DATA QUALITY ASSESSMENT FINAL REPORT

Monitoring and Evaluation of the WHO Rapid Access Expansion (RAcE) 2015 Program
Save the Children Malawi

August 21, 2014

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ACRONYMS

CCM   Community case management
CMAM   Case management of acute malnutrition
DHIS-2   District health information system-2
DQA   Data quality analysis
iCCM   Integrated community case management
IMCI   Integrated management of childhood illness
FIC   Facility in charge
ICF   ICF International
HMIS   Health management information system
HSA   Health surveillance assistant
KII   Key informant interview
LA   Lumefantrine-artemether
M&E   Monitoring and evaluation
MOH   Ministry of Health
mRDT   Malaria rapid diagnostic test
ORS   Oral rehydration solution
PMF   Performance monitoring framework
RAcE   Rapid Access Expansion
SHSA   Senior health surveillance officer
VF   Verification factor
VSC   Verified site count ratio
WHO   World Health Organization

EXECUTIVE SUMMARY

As the independent technical support to the World Health Organization's (WHO) Rapid Access Expansion (RAcE) Program grantees, ICF International's (ICF) role is to assess and monitor the monitoring and evaluation (M&E) activities of individual RAcE grants, perform data quality assurance, and build grantee capacity in M&E. As part of this mandate, ICF conducted in January 2014 a rapid and comprehensive external data quality assessment (DQA) of M&E data generated through the RAcE project in Malawi.

ICF used a mixed methods approach, with qualitative and quantitative measures to capture the involvement of stakeholders at each level, verify how the data reporting system functions, and assess the quality and validity of data collected. ICF randomly selected 10 active health facilities across the four RAcE districts for site visits and also visited the health office in each district, Save the Children's Malawi headquarters, and the Ministry of Health's (MOH) Integrated Management of Childhood Illness (IMCI) office.

ICF found that a well-established national integrated community case management (iCCM) program exists in Malawi, complete with training curricula, data collection and reporting tools, and a reporting structure. Save the Children and partners are working hand-in-hand with the MOH IMCI unit to support each of these aspects of the iCCM program. Data collected at the community level are systematically aggregated at the facility and district levels and reported to the national level monthly.

In assessing the iCCM data management system in RAcE districts, ICF computed scores for five areas: (1) structure, functions and capabilities (98%); (2) indicator definitions and reporting guidelines (77%); (3) data collection, reporting forms, and tools (88%); (4) data management processes (47%); and (5) links with the national reporting system (95%). ICF found that written standard procedures for data management generally, and for documenting and resolving discrepancies in the reporting system, are lacking. Data verification indicated improvements are needed in three dimensions of quality: completeness, integrity, and reliability. ICF found report availability was high at all levels of the reporting system.

ICF calculated verified site count ratios and verification factors (VF) for the RAcE project area, for three indicators using HMIS reporting forms. While new cases of illness were usually reported accurately between levels (VF of 0.91), referrals and stockouts lasting longer than seven days were less accurately reported, with project area VFs of 1.83 and 2.54, respectively. At Save the Children's M&E Unit, agreement between the values in HMIS reporting forms and Save the Children's database was good, as indicated by result verification ratios near 1.0, specifically, 1.11, 1.02, 0.88, and 1.14 for new cases of illness, referrals, stockouts lasting longer than seven days, and supervision, respectively.

As Save the Children and partners continue to support the MOH IMCI unit to strengthen the national iCCM program's data collection and reporting system under RAcE, ICF recommends the RAcE Project focus on developing, documenting, and implementing standard procedures for each level of the reporting system to (1) improve accurate completion of village clinic registers and reporting forms, and (2) systematically address reporting issues at all levels including late submission of reports, missing values, incorrect aggregation, and implausible values. Save the Children and partners also should

provide additional support to HSAs and MOH staff to accurately complete the village clinic forms and registers through refresher trainings, regular and additional targeted supervision, and regular data review meetings.

1. INTRODUCTION AND BACKGROUND

1.1 Purpose of the Data Quality Assessment

As the independent technical support to the World Health Organization's (WHO) Rapid Access Expansion (RAcE) program grantees, ICF's role is to assess and monitor the monitoring and evaluation (M&E) activities of individual RAcE grants, perform data quality assurance and control to improve grantee performance, build grantee capacity in M&E, and make timely reports to the donor on grantees' performance. At the beginning of the fourth quarter of each program year for each RAcE grantee's project, ICF is required to conduct a rapid and comprehensive data quality assessment (DQA) of M&E data generated by grantees. The DQA evaluates the monitoring system in place and provides detailed recommendations. Here we summarize evidence gathered during the assessment, identify gaps, and provide recommendations to improve data quality.

DQA has the following objectives:

- To assess the effectiveness of the grantee data collection system and identify bottlenecks in the national health information system that affect grantee routine reporting.
- To assess the integrity of project data, including health surveillance assistants (HSAs) and supervisor registers, and data on quality of service and case management.
- To provide guidance and recommendation to grantees and Ministries of Health (MOHs) in the generation of quality data to guide project implementation.

To meet those objectives, ICF used qualitative and quantitative approaches. The qualitative component documented the RAcE project data collection process to capture the involvement of stakeholders at each level, while also verifying how the data reporting system functions. The quantitative component assessed the integrity and validity of data collected. The methodology for the RAcE Rapid DQA is based on the Global Fund's DQA Conceptual Framework (see Figure 1).[1]

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

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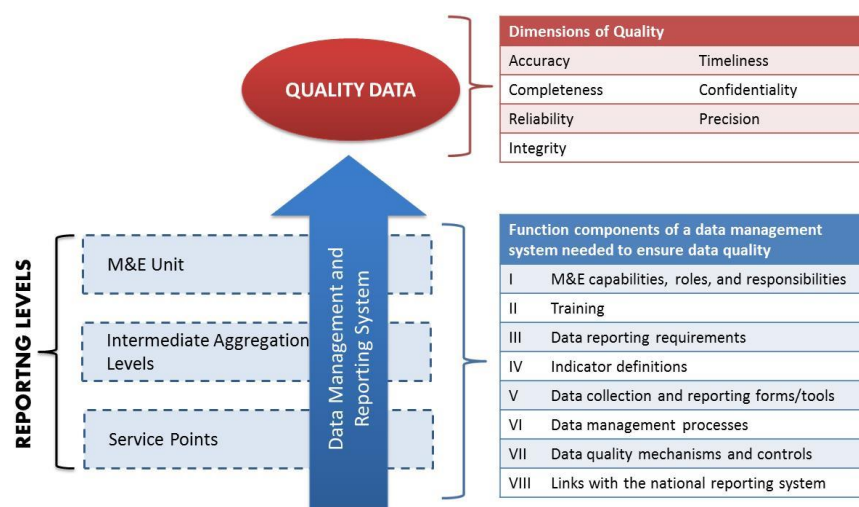
Figure 1. Global Fund Data Quality Assessment Conceptual Framework, 2008

1.2 Program Background

WHO launched the RAcE 2015 project in five African countries (Democratic Republic of Congo, Malawi, Mozambique, Niger, and Nigeria) to accomplish the following:

- Catalyze the scale-up of community case management of malaria (CCMm) and integrated community case management (iCCM).
- Stimulate policy review and regulatory update in each country on disease case management.
- Accelerate adaptation of supply management and surveillance systems to include services at the community level.

This effort comes during great momentum for CCMm and iCCM at the country level and a high degree of interest among the global health community to understand how to best measure success and how to build country ownership and capacity to sustain community case management (CCM) interventions. In Malawi's national iCCM program, which was implemented in 2006, CCM-trained community health workers, referred to as HSAs, are the service providers at the community level. They are assigned to a catchment area that is more than 5 kilometers from the nearest health facility. RAcE focuses on supporting iCCM during episodes of diarrhea, pneumonia, and malaria in children ages 2–59 months through a network of HSAs.

RAcE is being implemented in four districts in Malawi (Dedza, Mzimba North, Ntchisi, and Ntcheu) by Save the Children, in collaboration with Medical Care Development International, Clinton Health Access Initiative, and D-Tree and with support from Malawi's IMCI unit in the MOH.

1.3 Description of Malawi's iCCM Data Collection and Reporting System

RAcE, in its support of the implementation of the national iCCM program in Malawi, is using the national data collection and reporting tools approved by the MOH, which include the following instruments:

- The village clinic register is an over-sized bound book HSAs keep at the village clinic.

- The monthly village clinic reporting forms (Forms 1A, 1B, 1C) are loose paper forms that contain treatment, referral, supervision, mentorship, and supply information. At each level, two copies of the reporting forms are generated. One remains at that level, and the second is submitted to the next level.

- The Supervision Checklist and Summary forms are also loose papers that contain HSA supervision information. These forms remain with supervisors, who usually are the senior health surveillance assistants (SHSAs) at the facility level.

- Mentorship booklets are used by mentors, who are usually medical assistants or nurses, to mentor HSAs. These booklets remain with the mentor at the health facility.

HSAs record in their village clinic register the identification, assessment, and treatment information for each child brought for care. At the end of every month, HSAs summarize the information in Form 1A, the HSA monthly village clinic reporting form. HSAs are responsible for delivering by Day 2 of the next month Form 1A to the health facility with which they are associated.

Facility staff, usually SHSAs, are responsible for compiling the information that the HSAs submit to the health facility on Form 1A into Form 1B, the facility-level monthly village clinic reporting form. They also add information to Form 1B about supervision they provide to HSAs in their catchment area. This supervision information is recorded by HSA supervisors, the SHSAs, in Supervision Checklist forms and Supervision Summary reports. They deliver Form 1B to the district office by Day 5 of the month.

Staff at the district health office compile the information that they receive from the facilities on Form 1B and transfer it to Form 1C, the district-level monthly village clinic reporting form, by entering it into an Excel file with a layout that mirrors the paper forms. Formulas in the Excel file automatically generate Form 1C. The district office submits the Excel version of Form 1C to the MOH's IMCI unit by Day 10 of the month. In RAcE districts, the district office also submits Form 1C and the corresponding Forms 1B to Save the Children. Many of the indicators that Save the Children reports are calculated using a dashboard Excel file maintained by Save the Children's M&E coordinator, who enters data from Form 1C into the Excel file, and then calculates indicators using formulas in the file. Save the Children shares this information with ICF and WHO through the performance monitoring framework (PMF) indicators included in quarterly project reports.

At the district level, information from the Forms 1B also is entered into DHIS-2, the national health information system that stores data across health programs. Data entry for the iCCM program in DHIS-2 also is set up to mirror the reporting forms. The information in the Forms 1B is aggregated automatically into Form 1C, which is then sent to the central MOH. Figure 2 summarizes the data collection and reporting flow.
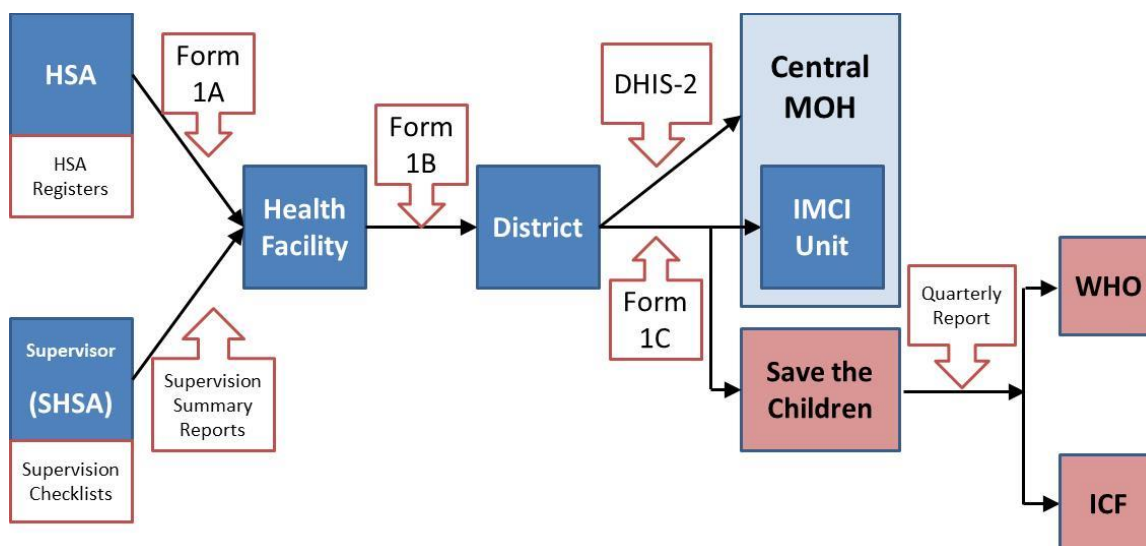
Figure 2. Data collection and reporting flow in RAcE Malawi project

2. DATA QUALITY ASSESSMENT IMPLEMENTATION

2.1 Overview

The Year 1 RAcE Malawi DQA was implemented in January 2014, with ethical approval from both ICF and Malawi's Ethical Review Board. Kirsten Unfried, ICF, traveled to Malawi to lead the assessment. ICF hired a local consultant, Mischeck Luhanga, to assist with pre-visit logistics, help with data collection, and provide input for the report. Pre-visit activities included obtaining ethical approval, selecting indicators to be traced, selecting the sites to be visited, adapting data collection tools, and reviewing project documentation.

Fieldwork was conducted from January 20 through January 31, 2014. An initial in-briefing was held with representatives from Save the Children Malawi, WHO Malawi, and the Malawi MOH IMCI unit at Save the Children's main office in Lilongwe. Site visits subsequently were conducted according to the assessment itinerary (Annex 1) to collect information from four levels in the national iCCM program and RAcE:

- Level 1: Save the Children's M&E unit and the MOH IMCI unit
- Level 2: District health offices or hospitals
- Level 3: Health facilities
- Level 4: HSAs

The ICF staff and a local consultant worked together to gather information from Save the Children's M&E unit and conducted a joint visit to the first health facility to ensure that the assessment protocols were clear. Later the ICF staff and the local consultant worked independently to collect data simultaneously. In each district, ICF or the consultant visited the district health office or hospital and the selected health facilities. HSAs who report to the selected health facilities traveled to the facility with their village clinic registers on the day of the DQA site visit. After visiting all sites, the ICF staff and local

consultant reconvened in Lilongwe and spent one day reviewing and analyzing the information before sharing preliminary results with Save the Children and WHO in a debriefing on January 31.

2.2 Health Facilities Selected for Assessment

Ten health facilities, or 10 percent of the active health facilities included in the RAcE project, were selected randomly for assessment.[2] A facility was considered active if staff supervised and collected reports from HSA implementing iCCM under RAcE. Facilities were selected randomly across the four RAcE districts from a list of facilities that Save the Children supports through RAcE as the sampling frame.

After the initial facility selection, Save the Children indicated that one of the selected facilities in Dedza District, Kasina health center, was no longer active because of HSA attrition; a replacement facility, Kaphuka, was selected randomly. Table 1 shows the health facilities visited during the DQA.

Table 1. Health facilities selected for inclusion in the DQA, by district, and the number of HSAs who report to each facility		
District	**Health Facility**	**Number of HSA**
Dedza	Mphunzi	6
Dedza	Mjini	2
Dedza	Kaphuka*	6
Ntcheu	Lizulu	3
Ntcheu	Ntcheu District Hospital	3
Ntcheu	Phanga Health Centre	2
Mzimba North	Khuyukuyu	2
Mzimba North	Mzuzu	5
Ntchisi	Kangolwa	10
Ntchisi	Khuwi	13
Replacement facility		

2.3 Assessment Components

The DQA included both qualitative and quantitative components:

- The purpose of the qualitative component was to understand the use and perceived usefulness of iCCM data, data reporting systems, and data management, as well as to better understand data quality issues. The qualitative component also captured involvement of different stakeholders at different levels of the system. ICF and the local consultant interviewed key informants involved in the data generation process and reviewed the tools and processes used in RAcE.
- The purpose of the quantitative component was to assess the data management system and the integrity of data collected and reported at each level, with a focus on the key data collected by the project. ICF and the local consultant reviewed aggregated and reported data to assess completeness

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[2] Ten percent was a purposive sample size.

and consistency and double checked reported numbers against source forms or registers to assess the accuracy of the reporting.

2.4 Assessment Protocols and Tools

Each site used three protocols: key informant interviews (KIIs), systems assessment, and data verification.

2.4.1 Key Informant Interviews

ICF developed a KII guide for administration at all sampled sites (Annex 2) and adapted it as needed for use with interviewees who had supervisory roles or who were less involved in the data generation process. We selected key informants for DQA interviews based on their roles and involvement in the data generation and reporting processes of the RAcE project (Table 2 and Annex 3). One HSA among those who report to each sampled health facility was selected randomly to be interviewed.

Table 2. Key Informants by level of assessment

1. Team leader*	1. HMIS officer	1. Facility-in-Charge
2. Project M&E officer*	2. District IMCI officer	2. Senior HSA
3. IMCI unit M&E coordinator	3. RAcE project officer*	3. HSA (randomly selected)

Indicates personnel who are Save the Children staff. All others are Ministry of Health staff.

At the central level, three interviews were conducted. At the district level, each of the three key informant cadres was interviewed in each of the four RAcE districts for a total of 12 interviews. At the health facility level, each of the key informant cadres were interviewed at each facility selected for assessment. Ntcheu District Hospital and Phanga Health Center had no Facility-in-Charge (FIC); therefore, only 8 FIC interviews were conducted, but 10 HSA and 10 SHSA interviews were conducted.

Each interview lasted 40–60 minutes and was preceded by the interviewee's informed consent. All intended interviews were conducted, but one IMCI coordinator was not available for an in-person interview the day of the site visit; therefore, the interview guide was shared with him by email, and he submitted written responses to each question.

Annex 4 presents a full summary of the KII findings.

2.4.2 Systems Assessment

ICF used Protocol 1[3] to assess the iCCM data management system in RAcE districts. Protocol 1 captures information in five areas, outlined in the conceptual framework: (1) the M&E structure, functions, and capabilities; (2) indicator definitions and reporting guidelines; (3) data collection and reporting instruments; (4) data management processes; and (5) links with the national reporting system. ICF used

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[3] Adapted from MEASURE Evaluation. *Data Quality Audit Tool.* (2008). Available at http://www.cpc.unc.edu/measure/tools/monitoring-evaluation-systems/data-quality-assurance-tools/dqa-auditing-tool-implentation-guidelines.pdf.

information collected to generate scores for each area by level and across levels and to make recommendations for the program.

2.4.3 Data Verification

ICF used Protocol 2[4] to assess the accuracy, availability, completeness, reliability, integrity, and confidentiality of iCCM data in RAcE districts. ICF summarized the information for each of the selected indicators by level and across levels to generate dashboard statistics and recommendations.

Indicators and Reporting Period Selected for Assessment

Table 3 lists the four routine monitoring indicators that ICF selected for assessment. Data for these indicators are collected through the national iCCM reporting forms, and Save the Children uses the data to calculate project indicators in the PMF (Indicators 1, 2, and 4) or to supplement information reported in the quarterly reports (Indicator 3).

Table 3. Routine monitoring indicators selected for tracing in the Data Quality Assessment

	Indicator	Data Source	Form
1.	Number of new cases of diarrhea, fast breathing, and fever treated by HSAs, disaggregated by illness and month	Village clinic register	Forms 1A, 1B, 1C
2.	Number of cases of diarrhea, fast breathing, and fever recommended for referral by HSAs, disaggregated by illness, reason (drug stock out or danger sign), and month	Village clinic register	Forms 1A, 1B, 1C
3.	Number of stockouts lasting more than seven days, disaggregated by drug (Lumefantrine-artemether (LA) 6x1, LA 6x2, oral rehydration solution (ORS), zinc, and cotrimoxazole), and month	Form 1A	Forms 1A, 1B, 1C
4.	Number of HSAs supervised, disaggregated by month	Supervision Checklist	Forms 1B, 1C

These indicators were assessed for the RAcE Year 1 third quarter (October–December 2013), which was Save the Children's last completed reporting quarter before the DQA.

Data Verification Process

Save the Children's M&E Unit:

1. Re-aggregation of numbers reported by all districts on Form 1C.
2. Verification of availability, timeliness, and completeness of Form 1C from all districts.

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[4] Adapted from *Data Quality Audit Tool.* (2008). Available at http://www.cpc.unc.edu/measure.

3. Data aggregation of numbers reported by Save the Children in its data files or October–December quarterly report.

District offices:

1. Re-aggregation of numbers reported by all health facilities in the district on Form 1B.
2. Verification of availability, timeliness, and completeness of Form 1B from all health facilities in the district.
3. Data aggregation of numbers reported by districts in Form 1C.

Health facilities:

1. Description of the recording practices in relation to service delivery (e.g., supplies of forms, delays in submitting data).
2. Documentation review (e.g., availability, completeness, potential quality challenges).
3. Data aggregation of numbers reported by facilities on Form 1B.
4. Cross-checks that compare numbers reported in village clinic reporting forms (Forms 1A and 1B) to numbers in their source documents.

   - Indicators 1 and 2: The sum of the number of new cases or referrals in each HSA's village clinic register compared to the values he or she reported in Form 1A.
   - Indicator 3: No cross-checks could be performed because the source document was the reporting form.
   - Indicator 4: The number of HSAs supervised as reported in the supervision section of Form 1B compared to the number of HSAs who self-reported a supervision visit in Form 1A.

Because iCCM data enter the national reporting system through Form 1A, that was the "source document" for this assessment. The DQA data aggregation and verification steps at the health facilities, district offices and Save the Children's M&E Unit reviewed what happens to data as they flow through the system between levels. Village clinic registers and supervision forms were used to cross-check information in Forms 1A (new cases and referrals) and Form 1B (supervision). These crosschecks provided important information about the quality of data entering the system.

3. ASSESSMENT OF THE DATA MANAGEMENT AND REPORTING SYSTEM

3.1 Key Findings from Systems Assessment

Key findings across the levels of the RAcE data management system for the five areas are discussed here, along with supplementary information from the KIIs. Figure 3 shows the scores for each area. Annex 5 contains results for individual levels.
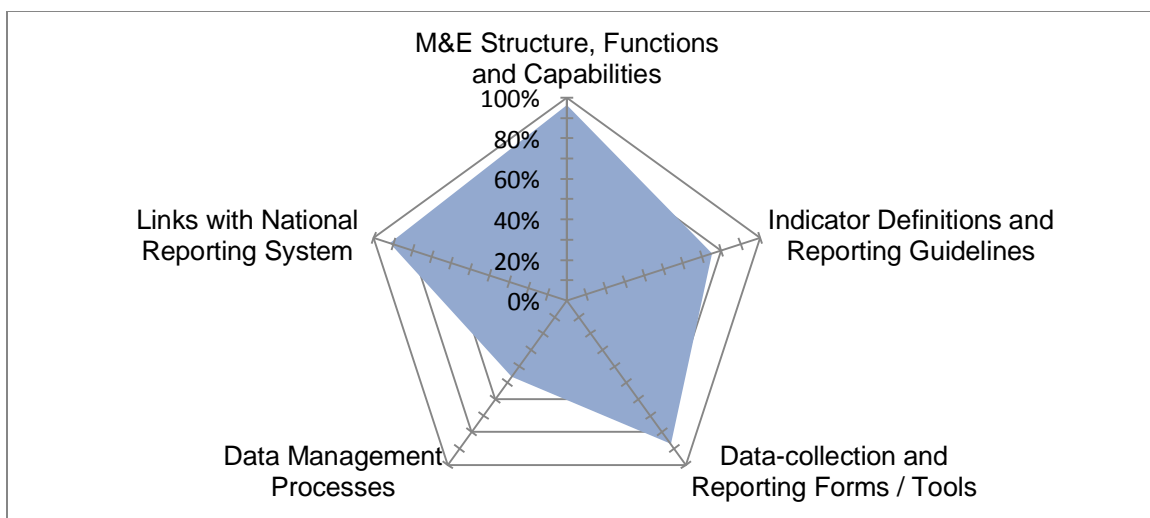
Figure 3. Overall systems assessment scores

3.1.1 M&E Structure, Functions, and Capabilities

Score: 98%

Structure and Functions

RAcE is supporting Malawi's national iCCM data management structure and providing extra support to RAcE districts through RAcE district coordinators who sit in each of the project districts and support MOH staff implementing the iCCM program. Save the Children also has a team leader and M&E officer at the central level who is responsible for providing support to all districts. Dedicated M&E officers sit at the central level—at both Save the Children and the MOH—and Health management information system (HMIS) officers sit at the district level. Save the Children staff members believe the workload is substantial, particularly checking and revising data received from project districts in Form 1C, which interferes with Save the Children's ability to conduct supervisory visits.

At lower levels, M&E functions are just one of the responsibilities of FICs and IMCI coordinators, who are also service providers (e.g., medical assistants or nurses) with other programs to oversee. District IMCI coordinators, in particular, often stated that their workload was too heavy. They spend a substantial amount of time reviewing and completing reporting forms, in addition to managing health programs and treating patients. A few staff members suggested hiring an additional staff member who could focus on managing health programs without being responsible for seeing patients. Some SHSAs have a catchment area and are responsible for providing iCCM services; others just serve as HSA supervisors and Form 1A reviewers and compilers. The majority of HSAs and SHSAs who were interviewed indicated that their M&E responsibilities were manageable and that they made time for them because they were part of their regular work; some indicated that filling out iCCM registers and reporting forms was a substantial amount of work.

Both Save the Children and the IMCI unit have senior staff in place to review the quality of data received from the districts in the monthly reports and the aggregated numbers before they are released from the

M&E units. Designated MOH staff members also perform quality checks and aggregate iCCM data at the district and facility levels.

Capabilities and Training

All staff with M&E responsibilities have been trained, and training is ongoing. For example, at the time of the DQA, Save the Children was arranging data management training for district-level staff. Most of the people interviewed felt qualified to perform their roles in RAcE; however, some HSAs, SHSAs, and mentors reported that they have not been trained in a few years and suggested that refresher training would be useful to increase data management and analysis skills. At central and district levels, respondents stated that they wanted to learn more about data management, analysis, quality assurance, and reporting.

Some key informants reported that quarterly review meetings are already in place to discuss iCCM issues, including data issues at both the district and facility levels in some areas, but the meetings are not universally implemented and they do not always occur as frequently as intended.

Recommendations to Save the Children and the MOH IMCI unit:

- Implement refresher trainings focused on data management and use for HSA, facility, and district-level staff to ensure that they understand the data management process and can perform the tasks expected of them. A few interviewees recommended implementing and training staff on methods used in TRAction, a project that introduces graphical data use templates to display health data collected at the community level to help manage and control the quality of data.
- Ensure that quarterly review meetings occur regularly throughout the program area.

3.1.2 Indicator Definitions and Reporting Guidelines

Score: 77%

Reporting Guidelines

Save the Children is using the national reporting guidelines and RAcE district coordinators are responsible for helping to enforce them. Under RAcE, reporting has still not reached 100 percent (see data verification section), but reporting deadlines are reportedly more strictly enforced than previously, which is in part the result of the efforts of the RAcE district coordinators. Reporting deadlines are printed on Forms 1A, 1B, and 1C, but otherwise they are not documented and shared with staff involved in the reporting process. During trainings, Save the Children ensures that reporting guidelines are communicated and understood in their project districts in the absence of written documentation from the MOH.

Understanding the Flow and Purpose of Data Collected

Respondents at all levels appeared to understand the flow of the data and the purpose of the data collected. They most commonly discussed using the data to order the correct amounts of supplies and monitor the progress of program indicators. Other purposes included providing information to donors,

understanding the activity or workload at various levels, informing the design of preventive interventions, understanding what is going well and what could be improved, and addressing gaps.

Perceived Benefits of Data Collection

Respondents most commonly believed that the data benefit the community, specifically children under 5 years of age who receive the treatment and care and receive the most benefit. Another common response was "all stakeholders" or "everybody."

Indicator Definitions

The indicators that Save the Children reports to WHO are included in the PMF, which was finalized in collaboration with WHO and ICF. Review of the village clinic reporting forms against PMF indicators and data in Save the Children's dashboard Excel file indicates that some of the numbers reported by Save the Children for certain indicators do not align with the information available to Save the Children through the national iCCM reporting system. For example, the percentage of HSAs who received at least one supervisory contact in the previous three months during which registers or reports were reviewed (routine supervision) is an indicator in Save the Children's PMF; however, because districts submit reporting forms to Save the Children and the IMCI unit monthly, they include aggregate numbers only, with no way to indicate if the same HSAs were supervised multiple times across months and, thus, be double counted.

Recommendation to Save the Children:

- In collaboration with WHO and ICF, adjust routine monitoring indicators in the project PMF to better align with routine information available through the national iCCM reporting system.

3.1.3 Data Collection, Reporting Forms, and Tools

Score: 88%

Use of Data Collection and Reporting Tools

Save the Children is using the MOH IMCI unit's standard set of iCCM tools. Training covers instructions that explain how to fill out the tools, but no written documents contain these instructions. The lack of documentation has generated confusion among personnel involved in the reporting process because it is unclear what should be entered in some of the fields on the form. For example, HSAs are supposed to count all children ages 2–4 months with fever that present for care as a new case although (1) according to national protocol, HSAs must refer the child to a facility for treatment, and (2) a separate section on the reporting form is reserved for fever referrals because of the danger signs for 2–4-month-olds. In addition, some HSA and facility staff reported that they sometimes run out of reporting forms. At one facility, ICF found that the HSAs were using the old reporting forms, and at a few other facilities, ICF found that the facility-level data were entered into Form 1C instead of Form 1B because that was the form that was available. Save the Children's RAcE district coordinators are trying to ensure the availability of adequate supplies.

Although documentation is lacking, most interviewees reported that registers and forms are easy to use, take a reasonable amount of time to complete, and that filling them out does not interfere with other responsibilities. Many respondents viewed their data management and reporting tasks as part of their regular work, rather than an extra burden, and stated that they always make time to fill out the registers and forms. Interviewees, primarily at the district and central levels, did have some recommendations to improve the forms. The most common recommendation was to increase the supply of forms. Here are some other recommendations:

- Define acronyms on the reporting forms.
- Improve the supplies management table in the reporting forms.
- Make the total row clearer in Forms 1A, 1B, and 1C for new cases, referrals, and deaths.
- Gray out the referral fields for children ages 2–4-months with fever.
- Reduce the amount of writing required on Form 1B.
- Combine the reporting forms into a booklet or electronic application.
- Combine the supervision checklist and summary forms into a booklet.
- Add space on the registers for follow-up assessment information.
- Add "Compiled by" and "Approved by" fields to Forms 1A, 1B, and 1C.
- Add c-Stock information to the village clinic register. c-Stock is an mHealth application that improves visibility and management of commodity stock at the community level by HSAs.
- Add a field for the child's name on the referral slip that the HSA keeps at the village clinic.
- Add a place for immunization information in the village clinic register.

Confidentiality and Precision of Reported Data

Information collected in the national iCCM program includes personal identifiers only in source documents, such as village clinic registers and supervision checklist and summary forms. Only aggregated data are reported up to the national level; Forms 1A, 1B, and 1C do not contain personal data.

The national iCCM reporting forms were improved in 2012 with stakeholder input and they have sufficient precision for MOH purposes, but pieces of data are lacking to calculate standard international indicators recommended for CCM programs, including two of the indicators that were investigated through this DQA: (1) the number of HSAs with stockouts of any key CCM medicines or diagnostics that last more than seven days in the previous quarter, and (2) the number of HSAs who received a supervisory visit in the previous quarter. Because the data are aggregated at each level and because reporting forms are completed monthly, numbers per quarter cannot be tracked. Furthermore, because the data are aggregated across HSAs and reported by commodity, the stockout indicator cannot be measured as presently defined because it is impossible to determine how many distinct HSAs had a stockout of any key commodity that lasted longer than seven days. It is possible to report only the number of cases when a commodity was reported to be out of stock for longer than seven days during the quarter, such as if an HSA had a week-long stockout of zinc and ORS in month 1 and LA 6x2 in month 2, he or she would be counted three times (for the three separate cases) in the indicator.

Further, the reporting forms do not contain sufficient detail to report all the indicators that WHO requested of RAcE grantees, including the following information:

- Disaggregation by gender for each illness
- Cases treated "appropriately"
- Cases referred "correctly"

For example, appropriate fever treatment at the community level at the time of the DQA was presumptive malaria diagnosis and treatment with the first-line artemisinin-based combination therapy, LA, within 24 hours of the onset of fever; malaria rapid diagnostic tests (mRDTs) were not yet rolled out in the program area. While the number of days since the onset of fever and the course of treatment provided (LA 6x1 or LA 6x2) are recorded in the village clinic register, the information is not captured when aggregated in the village clinic reporting forms. Only the number of "new cases" of fever or malaria is reported by HSAs in Form 1A. Another example is appropriate treatment for diarrhea. Appropriate treatment according to national guidelines is ORS and zinc, and while administration of both are tracked in the village clinic register, only the number of new cases of diarrhea is reported by HSAs in Form 1A, which means it is impossible to know if children were treated with only ORS, only zinc, or both.

Recommendations to Save the Children:

- Work with the MOH IMCI unit to ensure that one standard, documented method is used to fill out the village clinic reporting forms and ensure that the documentation reaches all levels of the reporting system. Any HSA and SHSA refresher trainings should have time allotted to go over the forms, including what the forms are collecting, how to fill out the forms, description of where the data go, and how the data are used.
- As already suggested, adjust project indicators to better align with routine information available through the national iCCM reporting system.
- Continue to work to ensure availability of reporting forms at the facility and village clinic levels.

3.1.4 Data Management Processes

Score: 47%

The RAcE Project scored lowest in data management practices, primarily because written procedures do not exist to address issues with late, incomplete, inaccurate, and missing reports; a lack of quality controls for data entry; and several opportunities for double counting in the system, such as the supervision indicator.

Many of the data management issues identified existed before RAcE began, and they are a function of the MOH's national iCCM program. For instance, Save the Children's computers are backed up automatically any time they log into the organization's system, but MOH IMCI unit computers are not backed up systematically, and no documented systems administration procedure is in place. Both the

MOH IMCI unit and Save the Children back up their data files by sending the files as attachments to emails.

Save the Children is trying to ensure quality data by implementing its own quality checks. Initially, Save the Children received Form 1C only from the districts, but then suspected that district staff were making errors aggregating data from Form 1B into Form 1C; therefore, Save the Children recently began requesting that districts also submit Form 1B monthly to double-check the data.

ICF found that, although it is not officially documented, a process is in place for following up on issues with reporting forms. The person who is responsible for receiving and reviewing the reporting forms follows up with the person who submitted the form if an error is found, if values are missing, or if a report is not submitted on time. The RAcE district coordinator helps district staff follow up on issues with reports submitted by facilities and also follows up with district staff if issues are found with reports submitted by the districts; however, if errors are corrected or reports are received late, no systematic way exists to document the correction or the date that the late report was received or whether data from the late report were included in the aggregated reporting form sent to the next level. Also, because a copy of Form 1A remains with the HSA and a copy of Form 1B remains at the facility, it is possible that two copies of each form would need to be corrected if an error is found.

Recommendations to Save the Children:

- Work with the MOH IMCI unit to structure and document a standard procedure for receiving, verifying, and editing village clinic reporting forms, including the following steps:
- Track when reports are received.
- Track if late reports are included in the monthly report to the next level.
- Follow up on actions taken.
- Record corrections made.
- Document feedback provided to the person who submitted the form.
- Rephrase or otherwise revise indicators to clarify situations where double counting is likely.

3.1.5 Links with the National Reporting System

Score: 95%

All district- and central-level interviewees recognized the RAcE program name, as did all SHSAs; however, just over half of interviewed HSAs and Facility-in-Charges recognized the name. Those that did not recognize the name "RAcE" were all involved in the project, but knew it only as the "CCM program," a testament to how well-aligned RAcE is with the national iCCM program. In terms of the RAcE reporting system specifically, Save the Children uses the iCCM national tools in project districts and enforces the national iCCM reporting deadlines.

Parallel reporting systems are, however, currently in place for iCCM data at the district and central levels in the iCCM program itself. The MOH IMCI unit uses an Excel-based system that is generally the responsibility of the district IMCI officer to specifically track the iCCM program. The District HMIS officer

is generally the responsible for DHIS-2, the national health management information system. DHIS-2 was adapted in 2013 to include iCCM data. Although district staff have started entering iCCM data in the system, data from before January 2013 are not captured, and iCCM reporting rates remains low. Furthermore, MOH staff who implement RAcE are not yet proficient in extracting data from the system beyond any existing pre-formatted reports, but the reports are of little use if data entry rates are low. Save the Children does not currently have access to DHIS-2, but is working with the IMCI unit to see how they both can better use DHIS-2 for reporting and data management to avoid duplication of efforts.

Recommendation: Save the Children should work with the MOH IMCI unit to ensure that district-level MOH staff can enter facility-level data into DHIS-2 and extract the data for use. The data entry clerk or the district HMIS officer who is responsible for entering data into DHIS-2 should work closely with the IMCI officer and the RAcE district coordinator to resolve any issues before the data are entered and to ensure data for all facilities in the district are entered. If the MOH IMCI unit begins to more regularly use DHIS-2, a regular backup system and other system administration procedures will be in place, which will improve data management in general; however, because the DHIS-2 data entry screen mirrors the layout of the village clinic reporting forms, the use of parallel systems might be unavoidable as MOH introduces revised village clinic reporting forms that include information about mRDTs and rectal artesunate, two interventions that are in the process of being rolled out at the community level.

4. VERIFICATION OF REPORTED DATA

4.1 Finalization of Selected Indicators

ICF intended to assess indicators that covered different areas of RAcE implementation in the DQA data verification step: cases treated, cases referred, cases followed up, stockouts, and supervision. ICF found indicators related to cases treated, stockouts, and supervision reported using routine reporting data in Save the Children's PMF:

- The indicator, "Cases treated," was broken out into three indicators:
  1. Number of cases of fever among children ages 5–59 months that received appropriate treatment according to national policy
  2. Number of cases of pneumonia among children ages 2–59 months treated with first-line antibiotics according to national policy
  3. Number of cases of diarrhea among children ages 2–59 months treated with ORS and zinc according to national guidelines
- Number of iCCM-trained HSA with no stockouts of more than seven days of key medicines and equipment within the last three months (antibiotics, artemisinin-based combination therapy, ORS, zinc, mRDTs, timer)
- Percentage of HSAs who received at least one supervisory contact in the prior three months during which registers or reports were reviewed (routine supervision)

ICF found only household survey indicators related to the other two areas: (1) follow-up and (2) referrals. After reviewing the village clinic reporting forms and registers, ICF found that while follow-up visit information can be recorded in the register, it is not included in the reporting forms; therefore, ICF

did not assess a follow-up indicator. Referral information is in the reporting forms, broken out by illness and whether the referral was due to a danger sign or treatment stockout; therefore, ICF included a referral indicator although Save the Children does not report it to WHO.

After further review of the village clinic reporting forms against the indicators that Save the Children included in its PMF, ICF tweaked the indicators selected from the PMF so that they reflected information available through the village clinic reporting forms and created a referral indicator. Table 4 lists the final set of indicators assessed. This process reinforces a recommendation made in earlier sections: Adjust project indicators to better align with routine information available through the national iCCM reporting system.

4.2 Availability, Completeness, and Timeliness of Reports

4.2.1 Definitions

Availability of reports and completeness of the data needed to calculate the four indicators assessed in the DQA were measured across levels and months. Timeliness could not be assessed because the forms do not note the dates that reports were received.

Availability at the facility level: An HSA's village clinic reporting form (Form 1A) is available at the health facility for review.

Availability at the district level: A facility's village clinic reporting form (Form 1B) is available at the district office for review.

Availability at the M&E unit level: A district's village clinic reporting form (Form 1C) is available at Save the Children's office for review.

Completeness at the facility level: An HSA's village clinic reporting form (Form 1A) is available for review at the facility; it contains all the necessary information for a specific indicator.

Completeness at the district level: A facility's village clinic reporting form (Form 1B) is available for review at the district office; it contains (1) all necessary information for a specific indicator and (2) information from all of the HSAs who report to that facility. If either or both of these conditions were not met, the report was not considered to be complete.

Completeness at the M&E unit level: A district's village clinic reporting form (Form 1C) is available for review at Save the Children's office; it contains (1) all necessary information for a specific indicator and (2) information from all of the HSAs who report in that district. If either or both of these conditions were not met, the report was not considered to be complete.

4.2.2 Availability and Completeness of Findings

Availability of village clinic reporting forms at all levels was high. Form 1A was available for review at the facilities visited in 96 percent of all cases (149/156). Form 1B also was available for review at the visited district offices in 96 percent of all cases (270/282). All districts' village clinic reporting forms (12/12)

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were available for review at the Save the Children office; however, availability of supervision checklists or supervision reporting forms was dismal. The forms were available for review at only 20 percent of the facilities (2/10).

Availability of village clinic registers was also high. In 95 percent of all cases (148/156), village clinic registers were available for review. In three instances, HSAs brought only their most current register to the facility for review, and it did not include data for October or November, or both, so cross-checks could not be performed for the missing months. In two instances, no data were available in the register for a given month.

Completeness of Form 1A reviewed at the facility level was generally good, but information used to cross-check the supervision indicator was notably less complete than for the other three indicators. Notably, in the Forms 1A reviewed, the data fields for new cases of malaria or fever, diarrhea, and fast breathing were all complete.

Because not all Forms 1A were available at the facility when Forms 1B were filled out, completeness of Forms 1B at the district level was consistently lower. Of the reports reviewed, some values were missing, but the larger issue concerned reports submitted to the district level without information from all HSAs in them. At the M&E unit, none of the Forms 1C was considered to be complete because each was missing data from at least one facility in the district.

Table 4 lists the results for availability of Forms 1A and 1B by the final set of indicators assessed.

Table 4. Report availability and indicator completeness at facilities and districts

HSA Village Clinic Reporting Forms (Form 1A)

| | Reports Available (%) | Complete (%) | | | |
		New cases (INDICATOR 1)	Referrals (INDICATOR 2)	Stockouts > 7 days (INDICATOR 3)	Supervision (INDICATOR 4*)
Ntchisi	94	100	95	100	66
Mzimba North	100	100	100	100	95
Ntcheu	100	100	100	100	79
Dedza	93	100	95	95	28
District Summary	97	100	97	98	67
Overall Average	96	100	96	98	62

Facility-Level Village Clinic Reporting Forms (Form 1B)

| | Reports Available (%) | Complete (%) | | | |
		New cases (INDICATOR 1)	Referrals (INDICATOR 2)	Stockouts > 7 days (INDICATOR 3)	Supervision (INDICATOR 4*)
Ntchisi	100	61	61	61	61
Mzimba North	100	82	82	81	81
Ntcheu	94	79	79	76	71
Dedza	94	80	77	78	70
District Summary	96	78	77	76	71

* One HSA in Ntcheu was using the old version of Form 1A, which does not track this information.

Recommendations to Save the Children and the MOH IMCI Unit:

- At the facility level, promote the importance of regular supervision visits as well as the importance of checking HSA's data among supervisors to ensure that HSA reports are complete, paying particular attention to the self-reported supervision field and the supply management table.

- Because the supply management table seems to be one of the more confusing parts of the village clinic reporting forms for those who fill it out, consider whether all the data in the supply management table are necessary, particularly as c-Stock becomes more widely implemented throughout the project area.

- As already recommended in the Systems Assessment section, structure and document a standard procedure for receiving, verifying, and editing village clinic reporting forms at each level of the reporting system.

4.3 Data Verification

ICF calculated verified site count (VSC) ratios to compare data across Forms 1A and 1B; adjustment factors to compare data across Forms 1B and 1C, and verification factors (VFs) for each indicator in each district and across the RAcE Project area. Additionally, result verification ratios were calculated for Save the Children's M&E Unit, and cross-checks compared data in HSA registers to Form 1A.

4.3.1 Definitions

Facility VSC Ratio: $\dfrac{\Sigma \text{ Counts from HSA reports (Form 1A) or Supervision forms}[5]}{\text{Total count reported by the facility in Form 1B}}$

Unadjusted District VF: $\dfrac{\Sigma \text{ Counts from HSA at selected facilities (Form 1A)}}{\Sigma \text{ Counts reported by selected facilities (Form 1B)}}$

Adjustment Factor: $\dfrac{\Sigma \text{ Counts from all facilities in a district (Form 1B)}}{\text{Total count reported by the district in Form 1C}}$

Adjusted District VF: Unadjusted District VF * Adjustment Factor

Weighted District Average: [6] $\dfrac{\Sigma \text{ (Adjusted District VF * } \Sigma \text{ Counts from HSA reports at selected facilities [Form 1A] for the district)}}{\Sigma \text{ Counts from HSA reports (Form 1A) at selected facilities across all districts}}$
for the RAcE Project Area

M&E Unit Result: $\dfrac{\Sigma \text{ Counts from district reports (Form 1C)}}{\text{Total count contained in Save the Children's project data files}}$
Verification Ratio

Cross-check Indicator 1 (%): $\dfrac{\text{Number of instances in which the } \textit{total number of new cases} \text{ reported for fever/malaria, fast breathing, and diarrhea in the village clinic register all match the values in Form 1A for a given month}}{\text{Total number of possible matches (or the sum of the number of months for which registers and Form 1A are available to perform the cross-check for each HSA)}}$
(All fields)

Cross-check Indicator 1 (%): $\dfrac{\text{Number of instances in which the } \textit{individual number of new cases} \text{ reported for fever/malaria, fast breathing, and diarrhea in the village clinic register all match the value in Form 1A for a given month}}{\text{Total number of possible matches (or the sum of the number of months For which registers and Form 1A are available to perform the cross-check for each HSA times three, to account for the three illnesses)}}$
(Individual fields)

Cross-check Indicator 2 (%): $\dfrac{\text{Number of instances in which the } \textit{total number of referrals} \text{ due to danger signs and stockouts reported for fever/malaria, fast breathing, and diarrhea in the village clinic register all match the values in Form 1A for a given month}}{\text{Total number of possible matches (or the sum of the number of months for which registers and Form 1A are available to perform the cross-check for each HSA)}}$
(All fields)

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[5] Supervision forms provided values for indicator 4.
[6] Although we used a purposive sample of 10% of facilities in the RAcE Project area, we selected those facilities randomly and thus believe our findings are applicable, for the purpose of recommending project-wide strengthening efforts, to the entire RAcE Project area.

Cross-check Indicator 2 (%):
(Individual fields)

Number of instances in which the *individual number of referrals* due to danger signs and stockouts reported for fever/malaria, fast breathing, and diarrhea in the village clinic register all match the value in Form 1A for a given month

Total number of possible matches (or the sum of the number of months for which registers and Form 1A are available to perform the cross-check for each HSA times six, to account for the three illnesses and two reasons for referrals)

Cross-check Indicator 4 (%):

Number of instances in which the value reported by the HSA in Form 1A matches the value reported in Form 1B

Total number of possible matches (or the sum of the number of months for which Form 1A and Form 1B are available to perform the cross-check for each facility)

Cross-checks could not be performed for the stockout indicator (Indicator 3) because documents where HSAs systematically record stockouts lasting more than seven days before entering the information into Form 1A did not exist. VSC ratios, VFs, and result verification ratios greater than 1 indicate under-reporting, meaning, the sum of the values reported *to* a level is greater than the value reported *by* the level. Conversely, VSC ratios, VFs, and result verification ratios less than 1 indicate over-reporting, meaning, the sum of the values reported *to* the level is less than the value reported *by* the level. There are various reasons why the data may not match across forms, including errors in calculation or transcription, or corrections made to errors discovered but not corrected on the sublevel form. These measures constitute an overall indicator of data accuracy throughout the system, and while we can distinguish where inaccuracies occur, it is difficult to determine if corrections are made along the way and how that impacts accuracy.

4.3.2 Findings

Facilities

At the selected health facilities, the values reported by the facilities in Form 1B were compared to the sums of the values reported by HSAs in Form 1A for three of the indicators: (1) new cases, (2) referrals, and (3) stockouts greater than seven days. The supervision indicator was assessed by comparing the values in Form 1B to what was in the supervision checklist or summary forms. VSC ratios were calculated for all facilities for each indicator (Table 5). Additionally, unadjusted district verification factors were calculated by summing the numerators for the indicators in Forms 1A and 1B and dividing by the sum of the denominators in those Forms, for each project district (Table 6).

New cases of illness (Indicator 1)

ICF found that new cases of illness was the indicator reported most accurately across selected facilities in Form 1A and Form 1B. VSC ratios calculated for new cases of illness were the most consistent and closest to 1, indicating that the numbers HSAs report to the facilities are similar to those reported by the facilities. Two facilities slightly over-reported new cases (VSC ratios of 0.99 and 0.97), but the remaining

facilities either reported the same number or under-reported, with VSC ratios ranging from 1.00 to 1.34). The biggest differences in Forms 1A and 1B were in Dedza district.

Referrals (Indicator 2)

The under and over-reporting of referrals at the facility level was more pronounced than that of new cases, with VSC ratios ranging from 0 to 7.38. Only half of the facilities had VSC ratios within the 0.90 to 1.10 range.

Stockouts lasting more than seven days (Indicator 3)

Half of the facilities selected reported that none of their HSAs had any stockouts that lasted longer than seven days during the quarter assessed. For three facilities this agreed with what was reported by HSAs on Form 1A, while two facilities under-reported the values in Form 1A. Among the remaining facilities, one VF was 1.00, indicating agreement between Form 1A and Form 1B, while the VFs for the other four facilities, ranging from 1.20 to 5.00, all indicated under-reporting, with the disagreement ranging from 2 to 16 HSAs with stockouts lasting longer than seven days.

In general, ICF found that information in the Supply Management section of Forms 1A and 1B, where stockouts lasting longer than seven days (Indicator 3) are reported, was often recorded incorrectly. During interviews, some SHSAs even mentioned that the last two columns on Form 1B (regarding stockouts for more than seven days) were confusing. In Form 1A, HSAs are supposed to indicate whether each drug listed was out of stock for more than seven days during the reporting month with a Yes (Y) or No (N), but sometimes answers were indicated with 0s or 1s in the form. Other times, the values were the opposite of what would be expected after looking at other information (any stockout) in the table, or this field was left blank. Meanwhile, in Form 1B, facility staff are supposed to indicate the number of HSAs who had a stockout of a medicine greater than seven days, but some forms were found to contain only Yes or No responses, totals that were not plausible based on other information in the Supply Management table, or fields were left blank.

Supervision (Indicator 4)

Supervision data for sampled facilities were available in Form 1B, but because supervision checklists and summary forms were rarely available for review, the number of HSAs supervised (Indicator 4) could be traced back to its source document in only two cases. For these two facilities, agreement between data sources was good (VSC ratios of 1.00 and 1.33); there was perfect agreement in one case, and in the other, the facility under-reported the number of HSAs supervised by one HSA. The number of HSAs that supervisors reported supervising during the previous quarter in Form 1B varied by facility, but ranged from 0 to 14 (keeping in mind that double counting is possible and the number of HSAs reporting to a facility varied from 2 to 13). For an idea of the level of supervision that the data in Form 1B indicate, if one visit for each HSA is assumed, 60 percent of all HSAs at the audited facilities received a supervision visit during the quarter.

During interviews, one SHSA reported that he had no completed supervision forms for the months being assessed because he did not have transport to perform supervision visits. At another facility, the SHSA looked for, but could not locate, the forms, and at another the SHSA reported that the forms they closet that could not be accessed because another meeting was in progress in that same room.

HSAs are supposed to receive supervision and mentorship from SHSAs and mentors (often medical assistants or nurses) at least one time a quarter. All but one interviewed HSA reported receiving supervision within the previous three months, with an average of three visits (ranging from one to six visits) over the quarter and one visit in the past month (ranging from zero to three visits). Half of the HSAs reported receiving support in completing their registers and forms outside of supervision and mentorship sessions. Sources of support cited included more experienced HSAs, medical assistants, health facility meetings, and ad hoc phone calls to SHSAs.

Table 5. Health-facility-level verified site count ratios

District	Health Facility	New Cases (INDICATOR 1)			Referrals (INDICATOR 2)			Stockouts > 7 days (INDICATOR 3*)			Supervision (INDICATOR 4*)		
		Form 1As	Form 1B	VSC ratio	Form 1As	Form 1B	VSC ratio	Form 1As	Form 1B	VSC ratio	Sup. Form	Form 1B	VSC ratio
Ntchisi	Kangolwa	2,426	2,499	0.97	0	115	0	23	17	1.35	N/A	0	N/A
Ntchisi	Khuwi	2,532	2,471	1.02	48	63	0.76	2	0	0.00	N/A	14	N/A
Mzimba	Mzuzu	1,968	1,997	0.99	99	92	1.08	0	0	1.00	10	10	1.00
Mzimba	Khuyukuyu	1,124	1,125	1.00	25	25	1.00	0	0	1.00	4	3	1.33
Ntcheu	Lizulu	362	338	1.07	15	6	2.50	12	10	1.20	N/A	2	N/A
Ntcheu	Phanga	775	775	1.00	17	19	0.89	7	7	1.00	N/A	1	N/A
Ntcheu	Ntcheu Dist. Hosp.	457	457	1.00	1	2	0.50	0	0	1.00	N/A	6	N/A
Dedza	Mjini	781	581	1.34	155	21	7.38	4	0	0.00	N/A	2	N/A
Dedza	Kaphuka	1,162	1,100	1.06	22	21	1.05	20	4	5.00	N/A	1	N/A
Dedza	Mphunzi	692	639	1.08	11	11	1.00	9	7	1.29	N/A	7	N/A

* In Ntcheu and Dedza districts, the values for Indicators 3 and 4 include only those that were found to be feasible based on other information in the Supply Management and Supervision sections of Forms 1A and 1B and recorded correctly. In Ntchisi and Mzimba North districts, the values include all those recorded in the forms. In Form 1A, 0 was considered to be No and 1 was considered to be Yes, if numbers were recorded instead of Yes/No.

Cross-checks

Cross-checks were performed as described in Section 2.4.3. Information HSAs entered into the village clinic registers was compared to the data that they reported in Form 1A for new cases (Indicator 1) and referrals (Indicator 2) (see Figures 4 and 5). Cross-checks were also performed to compare supervision information facility staff reported in Form 1B to supervision information HSAs reported in Form 1A for the supervision indicator assessed (Indicator 4) (see Figure 6). Cross-checks could not be performed for the stockout indicator (Indicator 3) because documents where HSAs systematically record stockouts lasting more than seven days before entering the information into Form 1A did not exist.

Cross-checks revealed the following:

- Data recorded in the village clinic registers for new cases and referrals often did not match the data in Form 1A.
- It was considerably more likely that data reported in Form 1A matched the data in the village clinic register for one or two of the three illnesses (cross-check 2) rather than for all three in a given monthly 24eport (cross-check 1) (see Figures 4 and 5).
- Often data discrepancies were not large, but in some instances the discrepancies were extremely large. These instances seemed to be particular to certain HSAs.
- The cross-check results for referrals (Indicator 2) were better than for new cases of illness (Indicator 1), likely because of the number of referrals was substantially smaller than the number of new cases. Often the number of referrals due to stockouts was zero.
- About half the time the number of HSAs that received supervision in a given month as reported by facility staff matched the number of HSAs who self-reported that they were supervised during that same month.
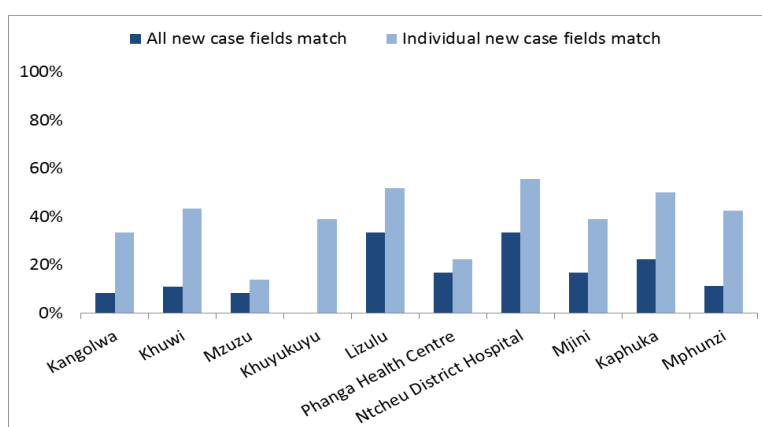

Figure 4. Indicator 1 cross-check results by health facility: New cases reported in Form 1A compared with the village clinic register
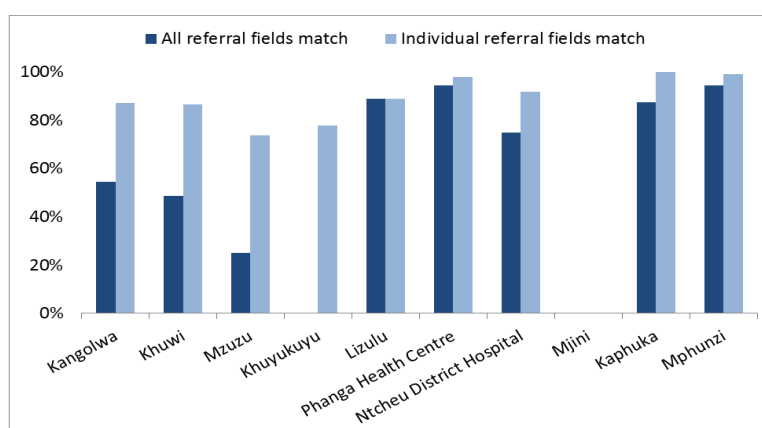

Figure 5. Indicator 2 cross-check results by health facility: Referrals reported in Form 1A compared with village clinic register
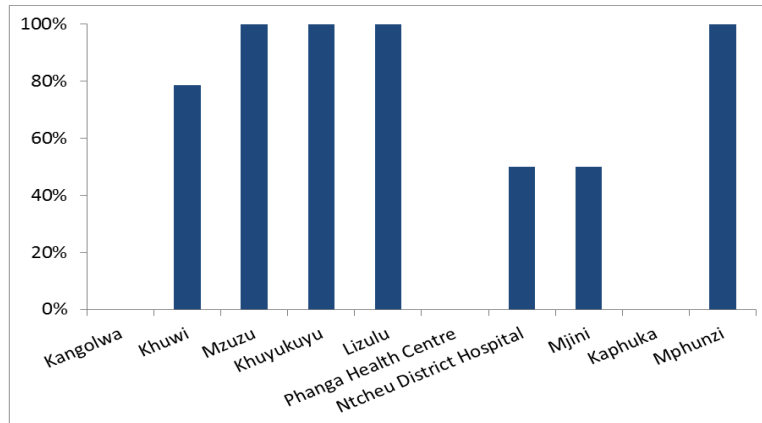
Figure 6. Indicator 4 cross-check results by health facility: Report by supervisors compared with aggregated HSA self-report in Form 1B

The SHSA at the Kangolwa health center did not perform any supervision visits during the quarter under review, and HSA reporting to that health center did not self-report receiving any supervision visits. The SHSA at both Phanga and Kaphuka health centers reported supervising one HSA, but no HSA self-reported receiving any supervision visits.

Districts

Table 6 indicates that, across districts in the RAcE Project area, there is over-reporting at the district level (average VF of 0.88) while there is under-slight under-reporting at the facility level (average VF of 1.02). Meanwhile result verification ratios for referrals and stockouts show more agreement at the district level compared to the VSC ratios at the facility level (0.96 vs. 1.23 and 1.26 vs. 1.73 for referrals and stockouts, respectively). Further, values for the supervision indicator showed that there was both over and under-reporting at the district level, but that there was generally good agreement; VFs ranged from 0.94 to 1.13.

The district (result verification) ratios were used as adjustment factors to calculate adjusted district VFs, which were in turn used to calculate the weighted district average for each indicator for the RAcE project area. As can be seen in Table 6, the weighted district average for new cases of illness was 0.91. For referrals, it was 1.83, and for stockouts lasting longer than seven days, it was 2.54. A weighted district average could not be calculated for supervision visits because the source documents were unavailable at 80 percent of the selected facilities.

These data indicate that the data entered by HSAs in Form 1A for new cases are reported more accurately in Form 1C than are the data for referrals and stockouts.

Table 6. District verification factors and weighted averages

New cases (Indicator 1)	Ntchisi	Mzimba North	Ntcheu	Dedza	District Summary
Sum of counts from HSA at selected facilities (Form 1A)	4,958	3,092	1,594	2,635	12,279
Sum of counts reported by selected facilities (Form 1B)	4,970	3,122	1,570	2,320	11,982
Unadjusted District VF	1.00	0.99	1.02	1.14	1.02
Sum of counts from all facilities in district (Form 1B)	28,874	16,151	22,588	22,505	90,118
Sum of counts reported by district (Form 1C)	30,330	22,483	26,847	22,847	102,507
Adjustment Factor	0.95	0.72	0.84	0.99	0.88
Adjusted District Verification Factor	0.95	0.71	0.85	1.12	0.90
Weighted District Average for RAcE Project Area					0.91
Referrals (Indicator 2)	Ntchisi	Mzimba North	Ntcheu	Dedza	District Summary
Sum of counts from HSA at selected facilities (Form 1A)	118	124	33	188	463
Sum of counts reported by selected facilities (Form 1B)	178	117	27	53	375
Unadjusted District VF	0.66	1.06	1.22	3.55	1.23
Sum of counts from all facilities in district (Form 1B)	917	328	350	629	2,224
Sum of counts reported by district (Form 1C)	965	304	325	716	2,310
Adjustment Factor	0.95	1.08	1.08	0.88	0.96
Adjusted District Verification Factor	0.63	1.14	1.32	3.12	1.19
Weighted District Average for RAcE Project Area					1.83
Stockouts > seven days (Indicator 3)*	Ntchisi	Mzimba North	Ntcheu	Dedza	District Summary
Sum of counts from HSA at selected facilities (Form 1A)	25	0	19	33	77
Sum of counts reported by selected facilities (Form 1B)	17	0	17	11	45
Unadjusted District VF	1.47	1	1.12	3.09	1.71
Sum of counts from all facilities in district (Form 1B)	83	12	55	133	283
Sum of counts reported by district (Form 1C)	52	9	43	120	224
Adjustment Factor	1.6	1.33	1.28	1.11	1.26
Adjusted District Verification Factor	2.35	1.33	1.43	3.33	2.16
Weighted District Average for RAcE Project Area					2.54
Supervision (Indicator 4)*	Ntchisi	Mzimba North	Ntcheu	Dedza	District Summary
Sum of counts from HSA at selected facilities (Form 1A)	N/A	14	N/A	N/A	14
Sum of counts reported by selected facilities (Form 1B)	14	13	9	10	46
Unadjusted District VF	N/A	1.08	N/A	N/A	0.3
Sum of counts from all facilities in district (Form 1B)	77	138	84	94	393
Sum of counts reported by district (Form 1C)	80	137	89	83	389
Adjustment Factor	0.96	1.01	0.94	1.13	1.01
Adjusted District Verification Factor	N/A	1.08	N/A	N/A	0.31
Weighted District Average for RAcE Project Area					N/A

In Ntcheu and Dedza districts, the values for Indicators 3 and 4 include only those that were found to be reasonable based on other information in the Supply Management and Supervision sections of Forms 1A and 1B and recorded correctly. In Ntchisi and Mzimba North districts, the values include all those recorded in the forms. In Form 1A, 0 was considered to be No and 1 was considered to be Yes, if numbers were recorded instead of Yes/No.

Reviewing Forms 1B submitted to the district office confirmed problems with recording stockout information across numerous facilities; it was not an isolated issue at some of the selected facilities. Ntcheu district, for example, had 14 instances (15 percent) in which the stockout data were incorrectly reported by facilities, 6 instances in which Form 1B was missing, and 2 instances in which values were missing. Dedza district had 21 instances (22 percent) in which the stockout data were incorrectly reported by facilities or missing and 6 instances in which Form 1B was missing.

Save the Children's M&E Unit

In addition to looking at the village clinic registers and Form 1A, Form 1B, and Form 1C, Save the Children's data files were assessed. The numbers in the districts' Forms 1C were larger that the numbers in Save the Children's data files for three of the four indicators (see Table 7). The number of new cases reported by the districts were substantially larger than the number in Save the Children's data files, in large part due to a formula error that ICF discovered when reviewing Mzimba North's Excel workbook. The assessment showed that the values reported for diarrhea and fast breathing in Mzimba North were systematically too large. When it was pointed out to the District RAcE project coordinator, he identified and corrected the error in the Excel file, and then the values reported to the district office in Mzimba North (90,118 new cases) matched the values reported by the district, and the sum of the counts reported by all districts dropped to 96,175 new cases, while the result verification ratio dropped to 1.04.

Table 7. Verified site counts for Save the Children's M&E Unit

Indicator	Sum of Verified Counts From District (Form 1C)	Sum of Counts in Save the Children's database	M&E Unit Result Verification Ratio
New cases (Indicator 1)	102,507	92,075	1.11
Referrals (Indicator 2)	2,272	2,234	1.02
Stockouts > seven days (Indicator 3)	224	256	0.88
Supervision (Indicator 4)	389	342	1.14

Values may have been larger in the reports generated at the district level, and thus under-reported to Save the Children by the districts, if facilities submitted data late and they were not included in the version of Form 1C that was shared with Save the Children. It is unclear why the stockout indicator value is greater in Save the Children's files than it is in the reports generated in the districts.

Of the indicators assessed in the DQA, only new cases of illness (Indicator 1) are included in Save the Children's quarterly reports to WHO. Save the Children reported that for October through December 2013, HSAs reported 96,228 new cases of fever or malaria, fast breathing, and diarrhea, which is 4,153 more cases than in their data files at the time of the DQA. Several possible explanations can account for this difference. Even after the reporting deadline for the quarter passes, Save the Children continues to collect data as they become available. Districts reportedly send updated files on a rolling basis if they receive outstanding or updated reports from health facilities. Save the Children's quarterly report was not due until 10 days after we visited the office and inspected the data files, so Save the Children may have received updated information from districts after the DQA. Save the Children may have also found

and corrected errors in formulas contained in the files received from the districts, but because corrections are not systematically documented, it is unknown if this happened.

4.3.3 Understanding and Perception of Tools and Data Use

Understanding and Adequacy of the Data Collection Tools

Although the majority of HSAs did not report any difficulties understanding or completing their forms, others involved in the data generation process stated that problems exist in the data reported at all levels, but particularly at the HSA level. The most commonly reported issues were missing data, miscalculations, and incorrect transfer of totals in reporting data. The following specific difficulties were mentioned:

- Reporting incorrect catchment area populations on reporting forms
- Reporting incorrect data by age group on reporting forms
- Confusion as to whether 2– to 4–month-old children with fever should be recorded as "new cases" or "referrals" in registers and on reporting forms
- Confusion as to what should be recorded for drug availability and use (particularly stockout information)
- Not entering follow-up information in the village clinic register
- Recording incomplete client names in the village clinic register

Perceived Factors That Affect Tools Use

The most commonly reported factor perceived to affect tool use across all levels was inaccurate and incomplete data provided by HSA in village clinic registers and Forms 1A, leading to inaccuracy in other reporting forms. Respondents suggested this might result from HSA's lack of understanding on how to complete the forms or aggregate the data, neglect in recording data, lack of time or commitment, or lack of supervision and mentorship. Notably, HSA reported these factors as well. Other commonly cited factors were a shortage of forms and poor organization of loose forms.

Understanding of Consequences of Poor Quality Data

The majority of respondents demonstrated an understanding that poor data quality would negatively impact program planning and the allocation of resources, specifically the supplies of CCM drugs. Some noted that an oversupply of drugs could lead to drugs expiring, while an undersupply could lead to an increase in illnesses and deaths.

Opinions on the Usefulness of Data Informing the Program

Many of the respondents thought that the data collected through the RAcE project are of good quality and useful for informing the program. Among HSA and facility-level respondents, only one FIC thought the data quality is not good. At the district level, ratings of the data quality were a bit more cautious. One district IMCI coordinator and two HMIS officers stated the data are not of good quality, two other respondents stated that the data were of good quality but could be better still, and two respondents stated that they did not feel qualified to rate the data quality. Two RAcE district coordinators noted that

they have seen improvements in data quality since RAcE began. Several SHSAs said they believe that their supervision and review of forms contributed to data quality.

4.4 Recommendations from the Data Verification Process

Recommendations to Save the Children and the MOH IMCI Unit:

- Ensure that supervision and mentorship of HSA occur regularly and that supervision includes a review of registers and reporting forms so that discrepancies can be discussed and corrected.
- Document a standard procedure for completing Forms 1A, 1B, and 1C and ensure the procedure is communicated to all personnel involved in the data generation process at each level, including the following instructions:
    - How HSAs should mark fields in their registers. Currently, some circle all non-applicable fields and check all applicable fields, while others check all applicable fields and leave all other fields blank.
    - How HSAs should make corrections in their registers. Currently some of the edits made are not clear.
    - For all M&E staff, how to enter fever cases among children 2–4 months old in registers and reporting forms.
    - How to document cases of illness that are not treated. For example, if an HSA indicates in his register that a child has diarrhea, but does not mark that the child received zinc or ORS and also does not mark that the child was referred because of the diarrhea, should the HSA include the child as a case of diarrhea? Some HSAs seemed to while others did not.
- Develop a standard procedure for making corrections to forms to ensure data is corrected in each form, at all levels, including the original source forms.
- Reinforce page summary use in the village clinic registers during supervision visits, trainings, and review meetings.
- Encourage data use at points of collection and aggregation (e.g., TRAction tool).
- Reduce the number of transcriptions (e.g., carbon copies of forms).
- Add a data verification step during computer entry.
- Integrate RAcE project reporting with DHIS-2.
- Put the supervision checklist and summary forms in a booklet.
- Ensure everyone is using the current register and reporting forms.
- Add fields to measure timeliness (e.g., date reported and date received).
- Adjust Save the Children's PMF to better reflect information that is available through the national iCCM reporting system.

5. SUMMARY OF FINDINGS AND RECOMMENDATIONS

Save the Children is working closely with the MOH IMCI unit to support each aspect of Malawi's national iCCM program through training curricula, data collection and reporting tools, and reporting structure. The reporting system reaches from the community level. Data from HSAs are aggregated systematically

at facilities and then passed to district offices. Facility data is then aggregated at district health offices and reported monthly to the national level and to Save the Children.

Looking at the data that was traced and verified broadly, agreement between data in Form 1B and 1C was better than agreement between data in Form 1A and Form 1B. Furthermore, crosschecks indicated that HSAs make many errors when filling out Form 1A using the data from their village clinic registers; in some instances these differences were substantial, but in most instances they were not.

New cases of illness was the most accurately reported indicator across the four districts when looking at Form 1A and 1B for the audited facilities. New cases and supervision were the most accurately reported indicators across the four districts when looking at Form 1B and 1C. The referral and stockout indicators showed much more variability among the districts both when comparing Form 1A to 1B and Form 1B to 1C. Stockout information was often reported incorrectly on or missing from Forms 1A and 1B because staff completing the forms were not certain of the correct procedure. It is less clear why the numbers of referrals—particularly in Form 1A and 1B differed substantially in two districts.

The numbers reported for new cases (range: 338 to 2,532) at the sampled facilities were much larger than for referrals (range: 2 to 155), but more accurately reported through the system, indicating that it may not be the aggregation and transfer of large numbers causing discrepancies at the facility level. It could be that facility staff make corrections to Form 1A data on Form 1B but not on Form 1A. It is also possible that facility staff who complete Form 1B pay more attention to new cases than to referrals because replenishment of stock is tied to the number of cases treated, a point acknowledged by both facility staff and HSAs.

ICF has generated several recommendations based on the findings of the systems assessment and data verification, outlined in each section above and summarized here. Key informants also provided recommendations for better implementation of RAcE, with the most common being to provide transportation and fuel for supervisors to visit HSAs at their village clinics and to provide incentives for HSAs. Additional recommendations provided by key informants are presented in Annex 6.

ICF was unable to assess timeliness of reporting, although our findings show good report availability in all RAcE districts; however, ICF encourages Save the Children, through RAcE district coordinators, to continue to ensure that reporting forms are available at the facility and village clinic level and strive for timely and complete submission of all reporting forms.

The data verification process identified gaps in completeness, integrity, and reliability of the data reported. To address gaps and improve data quality, ICF recommends that Save the Children support the MOH IMCI unit to develop, document, and implement standard procedures for each level of the iCCM program reporting system to improve quality completion of village clinic registers and reporting forms and to address reporting issues systematically. In implementing standard procedures, the iCCM program should provide more support to HSAs and district-level MOH staff to complete the village clinic forms and registers. Specifically, ICF makes these recommendations to the iCCM program, with RAcE support:

- Ensure that one standard, documented way is used to fill out the village clinic reporting forms and ensure that the documentation reaches all levels of the reporting system.
- Develop, document, and implement a standard procedure for dealing with reporting issues, including late submission of reports, missing values, incorrect aggregation, and implausible values.
- Support HSAs and MOH staff in completing the village clinic forms and registers:
    - Provide refresher trainings for HSAs and MOH staff who have not been trained in several years.
    - Provide more supervision to HSAs who have trouble filling out their registers and reporting forms.
    - Establish and systematize regular review meetings at facilities and districts and ensure that a part of these meetings are dedicated to reviewing data and discussing data issues.

At the time of the DQA field work, Save the Children was beginning a process of working with the MOH to fully integrate the national iCCM program with the computer-based DHIS-2. ICF recommends that RAcE districts be prioritized for such DHIS-2 data integration, if it requires pilot testing before national roll-out.

ICF will work collaboratively with Save the Children and WHO to adjust RAcE Malawi Performance Monitoring Framework indicators to better align with routine information available through the national iCCM reporting system. In doing this, we will consider and avoid the possibility of double counting (or acknowledge this appropriately in indicator definitions) and improve clarity of data reported by defining numerators, denominators, and source fields on the village clinic reporting forms.

6. ANNEXES

6.1 Annex 1. Final DQA Agenda

Malawi DQA
Final Agenda

January 19–February 31

Saturday, January 18
  Kirsten: Arrive in Lilongwe
Sunday, January 19
  Work/rest day
Monday, January 20
  Save the Children M&E Unit
  Inbrief with stakeholders
Tuesday, January 21
  Mjini, Dedza (2 HSAs)
Wednesday, January 22
  Kirsten: Mzuzu, Mzimba (5 HSAs)
  Mischeck: Kaphuka, Dedza (6 HSAs)
Thursday, January 23
  Kirsten: Khuyukuyu, Mzimba North (2 HSAs)
  Mischeck: Mphunzi, Dedza (6 HSAs)
Friday, January 24
  Kirsten: Mzimba North District Office
  Mischeck: Dedza District Office
Saturday, January 25
  Work day in Lilongwe
Sunday, January 26
  Rest Day
Monday, January 27
  Kirsten: Kangolwa, Ntchisi (10 HSAs)
  Mischeck: Lizulu, Ntcheu (3 HSAs)
Tuesday, January 28
  Kirsten: Khuwi, Ntchisi (13 HSAs)
  Mischeck: Ntcheu District Hospital* (3 HSAs)
   * As a facility and district office
Wednesday, January 29
  Kirsten: Ntchisi District Office
  Mischeck: Phanga, Ntcheu (2 HSAs)
Thursday, January 30
  Work day with Mischek in Lilongwe
Friday, January 31
  Debrief with Stakeholders

6.2 Annex 2. Key Informant Interview Guide[7]

Rapid Data Quality Assessment – Qualitative Component

Key Informant Interview Guide: Malawi

6.2.1 Part 1: Questions on the implementation of the RAcE project

Interviewer name: _____

Time and location of the interview:

Date of Interview			
Start time		End time	
Health Province/District		Health facility	
Place of interview			

Person Interviewed:

Name					
Job Title/Role					
Data collection level	M&E Unit	District	Facility	SHSA	HSA
Please can you tell me about you overall responsibilities:					

6.2.2 Part 2: Questions on the implementation of the RAcE project

I would like to ask a number of questions about the implementation of the RAcE project from its start date until today. The focus of our discussion today will be on the monitoring and evaluation of the project. I would like to better understand the quality of the data being collected to inform the implementation of the project.

Note to interviewer: Please make sure you don't lead the responses. Let the interviewee respond and probe when necessary.

1. Have you been involved in any capacity in the implementation of the RAcE project in Malawi?
   - ☐ Yes
   - ☐ No

Note to interviewer: If No, skip to question 4. If the informant has no knowledge of RAcE and is unable to answer questions in Part 3, continue to Part 4 focusing on CHW reporting tools.

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[7] The KII guide was adapted as needed for use with interviewees who had supervisory roles or who were less involved in the data generation process

2.   If involved, please can you describe the tasks involved in your work?

3.   How long have you been part of the implementation of RAcE?

4.   From you understanding what is the objective of the RAcE project in Malawi?

6.2.3 Part 3: Questions related to data quality

Understanding of responsibility

5.   Can you tell me about your specific roles in relation to the data generation process of the RAcE project?

6.   How were these roles communicated to you?

a)   In writing or verbally?
b)   Who communicated them to you?

7.   What are your impressions about these roles, in terms of:

a)   Workload?
b)   Qualification and skills you have?

8.   What do you think is the most important part of your work?

9.   Any suggestions you might have regarding these roles?

Understanding of the data collection tools

10.   What are the different data collection tools that you are using:

Note to interviewer: *Let the respondent list the tools individually and describe the purpose of each tool. Note that protocols and forms should be discussed separately. Probe the respondent to make this difference. (Ask (a), (b), and (c) below about each tool listed.)*

a)   What kind of information is collected?
b)   What is its purpose?
c)   Which part of the tools draws your attention the most when you are using them or filling them out?

11.   What do think about these tools, in terms of?

a)   Layout
b)   Number of tools
c)   Ease of filling them out
d)   Understandable

12.   What factors do you think can affect the proper use of these tools?

Adequacy of training received to fill out the data collection forms and supervisory support

13.   Did you receive any training on how to fill out the forms?

☐   Yes

☐   No

14. If yes, please list the training you attended:

Title of training	Target	# of attendees	Start date	End date

15. How useful did you find the training(s) you attended once you began filling out the forms in your regular work?

16. Any suggestions you might have regarding the training?

17. Did you receive any supervision to help you in filling out the forms?

   ☐ Yes

   ☐ No

   a) If yes:

      a. How many supervision visits you received in the past month? _____

      b. How many in the past three months? _____

   b) What do think about the supervision you received in relation to filling out the forms?

18. Have you encountered any difficulties with filling out the forms?

   a) When you are facing this problem in filling out the forms, do you get the support you need? If yes, what kind of support? Is the support adequate to your needs?

19. Did you receive a manual to help you in filling out the forms?

   ☐ Yes

   ☐ No

   a) If yes, have you used it? What do think about the manual in relation to filling out the forms? Is it helpful? Is it written in a language that is easy to understand?

   b) Have you received any support in filling out and submitting the forms?

   ☐ Yes

   ☐ No

   c) If yes, what kind of support? Is the support adequate to your needs?

Adequacy of the data collections forms

20. You previously described the information each form is supposed to collect. Now I would like to know your opinion about the appropriateness of the forms in collecting the information they are supposed to collect.

   a) Not appropriate – What is missing? What is the issue? What should be improved?

   b) Appropriate – What do you like the most?

21. Do you have any other suggestions to improve the adequacy of the forms?

Understanding of the purposes of data being collected

22. Can you tell me where all these data go once they have been collected?

23. From your perspective, can you tell me why all these data are being collected?

24. Who do you think benefits most from the data being collected?

25. What do you think are some of the consequences if the data collected are not of high quality?

26. Do you have any other suggestions on how the data can be of better use to inform the implementation of the project?

Perception of the workload

27. What is the proportion of your work that is dedicated to completing the data collection forms?

28. Do you share these tasks and responsibilities with another team member? Are the tasks appropriately distributed?

29. Does the process of completing the forms interfere with your other tasks?

    a) How do you judge the time you have to complete the forms and review them?

    b) Note to interviewer: Please probe if the interviewee thinks his workload is too heavy-Does your workload affect the quality of the data? How?

6.2.4 Part 4: Ending the interview

30. Okay, you've given us a lot of valuable information about the data generation process from your perspective. Now I'd like to ask you about your recommendations. If you had the power to change things about the process, what would you change or do differently? What would you focus on first?

31. Suppose you were asked for your honest opinion on whether or not the information collected is of quality can help better inform the implementation of the program. What would you say?

6.2.5 Closing

That covers the things I wanted to ask. Is there anything you would like to add?

We will analyze the information you and others gave me and submitting a draft report to the organization. I'll be happy to send you a copy to review when it is ready if you want, if you are interested.

Thank you so much for your time. I've really learned a lot from you today and I really appreciate your insights.

<div align="center">END</div>

6.3 Annex 3. Key Informants Interviewed

Table A2. Number of Key Informants, By Role

Title, Role	Number interviewed	Distribution
Health surveillance agent (HSA)	10	One per facility
Senior HSA (SHSA)	10	One per facility
Facility-in-Charge	8	One per facility*
District IMCI officer	4	One per district
District HMIS officer	4	One per district
District RAcE project coordinator	4	One per district
Save the Children team leader	1	
Save the Children project M&E coordinator	1	
MOH IMCI unit M&E officer	1	
Total	**43**	

* No FIC was assigned to Ntcheu District Hospital or Phanga Health Center, and therefore only eight FICs were interviewed.

6.4 Annex 4. Key Informant Interview Results by Theme

Seven themes were explored in the key informant interviews. Results are described, by theme, below.

6.4.1 Knowledge and implementation of the RAcE project

All district and central level interviewees recognized the RAcE program name, as did all SHSAs; however, just over half of interviewed HSAs and FICs recognized the name. Those that did not recognize the name "RAcE" all were involved in the project, but knew it only as the "CCM program." For those respondents, "CCM program" was used throughout the interview instead of "RAcE."

The majority of the respondents knew that the objective of RAcE is to reduce the mortality and morbidity of children under age 5 years. Respondents at all levels also stated that providing access to health care is a primary program objective.

Implementation of RAcE

At the central level, Save the Children's M&E coordinator and the IMCI unit M&E officer both reported focusing on data management and data quality and providing support to districts in their roles while the Save the Children team leader reported focusing more on overall management and coordination, but her roles included ensuring data quality, monitoring the data flow, and guaranteeing supplies of data collection forms.

At the district level, the roles of the HMIS officer, IMCI coordinator, and RAcE district coordinator in the RAcE data generation process complemented each other; however, roles varied slightly by district. For example, in some districts the HMIS officer entered CCM data into DHIS-2 himself, whereas in other districts, clerks were available to enter the data and the HMIS officer had more of an oversight role. Within a district, collaboration seemed to ensure that reports were received from facilities, reviewed for quality, aggregated, and submitted to the IMCI unit and Save the Children's M&E unit.

District-level respondents commonly stated that their most important role was the supervision of staff at district and facility levels to ensure that CCM program reporting forms are filled out accurately and submitted in a timely fashion. Training staff and using data to inform drug orders were two other priorities.

At the facility level, both FICs and SHSAs reported one of their roles is to compile village clinic reports submitted by HSAs. FICs and SHSAs also reported commonly mentoring and supervising HSAs. FICs also reported ordering and distributing drugs, providing and accepting patient referrals, and treating children. SHSAs also reported ensuring data quality and accuracy, ordering drugs, and managing the village health clinic. SHSAs and FICs most commonly indicated that their most important roles in implementing RAcE were oversight of HSAs and ensuring village clinics have sufficient drug supplies.

All HSAs said their primary roles in RAcE are completing the village clinic registers and reporting forms, reporting drug supply information using c-Stock, and managing child cases of illness. While HSAs reported that they focused primarily on properly assessing and treating children, they stated that they

also oversee their catchment areas and educate their communities about various health topics (e.g., hygiene and sanitation).

6.4.2 Qualifications, Training, and Perceptions of Workload

Most HSAs and facility-level respondents felt qualified to perform their roles in RAcE. At higher levels, respondents generally felt capable, but when asked if they wish they had any additional training, many said that they wanted to learn more about data management, analysis, quality assurance, and reporting.

Respondents commonly suggested providing additional and refresher trainings at all levels to increase data analysis and management skills. A few respondents also recommended implementing and training staff on TRAction to help manage and control the quality of data. One SHSA suggested creating an SHSA exchange program so that SHSAs could visit other facilities to learn from each other and share experiences.

Most respondents found that the workload related to filling out the registers and reporting forms took a reasonable amount of time and did not interfere with other responsibilities. Many viewed their data management and reporting tasks as part of their regular work rather than an extra burden, and stated that they always made time for filling out the registers and forms. SHSAs and FICs often reported sharing their workload with peers (e.g., nurses or other medical assistants), while HSAs reported completing their registers and reporting forms by themselves. District-level respondents also discussed sharing the workload with each other, as well as with SHSAs and data entry clerks, and central-level staff reported receiving support from other M&E staff.

Although most found the workload manageable, a few cadres indicated otherwise. District IMCI coordinators, in particular, often stated that their workload was too heavy. They spend a substantial amount of time reviewing and completing reporting forms, in addition to managing health programs and treating patients. A few suggested hiring an additional staff member who could focus on managing health programs without being responsible for seeing patients. The Save the Children M&E coordinator also found the workload to be substantial, particularly when completing and revising results for Form 1C, which interfered with his ability to conduct supervisory visits.

6.4.3 Understanding and Adequacy of the Data Collection Tools

A majority of the respondents indicated that the tools (Appendix A) adequately collected information needed to monitor the program and were easy to use and understand. A couple of district IMCI coordinators thought Form 1A required that HSAs provide too much information, although HSAs did not report this. Some SHSAs also mentioned that the last two columns on Form 1B (stockouts for more than seven days) were confusing, and the text on the form was too small. Someone also stated that the registers are not reconciled with guidelines on managing malnutrition.

Although the majority of HSAs did not report difficulties understanding or completing their forms, respondents noted problems in the data reported at all levels, but particularly at the HSA level. The most commonly reported issues were missing data, miscalculations, and incorrect transfer of totals in reporting data. The following list includes some of the specific difficulties mentioned:

- Reporting incorrect catchment area populations on reporting forms
- Reporting incorrect data by age group on reporting forms
- Confusion as to whether children ages 2–4 months with fever should be recorded as "new cases" or "referrals" in registers and on reporting forms
- Confusion as to what should be recorded for drug availability and use (particularly stockout information)
- Not entering follow-up information in the village clinic register
- Recording incomplete client names in the village clinic register

Respondents reported paying special attention to several types of data: the administration and availability of CCM drugs, the number of cases treated and referred, and illness incidence. A few respondents at district and central levels also highlighted the importance of supervision and mentorship information.

Perceived Factors That Affect the Use of Tools

The most commonly reported factor perceived to affect tool use across all levels was inaccurate and incomplete data provided by HSAs in the village clinic registers and Forms 1A, which leads to inaccuracy in other reporting forms. Respondents suggested this might be due to HSAs' lack of understanding on how to complete the forms or aggregate the data, neglect in recording data, lack of time or commitment, or lack of supervision and mentorship. Notably, HSAs reported these factors as well. Other commonly cited factors were a shortage of forms and poor organization of loose forms.

Recommendations to Improve Data Collection Tools

Respondents, primarily at the district and central levels, provided many recommendations for improving the data collection tools, with one common recommendation: to increase the supply of reporting forms. Other recommendations included:

- Define acronyms on the reporting forms.
- Improve the supplies management table in the reporting forms.
- Make the total rows clearer for new cases, referrals, and deaths in Forms 1A, 1B, and 1C.
- Gray out the referral fields for children ages 2–4 months with fever.
- Reduce the amount of writing required on Form 1B.
- Combine the reporting forms into a booklet or electronic application.
- Combine the supervision checklist and summary forms into a booklet.
- Add space on the registers for follow-up assessment information.
- Add "Compiled by" and "Approved by" fields to Forms 1A, 1B, and 1C.

- Add c-Stock information to the village clinic register.
- Add a field for the child's name on the referral slip that the HSA keeps at the village clinic.
- Add a place for immunization information to the village clinic register.

6.4.4 Adequacy of Training, Supervision, Mentorship, and Other Support

Training Received for Completing Registers and Forms

All HSAs reported attending an initial week-long CCM training that included instruction on how to complete the village clinic register and reporting Form 1A. Eight of the 10 HSAs interviewed were first trained in CCM before the start of the RAcE project (sometime between 2008 and 2012), and of those HSAs, only three attended a refresher training (two in 2013 and one in 2011). Nine of 10 SHSAs reported attending an initial CCM training sometime between 2010 and 2013, and eight reported attending a three-day CCM supervision training during the same time. One SHSA missed the supervision training because it conflicted with another training. Six of eight FICs reported attending a three-day CCM mentorship training sometime between 2011 and 2013, while one reported attending only a one-day orientation and another reported attending only c-Stock and case management of acute malnutrition trainings. Only one reported attending an initial CCM training. Four HSAs (one HSA and two FICs) also reported attending a c-Stock training.

Staff at the district level most commonly mentioned participating in CCM, supervision, and mentorship trainings as facilitators or coordinators in 2012 and 2013, but they also were participants in a few instances. Refer to Appendix B for a full list of the reported trainings.

Recommendations on Trainings

Staff at the facility and community levels, in particular, found the trainings they attended to be helpful in teaching them how to complete the village clinic registers and reporting forms. Respondents generally thought the trainings were useful and many did not have recommendations for improvement, but among those who did, the most common recommendation was to increase the number of days to allow time for practical exercises and for facilitators to assess attendees' knowledge. Several stated that there was a substantial amount of information to get through, so it felt quite intense, and one respondent mentioned that the section on the reporting forms in particular felt rushed. One district-level respondent thought that the length of the trainings is adequate, but that they need to be better supplemented with regular supervision and mentorship. SHSAs suggested that review meetings help provide support to HSAs and should be more regular. SHSAs also made these recommendations:

- Add more content on the sick child recording form.
- Train more staff.
- Require nurses and medical assistants to attend the IMCI training before the CCM trainings.

Supervision and Mentorship

HSAs are supposed to receive supervision and mentorship from SHSAs and mentors, often medical assistants or nurses, at least one time per quarter. SHSAs and FICs also are supposed to receive quarterly supervision from the district level, and districts are supposed to receive similar supervision from the

central level. The frequency of supervision and mentorship sessions, however, seems to vary widely across the program area.

All RAcE district coordinators reported conducting supervision visits with facility staff and HSAs, although the number of visits in the previous quarter ranged from 6 to 31 of those who reported. Three of four district IMCI coordinators reported supervision as a responsibility, but one indicated that she was able to visit each facility only once in the previous year. Lack of time and money for transport fuel were common issues raised during interviews. Outside of structured supervision visits, many district-level respondents reported providing support to SHSAs and HSAs as needed, most commonly over the phone or in review meetings.

Only four SHSAs reported receiving supervision visits during the previous quarter, with an average of one visit a month among those who received at least one visit. One SHSA reported his last supervision visit was in May 2013, and another SHSA who was recently trained (September 2013) reported that while he had not yet received a visit, supervision was planned at his facility the following month. A few SHSAs mentioned receiving additional support in completing the village clinic reporting forms from a variety of sources, such as the district IMCI coordinator, district health officer, district RAcE coordinator, and FIC.

All but one HSA reported receiving supervision in the previous three months, with an average of three visits (ranging from one to six visits) over the quarter and one visit in the past month (ranging from zero to three visits). Only a few HSAs reported visiting health facilities to receive mentorship, but this question was not specifically asked about during interviews. Half of the HSAs reported receiving support in completing their registers and forms outside of supervision and mentorship sessions. Sources of support cited included more experienced HSAs, medical assistants, health facility meetings, and ad hoc phone calls to SHSAs.

Only two FICs reported receiving a supervision visit in the past three months; none had received one in the previous month, perhaps because of the holidays. Seven of eight FICs reported mentoring as a responsibility, although one had not yet started providing mentorship, and details about the number of HSAs mentored and frequency of mentorship sessions was not collected. One FIC mentioned receiving feedback on the mentorship forms from the district IMCI coordinator, while other FICs reported reviewing the village clinic reporting Form 1B compiled by the SHSA and discussing any data issues discovered.

Most of the district, facility, and community staff indicated using a help manual, although it was unclear if the help manual contained instructions on how to fill out the registers and reporting forms. District staff mentioned different items in reference to the manual, including job aids for supervision, training manual for Forms 1A, 1B, and 1C, and a checklist for completing forms. Of those reporting having a help manual, most found the manual to be useful, particularly for problem solving when having difficulties completing the forms, but several reported that they did not consult the manual too often.

6.4.5 Understanding the Purposes of Data Collection, Data Quality, and Data Use

Understanding the Flow of Data Collected

Respondents at all levels appeared to understand the flow of data. HSAs record data in village clinic registers, compile it at the end of every month, and send reports to the health facility. HSAs' data are aggregated at the facilities, then sent the district, and then to the central level.

Understanding the Purpose of Data Collected

Respondents had similar perceptions of the purpose of the data collected. They most commonly discussed using the data to order the correct amounts of supplies and monitor the progress of program indicators. Other purposes mentioned included providing information to donors, understanding the activity and workload at various levels, informing the design of preventive interventions, understanding what is going well and what could be improved, and addressing gaps.

Perceived Benefits of Data Collection

Respondents most commonly believed that data collection most benefits the people of the community, specifically children under age 5 years, who receive treatment and care. "All stakeholders" or "Everybody" was another common response.

Understanding of Consequences of Poor Quality Data

Most respondents demonstrated an understanding that poor data quality would negatively impact program planning and the allocation of resources, specifically the supplies of CCM drugs. Some noted that an oversupply of drugs could lead to drugs expiring, while an undersupply could lead to an increase in illnesses and deaths.

Opinions on the Usefulness of Data Informing the Program

Many of the respondents thought that the data collected through the RAcE project are of good quality and useful for informing the program. Among HSAs and facility-level respondents, only one FIC thought the data quality is not good. At the district level, ratings of the data quality were a bit more cautious. One district IMCI coordinator and two HMIS officers stated the data are not of good quality, two other respondents stated that the data were of good quality but could still be better, and two respondents stated that they did not feel qualified to rate the data quality. Two RAcE district coordinators noted that they have seen improvements in data quality since RAcE began. Several SHSAs believed that their supervision and review of forms contributed to data quality.

Recommendations on Improving Data Use

Respondents provided several suggestions on how to improve data use. The most common recommendation at each of the levels was to provide additional training and to share the data with HSAs and SHSAs during regular review meetings. Respondents at the central and district levels also stated that tools, such as TRAction, DHIS-2, and a project database that Save the Children is developing in Microsoft Access, can improve data availability and use. Respondents also made these other recommendations:

- Provide feedback to program districts and comparisons across districts.
- Because staff turnover is high, orient district health management teams to ensure they are aware of the program activities.

6.4.6 Recommendations from Respondents

In addition to the recommendations above, respondents provided other recommendations on the implementation of RAcE. The most common recommendations were to provide transportation and fuel for supervisors to visit HSAs at their village clinics and provide incentives for HSAs. Following are some other recommendations:

- Computers and internet access for data entry
- Calculators to help with calculations
- Booklets of reporting forms instead of loose papers
- Printer or copier to produce more forms at the district level
- Increased deployment of HSAs
- Designated data entry clerks at the district level
- Backpacks to protect and deliver reports
- Phones for entering c-Stock data
- Provisions for mentorship at village clinics, rather than at health facilities
- Reconciliation of c-Stock and RAcE guidelines for drug allocation

In addition to the recommendations related to data collection and reporting, respondents provided other recommendations related to medical services:

- Provide mRDTs to HSAs for use at village clinics.
- Increase the supply of LA 6x2.
- Improve drug storage at village clinics.
- Prioritize the most hard to reach areas for programs like RAcE.
- Improve HSA lodging in catchment areas.
- Provide lamps to use when providing care at night.
- Improve infrastructure.
- Incorporate family planning and voluntary counseling and testing services.
- Improve processes for distributing drugs to HSAs.
- Incorporate research into the program.
- Collect the HIV status of patients during an assessment and include this information in treatment protocols because it can have implications on what course of action is recommended.
- Provide drugs for conditions commonly related to malaria and fever, diarrhea, and fast breathing (e.g., eye ointment).

6.5 Annex 5. Systems Assessment Summary Table and Figures

| Table A5.1 Summary table: Assessment of data management and reporting systems at audited sites						
	I	II	III	IV	V	
	M&E Structure, Functions and Capabilities	Indicator Definitions and Reporting Guidelines	Data-collection and Reporting Forms / Tools	Data Management Processes	Links with National Reporting System	Average (per site)
Central Level						
MOH	2.33	2.00	2.60	1.83	2.00	2.15
Save the Children	2.83	2.57	2.63	2.08	2.67	2.56
District Level						
1 Ntchisi	2.67	2.50	3.00	1.80	2.67	2.53
2 Mzimba North	3.00	2.50	2.67	1.70	2.67	2.51
3 Ntcheu	3.00	2.50	3.00	2.10	2.67	2.65
4 Dedza	3.00	2.50	3.00	1.80	2.67	2.59
Health Facilities						
1.1 Kangolwa	3.00	2.50	2.50	2.00	3.00	2.63
1.2 Khuwi	3.00	3.00	2.67	2.00	3.00	2.73
1.3 Mzuzu	3.00	2.50	3.00	2.00	3.00	2.70
1.4 Khuyukuyu	3.00	2.50	3.00	2.00	3.00	2.70
1.5 Lizulu	3.00	2.50	2.67	1.88	3.00	2.61
1.6 Phanga Health Centre	3.00	2.50	2.67	1.88	3.00	2.61
2.1 Ntcheu District Hospital	3.00	2.50	2.67	1.88	3.00	2.61
2.2 Mjini	3.00	2.50	2.50	2.00	3.00	2.60
2.3 Kaphuka	3.00	2.50	2.67	2.00	3.00	2.63
2.4 Mphunzi	3.00	2.50	2.67	1.88	3.00	2.61
Average (per functional area)	2.97	2.54	2.75	1.93	2.89	2.62
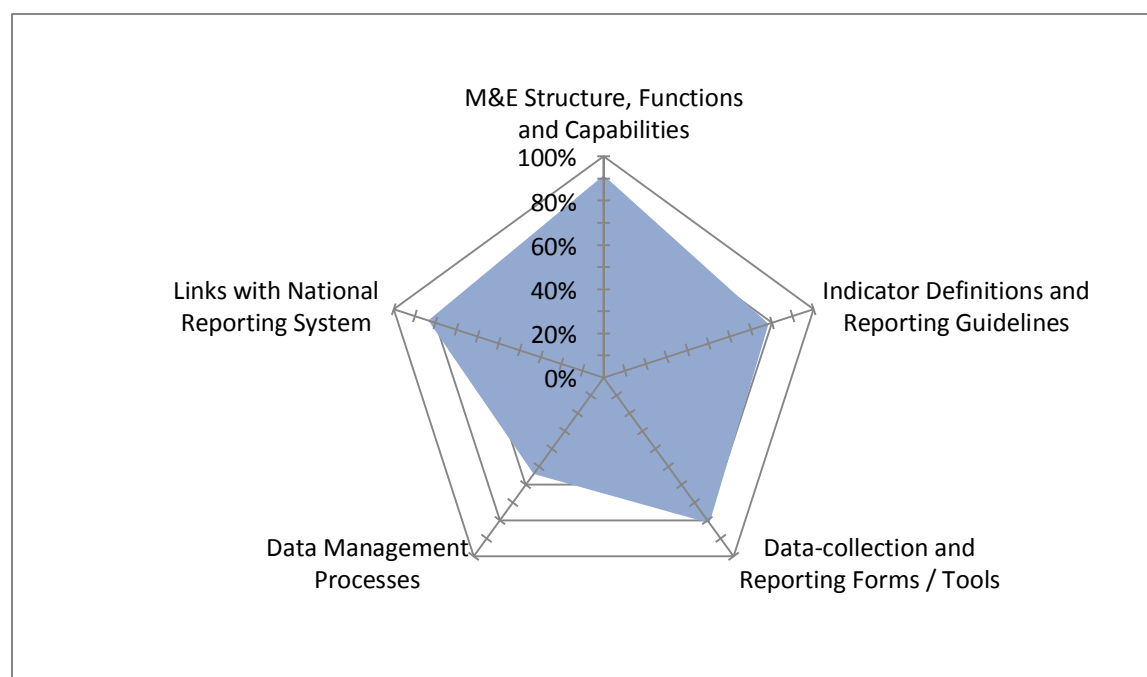
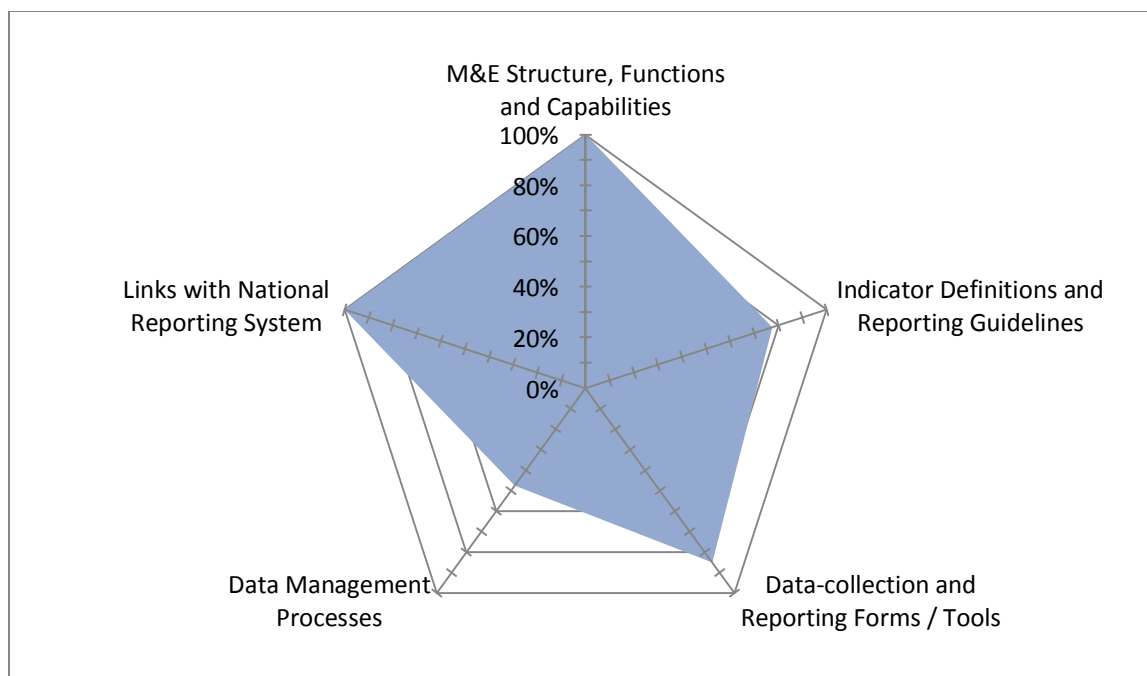**Figure A 5.1. Systems assessment scores: Save the Children**

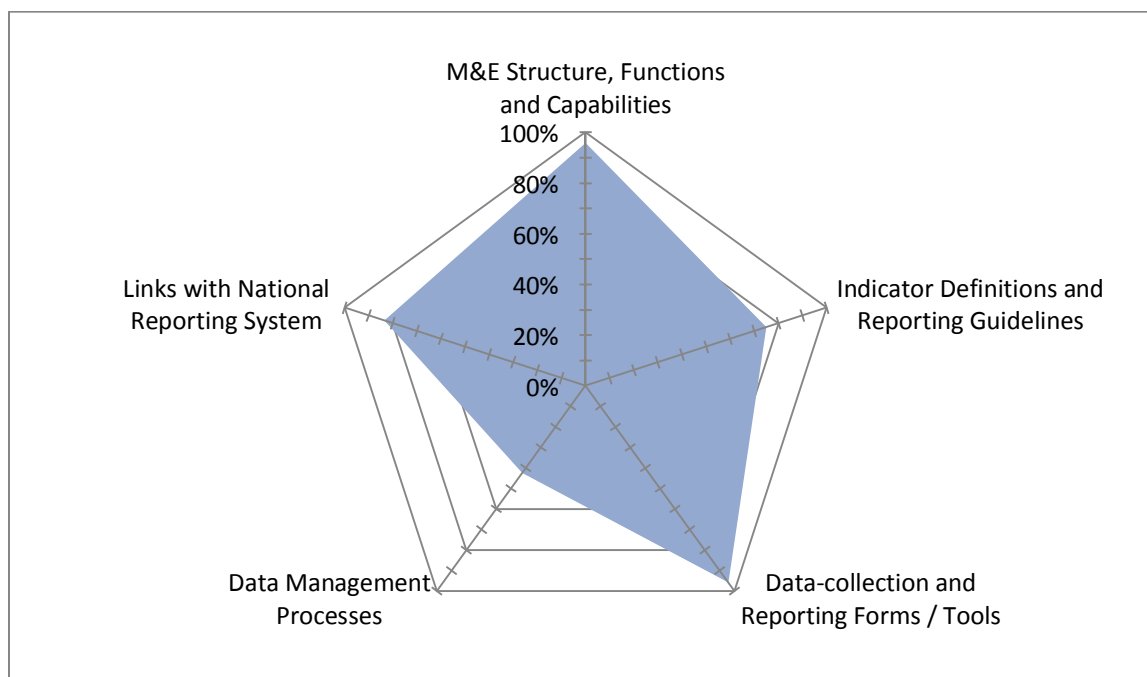**Figure A5.2. Systems assessment scores: district level**

Figure A3.3. Systems assessment scores: facility level

6.6 Annex 6. Recommendations from Key Informants

Key Informant Recommendations for Data Collection and Reporting:

- Computers and internet for data entry
- Calculators to help with calculations

- Booklets of reporting forms instead of loose papers
- Printer or copier to produce more forms at the district level
- Increased deployment of HSAs
- Designated data entry clerks at the district level
- Backpacks to protect and deliver reports
- Phones for entering c-Stock data
- Provisions for mentorship at village clinics (rather than at health facilities)
- Reconciliation of c-Stock and RAcE guidelines for drug allocation
- SHSAs exchange program so that SHSAs could visit other facilities to learn from each other and share experiences

Key Informant Recommendations for Service Provision:

- Provide mRDTs to HSAs for use at village clinics.
- Increase the supply of LA 6x2.
- Improve drug storage at village clinics.
- Prioritize the most hard-to-reach areas for programs like RAcE.
- Improve HSAs' lodging in catchment areas.
- Provide lamps to use when providing care at night.
- Improve infrastructure.
- Incorporate family planning and voluntary counseling and testing services.
- Improve processes for distributing drugs to HSAs.
- Incorporate research into the program.
- Collect the HIV status of patients during an assessment and include this information in treatment protocols because it can have implications on what course of action is recommended.
- Provide drugs for conditions commonly related to malaria or fever, diarrhea, and fast breathing (e.g., eye ointment).

APPENDIX A

Data Collection Tools Commonly Mentioned by Staff Type

Cadre, RAcE Role	Most Commonly Mentioned Tools	Other Mentioned Tools
Central Level		
IMCI M&E officer	Forms 1A, 1B, and 1C Village clinic register	Sick child reporting form Drug management forms
RAcE team leader	Forms 1A, 1B, and 1C Village clinic register	Supervision checklist Supervision summary form Mentorship checklist
Save the Children M&E coordinator	Forms 1A, 1B, and 1C Village clinic register	c-Stock D-tree mobile application
District Level		
HMIS officers	Forms 1B and 1C	Form 1A Village clinic register
District RAcE coordinators	Forms 1A and 1B Village clinic register Supervision checklist Supervision summary form	Mentorship checklist or booklet
IMCI coordinators	Forms 1A and 1B	Form 1C Supervision checklist DHIS-2 Mentorship checklist
Facility Level		
FICs	Forms 1A and 1B Mentorship checklist or booklet	Case scenario booklet Sick child report C-stock Referral slip
SHSAs	Forms 1A and 1B Supervision checklist Supervision summary form	Village clinic register Sick child reporting form Supply delivery notes Referral slip Case scenario booklet
Community Level		
HSAs	Form 1A Village clinic register	

APPENDIX B

Training Participation by Cadre

Staff Type	Trainings	Number of Staff Reporting
Central Level		
IMCI M&E officer	TRAction (2013)	1
	CCM (2013)	1
RAcE team leader	TOT District	1*
	CCM HSA	1*
	CCM SHSA	1*
	TRAction	1*
Save the Children M&E coordinator	No formal trainings	
District Level		
HMIS officers	CCM (2012)	2
	CCM (2013)	1*
	Supervision (2013)	2
District RAcE coordinators	Supervision (2013)	2*
	Mentorship (2013)	1
	CCM (2013)	2**
	Race district officer (2013)	1
	Data orientation (2013)	1*
	Supervision TOT (2012)	1
	Mentorship TOT (2012)	1
IMCI coordinators	Mentorship TOT (2010)	1
	Supervision TOT	1
	CCM TOT (2008)	1
	FB IMCI TOT (1999)	1
	c-Stock TOT (2012)	1
	DPAT TOT (2012)	1
	Community mobilization TOT (2013)	1
	CCM (2010)	1
	CCM (2013)	1
	CCM (no date)	1*
	Mentorship (no date)	1*
	Supervision (no date)	1*

Staff Type	Trainings	Number of Staff Reporting
Facility Level		
FICs	Mentorship (2011)	1
	Mentorship (2012)	1
	Mentorship (2013)	2
	CCM (2011)	1
	CCM (2013)	1
	ICAT (no date)	1
	Supervision (2013)	1
	CMAM (2013)	1
	c-Stock (2013)	1
	c-Stock (no date)	1
	CMAM (no date)	1
	Mentorship (no date)	1
SHSAs	CCM (2010)	1
	CCM (2011)	2
	CCM (2013)	6
	Supervision (2010)	1
	Supervision (2012)	1
	Supervision (2013)	3
	c-Stock (2013)	1
	D-tree mobile application (2013)	1
	CCM (no date)	1
Community Level		
HSAs	CCM (2008)	1
	CCM (2009)	4
	CCM (2011)	2
	CCM (2012)	2
	CCM (2013)	3
	c-Stock (2013)	4

*Includes one reported role as facilitator.

**Includes two reported roles as facilitator.