



iCCM Data Quality Assessment Toolkit

September 2017

This work was made possible by the World Health Organization Rapid Access Expansion (RAcE) Program through funding from Global Affairs Canada.

TABLE OF CONTENTS

Introduction	1
Toolkit Purpose	1
Toolkit Structure	1
Personnel and Logistics Considerations	2
Sampling Considerations	3
Fieldwork Preparation Considerations	3
Considerations and Tips to Adapt the Tools	4
System Assessment Tool	4
Facility-level System Assessment	4
District or Province-level System Assessment	5
National-level System Assessment	5
Systems Assessment Scorecard	5
Data Tracing	6
Data Tracing Tool Component Overview	7
Data Tracing Tool Background Sheet	7
Data Tracing Tool Analysis Worksheets	13
Data Tracing Tool Printable Tracker Sheets	15
Data Tracing Tool Results Worksheets	16
Reporting Performance Measure Definitions	18
Consistency Ratio Definitions	19
Implementation Considerations	22
System Assessment	22
Scoring the Facility-level	23
Scoring the District or Province-level	24
Scoring the National-level	24
Data Tracing	25
Tracing Data at Sampled Facilities	25
Tracing Data at the Subnational-level Site (Level 3)	26
Tracing Data at the Second Subnational-level and National-level Sites (Levels 4 and 5)	26
Considerations and Tips to Analyze, Visualize, and Interpret Data	27
System Assessment	27
Data Tracing	27
Overall	28
Appendix A. Glossary of Terms as They Relate to the DQA Toolkit and an iCCM Data Reporting System	29
Appendix B. Additional Information about the Data Tracing Tool Capabilities, Understanding the Flow of iCCM Data, and Data Flow Examples	30
Appendix C. Suggestions for Debriefs	33

INTRODUCTION

In 2013, ICF designed a tool to assess the quality of integrated community case management (iCCM) data and the iCCM data collection, reporting, and management system for the World Health Organization's (WHO) Rapid Access Expansion (RAcE) program. The design was based on MEASURE Evaluation's tool to assess the quality of HIV/AIDS treatment data emanating from facility-based services.¹ Over two applications in each of five countries, ICF continuously adapted this tool. This toolkit is based on that learning and is designed to assess the quality of iCCM data from the community where it is generated to the central health management information system (HMIS), and it is designed for routine use by ministries of health.

This guidance document provides a description of the purpose and structure of the iCCM data quality assessment (DQA) toolkit; considerations for determining personnel and logistics, selecting the sample, and preparing for fieldwork; detailed instructions for adapting the tools; guidance on how to implement the DQA using the tools; and guidance for analyzing, visualizing, and interpreting the data collected during the DQA.

Toolkit Purpose

The iCCM DQA toolkit is designed to be used by staff at the district, regional, or national level for periodic (biannual or annual) data quality checks. It can be used to assess data recorded by community health workers (CHWs) as data travel through the iCCM data reporting system to the central HMIS. It is also designed to assess the iCCM data collection, reporting, and management system.

Toolkit Structure

The toolkit includes two Excel-based tools: the system assessment tool and the data tracing tool:

- The system assessment tool includes a set of modules, one for each level of the data reporting system. The designated individuals conducting the DQA (the DQA team) record and score each item in the module, and the tool generates a scorecard to display the results of the system assessment.
- The data tracing tool includes data collection and analysis worksheets for tracing selected indicators through the iCCM data reporting system. The DQA team uses the tool to review and collect information from the iCCM data collection and reporting tools at each level of the data reporting system at the sites selected for assessment. The tool then uses these data to calculate measures of data availability, completeness, and consistency as the data travel through the iCCM data reporting system. These measures are displayed in a series of charts and tables included in the tool.

¹ MEASURE Evaluation. 2008. *Data Quality Audit Tool*. Available at <http://www.cpc.unc.edu/measure/tools/monitoring-evaluation-systems/data-quality-assurance-tools/dqa-auditing-tool-implentation-guidelines.pdf>

PERSONNEL AND LOGISTICS CONSIDERATIONS

The DQA team should be a small group of Ministry of Health (MOH) staff involved in the monitoring and evaluation (M&E) of the iCCM program, including relevant program managers such as the iCCM or child health program manager. The team should be composed of at least two people but may include more (six is the suggested maximum), depending on the number of sites to be visited, the amount of time available to conduct the assessment, and the number of staff available. If the DQA is implemented as a national-level activity, ideally the team will include national-level MOH staff as well as MOH staff from each subnational level assessed, such as a district-level M&E officer. If the DQA is implemented at the subnational level only, such as by district health offices, the team would not need to include any national-level staff. One person should be designated as the DQA team leader, who oversees the team and is in charge of the analysis of the data collected.

The system assessment tool has three modules, one per reporting level, intended to be implemented by staff from a higher reporting level to minimize bias and maintain some independence. The national-level module, however, is intended to be a self-assessment by national-level MOH M&E staff. The subnational-level module is intended to be implemented by national staff at the selected subnational-level site for assessment. If the DQA is implemented at the subnational level only, the subnational-level module will be a self-assessment by subnational-level MOH M&E staff. The facility-level module should be implemented in the sampled facilities in the selected subnational site by staff from the subnational level to which the facility reports, or jointly by subnational- and national-level MOH staff.

Similar to the system assessment, the data tracing fieldwork can be implemented by MOH representatives who work at the national or subnational level of the iCCM data reporting system. All team members should meet before beginning fieldwork to ensure that they have a shared understanding of the protocol so they collect the same data following the same procedures.

The DQA team can be determined before or after the sites for assessment are determined. The DQA team leader should be involved in site selection. Depending on the country context, other DQA team members may be important to involve in site selection or may be most appropriately determined afterward based on the sites selected. Steps for selecting the sample are outlined in the Sampling Considerations section. The sampled facilities and the health offices in the subnational areas of interest comprise the sites that the DQA team will visit during the assessment.

After both the DQA team and the sample are selected, a fieldwork timeline should be established based on the number of facilities and subnational sites that will be visited and their geographic locations.

The DQA team members can split up and visit sites separately, or they can visit sites together and divide the work at each site, with one team member conducting the system assessment and one conducting the data tracing.

The data tracing tool requires that the DQA team visit a select number of health facilities to review CHW registers for all CHWs reporting to each facility and verify the counts for each indicator being traced through the iCCM data reporting system. This component of the assessment takes the most time, which varies depending on how many CHWs report to the selected facilities. ICF recommends that multiple members of the DQA team visit any health facilities that have more than five iCCM CHWs for efficient and timely completion of the data tracing.

SAMPLING CONSIDERATIONS

To establish the sample, first select an area of interest (e.g., a specific district, province, or other subnational area) in which the iCCM program is being implemented. Next, select a sample of health facilities from the area of interest. Use the following steps to select health facilities that will provide a representative sample of the area of interest:

1. List and number all facilities in the area of interest and their iCCM-eligible under-five populations.
2. Randomly select 10 percent of facilities using a random number generator (round the number of facilities up to the next whole number, as needed). You will complete the system assessment at each of these facilities and review the data for all CHWs reporting to these facilities using the data tracing tool.
3. Confirm that the sum of the iCCM-eligible under-five population served by the selected facilities is at least 8 percent of the total iCCM-eligible under-five population in the area of interest. If not, then randomly choose one more facility and re-check the proportion of the eligible population. Repeat this process until the number of facilities selected serves at least 8 percent of the total iCCM-eligible under-five population.²
4. If, after facility selection, you discover that there are no CHWs working at a sampled facility, or if, for other reasons (e.g., security), you need to replace a facility, identify the facilities in the area of interest with a similar iCCM-eligible under-five population and randomly select one to visit.

FIELDWORK PREPARATION CONSIDERATIONS

After the DQA team has been determined, the sample selected, and the schedule and logistics determined, the DQA team needs to prepare the assessment tools and engage with and notify key stakeholders about the assessment plans.

In preparation for the DQA fieldwork, the DQA team should follow these steps:

1. Determine which month of data will be assessed in the data tracing tool. The DQA team should choose a recent, completed reporting month. iCCM data for the chosen month should already be entered in the HMIS, based on reporting deadlines, at the time that the DQA team is conducting fieldwork.
2. Review copies of all relevant iCCM data collection and reporting tools, including CHW registers, monthly reporting forms, stock forms, supervision forms, job aids, standard operating procedures, and guidelines, to ensure familiarity.
3. Adapt the systems assessment and data tracing tools to align with the reporting levels and number of sites included in the DQA. Detailed guidance on how to adapt each tool is provided in the Considerations and Tips to Adapt the Tools section.

² MEASURE Evaluation's Data Quality Audit Tool Implementation Guide states that 8 percent is robust in most situations. See <https://www.measureevaluation.org/resources/tools/health-information-systems/data-quality-assurance-tools/dqa-auditing-tool-implentation-guidelines.pdf>.

4. Coordinate a meeting for all DQA team members to discuss the contents of the adapted tools and how to use the tools consistently during the DQA fieldwork, particularly if multiple DQA team members will be using the same tool at different sites.
5. Contact relevant staff at each selected site to alert them of the DQA and the date on which the DQA team plans to visit the site.
6. Ensure that staff at the sampled facilities request that the CHWs who report to these facilities come to the facility with their iCCM registers on the day of the DQA team's visit.
7. Arrange adequate time to debrief relevant stakeholders at each site visited to share preliminary observations and results. See Appendix C for suggested debrief content.

CONSIDERATIONS AND TIPS TO ADAPT THE TOOLS

The system assessment tool and the data tracing tool are designed to be adapted to the implementing country's iCCM program. Each tool needs to be adapted to reflect the appropriate administrative levels at which the MOH and iCCM program operate as well as to reflect the sites selected for assessment.

ICF recommends routine use of the assessment tools. The first assessment will provide information about areas performing well and areas that need strengthening, and will guide the MOH in determining which aspects to prioritize and monitor. Subsequent assessments may require the tools to be tailored accordingly. For example, some elements may be removed from the system assessment, or the system assessment may be conducted less frequently (every two years) than the data tracing (annually).

Steps to adapt and tailor each tool are described in detail in this section.

System Assessment Tool

ICF recommends conducting a system assessment at the national, subnational, and facility levels. There are three system assessment modules, one for use at each level. The system assessment tool is set up to accommodate five facilities, one subnational-level site, and the national level. If the MOH wants to expand the assessment to more than one subnational-level site (e.g., two districts) or to include multiple subnational levels (e.g., both district and province), the district or province-level module can be copied to an additional tab and adapted and used for these levels. Likewise, if the MOH wants to include more than five facilities in the assessment, the facility-level module can be copied to an additional tab. This is most easily done after adapting the facility-level module for the country context.

For all levels, the system assessment covers six components: (I) Staffing, Responsibilities, and Capabilities; (II) Reporting System and Guidelines; (III) Data Collecting and Reporting Tools; (IV) Data Elements and Indicators; (V) Data Management Processes; (VI) Integration with National Health Management Information System (HMIS). Items within each component vary across levels. Some items require tailoring to the specific country context; guidance for tailoring is provided in the sections below.

Facility-level System Assessment

Before implementing the assessment, determine which iCCM forms are used at the facility level and which should be included in the assessment. For example, some facilities may have a summary form of all CHW data, separate forms for documenting stocks of iCCM commodities, and formal supervision reporting forms. All of these forms must be accounted for when scoring items 10 and 11 in Component

III: Data Collection and Reporting Tools, which refer to standardized iCCM data collection and reporting forms.

If any item is not applicable to the iCCM data reporting system, remove that item in the worksheet by hiding the row. Do not delete the row, because this will affect formulas used in the scorecard. If any rows are added or deleted from the facility-level module, check the scorecard formulas to ensure that they include the appropriate cells.

District or Province-level System Assessment

The district or province-level module should be renamed for the appropriate administrative subnational level in the country. If there are multiple subnational levels included in the assessment, then duplicate the tab and name and tailor it accordingly.

Items 24–27 in Component V: Data Management Processes refer to use of electronic databases. If there is no electronic database used in country, hide the row or adapt these items accordingly. Item 27 refers to a timeframe in which electronic iCCM data files are backed up; this item should be adapted to specify the appropriate time period (e.g., weekly, monthly) according to the country preference or protocol. Item 29 refers to a time period in which supervision from subnational levels to facilities takes place; this item should be adapted to specify the appropriate time periods in which supervision occurs according to country protocol (e.g., quarterly, monthly).

If any item is not applicable to the iCCM data reporting system, remove that item in the worksheet by hiding the row. Do not delete the row, because this will affect formulas used in the scorecard. If any rows are added or deleted from the district or province-level module, check the scorecard formulas to ensure that they include the appropriate cells.

National-level System Assessment

Two items in Component V: Data Management Processes must be tailored to the country context. Item 21 refers to a timeframe in which electronic iCCM data files are backed up; this item should be adapted to specify the appropriate time period (e.g., monthly, quarterly) according to the country preference or protocol. Item 24 refers to a time period in which national-level staff conduct supervision visits to subnational levels; this item should be adapted to specify the appropriate time periods in which supervision occurs according to country protocol (e.g., quarterly, monthly).

If any item is not applicable to the iCCM data reporting system, remove that item in the worksheet by hiding the row. Do not delete the row, because this will affect formulas used in the scorecard. If any rows are added or deleted from the national-level module, check the scorecard formulas to ensure that they include the appropriate cells.

Systems Assessment Scorecard

If fewer than five facilities have been selected, simply hide the rows in the scorecard for the facilities not included. There is no need to adjust any of the formulas in the scorecard.

If more than five facilities have been selected, insert a row for each additional facility under the row that contains the scores for the Facility 5. Select the cells that contain the information for the Facility 5 (columns A–J) and paste them in each added row. In each added row, adjust the facility number in column A to be the correct facility number and adjust the formulas in columns D–J to point to the correct facility module worksheet (e.g., Facility 6 SA). Also, adjust the conditional formatting rules to

include the cells in the added rows so that the results for the additional facilities will be color-coded according to the scorecard's color code key. Finally, adjust the formulas in the Facility Average row to include the added rows.

If more than one subnational level is included in the system assessment, copy the two District (Subnational) rows and insert them above the rows that contain the district information. Adjust the name of the reporting level in column A of the first inserted row and adjust the formulas in columns D–J of the second inserted row to point to the added subnational module worksheet (e.g., Province SA). Also, adjust the conditional formatting rules to include the cells in the added rows so that the results for the additional subnational level will be color-coded according to the scorecard's color code key. Finally, adjust the formulas in the Average (per component) row to include the added rows.

Data Tracing

The data tracing tool is designed to accommodate several variations in data flow through a reporting system but may not account for all possible variations implemented in different countries (see Appendix B.) The tool can be further adapted to capture other data flows. Some adaptations require a simple change of text in certain cells; other adaptations are more complex. For more complex adaptations, a strong understanding of the purpose of the data tracing and how the data tracing tool works, as well as a strong level of comfort working with Excel (e.g., adjusting and creating formulas, tables, and charts and adding worksheets) are needed.

The data tracing tool is designed to track iCCM data aggregated at the facility or subnational level, as described below. The last completed calendar month of available HMIS data should be reviewed. It is important to have a thorough understanding of the flow of iCCM data through the reporting system, including at what levels data are aggregated and at what levels they are entered into an electronic system, before tailoring or using the tool. (See Appendix B for data flow examples.)

Tracing iCCM data aggregated at the facility level: The data tracing tool can be used to trace iCCM data collected by CHWs and reported to the facility, and then to trace CHW data aggregated by the facility as they travel through the reporting system for the sampled facilities.

Tracing iCCM data aggregated at the subnational level: In some reporting systems, iCCM data do not flow through the reporting system aggregated by facility; instead they are aggregated at a subnational level. The tool, therefore, is designed to also capture facility-level iCCM data aggregated at the subnational level for one subnational-level site (e.g., iCCM data for all facilities in one district) to compare reporting consistency between facility reports and the report generated at the subnational-level site, as well as between the subnational-level site and higher levels of the reporting system. This component of the data tracing tool is useful if data at the higher levels of the reporting system are not disaggregated by facility and the DQA team would like to trace iCCM data at these higher levels. If more than one subnational-level site is included in the area of interest, use a separate data tracing tool for each subnational-level site and its associated facilities and CHWs, as recommended in the bullet, Sites included in the assessment (Section D), in the Data Tracing Background Sheet section.

Data Tracing Tool Component Overview

There are four components to the data tracing tool:

- Background sheet, in which information needed for the data tracing exercise is entered before data collection (1 black tab)
- Analysis worksheets to enter data collected at each site included in the data tracing exercise (7 blue tabs)
- Printable tracker sheets to collect data at each site included in the data tracing exercise (3 yellow tabs)
- Results worksheets containing summary data tables and figures for the data tracing exercise (4 green tabs)

Data Tracing Tool Background Sheet

The first step in using the tool is to fill in the Background sheet following the instructions in the worksheet. The following points should be considered in tailoring the background sheet:

- **Reporting month (Section A):** The tool is designed to trace data for one reporting month. If data for more than one month will be traced, a separate data tracing tool should be used for each month.
- **Reporting levels and reporting tools (Section B) and Indicators and data fields (Section C):** Sections B and C of the Background sheet outline what will be traced, in what iCCM program tools, and at what levels. The information that is entered in Section B is dependent on the information entered in Section C, and vice versa. Therefore, before filling in Sections B and C of the Background sheet, spend time reviewing the iCCM data collection and reporting tools used at each level of the reporting system to determine the data tracing plan. Start by determining:
 - What indicators will be traced?
 - What tools are used to collect and report these indicators?
 - What fields (data elements) within these tools contain the information for these indicators?
 - What happens to the data for these indicators at each level of the reporting system?
 - Are they aggregated?
 - Are they transcribed to another form?
 - Are they entered in an electronic system?
 - Do multiple things happen with the data?
 - Are there parallel reporting systems or do the data flow through a single channel?
- **Reporting levels and reporting tools (Section B):** The tool can accommodate tracing data at five reporting levels, noted in Section B as levels 1–5. Specify each level in column B (Local Term) using local terminology. If there are more than five reporting levels, all four components of the Excel tool (the Background sheet, the analysis worksheets, tracker sheets, and results sheets) need to be adapted. This requires a substantial amount of work and is best done by someone who is comfortable working with formulas in Excel.

Before filling in Section B:

- Determine whether there are parallel reporting paths at certain levels of the reporting system; if there are, select one of the paths to trace. Select the path with the national HMIS as its endpoint. If iCCM data are not entered in the national HMIS, then choose the most common path.
- Determine whether there are multiple reporting paths; for example, some sites enter data in an electronic system but other sites at the same level of the reporting system fill out paper reporting forms and submit them to the next level. If there are multiple reporting paths, adapt the data tracing tool to accommodate this. Adapting the tool for this situation is not covered in this guidance document but may require adding an additional row to existing tracker and analysis worksheets indicating which reporting tool was reviewed (e.g., electronic system entry or paper reporting form). The corresponding reporting performance calculations would also need to be added to the analysis and results worksheets.
- Determine whether multiple forms are submitted to a reporting level; for example, both facility-level and district-level reporting forms are submitted directly to the next reporting level. If multiple forms are submitted, either select one of the forms to trace or adapt the tool to compare the two forms. Comparing the forms, for example, may help uncover whether one form is more consistent than the other. Adapting the tool for this situation is not covered in this guidance document but may require adding additional analysis worksheets or setting up additional columns in an existing worksheet to accommodate the additional tool. The corresponding reporting performance calculations would also need to be added to the analysis and results worksheets.

After specifying the levels in the reporting system, specify the reporting tools associated with each level of the reporting system in column D (Reporting Tool) of Section B. Note that the information in column C (Type of Tool) indicates the type of tool (e.g., report or database) and how the data are captured in each reporting tool (e.g., by CHW, by facility, or by another level).

The data tracing tool uses the information entered in column B (Local Term) to auto-populate column D (Reporting Tool). If any of the cells contains a reporting tool that is not used in the iCCM data reporting system, replace the contents of the cell with **N/A**. Note that if, for example, the facility reporting forms do not contain entries by CHW, cell D11 (Level 1 “report entry” reporting tool) should contain **N/A**. Also note that if, for example, the facility reporting forms contain entries by CHW, cell D11 (Level 1 “report entry” reporting tool) should specify **entry**, and cell D12 (Level 1 “report total” reporting tool) should specify **total**. At the district level, if data are available by facility, the cell should specify **entry**. You can replace the auto-populated contents of column D with the local names of each of the reporting tools, if desired. Be sure, however, to include **entry** or **total** if the auto-populated contents did.

The following bullets contain detailed notes indicating the information that each cell in column D (Reporting tool) of Section B (Reporting levels and reporting tools) should contain.

(Note that these instructions use the example levels included in column A (Level) of the Background sheet. They may be different in your iCCM reporting system.)

Level 1 (e.g., CHW)

- **Cell D9 (Level 1 data source):** This cell should contain the name of the data source of the indicators being traced. Generally, it should be the name of the CHW register.
- **Cell D10 (Level 1 report):** This cell should contain the name of the reporting form that CHWs complete and submit to the facility. If CHWs do not fill out reporting forms themselves, but their registers have a row or column for page or monthly totals, those fields can be checked by the DQA team. In that case, enter “Register total” directly in cell D10 as the Level 1 (CHW) report. Otherwise, if CHWs do not fill out reporting forms themselves, enter *N/A*.

Level 2 (e.g., facility)

- **Cell D11 (Level 2 report entry):** If the facility reporting form contains entries for each CHW, this cell should contain the name of the reporting form, plus the word **entry**. If the facility report only contains aggregated data for all CHWs who report to the facility, enter *N/A*.
- **Cell D12 (Level 2 report total):** If the facility reporting form contains entries for each CHW, this cell should contain the name of the reporting form, plus the word **total**. If the facility reporting form contains aggregated data only for all CHWs who report to the facility, this cell should contain the name of the facility reporting form, without the word **total**.

Level 3 (e.g., district)

- **Cell D13 (Level 3 report entry):** If the district reporting form contains entries for each facility, this cell should contain the name of the reporting form, plus the word **entry**. If the district reporting form only contains aggregated data for all facilities that report to the district, enter *N/A*.
- **Cell D14 (Level 3 database entry):** If facility-level data are entered in an electronic system at the district level, this cell should contain the name of the reporting form, plus the word **entry**. If data are not entered into a database at the district level, enter *N/A*.
- **Cell D15 (Level 3 report total):** If the district reporting form contains entries for each facility, this cell should contain the name of the reporting form, plus the word **total**. If the district reporting form contains only aggregated data for all facilities that report to the district, this cell should contain the name of the district reporting form, without the word **total**.

Level 4 (e.g., province or national)

- **Cell D16 (Level 4 report/database entry by Level 2 sites):** If the province/national reporting form/database contains entries for each facility, this cell should contain the name of the report or database, plus the word **entry**. If the province/national reporting form/database does not exist or does not contain data by facility, enter *N/A*.
- **Cell D17 (Level 4 report/database entry for Level 3 site):** If the province/national reporting form/database contains data by district, this cell should contain the name of the report or database, plus the word **entry**. If the province/national reporting form/database does not exist or does not contain data by district, enter *N/A*.

Level 5 (e.g., national)

- **Cell D18 (Level 5 report/database entry for Level 3 site):** If the national reporting form/database contains data by district, this cell should contain the name of the report or database, plus the word **entry**. If the national reporting form/database does not exist or does not contain data by district, enter **N/A**.

Note: Simply because a level or iCCM data reporting tool exists, it does not have to be included in the data tracing exercise. For example, if the DQA is being conducted at the two lowest levels of the iCCM data reporting system only (e.g., CHW and facility levels), higher levels will not be relevant. In other cases, a tool may contain individual CHW entries as well as a facility total, but the DQA team does not want to assess intra-report consistency. If an existing tool or component of a tool is not included from the data tracing exercise, replace the name of the tool with **N/A** in column D (Reporting Tool).

Figures 1, 2, and 3 show examples of a completed Background sheet Section B. The example in Figure 1 includes four levels and iCCM data that are aggregated at the facility level and then entered in an electronic system by facility at the district health office. The facility-level database entries are then available at the national level.

Figure 1. Example 1 of a completed Background sheet Section B for an iCCM data reporting system with four levels and iCCM data aggregated at facilities and entered into database at District Level

Example #1			
Section B: Reporting levels, data source, reporting forms/tools			
Level (example)	Local Term	Aggregation	Reporting Form/Tool
Level 1 (CHW)	CHW	Data source	CHW register
		CHW report	CHW report
Level 2 (Facility)	Facility	Report by CHW	N/A
		Report by Facility	Facility report
Level 3 (District)	District	Report by Facility	N/A
		Database by Facility	Database entry (DHO)
		Report by District	N/A
Level 4 (Province/National)	National	Report by Facility	Database entry (MOH)
		Report by District	N/A
Level 5 (National)	N/A	Report by District	N/A

The example in Figure 2 includes four levels and iCCM data that are available by CHW in the facility-level report and then aggregated and entered in an electronic system by facility at the district health office. The facility-level database entries are then available at the national level.

Figure 2. Example 2 of a completed Background sheet Section B for an iCCM data reporting system with four levels and iCCM data aggregated and entered into database at District Level

Example #2			
Section B: Reporting levels, data source, reporting forms/tools			
Level (example)	Local Term	Aggregation	Reporting Form/Tool
Level 1 (CHW)	CHW	Data source	CHW register
		CHW report	CHW report
Level 2 (Facility)	Facility	Report by CHW	Facility report entry
		Report by Facility	Facility report total
Level 3 (District)	District	Report by Facility	N/A
		Database by Facility	Database entry (DHO)
		Report by District	N/A
Level 4 (Province/National)	National	Report by Facility	Database entry (MOH)
		Report by District	N/A
Level 5 (National)	N/A	Report by District	N/A

The example in Figure 3 includes five levels and iCCM data that are aggregated at the facility level and again at the district level and then entered into an electronic system by district at the provincial health office. The district-level database entries are then available at the national level.

Figure 3. Example #3 of a completed Background sheet Section B for an iCCM data reporting system with five levels and iCCM data aggregated at facility level and district level and entered into database at Province Level

Example #3			
Section B: Reporting levels, data source, reporting forms/tools			
Level (example)	Local Term	Aggregation	Reporting Form/Tool
Level 1 (CHW)	CHW	Data source	CHW register
		CHW report	CHW report
Level 2 (Facility)	Facility	Report by CHW	N/A
		Report by Facility	Facility report
Level 3 (District)	District	Report by Facility	N/A
		Database by Facility	N/A
		Report by District	District report
Level 4 (Province/National)	Province	Report by Facility	N/A
		Report by District	Database entry (PHO)
Level 5 (National)	National	Report by District	Database entry (MOH)

- Indicators and data fields (Section C):** The tool is designed to trace the data fields used to calculate three iCCM treatment indicators: one associated with each of the three primary iCCM illnesses—malaria, diarrhea, and pneumonia, shown in column A. The tool can also be adapted to trace data fields used to calculate other indicators.

Enter the indicator names in column B (Indicator name), the field or fields in the data source in column C (Field(s) in register), and the field or fields in the reporting tools in column D (Field(s) in reporting tools). Fields in the data source are sometimes labeled differently than fields in the reporting tools, but the fields in the reporting tools are usually labeled consistently across tools, so Section C is arranged accordingly. If field names vary among reporting forms, the tool can be adapted to accommodate the differences. Additional columns would need to be added to Section C to specify the field names, and then those added field names would have to be linked to the affected cells in the analysis and tracker worksheets.

To determine which indicators to trace, consider the following:

- Which indicators are most important to the iCCM program?
- Have any previously reported iCCM data raised questions or concerns about the iCCM program or about data quality? For example, the values reported for certain indicators were either much higher or much lower than expected.
- Are there any indicators that CHWs are known to have trouble recording or reporting?

Key indicators to consider include the following:

- Number of cases of cough or difficult breathing and high respiratory rate for age among children ages 2–59 months treated with amoxicillin by a CHW
- Number of cases of confirmed malaria (tested positive with an RDT) among children ages 2–59 months that received ACT from CHWs
- Number of cases of diarrhea among children ages 2–59 months that received treatment with ORS and zinc by CHWs
- Number of CHWs with no stockouts of ACT in the last month

There may be more than one indicator of interest associated with each illness. If this is true, consider combining two indicators (e.g., combine treatment with artemisinin-based combination therapy [ACT]1 and treatment with ACT2 into treatment with ACT) or choosing a priority indicator (e.g., treatment with oral rehydration solution [ORS] and zinc even though treatment with ORS only and zinc only are also collected and reported) to trace. In addition, it is best to trace “count” indicators (such as the examples above) to keep the assessment simple and rapid. Keep in mind that the data tracing exercise is meant to provide a snapshot of consistency between reporting tools and levels—not a comprehensive assessment of all iCCM data collected.

The Background sheet will need to be adapted if the three indicators selected to trace are associated with the same illness, or if two indicators are associated with one illness and one indicator is associated with a second illness. In that case, adjust the indicator wording in column A of Section C (Indicators and Data Fields). These changes would not affect anything else in the tool.

If the DQA team decides to trace more than three indicators, the easiest approach is to use multiple data tracing tools to collect the information—analyzing three indicators per tool.

If the DQA team decides to trace more than three indicators and prefers to use a single data tracing tool, all four components of the Excel tool (the Background sheet, the analysis worksheets, tracker sheets, and results sheets), need to be adapted. This requires a substantial amount of work and is best done by someone who is comfortable working with formulas in Excel.

- **Sites included in the assessment (Section D):** The tool can accommodate up to 5 facilities and up to 20 CHWs per facility within the “area of interest” (e.g., district). In Section D, only include sampled facilities.

Note: *If the DQA team will assess overall reporting performance and consistency measures at the subnational-level site to which the sampled facilities report, the non-sampled facilities included in these overall measures do not have to be entered in Section D.*

- If the DQA sample is 5 or fewer facilities and no more than 20 CHWs per facility, only the results worksheets need to be adapted (see the section on results worksheets).
 - If the DQA sample is greater than 5 facilities, unhide the relevant number of rows at the end of Section D of the Background tab and fill them in.
 - If the DQA sample is more than 10 facilities, add the relevant number of rows at the end of Section D of the Background tab and fill them in.
 - If any of the selected facilities has more than 20 CHWs, add a row for each additional CHW in the CHW tracker sheet and in the analysis worksheet for that facility.
 - If your area of interest contains multiple “Level 3” sites (see Section B, Reporting levels and reporting tools, of the Background sheet)—for example, two districts—use a separate data tracing tool for each Level 3 site and its facilities and CHWs.
- **Assessment team members (Section E):** The data tracing tool has rows for the names, titles, and emails of four DQA team members. If the team is larger, simply add a row for each additional team member to that section.

Data Tracing Tool Analysis Worksheets

After completing the Background sheet, check the analysis worksheets, designated with blue tabs, and ensure that there is an analysis worksheet for each facility as well as worksheets named *Facilities_Visited* and *Facilities_All*. If more than five facilities are sampled, add a worksheet for each additional facility by copying an existing facility analysis worksheet. Any added facility worksheets will also need to be added to the tables and charts in the results worksheets.

Rename any of the blue tabs to use the local terminology or the name of the facility itself by double-clicking on the tab name.

The information entered in the Background sheet is used to populate fields in the analysis worksheets. Review each analysis worksheet to verify that the local terminology for the reporting levels and the reporting tools align with what has been entered in the Background sheet. Also verify that there are an appropriate number of rows in each analysis worksheet for entering and analyzing the data that the DQA team collects. Tailor the analysis worksheets as needed.

- Review each facility analysis worksheet to verify that:
 - Row 13 contains the names of the CHW data source, CHW reporting form, and facility reporting form. If a tool is not applicable, the cells should be greyed out. For example, if the facility reporting form does not contain entries by CHW, it will be greyed out.
 - There is a row for each CHW who reports to that facility.
 - If there are fewer than 20 CHWs, leave the rows that are not needed or hide them if preferred.
 - If there are more than 20 CHWs:
 - Add a row for each additional CHW by inserting the necessary number of rows between the last and next-to-last CHW (rows 33 and 34); this ensures that the formatting is automatically copied to the new rows and that the new rows are included in the summations in row 36.
 - Copy row 33 and paste it into each new row.
 - Update the formulas in column A of each new row, as well as the row for the last CHW, so that they link to the appropriate cells in the Background sheet and include the appropriate CHW number. Use the existing formulas in column A as a guide.
- In the *Facilities_Visited* analysis worksheet, verify that:
 - Row 14 contains the names of up to four reporting tools used in the iCCM program: (1) facility report or facility report total, (2) district report entry, (3) district database entry, (4) province/national report/database entry. If a tool is not applicable, the cells should be greyed out.
 - There is a row for each sampled facility.
 - If there are fewer than five sampled facilities, leave the rows that are not needed or hide them if preferred.
 - If there are more than five sampled facilities:
 - Add a row for each additional facility. Unhide the necessary number of rows between the last facility and the summation row (rows 21 and 36).
 - Copy the formulas in cells AE20–BA20 to the corresponding cells in the unhidden rows. Any additional facilities will automatically be captured in the consistency ratio calculations and statistics.
- *Note: The Facilities_All worksheet is only applicable if you plan to assess all facilities that report to the subnational-level site included in the assessment (e.g., district health office), in addition to the sampled facilities. If you do not plan to do this, you can ignore this worksheet.*

If you are using the *Facilities_All* analysis worksheet, worksheet, verify that:

 - Row 12 contains the name of the facility report or facility report total.
 - There is a row for each facility.
 - If there are fewer than 20 facilities, leave the rows that are not needed or hide them if preferred.
 - If there are more than 20 facilities that report to the subnational-level site:
 - Add a row for each additional facility. It is easiest to do this by inserting the necessary number of rows between rows 32 and 33 so that the formatting is automatically copied to the new rows and the new rows are included in the summations in row 36.

- Copy row 32 and paste it into each new row.
- Update the formulas in column A of each new row, as well as the row for the last facility, so that they reflect the appropriate facility number. Use the existing formulas in column A as a guide.

Data Tracing Tool Printable Tracker Sheets

There are printable tracker sheets for CHW-level data (*CHW Tracker*), for facility-level data for facilities sampled (*Facilities_Visited Tracker*), and for facility- and subnational-level data for all facilities that report to a subnational-level site (*Facilities_All Tracker*). These sheets are designated with yellow tabs. The tracker sheets contain the same fields for each iCCM reporting tool as the analysis worksheets, but the tracker sheets do not include the calculations or summary statistics included in the analysis worksheets.

The tracker sheets are meant to be printed so that the DQA team can record the information by hand during fieldwork, because this is typically more convenient than using a computer to enter information while in the field. The data from the tracker sheets will be entered in the corresponding data tracing tool analysis sheets at a later time. However, if preferred and feasible, the DQA team can enter information directly in the analysis worksheets when visiting a site if using a laptop. ICF recommends printing the tracker sheets as a backup option in case the laptop battery dies or the laptop breaks. It is good practice to save the data tracing tool often during data collection and back up the data tracing tool on a flash drive to ensure that data are not lost if something unexpected happens. It is also good practice to have another members of the team verify or spot check data entered by another team member, if the size of the team allows for this.

The information entered in the Background sheet populates fields in the tracker sheets worksheets. Before printing, review each tracker sheet to ensure that the information is correct and adapt as needed. The tracker sheets are described as follows.

- *CHW Tracker*
 - This sheet allows the DQA team to capture CHW-level information from the CHW register, CHW report, and facility report if it has entries by CHW.
 - The tracker sheet for each iCCM reporting tool reviewed in the assessment will print on a separate sheet of paper.
 - If more than 20 CHWs report to a facility, either add rows to accommodate all of the CHWs for that facility or print two tracker sheets for that facility.
 - Ensure that the tracker sheet will print as expected. Adjust the paper size, margins, cell size, and font size as needed.
 - Print a separate set of tracker sheets for each sampled facility.
- *Facilities_Visited Tracker*
 - This sheet allows the DQA team to capture facility-level information for the facilities included in the assessment for up to four reporting tools, as applicable to your iCCM reporting system: (1) facility report or facility report total, (2) subnational report entry, (3) subnational database entry, (4) second subnational level/national report/database entry.
 - If there are more than five sampled facilities, unhide the necessary number of rows for each applicable tool.

- Ensure that the tracker sheet will print as expected; it may span multiple pages. Adjust the paper size, margins, cell size, and font size as needed.
- Print one copy of this tracker sheet.
- **Facilities_All Tracker**

*Note: This analysis worksheet is only applicable if you plan to assess **all facilities** that report to the subnational-level site included in the assessment (e.g., district health office), in addition to the sampled facilities. If you do not plan to do this, you can ignore this worksheet.*

 - This sheet allows the DQA team to capture facility-level information for all facilities that report to a subnational-level site (rows 7–26) and subnational-level information for the subnational site to which these facilities report (rows 27–29).
 - If any of the tools that captures district-level data is not applicable to the iCCM data reporting system, remove those rows from the tracker sheet before printing.
 - If there are more than 20 facilities in the district, add a row for each additional facility. It is easiest to do this by inserting the necessary number of rows between rows 25 and 26 so that the formatting is automatically copied to the new rows. Then copy cell A25, paste it into each new row, and update the formulas in column A of each new row, as well as the row for the last facility, so that they reflect the appropriate facility number. Use the existing formulas in column A as a guide.
 - Print this tracker sheet after making any necessary adjustments to the paper size, margins, cell size, and font size.

Data Tracing Tool Results Worksheets

The results worksheets included in the data tracing tool summarize the information collected by the DQA team. The information entered in the Background sheet is used to populate fields in the results worksheets. Review each of the results worksheets to ensure that the information is correct and adjust if needed. The results worksheets also need to be reviewed after data are collected and entered in the analysis worksheets to ensure that the results make sense. If the results do not appear to be aligned with the data in the analysis worksheets, this indicates a problem with the formulas and linkages within the tool. Click on any of the cells or graphs to see where the data are being pulled from and then review and correct formulas and linkages as needed.

There are four results worksheets:

- **Summary chart data:** This worksheet contains reporting performance measures (percentage available, percentage complete, and percentage of CHWs reporting) and consistency ratios by sampled facility for each of the indicators traced between reporting tools. These data are used to generate the graphs in the *Summary charts* worksheet.
- **Summary charts:** This worksheet presents the data in the *Summary chart data* worksheet in graphs.
- **Summary tables:** This worksheet summarizes the reporting performance measures and consistency ratios across the facilities included in the data tracing exercise. These data include averages across facilities and values for district-level consistency ratios, if applicable.
- **Count differences:** This worksheet compares the counts verified in the data source, or CHW register, to the values found in the various reporting tools by facility included in the data tracing exercise for each of the indicators traced.

Headings and titles of graphs and tables may need to be manually adjusted if the auto-generated titles or labels do not correctly reflect the data presented for your iCCM reporting system.

If more than five facilities are sampled, add the additional facilities to the tables in the *Summary chart data*, *Summary chart*, and *Count differences* worksheets. Review the tables in the *Summary tables* worksheet; they should not need to be updated.

If fewer than five facilities are sampled, the extra rows in the *Summary chart data* worksheet can be hidden if preferred. For cleaner graphs, remove the data points for the extra facilities from all graphs in the *Summary chart* worksheet.

The *Count differences* worksheet is set up to include all reporting tools in Section B (Reporting levels and reporting tools) of the Background sheet with CHW or facility-level entries. Tailor the worksheet to include only the iCCM data collection and reporting tools included in the data tracing. Remove the columns that are placeholders for tools not applicable to the data tracing, and adjust the count difference formulas to include only the applicable tools.

There are two tables in this worksheet. In the first table, “Counts by data collection and reporting tools,” any tools that are not applicable to the data flow in the data tracing exercise will show zeros for all facilities, and the column heading will be contained in square brackets. It might be helpful to grey out these columns in the table. To do so, you must first unprotect the sheet by going to the “Review” tab in the Microsoft Excel toolbar and clicking on “Unprotect Sheet.” Then you can select the cells that you would like to grey out and apply the fill color.

In the second table, “Count differences,” any tools that are not applicable to the data flow in the data tracing exercise will display in square brackets in the column heading. The formulas should be set up so that the value reported in a tool is subtracted from the value reported in the next tool in the data flow. For example, the CHW register value should be subtracted from the CHW report value, the CHW report value should be subtracted from the facility report CHW entry value, the facility report total value should be subtracted from the district report value for that facility, and so on. In the final column for an indicator, the value in the first tool (the CHW register) should be subtracted from the value in the last (or final) tool in the data flow. If any tools included in the template tables are not included in the data flow, as specified and tailored in the background tab, the calculations should be adjusted to skip those tools by adjusting the formulas to point to the appropriate columns and cells in the first table: counts by data collection and reporting tools.

If you unprotect the worksheet to make any adjustments, be sure to protect and save the worksheet again when you are finished. To protect the worksheet, click on “Protect Worksheet” in the “Review” tab of the Microsoft Excel toolbar. A pop-up box will appear. Do not enter a password or mark/unmark any checkboxes; simply click on “Okay.” Then save the tool.

Reporting Performance Measure Definitions

Note: These definitions need to be modified to reflect local terminology, reporting levels, and data collection and reporting tools.

- **Percentage available:** Are all expected registers, reporting forms, or database entries available for review?

Number of registers/reporting forms/database entries available for
review

Number of registers/reporting forms/database entries expected
for the month being assessed in the data tracing exercise

- **Percentage complete:** Are all available registers, reporting forms, or database entries complete?

Number of registers/reporting forms/database entries that are
complete

Number of registers/reporting forms/database entries available for
the month being assessed in the data tracing exercise

Note: The DQA team will need to agree on what it means for a register, form, or database entry to be complete before fieldwork begins. The team can choose to look only at the data fields related to the indicators being traced, the team can choose to look at entire entries or forms to see if all fields are filled in, or the team can choose another definition of completeness. Because tools are structured differently, there may be different definitions of completeness for each tool. Definitions of completeness will be context specific and might be based on particular elements that the DQA team wants to ensure are captured. For example, ensuring that date, age, and sex are legible and recorded is a possible definition of completeness.

- **Percentage of CHWs reporting:** Are all the CHWs who are supposed to be included in the available reporting forms or database entries included?

Number of CHWs included in the available reporting
forms/database entries

Number of CHWs who should have been included in the available
reporting forms/database entries for the month being assessed in
the data tracing exercise

Consistency Ratio Definitions

Note: These definitions need to be modified to reflect local terminology, reporting levels, and data collection and reporting tools.

Four versions of consistency ratios are calculated using the treatment data collected during the data tracing exercise:

- **Data source to Reporting tool A, consistency ratio:** Do the counts in the data source, as verified by the DQA team, match the value reported in reporting tool A? This ratio compares the data source to the lowest-level data reporting tool. Examples include: CHW register to CHW reporting form, CHW register to CHW entry in facility reporting form (if there is no separate CHW reporting form).

$$\frac{\text{Number of verified counts in the data source}}{\text{Value reported in reporting tool A for the month being assessed in the data tracing exercise}}$$

- **Reporting tool A entries to Reporting tool A, total consistency ratio:** Does the sum of the values reported in reporting tool A match the total value reported in reporting tool A? This ratio compares the entries in a reporting tool to the total in the same reporting tool. Examples include: CHW entries in facility reporting form to Facility reporting form total, Facility entries in district reporting form to District reporting form total.

$$\frac{\text{Sum of values reported in reporting tool A}}{\text{Total value reported in reporting tool A for the month being assessed in the data tracing exercise}}$$

- **Reporting tool A to Reporting tool B, consistency ratio:** Does the sum of the values reported in reporting tool A match the value reported in reporting tool B? This ratio compares the sum of values in a reporting tool for multiple sites (e.g., CHWs or facilities) to the aggregated value in a second reporting tool. Examples include: Sum of CHW reporting form values to Facility reporting form value, Sum of facility reporting form values to District reporting form value.

$$\frac{\text{Sum of values reported in reporting tool A}}{\text{Value reported in reporting tool B for the month being assessed in the data tracing exercise}}$$

- **Reporting tool A to Reporting tool B, consistency ratio:** Does the value reported in reporting tool A match the value reported in reporting tool B? This ratio compares the value in a reporting tool to the value in a second reporting tool. Examples include: CHW reporting form value to CHW entry in facility reporting form, Facility reporting form value to Facility entry in district database, Facility entry in district database-Facility entry in national database.

$$\frac{\text{Value reported in reporting tool A}}{\text{Value reported in reporting tool B for the month being assessed in the data tracing exercise}}$$

The following examples assume a scenario in which the data flow from CHW registers to CHW monthly summary forms to facility monthly summary forms that have entries by CHW to a database at the district level that has entries by facility. The database is accessible by national MOH staff.

- **CHW register to CHW reporting form, consistency ratio:** Do the counts in the CHW register, as verified by the DQA team, match the value reported in the CHW reporting form?

$$\frac{\text{Number of verified counts in the CHW register}}{\text{Value reported in the CHW reporting form for the month being assessed in the data tracing exercise}}$$

- **CHW reporting form to Facility reporting form entry, consistency ratio:** Does value reported in the CHW reporting form match the value reported for that CHW in the facility reporting form?

$$\frac{\text{Value reported by CHW in his or her CHW reporting form}}{\text{Value reported for that CHW by the facility in its facility reporting form for the month being assessed in the data tracing exercise}}$$

- **Facility reporting form entry to Facility reporting form, total consistency ratio:** Does the sum of values reported for all CHWs in the facility reporting form match the total value reported by the facility in the facility reporting form?

$$\frac{\text{Sum of values reported for all CHWs in the facility reporting form}}{\text{Total value reported by the facility in its facility reporting form for the month being assessed in the data tracing exercise}}$$

- **District database consistency ratio:** Does the value reported by a facility in the facility reporting form match the value in the district database for that facility?

$$\frac{\text{Value reported by a facility in its facility reporting form}}{\text{Value in the district database for the facility for the month being assessed in the data tracing exercise}}$$

- **National database consistency ratio:** Does the value in the district database for a facility match the value in the national database for that facility?

$$\frac{\text{Value in the district database for a facility}}{\text{Value in the national database for the facility for the month being assessed in the data tracing exercise}}$$

Note: If the electronic system is the same at the subnational and national levels, that is, there are not separate databases at the two levels, the denominator should be the “value extracted from the database by national level staff on the day of the site visit for the facility for the month being assessed in the data tracing exercise.”

Interpreting consistency ratios: A consistency ratio of 1 means that the values being compared match exactly, or that the data reported in the first tool match the data reported in the second tool. A consistency ratio of less than 1 means that the value or sum for the second tool (denominator) is greater than the value or sum for the first tool (numerator), which indicates over-reporting. A consistency ratio of greater than 1 means that the value or sum for the first tool (numerator) is greater than the value or sum for the second tool (denominator), which indicates under-reporting.

Consistency ratios cannot be calculated if the value in the denominator is 0 or not available. A denominator is not available, for example, if a reporting form or database entry is not available or if the reporting form or database entry is available but the field is blank.

If the numerator and denominator of a consistency ratio are both 0, formulas in the tool set the consistency ratio to be 1, indicating consistency.

IMPLEMENTATION CONSIDERATIONS

The systems assessment has three modules, which can be implemented by different MOH representatives on the DQA team. The national-level module is intended to be a self-assessment by national-level MOH M&E staff. The district-level module can be implemented by national staff, followed by a debrief with district-level staff. The facility-level module should be implemented by district-level staff, or jointly by a team of district- and national-level staff. The facility-level assessment should also be followed by a debrief with facility staff.

The data tracing exercise entails reviewing data from data collection and reporting tools at each site included in the DQA using the tracker sheets in the data tracing tool. When data tracing results are generated, the DQA team should follow up with relevant staff at each level to debrief them on the results. Debriefs should be approached as constructive feedback and an opportunity to collaboratively consider actions to improve data quality.

System Assessment

The facility-level module should be implemented at each selected facility. If there are multiple CHW supervisors at a facility, likely in a context in which a large number of CHWs report to the facility, consider implementing the facility-level assessment jointly with several of the CHW supervisors. The same may be true at the subnational level. Multiple people at each level may need to be consulted to complete the assessment.

Each item in the module should be reviewed and scored by the DQA team. There are four possible scores for each item, which can be selected from the drop-down menu in the answer codes column:

- Yes—completely true
- Partly or partially true
- No—not at all or not sure
- N/A (not applicable)

If the item is true and verified by the DQA team, select “Yes—completely true” as the score. If the item is partially true, or believed to be true but cannot be verified by the assessment team, score the item as “Partly or partially true” and record the details about why the item is scored this way—what part is true, what part is missing, any disagreement about the scoring, etc.—in the appropriate column in the tool. If the item is not true, missing from the level being assessed, or the team is not sure that the item is true, then score the item as “No—not at all or not sure” and record the details about why the item is scored this way in the appropriate column. If the item is not applicable, score it as “N/A.” The process of

Scoring example

*Component IV: Data Elements and Indicators
Item 13: Illness assessment results are captured*

Observation A: *The CHW register captures a field that indicates a fever case is malaria but does not include a field that indicates a rapid diagnostic test (RDT) was administered or a field that indicates the RDT result.*

Score: *No—not at all or not sure*

Observation B: *The CHW register captures a field that indicates an RDT was administered for a fever case and captures a field that indicates the fever case is malaria, but it does not include a field that indicates the result of the RDT.*

Score: *Partly or partially true*

Observation C: *The CHW register captures a field that indicates an RDT was administered for a fever case and captures a field that indicates the result of the RDT.*

Score: *Yes—completely true*

tailoring the tool to the specific country context should remove items that are known not to be applicable to the iCCM M&E system. Some specific scoring considerations for certain items in each module are discussed in the sections that follow.

Scoring the Facility-level

Items 4–9 in Component II: Reporting System and Guidelines refer to written instructions, procedures, and policies. If the instructions or procedures have been provided orally and are commonly understood, but not documented in written form, score this as “Partly or partially true” and record the explanation for this score.

Items 10–11 in Component III: Data Collection and Reporting tools refer to standardized iCCM data collection and reporting forms. Because facilities may be using multiple iCCM data collection forms, all data collection and reporting forms included in the assessment (determined when tailoring the tool to country context) must be used (item 10) and in stock (item 11) in order to score those items as “Yes—completely true.”

Items 12–19 in Component IV: Data Elements and Indicators are elements captured in various facility data collection forms, many directly from CHW reporting. The purpose of these items is to determine whether these data are aggregated at the facility level and reported up. Illness assessment results (item 13) include whether RDT was administered and if it was positive or negative, and if respiratory rate was counted and if it was marked in some way (high or low for age, or actual rate).

Item 22 in Component V: Data Management Processes is about maintaining confidentiality. When scoring this item, make note that names are needed on some forms (e.g., patient names are likely recorded in CHW registers and on referral slips). To maintain confidentiality, patient names and other identifying information should not be reported up the system through facility aggregate forms; this is the focus of this item.

Item 23 in Component V: Data Management Processes refers to all iCCM data collection tools and reports. All tools and reports included in the assessment, determined when tailoring the tool to the country context, must be stored appropriately to earn a score of “Yes—completely true.” If only some are stored appropriately, then score this item as “Partly or partially true” and record an explanation of this score.

For item 23 in Component VI: Integration with the National HMIS, “all CHWs implementing iCCM in the facility catchment area report data to the facility according to national iCCM data reporting timelines,” the following scores should be used:

- If this happens **most of the time**, score as “Yes—completely true.”
- If this happens **some of the time**, score as “Partly or partially true.”
- If this happens **rarely or never**, score as “No—not at all or not sure.”

Item 25 in Component VI: Integration with the National HMIS is “iCCM data from the facility are reported to the district through a single channel of the national HMIS.” All iCCM data elements must be reported to the district through a single channel of the national HMIS to earn a score of “Yes—completely true.” If only some are, then score as “Partly or partially true” and record an explanation of this score.

Scoring the District or Province-level

Items 1–3 in Component I: Staffing, Responsibilities, and Capabilities refer to subnational-level staff at the subnational level being assessed.

Items 4–9 in Component II: Reporting System and Guidelines refer to written instructions, procedures, and policies. If the instructions or procedures have been provided orally and are commonly understood, but not documented in written form, score this as “Partly or partially true” and record the explanation for this score. Item 5 refers to the format of reports; here “format” refers to both the technology and mode of information transmission, such as, are original paper copies submitted, are duplicate or carbon paper copies created, is electronic transmission done by email or entry into Excel.

Items 10–11 in Component III: Data Collection and Reporting tools refer to standardized iCCM data collection and reporting forms. Data collection and reporting forms that are considered to be in adequate stock (item 11) can be scored with “Yes—completely true” if either paper copies are available or if there is a functional printer with paper available to print the copies. Note that item 11 is applicable for facility forms, supplied by the subnational level to the facility, even if DHIS2 is used and data are entered at the subnational level being assessed.

Items 24–25 in Component V: Data Management Processes refer to quality controls and procedures for electronic data entry. If the instructions or procedures have been provided orally and are commonly understood, but not documented in written form, score this as “Partly or partially true” and record the explanation for this score.

For item 30 in Component VI: Integration with the National HMIS, “all facilities supporting the iCCM program report data to this site according to national iCCM data reporting timelines,” the following scores should be used:

- If this happens **most of the time**, score as “Yes—completely true.”
- If this happens **some of the time**, score as “Partly or partially true.”
- If this happens **rarely or never**, score as “No—not at all or not sure.”

For item 31 in Component VI: Integration with the National HMIS, all iCCM data elements must be reported through a single channel of the national HMIS to earn a score of “Yes—completely true.” If only some are, then score as “Partly or partially true” and record an explanation of this score.

Item 33 in Component VI: Integration with the National HMIS refers to standard naming conventions for facilities and CHWs. Standard naming conventions are a standardized way to refer to individuals or facilities, such as use of a specific acronym or other designation. Examples may include referring to referring to facilities as HC1, HC2, etc. instead of “health center 1.”

Scoring the National-level

Item 11 in Component II: Reporting System and Guidelines refers to source documents and reporting forms. “Source documents” may include completed reporting forms, other forms of data submission, supervision data, and other information received from subnational levels.

For item 25 in Component VI: Integration with the National HMIS, “iCCM data are received from the next reporting level according to determined schedules,” the following scores should be used:

- If this happens **most of the time**, score as “Yes—completely true.”
- If this happens **some of the time**, score as “Partly or partially true.”
- If this happens **rarely or never**, score as “No—not at all or not sure.”

Data Tracing

During the fieldwork portion of the DQA, collect the information needed for the data tracing exercise at each site using the printed tracker sheets (yellow tabs) or by directly recording the data in the analysis worksheets (blue tabs) in Excel. The instructions in this section refer to use of the printed tracker sheets; the same instructions apply for entering the information directly in the analysis worksheets.

Data tracing should be conducted for the last completed calendar month of available HMIS data.

Tracing Data at Sampled Facilities

Because CHW data are often aggregated by facility at some point in the reporting system, it is important to review the CHW registers for **all** CHWs who report to each sampled facility. This enables the DQA team to assess data availability and consistency at higher levels of the reporting system in the assessment. At each facility review the CHW register and CHW reporting form for each CHW who reports to that facility.

- For each CHW:
 - Enter “1” in the available column of the CHW tracker sheet if the register is available, or enter “0” if it is not available.
 - Using the definition of completeness determined by the DQA team, enter “1” in the complete column of the CHW tracker sheet if the register is complete, or enter “0” if it is not complete.
 - Review the entries in the CHW register for the reporting month being assessed and count the number of entries that specify the data element that contributes to the first indicator being traced. For example, if the malaria treatment indicator is the number of children with fever who received ACT, count the number of entries that indicate that ACT was given to a child who presented with fever and record that number in the tracker sheet.
 - Repeat the previous step for the other two indicators being traced.
 - Next review the CHW reporting form—the version that is kept at the facility. On the tracker sheet, record whether the reporting form is available and complete, and also record the values reported for each of the indicators being traced.
- If possible, review the copy of the facility reporting form that is kept at the facility. If the facility tracker sheet record is available and complete, record the values reported for each of the indicators being traced. The fields for this are located in the second-to-last row of the tracker sheet.
- After completing data collection at a facility, enter the data from the tracker sheet in the corresponding analysis worksheet. Also add any important notes to help interpret the data tracing results in the Notes section of the analysis worksheet.

- When data are entered in an analysis worksheet, availability, completeness, and consistency measures are automatically calculated in the yellow cells. Spot check the calculations to ensure that they make sense.

Tracing Data at the Subnational-level Site (Level 3)

Note: This guidance refers to the data tracing tool set up to include one subnational-level site. If the tool was adapted to include more than one subnational-level site, perform the following steps at each site.

Review the facility reporting forms for the month being assessed at the subnational, or Level 3, health office to which the sampled facilities report.

If the facility reporting forms have entries for each CHW, record the availability and completeness of each entry in the CHW tracker sheet. Also record the values reported for each indicator being traced. If the facility reporting forms do not have entries for each CHW, the DQA team will collect the facility-level information only.

In the *Facilities_Visited* tracker sheet, record whether the facility reporting form is available and complete, the number of CHWs actually included in the report, the number of CHWs who should have been included in the report, and the values for each of the indicators being traced.

If data are entered in an electronic system (e.g., DHIS2) at this level, also review the data available in that electronic system. In the *Facilities_Visited* tracker sheet, record whether the entry is available and complete, the number of CHWs included in the entry, the number of active or existing CHWs who should have been included in the entry, and the values for each of the indicators being traced.

If assessing reporting performance and consistency for **all** facilities that report to the subnational-level site (not just the sampled facilities), in the *Facilities_All* tracker sheet, record whether the facility reporting form for each facility is available and complete, the number of CHWs included in the report, the number of active or existing CHWs who should have been included in the report, and the values for each of the indicators being traced.

After data collection is complete at the subnational-level site, enter the data from the tracker sheet(s) into the corresponding analysis worksheet(s). Also add any important notes for interpreting the data tracing results in the Notes section of the analysis worksheet.

When data are entered in an analysis worksheet, availability, completeness, and consistency measures will be automatically calculated in the yellow cells. Spot check the calculations to ensure that they make sense.

Tracing Data at the Second Subnational-level and National-level Sites (Levels 4 and 5)

For higher levels of the iCCM reporting system, the DQA team will review facility or subnational-level entries in data reporting tools as applicable using the *Facilities_Visited* or *Facilities_All* tracker sheets. The information should be obtained from the appropriate sites (e.g., provincial health office, national MOH office).

After data collection is completed at a site, enter the data from the tracker sheet in the corresponding analysis worksheet. Also add any important notes for interpreting the data tracing results in the Notes section of the analysis worksheet.

When data are entered into an analysis worksheet, availability, completeness, and consistency measures are automatically calculated in the yellow cells. Spot check the calculations to ensure that they make sense.

CONSIDERATIONS AND TIPS TO ANALYZE, VISUALIZE, AND INTERPRET DATA

System Assessment

The system assessment generates a scorecard with average scores for each component across each level and overall, inclusive of all levels assessed. Scores range from 1 to 3, with 3 being the highest score. The average score for each component is converted to generate a percentage.³ Scores of 75 to 100 percent correspond to average scores of “Yes—completely true” and are automatically color-coded green. Scores of 50 to 74.9 percent correspond to average scores of “Partly or partially true” and are automatically color-coded yellow. Scores of 25 to 49.9 percent correspond to average scores of “Partly or partially true” and are automatically color-coded orange. Scores of less than 25 percent correspond to scores of “No—rarely, not at all or not sure” and are automatically color-coded red. The average scores and color coding provide a snapshot of which components of the iCCM M&E system are strong and working well and which components have gaps and require effort to strengthen.

ICF recommends prioritizing components that have scored less than 25 percent (red) for more immediate review and action planning, followed by those that scored 25 to 49.9 percent (orange) and then those that scored 50 to 74.9 percent (yellow). It is important to review explanations for scores recorded during the assessment with key stakeholders to better understand the identified gaps, a critical first step in determining actions to address the gaps.

ICF also recommends reviewing components that scored 75 percent and above (green) to better understand what is working well and why. Best practices may be gleaned from these components and applied to other components of the iCCM system. These scores also provide benchmarks for future assessments, or targets to strive for or maintain.

Data Tracing

The definitions of performance measures and consistency ratios are outlined in the Data Tracing Tool Results Worksheets subsection of the Considerations and Tips to Adapt the Tool section. The DQA team, together with other key stakeholders, will determine which reporting performance and consistency scores merit prioritization for follow-up. ICF recommends classifying the data tracing results according to the scoring chart shown in Table 1.

³ The average score on a scale of 1 to 3 is converted a score on a scale of 0 to 2 by subtracting 1 from the average score. The score is then divided by 2, to convert it to a scale of 0 to 1, and multiplied by 100 to generate a percentage.

Table 1. Scoring chart for data tracing results

	Reporting performance measure percentages	Consistency ratios
Good	≥ 90%	0.90–1.10
Fair	75%–89%	0.75–0.89, 1.11–1.25
Poor	< 75%	< 0.75, >1.25

ICF recommends that reporting performance measures—availability, completeness, and CHW reporting percentages—that fall in the fair or poor categories be investigated further to understand any underlying issues contributing to data gaps, and to generate actions to address the most critical issues. ICF also recommends that consistency ratios that fall in the fair or good categories (scores outside the 0.9–1.1 range indicate more than a 10 percent deviation from the ideal) be investigated further by reviewing the analysis worksheet to determine whether the factor driving the consistency ratio is due to an issue with a single CHW or facility or due to broader issues that require examining data reporting tools and processes. Then actions to address the most critical issues can be determined.

Overall

Results from the system assessment and data tracing should be reviewed together to determine priority areas for action. ICF suggests convening a group of key stakeholders to present the DQA findings and to develop recommendations and next steps to address the key gaps and areas prioritized for action.

APPENDIX A. GLOSSARY OF TERMS AS THEY RELATE TO THE DQA TOOLKIT AND AN iCCM DATA REPORTING SYSTEM

Level 1: Community level

Level 2: Facility level

Level 3: Subnational level directly above the facility level in the iCCM reporting system

Level 4: Second subnational level, the subnational level two levels above the facility level; or if a second subnational level does not exist in an iCCM data reporting system, it is in the national level.

Level 5: National level if two subnational levels exist in an iCCM data reporting system. This level will not exist if Level 4 is the national level.

Subnational level: Level in the reporting system between the facility and national level (e.g., district, province, local governance area, region, health zone). There may be one or more subnational levels relevant to an iCCM data reporting system.

Subnational-level site: A site, or office, at a subnational level (e.g., district health office, provincial health office)

APPENDIX B. ADDITIONAL INFORMATION ABOUT THE DATA TRACING TOOL CAPABILITIES, UNDERSTANDING THE FLOW OF iCCM DATA, AND DATA FLOW EXAMPLES

The data tracing tool is used to track iCCM treatment data recorded by all CHWs who report to selected facilities as they travel through the iCCM data reporting system to determine iCCM data availability, completeness, and reporting consistency. This requires that a certain number of facilities within an area of interest are selected for inclusion in the DQA. The data tracing tool is designed to track data for three treatment indicators for one reporting month. The tool can accommodate up to five reporting levels (see Figure A1): Level 1 is the CHW level; Level 2 is the facility level; Level 3 is the subnational level above facility to which iCCM data are reported by facility staff (e.g., district); Level 4 is the level above Level 3 to which iCCM data are reported by Level 3 staff (either a second subnational level, such as province level or the national level); and Level 5 is the level above Level 4 to which iCCM data are reported by Level 4 staff (likely the national level if applicable).

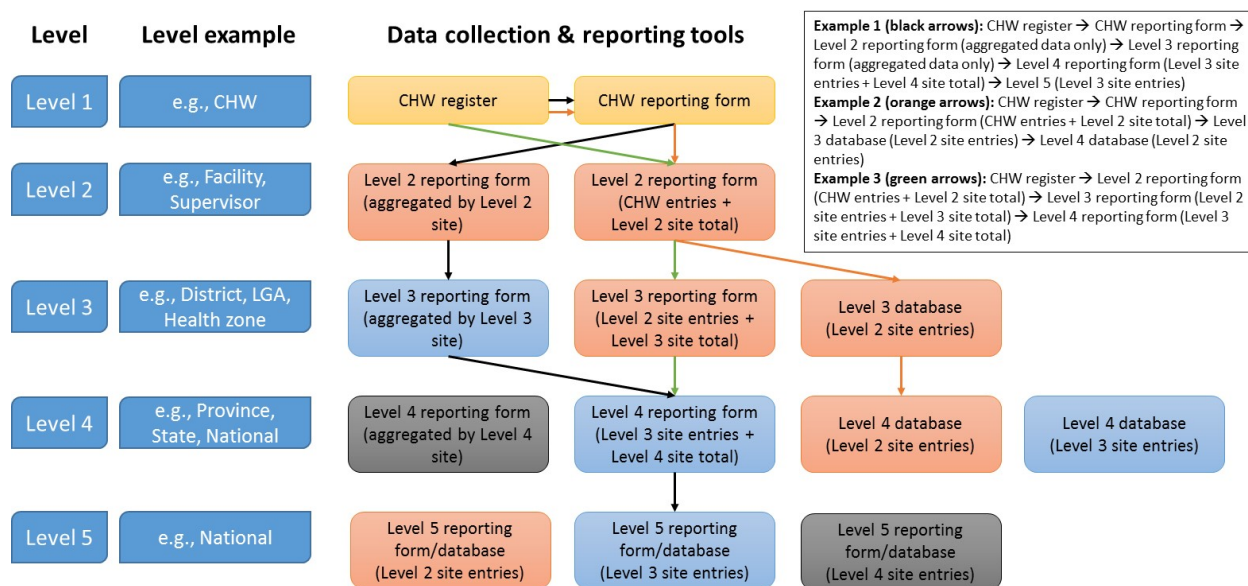
If data are entered in a database or electronic system at a subnational level, the data for the sites included in the DQA can still be tracked at higher levels, as available, to see whether the values that MOH staff at the higher-level sites extracted and are using are the same as those entered in the system at the subnational-level site.

The data tracing tool is set up to accommodate data aggregated at Level 2 or Level 3 sites; therefore:

- If iCCM data are aggregated at Level 2 sites (e.g., facilities) and travel through the rest of the iCCM reporting system without further aggregation, the data from the CHWs who report to the selected Level 2 sites can be traced all the way to the highest level of the reporting system, if desired.
- If iCCM data are aggregated at Level 3 sites (e.g., districts), the data from the CHWs who report to the selected Level 2 sites can only be traced to the relevant Level 3 site. However, if desired, the DQA team can get a sense of data availability, completeness, and reporting consistency for all Level 2 sites reporting to a Level 3 site included in the assessment, as well as report availability, completeness, and consistency for that Level 3 site at any higher levels of the reporting system.
- If the highest level of iCCM data aggregation is at Level 2 sites, then the area of interest for the DQA can include multiple Level 3 sites. However, if iCCM data are aggregated at Level 3 sites and the DQA team wishes to get a sense of reporting performance for the Level 3 site to which the selected Level 2 sites report, then ICF recommends that the area of interest for the DQA be limited to one Level 3 site or that multiple data tracing tools be used—one for each Level 3 site.

Figure A1 outlines iCCM data reporting levels as they are defined for the data tracing tool, includes examples of the levels and data collection and reporting tools possibly used at each level, and provides a few examples of iCCM data flow through the reporting system.

Figure A1. iCCM data tracing information and examples



Note: Yellow boxes indicate tools that contain CHW-level data, orange boxes indicate tools that contain iCCM data aggregated at Level 2, blue boxes indicate tools that contain iCCM data aggregated at Level 3, and grey boxes indicate tools that contain iCCM data aggregated at Level 4 (which cannot be assessed using the data tracing tool unless the tool is adapted).

Example 1 in Figure A1

CHWs enter data in their registers and then aggregate their register data for a month in a CHW monthly reporting form. The CHW reporting forms are submitted to a Level 2 site. At the Level 2 site, the M&E staff aggregate data from all CHWs and enter the aggregated values in the Level 2 site monthly reporting form. The Level 2 site reporting form is then submitted to a Level 3 site. At the Level 3 site, the M&E staff aggregate data from all Level 2 sites and enter the aggregated values in the Level 3 site monthly reporting form. The Level 3 site reporting form is then submitted to a Level 4 site. At the Level 4 site, the M&E staff enter the values from each Level 3 site directly in the Level 4 site monthly reporting form—as form entries—and total the values for all the included Level 3 sites at the bottom of the form. The Level 4 site reporting form is then submitted to the Level 5 site, where the Level 3 site entries in the Level 4 site monthly reporting forms are entered in an electronic system.

Following the data flow in this example, during the DQA fieldwork, the DQA team would review the following tools at the visited sites:

- Level 2 sites: Review all CHW registers and CHW reporting forms.
- Level 3 site: Review Level 2 site reporting forms for sampled Level 2 sites.
[Optional*: Review Level 2 site reporting forms for all Level 2 sites that report to the Level 3 site.]
- Level 4 site: [Optional*: Review the Level 3 site reporting form for the Level 3 site visited in the DQA.]
- Level 5 site: [Optional*: Review the Level 3 site database entry for the Level 3 site visited in the DQA.]

* Reviews of tools that are optional only apply if the DQA team will assess reporting performance and consistency for all Level 2 sites that report to the visited Level 3 site.

Example 2 in Figure A1

CHWs enter data in their registers and then aggregate their register data for a month in a CHW monthly reporting form. The CHW reporting forms are submitted to a Level 2 site. At the Level 2 site, the M&E staff enter the values from each CHW reporting form directly in the Level 2 site monthly reporting form and total the values for all the included Level 2 sites at the bottom of the form. The Level 2 site reporting form is then submitted to a Level 3 site. At the Level 3 site, the M&E staff enter the totals from each Level 2 site directly in an electronic system. The data in the electronic system are available for extraction by M&E staff at the Level 4 site, which, in this example, is the highest level in the reporting system.

Following the data flow in this example, during the DQA fieldwork, the DQA team would review the following tools at the visited sites:

- Level 2 sites: Review all CHW registers and CHW reporting forms.
- Level 3 site: Review Level 2 site reporting form entries and totals and database entries for sampled Level 2 sites.
- Level 4 site: Review Level 2 database entries for sampled Level 2 sites.

Example 3 in Figure A1

CHWs enter data in their registers, but they do not fill out CHW monthly reporting forms. Instead, the Level 2 M&E staff aggregate CHW register data and enter them in the Level 2 monthly reporting form as an entry. The Level 2 M&E staff then sum all the CHWs entries and report a Level 2 site total at the bottom of the form. The Level 2 reporting form is then submitted to the Level 3 site. At the Level 3 site, the M&E staff enter the totals from each Level 2 site directly in the Level 3 site monthly reporting form and total the values for all the included Level 2 sites at the bottom of the form. The Level 3 form is then submitted to the Level 4 site. At the Level 4 site, the M&E staff enter the totals from each Level 3 site directly into the Level 4 site monthly reporting form and total the values for all the included Level 3 sites at the bottom of the form. In this example, the Level 4 site is the highest level of the reporting system, which does not include entry in an electronic system; all iCCM data are contained in paper-based tools.

Following the data flow in this example, during the DQA fieldwork, the DQA team would review the following tools at the visited sites:

- Level 2 sites: Review all CHW registers and CHW reporting forms.
- Level 3 site: Review Level 2 site reporting form entries and totals and database entries for sampled Level 2 sites.
[Optional*: Review Level 2 site reporting form totals and database entries for all Level 2 sites that report to the Level 3 site.]
- Level 4 site: Review Level 3 site reporting form entries for sampled Level 2 sites.
[Optional*: Review Level 3 site reporting form entries for all Level 2 sites that report to the Level 3 site and the Level 3 site reporting form total.]

** Reviews of tools that are optional only apply if the DQA team will assess reporting performance and consistency for all Level 2 sites that report to the visited Level 3 site.*

APPENDIX C. SUGGESTIONS FOR DEBRIEFS

At Selected Facilities and Health Offices

Prior to leaving the facility or health office:

- Share preliminary observations from the data tracing and system assessment with the health officer in charge or staff person in charge of the facility or health officer. Focus on sharing preliminary findings using constructive feedback.
 - If data have been input directly in the system assessment Excel files while at the site, consider reviewing the scores.
- Let the key staff at the site know when the findings will be completed and any plans to share the final results; ensure that final results are shared back with these staff.

A Broader Subnational- or National-level Debrief

A broader subnational- or national-level debrief can include the following content:

- An overview of the DQA purpose and objectives
- The sites and number of CHWs included in the DQA
- An overview of the indicators traced, data collection and reporting tools reviewed, and data flow
- Systems assessment results—overall and for each level/site visited
- Data tracing results
 - Reporting performance measures
 - Consistency ratios
- Recommendations based on findings
- Feedback, suggestions, and questions from the audience