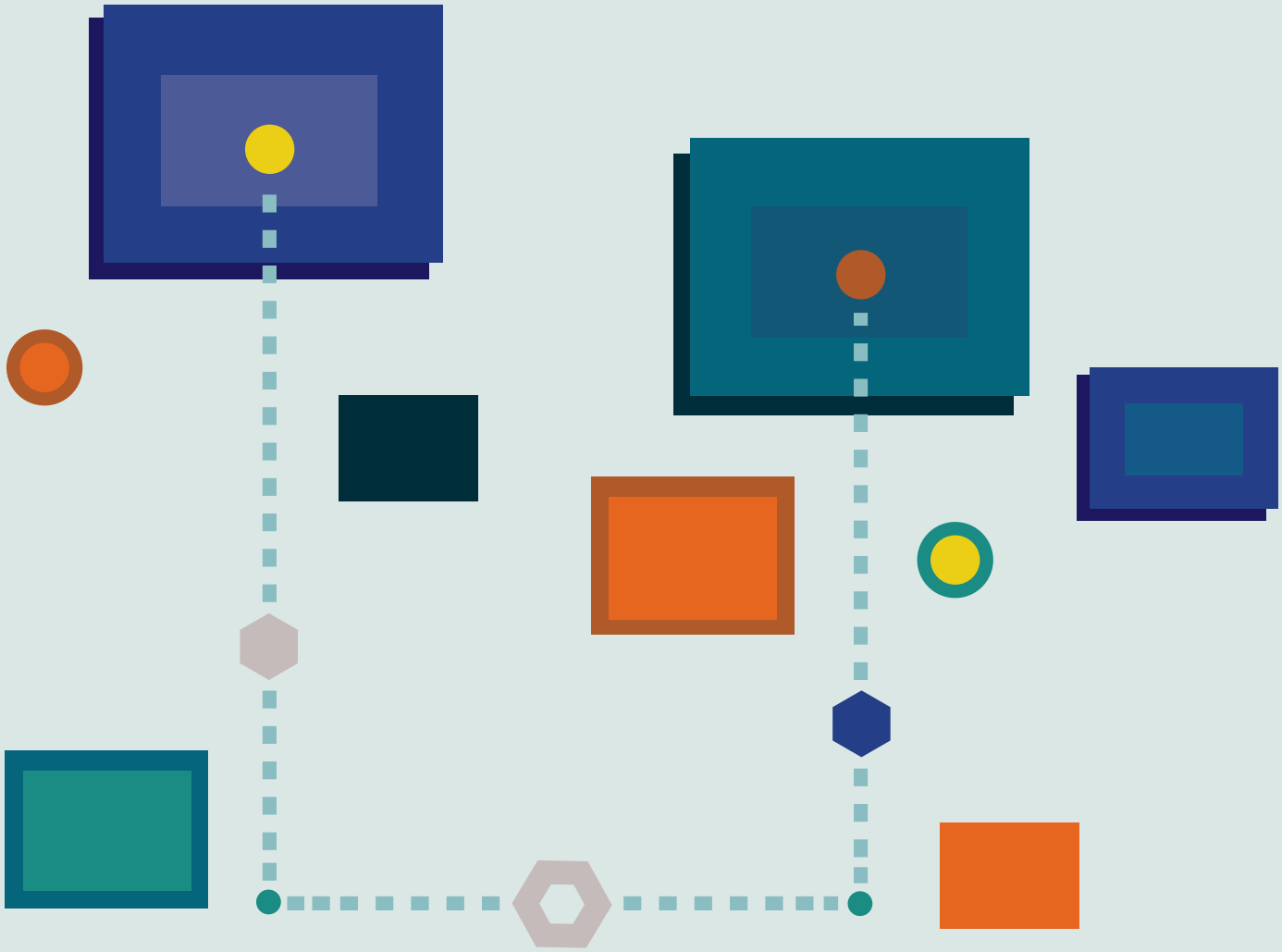

Comparative Analysis of Data Quality Assessment Tools

October 2018

USAID
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PEPFAR

MEASURE Evaluation

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CONTENTS

ABBREVIATIONS

ANC	antenatal care
ART	antiretroviral therapy
ARV	antiretroviral
C&T	counseling and testing
CDC	United States Centers for Disease Control and Prevention
DAR	daily activity record
DATIM	Data for Accountability, Transparency, and Impact
DQA	Data Quality Audit Tool
DQR	Data Quality Review
DQRS	Data Quality Results Snapshot
DTP3	diphtheria, tetanus, pertussis—three dose vaccine
EDQA	Expedited Data Quality Assurance Tool
EMR	electronic medical record
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HMIS	health management information system(s)
HTS	HIV testing
IDQA	Immunization Data Quality Audit
LTFU	lost to follow-up
M&E	monitoring and evaluation
MOH	ministry of health
NGO	nongovernmental organization
OVC_SERV	Number of beneficiaries served by PEPFAR orphans and vulnerable children (OVC) programs for children and families affected by HIV
PEPFAR	United States President's Emergency Plan for AIDS Relief
PMTCT	prevention of mother-to-child transmission of HIV
PMTCT_ART	percentage of HIV-positive pregnant women who received ART

PMTCT_STAT	percentage of pregnant women with known HIV status at ANC
RDQA	Routine Data Quality Assessment Tool
RDT	rapid diagnostic test
SARA	service availability and readiness assessment
SDP	service delivery point
S/GAC	Office of the U.S. Global AIDS Coordinator and Health Diplomacy
TB	tuberculosis
TX_CURR	number of adults and children currently receiving ART
TX_NEW	number of adults and children newly enrolled on ART
TX_RET	percentage of adults and children known to be on treatment 12 months after initiation of ART
TWG	technical working group
VF	verification factor
VMMC_CIRC	number of males circumcised as part of the voluntary medical male circumcision for an HIV prevention program
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

INTRODUCTION

The advent of the United States President's Emergency Plan for AIDS Relief (PEPFAR) and the Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund) 15 years ago brought significantly increased investments in disease control and prevention in developing countries. As more funds became available, so did the need to show returns on investment in the form of public health gains. Monitoring and evaluation (M&E) of interventions is critical for demonstrating the effectiveness of health programs but is dependent on data reported from health facilities that are often of poor quality. Resources have been devoted to improve data quality in health and disease programs, but problems persist as countries struggle to maintain capacity for data management, analysis, and use.

The number of patients on treatment is a very high-profile and useful indicator for monitoring the effectiveness of HIV programs. Treating patients over their lifetime and accurately recording these results is a challenge, however. Longitudinal treatment records (registers) for patients who return repeatedly for treatment and evaluation need to be summarized periodically in static reports. Counting accurately becomes more challenging as patients come and go from active treatment cohorts, move from one site to another, stop treatment as a result of side effects, or become lost to follow-up.

With the advent of "test and start"—an effort to expand the rolls of those on treatment and reduce the "waiting list" (those enrolled in care but not yet on treatment)—more scrutiny has been applied to treatment results, and the findings have not always been up to standard.

Several new tools have been developed to try to meet the need for data quality assurance, particularly for HIV and AIDS. The tools all use similar methods for gauging the accuracy of reporting, though many differences exist between them regarding the objectives and scope of their methodologies. This comparative analysis of data quality tools seeks to aid in the understanding of their similarities and differences as well as the selection of the appropriate tools and methods for assessing and improving data quality within a particular context.

DESCRIPTION OF AVAILABLE TOOLS AND METHODS

Data Quality Audit (DQA)

The Data Quality Audit Tool (DQA) was developed by MEASURE Evaluation—funded by the United States Agency for International Development (USAID) and PEPFAR—with the Global Fund for use in Global Fund and PEPFAR programs. The DQA was modeled after the Immunization Data Quality Audit (IDQA),[1] developed by the Vaccines and Biologicals Department of the World Health Organization (WHO) for Gavi (the Global Alliance of Vaccines and Immunization). The DQA comprises 16 indicator-specific templates in Microsoft Excel and a generic "System Assessment" module to qualitatively assess the reporting system for gaps and weaknesses. The 16 program-level indicators targeted by the DQA are as follows:

HIV/AIDS

- Treatment: Currently on antiretroviral therapy (ART)
- Prevention of mother-to-child transmission of HIV (PMTCT): Antiretroviral (ARV) prophylaxis for HIV-positive pregnant women
- HIV counseling and testing (C&T): Number of people counseled and tested for HIV, including provision of test results
- Prevention: Number of condoms distributed

Malaria

- Prevention: Pregnant women receiving intermittent preventive treatment (IPT) (SP) as prophylaxis for malaria
- Prevention: Indoor residual spraying
- Prevention: Number of insecticide-treated nets distributed
- Diagnosis: Number and percentage of malaria cases tested (blood test or rapid diagnostic test [RDT]) in health facilities
- Treatment: Number of people with uncomplicated or severe malaria receiving anti-malarial treatment (artemisinin-based combination therapies [ACT]/non-ACT)

Tuberculosis (TB)

- Case detection: Number of new smear-positive TB cases notified
- Case detection: Number of people benefiting from community-based detection of TB
- Treatment: Number of new smear-positive TB cases registered under directly observed treatment, short-course treated successfully
- Treatment: Number of people benefiting from community-based TB treatment support
- Multidrug-resistant (MDR) TB: Number of TB cases who started treatment for MDR TB

Generic Templates

- Community-based programs: Number of people benefiting from community-based programs
- Training: Number of service deliverers trained (a. health services, b. peer and community programs)
- System assessment: Qualitative assessment of data management and reporting system

[1] Retrieved from http://apps.who.int/iris/bitstream/10665/68462/1/WHO_V-B_03.19_eng.pdf.

The DQA was developed in 2007 and piloted in three countries in 2008 (Vietnam, Tanzania, and Belarus). From 2008–2011, the Global Fund used the DQA as part of its performance-based grant-making mechanism, conducting more than 96 indicator audits (Table 1).

Table 1. DQAs, by Global Fund region and disease, 2008–2010

Global Fund region	Disease	No. of DQAs	Percentage
East Africa	HIV	8	8
	Mal	8	8
Southern Africa	HIV	11	11
	TB	2	2
West and Central Africa	HIV	4	4
	Mal	11	11
Middle East and North Africa	HIV	2	2
	TB	2	2
Eastern Europe and Central Asia	HIV	5	5
	TB	2	2
East Asia/Pacific	HIV	2	2
	Mal	10	10
	TB	4	4
South and West Asia	Mal	6	6
Latin America/Caribbean	HIV	10	10
	Mal	8	8
	TB	1	1
Total		**96**	**100**

The DQA typically employs a cluster sampling algorithm to select 9 to 12 service delivery points (SDPs) within each of three to four clusters (or districts). Whereas the IDQA standard application called for the selection of 24 sites (6 in each of 4 clusters), the DQA as implemented by the Global Fund used smaller samples because of resource constraints.[2] A team of 4 external and independent consultants could conduct the audit of 9 to 12 sites in about 2 weeks.

The DQA traced reported results for a selected reporting period from sampled health facilities, through intermediate aggregation levels (e.g., districts) to the national level, from which country-level indicator values are derived. In the three-year period, the Global Fund implementation of the DQA led to the assessment of more than 1,000 health facilities, intermediate aggregation sites, and national M&E units (Table 2).

[2] Although as many as 55 sites in 30 clusters are required to obtain ±10 percent precision on sample estimates of accuracy of reporting, experience has shown that samples as small as 10 SDPs can be used to identify weaknesses in data quality and reporting (for more information on sample size requirements for the IDQA, see Woodard, S., Archer, L., Zell, E., Ronveaux, O., & Birmingham, M. (2007). Design and simulation study of the immunization Data Quality Audit (DQA). *Annals of Epidemiology*, 17 (8), 628-633.

Table 2. Number of audited sites, by level of health system

Level of the site	No. of sites	Percentage
Service delivery site	637	63
District office	215	21
Regional office	67	7
M&E unit at the national level	96	9
Total	**1,015**	**100**

The Global Fund continued to use the DQA from 2011–2013, though it did so more sparingly as changes were made to the internal grant monitoring mechanisms. Eventually, the Global Fund moved exclusively to the use of a proprietary assessment tool,[3] based on the DQA, which was used by Global Fund Local Fund Agents to monitor data quality. The DQA was also used by PEPFAR during this period, though the results are less well documented.

The DQA suite of tools and guidelines can be downloaded here: https://www.measureevaluation.org/resources/tools/data-quality/.

Routine Data Quality Assessment Tool (RDQA)

The RDQA is a self-assessment and capacity-building version of the DQA. This tool arose from demand by country programs undergoing audits with the DQA. Many stakeholders expressed the need for a tool to allow them to assess their own data quality and prepare for audits by donors. Thus, the RDQA was developed.

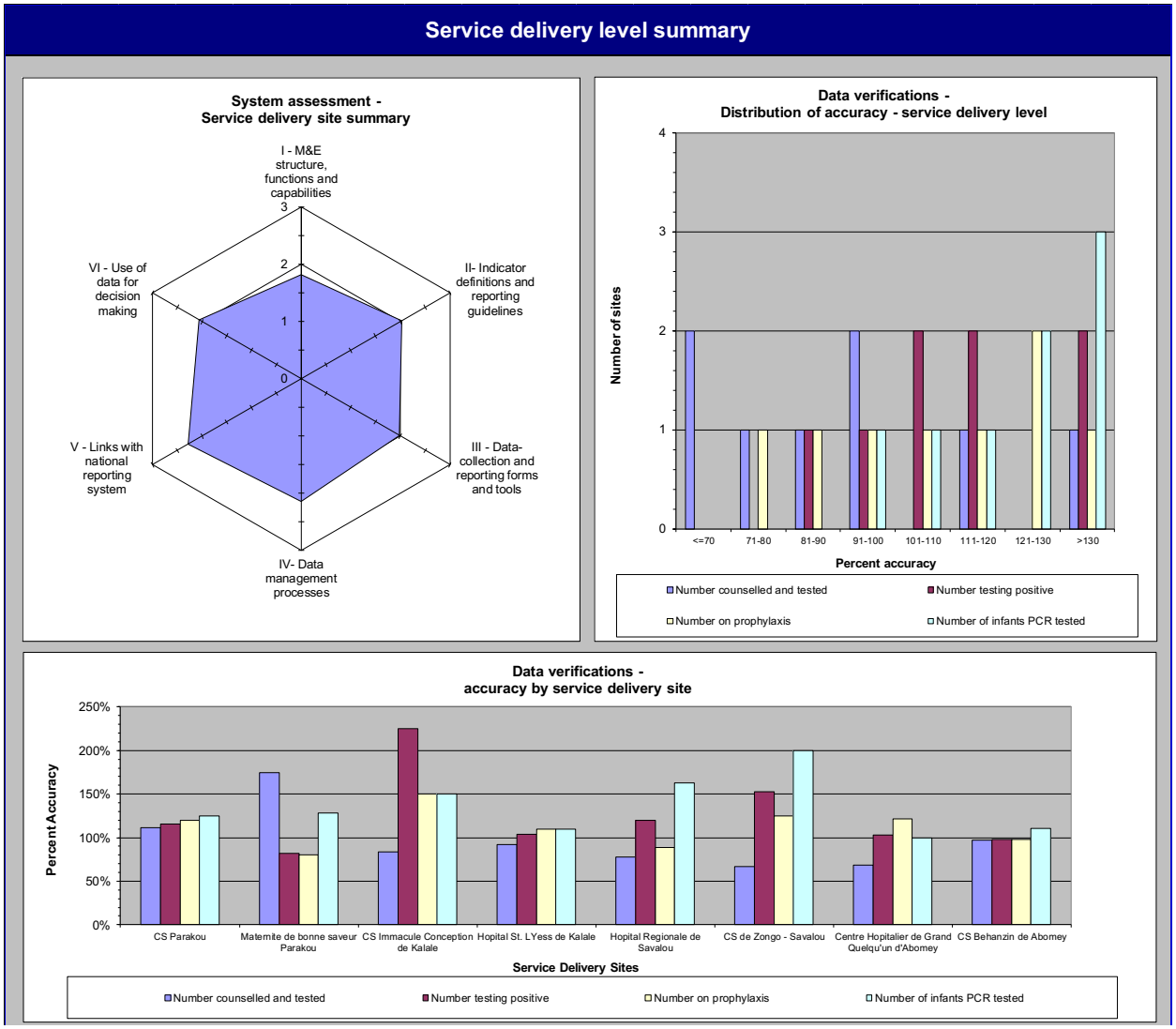
The RDQA began as a single-indicator tool that combined the quantitative and qualitative components of the DQA into a single MS Excel-based tool. The sampling method and calculation of a national-level estimate of reporting accuracy were removed and dashboards were developed for specific levels. The principal goal of the RDQA is to conduct routine data quality checks on a targeted group in health facilities and the aggregation levels through which they report. Identified data quality problems are grouped by the level of the health system to better tailor interventions to improve data quality.

Subsequent versions of the RDQA have been expanded to permit up to four indicators within the same health or disease program. Additional metrics have been added to more finely analyze accuracy—for example, weighted accuracy measures, proportion of sites under and over reporting, and so on.

The RDQA typically works best as a program-specific tool because its qualitative aspects (which ideally should be adapted to country settings) are specific to the set of data collection and reporting tools being used to report on the selected indicators. Because data collection tools (and sometimes reporting tools where reporting is not integrated) are program-specific, the tool should not be used across programs without extensive modification of the system assessment component.

[3] On-Site Data Verification Tool (OSDV).

Figure 1. RDQA service delivery-level summary dashboard



Between 2009 and 2018, the RDQA was adapted and integrated into routine program monitoring for health programs and nongovernmental organizations (NGOs) in more than 20 countries (e.g., Botswana, Cote d'Ivoire, Dominican Republic, Guinea, Guyana, Haiti, Kenya, Lesotho, Mali, Mozambique, Namibia, Nepal, Nigeria, South Africa, Swaziland, Tanzania, etc.)

The RDQA tool and guidelines can be downloaded here: https://www.measureevaluation.org/resources/tools/data-quality/.

Data Quality Review (DQR)

The tools and methods developed initially in the era of PEPFAR and the Global Fund focused on specific indicators and disease programs (e.g., AIDS, TB, malaria, etc.), primarily because of novel program-specific funding modalities and the needs of these enhanced health programs. Experience has taught that such fragmentation of resources and expertise leads to imbalance across the health information landscape and burden on health information system and personnel. Although these tools met the need for information on

the quality of the data needed to justify large-scale investments in disease control and prevention, they contributed to an increased fragmentation of the health information system.

WHO, with MEASURE Evaluation Phase IV, Global Fund, and GAVI, among others, developed a framework for a more holistic approach to data quality assurance that reduces overlap, redundancy, and burden on the health workforce while providing a good quality of data to inform planning. The Data Quality Review (DQR), a suite of tools and methods, was created to facilitate and standardize this crosscutting data quality assessment and provide guidelines for implementation in countries. These guidelines include advice on the formation of multistakeholder technical working groups (TWGs) led by ministries of health (MOH) to monitor, oversee, and coordinate data quality activities across health programs, technical partners, and donors.

Although still gaining steam, this holistic approach to data quality assurance holds much promise for the future by empowering a MOH to take the lead on ensuring data quality for health management information systems (HMIS) and health programs. An empowered MOH will lead to sustainability for health information system implementation and reform efforts.

The DQR collects information on up to five priority health programs in one assessment and provides much of the information on data quality needed for planning purposes. Recommended tracer indicators for the holistic application of the DQR are presented in Table 3.

Table 3. Recommended tracer indicators for the DQR

Recommended DQR indicators		
Program area	**Abbreviated name**	**Indicator name**
Maternal health	Antenatal care 1st visit (ANC1) coverage	Number and percentage of pregnant women who attended ANC at least once during their pregnancy
Immunization	(DTP)3/Penta3 coverage	Number and percentage of children < 1 year receiving three doses of DTP/ Penta vaccine
HIV	Current on ART	Number and percentage of people living with HIV who currently are receiving ART
TB	TB notification rate	Number of new and relapsed cases of TB notified per 100,000 population
Malaria	Confirmed malaria cases[1]	Confirmed malaria cases (microscopy or RDT) per 1,000 persons per year

Note: ANC = antenatal care; ART = antiretroviral therapy; DTP3 = diphtheria-tetanus-pertussis three-dose vaccine; Penta = pentavalent vaccine; RDT = rapid diagnostic test; TB = tuberculosis.
[1] If the number of confirmed malaria cases is not collected, total malaria cases can be substituted.

The DQR is frequently implemented as one module of a larger health facility assessment—for example, a service availability and readiness assessment (SARA). As part of a larger survey, the DQR can take advantage of the typically larger sample sizes associated with such surveys and improve precision on accuracy estimations.

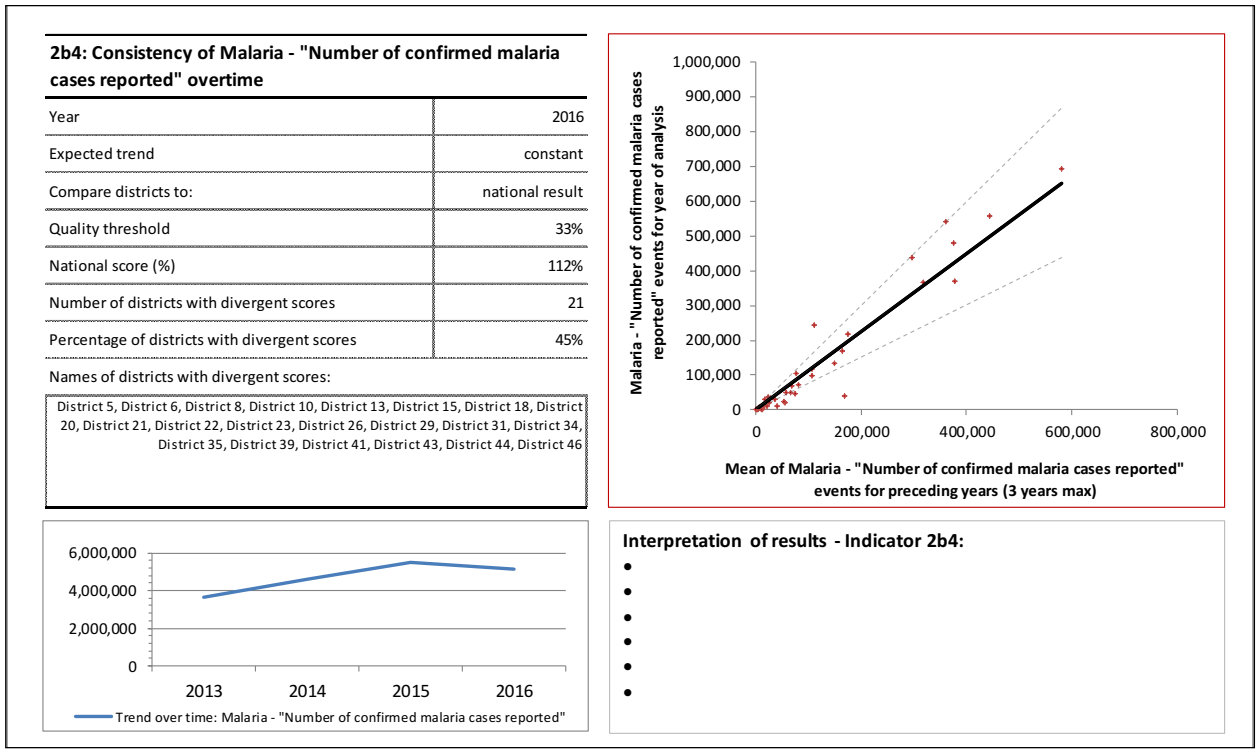
The DQR cannot, however, collect all of the information required for all health programs and remain a manageable and routine undertaking. Thus, as a feature of the DQR method, a periodic in-depth assessment of a priority health program is recommended to meet the needs of these programs as they arise. This assessment also would be coordinated by the data quality TWG, though the priority program selected for assessment would necessarily provide most of the direction and technical input as required.

The DQR includes standardized data collection tools, both paper-based and electronic (in CSPro). Automated tools in MS Excel facilitate data compilation and analysis through charts and graphs.

In addition to the health facility assessment, the DQR method calls for an analysis of previously reported aggregate data in the HMIS. This so-called "Desk Review" examines the historical data for gaps, inconsistencies, and outliers for selected program-level indicators. An automated tool in either MS Excel or an app downloaded and installed on the country instance of DHIS 2 facilitates the analysis.

Figure 2 displays an example of the output of the DQR Desk Review Tool in Excel.

Figure 2. Example DQR trend analysis: ratio of current year value to the average of the preceding three years



The Global Fund has adopted the DQR as its primary mechanism for assessing data quality and has made significant financial contributions to health facility assessments (SARA, with DQR) in more than 20 countries since 2016. WHO and MEASURE Evaluation have conducted training in the use of the DQR tools and methods in many countries, including Uganda, Rwanda, Burundi, and the West Africa Region.

The DQR suite of tools can be downloaded from the following:

- http://www.who.int/healthinfo/tools_data_analysis/dqr_modules/en/
- https://www.measureevaluation.org/our-work/data-quality/data-quality-review

CDC DQA Protocol

The United States Centers for Disease Control and Prevention (CDC) has produced a new data quality protocol to address the insufficiencies in reporting on the number of clients currently on ART (and other priority indicators, such as "New on ART", and "Voluntary Male Circumcision") for use by its PEPFAR implementing partners (in conjunction with the MOH).

The CDC DQA protocol is a comprehensive tool that uses established methods to validate indicator data at health facilities. These methods include recounting (or recreating) indicator values at sites and comparing them with reported values, and cross-validating data between different sources (i.e., register to pharmacy records or patient files). The CDC DQA protocol has elements not found in other data quality assurance methods, such as a data flow mapping tool to help identify bottlenecks in reporting; an assessment of patients categorized as lost to follow up (LTFU); and templates to assist with recounts, cross-checks, and other data quality checks.

The principal added value of the new protocol is in its specificity—what to assess and how—and the standard templates developed to assist with recounts and comparisons.

The CDC DQA has the following components:

- DQA site questionnaire
    - Interview with the data manager to understand the facility data systems and reporting procedures
    - Indicator validation method: Describes how the data validation was conducted, using a site-specific method (i.e., the method used by the site to report originally), the data compilation procedure prescribed by PEPFAR, or both.
- Recount of reported numbers for selected PEPFAR indicators and comparison against numbers reported to Data for Accountability, Transparency and Impact (DATIM) (may include a review of paper charts, registers, electronic medical record systems, pharmacy records, or other record systems)
- Cross-validation of paper charts, registers, electronic medical record systems, pharmacy records, or other record systems
- Data flow mapping: A site walkthrough and assessment of recording systems to determine patient and data flow from point of initial data capture (patient files) to data aggregation and reporting (registers and monthly aggregate tools) to identify gaps and opportunities for improving data quality

The CDC DQA targets the following program-level indicators:

- Number of adults and children currently receiving ART (TX_CURR)
- Number of adults and children newly enrolled on ART (TX_NEW)
- Number of males circumcised as part of the voluntary medical male circumcision for an HIV prevention program (VMMC_CIRC)

The CDC Division of Global HIV/AIDS and TB (CDC/DGHT) recommends that all CDC-funded partners validate 80 percent of reported TX_CURR and VMMC_CIRC by conducting annual data quality assessments at the facilities representing 80 percent each of CDC's TX_CURR and VMMC_CIRC clients. In addition, implementing partners should perform a data quality assessment on other reported indicators at least once during the funding period, sampling sites annually based on patient volume and known data quality challenges

(other indicators include but are not limited to HIV testing (HTS), PMTCT, TB, and/or other PEPFAR-supported services). The protocol includes the caveat that "80% is ideal, but in cases where this is not feasible, an alternative sampling strategy should be discussed with DGHT/[Monitoring, Evaluation, and Data Analysis Branch] MEDAB. VMMC_CIRC is only required at facilities/countries that report this indicator."

The CDC DQA protocol contains templates to assist with recounts, cross-checks, and data flow mapping. The recount tools (for TX_NEW and TX_CURR) include tally tools to facilitate counting of cases by age and gender. The disaggregations follow those required by DATIM and may not adhere to disaggregations required by national programs.

The CDC DQA also contains guidance on conducting additional data validation exercises, such as for electronic medical records (EMRs) and for the inactive list (i.e., clients no longer on ART for whatever reason).

Templates are available in MS Excel to assist with data gathering and conducting recounts of indicator values, cross-checks with other data sources, data flow analysis, and so on.

The CDC DQA is not available for public download.

S/GAC Data Quality Results Snapshot (DQRS)

The Data Quality Results Snapshot (DQRS) from the Office of the U.S. Global AIDS Coordinator and Health Diplomacy (S/GAC), which leads the implementation of PEPFAR, is a protocol for a data quality assessment of priority HIV and AIDS program-level indicators. The tool is designed for use by United States Government (USG) agencies and their implementing partners in PEPFAR-funded countries.

The purpose of the S/GAC protocol is to assess whether PEPFAR-funded partners are collecting and reporting data accurately to their agencies and subsequently into DATIM at a select sample of sites. The DQRS activity is conducted as part of S/GAC's oversight role as the coordinator of USG's global HIV and AIDS response. The exercise is not intended to serve as an audit or carry punitive consequences, nor to replace site improvement through monitoring systems (SIMS) visits or full-scale DQAs that agencies or implementing partners may have planned. The findings produced from a purposive or targeted sample will not be used to make inferences or generalizations about all sites, or a group of sites, within a country. It is expected that results from the DQRS assessment will be used immediately to make course corrections at the implementing partner and site levels, and document and monitor corrective actions for improvement.[4]

The DQRS specifies six priority indicators for validation:

[4] S/GAC Data Quality Results Snapshot, August 2017 version.

Table 4. DQRS priority indicators

	Program area	Indicator code	Indicator name	Reporting frequency
1	90: Knowing your HIV status	**PMTCT_STAT**	Percentage of pregnant women with known HIV status at antenatal care (includes those who already knew their HIV status before ANC), disaggregated by HIV result.	Quarterly
2	90-90: On ART	**TX_NEW**	Number of adults and children newly enrolled on ART	Quarterly
3	90-90: On ART	**TX_CURR**	Number of adults and children currently receiving ART	Quarterly
4	90-90: On ART	**PMTCT_ART**	Percentage of HIV-positive pregnant women who received ART to reduce the risk of mother-to-child-transmission (MTCT) during pregnancy	Quarterly
5	90-90-90: Viral suppression (narrative review)	**TX_RET**	Percentage of adults and children known to be on treatment 12 months after initiation of ART	Annual
6	Prevention	**OVC_SERV**	Number of beneficiaries served by PEPFAR orphans and vulnerable children (OVC) programs for children and families affected by HIV	Semiannual

The DQRS assessment takes place in five phases:

1. *Preparation:* The DQRS guidelines specify that the assessment should be coordinated and implemented by in-country USG staff, including the S/GAC Strategic Information (SI) advisor and country lead. Assessment teams will include staff members from USG agencies operating in country. Leadership at the MOH and regional/district levels (e.g., district medical officers) should be notified and encouraged to participate, if feasible.

   Priority indicators will be selected from the list above based on their national or international relevance, strategic importance for control of the epidemic, and significance with regard to financial investment.

2. *Site Selection:* Sites selected for review will be limited to "sites in scale-up (saturation and aggressive), sustained, and attained subnational units (SNUs). Centrally supported SNUs will be excluded." The S/GAC SI advisor will lead site selection for the DQRS based on, but not limited to, site volume and contribution toward the national TX_CURR/ TX_NEW results, geographic proximity, epidemiologic burden, and implementing partner (with goal of sampling one or more sites from most or all of the large clinical implementing partners).

3. *Data Collection:* Data for the selected indicators and periods will be recounted from source documents at the selected facilities and compared to the value for the site and period in DATIM. The threshold

for a site to "pass" the DQRS is +/- 5 percent of the reported number. Any sites with a result verification ratio beyond +/-5 percent threshold must have remediation and follow-up plans developed and shared with the site and responsible implementing partner. Data should be entered into the standard DQRS Excel data collection tool.

4. *Dissemination:* Assessment teams should provide feedback to the site on the quality of the data found there. Assessment teams should share a review of methods used, innovative solutions or successes in data management identified, challenges encountered in counting or locating registers or records, and pass/fail results for all indicators. Site staff should be given the opportunity to share challenges or best practices in their data collection and reporting procedures, and ask questions.

5. *Remediation:* For sites that fail to meet the pass threshold, USG agency personnel will develop a detailed, context-specific remediation plan based on the needs of the partner or site, including a summary of corrective actions, planned technical assistance, and follow-up that will be provided to ensure a correct submission for the annual progress report.

The DQRS guidelines include the following templates to facilitate the assessment at health facilities:

- A script for introducing the activity to health facility personnel
- A template for recording meeting notes at health facilities
- An example outline for a final report on assessment findings
- An assessment preparation checklist
- A checklist for guiding the assessment while on site

The DQRS guidelines and associated Excel data collection tool are not currently available for public download.

Expedited Data Quality Assurance Tool (EDQA)

The EDQA is an approach to data quality assessment specific to HIV and AIDS, and the number of patients currently on treatment. Developed in Zambia by MEASURE Evaluation and the USAID Mission in 2017, the EDQA combines traditional DQA methods and tools with a novel method for classifying cases by treatment status with a view to organizing patient records and cleaning the data.

The EDQA begins with a standard data quality assessment (the MEASURE Evaluation RDQA was used in Zambia) whereby a recounted (i.e., validated) value for the indicator "Current on ART" is derived and compared to the number reported by the site for the same period. Facilities with significant discrepancies between the recounted and reported values (e.g., greater than ± 5–10%) are targeted for a data cleaning exercise. This exercise focuses on clarifying the classification and identification of clients who are LTFU, facilitating community follow-up of clients deemed LTFU, and maximizing treatment reactivation of those LTFU. Once the records have been cleaned, a new assessment is conducted, using a system of tally sheets to verify and quantify correct classification of clients as "current on treatment."

The validation involves reviewing active files (i.e., files for patients with documentation indicating that they are alive and on treatment during the specified reporting period—such as a recorded patient visit or prescription for ARVs)—and inactive files (files for patients with no such documentation or documentation that the patient has died, transferred to another facility, stopped treatment with provider knowledge, or is

deemed LTFU). Cross-checks against a daily activity record (DAR), the pharmacy log book, and the EMR (if applicable) also feature in the method.

The validation takes place in four steps:

1. *Tally of active files:* Make a line listing of patient numbers with columns for tick marks to indicate the status of the patient. If the file has documentation to indicate that the patient is alive and on treatment, mark "active" on the tally sheet and proceed to the next file. If there is no such documentation in the file, mark it as "pending" on the tally sheet.
2. *Cross-checks against other data sources:* For the "pending" files, cross-check against the DAR. If there is an indication that the patient received ARVs in the period, mark the file as active and move on. If not, indicate that there is no evidence in the DAR that the patient is active and check the patient file in the EMR. If there is evidence to indicate that the file is active in the EMR, mark the file as active. If not, the file is deemed inactive.
3. *Back-check active files:* Back-check a quantity of active files with old documentation and at least one line in the pharmacy record to indicate that the patient is currently on treatment (100 files were selected in Zambia, or as many as met the criteria if not up to 100). Cross-check against the DAR to ensure the date of prescription in the DAR matches the pharmacy record in the file. Tally if the dates are not the same.
4. *Back-check inactive files:* Back-check a quantity of the files marked as inactive. Verify that there is clear evidence the file should be labeled as inactive according to the protocol in use in the program. If there is evidence of a prescription being filled in the selected period, mark as active and record the reason for the status change.

Using the completed tally sheets, the records in the facility (ART register, EMR, etc.) can then be updated to reflect the revised status.

As far as can be determined, the EDQA has been conducted only in Zambia. Although the tally sheets can be used in other countries and programs, they would likely need to be adapted to the country context—that is, the data collection tools and protocols in use in a given country.

A report on the Zambia application of the EDQA, as well as examples of tally sheets used to classify cases according to treatment status and clean the recordkeeping systems, can be found here:

https://www.measureevaluation.org/resources/publications/tr-17-228.

COMPARISON OF DATA QUALITY TOOLS, BY ATTRIBUTE

Objective/Purpose/Scope

Many of these tools have been developed in response to concerns about the validity of the high-profile HIV and AIDS indicator "Current on ART."

The CDC DQA protocol, PEFAR DQRS, and EDQA all focus on HIV and AIDS exclusively, and in particular "Current on ART." The CDC tool is meant to be implemented annually, whereas the DQRS appears to be intended for routine use, though there is no indication of periodicity in the available documentation. The EDQA, an admittedly less developed tool, seems applicable as the need arises.

The DQR is intended to be "holistic"—that is, covering the whole health sector (i.e., HMIS), including HIV and "Current on ART. It is intended to be routinely applied in advance of health sector planning events (though more realistically it would be implemented as resources allow). The DQR can also be adapted for a periodic in-depth assessment of a single health program (up to five indicators).

The DQA is intended to be a formal, independent (e.g., done by an external team) audit of HIV, TB, or malaria indicators for use in judging grant performance. The RDQA is program-specific, though generic to indicator; the RDQA permits the evaluation of up to four indicators at once from the same health or disease program. The RDQA was intended as a self-assessment and for capacity building for data quality assurance, though it has been used for more formal assessments and as a routine program monitoring tool.

Indicators

DQR

The WHO-recommended indicators for the holistic application of the DQR are ANC first visit, Diphtheria/tetanus/pertussis (DTP) third dose, Current on ART, TB cases notified, and Confirmed malaria cases. There is provision for periodic in-depth assessment of priority health programs, wherein up to five indicators from the same program may be assessed (with adaptation of the tool). The indicator "Current on ART" is recounted in aggregate (no disaggregations).

Data Quality Audit (DQA)

The DQA has 14 indicator-specific and 2 generic tools for quantitative assessment, and one generic tool for qualitative assessment. (For a complete list, see "Data Quality Audit" in the section above: "Description of Available Tools and Methods.")

Routine Data Quality Assessment Tool (RDQA)

The RDQA is generic to indicator; it can accommodate up to four indicators within a given program area.

CDC DQA Protocol

This tool uses New on ART (TX_NEW), Current on ART (TX_CURR), and Voluntary Male Circumcision (VMMC_CIRC). New on ART and Current on ART are recreated with disaggregation by age and gender, and may include HTS, PMTCT, TB, and other PEPFAR-supported services as needed.

PEPFAR DQRS

- PMTCT_STAT: Percentage of pregnant women with known HIV status at ANC
- TX_NEW: Number of adults and children newly enrolled on ART
- TX_CURR: Number of adults and children currently receiving ART
- PMTCT_ART: Percentage of HIV-positive pregnant women who received ART
- TX_RET: Percentage of adults and children known to be on treatment 12 months after initiation of ART
- OVC_SERV: Number of beneficiaries served by PEPFAR OVC programs

EDQA

- TX_CURR: Number of adults and children currently receiving ART

Sampling

The need for sampling in data quality assessments is generally determined by the objectives of the assessment. If the primary objective is to estimate the accuracy of reporting for a given indicator (and other parameters), and the available resources dictate that not all health facilities can be assessed, then a sample should be drawn. Health facility samples can be obtained through a variety of valid mechanisms (e.g., random sampling, list or area sampling, cluster sampling); the objectives of the assessment and available resources will generally determine the sampling scheme.

However, some methods have recommended sampling strategies, whereas others are based on a convenience sample. For example, the recommended sampling for the DQR is "list" sampling, with sample size determined by the desired level of estimation (e.g., national or regional) and number of strata. For list sampling, an exhaustive list of health facilities is necessary (i.e., master facility list). The DQA is meant to employ cluster sampling, which has the advantage of limiting the travel required by assessment teams (and therefore the overall cost of the assessment). The WHO/UNAIDS version of the CDC DQA protocol uses a variation of list sampling, whereas the PEPFAR DQRS and RDQA are intended to be conducted via a purposive or convenience sample.

Experience has shown that if the objective of the assessment is to identify shortcomings and data quality problems and not to estimate population parameters (e.g., accuracy) then a much smaller sample can be used, though for aesthetic purposes and to gain a more comprehensive perspective on issues affecting data quality, facilities should still be selected as randomly as possible.

Validation Techniques

Accuracy Assessment

All the methods use a similar method for gauging the accuracy of reporting; that is, a ratio of a validated value for a specific indicator and reporting period to the value reported by the site during that period (the so-called verification factor [VF] or ratio). A perfect coherence between the validated and reported values results in a value of 1.0. Over-reporting of the indicator results in a VF of less than 1.0, whereas under-reporting results in a VF greater than 1.0. The CDC method calls for extensive disaggregations of the count for Current on ART, whereas the DQR, DQA/RDQA, and DQRS all call for validation of the aggregate value.

For the DQR, DQA, and RDQA, the recount is done according to the standard country program definitions. If sites use alternative methods or definitions these are to be noted. The CDC DQA protocol calls for the use of the PEPFAR and country (or site-specific) definitions, whereas the DQRS uses the PEPFAR definition.

The DQR also calculates the proportion of sites with VF ±10 percent discrepant and the proportion with a perfect match between recounted and reported.

Cross-Checks with Other Data Sources

Although cross-checks are not included in the standard configuration of the DQR, recommended cross-checks are included in the guidelines when additional verification is warranted and during an in-depth assessment of a single health program.

Cross-checks are included in the DQA tool (two to three for each indicator), including between patient files and register, and comparison of commodities usage from service delivery to logistics management information system (LMIS). Similar cross-checks are included in the RDQA, though they are not specific.

The CDC DQA protocol calls for the completion of at least one of the following: Cross-validation against other data sources (e.g., register to patient files or pharmacy data system), review of patient files, an analysis of patients lost to follow-up, or a comparison of paper data sources (e.g., the register) to the EMR (if applicable).

Cross-checks between data sources are an integral part of the EDQA method. They are not indicated in the DQRS method.

Other Metrics

The DQR, DQA, and RDQA all calculate the completeness and timeliness of reporting from facilities and aggregation levels, and the completeness of indicator data:

$$\frac{\text{number of cells filled}}{\text{number expected to be filled}}$$

Data Collection Tools

All of the tools have standard instruments for collecting data, either on paper, electronically, or both. The CDC DQA protocol has elaborate templates and tally sheets for data verification for both Current on ART and New on ART, disaggregated by age and gender. It also has templates for cross-checks and data flow analysis. There are Excel templates for assisting in the data collection and compilation. However, there is no standardized database for compiling electronic data, only the direction that data should be digitized ("All aggregated data will be entered into an electronic format such as MS Access, Excel or similar software").

The DQRS has an Excel template for data collection that also calculates the discrepancy between recounted and reported values, and assigns a grade for the site based on the result.

The DQA/RDQA tools are Excel based and data are meant to be entered into the electronic tool in the field. However, the site-level sheets can be printed and data collected on paper forms if needed.

The DQR has paper-based data collection tools and electronic versions in CSPro for use on tablet computers. Because the CSPro data-entry application also works on a personal computer, it can support entry of data collected on paper forms, as well.

The EDQA includes example tally sheets that can be customized for local use.

Qualitative Assessment

A qualitative assessment can help identify weaknesses in the data collection and reporting system. All of the tools have a method of qualitative assessment, with the exception of the EDQA. The qualitative assessments for the CDC DQA protocol and DQRS are specific to HIV treatment data collection and reporting tools.

The qualitative assessments for the DQR, DQA, and RDQA tools are relatively more extensive than for the HIV-specific tools. Themes explored on these tools include the adequacy of training of data management staff, the use of standardized forms and occurrence of forms stockouts, adequacy of supervision and data quality controls, and prevalence of data analysis and use. The qualitative assessment for these tools is also conducted at aggregation levels.

Data Analysis

All of the tools except the EDQA have templates to assist with data analysis. For the HIV-specific tools (CDC DQA protocol and DQRS), the analysis tools consist of Excel-based tables with automatic calculation of the level of agreement between validated and reported values.

The DQR provides automated analysis and production of charts, disaggregated by region, facility type, management authority, and urban vs. rural area in an Excel-based chartbook. The DQA and RDQA have automated dashboards that depict performance for all quantitative and qualitative indicators. The RDQA also includes dashboards to summarize results by the level of the health system (e.g., facility, district, region, and national levels).

Desk Review

All of the tools address data quality in source documents and the ability of the sites to correctly compile indicator values for reporting to the next level. Another important source of data error is in the previously reported data. Without assessing the aggregate data in the national database, such errors will persist in the national results and hamper effective monitoring, evaluation, and planning.

Only the DQR has this type of desk review included as an aspect of the method (though the WHO/UNAIDS version of the CDC DQA protocol also includes a desk review). The DQR Desk Review examines the previously reported aggregate data in the national HMIS for gaps, inconsistencies, and outliers and flags districts and sites with anomalous values for follow-up. The desk review is available as an "app" that can be installed on the local instance of DHIS 2 in countries that use this tool for data management of HMIS. An Excel version of the tool is available for countries that do not use DHIS 2.

USE CASES FOR THE DATA QUALITY ASSURANCE TOOLS

Routine or Ad Hoc Assessment of the Quality of HIV and AIDS Program-Level Indicators

Any of these tools can be used to assess the indicator Current on ART, and all but the EDQA can be used for other priority PEPFAR indicators, such as TX_NEW, PMTCT, and HTS. (In fact, the EDQA is somewhat more of an intervention to clean patient records and classify them according to status on ART than a traditional data quality assessment method. Thus, it occupies an invaluable place among the tools for improving data quality for the all-important indicator Current on ART.)

The CDC DQA protocol and PEPFAR DQRS are both highly specific to the context of the USG and PEPFAR. The DQRS has the look of a tool for internal PEPFAR monitoring (and currently is not available for public download). The CDC DQA is also USG and PEPFAR centric, though the existence of a WHO/UNAIDS version suggests that it is indicated for wider use.

The CDC DQA is by far the most comprehensive and detailed tool for HIV indicators (particularly Current on ART). Though it has not been put to widespread use (it has been used at least in Kenya, Uganda, and Haiti as of fall 2018), it shows great promise to standardize thorough assessment of HIV indicators. In countries where the DQR has been adopted for routine, holistic data quality assurance, the CDC DQA protocol could be used when the national-level data quality coordinating body (i.e., TWG or interagency working group) elects to conduct an in-depth data quality assessment of the HIV and AIDS program.

Routine, Holistic Data Quality Assurance Before Health Sector Planning

The DQR was developed in response to a proliferation of ad hoc and uncoordinated program-specific data quality assurance activities that led to overlap, confusion, and burden on health facility staff. The holistic approach, when effectively coordinated by a national-level monitoring and coordination TWG with representation of all stakeholders, is an efficient and effective way to ensure high-quality data used for planning. The holistic approach obviates the need for ad hoc data quality assessment and standardizes outputs to satisfy the information needs regarding data quality of all stakeholders.

The DQR has the advantage of a standard approach to data quality for maternal health, immunization, HIV and AIDS, TB, and malaria. Although it can provide essential information on data quality for all of these health programs at once, it cannot provide all required information for every health program—thus, the provision for in-depth assessment of a priority health program coordinated on a revolving basis by the national-level data quality working group. For the in-depth assessment, the DQR tools can be adapted or a program-specific tool can be used (e.g., the CDC DQA protocol for the case of HIV and AIDS or the IDQA for the immunization program).

Routine Data Quality Assurance Subnationally, or for NGO Projects

The RDQA has had great success as a program-specific data quality tool. Its versatility and ease of use has lent itself to a wide range of applications, from routine data quality monitoring subnationally to one-off program-specific assessments by donors and partners. It has even been integrated into standard operating procedures for HMIS in several countries, and adapted to disease surveillance.

Any indicator can be assessed with RDQA, but the system assessment (qualitative component) is specific to the forms used to collect and report on the indicator. Because such forms are typically specific to a program, the tool is essentially limited to a program-specific application. With its ability to assess up to four indicators at once from a given health program, the RDQA is particularly suited to the assessment of cascade-type indicators—for example, the HIV treatment cascade or PMTCT.

Although the general trend in data quality assurance is toward holism, NGO projects are often specific to interventions in a particular disease area. Thus, the RDQA is useful for this purpose as well.

Formal Auditing of HIV, TB, or Malaria Indicators as Part of a Performance-*Based* Financing Program

The DQA tool was originally designed for use by PEPFAR and the Global Fund. In the early years of the latter, data quality audits were mandated at the mid-term evaluation of grants for priority countries, and decisions on continued grant funding were often predicated in part on DQA results.

The DQA is not widely used these days but has been shown to be effective in assessing data quality—in particular, for calculating a national-level estimate of reporting accuracy for a given indicator based on a sample survey of health facilities. It could again play that role should this particular use case arise.

Verifying and Correcting the Status of HIV and AIDS Patients on ART

The EDQA fills a niche as a standard approach to verifying and classifying HIV and AIDS patients according to their status vis-à-vis treatment. Application of this system of tally sheets can help clean up patient files, correct the site-level numbers of people on treatment, and improve the national-level values over time. The combination of a proven assessment tool to accurately target health facilities and the EDQA as an intervention to clean and reclassify erroneous records constitutes an effective way forward to improving the quality of data for Current on ART.

CONCLUSIONS

For more than 10 years, MEASURE Evaluation has worked with global health information stakeholders, such as PEPFAR, WHO, the Global Fund, GAVI, and others to produce standard approaches and tools for assessing and ensuring quality data on public health interventions. Initial tools and methods focused on specific indicators and programs (e.g., AIDS, TB, malaria, etc.) based on the needs of these enhanced health programs. Experience has taught that such fragmentation of resources and expertise leads to imbalance across the health information landscape and burden on the health information system and personnel.

The holistic approach taken by the DQR, combined with the formation of multistakeholder TWGs led by the MOH can help alleviate the inefficiencies caused by fragmentation of the health information system. This approach to data quality empowers the MOH to take the lead on ensuring data quality for HMIS and health programs. An empowered MOH promotes sustainability data quality assurance and HMIS reform efforts.

Advent of the New HIV and AIDS-Specific Tools

The CDC and PEPFAR have produced new data quality protocols to address the insufficiencies in reporting on the number of clients currently on ART (and other priority indicators, such as New on ART and Voluntary Male Circumcision) for use by PEPFAR country programs and implementing partners.

The CDC DQA protocol is a comprehensive tool that uses established methods to validate indicator data at health facilities. The main added value of the new protocol is in its specificity—what to assess and how—and the standard templates developed to assist with recounts and comparisons. The PEFPFAR DQRS is similar in scope and purpose to the CDC DQA, albeit less comprehensive. It seems almost entirely for use by USG in PEFPAR countries. Language in the tool indicates that host country officials are encouraged to join evaluation efforts by using it, but assessment teams are composed entirely of USG staff. (Please see the table below for specifics on the various data quality tools.)

How the New HIV and AIDS-Specific Tools Can Be Used within the Established Framework

Although the importance of HIV and AIDS data—in particular, the data on treatment—cannot be overstated, and current efforts to rationalize and improve data on treatment are both warranted and necessary, data quality assurance for other health programs and the HMIS need not be set aside. The holistic approach to data quality assurance promoted by USAID, WHO, the Global Fund, the Health Data Collaborative (HDC), and others can be maintained while using these HIV- and AIDS-specific tools to improve HIV and AIDS data.

These tools should be adopted as the means used for conducting periodic in-depth assessment (or annual for PEPFAR, if necessary) of the HIV and AIDS Program, and PEPFAR and its implementing partners should continue to work with established in-country structures, such as the Data Quality Technical Working Group, to plan and implement data quality activities. The CDC DQA protocol indeed speaks to the need to work within established in-country oversight and coordination mechanisms. They should be utilized as much as possible to promote sustainability and capacity of these mechanisms and their personnel.

APPENDIX 1. COMPARISON OF AVAILABLE TOOLS

Technical element	WHO/MEval Data Quality Review (DQR)	PEPFAR/Global Fund/MEval DQA/RDQA	CDC DQA Protocol (version 1.0)	PEPFAR Data Quality Report Snapshot (DQRS)	Expedited DQA (EDQA)
Objective/ purpose	Routine (annual/semiannual) review of data quality in advance of health sector planning	DQA: Independent program-specific data quality audit RDQA: Program-specific self-assessment and capacity building	HIV- and AIDS-specific data validation	HIV- and AIDS-specific data validation	HIV- and AIDS-specific data validation and cleaning, with emphasis on validating the status of the patient vis-à-vis treatment
Scope	Holistic (crosscutting) and program-specific	DQA: Disease-specific (HIV and AIDS, TB, malaria) RDQA: any health program and indicator (program-specific)	HIV and AIDS	HIV and AIDS	HIV and AIDS
Indicators	Recommended: ▪ ANC 1st visit ▪ DTP 3rd dose ▪ Current on ART ▪ TB cases notified ▪ Confirmed malaria cases ▪ Other (as needed) Provision for periodic in-depth assessment of priority health programs Current on ART is recounted in	For DQA: 14 indicator-specific and 2 generic tools for quantitative assessment; one generic tool for qualitative assessment For RDQA: Generic to indicator, can accommodate up to 4 indicators within a given program area	▪ New on ART ▪ Current on ART (TX_CURR), ▪ Voluntary Male Circumcision (VMMC_CIRC) -New on ART and Current on ART are recreated with disaggregation by age and gender May include HTS, PMTCT, TB, or other	**PMTCT_STAT**: Percentage of pregnant women with known HIV status at ANC (includes those who already knew their HIV status before ANC), disaggregated by HIV result **TX_NEW:** Number of adults and children newly enrolled on ART	**TX_CURR:** Number of adults and children currently receiving ART

Technical element	WHO/MEval Data Quality Review (DQR)	PEPFAR/Global Fund/MEval DQA/RDQA	CDC DQA Protocol (version 1.0)	PEPFAR Data Quality Report Snapshot (DQRS)	Expedited DQA (EDQA)
	aggregate (no disaggregations)		PEPFAR-supported services as needed	**TX_CURR:** Number of adults and children currently receiving ART **PMTCT_ART**: Percentage of HIV-positive pregnant women who received ART to reduce the risk of MTCT during pregnancy **TX_RET:** Percentage of adults and children known to be on treatment 12 months after initiation of ART **OVC_SERV:** Number of beneficiaries served by PEPFAR OVC programs for children and families affected by HIV	
Sampling / facility selection	Suggested sampling for DQR is "list" sampling, with sample size determined by the desired level of estimation (e.g., national or regional) and number of strata	DQA has a recommended cluster sampling technique with random selection of sites within cluster (i.e., district) and probability of	80% of reported TX_CURR and VMMC_CIRC clients on an annual basis; DQA on other reported indicators at least once during the funding period,	The S/GAC SI advisor will lead site selection for the DQRS assessment based on, but not limited to the following: • Site volume and contribution toward	

Technical element	WHO/MEval Data Quality Review (DQR)	PEPFAR/Global Fund/MEval DQA/RDQA	CDC DQA Protocol (version 1.0)	PEPFAR Data Quality Report Snapshot (DQRS)	Expedited DQA (EDQA)
		selection proportional to service volume RDQA: Typically convenience sampling, and or above cluster sampling; none prescribed	annually for sampling sites based on patient volume and known data quality challenges; or purposive sampling, depending on need/available resources	the national TX_CURR/ TX_NEW results • Geographic proximity and epidemiologic burden • Implementing partner (with goal of sampling one or more sites from most or all of the large clinical implementing partners)	
Periodicity	DQR: Recommended as annual by WHO but, at a minimum, the start and mid-point of the 5-year planning cycle	DQA/RDQA: As needed /not prescribed	Annual	Not specified	Not specified
Assessment period	DQR: Quarter (aggregate of 3 months)	DQA/RDQA: Monthly or quarterly	Quarter (aggregate of 3 months)	Annual and semiannual progress reports (PR/SAPR), and quarterly reports	Not specified
Validation technique	Verification factor (same method used by DQA/RDQA and DQR) Recounted (i.e., validated)/reported, *100% Recount is done according to standard country program	Recounted (i.e., validated)/reported, *100% Recount is done according to standard country program definition; if sites use alternative methods or definitions, they are to be noted	Recreating selected indicators Recounted (i.e., validated)/reported, *100% PEPFAR MER definition of Current on ART to be used for the recount; if sites use a	Recounted (i.e., validated)/reported, *100% Recounted value is compared to the value stored in DATIM for the specified period	Not specified

Technical element	WHO/MEval Data Quality Review (DQR)	PEPFAR/Global Fund/MEval DQA/RDQA	CDC DQA Protocol (version 1.0)	PEPFAR Data Quality Report Snapshot (DQRS)	Expedited DQA (EDQA)
	definition; if sites use alternative methods or definitions, they are to be noted Other validation methods: DQR: Assessment of proportion of sites offering the different sources and reporting to HMIS; assessment of proportion of sites with VF ±10% discrepant; proportion with perfect match between recounted and reported; proportion of missing data for key indicators (TB) Causes for data and reporting discrepancies Availability of reports; timeliness and completeness of reporting from facilities and aggregation levels	Availability of reports, timeliness, and completeness of reporting from facilities and aggregation levels	different definition, the count will be conducted according to this definition as well and compared to the count done according to the PEPFAR definition Teams should do the primary data validation (above) and at least one of the following: ▪ Cross-validation against other data sources ▪ Review of patient files ▪ LTFU analysis		
Source document for validation	DQR: ART register (and other sources as necessary)	DQA: Patient files (patient files are considered a "primary source document"—	Recreation of the selected indicators should use the same data source that the	"Patient records"	Patient files, patient cards, pharmacy records, database, etc.

Technical element	WHO/MEval Data Quality Review (DQR)	PEPFAR/Global Fund/MEval DQA/RDQA	CDC DQA Protocol (version 1.0)	PEPFAR Data Quality Report Snapshot (DQRS)	Expedited DQA (EDQA)
		that is, where the service is initially recorded and thus the most reliable; in audit settings, the primary source document should be used (time permitting); registers are also acceptable, although conceding that errors can be introduced in transcribing information from the patient file to the register RDQA: Registers (and other sources, as necessary)	sites use to report the indicator The recreation may include computing patient tallies and confirming results from facility registers, patient databases, pharmacy logs, and laboratory records, and should review the most recently reported data Includes standard tally sheets to assist with recount; a review of patient files is indicated when discrepancies are found between the validated and reported count		
Comparisons across data sources	Cross-checks/Spot checks DQR: None recommended in standard crosscutting application of DQR, but recommended for in-depth program-specific	-DQA: Specific to indicator—e.g., ART: patient file to ART register, and vice-versa -On a sample of 5%, or 20 records -Select indicators include cross-checks	Cross-validation of different data sources -Highly specific, w/ standardized forms: patient charts vs. ART register and patient charts vs. pharmacy records	Not specified	Compares daily patient activity record with pharmacy register, compares patient files to analogous records in the patient database (if available).

Technical element	WHO/MEval Data Quality Review (DQR)	PEPFAR/Global Fund/MEval DQA/RDQA	CDC DQA Protocol (version 1.0)	PEPFAR Data Quality Report Snapshot (DQRS)	Expedited DQA (EDQA)
	DQR. For ART this includes the following: ▪ ART registers cross-checked against patient files and/or pharmacy records ▪ Patient files cross-checked against the patient database (if applicable) ▪ Spot checks: Patients at the facility at the time of verification can be asked about the services they received	against commodities management systems (e.g., test kits, drug stocks, condoms, etc.) RDQA: User-specified, up to three different cross-checks; 2 for comparing different data sources, 1 for validating service delivery results against commodities management or LMIS	For the following data elements: ▪ Last ART pick-up date ▪ Last clinic visit: DD-MM-YY ▪ ART regimen ▪ Last viral load result -On sample of 10% (or 20 records)		
EMR	Not specified; typically, the method for the validation is specified with national-level planners before conducting the assessment, and depending on country-specific systems and protocols; it thus would include EMR if in use in the country	Not specified; typically, the method for the validation is specified with national-level planners before conducting the assessment, and depending on country-specific systems and protocols; it thus would include EMR if in use in the country	Software report or query used to run the calculations are requested and validated for consistency with PEPFAR or MOH definitions for the respective indicator, when possible Assessment of LTFU produces a line listing from the database of patients assigned the	Not specified	If available cross-checks are conducted between the EMR and the patient files

Technical element	WHO/MEval Data Quality Review (DQR)	PEPFAR/Global Fund/MEval DQA/RDQA	CDC DQA Protocol (version 1.0)	PEPFAR Data Quality Report Snapshot (DQRS)	Expedited DQA (EDQA)
			status of LTFU; verify the status of these patients in the patient files or other sources, as necessary		
Standardized data collection tools	DQR: Standard paper data collection forms available for 5 core tracer indicators; CSPro data entry modules available for electronic data capture	DQA/RDQA: These tools exist as standardized Excel workbooks; data are meant to be entered directly into the Excel workbook in the field, though the worksheets are formatted for printing so it can be done on paper as well, if needed	Standard reporting forms and tally sheets for recounts and comparisons across data sources: - Standard forms for qualitative assessment - Quantitative information is consolidated using tables (Excel spreadsheets)	Excel-based data compilation tool	Paper-based tally sheets and example tally tables
Data flow mapping (within the facility – i.e., business process analysis)	Not explicit in the DQR; auditors are prompted to determine causes of discrepancies found, which often requires such an exercise	Not explicit in the DQA/RDQA; auditors are prompted to determine causes of discrepancies found, which often requires such an exercise	Data flow mapping is explicitly called for in this tool; there is a module to record data flows within the health facility; essentially qualitative, and would be difficult to summarize across sites	None	None
Qualitative assessment of reporting	DQR: Generic to indicator or program	DQA/RDQA: Generic to indicator, though results are thought to be program-specific	Comprehensive and specific to ART patient monitoring	Not extensive; the "At site" checklist contains some indicators that speak to presence or	None

Technical element	WHO/MEval Data Quality Review (DQR)	PEPFAR/Global Fund/MEval DQA/RDQA	CDC DQA Protocol (version 1.0)	PEPFAR Data Quality Report Snapshot (DQRS)	Expedited DQA (EDQA)
system elements		(e.g., one would not mix indicators from different health programs in the same copy of the multiindicator RDQA); the system assessment indicators apply to the tools and staff of the health program reviewed		adequacy of key information system elements; specific to ART patient monitoring	
Data quality improvement action plans	Guidance is in the guidelines documents, though not extensive Sites should be provided with findings on the day of the assessment, and with advice on corrective measures, if warranted	Guidance is in the guidelines documents, though not extensive Sites should be provided with findings on the day of the assessment, and with advice on corrective measures, if warranted	Template included for standardized report of assessment findings Sites should be provided with findings on the day of the assessment, and with advice on corrective measures, if warranted Implementing partners will be asked to maintain the results of all data quality assessments in a centralized database to demonstrate routine monitoring of data quality and	Remediation phase: detailed context-specific remediation plan based on the needs of the partner/site that will include a summary of corrective actions, planned TA, and follow-up that will be provided to ensure a correct submission for the Annual Progress Report	This tool would be prescribed on a data quality improvement action plan

Technical element	WHO/MEval Data Quality Review (DQR)	PEPFAR/Global Fund/MEval DQA/RDQA	CDC DQA Protocol (version 1.0)	PEPFAR Data Quality Report Snapshot (DQRS)	Expedited DQA (EDQA)
			quality improvement over time		
Implication of other reporting levels	Qualitative and quantitative data are collected at district level for districts containing sampled health facilities; district-specific data collection tools (paper and electronic) are available; a standardized Excel chartbook is available for automated analysis of district findings	Aggregation levels are included for those districts and regions implicated in the data flow for selected indicators; specific district (and region) site surveys are included in the Excel tools, with level-specific analysis and dashboard	No implication of aggregation levels other than to acquire necessary access to facilities in the district or region	None specified	None specified
Desk review of previously reported data at the national level	DQR: A rigorous review of previously reported aggregate data in HMIS is prescribed by the method; standardized tools are available (DHIS 2, Excel) to facilitate the analysis which includes the following: ▪ Completeness and timeliness of reporting, completeness of indicator data	None	Not included in CDC Protocol, but a desk review is included in the WHO harmonized version of the different tools	None	None

Technical element	WHO/MEval Data Quality Review (DQR)	PEPFAR/Global Fund/MEval DQA/RDQA	CDC DQA Protocol (version 1.0)	PEPFAR Data Quality Report Snapshot (DQRS)	Expedited DQA (EDQA)
	▪ Internal consistency; i.e., over time and with respect to other indicators, and the presence of extreme values ▪ Comparison of routine indicator values with external data sources (e.g., population-based surveys) ▪ Evaluation of denominator data used to calculate coverage rates				
Data analysis	DQR: Standardized indicator "batch" files are included in CSPro applications to produce recoded data ready for analysis; the data are then pasted into standardized Excel chartbooks with automated tables and graphs	DQA/RDQA: Standardized dashboards included in the Excel-based data collection workbooks for individual sites, level-specific, and overall analysis of sites included in the assessment raw data are compiled in a hidden sheet to facilitate exportation to other software and	Not specifically detailed in the available documentation, though quantitative data are meant to be compiled in Excel workbooks	None	None

Technical element	WHO/MEval Data Quality Review (DQR)	PEPFAR/Global Fund/MEval DQA/RDQA	CDC DQA Protocol (version 1.0)	PEPFAR Data Quality Report Snapshot (DQRS)	Expedited DQA (EDQA)
		combine results from different workbooks			
Guidelines for implementation	DQR: 3 modules (available on WHO, HDC, and MEval websites) ▪ Framework document ▪ Health facility data verification ▪ DQR Desk Review metrics and analyses	DQA: Guidelines for implementation (available on MEval website) RDQA: Recently updated guidelines document (available on MEval website)	CDC Protocol document with appendices containing data collection forms	Guidance document, along with the following: • Example final report outline • Assessment preparation checklist • "At site" checklist	Example tally sheets and tally tables
Language support	DQR: English and French versions	DQA: English, French, and Spanish versions RDQA: English, French, Spanish, and Portuguese versions	Unknown, though Excel data collection tools appear in French (Cote d'Ivoire version)	None specified	None specified

APPENDIX 2. DQR DATA VERIFICATION TOOL FOR ANC1 AND FACILITY-LEVEL SYSTEM ASSESSMENT

Number	Question	Result	Skip
MATERNAL HEALTH INDICATOR			
ANTENATAL CARE FIRST VISIT (ANC1)			
DV_100	Does this facility provide antenatal care services?	YES ..... 1 NO 2	➔DV_200
DV_101	Does this facility report ANC data to a reporting system?	YES ..... 1 NO 2	➔DV_200
SOURCE DOCUMENTS AND REPORTS			
DV_102	What is the source document used by this facility for monthly reporting of antenatal care services? We are primarily interested in the main document that is used for **compiling** the total number of ANC1 visits seen at this facility. Please report if any improvised documents are used.	ANC REGISTER OR INTEGRATED ANC REGISTER ..... 1 TALLY SHEETS ..... 2 PATIENT CARDS ..... 3 OTHER (SPECIFY) _____96	
BASED ON RESPONSE TO QUESTION DV_102, PLEASE ASK THE PERSON IN THE FACILITY WHO REGULARLY PREPARES THE FACILITY MONTHLY REPORTS TO PROVIDE YOU WITH THE SOURCE DOCUMENT USED TO COMPILE AND SUMMARIZE INFORMATION FOR MONTHLY REPORTING (i.e. REGISTERS, TALLY SHEETS, ETC.) AS WELL AS THE MONTHLY REPORTS FOR MONTH1, MONTH2, AND MONTH3 FOR ANC.			
REVIEW SOURCE DOCUMENT FOR ANC1 AND ANSWER THE FOLLOWING QUESTIONS			

		(A) SOURCE DOCUMENT AVAILABLE		(B) RECOUNT NUMBER OF ANC1 IN SOURCE DOCUMENT
DV_103	Please confirm the availability of the **main source** document used for reporting of ANC visits for Month1 to Month3. If available and information on ANC visits is recorded, please **recount** the number of ANC1 visits for Month1 to Month3.			
		YES, SOURCE DOCUMENT AVAILABLE WITH INFORMATION RECORDED FOR ANC VISITS*	**NO, SOURCE DOCUMENT NOT AVAILABLE OR INFORMATION ON ANC VISITS NOT RECORDED**	
01	**Month1**	1 → B	2 02	
02	**Month2**	1 → B	2 03	
03	**Month3**	1 → B	2 DV_104	

***Even if information is only partially filled (for example for a few days in the month, you would answer YES**

REVIEW MONTHLY REPORT FOR ANC1 AND ANSWER THE FOLLOWING QUESTIONS

Number	Question	Result			Skip
DV_608	Does the health facility prepare data visuals (graphs, tables, maps, etc.) showing achievement towards targets (indicators, geographic and/or temporal trends, and situation data)?	YES, PAPER, WHITE/BLACK BOARD, OR ELECTRONIC COPIES OF DATA VISUALS AVAILABLE AT THE HEALTH FACILITY ..... 1 YES, BUT A COPY NOT AVAILABLE AT THE HEALTH FACILITY..... 2 NO 3			➔DV_610
DV_609	Which of the following types of information is captured in the data visuals? **PLEASE OBSERVE VISUALS FOR EACH ITEM BELOW.**	**OBSERVED**	**REPORTED NOT SEEN**	**NOT AVAILABLE**	
01	Maternal health care	1	2	3	
02	Neonate and child health care (other than immunization)	1	2	3	
03	Immunization	1	2	3	
04	Top causes of morbidity and mortality	1	2	3	
05	Other _____ (specify)	1	2	3	
DV_610	Does the health facility use RHIS data for performance reviews (e.g. to monitor progress towards targets)?	YES, EVIDENCE OF DATA USE OBSERVED ..... 1 YES, REPORTED BUT NOT OBSERVED..... 2 NO 3			
DV_611	Does the health facility use RHIS data for planning?	YES, EVIDENCE OF DATA USE OBSERVED ..... 1 YES, REPORTED BUT NOT OBSERVED..... 2 NO 3			

Number	Question	Result			Skip
DV_104	Please confirm the availability of the **monthly report** form in which antenatal care visits are recorded and sent to the district or next level administrative unit for Month1 to Month3. If available, please **record** the number of ANC1 visits entered in the **monthly report form** for Month1 to Month3.	**(A) MONTHLY REPORT AVAILABLE**			**(B) RECORD NUMBER OF ANC1 IN MONTHLY REPORT**
		YES, MONTHLY REPORT AVAILABLE WITH INFORMATION RECORDED FOR ANC VISITS	**YES, MONTHLY REPORT AVAILABLE BUT INFORMATION ON ANC VISITS NOT RECORDED**	**NO, MONTHLY REPORT NOT AVAILABLE**	
01	**Month1**	1 → B	2 → 02	3 → 02	
02	**Month2**	1 → B	2 → 03	3 → 03	
03	**Month3**	1 → B	2 → DV_105	3 → DV_105	
DISCREPANCIES					
DV_105	If there is a discrepancy between the source document data and the monthly report data, ask your informant why. **CIRCLE ALL ANSWERS THAT APPLY.**	NO DISCREPANCY..... A ARITHEMATIC ERRORS..... B TRANSCRIPTION ERRORS ..... C SOME DOCUMENTS WERE MISSING WHEN THE REPORT WAS PREPARED.....D SOME DOCUMENTS ARE NOW MISSING..E OTHER (SPECIFY)..... Y _____			
DV_106	For any instance where no monthly report can be found, ask the informant why there is no report. **CIRCLE ALL ANSWERS THAT APPLY.**	ALL 3 MONTHLY REPORTS ARE AVAILABLE ..... A THE REPORT WAS SUBMITTED BUT THE COPY CANNOT NOW BE FOUND ..... B NO TRAINED STAFF ARE AVAILABLE TO REPORT ..... C NO REPORTING FORM WAS AVAILABLE ..D WE DON'T HAVE TIME TO REPORT..... E THE FACILITY WAS NOT OPERATING DURING 1 OR MORE OF THE MONTHS.... F OTHER (SPECIFY) ..... Y _____			

Number	Question	Result	Skip
	FACILITY LEVEL SYSTEMS ASSESSMENT TOOL		
	FIND THE PERSON MOST KNOWLEDGEABLE ABOUT THE FACILITY ROUTINE REPORTING SYSTEM. INTRODUCE YOURSELF, EXPLAIN THE PURPOSE OF THE SURVEY AND ASK THE FOLLOWING QUESTIONS.		
DV_599	Does this health facility report health data to the MOH reporting system?	YES ..... 1 NO 2	➔DV_700
DV_600	Is there a designated person to enter data and compile reports from the different units in the health facility?	YES ..... 1 NO 2	
DV_601	Is there a designated person to review the quality of compiled data prior to submission to the next level, e.g., to districts, to regional offices, to the central HMIS, etc.?	YES ..... 1 PARTLY, THE DATA ARE REVIEWED BUT NO ONE IS DESIGNATED WITH THE REPONSIBILITY ..... 2 NOT AT ALL..... 3	
DV_602	Have staff **who perform** data entry and compilation received training on it in the past 2 years? *COUNTRY SPECIFIC TRAININGS CAN BE ADAPTED FOUR COUNTRY IMPLEMENTATION	YES ALL STAFF HAVE RECEIVED TRAINING IN THE PAST TWO YEARS..... 1 SOME STAFF HAVE RECEIVED TRAINING IN THE PAST TWO YEARS..... 2 NO STAFF HAVE RECEIVED TRAINING IN THE PAST TWO YEARS..... 2	
DV_603	Have staff **who perform** data review and quality control received training on it in the past 2 years? *COUNTRY SPECIFIC TRAININGS CAN BE ADAPTED FOUR COUNTRY IMPLEMENTATION	YES ALL STAFF HAVE RECEIVED TRAINING IN THE PAST TWO YEARS..... 1 SOME STAFF HAVE RECEIVED TRAINING IN THE PAST TWO YEARS..... 2 NO STAFF HAVE RECEIVED TRAINING IN THE PAST TWO YEARS..... 3	
DV_604	Does the health facility have written guidelines on the reporting protocol for the program/HMIS? **PLEASE OBSERVE THE GUIDELINES.**	Yes, observed .....1 Yes, reported not seen .....2 No.....3	
DV_605	In the last 6 months, has this health facility experienced any stockout of tally sheets, registers or reporting forms?	YES ..... 1 NO 2	
DV_606	How many times did the district supervisor visit your health facility over the last three months?	MORE THAN FOUR TIMES..... 1 FOUR TIMES ..... 2 THREE TIMES ..... 3 TWO TIMES ..... 4 ONE TIME ..... 5 NONE..... 6	➔DV_608
DV_607	Did the supervisor send a report/ written feedback on any supervisory visit in the last year, including feedback on data quality? **PLEASE ASK TO OBSERVE THE REPORT.**	WRITTEN FEEDBACK INCLUDING DATA QUALITY OBSERVED ..... 1 WRITTEN FEEDBACK OBSERVED BUT DOES NOT INCLUDE FEEDBACK ON DATA QUALITY..... 2 WRITTEN FEEDBACK REPORTED BUT NOT OBSERVED ..... 3 NO WRITTEN FEEDBACK 4	

Number	Question	Result			Skip
DV_608	Does the health facility prepare data visuals (graphs, tables, maps, etc.) showing achievement towards targets (indicators, geographic and/or temporal trends, and situation data)?	YES, PAPER, WHITE/BLACK BOARD, OR ELECTRONIC COPIES OF DATA VISUALS AVAILABLE AT THE HEALTH FACILITY ..... 1 YES, BUT A COPY NOT AVAILABLE AT THE HEALTH FACILITY ..... 2 NO 3			➔DV_610
DV_609	Which of the following types of information is captured in the data visuals? **PLEASE OBSERVE VISUALS FOR EACH ITEM BELOW.**	**OBSERVED**	**REPORTED NOT SEEN**	**NOT AVAILABLE**	
01	Maternal health care	1	2	3	
02	Neonate and child health care (other than immunization)	1	2	3	
03	Immunization	1	2	3	
04	Top causes of morbidity and mortality	1	2	3	
05	Other _____ (specify)	1	2	3	
DV_610	Does the health facility use RHIS data for performance reviews (e.g. to monitor progress towards targets)?	YES, EVIDENCE OF DATA USE OBSERVED ..... 1 YES, REPORTED BUT NOT OBSERVED ..... 2 NO 3			
DV_611	Does the health facility use RHIS data for planning?	YES, EVIDENCE OF DATA USE OBSERVED ..... 1 YES, REPORTED BUT NOT OBSERVED ..... 2 NO 3			

APPENDIX 3. RDQA SERVICE DELIVERY SITE SURVEY

Data Verification and System Assessment Sheet - Service Delivery Site

Service Delivery Point/Organization:	-
District, Region	-
Indicator(s) Reviewed:	-
Date of Review	-
Reporting Period Verified	-

Component of the M&E System	Data Verifications	REVIEWER COMMENTS (Please provide detail for each response not coded "Yes - Completely". Detailed responses will help guide strengthening measures.)

Part 1: Data Verifications

	A - Documentation Review:	Indicator 1	Indicator 2	Indicator 3	Indicator 4	COMMENTS
	Review availability and completeness of all indicator source documents for the selected reporting period.					
1	Review available data sources for the reporting period being verified. Are all necessary data sources available for review?					1) 2) 3) 4)
	If no, determine how this might have affected reported numbers.					
2	Are all available data sources complete?					1) 2) 3) 4)
	If no, determine how this might have affected reported numbers.					
3	Review the dates on the data sources. Do all dates fall within the reporting period?					1) 2) 3) 4)
	If no, determine how this might have affected reported numbers.					
	B - Recounting reported Results:					
	Recount results from source documents, compare the verified numbers to the site reported numbers and explain discrepancies (if any).					
4	Recount the number of people, cases or events during the reporting period by reviewing the data source. [A]					
5	Enter the number of people, cases or events reported by the site during the reporting period from the site summary report. [B]					
6	**Calculate the ratio of recounted to reported results. [A/B]**	-	-	-	-	
7	What are the reasons for the discrepancy (if any) observed (i.e., data entry errors, arithmetic errors, missing data source, other)?					1) 2) 3) 4)
	C - Cross-check reported results with other data sources:					
	Cross-checks can be performed by examining separate inventory records documenting the quantities of treatment drugs, test-kits or ITNs purchased and delivered during the reporting period to see if these numbers corroborate the reported results. Other cross-checks could include, for example, randomly selecting 20 patient cards and verifying if these patients were recorded in the unit, laboratory or pharmacy registers. To the extent relevant, the cross-checks should be performed in both directions (for example, from Patient Treatment Cards to the Register and from Register to Patient Treatment Cards).					
	Cross-Check 1: Verify the **primary source of data** against the **secondary source of data.** (If the cross-check conducted is different than the one that was planned, specify the cross-check performed in the cells to the right.)	Indicator 1	Indicator 2	Indicator 3	Indicator 4	1) 2) 3) 4)
1.1	If feasible, select 5% of units being counted (or at least 20 units) in the secondary data source. How many units were selected?					
1.2	For how many units does the information for the indicator in the secondary data source match the information in the the primary data source?					
1.3	**Calculate % difference for cross check 1:** If difference is below 90%, select an additional 5% of individual client records (or at least an extra 10 records) and redo the calculation (ADD the numbers to the existing numbers in the above cells).	-	-	-	-	1) 2) 3) 4)
	CROSS-CHECK 2: Cross-check **secondary data source** with the **primary data source.** (If cross-checks are different from the planned cross-check, i.e. the cross-checks entered on the Information Page, specify the cross-checks performed in the comment cells to the right.)	Indicator 1	Indicator 2	Indicator 3	Indicator 4	1) 2) 3) 4)
2.1	If feasible, select 5% of units being counted (or at least 20 units) in the secondary data source. How many units were selected?					
2.2	For how many units does the information for the indicator in the secondary data source match the information in the the primary data source?					
2.3	**Calculate % difference for cross check 2:** If difference is below 90%, select an additional 5% of individual client records (or at least an extra 10 records) and redo the calculation (ADD the numbers to the existing numbers in the above cells).	-	-	-	-	1) 2) 3) 4)
	CROSS-CHECK 3 : Between **stock movement** and **commodities distributed** by the site.	Indicator 1	Indicator 2	Indicator 3	Indicator 4	1) 2) 3) 4)
3.1	Enter the number of commodities in stock at the site at the beginning of the reporting period (initial in stock).					
3.2	Enter the number of commodities received by the site during the reporting period.					
3.3	Enter the number of commodities in stock at the site at the end of the reporting period (closing in stock).					

3.4	Enter the number of commodities distributed by the site during the reporting period.					
3.5	**Calculate % difference in cross check 3.** (i.e., Distributed / (Beginning stock + Stock received - End stock)) If there is a discrepancy between in stock and distributed commodities during the reporting period, determine why, and if and how the store or site addressed this discrepancy.	-	-	-	-	1) 2) 3) 4)

Part 2. Systems Assessment			
Component of the M&E System		Answer Codes: Yes - completely Partly No - not at all N/A	**REVIEWER COMMENTS** (Please provide detail for each response not coded "Yes - Completely". Detailed responses will help guide strengthening measures.)
I - M&E Structure, Functions and Capabilities			
1	The responsibility for recording the service delivery on the source document is clearly assigned to the relevant staff.		
2	There is a process in place to ensure that data compilation and reporting is completed in the event that the reponsible staff is not available to do the job (e.g. shared duties, a team approach etc.)		
3	There are designated staff responsible for reviewing periodic reports prior to submission to the next level (e.g. sub-district, district or national levels).		
4	The health facility receives regular feedback on the quality of their submitted reports according to the guidelines.		
5	The health facility receives regular supportive supervisory visits from district and/or national level staff according to the guidelines.		
6	…If yes, the last visit was within the past three months.		
II- Indicator Definitions and Reporting Guidelines			
The National M&E Office has provided written guidelines to each sub-reporting level on …			
7	,,, what should be recorded in the source document.		
8	,,, what should be included on the monthly report.		
9	… how (e.g., in what specific format) reports are to be submitted.		
10	… to whom the reports should be submitted.		
11	… when the reports are due.		
12	The written instructions provided by the Program are adequate to ensure standardized recording and reporting of program data.		
III - Data-collection and Reporting Forms and Tools			
13	The National Program has identified standard reporting forms/tools to be used by all reporting levels		
14	…If yes, the standard forms/tools are consistently used by the service site.		
15	If multiple organizations are implementing activities under the Program/project, they all use the same reporting forms and report according to the same reporting timelines.		
16	There are sufficient stocks of blank reporting forms at the service site.		
17	The service delivery site monitors stocks of data collection tools/reporting forms at facilities to ensure their continuous availability (i.e. forecasting.)		
18	The data collection tools are adequate to measure the indicators required for reporting.		
IV- Data Management Processes			
19	There are quality controls in place for compiling data for the monthly facility report to ensure the accuracy (e.g. detection of transcription errors).		
20	If applicable, there are quality controls in place for when data from paper-based forms are entered into a computer to ensure the accuracy of data entry (e.g. edit and/or logic checks, post-data entry verification, etc).		
21	The service delivery site routinely creates back-up files of Program data.		
22	If yes, the latest date of back-up is appropriate given the frequency of update of the computerized system (e.g., back-ups are weekly or monthly).		
23	Relevant personal data are maintained according to national or international confidentiality guidelines.		
24	The recording and reporting system avoids double counting people within and across service delivery sites (e.g., a person receiving the same service twice in a reporting period, a person registered as receiving the same service in two different locations, etc).		
25	The reporting system enables the identification and recording of a "drop out", a person "lost to follow-up" and a person who died.		
26	There is a written policy that states for how long source documents and reporting forms need to be retained.		
27	There is a written policy that describes how program documents (e.g. source documents and reporting forms) should be archived (e.g. filing cabinets, storage rooms etc.)		
V - Links with National Reporting System			

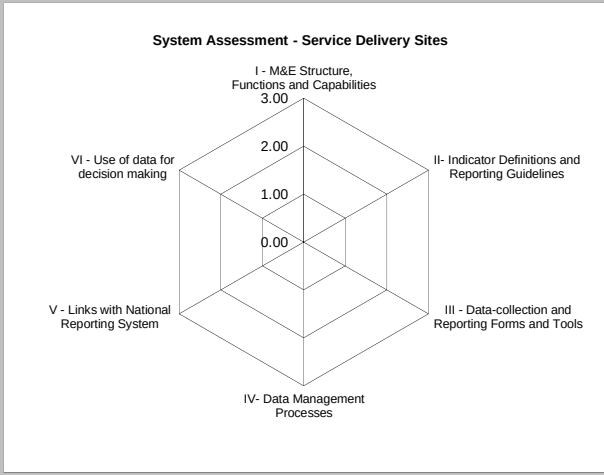
28	When available, the relevant national forms/tools are used for data-collection and reporting.		
29	When applicable, data are reported through a single channel of the national information systems.		
30	The system records information about where the service is delivered (i.e. region, district, ward, etc.)		
31	....if yes, place names are recorded using standarized naming conventions.		
VI - Use of data for decision making			
32	The service delivery site develops charts, graphs, maps, etc. (If yes, ask to see them.)		
33	...If yes, there are assigned staff to develop them regularly.		
34	There are assigned staff to interpret and analyze the data / results.		
35	The analyzed data / results are presented / disseminated to other information system stakeholders in the community in a timely manner so that the information can be used to inform decisions. (Ask to see an examples.)		
36	Are there any programmatic decisions taken by the service delivery site based on analyzed data / results. (Ask to see examples.)		

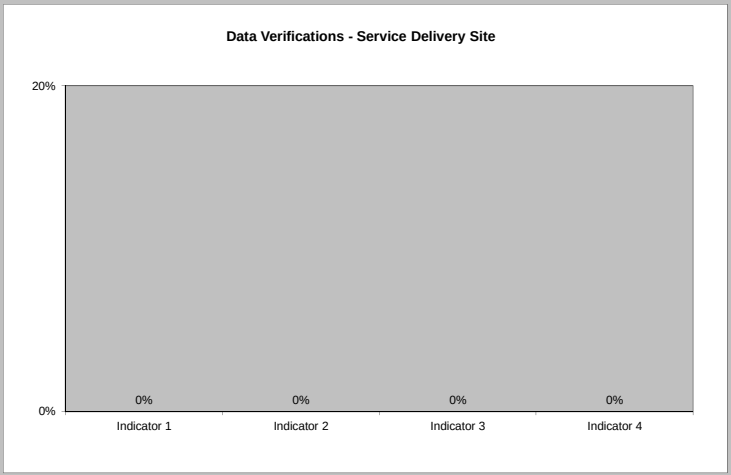
Partie 3 : Recommandations pour le site de prestation de service

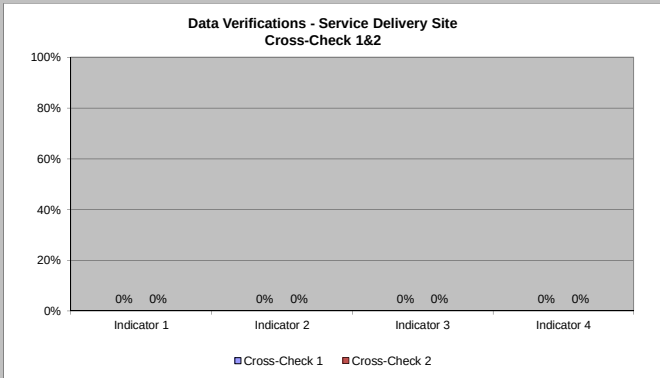
En vous basant sur les résultats du passage en revue du système et de la vérification des données sur le site de prestation, veuillez décrire tout problème identifié concernant la qualité des données et les mesures de renforcement recommandé, en estimant la période de temps que l'exécution de la mesure d'amélioration pourrait prendre. On discutera de ceci au niveau du programme.

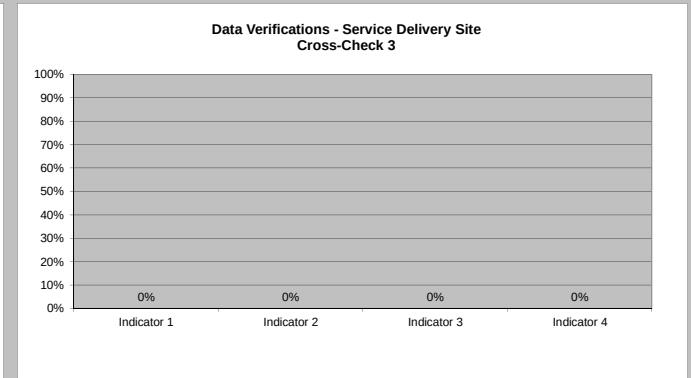
	Identified Weaknesses	Description of Action Point	Responsible(s)	Time Line
1				
2				
3				
4				

Part 4: DASHBOARD: Service Delivery Site









APPENDIX 4. CDC DQA PROTOCOL – ART VALIDATION

ART Validation Methodology

Instructions for the DQA team: Please describe in detail the methodology used by your team to validate each indicator

1. **New on ART (TX_NEW)**

1a. Definition of Site Method (how does the implementing partner (MOH) collect and report this indicator?):

1b. Recreation of Indicator	
Site Method	PEPFAR Method
Were you able to calculate the Site Method? ❑ Yes ❑ No. If no, explain:	Were you able to calculate the PEPFAR Method? ❑ Yes ❑ No. If no, explain:
Which data sources did you use to calculate <u>Site Method</u>? ❑ ART Register ❑ ART Patient Card ❑ Pharmacy Tools ❑ Electronic register or EMR ❑ Other:	Which data sources did you use to calculate <u>PEPFAR method</u>? ❑ ART Register ❑ ART Patient Card ❑ Pharmacy Tools ❑ Electronic register or EMR ❑ Other:

Describe how you calculated the Site Method (if it is the same as the Site Method description above, please note that):	Describe how you calculated the PEPFAR method:
1. Is the Site Method consistent with the PEPFAR Method? ❑ Yes ❑ No 2. Are transfers in excluded? ❑ Yes ❑ No	*PEPFAR method:* *Includes = On treatment, naïve on ART* *Excludes = Transfers in*

2. Current on ART (TX_CURR)

2a. Definition of Site Method (how does the implementing partner (MOH) collect and report this indicator?):

2b. Recreation of Indicator using Site and PEPFAR Method	
Site Method	PEPFAR Method

Were you able to calculate the Site Method? ❑ Yes ❑ No. If no, explain:	Were you able to calculate the PEPFAR Method? ❑ Yes ❑ No. If no, explain:
Which data sources did you use to calculate Site Method? ❑ ART Register ❑ ART Patient Card ❑ Pharmacy Tools ❑ Electronic register or EMR ❑ Other:	Which data sources did you use to calculate PEPFAR method? ❑ ART Register ❑ ART Patient Card ❑ Pharmacy Tools ❑ Electronic register or EMR ❑ Other:
Describe how you calculated the Site Method (if it is the same as the Site Method description above, please note that): :	Describe how you calculated the PEPFAR method:
1. Is the Site Method consistent with the PEPFAR Method? ❑ Yes ❑ No 2. Are transfers in included? ❑ Yes ❑ No 3. Are restart included? ❑ Yes ❑ No 4. Are transfer out excluded? ❑ Yes ❑ No 5. Are stopped ART excluded? ❑ Yes ❑ No 6. Are dead excluded? ❑ Yes ❑ No 7. Are dropped (LTFU) excluded? ❑ Yes ❑ No 8. Are lost (missed drug pick-up) included? ❑ Yes ❑ No	*PEPFAR method:* *Includes = On treatment, Transfers in, Restart, Lost (missed drug pick-up)* *Excludes = Transfer out, Stopped, Dead, Drop (lost to follow up)*

Site Name: _____ **Visit Date:** _____ **Team #:** _____

TABLE 2: *PEPFAR data collection tool - Current on ART Reported Site Data (TX_CURR)*

Use this table to record the reported results for TX_CURR across all disaggregates for both PEPFAR and MOH reporting. Be sure to verify the correct time-frame being reviewed. For the MOH reported "Current on Treatment" use the reported data from the last month in the Quarter (i.e. Q2=March)

PEPFAR Data Sources and Quarter:_____ ***MOH Data Sources (Month reviewed): _____***

	PEPFAR (DATIM or PEPFAR specific data system): FY17 Q2	**MOH Monthly Report (March 2017)**	**Comments**
TOTAL NUMERATOR			
DISAGGREGATES			
Age/Sex Disagg			
<1			
1-9			
FEMALES			
Female 10-14			
Female 15-19			
Female 20-24			
Female 25-49			
Female 50+			
Unknown			
MALES			
Male 10-14			
Male 15-19			

Site Name: _____ **Visit Date:** _____ **Team #:** _____

Male 20-24			
Male 25-49			
Male 50+			
Unknown			

Site Name: _____ **Visit Date:** _____ **Team #:** _____

TABLE 3: Recounted/ Verified *New on ART (TX_NEW) FY17Q2*

Use this table to fill in the totals collected from the tally sheets. If the site-method is different from the PEPFAR recommended method of recounting TX_NEW, recount using both methods and record in the appropriate columns. Additionally if there is an EMR system, but it is not used to verify TX_NEW, the EMR column can be used to include those totals.

	EMR (optional)	Site- Method	PEPFAR Method	Comments
TOTAL NUMERATOR				
DISAGGREGATES				
Pregnant				
Breastfeeding				
Confirmed TB/ TB Treated				
Age/Sex Disagg				
<1				
1-9				
FEMALES				
Female 10-14				
Female 15-19				
Female 20-24				
Female 25-49				
Female 50+				
Unknown				
MALES				
Male 10-14				
Male 15-19				
Male 20-24				
Male 25-49				
Male 50+				

Comparative Analysis of Data Quality Assessment Tools

DQA Form 1: [COUNTRY NAME] ART DQA RECORDING SHEETS

Site Name: ________________________________ **Visit Date:** _____________ **Team #:** _____

TALLY SHEETS FOR RECOUNTING TX_NEW (PEPFAR METHOD)		TOTAL
Pregnant	00000 00000	
Breastfeeding	00000 00000	
Confirmed TB/ TB Treated	00000 00000	
Age/Sex Disagg	**Total ART clinic registrations**	
<1	00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000	
1-9	00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000	
FEMALES		
Female 10-14	00000 00000	
Female 15-19	00000 00000	

DQA Form 1: [COUNTRY NAME] ART DQA RECORDING SHEETS

Site Name: ________________________________ **Visit Date:** ______________ **Team #:** ______

Female 20-24	**00000 00000**	
Female 25-49	**00000 00000**	
Female 50+	**00000 00000**	
Unknown	**00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000**	
MALES		
Male 10-14	**00000 00000**	
Male 15-19	**00000 00000**	
Male 20-24	**00000 00000**	

DQA Form 1: [COUNTRY NAME] ART DQA RECORDING SHEETS

Site Name: ______________________________ **Visit Date:** ____________ **Team #:** _____

Male 25-49	**00000 00000**	
Male 50+	**00000 00000**	
Unknown	**00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000**	

Site Name: _____ **Visit Date:** _____ **Team #:** _____

TABLE 4: Recounted/Verified *Current on ART (TX_CURR) FY17Q2*

Use this table to fill in the totals collected from the tally sheets. If the site-method is different from the PEPFAR recommended method of recounting TX_CURR, recount using both methods and record in the appropriate columns. Additionally if there is an EMR system, but it is not used to verify TX_CURR, the EMR column can be used to include those totals.

	EMR (optional)	Site Method	PEPFAR Method	Comments
TOTAL NUMERATOR				
Age/Sex Disagg				
<1				
1-9				
FEMALES				
Female 10-14				
Female 15-19				
Female 20-24				
Female 25-49				
Female 50+				
Unknown				
MALES				
Male 10-14				
Male 15-19				
Male 20-24				

Site Name: _____ **Visit Date:** _____ **Team #:** _____

Male 25-49				
Male 50+				
Unknown				

DQA Form 1: [COUNTRY NAME] ART DQA RECORDING SHEETS

Site Name: _____ **Visit Date:** _____ **Team #:** _____

TALLY SHEETS FOR RECOUNTING TX_CURR (PEPFAR METHOD)		**TOTAL**
Age/Sex Disagg	**Total ART clinic registrations**	
<1	**00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000**	
1-9	**00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000**	
FEMALES		
Female 10-14	**00000 00000**	
Female 15-19	**00000 00000**	
Female 20-24	**00000 00000**	
Female 25-49	**00000 0000000000 00000**	

DQA Form 1: [COUNTRY NAME] ART DQA RECORDING SHEETS

Site Name: ______________________________ **Visit Date:** ______________ **Team #:** ______

Female 50+	**00000 00000**	
Unknown	**00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000**	
	MALES	
Male 10-14	**00000 00000**	
Male 15-19	**00000 00000**	
Male 20-24	**00000 00000**	
Male 25-49	**00000 00000**	
Male 50+	**00000 00000**	
Unknown	**00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000**	

APPENDIX 5. PEPFAR DQRS EXCEL TOOL

Verification Period: Period April - June 2017

Site Selected?	Province	District	Site Name	Top Level Numerator TX_CURR	Top Level Numerator TX_NEW	Top Level Numerator PMTCT_STAT	Top Level Numerator PMTCT_ART

DQRS Site Count Instructions:
After the DQRS team finalizes counts, the SI advisor will record the DQRS **site total** for each indicator below.

			DQRS Total Count at Site			
DQRS Selected Site Name	**Date of visit**	**S/GAC Team Lead**	**TX_CURR**	**TX_NEW**	**PMTCT_STAT**	**PMTCT_ART**

Fail: <95% or >105%

Pass: Between 95% and 105%

ID	SNU1	SNU2	DQRS Sites	COP16 Prioritization	TX_CURR	TX_NEW	PMTCT_STAT	PMTCT_ART	COUNTS FAILED	Notes/Caveats on Failed Counts
									0	
									0	
									0	
									0	
									0	
									0	

TX_RET Prompts:
How do you monitor and report (e.g., how reported to partner at end of reporting period) the retention rate of patients who initiate ART?
What is the current (or most recent) percentage of patients who are still on treatment a year after initiating ART?
If below 90%, what methods is the site using to improve retention?
If greater than 90%, what methods has the site used to retain patients – what lessons can we disseminate to other sites/partners?

DQRS Selected Site Name	TX_RET %	Retention as of what date?	How monitored & Reported?	If <90%: Methods to Improve	If >90%: Lessons Learned/Best Practices

DQRS Selected Site Name	ART Clinic Hours	# of ART patients seen per day

APPENDIX 6. EDQA TALLY TOOLS

TALLY SHEET INSTRUCTIONS

MEASURE Evaluation TX_CURR Data Validation Exercise

TALLYING PROCEDURES

Step 1:

Make a tally sheet for ZPCTIIB's active files that looks like this:

Ndola Central Hospital, 3-10-17, Mwamba Mulenga (facility, data, enumerator name)

ART Number	Active	Inactive between July 3rd and Sept 1st	Notes from file	DAR SmartCare Cross-Check	Final Determination

- If a file is active, you do not need to do anything except check it as "active"
- If a file is not active given the available information in the file, clearly star (*) the ART number
- For each starred ART number, write a note ONLY if it is a patient that appears to be active after September 1st. Please write "pick up after Sept 1" or "Visit after Sept 1." No other notes are necessary.
- **SKIP** the DAR, SmartCare check column — this will be done later
- Final Determination: Write in this column if there is a patient status form or note on the outside of the file that states: Stopped, Dead, LTFU, Transferred Out, or Reactivated

Here's an example of a tally sheet filled out:

ART Number	Active	Inactive between July 3rd and Sept 1st	Notes from File	DAR SmartCare Cross-Check	Final Determination
4032	✓				
4033 *					
4034 *			Pick up after September 1		
4035	✓				
4036 *					
4037					Dead
4038					T.O.

STEP 2:

Cross-check files from tally sheets that were marked as <u>inactive</u> using the following flow chart:

Cross-Checks for ZPCTIIB's Active Files	Source	Outcome
1. Does the DAR (daily activity register) show that the patient had medication between July 3rd and September 1st?	DAR	YES – file is active. Check the <u>active</u> column and write "DAR = YES" in cross-check column (4034) NO – Write "DAR = NO" in cross-check column. Go to next
2. Does SmartCare show that the patient had medication or a clinical visit between July 3rd and September 1st?	SmartCare	YES – file is active. Check the <u>active</u> column and write "SC = YES" in cross-check column (4036) NO – Write "SC = NO" in cross-check column. Go to next
3. The patient is NOT active in either SmartCare or the DAR		TRUE – File is inactive. Check the <u>inactive</u> column (4033)

Here is an example of the same tally sheet filled out with the Check column completed.

ART Number	Active	Inactive between July 3rd and Sept 1st	Notes from file	DAR, SmartCare Cross-Check	Final Determination
4032	✓				
4033 *		✓		DAR = NO SC = NO	
4034 *	✓			DAR = YES	
4035	✓				
4036 *	✓		Pick up after September 1	DAR = NO SC = YES	
4037					Reactivated
4038					T.O.

STEP 3:

Back cross-check 100 active files in the DAR:

1. Identify files that have very old documentation and 1 line of updated pharmacy information that makes the file active.

2. Pull 100 of these files and set aside. Note: If you are unable to find 100 such files at your facility, pull as many as you find.

3. One team member should look these patients up in the DAR by ART number to ensure that the date of service on the pharmacy form matches the date in the DAR.

4. Please record all dates in a facility notebook together on one page as below.

5. Mark the 4th column if dates do not match

ART Number	Date of Pharmacy Pick Up in File	Date of Pharmacy Pick Up in DAR	Dates do not Match
4032	15/7/17	15/7/17	
4033	05/09/17	15/7/17	X

Step 4:

Make a tally sheet for ZPCTIIB's inactive files that looks like this:

Ndola Central Hospital, 3-10-17, Mwamba Mulenga (Facility, data, enumerator name)

ART Number	Inactive	Active between July 3rd and Sept 1st	Notes from File	Final Determination

Description of table contents to be filled out by enumerators:

- If a file is inactive and there is no patient status form, mark inactive
- If a file is inactive and there is a patient status form write the status in the final determination column (TO, Dead, LTFU, Stopped). The status may also be written on the outside of the file
- If a file has evidence of being "active," check the active column
- For each file marked "active," write a note about what you found in the file that determines that it is active

Here's an example of a tally sheet filled out:

ART Number	Inactive	Active between July 3rd and Sept 1st	Notes from File	Final Determination
6032	✓			
6039	✓			
6059		✓	Picked up prescriptions on 20/8/2017	
6065	✓			
6069				Dead
6070				TO
6071				Stopped

MEASURE Evaluation ART Data Validation Exercise: October 2–31, 2017

Date(s) of Assessment: _____

Facility Name:_____ Facility Type*_____

Province:_____ District:_____

Beginning Date for ART at Facility: Month_____ Year_____

DATA TALLY SHEET: For ZPCT active files

Total Files Reviewed	Active files on ART	Inactive Files	Number of Files with patient STATUS DOCUMENTED by Patient Status Form or written on outside of file				
			Transfer Out (TO)	Lost to Follow-Up (LTFU)	Dead	Stopped	Reactivated

How many active files were back cross-checked in the DAR (Step 3)?

What percent of active files that were back cross-checked had dates that matched the DAR?

DATA TALLY SHEET: From ZPCT inactive files

Total Files Reviewed	Inactive files	Active files on ART	Number of Files with patient STATUS DOCUMENTED by Patient Status Form			
			Transfer Out (TO)	Lost to Follow-Up (LTFU)	Dead	Stopped

Estimate what percent of total inactive files were reviewed and reported:

Tracking Team Progress			
Total number of all files reviewed at facility	No. of auditors counting	Average. no. files counted per person (Total divided by number of auditors)	Total number days/hours required to complete count

ZPCTIIB Data Base:

How many active patients are in the ZPCTIIB data base for this facility?

***Facility Type:** Hospital, Health Centre, Rural Health Centre, Clinic

Tally sheet completed by: _____ Date: _____

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PEPFAR

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