A photograph of a woman wearing a blue headscarf and a patterned dress, smiling warmly while holding a baby. The background is a textured, light-colored wall.

Community Management of Acute Malnutrition (CMAM) in Nigeria:

Performance assessment of the CMAM information system

Report

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List of abbreviations

CMAM	Community Management of Acute Malnutrition
FMoH	Federal Ministry of Health
LGA	Local Government Area
LNFP	LGA-level Nutrition Focal Person
MoH	Ministry of Health
OPM	Oxford Policy Management
OTP	Outpatient Therapeutic Programme
PHC	Primary Health Care
RUTF	Ready-to-Use Therapeutic Food
SMoH	State Ministry of Health
SMS	Short message service

Summary of main findings

The Nigeria CMAM information system is based on weekly (SMS) and monthly (paper-based) collection of data. The two sub-systems are complementary. The SMS system enables rapid response to stock shortages and so facilitates smooth running of the programme. The data from the paper-based system are currently more complete, and the format is more compatible with other health service reporting systems. The system is implemented by the Nigerian government, supported by UNICEF.

This report presents the findings of a performance assessment of the Nigeria CMAM information system, which is intended to support lesson learning and ongoing improvement. Fieldwork was undertaken in Sokoto State, with analysis of secondary CMAM facility data from Sokoto, Bauchi, Gombe, Kaduna, and Kano states.

- The **paper-based and SMS-based systems to monitor CMAM were operational** in all the visited facilities, and data were largely timely and complete. However, levels of accuracy and reliability varied.
- **Technical aspects of data transmission work well** for both the SMS- and paper-based systems, apart from occasional lack of network connectivity that affects the completeness and timeliness of the SMS data.
- **There is good motivation among staff at all levels.** Stakeholders recognise the importance of data for monitoring and developing the CMAM programme, and there is high motivation and therefore good potential to improve the system.
- **Where there are errors, these are primarily introduced at the stages of data collection and transmission by health workers.** The following challenges affect the accuracy of CMAM indicators:
 - The inadequate number of health workers, high workloads and capacity issues;
 - Although training includes sessions on how to complete forms and tally data, written guidance is not held at facilities;
 - Various versions of the forms are being used. Some health workers incorrectly use the 'outcome' categories (e.g. to indicate treatment rather than discharge) and admissions categories are not always recorded in the Outpatient Therapeutic Programme (OTP) form;
 - There are also challenges with the consistency of weekly data tallying. For example, values for the variable 'number of children in treatment' are carried over from the previous week or month, resulting in errors being carried forward in the data; and
 - There is limited or no quality assurance at the point of data entry.
- **UNICEF shares summary analysis of the data on request, but this could be more systematic.** At monthly state-level meetings there is some degree of feedback on performance and data quality, and findings from data analysis, to Local Government Area (LGA) and facility level. At some facilities and LGA offices there is interest in receiving summarised findings. Regular provision of hard copies of findings would likely stimulate use of the data at these lower levels, which in turn would promote improvement in data quality.
- **There is potential for greater data use.** Use of the CMAM data is more expansive at state and federal levels where they are used for monitoring, planning, reporting, tracking, and advocacy. At LGA and facility levels, CMAM data are used predominantly for forecasting, to ensure timely replenishment of ready-to-use therapeutic food (RUTF) supplies.
- **Some government stakeholders spoke of a need for written guidance on the interpretation and use of the SMS data,** so that they can more independently use the data. The user-friendliness of the both the weekly and monthly datasets could also be improved, and this would likely stimulate great use of the datasets.

Recommendations

Priority actions to improve the accuracy and reliability of CMAM data

Training and guidance

- Strengthen guidance and training materials. These should establish clear protocols with respect to collection, transfer, aggregation, data management, and analysis processes. Highlight the importance of data quality and include practical exercises relating to data production and use.
- Expand the remit of the CMAM monthly meetings to include data accuracy and reliability.

Technical and process

- Improve and provide a single uniform set of forms for data aggregation and reporting.
- Improve the software for data entry and aggregation (paper-based system): utilise automatic quality checks using Excel's data validation functionality.
- Develop a protocol to use child-level records to determine the number of children in treatment at the beginning of the week (SMS system) or month (paper-based system).

Supervision, feedback, and quality assurance

- Strengthen the supervisory system to emphasise data quality, with special focus on:
 - The correct use of admissions and outcome categories in the OTP form; and
 - The processes of weekly data tallying (with recounts and cross-verification against the register) and data entry.
- Consistently record feedback provided to facilities with respect to data quality issues. This should include whether and when the issue has been resolved, as well as feedback on weekly submissions from facilities (going beyond the current supervisory checklist). In the medium term, a paper form or spreadsheet could be used, moving later to an online solution. This would enable sharing of data quality issues across LGAs and at state and federal level.
- Develop quality criteria for data submitted via SMS, e.g. for range checks or missing values.

Priority actions to increase use of the CMAM data

Training and guidance

- Expand the remit of the CMAM monthly meetings to cover data interpretation and use.
- Develop written guidance on the interpretation and use of the SMS dataset, for users at the state and federal ministries of health, as well as UNICEF sub-national teams.
- Strengthen the capacity of Federal Ministry of Health (FMoH) counterparts in the Nutrition Unit to assess data quality and to interpret and use statistics. For example, UNICEF could work with a FMoH counterpart to apply quality checks on the dashboard dataset and provide feedback to lower levels. In the longer term, provide advanced training in the interpretation and use of statistics for these FMoH staff.

Technical and process

- Increase the user-friendliness of the data files produced from both the paper-based and SMS systems, e.g. by integrating automatically generated trends or graphs.
- Develop a system to automatically generate single-page paper reports for each LGA with a breakdown by facility (monthly) to be discussed and distributed at monthly CMAM meetings. LGA-level nutrition focal persons (LNFPs) could also share this with facility staff during regular supervisory visits.
- Provide convenient online access to the compiled SMS data, in addition to email, to users in the MoHs and UNICEF, and possibly other organisations (including civil society) in the future.

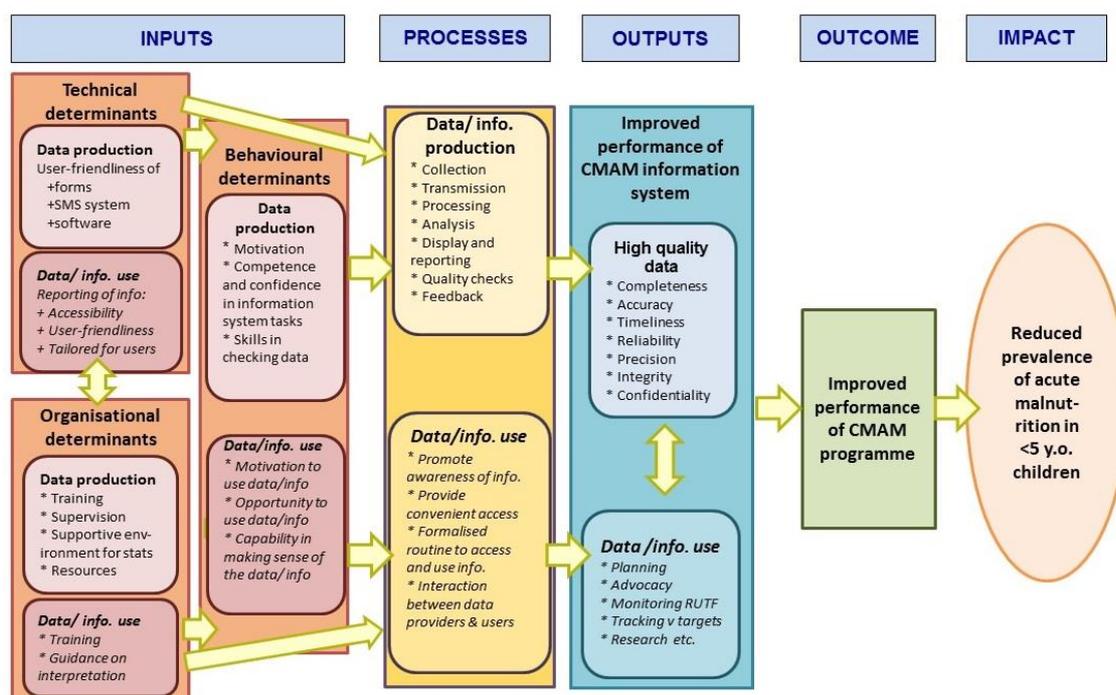
1 Introduction

This report presents summarised findings of a performance assessment of the Nigeria CMAM information system, which is intended to support lesson learning and ongoing improvement.

Fieldwork was undertaken in Sokoto State, with analysis of secondary CMAM facility data in Sokoto, Bauchi, Gombe, Kaduna, and Kano states, as well as review of forms and documentation. Fieldwork methods included: observation of the data system in nine sampled facilities in three LGAs in Sokoto; recounting of data for admissions, exits, and RUTF utilisation; and interviews with health workers and government officials.

1.1 Conceptual framework

The analysis and presentation of findings corresponds to the following conceptual framework:



Source: Based on the PRISM (Performance of Routine Information System Management) framework developed by the Measure Evaluation Project¹

This report presents a summary of the findings. Specifically, **Section 2** provides the findings related to data production (processes and inputs) and data quality (outputs) and **Section 3** provides the findings related to the use of data/information. Finally, **Section 4** examines government readiness to manage the information system and make effective use of the data.

¹ Measure Evaluation (2011) Tools for data demand and use in the health sector: PRISM Tools, p.5.

2 Data quality and data production

This section summarises the findings on data quality and the processes of data production. We conclude with discussion of the benefits and drawbacks of the SMS- and paper-based systems.

2.1 Outputs: Data quality indicators

Table 1 summarises the findings on data quality. The analysis utilises a rating system to present the Oxford Policy Management (OPM) team's judgement on elements of the CMAM information system performance:

Explanation of ratings	
	Positive rating: system generally working well
	Intermediate rating: Some improvements required, as highlighted by observations, interviews, or data review. Recounted data varied with reported data by 10-19%
	Negative rating: Urgent improvements required. Recounted data varied with reported data by 20% or more

The ratings are based on: (a) Interviews and observations at nine facilities in Sokoto State; (b) verification of data collected at these nine facilities; (c) secondary analysis of data (January–July 2017) from Sokoto, Bauchi, Gombe, Kaduna, and Kano states; and (d) document review.

Table 1: Ratings for eight dimensions of data quality

Score	Source	Comments
Completeness (<i>without omissions</i>)		
	Interview or observation	Completeness is addressed during supervision and state-level meetings.
	Data analysis	<p>Completeness is acceptable, but room for improvement:</p> <ul style="list-style-type: none"> 7% of observations (weeks) were missing in SMS data; no entire observations (months) were missing for paper data. Where data are reported, variables were largely complete except for: <ul style="list-style-type: none"> (a) RUTF in the SMS system (6% with no data on RUTF stock at start of week) (b) Children in treatment at the beginning/end of the month (11–12% data are missing in the paper-based system).
Accuracy (<i>close to true value, with minimal errors</i>)		
	Verification	<p>Verification analysis suggests inaccuracies in data entered</p> <ul style="list-style-type: none"> Discrepancies exist between recounts of weekly tallies, registers, and SMS data. Discrepancies were particularly common for RUTF consumption and defaulters. Entry of monthly LGA reports into spreadsheets was largely accurate.
	Interview or observation	<p>Errors in completion of forms:</p> <ul style="list-style-type: none"> Fields are left blank in OTP card (e.g. discharge or admission details) or without measurements (e.g. oedema or temperature). In some cases, there is incorrect use of categories and absences are not recorded. The tally process is more appropriate for admissions than exits. Health workers did not report any challenges with the forms, except for a lack of copies. However, observations suggest that the cards are hard to read (see below). Observations suggest that errors are mostly introduced at the point of data capture, rather than data transfer or analysis.

 <p>Document review</p>	<p>Layout and headings on OTP card and tally sheet need revision:</p> <ul style="list-style-type: none"> The codes for treatment outcomes are unclear, while the font and formatting make cards difficult to read. Tally sheets do not capture detailed admissions categories² of children to aid verification against OTP cards.
<p>Reliability (<i>Data are consistent internally and over time and are produced using common protocols</i>)</p>	
 <p>Interview or observation</p>	<p>Quality assurance protocols at all levels require strengthening, alongside development of consistent protocols for data collection and tallying.</p> <ul style="list-style-type: none"> A variety of forms are used for monthly aggregates in the paper-based system. There are inconsistencies between CMAM operations and national CMAM guidelines, with respect to identification of defaulters. <p>Inconsistencies in the data on some variables. Examples include:</p> <ul style="list-style-type: none"> Children in treatment (28% of SMS observations showed discrepancies between the number at end of week and start of the following week). RUTF stock balance (54% of SMS observations showed discrepancies between reported RUTF stock balances and recalculated end-of-week stocks). In 14% of records in the paper-based system, the number of children under treatment at end of month was incorrectly computed. Performance indicators examined from the SMS system (new admissions, number of children recovered, and RUTF) had a small percentage of outliers.
 <p>Data analysis</p>	<p>Inconsistencies in the data on some variables. Examples include:</p> <ul style="list-style-type: none"> Children in treatment (28% of SMS observations showed discrepancies between the number at end of week and start of the following week). RUTF stock balance (54% of SMS observations showed discrepancies between reported RUTF stock balances and recalculated end-of-week stocks). In 14% of records in the paper-based system, the number of children under treatment at end of month was incorrectly computed. Performance indicators examined from the SMS system (new admissions, number of children recovered, and RUTF) had a small percentage of outliers.
<p>Timeliness (<i>Data are reported and made accessible on a timely basis</i>)</p>	
 <p>Data analysis</p>	<p>Data are submitted through the paper-based system in a timely fashion. However, many weekly SMS reports are submitted late:</p> <ul style="list-style-type: none"> Over the seven months, 76% of the SMS reports received were submitted two or more days after OTP day. Over half of the SMS reports were late when applying the UNICEF definition: <i>reporting by the Monday following the OTP day</i> (which is less stringent but is not comparable across facilities).
 <p>Interview or observation</p>	<p>There is emphasis on timeliness in state CMAM meetings. The late submission of SMS data is mostly due to connectivity issues. Monthly submission of paper records appears timely.</p>
<p>Confidentiality (<i>Data is collected, analysed, stored, and reported in a way that protects individual privacy</i>)</p>	
 <p>Interview or observation</p>	<p>Confidentiality of client CMAM information is compromised by poor practices and a lack of guidance (in national guidelines) on the storage of paper forms:</p> <ul style="list-style-type: none"> Staff interviewed showed little awareness of the need for confidentiality. There is a lack of facilities for secure storage
<p>Integrity (<i>system used to generate data is protected from deliberate bias or manipulation</i>)</p>	
 <p>Interview or observation</p>	<p>Integrity is compromised by poor levels of protection rather than evidence of manipulation:</p> <ul style="list-style-type: none"> There is insufficient cross-checking of data entry. Dissemination of data down to those responsible for its collection is lacking.

² Specifically, row headings in the amended tally sheets should indicate if returning defaulters must be tallied together with new cases or (as specified in the form in the current CMAM guidelines) together with transfers from OTP or inpatient care.

Relevance (<i>the degree to which statistics meet user needs</i>)	
	<p>Document review</p> <p>Indicators reported are appropriate and have sufficient disaggregation:</p> <ul style="list-style-type: none"> Additional indicators suggested by national guidelines (e.g. sex or capture of old cases returning) are to be considered after analysis of utility and additional burden on CMAM staff.
Accessibility (<i>data and metadata are easily available and assistance to users is adequate</i>)	
	<p>Interview or observation</p> <p>Limited access to data:</p> <ul style="list-style-type: none"> UNICEF and the FMoH have routine access to the data. Summarised data and assistance to users are provided to other stakeholders on request, and this is dependent on a small number of UNICEF staff. There is an appetite among other CMAM stakeholders (NGOs) for routine access to the SMS dataset.
	<p>Document review</p> <p>There is insufficient documentation specific to the CMAM information system that would help current and potential users to understand the data as well as limitations to data quality.³</p>

2.2 Findings relating to CMAM data production processes

This analysis is based on research in Sokoto State, including visits to nine facilities.

UNICEF collaborates well with the State Ministry of Health (SMoH) on task sharing, supervision, and data entry.

Data collection

- Reporting tools, such as the weekly tally form, are not standardised: there is variation in formatting and categories in forms used by facilities and LGAs, which presumably originated at state or LGA level. There were also shortages of the forms in some facilities.
- When filling in the OTP form, some errors are made in the use of categories for both admissions and exits. Some fields are left blank (e.g. outcome categories or details on admission) or filled without measurements (e.g. oedema or temperature).
- Adherence to national protocols for admissions and treatment varies between facilities. There was weak adherence to guidance relating to recording defaulters, who should be discharged on a child's third consecutive absence. This likely results in under-reporting of defaulters.
- There is variable maintenance of record confidentiality at facility and LGA levels.
- At facilities, there is low availability of trained staff for operation of the CMAM programme, while demand for CMAM services is high.
- Community volunteers were generally not active in the sampled facilities because incentives are not provided. The lack of tracing of defaulters is presumed to affect the accuracy of the key performance indicators on recovery, defaulting, and death.
- There is a valuable system of supportive supervision using checklists and these include many aspects of CMAM implementation, including monitoring and reporting.

Transmission

- Quality assurance when copying data from forms to forms, forms to phone, or from forms to computer is not sufficiently developed.

³ For the datasets to be useful to stakeholders other than UNICEF, details to accompany the dataset are needed on the processes of data production (including data collection, transmission, and analysis).

- The transmission of data to higher levels works well for both the paper-based and SMS systems in terms of efficiency of the data transfer, with high levels of timeliness and completeness.

Analysis

- Some analysis of the raw SMS data occurs automatically within the dashboard file, which means users can obtain values and graphs of admissions and key performance indicators. This feature does not exist in the monthly dataset.

Display and reporting

- For display, there are a few figures produced to show trends in admissions and performance indicators within the dashboard data file. This does not occur in the monthly dataset.
- There is no regular reporting of synthesised data from federal level to potential users at any level. Nor is there reporting of facility- or LGA-specific data at these lower levels. However, interviews revealed that in some facilities and LGAs there is high motivation to obtain summarised data derived from the CMAM information system.

Quality checks

- Quality checks of electronic datasets are by eye and helped by conditional formatting.

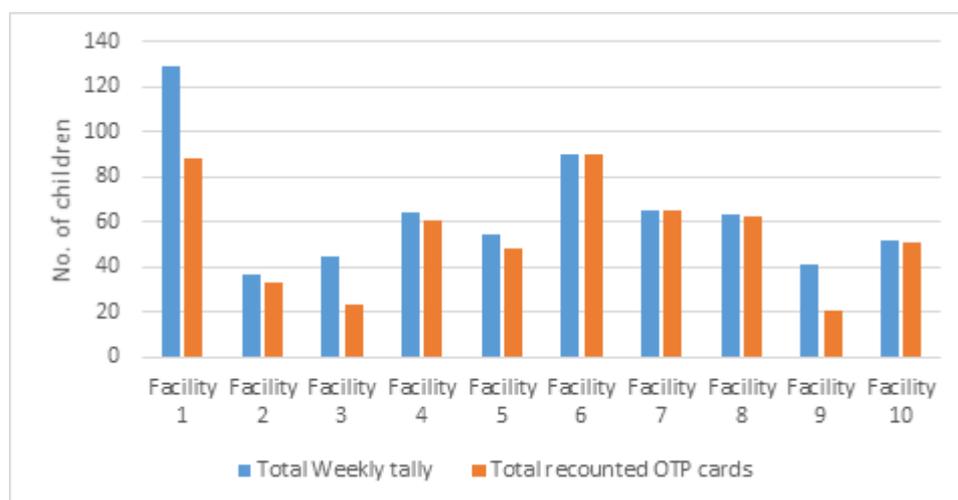
Feedback to lower levels (LGA and facility)

- Feedback on quality issues (identified on paper forms or in electronic datasets) is done by phone or in person. However, such feedback only occurs when a problem has been identified, and the feedback and any actions taken are not consistently recorded.

2.3 Data verification exercise

- Our recount of admissions data for July 2017 from OTP cards found a variation of over 10% in half of the facilities visited.⁴ In most cases, the recount was lower than the reported admissions (see Figure 1), pointing either to OTP cards being lost or to over-reporting of admissions.

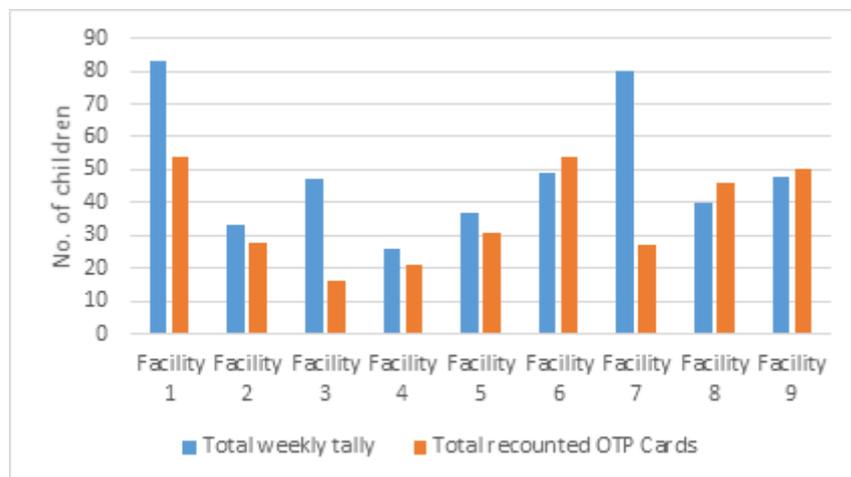
Figure 1: Recorded and recounted admissions by facility, July 2017



⁴ Data from the facility visited during the pre-test were used for this analysis, so the sample was 10 facilities rather than nine.

- Our recount of exit data for July 2017 from OTP cards found a variation of over 20% in one-third of the facilities and over 10% in the remainder of the facilities. In most cases, recounted exit data were lower than the reported exits (see Figure 2).

Figure 2: Recorded and recounted exits by facility, July 2017



- Our recounts suggest a considerably higher number of defaulters or deaths than is reported through CMAM data systems.⁵ For July 2017, in the sample the reported percentage of deaths or defaulters was 6.5% of all exits, compared to 22% based on the recount. **This finding is indicative only, given that it is based on one month in nine facilities in one state. Additionally, the OPM team encountered challenges in terms of identifying exits by discharge category due to gaps in the data recorded on the OTP cards.**
- Our recounts of RUTF consumption based on OTP cards (for July 2017) compared to RUTF reported on stock cards found a variation of over 20% in half of the facilities visited. In most cases, reported RUTF consumption exceeded recounted consumption. This could be due to a combination of lost OTP cards and errors in the capture of RUTF consumption.
- Our observation of facilities in Sokoto also found that recounts of RUTF consumption (based on OTP cards from one day) differed from reported consumption by more than 20% in three of the nine facilities. In this case, human error is more likely to be the reason for the difference than loss of OTP cards. In two of the three cases, reported consumption was higher than consumption noted during verification, while the opposite was the case in the third facility.
- In observations at six facilities, in a sample of 31 children, RUTF provided to caregivers on the day of the visit was consistent with RUTF recorded on ration cards and OTP cards.
- Data entry for the paper-based system at state level appears to work well, as data are consistent with LGA reports. However, there are discrepancies between weekly tallies at facility level and in the LGA-level report, with monthly aggregates for facilities.
- Among children who were classified as (likely) recovered during July 2017 based on the recount, almost half had received treatment for eight weeks, in line with the CMAM guidelines for treatment duration.
- Errors when keying data from the weekly tally into the SMS do occur but are relatively rare and differences are small.

⁵ We combine defaulters and deaths together here because without a functioning system of home visits for tracing defaulters it is impossible to know if a defaulted beneficiary is alive and thus a 'true' defaulter or if they have died.

2.4 Desk-based assessment of SMS- and paper-based data

This analysis is based on data from the five states of Bauchi, Gombe, Kaduna, Kano, and Sokoto. A total of 139 facilities were included for the paper-based system and 126 facilities for the SMS system.

- For 2017 (January–November for SMS and January–October for paper), 16 facilities are covered in the paper-based system that do not report through the SMS system. Moreover, three facilities report through the SMS system but do not have valid data on admissions, exits, or RUTF in the paper-based system. This suggests the need for regular assessment of coverage against a standard list of all facilities implementing CMAM.
- In most weeks, completeness for the SMS system exceeds 90% (of the 126 facilities included in the analysis) but drops to just over 80% in some weeks. For facilities that do report data, no months are entirely missing from the paper-based data.
- Missing values on specific variables only affect a very small percentage of observations. There were two exceptions: (a) 6% of facilities had not recorded RUTF stock at the beginning of the week in the SMS data; and (b) 11% of facilities had not reported the number of children in treatment at the beginning of the month and 12% had not reported this at the end of the month in the paper-based data.
- There are some keying errors when sending the SMS data (e.g. 0.144 instead of 144). This was seen in only a very small percentage of observations but was also noted during the data verification exercise.
- Inconsistencies in the calculation of children in treatment at the end of a period compared to the beginning of the following period were found in more than a quarter of weeks in the SMS data, and a similar percentage of months in the paper-based data. In more than half of the observations in the SMS data, RUTF stock balances were incorrectly computed and in most of these cases the recalculated end-of-week stock was higher than reported stock.
- Only a small percentage of observations (~1%) are clear outliers in terms of admission, discharge, or RUTF consumption numbers (in both systems) and these do not have a considerable impact on average values.
- Timeliness for weekly data is an issue. When adopting the timeliness definition applied by UNICEF in the case of the SMS system (reporting allowed until the Monday following the OTP day), facilities reported late in 55% of the weeks between January and July 2017. Using a definition of late reporting that is common across all facilities (two days or more after the OTP day), facilities reported late in 76% of the weeks.

2.5 Contextual factors affecting data production

Technical determinants

- The choice of indicators for reporting is appropriate. Additional indicators suggested by the national guidelines (e.g. % of relapse among new admissions, and gender) should only be added if their utility is clearly established and integration in the reporting process does not substantially increase the burden on facility staff.
- Forms for data collection and aggregation vary across the facilities and LGAs visited. The OPM team also observed some challenges in the user-friendliness of OTP cards: the font and formatting make the cards difficult to read, and the same code is provided for two treatment outcomes (those of 'Refused inpatient care' and 'Recovered').
- The SMS system used for the transmission of weekly data from facility to federal level is user-friendly but there are telephone network connectivity issues, which have an impact on the completeness of the consequent datasets.
- The specialist skills required for creating the dashboard file currently do not exist at the FMOH Nutrition Unit.

Organisational determinants

- There is variation in the quality and frequency of supervision visits to facilities.
- There is a lack of detailed feedback to facilities following supervisor visits (only brief comments can be left on the checklist) or following provision of weekly or monthly reports (unless there is a problem with the data submitted).
- Priorities for health workers appear to be completeness and timeliness, with less awareness of accuracy or reliability.
- There is no display of CMAM data in the form of tables, graphs, or maps in the workplace.⁶ Adding these could help to increase motivation to use data and to produce better-quality data.
- As for all health programmes provided through the government systems, there are significant constraints on resources with respect to finance, staff, and equipment. This is an overarching challenge for the production of high-quality data by the Nigeria CMAM information system.

Behavioural determinants

- The FMoH has limited knowledge with respect to data quality assurance and assessment, analysis, or use of information. These tasks are mainly undertaken by UNICEF.
- Low capacity with respect to interpretation of data is indicated by the acceptance (except by UNICEF at federal level) of unrealistically high values for some performance indicators. For example, a 98% cure rate is unlikely to be accurate and may result from inconsistencies relating to discharge between the national CMAM guidelines and actual CMAM implementation.
- At facility level, respondents had limited knowledge about what data are, or could be, used for.
- While introduction of the SMS system has slightly increased the workload of facility in-charges, it has the benefit of ensuring tallies are completed weekly. LNFPs' workload has also increased: they check that the texts have been successfully sent by all CMAM facilities in the LGA.
- The timely submission of weekly and monthly data is encouraged by 'naming and shaming' at state-level CMAM meetings of those facilities and LGAs that have submitted late or incomplete data. No other incentives or performance management measures are used to encourage better data quality overall.

2.6 Comparison of the SMS system with the paper-based system

Advantages of the SMS reporting system over the paper-based system

- In the SMS system, there is no need to physically transport records and fewer intermediate data transfer or manipulation steps (which would increase the risk of introducing errors in the data).
- Data reach the federal level faster in the SMS system, which facilitates more rapid programme-level decision making. For example, RUTF stock alerts are generated and sent out automatically when low levels of stock are detected.
- There is a reduced risk of data loss that may arise from loss or destruction of paper forms.

⁶ Displays of data from other health programmes were also not observed, indicating the lack of a 'culture of information'. While health workers did not mention that it would boost their motivation, several did report an appetite to receive paper copies of reports from federal level. If LGA-specific paper reports were produced monthly, these could be displayed in facilities and enable comparison of performance over time and with other facilities.

Drawbacks of the SMS system

- A few CMAM in-charges perceive that sending the texts adds an extra burden to their workload.
- Geographically remote facilities in particular are affected by poor network coverage. If the data cannot be sent, completeness and/or timeliness of the dataset is reduced.
- In the SMS system, data extraction and consolidation are more complex than for the paper-based system, requiring technical skills that do not exist in the FMoH Nutrition Unit.
- Without the paper-based system operating in parallel, the LGA and state levels would be less aware of data reported by facilities under their supervision. This holds a risk of reducing quality assurance mechanisms at those levels, as well as motivation to use the data.

Necessary conditions before phasing out the paper-based system (in transferring data)

- Strengthened role of LNFPs, including improving their access to computers and development of computer literacy (so they can access the data and summary reports sent from federal level).
- Appointment of a staff member at the SMoH in each state to work full time on the CMAM information system, whose remit includes promoting integration of CMAM data into the state-level Health Management Information System (HMIS).
- Integration of SMS data into the District Health Information Software (DHIS). This would require transfer of the technical aspects of the SMS system from UNICEF to the FMoH Planning, Research and Statistics Department. The staff at this department have already received training to ensure they take this lead.

3 CMAM data use

This section first presents the findings on data use and then briefly explores the underlying processes and contextual determinants.

3.1 Use of CMAM data and information

Facility level

- Health workers mainly use the CMAM data to forecast RUTF needs.
- Beyond this, there is limited analysis or discussion of the CMAM data. This is also the case for other programmes and is at least partly a product of the low capacity for data interpretation.
- None of the in-charges at the 10 facilities we visited described scheduled meetings, nor regular reports, that require the input of CMAM data.

LGA level

- The LNFPs discuss the data at CMAM monthly meetings at state level.
- However, the three LNFPs we interviewed described limited use of the CMAM data at LGA level. The sampled LGA Primary Health Care (PHC) coordinators do not issue reports containing CMAM data.
- One LNFP described using the CMAM data to '*to make a case for extra support from the LGA*'.

State level

- The State Primary Health Care Development Agency (SPHCDA) issues annual reports for which CMAM data are needed.
- In Sokoto, the SPHCDA and the Ministry of Planning convene a formal meeting annually at which CMAM data are compared to annual targets. SPHCDA officials in Sokoto also use the data when developing the state-level nutrition action plan.
- The CMAM data are used by SMOH staff for advocacy.
- UNICEF regional offices use CMAM data to identify which locations are most urgently in need of supportive supervision and training. They also use the data for advocacy, for example to motivate state governments to fund RUTF, to forecast the need for supplies including RUTF, and for budgetary planning.

Federal level

- The FMOH Nutrition Unit uses the data to respond to issues and for advocacy. It is also utilised in reports and the meetings of the CMAM task force, the National Food and Nutrition Committee, the Nutrition in Emergencies Working Group, and FMOH planning meetings.
- Other government ministries that use CMAM data are the National Primary Health Care Development Agency and the Ministry of Budget and National Planning.
- At federal level, UNICEF use the data for:
 - *Monitoring*: Examination of patterns of RUTF use and comparison of key performance indicators against SPHERE standards, as well as the identification of facilities that need checking and more support.
 - *Planning*: To forecast RUTF needs.
 - *Tracking* against international targets and for accountability.
 - *Advocacy* to promote increased public financing for CMAM.

3.2 Processes of data use

- For facility- and LGA-level users, data are presented and discussed at state-level meetings.
- The lack of computer resources at LGA level constrains interaction between data providers and users. Users at lower levels can interact with data providers at the state-level meetings. At federal level, there is potential for more interaction via online networks and via face-to-face mentoring and meetings.
- We did not identify activities to build awareness of the information system and develop positive attitudes toward uptake of the data.
- At state and federal levels, UNICEF and the MoHs have routine access to the SMS data. Data are provided to other stakeholders on request.
- The SMS dashboard files were described to us as 'cumbersome' and not easy to use.

3.3 Contextual factors affecting data use

Technical determinants

- The spreadsheets of data collected via the paper-based system are reasonably user-friendly, while the spreadsheets of data collected via the SMS system are less so.
- Email is used to distribute updated datasets monthly (paper-based system) and weekly (SMS system), although UNICEF is developing an interactive website to facilitate access to the SMS data.
- No summarised findings are produced for actual or potential users, except on request.

Organisational determinants

- There is good collaboration at state level between the SMOH and UNICEF in Sokoto.
- Monthly state-level meetings bring people together working at the same level and offer a valuable forum to foster information use.
- At federal level, there may be opportunities for on-the-job training of FMOH staff (by UNICEF) that are not currently being taken.
- There is no written guidance to help interpret data sets, as well as a lack of advice on data use.
- Practical presentation of data in the workplace (tables, graphs, etc.) was not observed.

Behavioural determinants

- At the facility and LGA levels, there is varied motivation to use the CMAM data.
- At some facilities and LGA offices there is interest in receiving summarised findings of the data. Regular provision of hard copies of summarised findings would likely stimulate use of the data at these lower levels, which in turn would promote improvement in data quality.
- Motivation to use data is high in UNICEF and international NGOs that support CMAM implementation such as Save the Children International and Action Against Hunger.
- The opportunity to use data is limited at lower levels. The CMAM in-charges and LNFPs only have access to their own data and not to reports of summarised data from higher levels.
- Staff capacity to use data is untested at lower levels. At higher levels, there is a lack of a critical approach, with some government staff unaware or unconcerned by the potential unreliability of the performance indicators.

4 Government readiness to manage the system and use the data

Factors that thwart government readiness

- UNICEF currently plays a vital role in quality assurance. Its presence and strong expertise reduces the incentive for the government to increase its responsibilities in this area.
- Expertise to improve data quality is lacking in the SMOH and in the PHC system at LGA level.
- The SMOH lacks spare human resource capacity to devote to taking over tasks from UNICEF.
- The LNFPs' role is limited by their lack of access to computers and low computer literacy.
- The FMOH Nutrition Unit does not collaborate closely with other units in the FMOH where there are likely to be staff with complementary technical expertise.
- The findings from supportive supervision are inconsistently recorded and shared, while the criteria used to identify which facilities have greatest need for visits and support are unclear.

Factors that bolster government readiness

- Government staff at all levels are generally highly motivated to improve their programme, and to gain more skills.
- UNICEF has supported an excellent system of regular state-level meetings for LNFPs and CMAM-in-charges, and these are attended by SMOH and SPHCDA staff. With respect to data quality, these forums already focus on timeliness and completeness. There is potential for them to also focus on the additional aspects of accuracy, reliability, and confidentiality, as well as to cover data interpretation and use.



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