Semi-Quantitative Evaluation of Access and Coverage (SQUEAC)
Katagum LGA CMAM Program
Bauchi State, Northern Nigeria
August-September 2014

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Action Against Hunger | ACF International
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ACF international in collaboration with FMoH, SMoH and SPHCDA\(^2\) implemented the SQUEAC assessment covering the entire LGA. Mr. Alhaji Sabo Burai (State Nutrition officer) was instrumental in leading the collaboration with active participation of Mr. Ezekiel Daniel (deputy director SPHCDA), Mr. Alhaji Lamara Abubakar and Mr. Alhaji Adamu Inuwa Yayu, the Nutrition focal person and representative of Primary health department in Katagum LGA respectively.

Joseph Njau (ACF CMAM coverage program manager) led the coverage assessment team in the implementation of the SQUEAC assessment. The team consists of: Ifeanyi Maduanusi (CMAM coverage program Deputy Manager) and Program Coverage Officers (Chika Obinwa, Zulai Abdulmalik, Janet Adeoyo and Francis Ogum). Sophie Woodhead (The Coverage Monitoring Network Coordinator) gave technical insights in validation of the SQUEAC report. To mention a few ACF support staff, Mr. Patrick Williams (ACF Logistics coordinator) and Mr. Abubakar Kawu (CMAM Program Coverage Support Officer) ensured logistics mechanisms were in place for smooth running of the assessment. Importantly the dedication shown by a team of SQUEAC assessment enumerators was invaluable when they probed for information on factors affecting CMAM program in Katagum LGA.

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Coverage Assessment Team

ACF international.

\(^1\) Semi Quantitative Evaluation of Access and Coverage

\(^2\) Federal Ministry of Health (FMoH), State Ministry of Health (SMoH) and State Primary Health Care Development Agency (SPHCDA)

\(^3\) Traditional Birth Attendants, Patent medicine vendors, traditional healers
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ABBREVIATIONS

ACF  Action Contre La Faim | Action Against Hunger | ACF International
CIFF  Children Investment Fund Foundation
CMAM  Community-based Management of Acute Malnutrition
CV  Community Volunteer
FMOH  Federal Ministry of Health
HF  Health Facility
IYCF  Infant and Young Child Feeding
LGA  Local Government Area
NFP  Nutrition Focal Person
INGO  International Non-Governmental Organization
MUAC  Mid Upper Circumference
OTP  Outpatient Therapeutic Program
PHC  Primary Health Care
RUTF  Ready to Use Therapeutic Food
SAM  Severe Acute Malnutrition
SLEAC  Simplified Lot quality assurance sampling Evaluation of Access and Coverage
SNO  State Nutrition Officer
SMART  Standardized Monitoring Assessment of Relief and Transitions
SMOH  State Ministry of Health
SQUEAC  Semi Quantitative Evaluation of Access and Coverage
VI  Valid International
SPHCDA  State Primary Health Care Development Agency
TBA  Traditional Birth Attendant
UNICEF  United Nations Children’s Fund
1. Executive summary

The Katagum is one of the Local Government Areas (LGAs) in Bauchi state and also, part of the 71 LGAs where the Simplified Lot Quality Assurance Sampling Evaluation of Access and Coverage (SLEAC) assessment was implemented in Northern Nigeria. The Community-based Management of Acute Malnutrition (CMAM) program in Katagum is implemented by the Bauchi State Primary Health Care Development Agency (BSPHCDA) which work closely with the Bauchi State Ministry of Health (BSMoH) and supported by United Nations Children Fund (UNICEF). The CMAM services are integrated into the other primary health care services at 5 Health Facilities (HFs).

The SLEAC assessment that was conducted by Valid International (VI) in Bauchi in the month of January 2014 unveiled results of high coverage classification. According to the results, a total of 65 SAM cases that were found in Katagum LGA, 44 were in the CMAM program. Katagum LGA was identified for implementation of Semi Quantitative Evaluation of Access and Coverage (SQUEAC) assessment to investigate in depth factors that affect CMAM program coverage.

The program routine program data in the period of January 2013 to August 2014 were extracted to investigate quality of the monitoring data, time to travel to site of the beneficiaries, Mid Upper Circumference (MUAC) at admission among other program characteristics that affect the coverage. The analysis of this quantitative data opened relevant questions that would be used in qualitative data gathering to collate further information to give a deep insight into the performance of the program, perception of the program in the community, delivery of CMA services at the Health Facilities, Health seeking behavior of the community, definitions and perceptions of malnutrition among the communities in Katagum LGA. This information was collected from various sources using various methods exhaustively until no new information was forthcoming. This information was continuously analyzed into barriers, boosters and questions to program coverage.

In general, the program performance shown by the analyzed performance data indicated, a low program performance. The trend of the recovery rate had remained below the minimum recommended rate. Similarly, the default rate was also, significantly above the maximum recommended rate. It is noteworthy that in the period of March to July 2013, the program performance declined significantly. Performance was not monitored in the period spanning July and October 2013. Beginning the month of October 2013 and peaking in......
January 2014 the CMAM program performance monitoring was captured and indicated an improving trend similar to that of an attack phase period seen at the start of an emergency CMAM program. Nonetheless, the default rates increased significantly in the same period.

The routine data analyses indicated Low MUAC at admission\(^9\). The data extracted and analyzed covered the period beyond the initial attack phase, as such the critical cases (admitted with MUAC<100mm) which were evident should have ideally been detected early and treated in a good program that has early case finding an admission, however, the cases were living in the community before being detected and admitted. More information revealed that the limited early case finding, defaulter tracing and beneficiary follow-up may have in a large way contributed to the high defaulter rate, and late admission of cases into the program. Notably, the median Length of Stay (5 weeks) was short\(^10\), however, it is treated with caution in consideration of the poor quality of monitoring data and poor adherence to the national CMAM protocol by Health Workers (HWs). Cases in the program were often discharged as recovered when they had not attained 125mm or more\(^11\). It was suspected that some cases that defaulted were reported as discharged recovered, particularly atBulkachuwa HF making the HF data not reliable in analysis of exit indicators using routine data. Qualitative information revealed that caregivers who got admission into the program were charged for the beneficiary cards and/or routine drugs which has potential of lowering limiting regular access s to CMAM services, encourage defaulting and lowering the opinion of the program.

Generally, significant number of caregivers with beneficiaries in the program used motorized transport to access CMAM services. Few were not able to access the CMAM services due to far distance from the CMAM HF. There some areas that were barricaded by floods and gave limited access to CMAM services at certain periods of the year. This is discussed in detail in analyses of distance to travel to CMAM HF site plots and may also be understood well in the analysis of admission trends against seasonal activities/events in the year. Significant number of current beneficiaries came from outside the Katagum LGA.

The small area survey indicated a probable heterogeneous coverage while the small study revealed that charging of beneficiaries on aspects of CMAM services contributed to low coverage of the program.

In a nutshell the key barriers to the program coverage include: Non adherence to CMAM protocols, Non-existent/limited defaulter tracing/beneficiary follow-up, Poor community mobilization/sensitization, Caregivers have incurred charges Incurred charges on routine drugs (Yayu) and cards and dearth of routine drugs. The key boosters are: Good opinion of the program in the communities, the community awareness generates Peer to peer referral, referral by community persons to CMAM services and Good awareness of the program existence in the LGA.

\(^9\) Median MUAC at admission=106/105  
\(^10\) Short Length of stay in a program that has early detection of SAM cases, good retention of cases from admission to recovery and adherence to the CMAM protocol is an indicator of a quality program.  
\(^11\) 10.1%, 61% and 28.8% of the reported discharged recovered had MUAC of <115mm, =>115-<15mm and =>125mm respectively.

9
Point estimate of the program coverage was arrived at giving a headline program coverage of **Point coverage=19.5% (13.6% - 27.2%. CI; 95%)**

It is worth to note that the SLEAC assessment which concluded the wide area survey in Bauchi January 2014 coincided with the period when the program performance had improved significantly and peaking in the month of January 2014 (see figure 5 of this report). As such the number of covered cases at the time SLEAC assessment was done may have given a picture of high coverage at that point in time

Key recommendations to improve the CMAM program are presented as:

- Build the capacity of the HWs implementing CMAM to improve adherence to the national protocol on CMAM.
- Commitment of more funds for purchase and delivery of routine drugs to ensure affordability of and access to CMAM services.
- Scale up CMAM services to other HFs in an effort to ‘even out’ availability to the large populace. This includes strengthening the CV activity
- Operationalize the exiting stabilization centre at Azare General Hospital and FMC in terms of training, delivery of relevant supplies.
- Address the shortage of trained HWs to profile the current man power and make modalities to increase HWs in all CMAM LGAs in Bauchi including Katagum.
- Allocation funds for printing and delivery of data tools, guidelines/protocol for all the HFs in Katagum LGA. This includes support of an on-the-job training program for HW on how to monitor SAM cases in CMAM program,
- Strengthening of the community mobilization and sensitization in Katagum LGA (and by extension all CMAM LGAs in Bauchi state).
- Possible implementation of another SQUEAC assessment in 8 to 12 months.

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12 Results are expressed with a credible interval of 95%.
2. Introduction

Bauchi State is located in the Northeast of Nigeria. It is bordered by Kano and Jigawa states to the North, Plateau and Taraba States on the South, Gombe and Yobe to the East while Kaduna State borders it to the West. The State which occupies a total land area of 49,119 km², has 20 admistrative Local Government Areas (LGAs)\(^\text{13}\).

Katagum is a town, an LGA and a traditional emirate in Bauchi State of Northern Nigeria. The town is located on the Northern bank of the Jama’are River, which is a tributary of the Hadejia. The predominant communities include the Fulani, Kanuri, Hausa, Mangawa, Bede, Karekare, Ngizim, Shirawa, or Teshenawa tribes\(^\text{14}\). The town of Katagum is the administrative centre of Zaki LGA. The Katagum LGA is a completely separate and distinct LGA south of the Zaki LGA, from which it is separated by the Itas/Gadau LGA; the Katagum LGA thus does not include the town of the same name; it has an area of 1,436 km\(^2\) and a population of 295,970 at the 2006 Census; its administrative centre is Azare. The map below shows the location of Katagum LGA in the map of Bauchi State.

![Map of Bauchi State and Katagum LGA](image)

Implementation of Community-based Management of Acute Malnutrition (CMAM) in Katagum LGA commenced on 8\(^\text{th}\) of December 2011 with five CMAM HFs\(^\text{16}\). The program is implemented by Bauchi State PHCDA to provide CMAM services in Katagum LGA. UNICEF support the CMAM services technically and in terms of RUTF supplies to the LGA. The health workers (HWs) who are employed by the Bauchi State PHCDA work in each of the five health facilities (HFs) that offer CMAM services. The HWs work collaboratively with the Community Volunteers (CVs), who they also supervise directly.

\(^\text{13}\) The southern region has: Bauchi, Tafawa-Balewa, Dass, Toro, Bogoro, Ningi, Warji, Ganjuwa, Kirfi, Alkaleri, while the Northern region consist of: Darazo, Misau, Giade, Shira, Jama’are, Katagum, Itas/Gadau, Zaki, Gamawa and Damban.

\(^\text{14}\) http://en.wikipedia.org/wiki/Katagum

\(^\text{15}\) Sourced from http://nigeriazipcodes.com/378/bauchi-state-zip-code/

\(^\text{16}\) Urban maternity, Madara, Gwasamai, Bulkachuwa and Yayu
The SQUEAC assessment was implemented in the period 25th August and 16th September 2014. The objectives of the assessment are outlined below.

3. Objectives

Katagum LGA SQUEAC investigation was guided by the following specific objectives;

1. Investigate the barriers and boosters to program access and coverage.
2. Evaluate the spatial pattern of program coverage.
3. Estimate overall program coverage.
4. Make relevant recommendations in order to reform and to improve the CMAM program,
5. Build the capacity of SMoH/SPHCDA and LGA staff to conduct a SQUEAC assessment.

4. Methodology

The SQUEAC technical manual17 guided the methodology that was used in the SQUEAC investigation in Katagum LGA CMAM program. Various tools that were used in different stages of SQUEAC are outlined below:

Stage 1 data tools and analysis

Quantitative data tools:

Routine program data, and data from client information recorded in the beneficiary cards were extracted and analyzed into various plots/charts, that is; 1) distance travelled by beneficiaries to CMAM Health Facilities (HFs); 2) length of stay from admission to cure; 3) admission trends; 4) program exits/discharge outcomes; 5) MUAC at admission; 6) number of visits before default; 7) proportion of cases attending from other LGAs; 8) ages of the attending beneficiaries; and 9) proportion of exit MUACs according to discharge criteria.

Analysis of the findings of the plots aimed at giving leads to investigate factors that affect program coverage. A few of these include: proximity of the attending beneficiaries to CMAM services, adherence to the CMAM protocol by the Health Workers (HWs), ability of the program to admit Severe Acutely malnourished (SAM) cases early into the program, ability of the program to keep children from admission to cure without defaulting (non-adherence to treatment), and if beneficiaries who are undergoing treatment abscond/default, look for evidence of follow-up of such cases in the community.

Qualitative data tools

**Barriers, Boosters and Questions (BBQ):** Qualitative data was analyzed into a barriers, boosters and question (BBQ) tool to capture the positive and negative factors that affect the program access and coverage. The information was collected from different sources and methods and triangulated to abduce evidence. More scrutiny on the available information was done followed by collection of additional information to confirm the prior evidence gathered before until no further information was forthcoming about a certain theme/topic in a process referred as sampling to redundancy.

This information was further analyzed into weighted and un-weighted barriers and boosters, concept maps and belief histogram all which were scored according to the perceived weight/effect each factor (whether positive or negative) had on the program coverage. The process of making belief histogram, weighing barriers & boosters and concept map is discussed in detail in separate section of this report (making the prior section). The various plots and tables are annexed to this report.

**Stage 2 data tools and analysis**

During this stage the objective was to evaluate the spatial nature of coverage and also areas which contributed to the CMAM program failure in Katagum LGA. Small area survey, observational and small study were used. The process of undertaking the survey and the studies are described in the body of the report.

Making sense of the small area survey data employed Simplified Lot Quality Assurance Sampling technique. This was done by examining the number of Severe Acute Malnutrition (SAM) cases found \((n)\) and the SAM cases covered in the program. The threshold value \((d)\) was used to determine if the coverage was classified as satisfactory or not. Value \((p)\) was used to denote a standard used as a measure of coverage. In the Katagum LGA SQUEAC assessment the standard \((p)\) was adapted from the two standard three class classifier used in Wide Area Surveys (and also in the previous SLEAC survey). In this SQUEAC assessment the coverage classifier was used to allow for use of a minimum threshold of 20% which would be sensitive to little variations in spatial coverage in Katagum. The 2 standard 3 class classifier is illustrated below:

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18 The SPHERE standards has recommended minimum coverage for Therapeutic programs in rural, urban, and camp settlements. These thresholds which are 50%, 70% and 90% coverage for TFP program run in the contexts of rural, urban and camp areas respectively can be used to set the value of “p”. In this assessment two standard 3 class classifier was used to set the value of “p”. See below.

19 The two standard three class classifier classifies coverage as follows: Low coverage-20% and below; Moderate coverage-greater than 20% up to 50%; high coverage-above 50%

The values of \((p)\) that were used are 20% and 50%. The formula for deriving \((d)\) are outlined below:

\[
d_1 = \left\lfloor n \times p_1 \right\rfloor = \left\lfloor n \times \frac{20}{100} \right\rfloor = \frac{n}{5}
\]

And

\[
d_2 = \left\lfloor n \times p_2 \right\rfloor = \left\lfloor n \times \frac{50}{100} \right\rfloor = \frac{n}{2}
\]

If the number of covered cases exceeded prime value \((d_1)\), then the coverage was classified as being satisfactory. This is corollary when covered cases exceeded \((d_2)\). By exceeding the value \((d_1)\), the coverage would not only be deemed satisfactory but, also, it may indicate areas with potentially high coverage and as opposed to those with potential low coverage. However, if the number of covered cases found did not exceed value \(d_4\) then the coverage was classified as being unsatisfactory. The combination of the \((n)\) and \((d)\) was used as the sampling plan.

The reasons for coverage failure obtained were analysed and plotted in figure 19 in the results section of this report.

**Stage 3 data**

**The prior:** The tools that were used in stage 1 and 2 revealed a rich set of information about coverage and identified barriers to access and care aspects of the program as well as its spatial coverage.

Bayesian technique\(^{21}\) was helpful to provide information about overall coverage of the program. As such, all the relevant information that was collected in stage 1 and 2 were used together with the survey data that were collected in stage 3 of the SQUEAC investigation. In other words, the analysis of routine program data; the intelligent collection of qualitative data; and the findings in stage 1 as well as the small-area surveys and small studies in stage 2 revealed adequate but relevant information about program coverage. This information

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\(^{21}\) Bayesian methods allowed findings from work done prior to a survey to be combined with data from the survey. In this case survey data are treated as just another source of information and are used to update the prior information. The main advantage in using the Bayesian approach in this as well as in all SQUEAC investigation are: 1) Smaller survey sample sizes are required compared to larger population based dummy surveys; 2) It provides a framework for thinking about SQUEAC data that has been collated and analyzed in stage 1 and stage 2. Refer to SQUEAC Technical guideline (Myatt, M., et al. (2012).
was entered into a process of creating the prior (as described in latters sections of this report).

A conjugate analysis which is used to provide the final program coverage (as described below) requires that the prior and the likelihood are expressed in similar ways.

Therefore the prior of the program was arrived at through use of the following tools:

- Belief histogram
- Weighted barriers and boosters
- Calculated scores of the total positive and total negative factors illustrated in the concept map.

The prior was established in a beta prior distribution with prior shaping parameters (that is beta-β & alpha-α) and plotted on BayesSQUEAC calculator. The resulting beta prior distribution expresses the findings of stage 1 and 2 in a similar way as the likelihood survey binomial probability distribution described below. The BayesSQUEAC calculator usually suggest a sample size which has been calculated to yield results with 10% precision (at 95% Credible Interval (CI)).

The likelihood survey yielded data that was analyzed to give likelihood program coverage. The data was organized into the parameters tabulated in the table below and the likelihood results expressed as a point coverage (as shown in the table below). The binomial probability distribution of the likelihood results of Katagum LGA SQUEAC are shown in figure 28 in results section of this report.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current cases in the program (x)</td>
<td></td>
</tr>
<tr>
<td>Current SAM cases not in the program (y)</td>
<td></td>
</tr>
<tr>
<td>Total current SAM cases (n)</td>
<td></td>
</tr>
<tr>
<td>Point coverage(^{25}), CI 95%</td>
<td>(\text{point coverage} = \frac{y}{x+y})</td>
</tr>
</tbody>
</table>

The program coverage (Posterior).

The process of combining the prior and the likelihood to arrive at the posterior (also referred as conjugate analysis\(^{26}\)) was used in arriving at the final program coverage in the Katagum SQUEAC investigation.

This meant that the prior information about coverage\(^{27}\) were, like the likelihood results, expressed as a probability density as described process of developing a prior above.

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\(^{22}\) Each listed process is discussed in detail in the body of the report

\(^{23}\) The software can be downloaded free at: [http://www.brixtonhealth.com/bayessqueac.html](http://www.brixtonhealth.com/bayessqueac.html)

\(^{24}\) As illustrated in the example in figure 28 in results section of this report.

\(^{25}\) Point coverage gives overall accurate measure of this program

\(^{26}\) A conjugate analysis requires that the prior and the likelihood are expressed in similar ways.
The conjugate analysis combined the *beta* distributed prior with a *binomial* distributed likelihood to produce a *beta* distributed posterior in a process illustrated in the figure below:

![Figure 3: Beta binomial conjugate analysis in stage 3 of SQUEAC assessment](image)

**Met need** is calculated as:

\[
\text{Met need} = \text{Coverage (effectiveness)} \times \text{Median recovery rate}
\]

## 5. Description of planning and field activities

**SQUEAC planning, training and implementation**

The ACF Coverage Assessment team had organized a trip to Bauchi State to follow-up on the letter sent earlier by the FMoH to the SPHCDA director and State Nutrition Officer giving notification of the intention to undertake a SQUEAC assessment in Katagum LGA. Subsequent to this ACF team had a meeting with the relevant Bauchi State and LGA officers to brief them of the processes of SQUEAC and to make up the list of the Government officers whose capacity will be built in the process of the assessment. Besides this, advertisement for required enumerators was put up and appropriate dates for beginning the training decided upon.

ACF Coverage Assessment Team arrived in Katagum LGA on 23rd of August 2014. The key tasks that the team embarked on include: recruitment of enumerators, collation of beneficiary/OTP cards and entry into the computer and ultimately, training of the recruited enumerators on key SQUEAC precepts for 2 days. The training happened in the period 29th and 30th August 2014. The stage 1 of the SQUEAC assessment happened in the period 1st to 8th September while stage 2 and 3 were done between 9th and 15th September 2014. The Deputy Director of SPHCDA & the State Nutrition Officer (SNO) of Bauchi State, Nutrition Focal Person (NFP) & Health education promoter of Katagum LGA participated in the training and implementation of the SQUEAC assessment in Katagum LGA.

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27 which consisted of analyzed and amalgamated findings from the analysis of routine programs data; the intelligent collection of qualitative data; and the findings of small-area surveys
Dissemination of the SQUEAC assessment findings was done at the SPHCDA in Bauchi with participation of key Bauchi state Government officers among them; the Executive Chairman; Director and deputy director of SPHCDA; Commissioner of Health and SNO (SMoH); Director of PHC, NFP and Health education coordinator of Katagum LGA; village heads of Katagum LGA. The key recommendations to reform the CMAM program were also made and deliberated upon.

6. Results and findings

The results and findings of the SQUEAC assessment are reported in the following sections of the report. The findings of the stage 1 guided the investigation team in stage 2 and 3. This begins with quantitative followed by qualitative findings. Thus:

6.1. **Stage 1: Routine monitoring data-identifying potential areas of low and high coverage.**

Quantitative data was extracted from the beneficiary records/OTP cards, beneficiaries’ registers and program monitoring data. The analysis are presented inform of plots that gave the first ‘picture’ of the program.

6.1.1. **Routine monitoring (beneficiary cards) and performance data**

6.1.1.1. **Age distribution of current cases in the program**

![Plot of ages of cases in the program-Katagum LGA](image)

*Figure 4: distribution of ages of cases attending the program-January 2013 to August 2014*

Routine data analysis revealed that majority of the cases in the program were below 3 years. Malnutrition (specifically underweight) is generally known to be high in Northern Nigeria. In the SMART nutrition survey results of 36 states of Nigeria, the disaggregation of results by child’s age shows that underweight is lowest in younger children as indicated by 17 percent of children under 6 months and highest in children age 12 to 23 months at 26
percent. Furthermore, disaggregation by child’s age shows that the prevalence of acute malnutrition is highest in younger children as showed by 19 percent among children 6 to 11 months and 16 percent among children 12 to 23 months. This shows that it may not be unusual for the children get treated in a CMAM program to be coming mainly from the younger children.

6.1.1.2. Program exits (discharge outcomes)

The CMAM program monitoring data gives the picture of the program over 20 months period as illustrated below:

![Figure 5: Exit trends for Katagum LGA CMAM program-January 2013 to August 2014](image)

The analysis of the trend in performance covers the entire year of 2013 till month of August 2014. There was acute shortage of RUTF in the period of July to October 2013 occasioned by depletion of stocks at the state level.

The presentation of the trend of performance for individual HF (with exception of Bulkachuwa CMAM HF) in 2014 (January to August) indicates that generally the CMAM program is effectiveness is generally below the SPHERE minimum standards. The illustrations below show a recovery rate that is above the 75% threshold and a defaulter trend that remains above 15% mark. The death rate is below 10%. In further investigation it would be necessary to look at the factors that affect service delivery of CMAM services when the HWs and caregivers are interviewed when evidence is collected in stage of qualitative data collection. Further analysis of the visits before default, MUAC at default,

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28 Summary of the National Nutrition and Health survey findings (SMART). 9th to 5th May 2014. Nigeria
29 SPHERE recommends a minimum recovery rate of 75%, maximum defaulter and death rates of 15% and 10% respectively for a good TFP program. A good program should also have less than 5% of the children in the program who have not recovered.
MUAC at admission and discharge criteria are presented in the following sections. Bulkachuwa HF data had errors, one of which was lack of information on discharge and it would not be appropriate to run analysis of performance trend using the extracted routine data.

The exit over time for the period January to August 2014 is plotted below:

Figure 6: Exit trends for Katagum LGA CMAM program by HFs-January - August 2014

6.1.1.3. Admission trends

The program admissions over time compared to the calendar of events in Katagum LGA are illustrated below:
Figure 7: Admission trends and the seasonal calendar of events

6.1.1.4. **MUAC at admission**

The median MUAC at admission is considered low at 106/105mm. The MUAC at admission for all the HFs is illustrated below:

Figure 8: Admission MUAC for Katagum LGA CMAM program

The median MUAC at admission is considered low at 106/105mm. The MUAC at admission for all the HFs is illustrated below:
6.1.1.5. **Length of stay from admission to cure**

This analysis was done on all the recovered cases and presented in the illustration below:

**Figure 9: Length of Stay in program before recovery**

The length of stay (5 weeks) analysis should be interpreted with caution. The monitoring data was suspected to have errors. Different analysis of MUAC at exit indicate that
significant number of children who exited as formally as discharged recovered had a MUAC of less than 125mm or 115mm. see The analysis of MUAC at discharge is shown in another figure 10 below. The length of stay of four facilities that offers CMAM in Katagum is presented below:

![Figure 10: Length of Stay in program before recovery](image)

![Proportion of the Exit MUACs-Katagum LGA](image)

*Figure 11: proportion of the MUAC measurement of children discharged as recovered.*

In all the HFs the recovered children’s MUAC were mainly below 125mm which is one of the criteria to reach before a child in the program is discharged as recovered. The proportion of exits by HF is illustrated below:
Figure 12: proportion of the MUAC measurement of children discharged as recovered by HF.

6.1.1.6. Number of visits before default

Figure 13: Plot of number of visits (weeks in program) before default
Majority of defaults occurred early and importantly it most of the cases defaulted when they were likely SAM cases. See figure 13 above. The analysis of the weeks stayed in the program before defaulting for the four HFs is illustrated below:

In all the HF children defaulted early in to the program. The proportion of MUAC measurements at the time of default is illustrated in figure 14 below. Contribution of defaulters by each CMAM HF was plotted to yield the results in figure 14 below:

Figure 14: proportion of defaulter’s MUAC on exit and proportion of defaulters by HF
6.1.1.7. **Distance travelled to CMAM treatment HF**

Analysis of a significant proportion of beneficiaries’ distances travelled to the CMAM health facilities are shown in figure 15 below. There were caregivers who travelled to the CMAM HF using motorized transport.

![Distance travelled to CMAM site-Katagum LGA](image)

*Figure 15: Distance travelled to CMAM HF for current cases and defaulters*

The plots of individual CMAM HFs is illustrated below.
Figure 16: Distance travelled to CMAM HF for current cases by HFs

6.1.1.8. Attending cases from other LGAs other than Katagum

The cases attending the program were disaggregated by LGAs where they came from to yield the following findings.

Figure 17: Proportion of cases attending HFs in Katagum from other LGAs
The disaggregated results to show the individual LGAs by their contribution to attendance is illustrated below:
Figure 18: Disaggregated results of contribution of other LGAs to attendance in individual CMAM HFs
6.1.2. **Conclusion of the routine monitoring data analysis**

The information analyzed in the routine data gave guidance in the subsequent stage 2 of the SQUEAC investigations. Some of the key conclusions or questions that needed further investigations were around the following themes:

- Distance of travel to CMAM site may inhibit access
- Adherence to CMAM protocol may not be satisfactory and a contributor to coverage failure.
- Caregivers may not have adequate or lack knowledge on how the CMAM program works.
- The program referral system may be weak as most cases are admitted with low MUACs (when they have deteriorated).
- There are suspected errors or missing data when the cases in the program are monitored. This is seen in suspected erroneous MUAC measurements at admission and exits and/or erroneous discharge of beneficiaries as recovered. This should point to poor knowledge on part of the health worker.
- Defaulting cases early in the program who do may not have come back to the program. It is likely that there is poor defaulter follow-up given that there was no existing records to show it happens nor indication of returning defaulters on beneficiaries’ registers and cards.
- Majority of cases admitted into the program are mainly below 36 months. This could be in line with the fact that burden of malnutrition is mostly seen on children below 24 months\(^{30}\).
- Program performance is below generally below SPHERE STDS with exception of death rates\(^{31}\).

6.2. **Stage 1: Qualitative data-Investigation of factors affecting program and coverage.**

6.2.1. **Qualitative sampling Framework**

Information from the completed routine data extraction and analysis formed the basis of the qualitative data collection. As mentioned above key areas singled out for further investigation aided to know the areas that would be sampled to obtain the information, the sources that would be used and the respondents from which the information will be obtained from. 20 villages were purposively sampled from the catchment areas in which the 5 CMAM (Health Facilities) HFs targeted from the entire Katagum LGA. Thus qualitative information was:

- Collected from various respondents: Community persons - village heads, traditional leaders, religious leaders, traditional birth attendants, traditional healers, shop

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\(^{30}\) Evidence has shown that the burden of diseases related to malnutrition is within children less than 2 years of age.

\(^{31}\) SPHERE standards recommend **Recovery rate of >=75%**, **Default rate of <15%** and **Death rate of < 10%**. Normally, good program have a non-recovery rate of less than 5%
vendors, Patent Medicine Vendors (PMV) operating in the villages, Majalisa\textsuperscript{32}, lay persons; Health workers: program managers at state and LGA level, HWs at the health facilities and Community Volunteers (CVs).

- Collected using various ways were used to collect the information thus: in-depth interviews, focused group discussions, semi structured interviews, observation checklist, and case studies.
- Continuously analyzed into boosters barriers and questions. The relationships been barriers and boosters were represented into a concept map shown in the annex of the report.

The qualitative information obtained from the field are summarized and explained under thematic headings as follows:

6.2.2. **Perception of and definition of malnutrition in the community**

The etiology and manifestation of malnutrition are well known in most communities visited during SQUEAC investigation. All the same, the recognition of the signs of malnutrition is based on those visible during the later stages of malnutrition when wasting or oedema are clearly visible in the child. The criteria emphasized by the CMAM program in identification of SAM cases prior to manifestation of oedema or medical complications were generally not know in the community. This was also confirmed during area surveys (described later in the report) done in stage 2 and 3 when SAM cases with complications or oedema were seen when the SQUEAC investigation teams visited the villages.

The terms that are commonly used in describing malnutrition or related conditions are tabled below. The exercise of definition of terms of malnutrition preceded the general interviews in the community so that they are useful in specifying the conditions of SAM within the community in subsequent interviews.

*Table 2: Terms used to describe malnutrition and related condition in the community*

<table>
<thead>
<tr>
<th>Local term\textsuperscript{33}</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tamowa or Ciwon yunwa</td>
<td>Hunger</td>
</tr>
<tr>
<td>Rina</td>
<td>Swollen body</td>
</tr>
<tr>
<td>kwashiorkor</td>
<td>Kwashiorkor</td>
</tr>
<tr>
<td>Ciwon kumburi</td>
<td>Swollen body</td>
</tr>
<tr>
<td>Rana</td>
<td>Shrinking</td>
</tr>
<tr>
<td>Ramewa</td>
<td>Thinness</td>
</tr>
<tr>
<td>Iska/Bayama</td>
<td>Evil spirit drains the child</td>
</tr>
<tr>
<td>Ciwon makogoro</td>
<td>Slimming, redness of hair</td>
</tr>
<tr>
<td><strong>Other related terms</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>Daudda</td>
<td>Having sexual intercourse while breastfeeding</td>
</tr>
<tr>
<td>Lalacewan jiki</td>
<td>1) Infected breast milk.</td>
</tr>
</tbody>
</table>

\textsuperscript{32} Majalisa refers to small male social groups congregating near market places or shops discussing wide variety of issues in the community, usually partaking local drinks such as tea

\textsuperscript{33} Local term used to describe/refer malnutrition
2) Or Lack of being breastfeed(mother dead)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hakori</td>
<td>Teething</td>
</tr>
<tr>
<td>Nono shan ciki</td>
<td>Lactating while pregnant</td>
</tr>
<tr>
<td>Karanchin jini</td>
<td>Anaemia</td>
</tr>
<tr>
<td>Gudawa</td>
<td>Diarrhea</td>
</tr>
<tr>
<td>Koriya</td>
<td>Jaundice</td>
</tr>
</tbody>
</table>

### 6.2.3. Health seeking behaviors in the communities

During stage 1 &2 of SQUEAC investigation in Katagum LGA by CMAM coverage teams, it was clearly observed that health seeking behavior is mixed, such that some caregivers took their malnourished children to the traditional healer, while others presented them to the Patent Medicine dealers\(^{34}\), CMAM and Non-CMAM-HFs to get treatment for Severe Acute Malnutrition (SAM) condition. In one community, the caregivers said that they would ‘visit the traditional healer not far from their village and if the malnourished child did not show sign of improvement, we will visit the HF or the Patent Medicine Vendor’. Generally most of the interviewed caregivers and other community persons said that they visited or they know persons who visited the HFs to seek medical treatment when their children developed any general ailment. Some caregivers who had had SAM children acknowledged that they were referred to the CMAM HF at one time by their fellow caregiver/neighbor. Large amount of information confirmed this information, therefore, showing strong evidence of optimum health seeking behaviors and existent of peer referral. Caregivers who had SAM children were admitted in CMAM HF, after being referred from a Non-CMAM HFs thus, showing existent of passive referrals. There were a few caregivers who said that they visited the PMVs\(^{35}\) to seek advice on treatment of their SAM children before visiting any HFs. SQUEAC investigation revealed that a HW working at Madara CMAM HF operated a Patent Medicine store and would admit SAM cases at the Madara HF and prescribe medicine that caregiver would need to purchase at his store\(^ {36}\). Sometimes he would charge for consultation when the service was done within his medicine store.

In communities\(^ {37}\) who sought services at traditional healer or PMV store first there notable cases of SAM with medical complications (especially oedema) and children who were severely wasted. Communities who were far\(^ {38}\) from the CMAM health facilities had difficulties in accessing the CMAM services and would opt for readily available options such as traditional healers or the PMVs.

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\(^{34}\) Patent Medicine dealers are also locally referred to as pharmacies or chemists.
\(^{35}\) Patent Medicine Vendors
\(^{36}\) HW (Madara CMAM FH) interview
\(^{37}\) Communities such Charachara, Duhuwur Kura and Maze (under Gwasamai HF), Bulturi, Alamari and Kasa (Bulkachuwa HF), Nasarawa ‘B’, and Mangwashe (Urban Maternity), Kafin Sako (Yayu HF).
\(^{38}\) Some communities that were far include:
6.2.4. **Perception of CMAM program in the community**

Generally there was good perception about the program in all the villages that were visited and knew about the program. The communities were familiar with RUTF (locally referred to as ‘Gede’ and describes peanut in Hausa Language). The ‘Geda’ (RUTF) is perceived as both food and medicine for malnourished children (‘Rana’) in almost all communities visited by the SQUEAC investigation team in Katagum LGA.

In the interviews conducted on the community/religious leaders, caregivers, Traditional Birth Attendants (TBAs), Majalisa and Traditional Medicine Healers revealed that they knew the benefits of ‘Geda’ such as: ‘makes a wasted/thin child to gain weight rapidly and improves their condition to look healthier’. At Gwasamai ward in Katagum LGA where the CMAM HF is located, the community shared similar views about Gede and said ‘if you want your child to look big and healthier simply visit the CMAM HF’. Nonetheless, since the program began in November 2011 there was no tangible community mobilization specific to the Katagum LGA that was done. The current good awareness about the program could be attributed to ‘word of the mouth’ where caregivers and others who know about the benefits of the program and have shared this within their communities. The community felt that they had evidence of children who had SAM and were previously treated using Gede and recovered. The information about the program that was constantly shared within the community had a virtual effect of enhancing the program’s image in the community. Another resultant benefit out of this is peer-to-peer referral advantage at the community level.

6.2.5. **Delivery of CMAM services in Katagum LGA**

The delivery of CMAM services in Katagum LGA was captured in terms of admission, discharge criteria, availability and prescription of drugs and prescription of RUTF to the caregivers as well as performance of key services such as screening, weight monitoring, and appetite test among others. Thus:

6.2.5.1. **Admission criteria**

In a number of instances beneficiaries were admitted when they had a MUAC of >115mm. In most of the CMAM HF the HW in charge of delivery of CMAM services were overwhelmed and would have CVs assist them in screening beneficiaries at admission. The CVs were often not taking correct MUAC measurements and would direct the beneficiaries they have measured to the HW who would not countercheck the measurement. As such cases with MUAC of > 115mm would be enrolled. The HW, also, delegated the weight measurements and check of oedema to the CVs. In an interview session with a community leader in near village, the community leader said that he had been informed that the CMAM program is meant for children within 6- 36months. When this information is shared among the communities, it would have an effect of children who had or had developed SAM and happened to be above 3 years missing out on the treatment. Caregivers may fear rejection if

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39 Evident in Bulkachuwa and Yayu CMAM HFs
40 Village Alamari (Bulkachuwa HF)
they visited the CMAM HF. The Federal Medical Center (FMC) and General hospital both of which treats SAM cases with or without medical complications also, admits SAM cases erroneously.

At Yayu and Bulkachuwa CMAM HFs the HWs measured the height of children who attend. However, it is not recorded at all. HW at Bulkachuwa HF was asked how often he did the measurement and the purpose. He reported that he does it when the beneficiaries visit, but, not necessarily at every visit. HW reported that the height measurement will help him to monitor growth of the child and in detecting stunting. However, the HW could not demonstrate the criteria of identifying stunted child (with the height and age measurement he was taking). The health workers said it is not a criteria for admission of SAM cases but they keep on doing it “because it was brought to them by UNICEF, and did not receive training on its use”

In the opinion of the investigator it was counterproductive to continue height measurement, rather this time should be invested in taking correct MUAC and weight measurement and recording them on beneficiaries’ records for proper monitoring of SAM cases during admission and in-program.

6.2.5.2. Discharge criteria

The observations that were noted regarding the discharge criteria had also, reflected the findings of the routine data analysis. Often, significant number of cases were admitted late in the program with low MUACs (some of which were critical cases with MUACs <100mm). In an ideal situation, such cases will usually stay longer in-program as they get treatment, therefore, increasing the episode of treatment (Length of Stay -LoS). The LoS analysis of the extracted routine data indicated a short LoS which is indicative of a well performing CMAM program in terms of getting SAM cases treated quickly. The underside of this, however, is that in Katagum LGA CMAM program the HWs would discharge most of the cases-in-program when they were still SAM cases, or were moderately malnourished, which is reverse of the principles of the National CMAM protocol.

In one of the investigative visits to the CMAM HF41, observation revealed that beneficiaries who were eligible for discharge as recovered on that particular day had generally stayed for 8 weeks in the program and rarely beyond that time. The HW reported that he would rarely keep cases-in-program beyond 8 weeks before discharging them as recovered. The HWs emphasized that generally, he preferred to follow the CMAM protocol which suggest a LoS of 8 weeks in the program. Since the routine data analysis had shown that some cases still had a MUAC of <115mm or between 115 and 125mm that were discharged as recovered, then the SQUEAC investigation concluded that most cases in program received less than optimum CMAM care as they did not last the full term to recovery (within the standard discharge criteria). Thus the results of the routine data which shows an acceptable LoS

41 Gwasamai HF. Other HF (Madara, Urban Maternity and Yayu) also followed the suggested LoS in would often discharge children-in-program as recovered at less than 8 weeks. This was prioritized to MUAC criteria of child attaining 125mm before discharge as cured. Besides the Bulkachuwa HF erratic data on discharges, (and therefore, not included in routine data analysis) the criteria for discharge was observed to be erroneous, and extremely off the criteria specified in the National CMAM guideline.
should be interpreted with caution. In a program where the SAM cases with low MUACs are identified and admitted into the program it is highly probable that such cases would stay 8 weeks or beyond till they attained a MUAC of 125mm and a satisfactory weight gain. When the program depends on the time the beneficiary has stayed in the program to solely determine which case should continue with the treatment or not is erroneous and may result in a situation as seen here. Most of the discharged cases may be moderate cases that eventually slip to a severe form of malnutrition and may die if they are not identified quickly and returned into the program. Another risk include development of chronic form of malnutrition such as stunting (especially for the cases discharged with MUAC of <115mm). When this is coupled with non-existent patient follow-up and non-defaulter tracing as observed in Katagum LGA CMAM, then such cases may most likely not be traced back to the program. It may be concluded that this CMAM program may not be offering optimum care in treating malnutrition.

6.2.5.3. Administration of drugs and RUTF and general treatment to SAM cases

Observations upon visiting CMAM HF revealed that newly admitted SAM cases were given RUTF but not routine drugs on admission. Thus, key drugs such as antimicrobial and Albendazole (on second visit) were often not given. Interview with HWs revealed that it is common knowledge that the situation of drug stock outs has been persistent, therefore, beneficiaries would be asked to pay for the routine drugs that are existing in the HF to help in sustaining availability. At other times the prescription would be written for the beneficiary to purchase the drugs at the pharmacy.

At the Federal Medical center (FMC) which has a pediatric section that also treats malnutrition and an OTP site, the dietician who oversees the CMAM services has not received any training on CMAM.

The Nutritionist-In charge at FMC reported that there was a ‘local arrangement between the Director of Medical Services at FMC and the Director of PHC (Katagum LGA) to treat SAM at FMC. ‘The challenge has been that I have not been trained on how to dispense the RUTF. All I know is that it is very good in treating malnutrition and I give in my discretion when I observe the condition of the child that presents with malnutrition’. In a nutshell, close scrutiny of the patient registers at FMC revealed the following:

• Weight of children were often taken on admission (which happened in the previous 6 months and then stopped). In addition, the organization of the individual patient records was erratic and the dietician spent long time to look for the patient measurements readings. The CMAM recommended beneficiary cards were not used at all and on the register.

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42 See report on referral mechanism, defaulter tracing and existence of CVs
43 All HF of Madara, Yayu, Urban Maternity, Bulkachuwa and Gwasamai.
44 Bulkachuwa, Madara and FMC CMAM centre.
45 A letter requesting this service was sent by FMC director to the director (PHC-Katagum LGA) requesting for assistance with RUTF to treat cases of malnutrition that were presenting at the FMC. Both FMC and Katagum LGA PHC went ahead with this arrangement. The letter is annexed to this report
• It was apparent that the laborious process of retrieving patient information could have made the dietician not to record the weight at admission or follow-up measurements and recordings any more. At the time of investigation each visiting SAM patient who did not have medical complications received the RUTF only and then were then sent home. The dietician reported that she gave an average ration of 10 satchels of RUTF for every SAM patient treated at the centre. This prescription was not based on the protocol or any other documentary evidence. In some situations, RUTF was prescribed to beneficiaries based on its availability at the hospital. The in-charge/dietician, also gave 1-2 sachets of RUTF to caregivers whose children were not eligible for the program.

• The in-charge did not measure the MUAC of the SAM cases. She had not seen MUAC tape or had training that such would be relevant tool in process of treating or following up SAM cases.

• Visit at the pediatric inpatient wing, revealed that Oral Rehydration Solution (ORS) was given to SAM cases who had dehydration. Pap was also given to the SAM children at a cost of 10 NGN per 100 ML. There has never been supplies of ReSoMal, F75 and F100 therapeutic milks which are key supplies at an ideal SC centre.

At the general hospital SC the medical officer in-charge mentioned that it was not possible to treat SAM cases with complications due the following key reasons:

• There were no supplies such as ReSoMal, F75 not F100 therapeutic milks. There was evidence of children who died at the SC out of the malnutrition related complications. Key medical equipment such as like thermometer, stethoscope among others were not available (see the case study with the HW in latter section of the report)

• One of the HW mentioned that the capacity to handle cases of SAM with medical complications was low. She emphasized that HWs at the SC would need training and additional staff.

The evidence presented a lack of capacity for proper treatment of SAM cases with complications that are referred to the SC or that are detected in the FMC referral centre. As such, when cases with SAM that have deteriorated in the community find their way to the

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46 Pap is a cooked local blend of Soya beans ground nuts and guinea corn/millet/corn, water and sugar mainly given to the children under five years in the community. The Pap at the Inpatient facility was enriched with egg.

47 Modified Rehydration Solution for Malnourished children (Modified ORS solution for malnourished children is supplied by UNICEF)

48 F-75 is considered the "starter" formula, and F-100 the "catch-up" formula. The designations mean that the product contains respectively 75 and 100 kcals per 100 ml. Both are very high in energy, fat, and protein, and provide a large amount of nutrients.

49 SAM cases with medical complications are those children with Sam that presents with dehydration, oedema, cardiac problems, and Respiratory tract infections (RTIs), hypo-glycaemia, hypo/hyperthermia etc. (WHO).
general hospital\textsuperscript{50} and FMC centre which have less capacity to treat such cases, the mortality rates or malnutrition related cases may be high.

It is important to note that, the stabilization centre (SC) is critical in prevention of death of SAM cases with medical complications. Some key services need to be put in place for CMAM package to be successful in prevention of deaths:

- The CMAM service should be offered free of charge to the admitted cases.
- The supplies for the relevant drugs, therapeutic milk, equipment and training of the HWs in charge of treatment should be adequate.
- It is, also, usual practice for the CMAM program to offer ambulatory services at the community and cater for the costs of stay of the caregiver during the period the SAM child receives the treatment till recovery.
- Cases that have recovered should be linked with the CMAM HF and the Community Volunteer network proximate to their address/villages for proper follow-up till the child is fully recovered.

6.2.5.4. Adherence to treatment at the community level

In one community\textsuperscript{51}, caregivers would give RUTF to the sick/malnourished child, however it was also, shared among the sick child’s siblings such that the sick child would have less than what was prescribed at the HF\textsuperscript{52}. In most communities adults said they have both tasted and eaten the RUTF which they either obtained from caregivers, CVs or HFs offering CMAM services\textsuperscript{53}. In one interview a caregiver who does not actually have a beneficiary in the program had been sent to collect RUTF from Bulkachuwa HF on behalf of her neighbour who was not able to attend because of illness. It had been observed that she was able to receive RUTF from the HW. A caregiver in Kankau village (Under Madara HF) said that ‘\textit{I thought that the program is not meant for a child above 2 years of age’}. There is evidence that the caregivers may know about the program but do not understand how the program works

Investigations also revealed suspect sale of RUTF among the community. ‘\textit{In one PMV shop, some RUTF satchels were being sold to all who need although secretly’} said one of community members who was interviewed. The investigator traced the suspect shop within Azare town (Headquarters of Katagum LGA) and also within the community of Isawa in adjacent Giade LGA which is about 5km drive from Azare town.

\textsuperscript{50} As reported by the caregivers interviewed at the FMC. See the excerpts of the interviews in latter section of this report
\textsuperscript{51} Evidence found in Dogonjeji (Urban Matarnity HF)
\textsuperscript{52} Sharing of RUTF for healthy children Bulkachuwa, FMC (AT the
\textsuperscript{53} Nasarawa ‘B), Magwashi (Madara HF); Duhuwar Kura, Lariski (Gwasamai HF); Dorawari and Kafin Sako (Yayu HF); Chinede and Alamari ((Bulakahuwa HF)
6.2.6. **Referral mechanism**

6.2.6.1. **In the community**

There is evidence that most of the communities have awareness about CMAM program in Katagum LGA. More than half of the interviewed caregivers who did not have children in the program were aware about the program and what it does to change the situation of a malnourished child. Peer referrals are common where the caregiver of a child who shows signs of malnutrition (deteriorating cases) would be advised to seek help from a CMAM HF. There are some caregivers who mentioned that some malnourished children would need to be taken to the traditional healer and if the children did not improve then help could be sought from HF. There were cases spotted with oedema in the course of investigation. This confirms the quantitative data findings of MUAC at admission analysis which shows large proportion of SAM cases that were admitted with low MUACs more so, below 100mm (considered as critical cases).

The CV referrals in the LGA was minimal and the evidence of their activity as barely available.

6.2.6.2. **At the Health Facility**

Investigation shows no distinct referral of SAM cases from others health facilities (non CMAM sites) to the CMAM sites in Katagum LGA. The HW at Azare General Hospital and FMC were receiving referrals from pediatric sections within the hospital.

6.2.7. **Case studies**

6.2.7.1. **Interviews with caregivers of SAM cases at pediatric inpatient wing of FMC**

<table>
<thead>
<tr>
<th>SAM Case</th>
<th>Home location</th>
<th>Extracted information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (24 months): beneficiary from Azare:</td>
<td></td>
<td>The caregiver visited the hospital on her own volition. The Child had been ill with diarrhea and fever. On the 4th day caregiver brought her to the general hospital Azare. ‘We spent the night there’ the caregiver reported. ‘On the following day we decided to bring her to FMC. We were referred to FMC by the HW at the general hospital who were not able to treat my child’. At the time of the interview the beneficiary had not yet recovered.</td>
</tr>
<tr>
<td>2 (24 months) from Decina (Shira LGA) in Bauchi state</td>
<td></td>
<td>My child has had changes in hair coloration since she was born’. The caregiver reported. The condition is recognized as dauda (malnutrition). The child had been sick with diarrhea, had poor appetite and not able to eat. ‘I first visited a health facility at Decina (Shira LGA), however, the situation of my child did not improve, as such, I went to a traditional healer’.</td>
</tr>
</tbody>
</table>
The caregiver said that the father of the caregiver suggested to her that she should take her sick child to Bamako FMC permanent site where he had heard that Madara (RUTF) was being given. The Bamako Hospital referred the caregiver to the FMC. At the time of the interview, the child and the mother had already, spent a week at FMC hospital, where the child received drugs and rehydration. The appetite had improved slightly but still, the child had an anal infection. The caregiver was paying for the services at the FMC. She said ‘I have exhausted all the money I had and I want to leave this hospital’

3 (31 months) From Chinede ward: ‘This is my Sister’s child who does not breastfeed now and has poor appetite. Currently we are giving her only kunu geda’ the caregiver reported. The mother of the child had taken her to the traditional healer and later to CMAM HF. ‘The child was given Madara (RUTF). This improved her condition and she was sent back home, however, she got malnourished again when her mother left her with her grandmother a month ago. By the time we were bringing the child to the hospital, the child had convulsions and was wasted (looking thin). The village head who saw her referred us to the FMC where we came and were admitted yesterday. In my husband’s family house at Chinede there is also a boy like my niece who has this condition’. Sister to the mother reported. The location where the malnourished boy lived was confirmed to be at their house at ugwan liman Gidan Ubali (in chinedi ward).

6.2.7.2. In-depth interview with the Dietician at CMAM SC -General Hospital Azare.

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>How long have you have been in the CMAM program?</td>
<td>The HW reported that he came into the SC in 2013. At that time he noticed that the services were not run well and there were many Sam related deaths. He communicated with the NFP through the in-charge of the hospital subsequently, the hospital received RUTF and a weighing scale.</td>
</tr>
<tr>
<td>Training/knowledge on</td>
<td>The HW also received a training on CMAM once on January 2014</td>
</tr>
</tbody>
</table>

54 This is regarded as the permanent site where the FMC will be moved from the current. The Bamako HF does not have CMAM services.
55 This is the local food made of groundnut and millet
### CMAM by UNICEF.

| Where do our beneficiaries come from? | The beneficiaries are mainly referred from urban maternity, other CMAM HF while others come directly from home. There are SAM cases that get referral from other pediatric units within the general hospital. When the HW has treated them, he refers them back to the CMAM HF close to their home. |
| Services offered | He said he admits SAM cases with other medical complications treats, discharge them when they get better then ask them to come for follow up. |
| Is there defaulters tracing? | Usually when a SAM case improves the caregiver would deem the child healed and would not wait till the HW would declare the child healed. Technically this resulted to defaulting. On some occasions the HW had sent some neighbouring caregivers to enquire of the beneficiaries who had defaulted earlier. They had often reported that they were not able to afford and sustain regular travel to the General hospital for follow-up. |
| Admission and discharge criteria: | **Admission:** Age: 6-59 months children; MUAC <115mm with/and bilateral pitting oedema\(^{56}\).  
**Discharge:** Child adds weight for 3 consecutive times. (Noted that the HW does not measure the MUAC at discharge) |
| Relationship with the pediatrician: | HW gets referral from the pediatrician at the hospital. They maintain a cordial working relationship. |
| Reports: | HW sends monitoring (monthly) report to the LGA NFP. |
| Challenges he has in offering CMAM services: | • Lack of adequate staff trained on CMAM to support him.  
• Lack of essential working medical equipment like thermometer, Oxygen cylinder, Naso- Gastric tubes in the SC.  
• No space to offer OTP services.  
• Need to have a building for food demonstration  
• At times people that are not from the right units are been sent for training on CMAM and when they return they do not care to step down the training nor share the training manual.  
• Lack of food for caregivers when their children are admitted in the SC.  
• Lack of means to deliver RUTF from LGA HQ to the hospital. He has often used personal resources to transport the RUTF from the LGA to the Stabilization center to prevent stock-out. |
| Suggested way forward: | • Recruitment of staff and training is needed\(^{57}\)  
• Provision of essential materials like thermometer, more weighing scale, oxygen cylinder etc. for the SC  
• Taking profiles of the essential staff for CMAM training to ensure right staff are trained and the knowledge trickles down to other staff offering CMAM services. |

\(^{56}\) Oedema cases are admitted at the pediatric ward.  
\(^{57}\) The additional staff will assist in screening, taking weight measurements, health education and others
6.2.8. **Supply of RUTF/routine drugs and delivery mechanism**

A general stock out of RUTF was found to occur January to February 2014 at the state level. UNICEF authorized the Jigawa State (SMoH) to assist Bauchi State (SPHCDA) with RUTF, however, when the RUTF was delivered at the state, there were no funds to facilitate delivery to the CMAM LGAs in Bauchi (including Katagum)\(^{58}\). Sometime after the delivery to the State, a standing order was written in January 2014. The director (SPHCDA), three CMAM LGAs chairmen, PHC directors (at LGA level), UNICEF, Bauchi State Agricultural Development Program (SADP), the State Nutritional Officer (SNO) and the acting director played role in delivery of the RUTF to the LGAs.

The first cheque for funds to facilitate delivery to LGA was given in June 2014; a committee for CMAM at the State level came together and had a meeting in July 2014 to discuss modalities of how the funds will be channeled to LGA for this purpose and mainly based on the need of each LGA and their budget allocations. The process saw the first batch of funds for this exercise released in the month of July 2014 to facilitate delivery of RUTF from State to the LGA. This would also cater for routine drugs and printing of beneficiary cards as well as supervision visits.

All the same, it was noted that drugs were supplied although in small quantities that are not adequate when prescribed for SAM cases enrolled into CMAM program. As such there has been stock outs of routine drugs from time to time. In August 2014 some Albendazole and Amoxicillin was delivered to the LGA but was still, not adequate given the number of SAM incident cases that the CMAM program looked forward to. This explains the routine drugs stock outs reported in all the CMAM HF and incidences of beneficiary charges on all the routine drugs prescribed to them.

6.2.9. **General observations**

<table>
<thead>
<tr>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting arrangement as caregivers wait for services</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Workers delivering</td>
</tr>
</tbody>
</table>

\(^{58}\) Interview with Deputy Director State Primary Health Development Agency (SPHCDA). Information was collaborated by Nutrition Focal Person-Katagum LGA.
| CMAM services | persons delivering CMAM services. The caregivers would show their ration card and then be given RUTF. No measurement of MUAC or weight was taken. In most cases the CV recorded arbitrary figures of MUAC measurement on the ration card of each beneficiary given RUTF. Details of the beneficiaries were rarely followed up on the OTP cards.  

**Bulkachuwa:** It was observed that: 1) the procedure of taking height lengthened the time taken per beneficiary while not being useful as a criteria for normal admission into CMAM for new cases; 2) HW did not know how to detect stunting, and neither did he record the height (not to mention some of the weight) measurements that he did on beneficiaries.  

**Madara CMAM HF,** the HW did measure the beneficiaries, however, he would often record erroneous measurement on the on the ration card. |
| RUTF and routine drugs | Bulkachuwa HF, the RUTF dispensed was less than the number of RUTF recorded on the ration cards. The caregivers were more than the available RUTF on the OTP day where SQUEAC team happened to have visited.  

In another case, caregivers collected RUTF for their neighbour whose child was enrolled in the program but had not attended.  

A caregiver was also, sent home without RUTF and was told it was finished. It was observed that there were three cartons of unopened RUTF in the store.  

In some CMAM HFs, CVs would often prescribe RUTF; sometimes less than the recommended ration in the CMAM protocol. For instance, quick scrutiny of the beneficiaries’ ration cards would show that they received less RUTF (e.g. 8 sachets of RUTF to a child who should have received 18 sachets).  

RUTF were also given on behalf of the beneficiary who was absent on the day of follow-up. Appetite test were not done in all the HFs offering CMAM nor was key messages on use of RUTF shared with the caregiver so that they have knowledge of administration at home. Notably, follow-up days of CMAM services fell on public holiday and there were caregivers who were sent back home without treatment. Beneficiaries were often not screened when they visited the HF and therefore no |

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59 It is important to note that Bulkachuwa HF had erratic exit data and as such, it would not be used in routine data analysis  
60 Bulkachuwa, Madara, and Yayu  
61 Seen in Bulkachuwa CMAM HF
follow-up weight or MUAC measurements were available for reference in the following visits. The defaulters were not recorded as returned-defaulters whey the returned to the program; it was not possible to ascertain whether there were any defaulters that had returned.

6.2.10. Data triangulation

The information that was collated and analyzed into barriers and boosters that are tables below. Table 3 and table 4 shows sources and methods; barriers and boosters respectively.

Table 3: Sources and methods used to get information in a BBQ tool.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Sources</th>
<th>Method used</th>
<th>Method description</th>
<th>code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Health facility</td>
<td>A</td>
<td>Observation</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>Caregiver (child-in-program)</td>
<td>B</td>
<td>Semi structure interview</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>Community Volunteer</td>
<td>B,D</td>
<td>In-depth</td>
<td>D</td>
</tr>
<tr>
<td>4</td>
<td>Health Worker</td>
<td>B,D</td>
<td>Extraction</td>
<td>E</td>
</tr>
<tr>
<td>5</td>
<td>Traditional/community leader</td>
<td>B,D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Religious leader (Imam)</td>
<td>B,D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Traditional Birth Attendant</td>
<td>B,D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Majalisa</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Teacher</td>
<td>B,D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Traditional Healer</td>
<td>B,D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Patent Medicine Vendor</td>
<td>B,D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Provision store</td>
<td>B,D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>NFP</td>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>FMC Dietician</td>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>DDPHC Bauchi</td>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Okada/motorcycle rider (Doruwari Yayu)</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Routine data</td>
<td>E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Caregiver (child discharged from program)</td>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Returned defaulter (Caregiver)</td>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>State Nutrition Officer</td>
<td>D</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Table 4: key barriers, boosters & questions findings and sources of information**

<table>
<thead>
<tr>
<th>S/No</th>
<th>Barriers</th>
<th>Sources &amp; Methods</th>
<th>Team 1 scores</th>
<th>Team 2 scores</th>
<th>S/No</th>
<th>Boosters</th>
<th>Sources &amp; Methods</th>
<th>Team 1 scores</th>
<th>Team 2 scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Non adherence to CMAM protocols in terms of:</td>
<td>5</td>
<td>7</td>
<td>1</td>
<td>Good opinion of the program in the communities</td>
<td>3B,4B,5B,6B,7B,11B,12B,3D,4D,5D,7D,11D,6D,2B,8C,9D,12D</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Defaulters not being noted as returned defaulters</td>
<td>4B,3B,2B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Erratic admission and discharge criteria</td>
<td>1A,4D,14D,17E</td>
<td></td>
<td></td>
<td>2</td>
<td>The community awareness generates Peer to peer referral, referral by community persons to CMAM services</td>
<td>4B,2B,5D,8C,12D</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Few/Non-existent counselling and appetite test (Yayu and Madara), Caregivers sent home on public holiday without RUTF, HWS dispense less RUTF than that prescribed on ration card (Bulkachuwa OTP), Absentee beneficiaries are given RUTF through proxies (Bulkachuwa OTP), CVs used to run all processes at CMAM site albeit unsatisfactorily (Bulkachuwa OTP)</td>
<td>1A,4D,13D,17E,1A,4D,13D</td>
<td></td>
<td>3</td>
<td>Good awareness of the program existence in the LGA</td>
<td>5B,6B,7B,8C,9B,10B,11B,12B,5D,6D</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

*62 See detailed barriers boosters and questions in annex 7*
<table>
<thead>
<tr>
<th></th>
<th>Problem Description</th>
<th>Code(s)</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Poor documentation of beneficiary (monitoring) information on the available records</td>
<td>1A,2B, 17E</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Non-existent/limited defaulter tracing/beneficiary follow-up.</td>
<td>4B,3B,3D,2B, 19D</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Poor community mobilization/sensitization</td>
<td>5B,6B,7B,8C, 9B,10B,11B,1 2B,2B</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Low capacity of HWs to implement CMAM (urban maternity)</td>
<td>4B,1A</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Non-existent supervision of HWs at the HF/disconnect in communication between HWs at HF and program managers at LGA and State level</td>
<td>4D,5D,8C,15D ,20D</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Caregivers being sent home without RUTF</td>
<td>1A,2B,11D</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Caregivers have incurred charges Incurred charges on routine drugs (Yayu) cards</td>
<td>2B,9D,16D,8C ,11D,5D,18D</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>HWs have not received training on CMAM in long time. As such old HW may have left while new HWs may not be formally trained</td>
<td>4B,13D</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>Dearth of routine drugs</td>
<td>4B,3B,1A,2B, 3D,4D,7D,13 D,15D,23D</td>
<td>4</td>
</tr>
</tbody>
</table>
6.2.11. Concept map

The coverage team was split into two teams that is, A and B. Each team drew a concept map illustrating the positive and negative relationships. Non adherence to the CMAM protocol would result to long LoS and may contribute to defaulting. Lack of defaulter tracing and beneficiary follow-up results in program with many defaulters and low effectiveness. Charging beneficiaries on routine drugs and beneficiary cards encourages defaulting while giving beneficiaries less RUTF or none and no drug prescription contributed to long length of stay. Late admission into the program contributes to long length of stay and may contribute to defaulting. The detailed relationships are illustrated in concept maps drawn by team A and B in annex 6.

6.3. Stage 2: Confirmation of areas of probable high and low coverage in Katagum LGA CMAM program.

The quantitative and the qualitative data collected in stage one was triangulated and results organized into concept maps that yielded useful relationships and revealed potential areas where there would be disparity in coverage. The following key characteristics that emerged would also be used to construct hypothesis that would be tested, thus:

1. It was likely that the SAM cases that travelled from villages that were far from the CMAM HF were fewer than those that travelled from near villages.
2. It was also, likely that there would be few cases of SAM attending CMAM HFs in wards which did not have a CMAM site than those which had a CMAM site.
3. Adherence to CMAM protocol by the health workers was grossly below average and therefore, affected effectiveness of the program treatment given to the SAM cases and would help make hypothesis to test for coverage.

As such a small area survey was used to test the spatial coverage of the program: 1) In far and near villages; 2) Wards with CMAM HFs and those without CMAM HFs. Observation and small studies were done in two HFs; that is, Urban Maternity and Federal Medical Centre (FMC). The hypothesis are tabulated below

**Construction of hypothesis**

*Table 5: Hypothesis and the methods of data collection*

<table>
<thead>
<tr>
<th>Hypothesis to test:</th>
<th>Hypothesis</th>
<th>Method of study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial nature of coverage</td>
<td>1. Coverage is classified as equal to or below 20%(^{63}) in villages that are considered far from the CMAM HF. Coverage is classified as greater</td>
<td>Small area survey</td>
</tr>
</tbody>
</table>

\(^{63}\) This is based on the 2 standard 3 classification of coverage as less than 20% as low, 20% - 50% as moderate, and greater than 50% as high for rural areas.
than 20% in villages that are considered to be near CMAM HF. Name of communities visited in:
- Far villages (>2½ hours): Dagayari, Kafin Sako & Gangal
- Near villages (<2½ hours): Bidir, Dagal & Lariski

### Spatial nature of coverage

2. Coverage is classified as equal to or below 20% in villages that are within wards without CMAM HF.
   Coverage is classified as greater than 20% in villages that are considered to be within Wards with CMAM HF.
   Name of communities visited in:
   - Villages in wards without CMAM HF: Charachara (Madangala), Kujuru (Madangala), Buskuri (Buskuri)
   - Villages in wards with CMAM HF: Kaloluwa (Madara), Mazai (Gwasamai), Busari (Bulkachuwa).

### Effectiveness of CMAM treatment

3. Less than 75% of the new cases that were admitted into the CMAM program received complete regiment of routine medication, appetite test and were not charged for OTP/beneficiary cards at admission

### Effectiveness of CMAM treatment

4. Among the new admissions less than 75% of the cases had received right quantities of RUTF for the next 7 days.

### 6.3.1 Study Type

Small area survey and small studies\(^{64}\) were used in the selected communities and HFs respectively in order to test the formulated hypothesis.

\(^{64}\) See table 5

46
6.3.2. **Sampling Methodology**

The villages were selected purposively based on the characteristics used in setting the hypothesis. Active and adaptive case finding technique was employed to locate the SAM cases in the rural communities while door-to-door screening was done in communities which have urban characteristics during the small area survey.

The HFs (urban Maternity and Federal Medical centre) were purposefully selected for observational and small studies.

6.3.3. **Case Definition**

Severe Acute Malnutrition (SAM) is defined as Children (6-59 months), with MUAC <115mm and or bilateral pitting oedema.

**SAM case covered:** Refers to a SAM case (as defined above) who is currently enrolled in a CMAM HF or in hospital Stabilization Centre (SC). The status was verified when beneficiary showed evidence of the RUTF packets and/or ration card to the SQUEAC investigator.

**SAM case not covered:** Refers to a SAM case who was not enrolled in a CMAM program or the hospital SC at the time of this investigation. The case was also confirmed as not in the program when the beneficiary was unable to show evidence of the RUTF packets and/or ration Card.

**Recovering case:** A child (6-59months) with MUAC above 115mm and without Oedema who already enrolled in a CMAM program at the time of the investigation. This case was also, verified when beneficiary showed the RUTF packets and/or ration Card.

6.3.4. **Result of Small Area Survey, small studies and observational study**

The results of small area survey are presented in the table 6 & 7 below.

*Table 6: Simplified Lot Quality Assurance classification of small area survey results*

<table>
<thead>
<tr>
<th>Characteristics under investigation</th>
<th>Wards</th>
<th>Settlement</th>
<th>Total SAM ${x (n)}$</th>
<th>Decision rule $d = \frac{n \times 20}{100}$</th>
<th>Covered(c)</th>
<th>Not covered (NC)</th>
<th>Recovering case (RC)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Villages far from CMAM site (&gt;2½ hours):</td>
<td>Yayu</td>
<td>Dagayari, Kafin Sako &amp; Gangal</td>
<td>15</td>
<td>$d = 3 \leq 3$</td>
<td>1</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Villages near the CMAM site (≤2½ hours):</td>
<td>Bidir</td>
<td>Bidir</td>
<td>16</td>
<td>$d = 3, 2 \leq 3$</td>
<td>4</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>CMAM and Non</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

65 See interpretation of the results below
Table 7: results of small studies and observational study

<table>
<thead>
<tr>
<th>Characteristic/service under investigation</th>
<th>Total cases studied/Observed</th>
<th>Decision rule $d = \frac{n x 75}{100}$</th>
<th>Received correct service</th>
<th>Did not receive correct service</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAM cases given OTP card without charges</td>
<td>20</td>
<td>$d = \frac{[15]}{15} = 15$</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Appetite test is given upon visit</td>
<td>20</td>
<td>$d = \frac{[15]}{15} = 15$</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>Received Amoxicillin, Albendazole or mebendazole and Vitamin A without charges</td>
<td>20</td>
<td>$d = \frac{[15]}{15} = 15$</td>
<td>0</td>
<td>20</td>
</tr>
</tbody>
</table>

Case 2: Federal Medical Centre RUTF dispensed to SAM cases-3rd Hypothesis

<table>
<thead>
<tr>
<th>Characteristic/service under investigation</th>
<th>Total cases studied/Observed</th>
<th>Decision rule $d = \frac{n x 75}{100}$</th>
<th>Received adequate ration</th>
<th>Receive inadequate ration</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAM cases that received the RUTF during the visit</td>
<td>101</td>
<td>$d = \frac{[75.7]}{75} = 75%$</td>
<td>0</td>
<td>101</td>
</tr>
</tbody>
</table>

Interpretation of the results

The results from all the studies were analyzed using the simplified LQAS classification technique. The analysis of the presented information is described below.

Hypothesis one:

-Village/settlements considered far from the CMAM HF (that is more than two and half hours away in walking distance)

There were a total of 15 SAM cases. Those in the CMAM program were 1. The decision rule calculated was 3.

Since 1 is not greater than 3, the coverage in the area far from the CMAM HF is classified as being below 20%.

-Village/settlements considered near to the CMAM HF (that is less than two and half hours away in walking distance)

There were total of 16 SAM cases. SAM cases in the program were 4. The decision rule was 3. Since 4 is greater than 3 the coverage is classified as satisfactory.

The hypothesis 1 was confirmed.

---

66 The correct service is specified according to the Nigeria national CMAM protocol (service delivery during triage)
67 Refer to the table detailing RUTF dispensed per Sam case according to the weight (annexed to this report)
Hypothesis two:

-Wards without CMAM HFs had probable low coverage.

The number of covered cases was 2, the decision rule was 4. Since 2 is **not greater than** 4, the coverage in the surveyed area is classified as being **below 20%**.

-Wards with CMAM HFs had probable high coverage.

From the table the number of covered cases found was 4, the decision rule is 4. Since 6 is **greater than** 4, the coverage in the Wards with CMAM HFs is classified as being **above 20%**.

Hypothesis 2 was confirmed and accepted.

Hypothesis three:

When more than 75% of the caregivers were charged on the routine medication and OTP cards and did not receive optimum CMAM services then this was counted to contribute to program failure. Thus;

From the table the number of attending cases was 20, the decision rule is 15. Cases who obtained optimum services were 1. Since 1 is less than 15, the cases receiving less than optimum services are greater than 75%.

Hypothesis 3 was confirmed and accepted.

Barriers to program access and uptake are summarized in figure 19 below:

**Figure 19: barriers to program access and uptake in Small area survey in Katagum LGA**

6.3.5. **Conclusion of small area survey**

68 Include but not limited to lack of appetite test, inadequate RUTF, charges on drugs and cards
Proximity to the CMAM services is a major factor that affects homogeneity of coverage. Lack of optimum practices in provision of CMAC services is a major contributor to program failure. The coverage across Katagum LGA is considered heterogeneous. In such circumstances it would not be necessary to conduct the 3rd stage of SQUEAC investigation. However, in the interest of the Katagum LGA and Bauchi state to learn more on program coverage and process of SQUEAC investigation. The stage 3 of SQUEAC assessment was implemented.

6.4. Developing the prior.

This is the process in which the quantitative and qualitative findings of stage 1 as well as small studies and the small area surveys of stage 2 of the SQUEAC investigation were moulded into what is believed to be the coverage of the Katagum CMAM program. When making prior, the findings in stage 1 and 2 were expressed in such a way as to yield a beta prior distribution\(^6\) that would not only give an estimate of the program coverage but would also give a range of probabilities as to where the program coverage could lie. To begin the process the SQUEAC investigation team was asked to consider the barriers and boosters and consolidate those that looked largely similar so as to come up with a shorter and move solid list of the negative and positive factors that affected the Katagum CMAM program. It was also confirmed that there were no pending questions in the BBQ tool. The various processes of arriving at a prior are explained below:

6.4.1. Histogram of Belief.

The belief of the SQUEAC investigation team that had all along participated in the investigation was done on the basis of an informed guess to establish what the program coverage could. This was analyzed into a histogram of belief that gave illustrated the coverage idea and also set the minimum and maximum probable values of the coverage. The process of constructing a histogram of belief entailed the following steps:

- A histogram prior was drawn with x and y axis. The x axis was labeled Coverage (%) and marked on a scale of 0% to 100% in 10% decades. y axis was labeled belief (probability).
- The SQUEAC investigation team having looked at the barriers and boosters and their relationship in affecting program coverage were asked to think and give the most probable value they could assign the program coverage. The most likely coverage was identified and indicated as a prior mode with a tall column (at the point in the x axis and showing as the maximum probability on the histogram of belief). The SQUEAC team also identified the extremely unlikely values with horizontal lines drawn close to the x axis.
- The relative probability of coverage for each of the remaining decades was marked. A smooth line that captures the shape of a histogram was also drawn.
- The position of the minimum and maximum probable values were marked. The histogram of belief is illustrated below.

---

\(^6\) see an earlier section of this report with this description
The informed coverage was 28% with the minimum and maximum probable values of 10% and 50%.

Prior 1 results: Histogram of belief = 28%

6.4.2. Concept Map

The SQUEAC investigation team was split into Team A and B, and each team drew a concept map based on the barriers and boosters obtained in stage1 analysis.

Team A concept map has a total of 28 barriers, and 10 boosters while team B had 28 barriers and 12 boosters. So as to determine the impact of each barrier and booster using concept maps, a score of 3 was used by each team:

Results of prior calculated from concept map-Team A

\[
\text{contribution of barriers} = 28 \times 3 = 84 \\
\text{contribution of boosters} = 10 \times 3 = 30 \\
\text{prior estimation (team A)} = \frac{30 + (100 - 84)}{2} = 23
\]

Team ‘A’ prior estimation=23%

Results of prior calculated from concept map B:

\[
\text{Contribution of barriers} = 28 \times 3 = 84
\]
Contribution of boosters = 12 x 3 = 36

\[ prior \ estimation (team \ B) = \frac{36 + (100 - R4)}{2} = 26 \]

Team ‘B’ prior estimation = 26%

Prior 2 results: (Average prior of Team ‘A’ and Team ‘B’ concept maps)

\[ prior \ estimation (team \ A&B) = \frac{(26 + 23)}{2} = 24.5\% \]

Prior of developed by use of concept map = 24.5%

6.4.3. Un-weighted barriers and boosters

A fixed score was assumed for each barrier and booster to get the weight of the set of barriers and that of boosters. The maximum score used was determined in such a way that neither the sum of positive scores nor the sum of the negative scores can exceed 100%. Thus:

The number of barriers was 25 and boosters were 13. To calculate the maximum score that can be assigned:

\[ Maximum \ score = \frac{25 \times 4}{2} = 50 \]

Therefore, calculating the contribution of barriers and boosters to coverage yields:

\[ contribution \ of \ barriers = 25 \times 4 = 100 \]
\[ contribution \ of \ boosters = 13 \times 4 = 52 \]

Prior 3 results:

\[ prior \ estimation = \frac{52 + (100 - 100)}{2} = 26 \]

Prior estimated from un-weighted barriers and boosters = 26%

6.4.4. Weighted barriers and boosters.

Team A and B were asked to assign weights to the barriers and boosters independently. The highest possible weight was given as 4 while the lowest possible weight was given as 1. Two step process was used score the barriers so as to arrive at credible weights to determine the program probable coverage.

Step 1

---

70 The longest list of either the barriers or boosters is considered in calculation of the maximum score that could be possibly used.
Team members in each group discussed extensively how they perceive each of the barrier or booster that are listed affect the CMAM program in Katagum LGA. Each barrier or booster was analyzed in the face of the evidence adduced by information obtained from sources and methods in stage 1. A score was finally agreed upon by the team and was assigned to each barrier or booster after deliberations by team members per group. This was the first step of weighing all the barriers and boosters before moving to step 2.

**Step 2**

After completion of scoring the barriers and boosters the team looked at the relationship between the barriers and boosters and re-scored the barriers and boosters. Example of some of the questions or points that guided this process are:

- What is the score give to barrier $x$? Looking at the score of “3” could it be sufficient to represent to effect barrier $x$ has on coverage? If not we can re-evaluate the value previously given to barrier $x$ from weight of “3” to “5”. In this regard, how many think we should assign it “5”? (This entailed participation of all grouped members and the responses are recorded). How many think we should record the “4”? How many think we should record the “n”? (Similarly record the responses).

- What is the possible score of booster $y$? Looking at the score of “3” as the maximum score showing maximum impact on coverage, is it likely that booster $y$ has such much weight to contribute positively to coverage? If possibly not then we re-evaluate the weight from “3” to “2”. In this regard, how many think we should assign it “2”?
  (Record the responses). How many think we should record the “1”? How many think we should record the “t”? (Similarly record the responses)

- The score that yield more responses is used to give a final score to a barrier or booster. This process was done for all the barriers and boosters for group A and group B in such a way that the total scores giving weight to a set of barriers or boosters did not surpass 100% mark.

- The weights of the set of the barriers and boosters in step 2 were used to estimate the program coverage using the weighted barriers and boosters. The second step of weighing the barriers and boosters yielded a more credible value of coverage.

The tables showing scores arrived at for barriers and boosters are illustrated in annex 7. The summary of the calculations to derive coverage are shown in table 8 below:

**Table 8: summary of calculations of prior using weighted barriers and boosters**

<table>
<thead>
<tr>
<th>Team</th>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Total weight of barriers</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Total weight of boosters</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Contribution of barriers to coverage:</td>
<td>29</td>
</tr>
</tbody>
</table>

\[
\text{Contribution of barriers} = 100 - 71 = 29
\]
Prior 4 results:

Therefore,

\[ \text{prior estimation (team A&B)} = \frac{(30 + 32)}{2} = 31 \]

Prior estimate from weighted barriers and boosters = 31%

6.4.5. **Triangulation of Prior**

Prior estimate\(^{71}\) was calculated by triangulation of all the prior estimates (prior 1, 2, 3, & 4) obtained above. This is also illustrated in figure 21 below.

\[ \text{prior mode (final)} = \frac{20 + 24.5 + 26 + 31}{4} = 27 \]

Prior mode = 27%.

---

\(^{71}\) The average of the “coverages” is a credible value of the mode of the prior. It is also referred as the mode of the probability density of the coverage.
6.4.6. Bayes Prior Plot and Shape Parameters

The lowest and highest possible coverage\(^{72}\) for Katagum LGA CMAM program had been given by the team during making of the histogram of belief. The various parameters that were calculated to yield beta prior probability distribution shaping parameters \((\alpha_{prior}=12.6; \beta_{prior}=32.0)\) are also, shown in annex 1 of this report. The prior mode (27%) is relatively strong with minimum and maximum probable values of 10 and 50 respectively. The Beta prior distribution is illustrated in figure 24 below:

\(^{72}\) These are also referred as minimum probable value and maximum probable value for coverage.
Figure 22: BayesSQUEAC binomial distribution plot for prior showing the shape parameters and the suggested sample size.

6.5. **Stage 3: Wide area survey**

In stage 3 of the SQUEAC investigations, the likelihood survey was included in the Katagum LGA SQUEAC investigation to add to the existing information (collated and analyzed in stage 1 & 2), therefore, giving a final or headline coverage of the program. The stage there was accomplished through the process of:

1) A likelihood survey followed by,
2) Developing a Posterior mode\(^73\) or the overall coverage

The various processes before yielding the results of the likelihood survey are explained below under: calculation of sample size and number of quadrants to be visited, identification of villages within the quadrants, case finding method and presentation of the quantitative and qualitative results of the likelihood survey. Thus:

6.5.1. **Calculation of Sample Size and number of quadrants to be visited for likelihood survey**

The number of representative sample of SAM cases was calculated using the BayesSQUEAC calculator to be 43 SAM cases at 10% precision (with results expressed at CI; 95%).

The number of villages \((n)\) that needed to be visited was calculated using the following formula:

\(^73\) See the description of process of developing prior mode, likelihood and posterior in methodology section
Given that:

Table 9: Table showing parameters for number of villages to be visited to achieve desired sample size.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SAM cases sample size</td>
<td>43</td>
</tr>
<tr>
<td>2 N(Median population size of all ages)</td>
<td>753</td>
</tr>
<tr>
<td>3 Percentage of under-fives in the population</td>
<td>18%</td>
</tr>
<tr>
<td>4 SAM prevalence(^{75})</td>
<td>1.5% (0.8-2.7%; CI 95%()</td>
</tr>
<tr>
<td>5 Calculated SAM(^{76})</td>
<td>1.15</td>
</tr>
</tbody>
</table>

Therefore the number of villages that need to be visited:

$$n_{villages} = \left[ \frac{45}{753 \times 0.18 \times \frac{1.15}{100}} \right] = [27.58] = 28$$

The map of Katagum LGA was available and was used to select the villages to be sampled. The Centric Systematic Area Sampling (CSAS) or quadrat method was used in the Katagum LGA SQUEAC likelihood survey. The following process was used to select villages from the quadrants:

- The scope of the map allowed 21 quadrants (or squares) of 64cm\(^2\) on the Katagum LGA map\(^{77}\). This would allow adequate spatial representation of the LGA.
- Given that 28 villages were needed to get 43 SAM cases to complete the sample size, the number of villages needed per quadrant to make a representative sample was calculated using the following formula:

$$\text{number of villages per quadrant} = \left[ \frac{\text{Total number of villages}}{\text{number of quadrants}} \right]$$

\(^{74}\) Source: National Bureau of Statistics

\(^{75}\) Severe Acute Malnutrition results of Mid Upper Arm Circumference (MUAC) for the SMART Nutrition survey unveiled in Bauchi State in May 2014 were used.

\(^{76}\) This is the low estimate of SAM prevalence used in sample size calculation. It is given by value midway between the point estimate and the lower 95% confidence limit for SAM prevalence. The SAM prevalence (using MUAC rate) for Bauchi was estimated as 1.5% (95% CI = 0.8% – 2.7%). Therefore, the suitable estimate was calculated as prevalence = 1.5 - ((1.5 - 0.8)/2) as show in the table 10.

\(^{77}\) 1cm on paper is equivalent to 1km on ground
\[
\text{prevalence} = 1.5 - \frac{15 - 0.8}{2} = 1.5
\]

Therefore, the number of villages per quadrant:

\[
\text{number of villages per quadrant} = \left\lceil \frac{43}{21} \right\rceil = \left\lceil 2.0476 \right\rceil = 2
\]

- The centers of each quadrant were drawn and marked with a conspicuous color.
- Using the complete list of villages available for Katagum LGA and also the key features on the map (such as the villages, town centers, schools, hospitals etc.) the villages which are close to the centre of each quadrant were identified.
- Two villages most proximate to the centre of the quadrat were identified to be visited in the likelihood survey.

### 6.5.2. Case finding method

Active and adaptive case-finding methods was used during the wide area survey. Active and adaptive case-finding detailed steps are illustrated in annex 3 of this report. In a nutshell it involved the following simple steps:

- Identifying the local terms used to define malnutrition and those used for program case definition,
- When visiting the sampled villages, community leader was consulted to identify key informant,
- Explanation of the case definition to the key informant was done to enable him to lead the investigators to a SAM case\(^{78}\) (or Household-HH with SAM case);
- Measurement of MUAC was done on the identified case MUAC and questionnaire administered where relevant,
- The caregiver of the measured child gives investigators information about another case that would be similar to the one just measured\(^{79}\),
- The investigators uses this method until they are led to the HHs that they have previously visited.

The case definition used referred to a child:

- Aged 6-59 months
- With a MUAC less than 11.5 cm, and or
- With bilateral pitting oedema

### 6.5.3. Qualitative data Framework

Each SAM case identified in the likelihood/wide area survey, who was not in the CMAM program\(^{80}\) were regarded as non-covered case. In such cases a semi structured

---

\(^{78}\) See the basic case definition below

\(^{79}\) If the case just measured did not have malnutrition or MUAC of less than 115mm or Oedema, the case definition is shared with the caregiver to help her to give information that would lead to a likely case of malnutrition within her neighborhood.
questionnaire was administered to the caregiver to collect information on possible reasons for the SAM child not being in the program or not attending. The analysis of these reasons or barriers to access and uptake are illustrated in figure 24 and table 12 below.

6.5.4. Results of the wide area survey (WAS)

The results in this section are presented as: overall point coverage of the likelihood survey, distribution of per quadrant point coverage, barriers to program access and uptake, proportion of case found in WAS by age groups, age distribution of the SAM cases found in Wide area survey (WAS), and MUAC distribution of SAM cases in WAS.

6.5.4.1. Point coverage of the likelihood survey

The quantitative results of the wide area survey are shown in the table 10. The barriers to program access and uptake are also, shown in the table 12 while the disaggregated results per village and quadrant are shown in table 11.

Table 10: Results of the Likelihood (wide area) survey

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Total SAM cases</td>
<td>89</td>
</tr>
<tr>
<td>2 SAM cases in the program</td>
<td>14</td>
</tr>
<tr>
<td>3 SAM cases not in the program</td>
<td>75</td>
</tr>
<tr>
<td>4 Recovering cases in the program</td>
<td>11</td>
</tr>
</tbody>
</table>

The likelihood was calculated using the following standard formula for point coverage:

\[
\text{Point coverage} = \frac{\text{SAM cases in the program}}{\text{Total SAM cases}}
\]

Therefore:

\[
\text{Likelihood} = \frac{14 \times 100}{89} = 15.73\%
\]

Likelihood = 15.7%

6.5.4.2. Per quadrat\textsuperscript{81} point coverage -likelihood survey

The coverage of the program per quadrat is shown in table 12 below. The illustration of the coverage distribution of quadrats is also, shown in the figure 23 below. The results in table 11 below indicate that:

- 47.6% of the quadrant had a course estimate of 0% coverage.

\textsuperscript{80} As verified by show of RUTF or ration card by beneficiary

\textsuperscript{81} 21 quadrats were used to identify the villages to be included in the sample.
61.9% of the quadrant differed by approximately 15% points from the coverage average of 15.7%.

The spatial coverage is generally uneven. This had been tested in the small area survey presented in earlier results. The wide area survey (WAS) survey results also confirms this. Thus, the headline coverage of the program should be interpreted in the light of these differences in the coverages across the LGA.

![Figure 23: distribution of per quadrant coverage for Katagum LGA - WAS](image)

Table 11: Disaggregated SAM cases per quadrat the wide area survey

<table>
<thead>
<tr>
<th>Quadrat (Q)</th>
<th>Settlement</th>
<th>Total SAM cases</th>
<th>SAM covered</th>
<th>SAM not covered</th>
<th>Recovering cases</th>
<th>Per Q coverage</th>
<th>Deviates by 15% points from average (yes or no)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rabi kafi</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>12.5%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Darigo</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Magarya</td>
<td>5</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>16.7%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Kukoki</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bulturi</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>33.3%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Doleri</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Yalowo</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Bogawa</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Baccheri</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Dagaro sabuwa</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Gurwari</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Dugunda</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Kuturi</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Galadimari</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Madara</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>25%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Wuro billi</td>
<td></td>
<td></td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>-------</td>
<td>------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>9</td>
<td>Janbure</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>10%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Kare</td>
<td>6</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Bulturi</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Dulari</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Dakoli</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>16.7%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Gursha</td>
<td>8</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Jugga</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Bura jallo</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Damno</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>33.3%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Kankau</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Gadawa A</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Jatan</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Barkeji</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>25%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Dalli</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Garin</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0%</td>
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</tr>
<tr>
<td></td>
<td>Hausawa</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Naburkutu</td>
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<td>Yollol</td>
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<td>0</td>
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</tr>
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<td>Jigawa</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>18</td>
<td>Madangala</td>
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<td>0</td>
<td>14.3%</td>
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<td>1</td>
<td>3</td>
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</tr>
<tr>
<td>19</td>
<td>Kachawunj</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>25%</td>
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</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manini</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Tsangaya</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Filatari</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Dungun</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>66.7%</td>
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</tr>
<tr>
<td></td>
<td>Tsangaya</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Totals</td>
<td>89</td>
<td>14</td>
<td>75</td>
<td>11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.5.4.3. **Barriers to program access and coverage**

![Figure 24: summary of the barrier to program access and uptake of Katagum LGA CMAM program](image)

Table 12: **Barriers to program access and uptake in WAS**

<table>
<thead>
<tr>
<th>Barriers to program access and uptake-WAS</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge (program, malnutrition)</td>
<td>27</td>
</tr>
<tr>
<td>No knowledge about the program</td>
<td>10</td>
</tr>
<tr>
<td>Caregiver does not know her child is malnourished</td>
<td>5</td>
</tr>
<tr>
<td>The mother thought it was necessary to be enrolled at the hospital first</td>
<td>12</td>
</tr>
<tr>
<td>Limitation in accessing CMAM</td>
<td>21</td>
</tr>
<tr>
<td>Lack of money due to distance</td>
<td>21</td>
</tr>
<tr>
<td>Child did not improve/did not think program will help</td>
<td>6</td>
</tr>
<tr>
<td>Did not see child improving when formally admitted</td>
<td>1</td>
</tr>
<tr>
<td>The mother does not think the program can help her child (prefers traditional healer)</td>
<td>5</td>
</tr>
<tr>
<td>Caregiver would not attend due to competing priorities</td>
<td>4</td>
</tr>
<tr>
<td>Caregiver have no time/too busy</td>
<td>4</td>
</tr>
<tr>
<td>Rejected/afraid to be rejected/declared not eligible</td>
<td>8</td>
</tr>
<tr>
<td>The children of others have been rejected</td>
<td>2</td>
</tr>
<tr>
<td>Caregiver visited the OTP site and told child wasn't eligible</td>
<td>2</td>
</tr>
<tr>
<td>The child has been rejected last month</td>
<td>3</td>
</tr>
<tr>
<td>Afraid of rejection</td>
<td>1</td>
</tr>
<tr>
<td>Spouse refusal</td>
<td>11</td>
</tr>
<tr>
<td>Husband refused</td>
<td>10</td>
</tr>
<tr>
<td>Have not sought permission from husband</td>
<td>1</td>
</tr>
<tr>
<td>Caregiver sick and would not attend</td>
<td>5</td>
</tr>
<tr>
<td>Quarreled at HF/deterred by charges</td>
<td>3</td>
</tr>
<tr>
<td>Health worker would quarrel caregiver</td>
<td>1</td>
</tr>
<tr>
<td>Had no money to pay for incurred charges</td>
<td>2</td>
</tr>
<tr>
<td>Child previously discharged had relapsed</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
</tr>
<tr>
<td>Stigmatization about the program</td>
<td>1</td>
</tr>
</tbody>
</table>

---

Illustrated in form of a table and Pareto chart
God had not yet told caregiver to attend

My child couldn't eat the RUTF given to her by my neighbor

Child had diarrhea after consumption of RUTF

6.5.4.4. **Proportion of SAM cases found in WAS**

![Proportion of cases found in WAS by MUACs](image)

Figure 25: The proportion of SAM cases and distribution according to age groups-wide area survey.

**Age distribution of SAM cases measure in WAS**

![Ages of SAM cases found in Wide Area Survey](image)

Figure 26: Distribution of Ages of SAM cases found in the wide area survey.

Most of the SAM cases identified in the wide area survey are largely below 36 months of age. Severe Acute Malnutrition is more prevalent of children below 24 months of age more than any other age group.
Plot of MUAC of SAM cases measure in WAS

![Plot of MUAC of SAM cases found in Wide Area Survey (WAS)](image)

Figure 27: distribution of MUAC of cases found in WAS.

The median MUAC of 110mm indicates that cases that are in the community have not been captures early for referral. The earlier evidence indicated that there is poor active case finding and in such programs late cases of SAM increase in the community because they have not been captures early for admission. It is important to note that SAM cases that are not covered identified during WAS are referred to the nearest CMAM HF.

6.5.5. Posterior/Coverage Estimate

The BayesSQUEAC calculator\textsuperscript{83} was used to make diagnostic plot of beta-binomial conjugate analysis. The posterior distribution which unveiled a coverage estimate of 19.5% (13.6% - 27.2%.CI; 95%) was regarded as the final headline coverage of the program (see figure 28 below). The results of the conjugate analysis are credible and useful in this study because:

1) The prior & likelihood are coherent, as the curves show considerable overlap (p>0.05) and therefore there is no prior-likelihood conflict.
2) The posterior being narrower than the prior indicated that the likelihood survey had reduced uncertainty.
3) The probability measure of the posterior is high than likelihood and posterior making posterior more credence as an indication of coverage.

\textsuperscript{83} BayesSQUEAC Coverage Estimate Calculator version 3.01 downloaded free from \url{www.brixtonhealth.com}
The point coverage of the program is therefore:

**Point coverage=19.5% (13.6% - 27.2%. CI; 95%)**

The coverage of the Katagum LGA CMAM program, was expressed using point coverage estimate to indicate the headline coverage. It would not be ideal to calculate the period coverage for this program due to the following reasons:

- **Due to high level of defaulting, there is a poor retention of SAM cases in the program from admission to recovery.** The overall performance indicators and those disaggregated by individual HFs show relatively high defaulter rate. Analysis of routine data indicates defaulting mostly occurring at less than 4 weeks in the program indicating that the defaulting cases are likely current cases of SAM. (See figures 14 in earlier section of this report). In a good program period coverage places strong emphasis on good retention of SAM cases from admission to recovery.

- **The recovery rate has been below the recommended standard throughout the review period.** (See figure 5). This indicates that the proportion of the number who have been treated to recovery was consistently lower than 75%. The overall analysis of the routine (and also, that of individual HF) shows that a large proportion of cases that were discharged as recovered had MUAC of less than 125mm as opposed to the protocol criteria of discharge that allows recovered cases to have attained greater of equal to 125mm of MUAC measurement. Significant number of cases had been discharged with MUAC of less than 115mm. (see figures 11 and 12 in earlier sections of this report). There was evidence of cases that had been

---

84 Results are expressed with a credible interval of 95%.
85 SPHERE standards minimum is 75% of all the exits being discharged as cured/recovered. A program that attains this or above is regarded as an effective program.
discharged as recovered after being in the program for 7 weeks or less as reported by a couple of interviewed caregivers.

- There is a general poor adherence to CMAM protocol shown in various ways: 1) HWs who made erroneous measurements of MUAC or who exhibited lack of basic knowledge on discharge criteria and processes of triage in the treatment of SAM, 2) poor case monitoring while in the program, 3) stock-out of routine drugs such as amoxicillin & RUTF in all HFs that was seen when the HW gave no RUTF or gave less depending on availability, 4) HW charged caregiver for for routine drugs and the beneficiary cards to couple their cost, 5) caregiver shared the RUTF meant for SAM child with the child’s siblings, 6) consumption of RUTF meant for SAM cases by adults, 7) last but not least, severe SAM cases with complications were continuously treated at the CMAM centre rather than being referred to the SC. SC was noted not to be functional and caregivers had knowledge that children died easily when they were admitted in the hospital due to lack of appropriate care. These factors contribute to make the SAM child admitted into the program stay longer in the program and has potential to encourage defaulting and eventually poor opinion about the program.

This is the reason why the point coverage would be appropriate to indicate the coverage at the point in time when the SQUEAC investigation was implemented.

7. Discussions and conclusions.

The SQUEAC assessment in Katagum unveiled a Point coverage=19.5% (13.6% - 27.2%. CI; 95%)⁸⁶. The investigation also unveiled various barriers and boosters that affect program coverage. Importantly, the program performance is described as low performing as indicated by the low recovery rate and high defaulters rates which are below the minimum recommended rates⁸⁷.

Further analysis of routine quantitative data revealed set of factors that needed further investigation. Some of them included: Distance of travel to CMAM HF, Adherence to CMAM protocol by HWs, lack knowledge on how the CMAM program works, referral system at the community and HFs, and performance of the program among others.

The adherence to the CMAM national protocol by HWs has been found to be wanting. Cases in the program were often discharged as recovered when they had not attained 125mm or more⁸⁸. It was suspected that some cases that defaulted were reported as discharged recovered. Qualitative information revealed that caregivers who got admission into the program were charged for the beneficiary cards and/or routine drugs which has potential of

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⁸⁶ Results are expressed with a credible interval of 95%.
⁸⁷ SPHERE standards recommend: recovery rate of >=75%, Default rate of <15% and death rate of <10%. In the same vein a good program should have a non-recovery rate of <5% (not given by SPHERE but inferred by various researches on effective CMAM programs)
⁸⁸ 10.1%, 61% and 28.8% of the reported discharged recovered had MUAC of <115mm, >=115-<15mm and >=125mm respectively.
lowering/limiting regular access to CMAM services, encourage defaulting and lowering the opinion of the program. The HW reported that the routine drugs were not often adequate for all the SAM cases. The funds allocated by the state to the LGA has therefore not catered for adequate drugs and in most cases there were no tools that are used to monitor cases in program.

Lack of case follow-up, early case finding or defaulter tracing also featured prominently as factors that affect program negatively. The critical cases (admitted with MUAC<100mm) which were evident should have ideally been detected early and treated in the program if it had a robust early case finding and referral, however, the cases were living in the community before being detected and admitted. At most the cases were not mainly referred by peer to another when they had manifested signs of SAM such as wasting and/or oedema.

Drug and RUTF stock outs affected the program negatively to an extent that in the period of June to October 2013, no monitoring data of the SAM cases was available.

The SLEAC assessment that was done by VI in the month of January 2014 had classified Katagum to have high coverage, however, the in-depth investigation has shown various factors that had affected the program resulting to low coverage. Besides the factors that resulted to low coverage such as shortage of RUTF and drugs in various periods of program implementation, lack of adherence to the CMAM national guidelines has been a key factor contributing to program failure in Katagum. These factors are taken into consideration in determining the program coverage in this SQUEAC investigation. Cases would enrolled into the program and would default from the program rapidly (mainly before being four weeks in the program) and often as SAM cases. It is worth to note that the SLEAC assessment which concluded the wide area survey in Bauchi January 2014 coincided with the period when the program performance had improved significantly from naught peaking in the month of January 2014 (see figure 5 of this report). As such the number of covered cases at the time SLEAC assessment was done may have given a picture of high coverage at that point in time.

Generally, the small area survey indicated a probable heterogeneous coverage while the small study revealed that charges of the drugs or the beneficiary cards on the beneficiaries had contributed to low coverage of the program.

In summary the key barriers to the program coverage were identified as: Non adherence to CMAM protocols, Non-existent/limited defaulter tracing/beneficiary follow-up, Poor community mobilization/sensitization, Caregivers have incurred charges Incurred charges on routine drugs (Yayu) and cards and dearth of routine drugs. The key boosters were: Good opinion of the program, Peer to peer referral, referral by community persons to CMAM services and good awareness of the program existence in the LGA

The program met needs are illustrated below:
Met need: Met need = Coverage x Median recovery rate. Thus the met need of the Katagum LGA program is 19.5% x 0.642 = 12.5%. Out of the coverage of about 20% and median program performance of 64.2%, only 12.5% of the beneficiaries benefited from the CMAM program in Katagum LGA.

The Katagum LGA CMAM program is described as having significantly low coverage and appropriate actions should be taken to reform the program. The recommendations to reform the program are described in the following section.

8. Recommendations

In order to improve the Katagum LGA CMAM program recommendations were suggested to address the barriers and enhance on the boosters to improve coverage. A dissemination workshop that involved stakeholders at the State and LGA levels. Was held at Bauchi State. The following recommendations were made:

- Build the capacity of the HWs implementing CMAM to improve adherence to the national protocol on CMAM. This includes strengthening the integration of prevention of SAM, treatment of SAM, EPI, IYCF and other medical services and also to optimize community outreach activities which are part of HFs mandate to make medical service accessible to communities.

- Commit more funds for purchase and delivery of routine drugs to ensure affordability of and access to CMAM services.

- Scale up CMAM services to other HFs in an effort to ‘even out’ availability to the large populace. This includes strengthening the CV activity by recruitment of more CVs, building capacity of existing CVs and establishment of a fund for incentivizing CV activity.

- Operationalize the exiting stabilization centre at Azare General Hospital in terms of training, delivery of relevant supplies. This includes inclusion for support and streamlining of service delivery at FMC to be able to treat SAM with medical complications.
• To address the shortage of trained HWs to profile the current man power and make modalities to increase HWs in all CMAM LGAs in Bauchi including Katagum.

• Allocate funds for printing and delivery of data tools, guidelines/protocol for all the HFs in Katagum LGA. This includes support of an on-the-job training program for HW on how to monitor SAM cases in CMAM program,

• Strengthen the community mobilization and sensitization in Katagum LGA (and by extension all CMAM LGAs in Bauchi state). This would be done through identification of relevant State and LGA forums to incorporate relevant message on CMAM program, making of relevant messages to sensitize wide range of leaders who are in touch with the LGA populace.

• In 8 to 12 months implement a SQUEAC assessment in Katagum LGA.

The key action points that were discussed at the state level dissemination are illustrated below:
Table 13: framework of action points to address barriers in Katagum LGA CMAM program

<table>
<thead>
<tr>
<th>Topic</th>
<th>Process</th>
<th>Verification</th>
<th>Responsible Party</th>
<th>Expectation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Information Sharing/Training</td>
<td>Submission of needs, awareness raising</td>
<td>Comprehensive list of needs and training module on CMAM Program</td>
<td>SPHCD</td>
<td>Sufficient health workers trained on CMAM care and protocol.</td>
</tr>
<tr>
<td>2. Lack of essential supplies (e.g., case, orphaned card and OTP register)</td>
<td>Procurement of essential supplies</td>
<td>Stock list of all villages in the LGA</td>
<td>SPHCD</td>
<td>Stock list of all villages in the LGA.</td>
</tr>
<tr>
<td>3. Communication</td>
<td>Complete list of all villages in the LGA</td>
<td>Meeting of religious leaders, community leaders, health workers, and other key stakeholders</td>
<td>District Health Committee</td>
<td>Communication plan and list of participants.</td>
</tr>
<tr>
<td>4. Routine drug supply</td>
<td>Creation of a budget</td>
<td>Advocacy messages</td>
<td>SPHCD</td>
<td>Sufficient supply of routine drugs.</td>
</tr>
<tr>
<td>5. Supportive supervision</td>
<td>On the job training</td>
<td>Weekly plan</td>
<td>SPHCD</td>
<td>Evidence of periodic supervision.</td>
</tr>
<tr>
<td>6. Logistics</td>
<td>Administration of schedules for proper supply chain management</td>
<td>SPHCD</td>
<td>Sufficient supply of key supplies.</td>
<td></td>
</tr>
<tr>
<td>7. Scaling up of OTP to other villages</td>
<td>Mapping of all communities without CMAM services</td>
<td>SPHCD</td>
<td>Sufficient supply of key supplies.</td>
<td></td>
</tr>
<tr>
<td>8. Operational isuare: Social mobilization</td>
<td>Social mobilization activities</td>
<td>Distributed to all communities</td>
<td>District Health Committee</td>
<td>Sufficient operational support provided.</td>
</tr>
</tbody>
</table>

*This is presented as discussed and made in a session at Katagum LGA SQUEAC dissemination workshop.*
9. Annexure

9.1. Annex1: Parameters used in prior building and sample size calculation - Katagum LGA SQUEAC assessment

<table>
<thead>
<tr>
<th>Prior mode by weighted barriers and boosters</th>
<th>Values</th>
<th>Values</th>
<th>Prior by un-weighted barriers and boosters</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total barriers</td>
<td>25</td>
<td></td>
<td>Total weights to barriers</td>
<td>100</td>
</tr>
<tr>
<td>Total Boosters</td>
<td>13</td>
<td></td>
<td>Total weight to boosters</td>
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</tr>
<tr>
<td>Belief histogram</td>
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<td>Contribution of barriers to coverage</td>
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</tr>
<tr>
<td>Coverage belief</td>
<td>28</td>
<td></td>
<td>Contribution of boosters to coverage</td>
<td>52</td>
</tr>
<tr>
<td>Lowest probable value estimated by belief histogram</td>
<td>10</td>
<td></td>
<td>Average coverage</td>
<td>26</td>
</tr>
<tr>
<td>Highest probable value estimated by belief histogram</td>
<td>50</td>
<td></td>
<td>Concept map - Team A</td>
<td></td>
</tr>
<tr>
<td>Average score given to a barrier and booster - Team A</td>
<td>Step 1</td>
<td>Step 2</td>
<td>Total scores - positive factors</td>
<td>30</td>
</tr>
<tr>
<td>Total weight - barriers</td>
<td>56</td>
<td>71</td>
<td>Total scores - negative factors</td>
<td>84</td>
</tr>
<tr>
<td>Total weight - Boosters</td>
<td>30</td>
<td>31</td>
<td>Contribution of positive factors to coverage</td>
<td>30</td>
</tr>
<tr>
<td>Contribution of barriers to coverage</td>
<td>44</td>
<td>29</td>
<td>Contribution of negative factors to coverage</td>
<td>16</td>
</tr>
<tr>
<td>Contribution of boosters to coverage</td>
<td>30</td>
<td>31</td>
<td>Concept map coverage - Team A</td>
<td>23</td>
</tr>
<tr>
<td>Average coverage - Team A</td>
<td>37</td>
<td>30</td>
<td>Concept map - Team B</td>
<td></td>
</tr>
<tr>
<td>Average score given to a barrier and booster - Team B</td>
<td>Step 1</td>
<td>Step 2</td>
<td>Total scores - positive factors</td>
<td>36</td>
</tr>
<tr>
<td>Total weight - barriers</td>
<td>47</td>
<td>68</td>
<td>Total scores - negative factors</td>
<td>84</td>
</tr>
<tr>
<td>Total weight - Boosters</td>
<td>26</td>
<td>32</td>
<td>Contribution of positive factors to coverage</td>
<td>36</td>
</tr>
<tr>
<td>Contribution of barriers to coverage</td>
<td>53</td>
<td>32</td>
<td>Contribution of negative factors to coverage</td>
<td>16</td>
</tr>
<tr>
<td>Contribution of boosters to coverage</td>
<td>26</td>
<td>32</td>
<td>Concept map coverage - Team B</td>
<td>26</td>
</tr>
<tr>
<td>Average coverage - Team A</td>
<td>39.5</td>
<td>32</td>
<td>Concept map average coverage (Team A and team B)</td>
<td>24.5</td>
</tr>
<tr>
<td>Average coverage (Team A and team B)</td>
<td>38.25</td>
<td>31</td>
<td>Prior calculated from belief histogram, weighted, un-weighted barriers and boosters &amp; concept map</td>
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</tr>
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<td>Determination of ranges of prior in belief histogram</td>
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<td>Maximum probable value (derived from Belief histogram)</td>
<td>50</td>
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<td>Data:</td>
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<td>Prior shaping parameters</td>
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<td></td>
<td></td>
<td>Values</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Not (δ)</td>
<td>0.06666667</td>
</tr>
</tbody>
</table>

90 A minimum score of 1 was given to negative and positive factor with smallest impact and score of 4 given to a negative and positive factor with maximum impact
91 A minimum score of 1 was given to barriers and booster with smallest impact and score of 4 given to a barrier or booster with maximum impact
92 The weights allocated to each barriers was based on perceived impact of each to coverage. The evidence presented was evaluated multiple times.
<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Posterior Estimate Precision</th>
<th>Median Village Population</th>
<th>% of 6-59 Months</th>
<th>SAM Prevalence</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
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<td>Min -Prior</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
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<td>Mode -Prior</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Posterior estimate Precision</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Alpha prior (α)</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Beta prior (β)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Number of sampled villages and quadrants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number Of Villages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of quadrants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of villages per quadrant</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Values</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

93 Quadrants were drawn on the Katagum LGA map which had a scale of 1:100000
94 SAM prevalence by MUAC in Bauchi state is 1.5% (0.8-2.7%; CI 95%). SMART survey results; May 2014. Prevalence used in SQUEAC assessment arrived at: given p=1.5, therefore: prevalence=p-((p-lower interval value)/2)=1.5-((1.5-0.8)/2)=1.15%
9.3. Annex3: Active and adaptive case finding procedure

Visit the community gathering place first and seek permission to visit the village.

Request the village leader to provide a key informant of choice.

Ask the key informant the case finding question ‘can you show us child who is under-five years and is ‘Tamowa, rina (swollen body), rana (wasting, skiny or drying-up), ciwon kumburi (swollen body), & Ciwon yunwa (Hausa word for hunger). Bajul (Fulani word for oedema), and tuhundi- Fulani words for different types of malnutrition. Kadawu (Kanuri word for wasting), Kumberi (oedema), Kinna (hunger),

Check the child is aged between 6 and 59 months

Explain the purpose of the survey to the parents and what you will do

Measure the MUAC of the child

Does the child have bilateral Oedema or is the MUAC < 115mm?

Current SAM case

Is the child in HF?

Ask to see sachet of RUTF and health card

Not a Current SAM case

Is the child in HF?

Ask to see sachet of RUTF and health card

Current SAM case not in the program

1. Fill out the tally sheet
2. Apply questionnaire
3. Refer the child to CMAM program site
4. Thank the caregiver
5. Ask case finding question

Recovering SAM case

1. Fill out the tally sheet
2. Thank the caregiver
3. Ask case finding question

Current SAM case in the program

1. Fill out the tally sheet
2. Thank the caregiver
3. Ask case finding question

Normal child, No history of SAM

1. Not included in the study.
2. Thank the caregiver
3. Ask case finding question

Use additional sources or other key informants to inform and improve the search

Always ask parents of the SAM children identified whether they know of other cases

---

95 Local terms of malnutrition used are from Katagum LGA in Bauchi State, Northern Nigeria.
### 9.4. Annex4: List of participants in Katagum LGA SQUEAC assessment

<table>
<thead>
<tr>
<th>List of Participants (ACF)</th>
<th>Organization/Agency</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joseph Nganga</td>
<td>ACF</td>
<td>Program Manager</td>
</tr>
<tr>
<td>Ifeanyi Maduanusi</td>
<td>ACF</td>
<td>Deputy Program Manager</td>
</tr>
<tr>
<td>Abubakar Chiroma Kawu</td>
<td>ACF</td>
<td>Program Support Officer</td>
</tr>
<tr>
<td>Zulai Abdulmalik</td>
<td>ACF</td>
<td>Coverage Officer</td>
</tr>
<tr>
<td>Adegbola Janet Adeoye</td>
<td>ACF</td>
<td>Coverage Officer</td>
</tr>
<tr>
<td>Chika Obinwa</td>
<td>ACF</td>
<td>Coverage Officer</td>
</tr>
<tr>
<td>Francis Ogum</td>
<td>ACF</td>
<td>Coverage Officer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>List of Participants (Enumerators)</th>
<th>Organization/Agency</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hauwa Bello</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Hama Usman</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Nusaiba Abubakar</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Amina Bappa</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Litty Bayiya</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Rahila Abdu</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Fatima Adamu</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Musa Yaro</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Salamatu Ibrahim</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Ummi Idris</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Khadija Muhammed</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Zainab Idris</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Celine Sunday</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Hauwa Yakubu Gorama</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Hadiza Mohammed</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Rabiya Abdullahi</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Fatima Musa</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Maduka Loveth</td>
<td>None</td>
<td>Enumerator</td>
</tr>
<tr>
<td>Hajja Garba</td>
<td>None</td>
<td>Enumerator</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>List of participants (State, LGA, partners)</th>
<th>Organization/Agency</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sabo Burai,-SNOs,</td>
<td>SMoH</td>
<td>State Nutrition Officer (SNO)</td>
</tr>
<tr>
<td>Lamara Abubakar</td>
<td>LGA PHC</td>
<td>Nutrition Focal Person (SNO)</td>
</tr>
<tr>
<td>Ezekiel Daniel-DDPHC</td>
<td>SPHCDAD</td>
<td>Deputy Director (SPHCDAD)</td>
</tr>
<tr>
<td>Samaila Yusuf-Katagum PHC director</td>
<td>LHA PHC director</td>
<td>LHA PHC director</td>
</tr>
</tbody>
</table>
9.5. **Annex5: Recommended RUTF prescription** compared to weight measurement of SAM cases

<table>
<thead>
<tr>
<th>Weight (Kg) of SAM case</th>
<th>Recommended RUTF (weekly)</th>
<th>RUTF-Daily ration</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5-3.9kg</td>
<td>11</td>
<td>1.5</td>
</tr>
<tr>
<td>4.0-5.4kg</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>5.5-6.9kg</td>
<td>18</td>
<td>2.5</td>
</tr>
<tr>
<td>7.0-8.4kg</td>
<td>21</td>
<td>3</td>
</tr>
<tr>
<td>8.5-9.4kg</td>
<td>25</td>
<td>3.5</td>
</tr>
<tr>
<td>9.5-10.4kg</td>
<td>28</td>
<td>4</td>
</tr>
<tr>
<td>10.5-11.9kg</td>
<td>32</td>
<td>4.5</td>
</tr>
<tr>
<td>&gt;=12kg</td>
<td>35</td>
<td>5</td>
</tr>
</tbody>
</table>

---

*According to national CMAM guidelines*
### 9.6. **Annex 6: Schedule of implemented activities in Katagum LGA SQUEAC.**

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity/Villages visited</th>
<th>HF</th>
<th>Sources of information</th>
<th>Information collected/deliverables</th>
</tr>
</thead>
<tbody>
<tr>
<td>23/8/2014</td>
<td>SQUEAC team travel from Abuja to Azare, Bauchi state</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25/8/2014</td>
<td>Preliminary meeting with Director Primary Health Care, Council chairman, Nutrition Focal Person in Azare</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21/8/2014</td>
<td>Data extraction and entry</td>
<td>All HF: Urban Maternity HF, Gwasamai HF, Yayu HF, Madara HF, Bulkachuwa HF</td>
<td>OTP cards</td>
<td>All OTP cards from March 2013-August 2014 were sorted and collated Name, age, address/village, admission weight, admission MUAC, LOS, exit MAUC, RUTF at admission, defaulter, Transfer, discharge cured, Died, discharge non cured</td>
</tr>
<tr>
<td>22/4/2014</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>26/8/2014</td>
<td></td>
<td></td>
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<tr>
<td>27/8/2014</td>
<td></td>
<td></td>
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<tr>
<td>28/8/2014</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>29/8/2014</td>
<td>SQUEAC training</td>
<td>Azako conference hall (Katagum LGA)</td>
<td>List of Participants Enumerators (see list of participants annexed to this report)</td>
<td>At the end of day 1: participants were able to explain CMAM programme, identify barriers &amp; boosters and role play on qualitative information gathering At the end of day 2: participants were able to role play on how to gather qualitative information, identified SAM covered &amp; SAM not covered, calculate point coverage, Conduct MUAC standardization</td>
</tr>
<tr>
<td>30/8/2014</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>01/9/2014</td>
<td>Urban Maternity HF, Near community (Narasara B) &lt;3km to OTP, Far community (Magwamshi) &lt;9km to OTP</td>
<td>Urban Maternity Federal Medical centre (FMC)</td>
<td>2 religious leader 2 community leader 2 Majalisa (25 to 50 years) 2 patent medicine dealer 2 traditional birth attendance 1 traditional healer 2 Teacher 2 provision store dealer 4 health workers 4 community volunteers 4 care-givers</td>
<td>Local terms Dauda, Ciwon yunwa, tamowa, dauda, Rina, Kwashiokor, Lalacewan jiki, Mayankwania, Datti, Ciwon kumburi Description/perception 1. Yunwa: hausa word for hunger. 2. Tamowa: Malnutrition. 3. Lalacewan jiki: means infected breast milk. 5. Dauda: malnutrition tends to arise as a result of a lactating mother having sexual</td>
</tr>
<tr>
<td>Date</td>
<td>Location</td>
<td>Health Facility</td>
<td>Description/Perception</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------</td>
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<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>02/09/2014</td>
<td>Gwasamai HF, Near community (Maizai) &lt;3km to OTP, Far community (Duhuwar kura) &lt;17km to OTP</td>
<td>Gwasamai HF</td>
<td>intercourse with husband when still breastfeeding. Dauda: malnutrition tends to arise as a result of a lactating mother having sexual intercourse with her husband when still breastfeeding. Tamowa: means malnutrition.</td>
<td></td>
</tr>
<tr>
<td>03/09/2014</td>
<td>Yayu HF, Near community (Dorawaari) &lt;3km to OTP, Far community (Kafin Sako) &lt;15km to OTP</td>
<td>Yayu HF</td>
<td>Local terms Description/Perception</td>
<td></td>
</tr>
<tr>
<td>04/09/2014</td>
<td>Madara HF, Near community (Madara Chikin Gari) &lt;3km to OTP, Far community (Lariski) &lt;15km to OTP</td>
<td>Madara HF</td>
<td>Local terms Description/Perception</td>
<td></td>
</tr>
<tr>
<td>05/09/2014</td>
<td>Builkachuwa HF, Near community (Alamare) &lt;3km to OTP, Far community (Chinade) &lt;17km to OTP</td>
<td>Builkachuwa HF</td>
<td>Local terms Description/Perception</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Activity Description</td>
<td>Location Information</td>
<td>Key Terms</td>
<td></td>
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<td>---------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>06/09/2014</td>
<td>Bulkachuwa HF, Near community (alamare) &lt;3km to OTP, Far community (chinade) &lt;17km to OTP</td>
<td>Bulkachuwa HF General Hospital, 2 religious leader, 3 community leader, 2 Majalisa (25 to 60 years)</td>
<td>1 traditional healer, 1 Teacher, 2 provision store dealer, 4 health workers, 4 community volunteers, 4 care-givers</td>
<td></td>
</tr>
<tr>
<td>08/09/2014</td>
<td>Consolidates BBQ, Draw concept map, Conduct in-depth interview on programme staff: DDPHC, SNO, NFP &amp; Health Educator</td>
<td>Programme staff: DDPHC, SNO, NFP &amp; Health Educator</td>
<td>Local terms, Description/perception</td>
<td></td>
</tr>
<tr>
<td>09/09/2014-10/09/2014</td>
<td>Communities visited: FAR- dagayari, kafin sako, gangai NEAR- bidir, gagaro, Lariski OTP- kalkuriwa, mazai, busuri Non-OTP- charachara, kujuru, buskuri</td>
<td>Catchment area to the following CMAM sites97:</td>
<td>Small area survey, House-to-house active case findings</td>
<td></td>
</tr>
<tr>
<td>11/09/2014</td>
<td>Scale map into quadrant and select villages, Prior setting, Draw concept map, Weighed BBQ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12/09/2014-15/09/2014</td>
<td>LIST OF VILLAGES VISITED SELECTED FROM TWENTY ONE QUADRANTS Rabin kafi (yayu), Darigo (yayu), Margaya, Kukoki, Bulturi (Bulkachuwa), Doleri (Bulkachuwa), Yalowo, Boggawo (Bulkachuwa), Bacharri, Dagar sabuwa (Bulkachuwa), Gurwari, Dugunda, Kuturi, Galadimari, Gursha, Madara, Wuro billi, Janburi, Kare (Bulkachuwa), Bulturi, Dulari, Dakoli, Jugga, Bura jallo, Damno Kankau, Gadawa A, Jatan, Barkeji (Bulkachuwa), Dali, Garin hausawa, Naburkutu, Yollol, Jigawa taura, Madangala</td>
<td>Catchment area to the following CMAM sites: Yayu HF, Urban maternity HF, Madara HF, Bulkachuwa HF, Gwasamai HF</td>
<td>Wide area survey, House-to-house active case findings</td>
<td></td>
</tr>
</tbody>
</table>

97 Yayu HF, Urban maternity HF, Madara HF, Bulkachuwa HF, Gwasamai HF

<table>
<thead>
<tr>
<th>S/No.</th>
<th>BARRIERS</th>
<th>TEAM A</th>
<th>TEAM B</th>
<th>SOURCES and METHOD</th>
<th>TEAM A</th>
<th>TEAM B</th>
<th>TEAM A</th>
<th>TEAM B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low capacity of HWs to implement CMAM (urban maternity)</td>
<td>4B,1A</td>
<td>5</td>
<td>2</td>
<td>1A,2B</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Low motivation of CVs due to lack of incentives</td>
<td>3B,4B,3D,4D,13D</td>
<td>2</td>
<td>4</td>
<td>3B,4B,5B,6B,11B,12B,3D,4D,5D,7D,11D,6D,2B,8C,9D,12D</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Lack of data tools resulting to loss of beneficiary information: 1)Dearth of OTP cards 2)Lack of beneficiary registers</td>
<td>4B,1A,17E</td>
<td>4</td>
<td>2</td>
<td>4B,5D</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Non-existent defaulter tracing/beneficiary follow-up.</td>
<td>4B,3B,3D,2B,19D</td>
<td>4</td>
<td>5</td>
<td>4B,2B,5D,8C,12D</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Dearth of routine drugs</td>
<td>4B,1B,1A,2B,3D,4D,7D,13D,15D,23D</td>
<td>4</td>
<td>3</td>
<td>4B,2B,7D</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Delayed/Poor health seeking behavior in the community</td>
<td>5B,7B,9B,10B,11B,8C,2B,7D,11D</td>
<td>2</td>
<td>2</td>
<td>5B,6B,8C,9B,10B,11B,12B,28,3B,7B,5D,6D</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Poor community mobilization/sensitization99</td>
<td>5B,6B,7B,8C,9B,10B,11B,12B,8B</td>
<td>4</td>
<td>4</td>
<td>5B,6B,7B,8C,9B,10B,11B,12B,5D,6D</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Consumption of RUFT by adults and HWs</td>
<td>2B,12B,8C,9B,10B</td>
<td>4</td>
<td>2</td>
<td>1A,3B,4B,4D</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

---

98 SAM cases referred from other departments in General hospital (Azare) and FMC. HF without CMAM services refer children to the General hospital or FMC.

99 Has contributed to lack of knowledge about how the program works by caregivers. This was common in villages XXX

100 Evident in Yayu and Madara HFs
<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Use of RUFT to motivate CVs or caregivers</td>
<td>2B,14D,5B,3D,6D,7D,4D,10D,16D,8C</td>
<td>3</td>
<td>2</td>
<td>Limited active case finding by CVs</td>
<td>2B,3B,4B,3D</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Lack of access to CMAM services due to flooding</td>
<td>4B,2B,3D</td>
<td>1</td>
<td>1</td>
<td>Limited defaulter tracing by CVs</td>
<td>3B,4B</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Poor delivery mechanism of RUTF between LGA and HF which results to induced stock-outs of RUTF (Gwasamai HF in Feb 2014)</td>
<td>4B,2B</td>
<td>2</td>
<td>3</td>
<td>HWs contribute money for transport of RUTF and his ensures continuity of CMAM services</td>
<td>4B,13D</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Migration of Nomadic Fulani community increases absenteeism and defaulting</td>
<td>4B</td>
<td>1</td>
<td>1</td>
<td>Despite difficulty of access due to flooding, cost of travel or medical attention and distance, caregivers were not entirely discouraged from seeking CMAM services</td>
<td>3B</td>
<td>2</td>
</tr>
<tr>
<td>13</td>
<td>Non adherence to CMAM protocols in terms of:</td>
<td>5</td>
<td>7</td>
<td>Limited community mobilization (Madara community)</td>
<td>5D,8C,7D</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Defaulters not being noted as returned defaulters</td>
<td>4B,3B,2B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Erratic admission and discharge criteria</td>
<td>1A,4D,14D,17E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Few/Non-existent counselling and appetite test (Yayu and Madara)</td>
<td>1A,4D,13D,17E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Caregivers sent home on public holiday without RUTF</td>
<td>1A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HWs dispense less RUTF than that prescribed on ration card (Bulkachuwa OTP)</td>
<td>1A,4D,13D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Absentee beneficiaries are given RUTF through</td>
<td>3D,2B</td>
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101 Catchment populations of Yayu and Gwasamai HF
102 Treatment of SAM at FMC inpatient pediatric section is charge heavily. Caregivers in HF also pay for drugs and beneficiary cards
103 This practice has potential of making CMAM program loose integrity in the community
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<td>proxies (Bulkachuwa OTP)</td>
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<td>CVs used to run all processes at CMAM site albeit unsatisfactorily (Bulkachuwa OTP)</td>
<td>1A,2B</td>
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<td>Poor documentation of beneficiary (monitoring) information on the available records</td>
<td>1A,2B, 17E</td>
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<td>14</td>
<td>Caregiver wait to be served in poor environment i.e. No benches/mats to sit on. The environment is also dirty104(Yayu)</td>
<td>2B,1A,8C,5D,6D,18D</td>
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<td>15</td>
<td>There are long waiting times and poor crowd control. Some procedures done take more of caregivers’ time unnecessarily105.</td>
<td>1A,2B,8C,5D,6D,18D</td>
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<td>16</td>
<td>Caregivers have incurred charges Incurred charges on routine drugs (Yayu) cards</td>
<td>2B,9D,16D,8C,11D,5D,18D</td>
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<td>17</td>
<td>HWs have not received training on CMAM in long time. As such old HW may have left while new HWS may not be formally trained</td>
<td>4B,13D</td>
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<td>18</td>
<td>Stock-out of RUTF at the HF's106 (Jan-Feb)</td>
<td>3D,5D,13D,15D,20D</td>
<td>4</td>
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<td>19</td>
<td>Spouse refusal of caregiver to attend CMAM services</td>
<td>4D,6D</td>
<td>1</td>
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<td>20</td>
<td>Non-existent supervision of HWS at the HF/disconnect in communication between HWS at HF</td>
<td>4D,5D,8C,15D,20D</td>
<td>5</td>
<td>6</td>
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104 The poor sanitary condition in the waiting area poses a risk of infection for under-fives as the caregivers wait.
105 Example is the height measurements on under-five year olds done in Bulkachuwa and Yayu HF's
106 Some caregivers did not receive UTF when they attended while other got less ration than recommended in Bulkachuwa, Yayu and Madara HF.
and program managers at LGA and State level.

21 Suspicious sales of RUTF

22 Arbitrary assigning of MUAC readings without measurement at all.(Bulkachuwa OTP)

23 Long distance to CMAM HF

24 Caregivers being sent home without RUTF.

25 Caregivers do not know modality of the program (do not know how the program works)

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The purpose of such visit/s would be to ensure adherence to CMAM standards or to discuss various challenges HWs face in CMAM service delivery.

The shops where this was suspected were in Azare town and also Isawa town adjacent to Giade LGA.

Example is the HF of Bulkachua that was closed in public holiday while caregivers with children in the program had not been informed that it will close.
9.8. Annex 8: Letter of understanding between FMC and Medical Director.

[Letter content]

- The Director, Department of Primary Health Care, Katagum Local Government;
- Through:
- Nutrition Officer;

Sir,

REQUEST FOR READY TO USE THERAPEUTIC FOOD (RUTF) FOR USE ON MALNOURISHED CHILDREN

We are hereby requesting for Ready to use Therapeutic Food (RUTF) both 1700 & 755 for use on malnourished children admitted in Department of Paediatrics of Federal Medical Centre, Azare.

We are hopeful that our request will be granted, please.

Thank you.

Yours Sincerely,

[Signature]

Dr. Hayatu Ahmad, MSBS, FWACP (Paed)
HOD: Consultant Paediatrician

[Note]: Issue her all the necessary items and ensure prompt receipt and compliance.
9.9. **Annex9: Questionnaire for the carers of children (Severe cases) who are NOT in the programme**

CMAM site: ___________________Under Health Facility Name: ________________________________

Village: ________________________________ Interviewer name & Team #: _______________________

Local government authority: ________________________ state: ______________________________

Date: ____/____/2014

1. Do you think your child is malnourished?
   * YES    * NO

2. **If Yes:** Are you aware of the existence of a programme which can help malnourished children?
   * YES    * NO (→ stop!)

3. **If yes:** what is the program’s name? _____________________________________________

4. Where is this program? __________________________________________________________

5. Why is your child not attending or currently not enrolled in the programme? (do not prompt. Probe for “any other reason?”)
   * Program site too far (How long does it take to walk? .................hours)
   * No time / too busy. What is the parent doing instead? _____________________________
   * Mother is sick
   * The mother cannot carry more than one child
   * The mother feels ashamed or shy about coming
   * Security problems
   * There is no one else who can take care of the other siblings
   * The amount of RUTF was too little to justify the journey
   * The child has been rejected by the programme already. When? ______ (approx.)
   * Other parents’ children have been rejected
   * My husband refused
   * I thought it was necessary to be enrolled at the hospital first
   * I do not think the programme can help my child (prefer traditional healer, etc.)
   * Other reasons (specify): _______________________________________________________

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110 Can be used in small area survey and in wide area survey for non-covered cases
6. Has this child ever been to the program/previous admitted to the programme?

* YES  * NO (→ stop!)

7. **If yes**, why is he/she not enrolled anymore?

* previously rejected

* Defaulted (when? ...........why? .............)

* Condition improved and discharged by the programme (when? .........)

* Discharged because he/she was not recovering (when? .........)

* Other: _________________________________________________

(Thank the carer)