numerator	The number of PLHIV who have completed a course of TPT at the end of reporting period.
Denominator	Total number of PLHIV at the end of reporting period.
Source of data	ART electronic database
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Interpretation	Action point. All HIV infected patients have to receive one course of TPT. Higher completion rate of TPT lower expected rate of active TB. Interventions. The facility should review reasons for low completion rate of TPT for preventing active TB, determine what interventions would help to optimize TPT, and adopt program changes to correct the problem.

IV. Viral load indicators

12a. Percentage of ART patients receiving a viral load test in the past 12 months (viral load testing coverage)	
Definition	Number of PLHIV receiving ART with at least one viral load test result in their medical record (ART database) in the past 12 months divided by number of PLHIV receiving ART for at least 12 months, multiplied by 100.
Purpose	To monitor viral load test coverage/access among PLHIV in the past 12 months.
Method of Measurement	Count number of patients who have viral load test result within the last 12 months. De-duplicate records to avoid double counting of the numerator. The denominator should exclude patients who died, transferred out to another clinic, or been classified as lost to follow-up. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly and annually
Numerator	Number of PLHIV receiving ART with at least one viral load test result in their medical record (ART database) in the past 12 months.

Denominator	Number of PLHIV receiving ART for at least 12 months.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database
Interpretation	High proportion of viral coverage/access reflects high quality of HIV care and treatment. Interpretation. The viral load coverage should be at least 90%. The facility should review reasons for low viral load test coverage and determine what interventions would help to increase the rate.

12b. Percentage of people receiving antiretroviral therapy who had viral load monitored at six months [WHO: VLS.6]	
Definition	Number of people living with HIV and receiving antiretroviral therapy with at least one viral load test result in their medical record within the first six months after initiating ART divided by number of people living with HIV and receiving ART for at least six months, multiplied by 100.
Purpose	This indicator, WHO VLS.6, tracks coverage and outcomes of early VL testing of patients on ART at 6 months.
Method of Measurement	Count number of HIV infected patients who have at least 1 viral load test at 6th month after starting ART or changing ART regimen. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of people living with HIV and receiving antiretroviral therapy with at least one viral load test result in their medical record within the first six months after initiating ART
Denominator	Number of people living with HIV and receiving antiretroviral therapy for at least six months
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database
Interpretation	Action point. Failure to comply with national guideline (viral load test at 6 months after initiating ART or

	changing ART regimen) by health care providers, may lead to inefficacy treatment and care. Sites should monitor their performance and initiate improvements if percentage of non-compliance to the guideline exists. Interpretation: If a facility has a low percentage of patients who have viral load test at 6th month after starting ART or changing ART regimen, they should review reasons for this occurring, determine what interventions would help to improve the situation.

12c. Percentage of ART patients tested for viral load at <1000 copies/mL at 12 months after initiating antiretroviral therapy [WHO: VLS.1]	
Definition	Number of PLHIV receiving ART with viral load <1000 copies/mL at 12 months after initiating ART divided by number of PLHIV receiving ART with a viral load test result available at 12 months, multiplied by 100.
Purpose	To monitor viral load suppression of patients 12 months after initiating treatment and to estimate the percentage of PLHIV who have suppressed viral load.
Method of Measurement	These data are based on a cohort of patients alive and receiving ART who have suppressed viral load 12 months after initiating treatment. The denominator should exclude patients who died, transferred out to another clinic, or been classified as lost to follow-up. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly and annually
Numerator	Number of PLHIV receiving ART with viral load <1000 copies/mL at 12 months after initiating ART.
Denominator	Number of PLHIV receiving ART with a viral load test result available **at** 12 months.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database
Interpretation	High proportion of viral load <1000 copies/mL reflects treatment success rate. Interpretation. The facility should review reasons for low viral load suppression rate and determine what interventions would help to increase the rate.

12d. Percentage of PLHIV receiving ART who have suppressed viral load [WHO VLS.3]	
Definition	Number of PLHIV receiving ART who have a suppressed viral load (<1,000 copies/mL) divided by number of PLHIV receiving ART who have a viral load test in the past 12 months, multiplied by 100.
Purpose	To monitor suppression of viral load achieved among all those currently receiving treatment who received a viral load test, regardless of when they started ART.
Method of Measurement	The denominator should exclude patients who died, transferred out to another clinic, or been classified as lost to follow-up. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly and annually
Numerator	Number of PLHIV receiving ART who have a suppressed viral load (<1,000 copies/mL)
Denominator	Program-based denominator: number of PLHIV receiving ART who **have a viral load test in the past 12 months**. Population-level denominator: number of people living with HIV who **have been receiving ART for at least six months**
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database
Interpretation	High proportion of viral load suppression (<1000 copies/mL) reflects treatment success rate. It corresponds to the third 95 of the 95-95-95 targets (95% of the people receiving antiviral therapy have suppressed viral loads). Interpretation. The facility should review reasons for low viral load suppression rate and determine what interventions would help to increase the rate.

12e. Percentage of viral load test results received at site within 10 days of sample taken.	
Definition	Number of viral load results received at site within 10 days between date of sample collection and date of results received divided by total number of results expected to receive in the reporting period, multiplied by 100.
Purpose	To measure the duration in days from date of VL test request to the date the results were received in the facility how fast is it.
Method of Measurement	We used the date the viral load test was requested as a proxy for the date sample was collected. To measure date difference in days by subtracting date of receipt of viral load result and date request of viral load tests.
Frequency	Quarterly
Numerator	Number of viral load results received at site within 10 days between date of sample collection and date of results received in the reporting period.
Denominator	Total number of viral load results expected to receive in the facility in the reporting period.
Disaggregation(s):	≤10 days >10 days
Source of data	ART electronic database
Interpretation	The early the viral load results returned to site, the better case management.

V. Enhance adherence counseling indicators

13a. Percentage of PLHIV receiving ART with a viral load ≥1000 copies/mL who received enhanced adherence counselling	
Definition	Number of PLHIV receiving ART with a viral load ≥1000 copies/mL during a 12-month period who received enhanced adherence counselling divided by number of PLHIV receiving ART who had viral load ≥1000 copies/mL and were due for a follow-up viral load test within the reporting period, multiplied by 100.
Purpose	This indicator measures the number of people living with HIV receiving ART with viral load ≥1000 copies/mL who have partly or fully received EAC counselling since poor adherence is often a contributing factor to viral failure among PLHIV receiving ART.
Method of	The denominator should represent the number of people with viral

Measurement	load ≥1000 copies/mL, and numerator should represent the number of people with viral load ≥1000 copies/mL who received any EAC.
Frequency	Quarterly
Numerator	Number of PLHIV receiving ART with a viral load ≥1000 copies/mL during a 12-month period who received enhanced adherence counselling
Denominator	Number of PLHIV receiving ART who had viral load ≥1000 copies/mL and were due for a follow-up viral load test within the reporting period
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database and/or enhance adherence counselling register, high viral load logbook.
Interpretation	High proportion of patients with VL ≥1000 copies/mL received EAC reflects good monitoring of treatment adherence before decision is made regarding switching treatment regimen. Interpretation. The facility should review reasons for low proportion of EAC and determine what interventions would help to solve the problem.

13b. Percentage of PLHIV receiving ART with viral load ≥1000 copies/mL who received a follow-up viral load test within six months after enhance adherence counselling	
Definition	Number of PLHIV receiving ART who received a follow-up viral load test within six months after a viral load ≥1000 copies/ml, divided by number of PLHIV receiving ART with viral load ≥1000 copies/ml during the reporting period, multiplied by 100.
Purpose	This indicator measures the follow-up of people with non-suppressed viral load who should have received a follow-up viral load test
Method of Measurement	This is ideally a cohort-based indicator that measures the proportion of people who were due to and received a follow-up test in the reporting period. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of PLHIV receiving ART who received a follow-up viral load test within six months after a viral load ≥1000 copies/ml

Denominator	Number of PLHIV receiving ART with viral load ≥1000 copies/ml during the reporting period
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database and/or enhance adherence counselling register, high viral load logbook.
Interpretation	High proportion of viral load follow-up reflects good monitoring of treatment efficacy and help clinicians for on time clinical decisions. Interpretation. The facility should review reasons for low proportion of viral load follow-up testing and determine what interventions would help to solve the problem.

13c. Percentage of PLHIV receiving ART with viral load ≥1000 copies/mL who then suppressed to <1000 copies/ml on follow-up testing	
Definition	Number of PLHIV receiving ART with follow-up viral load test <1000 copies/ml, divided by number of PLHIV receiving ART with viral load ≥1000 copies/ml during the reporting period and receiving a follow-up viral load test within six months, multiplied by 100.
Purpose	This indicator helps to measure the potential impact of intervention after a non-suppressed viral load and informs about the prevalence of HIV drug resistance.
Method of Measurement	This is ideally a cohort-based indicator that measures the proportion of people who were due to and received a follow-up test in the reporting period. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of PLHIV receiving ART with follow-up viral load test <1000 copies/ml
Denominator	Number of PLHIV receiving ART with viral load ≥1000 copies/ml during the reporting period and receiving a follow-up viral load test within six months
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database and/or enhance adherence counselling register, high viral load logbook.
Interpretation	High proportion of viral load return to <1000 copies at viral load test follow-up reflects effective intervention of EAC.

VI. Switching regimen and Retention indicators

14a. Percentage of PLHIV receiving first line ART with two consecutive documented viral load test results ≥1000 copies/mL switching to second line	
Definition	Number of ART patients with two consecutive viral load test results ≥1000 copies/mL (at least 6 months apart) switching to second antiretroviral therapy regimen divided by number of PLHIV receiving first line ART with two consecutive viral load test results ≥1000 copies/mL during the reporting period, multiplied by 100.
Purpose	To measure clinical follow-up and case management. It may help to inform forecasting and budgeting for procuring second line regimen as well.
Method of Measurement	These data are based on a cohort of patients alive and receiving ART who have viral load ≥1000 copies/ml. The denominator should exclude patients who died, transferred out to another clinic, or been classified as lost to follow-up. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of ART patients with two consecutive viral load test results ≥1000 copies/mL switching to second line antiretroviral therapy regimens
Denominator	Number of PLHIV receiving first line ART with two consecutive viral load test results ≥1000 copies/mL during the reporting period.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database
Interpretation	Interpretation. The facility should review reasons for not switching regimen according to the national guidelines for HIV care and treatment and determine what interventions would help to manage cases properly.

14b. Percentage of PLHIV receiving second line ART with two consecutive documented viral load test results ≥1000 copies/mL switching to third-line ART regimen	
Definition	Number of SL ART patients with two consecutive viral load test results ≥1000 copies/mL (at least 7 months apart) switching to third-line antiretroviral therapy regimen divided by number of PLHIV receiving second-line ART with two consecutive viral load test results ≥1000 copies/ml during the reporting period, multiplied by 100.

Purpose	To measure clinical follow-up and case management. It may help to inform forecasting and budgeting for procuring third-line regimen as well.
Method of Measurement	These data are based on a cohort of patients alive and receiving SL ART who have viral load ≥1000 copies/ml. The denominator should exclude patients who died, transferred out to another clinic, or been classified as lost to follow-up. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of SL ART patients with two consecutive viral load test results ≥1000 copies/mL switching to third-line antiretroviral therapy regimen
Denominator	Number of PLHIV receiving SL ART with two consecutive viral load test results ≥1000 copies/mL during the reporting period.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	ART electronic database
Interpretation	Interpretation. The facility should review reasons for not switching regimen according to the national guidelines for HIV care and treatment and determine what interventions would help to manage cases properly.

15. Percentage of PLHIV on ART who are retained on treatment	
Definition	Number of PLHIV who continue ART after they initiated ART excluding those who are falling out of TX_CURR in a quarter or in a year.
Purpose	This indicator helps determine how many HIV+ adults and children are being retained in treatment.
Method of Measurement	Retention quarter = (1-(TX_CURR prior quarter + TX_NEW - TX_CURR current quarter)/TX_CURR prior quarter)4 where: - TX_NEW = Number of adults and children newly enrolled on antiretroviral therapy (ART) - TX_CURR $_{\text{prior quarter}}$ = The number of adults and children receiving ART in the **previous** quarter - TX_CURR $_{\text{current quarter}}$ = The number of adults and children receiving ART in the **current** quarter **How to Calculate the Annual Total**

	Annual rates can be calculated using **Q4 data from the current and previous year.** Quarterly rates should be annualized to ensure consistent comparison to target information that is based only on annual targets. Quarterly retention rates can be calculated by raising to the 4th power. (12) Alternative calculation: 1 + (NET NEW – NEW)/(All Current ART - NET NEW) + NEW)
Frequency	Quarterly
Numerator	The numerator is the number of patients falling out of TX_CURR in a quarter. This includes patients who were lost to follow-up, patients who died, and patients who transferred out of care. The numerator is calculated by adding the TX_CURR results from the previous quarter to the TX_NEW results, and then subtracting the TX_CURR results from the current quarter: ($TX\_CURR_{\text{prior quarter}}$ + TX_NEW - $TX\_CURR_{\text{current quarter}}$) Alternatively, the numerator can also be calculated as TX_NEW – NET_NEW
Denominator	The number of adults and children receiving ART in the previous quarter TX_CURR (Previous quarter) The denominator is taken directly from the TX_CURR results for the previous quarter
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	Electronic ART database. Quarterly report.
Interpretation	Action point. Retention rate <90% of ART patients required action to improve the service quality and follow up mechanism. Interpretation. Retention rates above 100% would generally suggest that patients who had previously fallen out of care were re-enrolled in care, or that facilities that didn't report TX_CURR results in previous quarters began reporting.

VII. Patient Satisfaction indicators

16. Percentage of clients reported satisfied with service they received	
Definition	Number of ART client who participate in patient satisfaction feedback (PSF) who reported satisfied with overall service they received at ART site during the reporting period
Purpose	To monitor the level of satisfaction to the quality of service that PLHIV received.
Method of Measurement	The data will be extracted from the PSF database on number of clients who reported satisfied with the overall service they received during the reporting period. The PSF system is being used routinely at ART facilities by using online tablet-based data collection tool and the data is automatically import to the PSF database.
Frequency	Quarterly
Numerator	Number of clients participating in PSF who reported satisfied with the overall service they received
Denominator	All ART clients who participated in PSF during the reporting period
Source of data	PSF database.
Interpretation	Action plan. There should be 90% of ART client satisfied with ART service and solve the problem accordingly PSF report finding.

17. Percentage of clients reported the waiting time is acceptable	
Definition	Number of ART clients reported the waiting time is acceptable based on their own judgement during the reporting period.
Purpose	To monitor the quality of services related to timeliness from the perspective of clients.
Method of Measurement	The data will be extracted from the PSF database on number of clients who reported the waiting time is acceptable during the reporting period.
Frequency	Quarterly
Numerator	Number of clients participating in PSF who reported that the waiting time is acceptable during the reporting period
Denominator	All ART clients who participated in PSF during the reporting period
Source of data	PSF database.
Interpretation	Action plan. The data will be used to improve the timeliness and responsiveness of service provision at ART. There is an expectation of at least 90% of clients reported the waiting is acceptable.

18. Percentage of clients reported they received adequate counseling	
Definition	Number of ART clients reported receiving adequate counseling at the end of reporting period
Purpose	To monitor the quality of services related to counseling services from the perspective of clients.
Method of Measurement	The data will be extracted from the PSF database on number of clients received adequate counseling during the reporting period.
Frequency	Quarterly
Numerator	Number of clients participating in PSF who reported receiving adequate counseling service at ART site during the reporting period
Denominator	All ART clients who participated in PSF during the reporting period
Source of data	PSF database.
Interpretation	Action plan. There should be 90% of ART client reported receiving adequate counseling service they received. The data will be used to improve the quality of counseling at ART site.

19. Percentage of providers rated their health facility's services for KPs with low and very low quality	
Definition	Number of health care provider rated their health facility's service for KPs with low and very low quality
Purpose	To monitor the self-evaluation of the ART service among service providers at ART site.
Method of Measurement	The data will be extracted from the PSF database on number of providers rated their health facility's service for KPs with low and very low quality during the reporting period.
Frequency	Quarterly
Numerator	Number of providers participating in PSF who reported their health facility's service for KPs with low and very low quality during the reporting period
Denominator	All providers who participated in PSF during the reporting period
Source of data	PSF database.
Interpretation	Action plan. There should be less than 10% of health care provider rated their health facility's service with high quality service for KPs. The data will be used to discuss and find the solution to improve quality of care at ART site.

ANNEX II: Budget plan for three necessary inputs for CQI implementation

NCHADS should budget for at least three necessary inputs listed below in order to implement the CQI-COC activities effectively:

1. CQI orientation workshop which covers:

- The revise CQI SOP including the problem-solving approaches,
- Data management: data quality, data collection, data processing, data analysis and data use.
- Practices to develop graphic of each indicator, and power point presentation.

2. Quarterly review workshop of **interlink active case management and continuous quality improvement of HIV care and treatment** following the P-D-C-A cycle. The review should be conducted regularly (quarterly) to continuously review percentage of new cases found are connected to ART services and received ART. The workshop will also review the performance of key indicators associated with ART services listed in the SOP. They will identify problem(s), root causes of the identified problem, then plan and act accordingly.

3. CQI dashboards. The dashboard can help ART team and PASP to monitor their daily activities and their monthly or quarterly performances complementing to the use of data at ART clinic.

ANNEX III: Problem Solving Matrix

(1) Problem (Prioritized problem)	(2) Cause (Causes of the problem)	(3) Proposed solution (Counter measures to the problem)	(4) Responsibility	(5) Timeline	(6) Follow-up
Discuss and prioritize the indicators based on how important, urgent and feasible. List all indicators considered as priority.	Discuss about all possible causes that lead to the problem. List all causes from patients, heath care providers and system point of view.	Discuss about possible solution. List all counter measures to the problem.	Who will be responsible for each proposed solution, individual or group	Set timeline to complete the proposed solution	State the status of the proposed solution, whether it was done, not done, or in progress.

ANNEX IV: Example use of Problem-Solving Matrix

(1) Problem (Prioritized problem)	(2) Cause (Causes of the problem)	(3) Proposed solution (Counter measures to the problem)	(4) Responsibility	(5) Timeline	(6) Follow-up report
% of late beyond ARV supply buffer date high	**Patient's side:** - Lack of support for travelling to the clinic - Working far from home	(not selected for problem solving)			
	- Forget the appointment date	- Counselor-CAA team have appointment list, set up reminder, remind the patients 2 days prior appointment date	- CAA team	- Today	In progress
	- Rely on drugs borrowing from others	- Clearly and repeatedly inform the patients during any meeting, there is no borrowing or lending drugs.	- Health care providers	- At next meeting on …(date)	Not start yet. Will be followed-up (follow-up report)
	- Don't care about ART, too poor - Being late many times, don't dare to see doctor - Feel healthy	- Counselor/CAA team provide counseling, health education focused more on related topics (health care, adherence, how to maintain your good health) and conduct home visit more often.	- Counselor, CAA team	- Within this week	Not start yet. Will be followed-up (follow-up report)
	Provider's side: - Make appointment coincide with holidays	Post visible holiday schedule at physician, counselor and CAA desk	Site manager	Today	In progress
	- Next appointment was not made (Dr. forgot or he was absent)	Counselor/CAA team reviews and sets up reminder for next appointment (as above)	CAA team	Starting from today	In progress

	- Few health care providers but many patents/visits per day	(not selected for problem solving)			
	- Lack of patient appointment book	Update and regularly share information regarding inventory (at any meeting). Make request on time.	Site manager	Next meeting	Not start yet. Will be followed-up (follow-up report)
	- CAA team was not allowed to visit patient's home	- Counselor/CAA team provides counseling, health education focused more on related topics (health care, adherence, how to maintain your good health) in health education sessions. Clearly stated the objective of home visit	Counselor, CAA team	Next health education sessions.	Not start yet. Will be followed-up (follow-up report)
	- CAA team has limited resource for transportation support - Incentive comes late - Lack of medical consumables	(not selected for problem solving)			
	System side: - Lack of system to monitor patient's visit	Further investigation should be conducted to identify specific component in the "system" which is absent.	Health facility director and site manager	October	Not start yet. Will be followed-up (follow-up report)
	- lack of communication between doctor-CAA team	Revitalize weekly (or monthly) meeting among health care providers, data management clerk, CAA team	Site manager	Next weekly/monthly meeting	Not start yet. Will be followed-up (follow-up report)
	- IT does not maximize the use of data for patient	Further investigation should be conducted to identify specific what we want	PASP, HF director, site manager and IT	Next week	Not start yet. Will be followed-up (follow-up report)

	monitoring				
	- Fund disbursement to CAA team was late or interrupted - Lack of coordination when planning for community activities.	(not selected for problem solving)			

ANNEX V: Examples of follow-up report (the solutions and outcomes of the previous quarter are reviewed in the current quarter)

Example 1: Actions taken to increase TLD transition among ART patients to 40%	
1. Initiated	Started on (date) …
2. When is it completed?	It will end when 80% of all PLHIV on ART using TLD
3. What are the results?	Last quarter we had 33% of all PLHIV on TLD. This quarter we have 40% of PLHIV on TLD as planned.
4. Are there constraints, challenges in completing the proposed solution?	Yes, we must wait for almost 3 months for the drugs supplied as requested.
5. Are there good things to learn from completing the proposed solution?	Yes, we must: 1) Update current list of PLHIV on each regimen. 2) Develop transition plan as instructed by NCHADS. 3) Submit the plan with drug request to NCHADS, and 4) Plan to implement developed plan 3 months after submitting the drug request.
6. What can we conclude from "ACTING" the proposed solution?	To implement steps of transition plan on time as instructed by NCHADS, we are sure to reach our target.
7. What do we recommend from the above conclusion?	ART clinic follows practical steps guided by NCHADS the transition plan is going on smoothly. NCHADS should present/share MEFW of national level so that each clinic can use it as reference to set its own target.

Example 2: To increase 6MMD from 6% to 10%	
2. Initiated	Started on (date) …
2. When is it completed?	It will end when 25% of all PLHIV on ART receiving 6MMD
3. What are the results?	Last quarter we had 6% of all PLHIV receiving 6MMD. This quarter still 6% receiving 6MMD.
4. Are there constraints, challenges in completing the proposed solution?	Yes, ARV amount was sufficient due to the supply was not matched the amount requested.
5. Are there good things to learn from completing the proposed solution?	Yes, we must: 1) Update list of stable patients using the viral load criteria. 2) Develop 6MMD plan as instructed by NCHADS. 3) Submit the plan with drug request to NCHADS, and 4) Plan to implement developed plan 3 months after submitting the drug request.
6. What can we conclude from "ACTING" the proposed solution?	To implement MMD following steps outlined in the MMD SOP, we are sure to reach our target. However, the ARV drugs must be supplied according to the amount requested and on time.
7. What do we recommend from the above conclusion?	NCHADS should show and instruct the development of MEFW of each clinic, so that ART clinic can develop its own.

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