Kingdom of Cambodia
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Ministry of Health

Standard Operating Procedure (SOP)
For the Continuous Quality Improvement for Continuum Of Care for People Living with HIV/AIDS in Cambodia

National Center for HIV/AIDS, Dermatology and STD

October, 2017

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Preface

Cambodia is one of the most successful countries in the Western Pacific Region in its response to the HIV epidemic by reducing the HIV prevalence among people aged 15-49 years-old from 1.6 % in 1998 0.6% in 2016. 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 in order to eliminate new HIV infections by 2025.

It is estimated that there are 70,741 people who are living with HIV (PLHIV), of whom 58,338 people (82%) were registered in care by the end of fourth quarter of 2016. Cambodia currently has 66 OI/ART sites for adults, and 36 pediatric OI/ART sites. These sites deliver HIV care and/or ART to 54,395 adults and 3,943 children patients in 2016.

Although the estimated annual number of new infections is declining, there were an estimated 590 new infections and 3,570 PLHIV who were newly enrolled in care in 2016. Thus, the number of HIV/AIDS patients attending the OI/ART clinics is increasing each year as PLHIV are identified and placed on life-saving therapy. In addition, there were an estimated 2,182 deaths due to HIV in 2016. The quality of care at OI/ART facilities has improved, but we will need to continuously improve the quality of health services at these facilities to maintain and improve quality of life of the people living with HIV/AIDS.

The Ministry of Health would like to congratulate NCHADS and all development partners who were actively participating in developing a Standard Operational Procedure (SOP) for Continuous Quality Improvement for Continuum of Care for People Living with HIV/AIDS in Cambodia. The SOP is important and helpful to guide our health care providers at OI/ART sites to maintain and improve their performance, quality of services; hence to improve the quality of life of HIV infected patients.

Ministry of Health officially approves the SOP and expects that all involving stakeholders will implement the continuous quality improvement effectively to improve quality of life of the people living with HIV/AIDS and help the country reach its 95/95/95 goals by 2025.

Phnom Penh, ..19..January....2018

For Minister of Health

Prof. ENG HUOT
SECRETARY OF STATE

ACKNOWLEDGEMENT

The National Centre for HIV/ AIDS, Dermatology and STD closely collaborated with the national centers and 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 of the first version of CQI for CoC services 2012 - 2017.

National Center for HIV/AIDS Dermatology and STD thanks all experts in the working group who actively participated in the development of this useful document.

In particular, NCHADS wishes to record our special thanks to:

- Minister of Health for his excellent recommendations and support for activities to prevent the HIV epidemic and provide care and treatment for people living with HIV/AIDS.

- Staff of AIDS Care Unit, Research and Surveillance Units, Data Management Unit and other Units of National Centre of HIV/ AIDS, Dermatology and STD, and city, 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 logistic management officers, data management officers, working at OI/ART sites, ANC services, Maternal and Child Health Departments, and TB services for their active participation and sharing experiences in the revision of this valuable document.

Phnom Penh, 15 Dec 2017

Director of NCHADS

Dr. Ly Penh Sun

Abbreviations

ACU	AIDS Care Unit
ART	Anti-Retroviral Therapy
COC	Continuum of Care
CQI	Continuous Quality Improvement
HBC	Home-Based Care
M&S	Monitoring and Supervision
MCH	Maternal and Child Health
MMM	Mondul Mith Chuoy Mith (friend help friend center)
NCHADS	National Center for HIV/AIDS, Dermatology and STD
OD	Operational Health District
OD-CoC-CC	Operational Health District- Continuum of Care-Coordination Committee
OI	Opportunistic Infection
PASP	Provincial AIDS and STD program
PDCA	Plan Do Check Act
PHD	Provincial Health Department
PLHIV	People Living with HIV
PMTCT	Prevention of Mother-to-Child Transmission (HIV)
SOP	Standard Operational Procedure
TWG	Technical Working Group

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1. Background and Rationale

Until recently, Cambodia was recognized as having the highest national prevalence of HIV infection in the Asia-Pacific region. Despite considerable socio-economic constraints, Cambodia embarked on a comprehensive response to HIV/AIDS that resulted in declining HIV prevalence in adults from 1.6% in 1998 to 0.6% in 2016[4]. The ART coverage of PLHIV in Cambodia has increased tremendously such that over 80% of PLHIV were on ART by the end of 2016. There are currently 66 adult and 34 pediatric OI/ART sites which delivered HIV care and/or ART to 54,395 adults and 3,943 children patients in 2016.

As outlined in the *Strategic Plan for HIV/AIDS and STI Prevention and Control in the Health Sector in Cambodia 2016-2020,* Cambodia is now striving for virtual elimination of new HIV infections by 2025. Virtual elimination is defined as fewer than 3 new infections per 100,000 population a year and a mother-to-child transmission rate of 5% or less. 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.

In order to reach these goals, NCHADS has outlined three main strategies for the health sector HIV response:

1) *Boosted Continuum of Prevention to Care and Treatment (CoPCT):* key population prevention and links to services,
2) *Boosted Continuum of Care (CoC):* retention and improvement of quality for patients in care, and
3) *Boosted Linked Response (LR):* elimination of new infections among children while addressing the needs of their mothers.

The cornerstone activity bringing together these three strategies, along with a new strategy to identify, reach, intensify and retain (IRIR) key populations, is called Boosted Integrated Active Case Management (B-IACM). B-IACM strives to track individuals across the cascade through case management coordinators (CMCs) and assistants (CMAs), strengthened information systems, and improved use of individual level data. As part of this, NCHADS has developed the Community Action Approach for B-IACM, which consolidates and defines the implementation approach for community work, including community support for facility-based care.

Although B-IACM staff are, with community partners, responsible for ensuring that HIV reactive clients are identified, confirmed and enrolled in care, ART facility-based staff are responsible for the Boosted CoC activities to retain and improve the quality of care for clients on ART (Figure 1). Two key activities for doing this are clinical mentoring and continuous quality improvement (CQI). Clinical mentoring, as outlined in the 2014 document entitled *"Standard Operating Procedure for Clinical Mentoring for Quality Improvement within Pre-ART and ART Services for Adults and Children in Cambodia",* is an approach to develop on-site, applied clinical competency through clinical mentoring, in order to build capacity of staff, foster professional support relationships, and establish referral networks between experts and sites. Clinical mentors use the dashboards and indicators established through the Continuous Quality Improvement (CQI) as the tools and metrics for their clinical mentoring work with providers. The purpose of this document is to outline what CQI consists of, and how it operates.

In 2006 NCHADS data management unit designed a standard electronic database that allows for individual patient data entry from standardized paper records at pre-ART/ART sites. By

2016, all of 66 pre-ART/ART sites were equipped with the electronic database and recorded individual patient information. At these sites, data entry is conducted either by the provincial data managers or by clinic staff. The database can produce an automatic aggregated report that is sent to the central Data Management unit at NCHADS every quarter. This quarterly report provides information on the number of pre-ART and ART patients lost to follow, transferred out and died during the current quarter and the remaining number of active pre-ART and ART patients at the end of the quarter. All data from the pre-ART/ART services in Y facilities are also input into a national database of line-listed data on individuals.

However, the electronic data quality is not checked regularly yet, and the use of data by the ART site team (clinicians, data management, nurses, ART site managers, etc) to monitor quality of patients' management at their own facility is still limited. Therefore, this SOP is intended to introduce a process for continuous quality improvement (CQI) that will improve the quality of data and improve use of data to improve clinical services.

2. Origin and Objectives of CQI

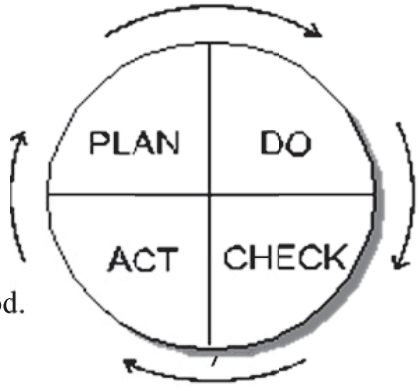
2.1 Origin

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.

Fig.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 considered to be opportunities for improving the process.

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

2.2 Objectives

Overall objective

To improve the quality of care and treatment services provided to PLHIV in Cambodia

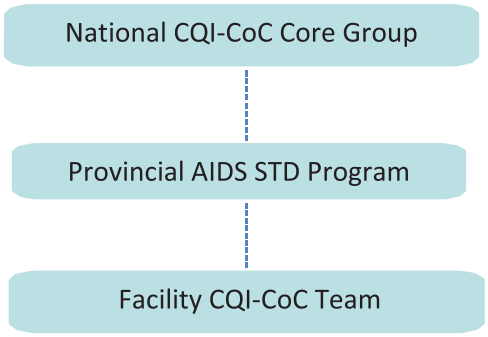
Specific objectives

1. To improve the quality of data related to standard criteria at pre-ART/ART sites,
2. To promote the use of quality data to improve the quality of services,
3. To develop a system for continuous quality improvement at pre-ART/ART sites,
4. To improve communication between clinicians, community support workers and data management staff at pre-ART/ART sites to work as a team to improve the quality of patient care.

3. Structure, Role and Membership

3.1 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 officer, and the onsite CQI-CoC team (Figure 2). The National CQI-CoC Core Group provides the necessary capacity to the PASP such that PASP can continuously and directly support, monitor, facilitate and coordinate the onsite CQI teams. The onsite CQI-CoC team are the critical players responsible for implementing CQI such that the full PDCA 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 and understanding of patient care and treatment,
- 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.

3.2 Members and Responsibility of CQI Team at each level

3.2.1 Members and Responsibility of National CQI-CoC Core Group

3.2.1.1 Members of National CQI-CoC Core Group

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

3.2.1.2 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 to ensure consistency with the CQI SOP
- Support PASP and pre-ART/ART sites to solve any problems or issues encountered
- Analyze data collected from field level, generate results and provide feedback to the PASP and pre-ART/ART sites for quality improvement on a timely and regular basis
- Develop and maintain CQI dashboards to facilitate analysis and use of CQI data by PASP and pre-ART/ART staff
- Builds capacity of PASP and train PASP to train pre-ART/ART site staff through teaching sessions, onsite coaching or peer-learning
- Provide recommendations and lead development and updating of technical guidelines and documents such as training materials, monitoring tools, etc.
- Develop a system to measure CQI performance
- Advocate and facilitate stakeholder collaboration to ensure their technical capacity is used to appropriately support CQI
- Ensure adequate resources are allocated to CQI activities to ensure sustainability of the program
- Coordinate and arrange technical forum or meetings such as an annual CQI review forum, CQI TWG…etc. that allows for discussion of CQI findings and triangulation with other data sources to identify opportunities for programmatic improvement.
- Shares lessons learned from HIV/AIDS CQI to the Ministry of Health for expansion to other health sectors
- Conduct any special studies as required to fulfill the needs for CQI program improvement.

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

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

- Director of OD
- Chief of pre-ART/ART site
- pre-ART/ART team

- B-IACM CMC
- Representative from TB
- Representative from MCH
- Representative from Drug section
- Data person
- Representative from HBC
- Representative from facility-based peer support programs
- Representative from development partners.

3.2.2.2 Responsibilities of OD-CoC-CC

- Support the implementation of CQI according to the SOP
- Organize quarterly CQI meetings to monitor and update the team on CQI progress
- Conduct supportive supervision to identify problems, causes and develop an appropriate improvement plan
- Attend technical forums, meetings and CQI-related trainings…etc.
- Collaborate with the National CQI-CoC Core Group to conduct special studies as required.

3.2.2.3 Responsibilities of onsite CQI-CoC Team

- Ensure the quality of data so that there is complete, correct and consistent information on all patients
- Enter and send data, findings from data analysis and feedback to the PASP on a regular basis and in a timely manner
- Regularly review site performance in providing HIV/AIDS services through use of CQI dashboards
- Organizes quarterly CQI meetings to monitor and update the team on CQI progress and to analyze information for both program improvement and individual patient monitoring
- Collaborate with PASP to conduct supportive supervision to identify problems, causes of the problems, develop or modify improvement plan as appropriate
- Attend technical forums, meetings and CQI-related trainings…etc.
- Collaborate with the National CQI-CoC Core Group to conduct special studies as required.

3.2.3 Coordination Roles of PASP

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

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

- Incorporate the CQI plan from each site into the PASP's CQI plan at provincial/city level
- Coordinate with the national program and all ART sites in their province to solve problems or issues such as incomplete data, lack of supplies, or resource issues
- Ensure data collected from site level and transmitted to province are correct and sent in a timely manner to national level
- Assists and build capacity of staff at pre-ART/ART sites to use CQI dashboards and analyze information for both program improvement and individual patient care

improvement

- Advocate and facilitate stakeholder collaboration to ensure evidence-based technical and resources allocation to CQI activities
- Facilitate in conducting technical forum or meetings, such as CQI quarterly workshops, CQI TWG meetings…etc., to promote use and triangulation of CQI data with other data sources (e.g., B-IACM, community outreach, etc.) for programmatic improvement
- Provide appropriate support for data management to staff at CoC services (especially at pre-ART/ART services) to ensure the quality of data management (data collection, data entry, and analyze the data) and data use for CQI implementation,
- Collaborate with and facilitate the national CQI-CoC Core Group to conduct special studies as needed.

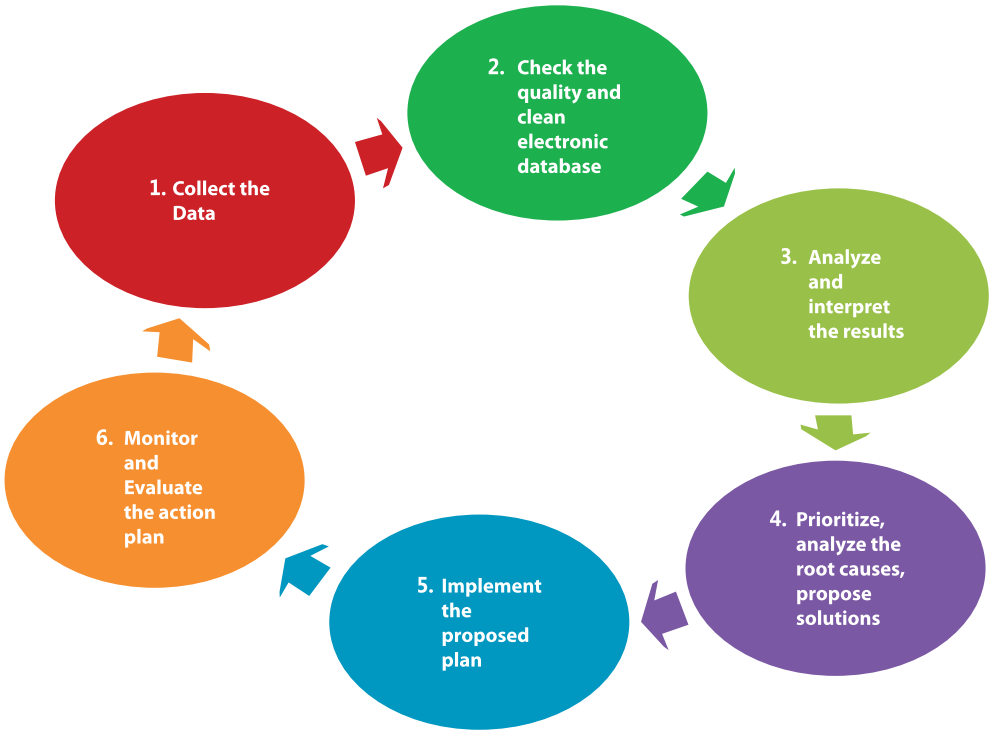
4. Implementation of CQI

Treatment of opportunistic infections and ARV treatment ensure people living with HIV maintain good health status and survive to have a normal life. Continuous quality improvement of the CoC is very important not only for the quality of life of the people living with AIDS, but also to limit ARV drugs resistance, and reduce new infection.

All pre-ART/ART sites in Cambodia should implement CQI concepts in order to maintain and improve quality health care services, and this practice should become a routine practice for all health care providers.

The implementation of CQI will require efficient collection and management of data and its transformation into indicators that will provide useful information about trends in the quality of healthcare services at pre-ART/ART sites. This section of the SOP describes the steps in implementation of CQI activities (Figure 3).

Figure 3: Steps in Implementing CQI-CoC Activities



4.1 Data collection

4.1.1. *Data collection for the electronic database*

Patient information including general information, clinical information and laboratory information are routinely collected by health care providers at each patient visit at the pre-ART/ART clinic and recorded neatly and completely in in the patient chart.

All information of all patients that the health care providers collect during the day should be daily computerized by the data entry clerk at pre-ART/ART site.

4.1.2. *Data collection for paper-database*

Additional data that are not contained in the pre-ART/ART site electronic database need collecting with a paper-based tool on a quarterly basis, such as TB, PMTCT, and pharmacy records.

4.2 Quality check and clean electronic database

4.2.1 Data quality assurance by data entry clerk

The data entry clerk should enter all information for all patient records on the day of pre-ART/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 compare the number of patient charts the service completed that day with a list of the day's appointments.
- Enter all required fields according to data entry guidance.
- During data entry, if noting any missing data (not ticked, blank, etc.), unclear script, or inconsistent data, she/he must note all of these in a given log book and get clarification immediately after data entry, at the end of the day, or early morning of the next day. 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 required variables.

In addition, the pre-ART/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 data entry logbook, with a note 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 instruction from the Data Management Unit of NCHADS.

4.2.2 Validation of electronic data using the paper-based patient records

The site manager should perform the following steps in checking the data quality:

- Obtain a 5% random sample of patient records in the database.
- Check the data against the paper records.
- For each field, check the number of discrepancies between the paper record and the

electronic record.
- Record the discrepancies, verify, find 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. 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.

4.2.3 NCHADS will check the data quality while compiling data sets from all pre-ART/ART sites, looking for missing or illogical or the completeness and accuracy of selected key CQI variables, such as CD4 count and viral load testing.

4.3 Analysis and interpretation of the CQI indicators

There are several different ways in with CQI data should be routinely reviewed.

Pre-ART/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), using the **CQI daily onsite action dashboard** which should be available at all facilities conducting CQI.

The summary analysis of CQI indicators should be also be 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 the 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 who returning “on time”
- % of patients who were retained on ART at 12 months
- % of patients screened for TB screening
- % of eligible patients tested for viral load
- % of patients who were viral load suppressed.

A **CQI quarterly onsite dashboard** which is updated routinely by the Data Management Unit at NCHADS will facilitate review of these indicators by sites. The CQI quarterly analysis dashboard can also be used by the province (PASP), and relevant Units at NCHADS, for example, Research Unit, and AIDS Care Unit to review site performance, develop action plans, or identify relevant interventions. DMU will also maintain a post the analysis results into a **CQI quarterly provincial dashboard** hosted by DMU at the national level.

4.4 Problem Analysis, Prioritization, Proposed Solution and Action Plan

4.4.1 Investigation of problems indicated by key indicator analysis

Using the CQI daily onsite action dashboard, 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 15 days, patients who were late beyond buffer, patients with viral load greater than 1,000 copies/ml, patients who were lost to follow-up, 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, community support team and data management team to ensure good participation in this CQI process.

4.4.2 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 preselected criteria, for example, magnitude of the problem, how strong it impacts on the quality of services, potential to cause death, potential to result in another problem, 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 poor coverage of cotrimoxazole prophylaxis is identified, the team should ask if it is due to a lack of understanding of instructions in the pre-ART/ART guidelines or a lack of drugs, for example. Depending on the findings of investigation, staff from PASP can provide targeted refresher training, or logistics management staff can review where the

forecasting and supply processes could be improved.

Example 2: If poor client appointment keeping is identified, the team should discuss whether or not this is due to poor adherence counseling, or if it is due to inadequate community/self-help group involvement, for example. Training of facility counsellors or improved engagement of community/self-help groups 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 understand when to request the test, VL test supply chain interruption, etc. Similarly, the first case would benefit from refresher training, 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.

4.5 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.

4.6 Monitoring and evaluation of action plan

The onsite CQI-CoC team, PASP and involved partners should monitor the implementation of the action 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 continued 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 plans routinely every quarter.

4.7 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, which include services being provided at the ART site, as well as ART service linkages with other health programs such as PMTCT and TB.

4.7.1 Mortality indicators

1 Percentage of pre-ART/ART patients who died

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

4.7.2 Quality of service indicators

3a Percentage of late visits beyond ARV supply buffer date

3b	Percentage of late visits within ARV supply buffer date
3c	Percentage of visits on schedule among ART patients
3d	Percentage of early visits among ART patients
4	Percentage of ART eligible patients received ART within 15 days after enrollment
5a	Percentage of patients with CD4 count less than 350 receiving prophylaxis with Cotrimoxazole
5b	Percentage of patients with CD4 counts less 100 cc/mm^3 receiving prophylaxis with Fluconazole
6	Percentage of patients who retained on ART at 12 months
7	Percentage of HIV infected patients at pre-ART/ART site who were screened for TB symptoms at their last visit
8a	Percentage of PLHIV at pre-ART/ART site who started INH preventive therapy (IPT)
8b	Percentage of PLHIV at pre-ART/ART site who started IPT and successfully completed 6 month course IPT
9	Percentage of HIV infected patient who received a baseline CD4 count before starting ART
10a	Percentage of patients who received at least 1 viral load test at 6 months after starting ART or after changing ART regimen
10b	Percentage of patients on ART for 12 months or more who received viral load testing at least once in the last 12 months
10c	Percentage of patients who received at least 1 viral load test after 3 months (3-4) of a detected VL result
10d	% of PLHIV with detectable VL who have received enhanced adherence counselling (EAC) and support (EAC 1, 2 and 3)
10e	% of patients who received detectable VL test and returned for a follow-up VL test, 3-6 months after initial detectable result
10f	(%) of ART patients with two documented VL test results ≥ 1,000 copies/mL switched to 2nd line regimen, 6 months or less after the first VL detectable result
11	Percentage of months in the year in which there were no ARV drug stock outages

4.7.3 Case-finding and prevention indicators

12	Percentage of new TB patients who receive HIV testing, counseling and test result

13 Percentage of pregnant women with known HIV status

14 Percentage of known HIV+ pregnant women who receive ART

4.8 Update or revision of CQI indicators

- The National CQI-COC working group is responsible for updating or revising CQI indicators.
- Any indicator that can 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 occur as necessary to ensure that CQI reflects current national standards and guidelines.

5 - Link with other services

Although Continuous Quality Improvement for pre-ART/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, hospitalization, VCCT, home-based care, TB, and PMTCT, laboratory and drug store. Below are several examples of linkages:

5.1 Community action providers

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

- Loss to follow-up: Home based care teams may be needed to gather data on what has happened to the individuals who are lost, and to help carrying out interventions to reduce this loss to follow-up.
- Adherence to treatment regimen: Some measures to improve adherence can take place at the pre-ART/ART clinic, but others may require home based care teams to assess and organize household and community support for better adherence.

5.2 Hospitalizations

An investigation of the rate of hospitalization of pre-ART /ART patients may require data from in-patient services if this is not routinely recorded on pre-ART /ART patient charts. 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 which case the TB-HIV referral program or provider initiated testing of selected hospital patients may need strengthening. In these cases the intervention is not at the pre-ART /ART clinic itself.

5.3 VCCT

An investigation into patients who appear late for pre-ART/ART (with very low CD4 counts) may find that some had been tested and knew their HIV status long before presenting to pre-ART/ART for treatment. If this is the case, then the intervention may need to take place at the VCCT site, through improved counseling and referral.

5.4 PMTCT

All pregnant women newly identified as HIV+ under the PMTCT program should be registered with pre-ART and placed quickly on ART if they meet the criteria for pregnant women. These services may best be evaluated in ANC and delivery facilities.

5.5 TB/HIV

The number of new patients who are known to have active TB at the time of registration represent a check of the results reported from the program to refer TB patients for HIV testing. If the numbers are much lower than the TB-HIV program reports then the TB program data is in error or patients are failing to register for pre-ART after being tested HIV+.

5.6 Prevention/STI

Entertainment workers report high rates of HIV testing, so many or most of those who are HIV+ should know their status and should be registered for pre-ART /ART. Review of pre-ART /ART patients may be able to reveal the proportion of EW who are registered compared to expectations, the proportion of female patients who are former or current EWs and provide a basis for investigating the process by which HIV+ women decide to continue with or discontinue commercial sex work.

5.7 Boosted integrated active case management

All new cases, whether found in the community or at a health facility, should be linked from the initial reactive testing to the confirmatory process then finally enrollment at the pre-ART /ART service. An examination of this process is merited if patients are presenting with low CD4 counts, for example. In addition, B-IACM case managers also use dashboards specific for B-IACM to track the steps prior to enrollment in the pre-ART /ART facility. The B-IACM data should also be reviewed periodically jointly with the CQI data to ensure a comprehensive picture of the care of clients across the cascade of diagnosis and care.

The listing above is intended to provide possible examples of linkages between CQI for pre-ART/ART and other services. As experience with CQI in the pre-ART /ART setting is gained, other examples of the linkage between pre-ART/ART and other services are likely to be found. While many CQI activities can take place completely within the pre-ART/ART clinic, CQI-CoC teams should recognize the opportunities for linking CQI with other services.

6- Monitoring, Supervision, Reporting and Training

6.1 Monitoring & Supervision:

The main objectives of monitoring and supervision are to support the onsite CQI-CoC team to maintain the quality of data and quality of health services.

PASP should schedule M&S 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 CQI daily action dashboard) PASP should conduct supportive supervision for every six months.

The national CQI-CoC Core Group should schedule joint M&S with PASP and development partners working in the area on an as needed basis.

During the M&S, 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,
- Ensure consistency of data between the patient paper record and the electronic database,
- Ensure availability of required data from other services – e.g., TB and PMTCT,
- Ensure availability and use of log books for problems faced during data entry,
- Ensure that each level is able to analyze, interpret and use the data.

6.2 Reporting:

The Team Leader at the pre-ART/ART site should send electronic data to the PASP who checks and analyzes the data from all pre-ART/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 workshops.

PASP sends data to the Data Management Unit at NCHADS, who regularly shares the data with AIDS Care Unit (ACU) for the follow-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.

6.3 Evaluating the Effectiveness of the Continuous Quality Improvement Program

- PASP will meet with the members of the CQI-CoC team from each OI/ART site in a joint yearly meeting in order to evaluate the overall progress of the CQI program at each site.
- Each of the sites will present CQI indicators as well as the National ART Database Quality Control reports 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 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.

6.4 Training & Capacity Building

CQI's most important asset is the dedicated people who work throughout the system. These individuals hold the key to successful and lasting quality improvement efforts.

The CQI workforce includes all those who contribute to the delivery of the organization's mission and services, regardless of career or volunteer status. 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.

6.4.1 SOP orientation workshop

To implement CQI-CoC effectively, relevant and involved staff members of the CQI-CoC team 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.

6.4.2 Data management training

Selected members of the CQI-CoC teams whose work relating with data shall take this 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:

- Apply the concepts of data quality in collecting and processing 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 (to get the answer for their queries related to their daily activities at the pre-ART/ART site)
- Develop a plan to manage their own data,
- Develop a data quality control mechanism for their own dataset.

ANNEX I: CQI Indicators

I. The Mortality Indicators

1. Percentage of patients registered in care who died	
Description	Percentage of registered patients who died
Purpose	To monitor the quality of the ART program
Method of Measurement	Count all dead patients in the reporting period and compute for percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Total number of patients registered in care 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, or patient records or the ART register
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. Interpretation. The ultimate 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 deaths to a minimum. Intervention. The facility should review the reasons for mortality among ART patients, what changes in the system could reduce the chance of death and implement those that appear feasible.

2. Percentage of pre-ART /ART patients who were lost to follow-up	
Description	Percentage of patients in the reporting period who were classified as "Lost to follow up" at the facilities according to the National Guidelines. The patients are not classified as dead, transferred out or stopped ART.
Purpose	To monitor the quality of the ART program and ARV drug resistance

Method of Measurement	The overall indicator is already reported quarterly as part of the national HIV information system. Further data for interpretation is available from the facility ART electronic database, patient records or the ART register.
Frequency	Quarterly
Numerator	Total number of patients who were lost to follow up during the reporting period. "Lost to follow up" is defined in the National ART Guidelines as lost for at least 3 months after the "Next appointment" date, and not classified as transferred out.
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, or patient records or the ART register
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. Interpretation. The ultimate 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 system could keep the patients adherent to the treatment.

II. Quality Service Indicators

3. Percentage of patients who kept all appointment

3a. Percentage of late visits beyond ARV supply buffer date.	
Description	Percentage of visits that are beyond the ARV supply buffer date.
Purpose	To promote counseling services and encourage patients to follow the physician's appointment recommendations in order 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 beyond ARV buffer supply date. Calculate for the percentage using numerator and denominator below.
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, or patient records or the appointment register
Interpretation	Action point. Facilities should limit the late beyond ARV buffer supply date to less than 2.5%. Interpretations. High percentage of late beyond ARV buffer supply 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.

3b. Percentage of late visits within ARV supply buffer date.	
Description	Number of late visits within ARV supply buffer date relative to total visits in the quarter.
Purpose	To promote counseling services and encourage patients to follow the physician's appointment recommendations in order 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.
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, or patient records or the appointment register
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 less than 10%. Interpretations. High percentage of late within ARV buffer supply likely lead to late beyond buffer, and burdening 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.

3c. Percentage of visits on schedule among ART patients.	
Description	Number of visits on schedule relative to total visits in the quarter.
Purpose	To promote counseling services and encourage patients to follow the physician's appointment recommendations in order 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 on schedule. Calculate for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Total number of visits on schedule 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, or patient records or the appointment register

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.

3d. Percentage of early visit among ART patients	
Description	Number of early visits relative to total visits in the quarter.
Purpose	To promote counseling services and encourage patients to follow the physician's appointment recommendations in order 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, or patient records or the appointment register
Interpretation	Action point. Facilities should limit the early visits at less than 10%. 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.

4. Percentage of HIV infected patients received ART within 15 days after enrollment to ART clinic	
Description	All HIV infected patients are eligible for prompt and timely ART initiation, regardless of CD4 cell counts
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 number of ART patients who received ART within 15 days after enrollment at ART service. Compute for percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of HIV infected patients who received ART within 15 days after enrollment at ART service in the selected quarter.
Denominator	Total number of all HIV infected patients enrolled at ART service in the selected quarter.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	Electronic database or the patient records
Interpretation	Action point. At least 90% of HIV infected patients should receive ART within 15 days after enrollment at ART service. Interpretation. A high rate of delay in starting ART endangers the patient and is a sign of quality of care problems. Interventions. The facility should review reasons for delay in starting ART in any patient, determine what interventions would help to reduce these delays, and adopt program changes to correct the problem.

5. Percentage of Patients receive OI Prophylaxis

5a. Percentage of patients with CD4 count less than 350 receiving prophylaxis with cotrimoxazole	
Description	All HIV infected patients with CD4 cell counts < 350 cc/mm^3 are eligible for cotrimoxazole prophylaxis.
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 cc/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 cc/mm^3 who received a new or ongoing prescription for cotrimoxazole at the most recent visit in the selected quarter.
Denominator	Total number of patients whose most recent CD4 count was below 350 cc/mm^3 and had a patient visit during the selected quarter.
Disaggregation(s):	Sex: Male, Female
Source of data	The electronic database or patient records
Interpretation	Action point. All patients with CD4<350 cc/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.

5b. Percentage of patients with CD4 count less than 100 cc/mm^3 **receiving prophylaxis with fluconazole**	
Description	All HIV infected patients with CD4 cell counts < 100 cc/mm^3 are eligible for fluconazole prophylaxis.
Purpose	To monitor the appropriate management of patients registered for OI/ART care in terms of opportunistic infections prophylaxis
Method of	Count actual number of patients whose most recent CD4<100 cc/mm^3

Measurement	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 cc/mm^3 who received a new or ongoing prescription for fluconazole at the most recent visit in the selected quarter.
Denominator	Total number of patients whose most recent CD4 count was below 100 cc/mm^3 and had a patient visit during the selected quarter.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	The electronic database or patient records
Interpretation	Action point. All patients with CD4<100 cc/mm^3 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.

6. Percentage of patients who were retained on ART at 12 months	
Description	Ideally, all HIV infected patients have to be on ART for life-long after ART initiation.
Purpose	To monitor the proportion of HIV infected patients who are being on ART and actively followed up by ART sites
Method of Measurement	Count number of registered patients at the ART site in the reporting period who have received ART. Compute for the percentage using numerator and denominator below.
Frequency	Annually
Numerator,	Number of patients who are still receiving ART at the ART site during the selected quarter at 12 months, after ART initiation (excluding those who were lost-to-follow-up, died, and transferred out).
Denominator	Total number of patients initiated ART at the ART site 12 months, prior to the beginning of the current reporting period (including those who were transferred in). • On ART is defined as those patients who had received enough ARVs to last to the end of the reporting period. See example below for more details. • LTFU is defined as a patient who has not received ARVs in the last 90 days (three months) following their last missed appointment or missed drug pick-up. • Died: Patients that are documented death during the previous 12 months. **For example**, if the reporting period is 1 January 2016 to 31 December 2016, calculate this numerator by using all patients who started ART any time during the 12-month period from 1 January 2015 to 31 December 2015. The 12-month outcomes are defined as 1) on ART and 2) not on ART because patient died, stopped ART or was lost to follow-up (LTFU), (including silent transfers).
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	Electronic database of patient records from the ART site.
Interpretation	Action point. All HIV infected patients initiated ART should be on ART for life-long. Low retention rate of ART patients required action to improve the service quality and follow up mechanism. Interpretation. The facility should review reasons for low retention rate, and determine what interventions would help to increase the retention.

7. Percentage of HIV infected patients at Pre-ART/ART site who were screened for TB symptoms at their last visit.	
Description	Ideally, all PLHIV patients have to be screened for TB symptoms at every visit.
Purpose	To assess the extent of implementation of the recommendation to screen all people living with HIV in care for presence of TB symptoms at every visit to HIV care and treatment facilities
Method of Measurement	Count number of patients at Pre-ART/ART site in the reporting period that have been screened for TB symptoms at their last visit. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of patients who registered at pre- ART/ART site during the selected quarter who were screened for TB symptoms at their last visit.
Denominator	Total number of persons enrolled in HIV care and seen for care during the reporting period
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	Electronic database modified Pre-ART/ART register or patient records.
Interpretation	Action point. All HIV infected patients should receive TB symptom screening. National target figure will be used as a reference for the comparison purpose but sites should monitor their performance and initiate improvements if their failure rate doubles in any quarter compared to previous rates. Interpretation. Tuberculosis is common in HIV patients (approximately 20% of newly registered patients are found to have active tuberculosis), often has atypical presentations and is associated with high mortality, particularly if treatment is delayed. Failure to screen regularly for tuberculosis is a significant quality problem. Interventions. The facility should review reasons for not screening for tuberculosis, determine what interventions would help to optimize screening, and adopt program changes to correct the problem.

8. Isoniazid Preventive Therapy

8a. Percentage of newly enrolled PLHIV at pre-ART/ART site who started INH preventive therapy (IPT)	
Description	Ideally, all PLHIV patients who have no active TB have to be offered IPT for 6 months to prevent the development of active TB which is the most common cause of death of AIDS patients.
Purpose	To monitor the proportion of registered PLHIV who received IPT to prevent the development of active TB as recommended in the national Standard Operating Procedure for TB/HIV collaborative activities.
Method of Measurement	Count the number of registered patients at pre-ART/ART site in the reporting period who were started IPT. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of newly enrolled patients in the reporting period who started IPT in the reporting period
Denominator	Total number of newly enrolled patients in the reporting period MINUS the number of patients who screened positive for TB
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female TB status:
Source of data	Electronic database, modified pre-ART/ART register or patient records.
Interpretation	Action point. All HIV infected patients who have no active TB or have been cured for TB should receive IPT for 6 months to prevent the development of active TB. National target figure will be used as a reference for the comparison purpose but sites should monitor their performance and initiate improvements if their failure rate doubles in any quarter compared to previous rates. Interpretation. Tuberculosis is common in HIV patients (approximately 20% of newly registered patients are found to have active tuberculosis), often has atypical presentations and is associated with high mortality, particularly if treatment is delayed. Failure to provide IPT to prevent development of active TB is a significant quality problem. Interventions. The facility should review reasons for not providing IPT for preventing active TB, determine what interventions would help to optimize IPT, and adopt program changes to correct the problem.

8b. Percentage of PLHIV at pre-ART/ART site who started IPT and successfully completed 6 month course IPT	
Description	It is observed that up to 40% of PLHIV enrolled in ART cohorts may develop TB. IPT is an effective TB preventive measure among PLHIV. The indicator measures the IPT completion rate.
Purpose	To monitor the successful completion rate of patients taking IPT for six months.
Method of Measurement	Count number of patients who have completed the 6-month course IPT. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	The number of ART patients who completed the 6 months course of IPT in the reporting period.
Denominator	The number of ART patients who were newly started on TB preventive therapy (including those who newly started on TB preventive therapy in this reporting period and those who started in the previous reporting period but had not been reported as they did not fulfill the minimum requirements for the previous reporting period.).
Source of data	The facility pre-ART/ART electronic database
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Interpretation	Action point. The national average figure will be used as a reference for comparison purpose, but sites should monitor their performance and initiate improvements if the completion rate is lower compared to previous period. Intervention. If a facility has a low IPT completion rate, they should review reasons for this occurring (e.g. poor adherence), determine what interventions would help to improve the situation.

9. Percentage of HIV infected patient who received a baseline CD4 count before starting ART.	
Description	Although ART can be started regardless CD4, CD4 cell count is still used as the criteria to start or stop Cotrimoxazole prophylaxis (CPT), Fluconazole prophylaxis, or Crag screening. All patients enrolled at pre-ART/ART site should be prescribed for baseline CD4 cell count before ART initiation.
Purpose	To measure compliance (baseline CD4 testing) of health care providers.
Method of Measurement	Count the number of HIV infected patients newly enrolled at pre-ART /ART site in the reporting period who were prescribed for 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 enrolled at pre- ART/ART site in the reporting period who were prescribed for baseline CD4 cell count before starting ART.
Denominator	Total number of patients who were newly enrolled at pre-ART/ART site in the reporting period.
Disaggregation(s):	Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
Source of data	The facility ART electronic database, patient records or the ART register.
Interpretation	Action point. Failure to comply with national guideline (baseline CD4 testing) 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. Intervention. If a facility has a high percentage of patients who have no baseline CD4 test, they should review reasons for this occurring, determine what interventions would help to improve the situation.

10. Percentage of patients who received viral load testing routinely according to the National Guideline

10a. Percentage of patients who received at least 1 viral load test at 6 months after starting ART or after changing ART regimen.	
Description	Viral load test is essential for monitoring the response to ART. The revised ART national guidelines recommend viral load test at 6th month after initiating ART or changing ART regimen.
Purpose	This indicator, WHO VLS.6, tracks coverage and outcomes of early VL testing of patients on ART at 6 months. This indicator assesses the extent to which VL is available in the country. By 6 months after ART initiation, all patients on ART should have received at least one VL test. This indicator also monitors VL suppression of patients 6 months after initiation on treatment. VL suppression is a disaggregation of WHO VLS.6.
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 HIV infected patients in the reporting period who have at least 1 viral load test between moth 5 and month 7 after starting ART or changing ART regimen.
Denominator	# of PLHIV who initiated ART 6 months before the start of the reporting period
Disaggregation(s):	• Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female • VL Suppression: Of those tested, # that had VL<1000 copies/mL by age/sex • Recommended: <1, 1-4, 5-9, 10-14, 15-19, 20+
Source of data	The facility ART electronic database, patient records or viral load logbook.
	Action point. Failure to comply with national guideline (viral load test at 6 months after initiating ART or changing ART

Interpretation	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. In general, a higher non-compliance, a poorer medical practice. Intervention. 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.

10b. Percentage of patients on ART for 12 months or more who received viral load testing at least once in the last 12 months.	
Description	Viral load test is essential for monitoring the response to ART. The revised ART national guidelines recommend routine viral load tests every 12 months after initiating ART.
Purpose	To measure compliance (routine viral load test) of health care providers.
Method of Measurement	Count number of HIV infected patients on ART for 12 months or more who received viral load testing at least once. Compute for the percentage using numerator and denominator below.
Frequency	Yearly
Numerator	Number of active patents on ART for 12 months or more who received at least one viral load test in the past 12 months.
Denominator	Total number of active patients on ART for 12 months or more in the reporting period.
Disaggregation(s):	• Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female • VL Suppression: Of those tested, # that had VL<1000 copies/mL by age/sex • Recommended: <1, 1-4, 5-9, 10-14, 15-19, 20+
Source of data	The facility ART electronic database, patient records or viral load logbook.
Interpretation	Action point. Failure to comply with national guideline (routine viral load monitoring) 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. Intervention. If a facility has a low percentage of patients who received routine viral load monitoring, they should review reasons for this occurring, determine what interventions would help to improve the situation.

10c. Percentage of patients who received at least 1 viral load test at 3 to 4 months after a detected VL result (40copies/ml).	
Description	According to the revised ART national guidelines, patients with a detectable viral load result should receive viral load testing 3 months after the detectable viral load result and adherence counseling.
Purpose	To measure compliance (viral load monitoring) of health care providers.
Method of Measurement	Count number of HIV infected patients who received at least one viral load test 3 months (3-4) after they had a detectable viral load test. Compute for the percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	Number of HIV infected patients who received at least one viral load test between 90 days to 120 days after they had a detectable viral load test.
Denominator	Total number of patients who had a detectable viral load result and reached 120 days in the reporting period.

Disaggregation(s):	• Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
	• VL Suppression: Of those who received a follow-up VL test within 3-6 months,
	  ○ **# that had VL<40 copies/mL by age/sex**
	  ○ **# that had VL Between 40-999 copies/mL by age/sex**
	  ○ **# that had VL1000 copies/mL by age/sex**
	• Recommended: <1, 1-4, 5-9, 10-14, 15-19, 20+

Source of data	The facility ART electronic database, patient records or viral load logbook.
Interpretation	Action point. Failure to comply with national guideline (routine viral load monitoring) 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. In general, a higher non-compliance, a poorer medical

	practice. Intervention. If a facility has a low percentage of patients who received viral load monitoring 3 months after their detectable viral load result, they should review reasons for this occurring, determine what interventions would help to improve the situation.

10d. % of PLHIV with detectable VL (≥ 40copies/ml) who have received enhanced adherence counseling (EAC) and support (EAC 1, 2 and 3)	
Description	Enhance adherence counseling is important to strengthen the adherence of a patient to take ARV rightly, regularly, and continuously.
Purpose	EAC is key to salvaging existing regimens and minimizing the risk of HIVDR. Factor to virological failure in ART patients. The indicator shows the follow-up performance after a patient has a detectable viral load.
Method of measurement	Data for this indicator can be collected from the ART registers/patient records from all ART facilities/clinics. For the analysis, sort it by latest records as of the end of the reporting period, up until 3 to 6 months before the beginning of the reporting period
Frequency	Quarterly
Numerator	Number of PLHIV with detectable VL who have received enhanced adherence counselling (EAC) and support
Denominator	Number of PLHIV with detectable VL, throughout the 3-6 month period of time prior to the beginning of the current reporting period

Disaggregation(s):	• Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female
	• **EAC Completion:**
	  ○ **% who Attended EAC#1,**
	  ○ **% who Attended EAC #2,**
	  ○ **% who Attended EAC#3**
	• Recommended: <1, 1-4, 5-9, 10-14, 15-19, 20+

Source of data	The facility ART electronic database, patient records or viral load logbook.
Interpretation	This indicator measures the promptness/timeliness to take action, per indicated protocol, in addressing high VL results

10e. % of patients who received detectable VL test (≥40copies/ml) and returned for a follow-up VL test, <u>3-6 months after initial detectable result.</u>	
Description	Once the viral load is detected, the follow-up of the patients is important to assure that the patients receiving appropriate interventions according to the level of their viral load status.
Purpose	Quality Indicators monitoring the adequate and prompt VL testing follow-up and effective receipt of results, to maximize the chances to salvage the current regimen
Method of measurement	Data for this indicator can be collected from the ART registers/patient records from all ART facilities/clinics.

Frequency	Quarterly
Numerator	Number of patients who received repeat VL test 3-6 months after initial detectable result.
Denominator	Number of patients who received detectable VL test (≥ 40 copies/mL) throughout the 6-month period of time prior to the beginning of the reporting period.
Disaggregation(s):	• Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female • VL Suppression: Of those who received a follow-up VL test within 3-6 months, o **# that had VL<40 copies/mL by age/sex** o **# that had VL Between 40-999 copies/mL by age/sex** o **# that had VL≥1000 copies/mL by age/sex**
Source of data	The facility ART electronic database, patient records or viral load logbook.
Interpretation	This indicator measures the promptness/timeliness to take action, per indicated protocol, in addressing High VL results

10f. (%) of ART patients with two documented VL test results ≥1,000 copies/mL switched from 1st to 2nd line regimen, 6 months or less after the first VL≥1,000 copies/mL result.	
Description	(%) of ART patients with two documented VL test results ≥1,000 copies/mL switched to 2nd line regimen
Purpose	Quality Indicators monitoring the adequate and prompt VL testing and switch to 2nd line regimen.
Method of measurement	Data for this indicator can be collected from the ART registers/patient records from all ART facilities/clinics.
Frequency	Quarterly
Numerator	Number of ART patients with two documented VL test results ≥1,000 copies/mL switched to 2nd line ART
Denominator	Number of ART patients with two documented VL test results ≥1,000 copies/mL, throughout the 3-month period of time prior to the beginning of the current reporting period.
Disaggregation(s):	• Age/Sex: <15 Male, 15+ Male, <15 Female, 15+ Female • Recommended annually: <15, 15-19, 20-24, 25-49, 50+
Source of data	The facility ART electronic database, or patient records or the ART register
Interpretation	Low switch to 2nd line rate (per pre-set target) will inform corrective action.
11. Percentage of months in the year in which there were no ARV drug stock outages	

Description	ARV drugs have to be always available at ART site to ensure that patients receive ARV drugs as prescription because ARV drug stock outages can lead to HIV DR.
Purpose	To measure ARV drug supply continuity.
Method of Measurement	ART sites report stock-outs of essential ARVs to the PASP and NCHADS. A stock-out is when any essential ARV is not available at an ART site.
Frequency	Yearly
Numerator	The number of months in the year in which there was no ARV drug stock outage reported for any ARV in the national standard regimens.
Denominator	Number of months in a year (12)
Source of data	Pharmacy stock records
Interpretation	Monitoring this indicator is important to ensure that the logistic supply system functions well. ARV treatment gaps can be dangerous to patients on ART, resulting in HIV DR and limiting treatment options. Movement of borrowing essential ARVs between ART sites within a province or between provinces in order to prevent stock-outs in ART sites with low stock of essential ARVs is not considered a stock-out, as long as an uninterrupted supply of essential ARVs remains available to meet patient treatment regimen needs and essential ARVs are defined as Antiretroviral drugs listed in the National ARV guidelines for adults and children. In addition, it will not be considered as a stock out in case when one essential ARV is out of stock, but its alternative drug is still available, thus there is no interruption on the treatment for patients.

III. Case-finding and prevention indicators

12. Percentage of new TB patients who receive HIV testing, counseling and test result	
Description	All new TB patients should be counseled and tested for HIV because there is a high risk of co-infection.
Purpose	Tuberculosis is a leading opportunistic infection for patients who have HIV. Routine screening of all new tuberculosis patients can identify those who are HIV positive, improve their therapy and reduce mortality.
Method of Measurement	Count number of new enrolled TB patients who received HIV counseling and testing in the reporting period. Compute for percentage using numerator and denominator below.
Frequency	Quarterly
Numerator	New TB patients who went for HIV testing and received their results in the reporting quarter
Denominator	New TB patients registered in the reporting quarter (excluding those known HIV+ or those who tested HIV+ within 1 month of registration)
Source of data	Routine national reporting system for tuberculosis services. Quarterly report from TB service.
Interpretation	Action point Some provinces achieve over 80% testing rates and all areas should attempt to do as well. Interpretation. The dangers of undiagnosed HIV in persons with active tuberculosis are so high that universal screening is desirable. In addition, TB screening is an important means of identifying PLHIV in Cambodia. Interventions. It is critical to ensure that all TB patients found reactive for HIV in the TB clinic immediately have blood drawn in the TB clinic for sending to VCCT for confirmation.

13. Percentage of pregnant women with known HIV status	
Description	Number of pregnant women who have been tested for HIV and know their status at delivery.
Purpose	Identification of HIV among pregnant women allows women to receive the services necessary to improve her health and decrease the risk of mother to child transmission of HIV.
Method of Measurement	Count number of known HIV status women at the delivery. Compute the percentage using the numerator and denominator below.
Frequency	Quarterly
Numerator	Number of pregnant women with known HIV status at delivery in the reporting period.
Denominator	Total number of deliveries in the reporting period.
Source of data	MCH PHD or MCH OD or HMIS
Interpretation	Action point. HIV services should strive to know HIV status for all women at delivery in order to take appropriate action to prevent HIV transmission from mother to child. Interpretation. The national target for this indicator is at least 95%. Interventions. Facilities need to examine the causes for lower coverage and design interventions to correct the problems.

14. Percentage of known HIV + pregnant women who receive ART	
Description	The number of HIV+ pregnant women who received ART consistent with national treatment guidelines.
Purpose	All known HIV+ pregnant women should receive ART prophylaxis to minimize the risk of transmitting HIV to their child and to protect their own health.
Method of Measurement	Count number of known HIV+ women who received ART and followed up during the reporting period. Compute the percentage using the numerator and denominator below.
Frequency	Quarterly
Numerator	Number of known HIV+ pregnant women in the denominator who received ART.
Denominator	Number of known HIV+ pregnant women in the reporting period
Source of data	NCHADS Database
Interpretation	Action point. HIV services should strive to have no HIV+ pregnant women fail to receive ART. Action should be taken, to the extent possible, on all cases of failure to receive ART. Interpretation. Failure to receive ART increases the risk of mother-to-child transmission. Interventions. Facilities need to examine the causes for failure to provide ART and design interventions that will reduce this failure.

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

NCHADS should budget for at least two 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.

2. CQI dashboards. There will be two forms of dashboard that can help sites and PASP to monitor their daily activities and their monthly or quarterly performances.

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 -MMM-HBC have appointment list, set up reminder, remind the patients 2 days prior appointment date	- MMM	- 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-HBC (self-help group) provide counseling, health education focus more on related topics (health care, adherence, how to maintain your good health) and conduct home visit more often.	- Counselor, HBC (self-help group leader)	- 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 MMM desk	Site manager	Today	In progress
	- Next appointment	Counselor-MMM review and	MMM	Starting from today	In progress

Counselor	was not made (Dr. forgot or he was absent)	set up reminder for next appointment (as above)			
	- 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)
	- HBC team was not allowed to visit patient's home	- Cousellor-HBC (self-help group) provide counseling, health education focus more on related topics (health care, adherence, how to maintain your good health) at the MMM. Clearly stated the objective of home visit	Counselor, MMM, SHGL	Next MMM	Not start yet. Will be followed-up (follow-up report)
	- HBC 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	Revitalize weekly (or monthly) meeting among health care	Site manager	Next weekly/monthly	Not start yet. Will be followed-up

	between doctor-MMM-HBC	providers, data management clerk, MMM and HBC		meeting	(follow-up report)
	- IT does not maximize the use of data for patient monitoring	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)
	- Fund disbursement to HBC was late or interrupted - Lack of coordination when planning for HBC	(not selected for problem solving)			

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

Proposed solution number …: Further investigation should be conducted to identify specific component in the "system" which is absent.	
1. Initiated	Yes (or No).
2. When is it completed?	On 28 September 2012
3. What are the results?	The specific components were identified. They are ….
4. Are there constraints, challenges in completing the proposed solution?	No
5. Are there good things to learn from completing the proposed solution?	Yes, they are: - -
6. What can we conclude from "ACTING" the proposed solution?	A specific component which is absent in the system to monitor patient's visit was identified and solutions are proposed in the recommendation below.
7. What do we recommend from the above conclusion?	…… …..
Proposed solution number …: Revitalize weekly (or monthly) meeting among health care providers, data management clerk, MMM and HBC	
2. Initiated	
2. When is it completed?	
3. What are the results?	
4. Are there constraints, challenges in completing the proposed solution?	

5. Are there good things to learn from completing the proposed solution?	
6. What can we conclude from “ACTING” the proposed solution?	
7. What do we recommend from the above conclusion?	

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