COVERAGE MONITORING NETWORK

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Coverage assessment of supplementary feeding programmes to treat moderate acute malnutrition in

Karamoja Region, Uganda

Using the simplified lot quality assurance sampling of access and coverage (SLEAC) and semi-quantitative evaluation of access and coverage (SQUEAC) methodologies

April-June 2016

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Acknowledgements

ACF International would like to acknowledge and thank the following parties for their assistance in in conducting the assessment and helping the team to achieve the required objectives:

Thanks to the World Food Programme for supporting the assessment financially and to the Ministry of Health for providing a large team of Supervisors. Thanks to the ACF team in Ugandafor providing technical and logistical support in-country, and to the team in Kaabong for hosting our survey team for three weeks during the SQUEAC. Thanks to Moroto hospital for lending equipment and providing the team with supplies. Many thanks to the implementing partners, CAFH and Cuamm, for supporting us during the SQUEAC assessment.

A special thanks to the assessment team, who spent countless days in the rain and mud, and especially to the enumerators, who tirelessly acted as geographers, survey experts and translators. Without their help, this assessment would not have been possible. Finally, a warm thanks to the people of Karamoja, who allowed us into their homes and provided us with a plethora of knowledge and information.

Abbreviations

CAFH	Concerned Action for Health
DHO	District Health Office
FGD	Focus Group Discussion
FSNA	Food Security and Nutrition Assessment
GAM	Global Acute Malnutrition
HH	Household
IMAM	Integrated Management of Acute Malnutrition
IYCF	Infant and Young Child Feeding
LOS	Length of Stay
LQAS	Lot Quality Assurance Sampling
MAM	Moderate Acute Malnutrition
MoH	Ministry of Health
MUAC	Mid-Upper Arm Circumference
NGO	Non-Governmental Organisation
OTC	Outpatient Therapeutic Centre
OTP	Outpatient Therapeutic Programme
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Programme
SLEAC	Simplified LQAS Evaluation of Access and Coverage
SQUEAC	Semi-Quantitative Evaluation of Access and Coverage
TBA	Traditional Birth Attendant
TH	Traditional Healer
UNICEF	United Nations Children's Fund
VHT	Village Health Team
WFP	World Food Programme
WHZ	Weight-for-Height Z-Score

Executive summary

[to be added after first round of comments]

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1. Introduction

In 2016, the World Food Programme (WFP) engaged ACF International to conduct an assessment of both supplementary feeding programme (SFP) for the treatment of moderate acute malnutrition (MAM) and the outpatient feeding programme (OTP) for the treatment of severe acute malnutrition (SAM). WFP, and partners,required the coverage information and an analysis of programme performance due to a number of reasons.

First 2016 sees WFP set out on a new strategic period (2016-2020) and therefore there was a requirement to have a baseline for what levels of coverage their SFP programmes are achieving in the region. Second, there were concerns about coverage in the region and a potential overestimation of coverage results from 2015. It was felt that the estimation for SFP calculated in 2015 (49%) was not in keeping with the expected prevalence and the amount of treatment product (CSB++) being used in the region. A further coverage assessment that evaluated the programme according to the national protocol (i.e. used weight-for-height (WHZ) measurements as well as mid-upper arm circumference) would contribute to the evidence available to give a more precise idea of what proportion of children are being treated, thereby allowing for better calculations for the amount of product needed. Third, the Karamoja is the region with persistently the highest levels of acute malnutrition in Uganda, and therefore is the focus of efforts to treat and prevent malnutrition in the country. A coverage assessment covering the region but also a district with a more in depth analysis to understand factors affecting coverage would provide programme decision makers with evidence on which to build recommendations and an action plan to improve programme coverage and effectiveness.

Therefore the general objective of the coverage assessments conducted in the region was to evaluate access and coverage of the SFP in the 7 districts of Karamoja region, with a view to strengthen routine programme monitoring and increase programme coverage. Specific objectives include:

1. To classify coverage in each district and estimate coverage for the region using the SLEAC methodology and identify factors affecting the uptake of the SFP programme.
2. To provide in depth analysis of programme performance and factors effecting coverage in one selected district.
3. To provide a community engagement plan and specific recommendations from the results from the selected district for improving acceptance and coverage of the programme and assess possible extrapolation to the region.
4. Enhance competencies of nutrition staff in coverage survey methodologies.

Although the primary focus for the assessments was the SFP and treatment of MAM factors affecting coverage are typically very similar for OTP and the treatment of SAM. Therefore in many cases the findings and analysis are relevant for OTP. Furthermore, during the case-finding, inevitably SAM cases are also found, and since it is little extra work to count SAM cases and interview caregivers, this was also done.

2. Methodology

In order to meet the objectives set out a SLEAC assessment was conducted across the Karamoja region followed by a SQUEAC assessment in one district (Kaabong).

The assessment process

The **SLEAC (Simplified Lot-Quality-Assurance-Sampling Evaluation of Access and Coverage)** approach is a low-resource method for classifying coverage of feeding programmes over wide areas. The SLEAC methodology was chosen to assess the level of SAM and MAM coverage in Karamoja with a coverage estimation for the region as well as the classification of coverage at regional level and the identification of affecting access to services.

SLEAC uses a two-stage sampling process in order to achieve a specified sample of SAM or MAM cases[1]. The first stage samples villages across a specified area (in this case districts). The second stage performs an exhaustive sample of malnourished children in each village selected. The caregiver of each SAM and MAM case is given a questionnaire to ascertain why the child is not in the programme (for uncovered cases) or to determine how the child came to be admitted (for covered cases). The information collected during the SLEAC formed the basis on which we made the selection of a district for the SQUEAC assessment.

The **SQUEAC (semi-quantitative evaluation of access and coverage)** approach provides a more in depth assessment of coverage in a single district. This gives a more precise coverage estimation (than a simple classification) in the district and also provides a more comprehensive analysis of programme performance and factors affecting coverage.The SQUEAC took place in the following stages:

Stage 1: An analysis of all quantitative data, collection and analysis of qualitative information and the identification of negative and positive factors effecting coverage.

Stage 2: Development and testing of hypothesise to confirm (or deny) assumptions related to areas of high or low coverage, and to ascertain whether coverage is uniform throughout the county.

Stage 3: Development of the prior and estimation of coverage with Bayesian techniques using cases found during the SLEAC assessment[2].

Each aspect of the SQUEAC methodology is explained in more detail in the relevant sections.

The SLEAC assessment was conducted in all seven districts of Karamoja, from 15 April to 14 May 2016. A complete work plan can be found in Annex 1.

The assessment team and training

There were 21 members ofcoverageteam including three ACF employees, eight Ministry of Health (MoH) employees and 10 local enumerators[3]. The assessment began with four days of training (conducted by the ACF team members) in Moroto on the SLEAC methodology, village level sampling techniques and on how to take nutritional diagnostics. The team was trained on door-to-door case finding, how to take mid-upper arm circumference (MUAC) and weight-for-height measurements, and how to identify oedema. Finally, the team were also trained on conducting interviews using questionnaires. This included role plays which also provided an opportunity to adjust the questionnaires in order to more adapt them to the Karamoja context.

For the SQUEAC training took place at each stage throughout the assessment. The assessment team was reduced by five enumerators but two staff from Community Action for Health (CAFH) (the operating partner in Kaabong) joined the team. It is important that those who know the programme very well (such as programme managers) take part in SQUEAC assessments.

Nutritional diagnostics

During the coverage assessment in 2015, coverage was only assessed using MUAC and oedema. Typically coverage assessments would not use weight-for-height z-scores as a case definition. However,the WFP requested that the assessment team take both measurements during the survey. In order to give the most accurate evaluation of performance, coverage should be evaluated against the definition of malnutrition defined in the national guidelines: in Uganda, this includes MUAC, weight-for-height z-score and oedema (see Table 1).

Table 1 Table showing definitions of SAM and MAM according to Uganda IMAM Guidelines(2016)*

Age	Nutritional	Moderate Acute Malnutrition	Severe Acute Malnutrition

[1] Sample size calculation is addressed in more detail in the investigation process section.

[2] Typically stage 3 would involve a wide area survey (such as in the SLEAC) however since a SLEAC had already been conducted the cases found were used to perform a conjugate analysis with the prior information in order to achieve the coverage estimation.

[3] See Annex 2

Category	Indicator	(MAM)	(SAM)
Children from 6 to 59 months	Weight for Length/Height (WFL/H)	Greater or equal to -3 z-score and less than -2 z-score (≥-3SD &<-2SD)	Less than -3 z-score (<-3SD)
	MUAC cut-off	Greater or equal to 11.5cm and less than 12.5cm (≥11.5cm &<12.5cm)	Less than 11.5cm (<11.5cm)
	Bilateral pitting oedema	No bilateral pitting oedema	Presence of bilateral pitting oedema

*Though this table was taken from the 2016 IMAM guidelines, which have yet to be released, the provided criteria are the same as the 2010 guidelines.

When looking at the SAM and MAM cases found during the assessment, we can see that had we not tried to find cases that qualify by weight-for-height we would have overlooked approximately 40% of the SAM and MAM population, thereby giving a distorted view of coverage. This is illustrated in Figures 1 and 2.

Figure 1 Qualifying criteria for SAM cases found during the assessment (n=89)

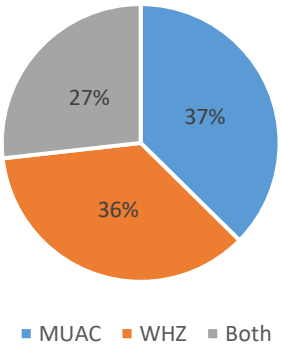
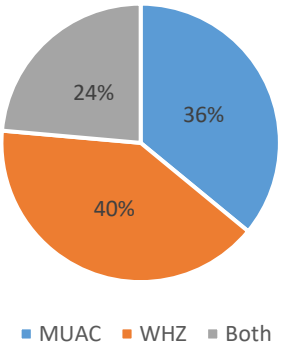


Figure 2 Figure 2 Qualifying criteria for MAM cases found during the SLEAC SLEAC (n=452)



3. Challenges and limitations

Availability of data and information

The single biggest challenge to stage one sampling was the absence of centralised data for sampling and planning. The population data and village lists required to complete calculations were attained from a variety of sources, including district health offices (DHO), NGOs and WFP, which meant that it often had to be disaggregated, cleaned and analysed before it could be used. For example, village lists often included duplicates and spelling errors, making the identification of sampled villages (on the list) difficult in reality.

Despite many attempts to find them online and at country-level, up-to-date, detailed and reliable maps were unavailable. The ACF staff in Kaabong were able to provide a very basic map of the region, however, it was out-dated, faded and lacked fine detail. ACF-Uganda also provided a map of Kaabong, with parish-level data, but it was too detailed and illegible when printed. The lack of reliable maps meant that village selection had to be calculated using the variable village lists.

In addition to being inconsistent, the acquired population data was often incorrect. Frequently, villages were either much larger or smaller than expected. In a few cases, villages had moved completely due to the migratory nature of the people who live in Karamoja. After speaking with nearby villages, teams were told that some villages had relocated. Reasons for movement included long distances from bore holes and trading centres, inappropriate village locations and migration to and from Kenya and South Sudan.

Timing of assessment

The timing of the SLEAC assessment happened to fall at the height of the Karamojong rainy season. This proved to be a considerable logistical challenge, particularly for village accessibility. Flooding in areas resulted in completely blocked roads, while mud in others stopped vehicles from moving altogether. Surveys days were interrupted on several occasions due to rain and, on other days, never began due to vehicles becoming stuck in the mud.

Figure 3 Photo of the survey team preparing to take weight for height measurements in Kaabong

Nutrition diagnostics

Taking weight and height (W/H) measurements, in addition to mid-upper arm circumference (MUAC), meant increased time and effort by the survey teams. Teams were required to carry the scales and height boards from household to household, through tiny manyatta (settlement area) entrances; this proved to be strenuous and exhausting for several team members, especially on very hot days. Relative to MUAC, W/H measurements are more time-consuming and hands-on. Children were often wary and became scared upon seeing height boards; explaining the purpose of the measurements to parents, reassuring and measuring children more than doubled the time it would have normally taken to complete each village for a MUAC-only survey.

Organisation in villages

It was decided that door to door case finding procedure would be used. This was challenged by communities tending to gather for screening. In the manyatta setting, communities often congregate at a central, or well-known location (e.g. under a large mango tree) for meetings, information sessions and special events. Since this was frequently the place where the team would be directed whilst attempting to find a specific village, community members were attracted to the meeting spot. In many cases, word spread that an NGO was present and drew people from their homes. Since the methodology specifically required teams to go to households, this put a strain

on following correct procedure. Under circumstances where communities gathered, teams responded in several ways:

- By asking community leaders and VHTs to direct people back to their homes, then continuing with screening from house to house.
- By screening at the gathering place and then completing the survey by sending a few team members do a sweep of the houses or manyattas to capture remaining children
- By cross-referencing with community leaders and VHTs to ensure that all children <5 were present and measured; if not, seeking out the missing children (in several cases, it meant traveling to the nearest health facility or distribution centre if on distribution day)
- By asking community members if any children <5 were missing and locating them

Absence of caregivers

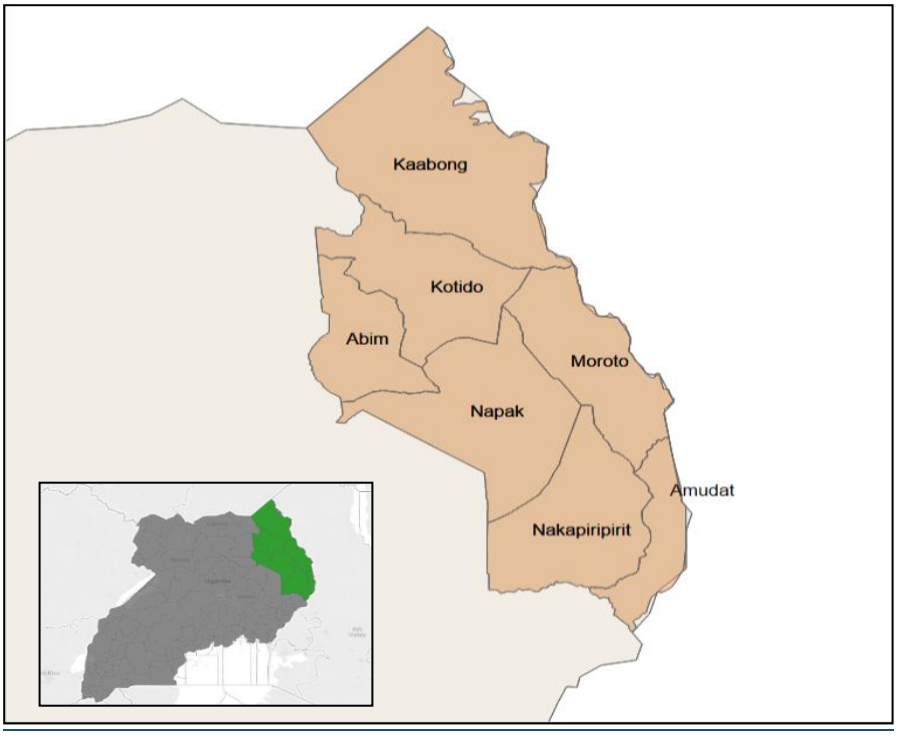
As well as being rainy season, the assessment was conducted during the planting season when caregivers (And therefore sometimes children) were away from the village. Attempts were made for teams to leave in early morning, but it was not always possible to arrive at villages before caregivers had left for the field and gardens. This resulted in many primary caregivers being absent for interviews. The team dealt with this by interviewing the next best person, if possible, such as older siblings and neighbours.

4. Context

Overview of area

The Karamojaregion is Uganda's poorest sub-region. The remote 27,990 square kilometre region borders South Sudan to the North and Kenya to the East. Karamoja is comprised of mountains, highlands and river valleys, is framed by four large mountains: Morongole (North), Kadam (South), Moroto (East) and Napak (West). Composed of seven administrative districts, Abim, Amudat, Kaabong, Kotido, Moroto, Nakapiripirit and Napak, (see Figure 4).Each district is divided into sub-counties, further into parishes and, finally, villages. There are two types of village settings in Karamoja: the manyatta, or grouped setting and those made up of individual households (huts).

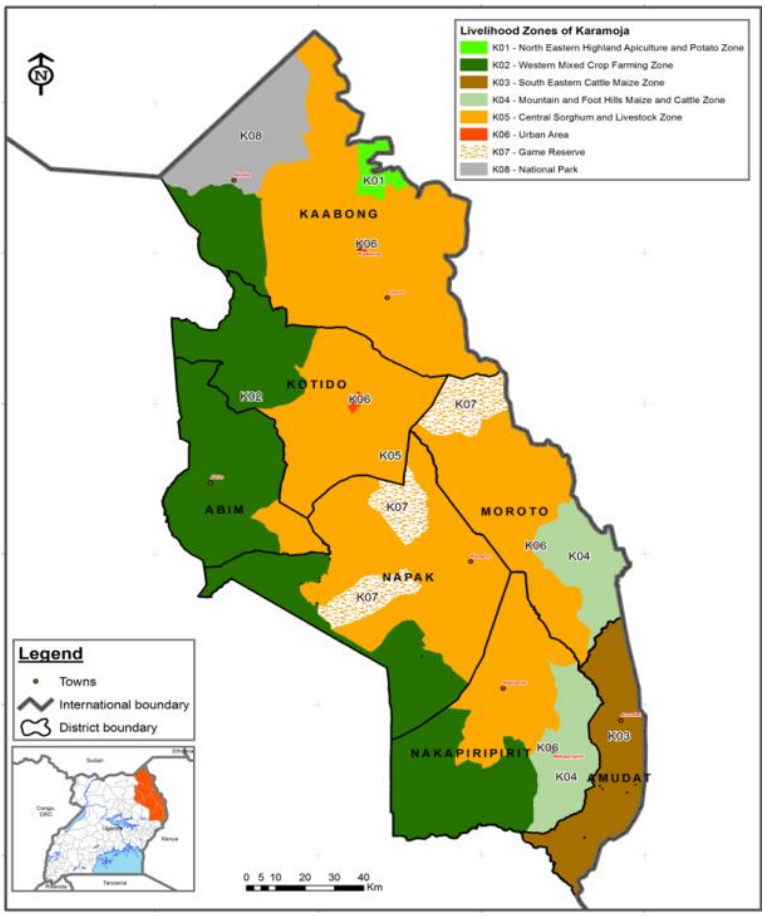
Figure 4 Map of the Karamoja Region, Uganda with districts marked



Population

According to latest census[4], the Karamoja has approximately 988,429 inhabitants. This population is split into three main livelihood zones: agricultural, agro-pastoral and pastoral including considerable variation within each district. Figure 5 illustrates geographical land classifications according to the core livelihood activities within the region, including apiculture and potato farming, mixed crop farming, cattle and maize farming, and sorghum and livestock farming. Karamoja is also home to Kidepo National Park, on the border with South Sudan, and three game reserves.

Figure 5 Karamoja livelihood zones (FEWSNET, 2013)



Nutrition situation

The underlying factors that contribute to the region's under-development include its relative isolation, livelihood instability and chronic droughts and flooding that result in poor harvest and persistent food insecurity. These combined factors undermine the capacity of households to meet their basic nutritional needs. The GAM rate currently at a critical level of 12.4%, with a SAM and MAM prevalence rates of 3.8% and 8.6% respectively[5].Food insecurity (and therefore malnutrition rates) is highest during the lean season from March to July[6].

Details of health and nutrition services

Funded by WFP, the SFP is part of Uganda's Integrated Management of Acute Malnutrition (IMAM) strategy, which was developed in 2006 with support from UNICEF and VALID International. The first official IMAM guidelines were released in 2010 and a set of revised guidelines are likely to be released in 2016. SFP specifically targets children 6-

[4]Government of the Republic of Uganda, National Population and Housing Census 2014, Revised Edition, November 2014

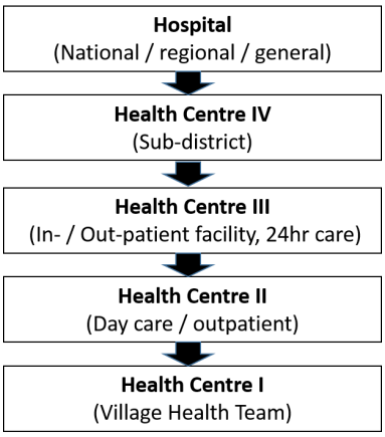
[5] Food Security and Nutrition Assessment (FSNA) in Karamoja Region, UKAID, UNICEF, WFP, Government of the Republic of Uganda, January 2016

[6]Famine Early Warning Systems Network (FEWS NET) (2016). *Uganda: Food Security Outlook. February to September 2016: Moroto and Kaabong Districts to remain in Crisis (IPC Phase 3) though June.* USAID. Retrieved online from < http://www.fews.net/east-africa/uganda/food-security-outlook/february-2016> on 13 June 2016.

59 months and other vulnerable groups, including pregnant and lactating women, elderly persons and infants under 6 months[7]. The coverage assessment focused on children aged 6-59 months.

The Ugandan health care system operates under a tiered system (see Figure 6). A hospital and numerous Health Centre IV, III and II's are located in each district of Karamoja. Additionally, outposts have been established in Karamoja to reach communities and families in the most remote areas. However, Ugandan health care is highly dependent on a referral system that relies on volunteers Village Health Team (VHT) members (Health Centre I) to identify children who are sick and malnourished.

Figure 6 Uganda's existing health system (Republic of Uganda MoH, 2016)



The supplementary feeding programme operates on a bi-weekly basis at health facilities and outpost distribution centres. On each distribution day health workers re-screen (measure) children and provide caregivers with the CSB++ ration, which is enough for two weeks for the specific child. New children can only be registered on the assigned SFP day. SFP referrals may be made by VHTs and health workers. In addition, caregivers may 'self-refer' in that they bring the child to the HF themselves and are admitted after being screened.

Results of previous coverage assessments in the area

In March 2015, a SLEAC assessment was conducted in the Karamoja region followed by a SQUEAC assessment in Moroto District.The SLEAC estimated the OTC programme coverage at 49%(95% CI 47-52%) and the SFP programme coverage at 49% (95% CI 48-51%)[8].It should be noted that the assessment only used MUAC and oedema as a case definition and therefore overlooked children that were malnourished by weight-for-height only. Therefore, the assessment is likely to have overestimated coverage. SAM and MAM classifications are listed in the table below:

Table 2 Table showing number of covered and uncovered SAM and MAM cases in each district and coverage classifications for coverage assessment in March 2015

District	SAM Covered	SAM Uncovered	Coverage Classification	MAM Covered	MAM Uncovered	Coverage Classification
Moroto	19	43	Moderate	21	89	Low
Nakapiripirit	19	28	Moderate	47	124	Moderate
Amudat	39	17	High	67	50	High
Kotido	16	27	Moderate	44	60	Moderate
Kaabong	19	21	Moderate	73	31	High
Abim	29	5	High	62	20	High
Napak	50	12	High	37	37	High

[7]IMAM 2010

[8] Prentice A and Hockenhull E, Coverage Assessment: Simplified LQAS Evaluation of Access and Coverage and Semi-Quantitative Evaluation of Access and Coverage, Karamoja, Uganda, Action Against Hunger, The Republic of Uganda Ministry of Health, UNICEF, World Food Programme, London, UK, 2015

Total	191	153		351	411	

5. SLEAC Assessment

To begin the SLEAC assessment we calculated the number of SAM children necessary in order to allow for a classification in each district. Since MAM cases are much more common we can be certain to find enough MAM cases when looking for SAM cases. We then proceeded with the first stage sampling of villages to ensure that we went to enough villages to find the required number of SAM/MAM children. We then went to each village to find all SAM/MAM cases for the second stage sampling. Each step is addressed in detail below.

5.1. Calculating required sample size

Estimated caseloads were calculated for each district using population data, SAM rates and % population under 59 months using the following formula:

$$Estimated\ caseload = total\ district\ population \times population\ of\ 6-59\ months \times SAM\ rate$$

The lowest SAM prevalence rates from the most recent Food Security and Nutrition Assessment[9] were used for calculations to ensure that the survey would reach the target sample size.Population data was attained from DHOs. When village lists were unavailable, villages were calculated using census data.

With the exception of Amudat, all districts used a standard target sample size of n=40. For districts with an estimated caseload of 500 this is deemed to be sufficient to reliably classify coverage with two classification thresholds[10]. Due to the much lower prevalence rate in Amudat the estimated number of cases was less than 125, therefore the target sample size for was n=29. Table 3 presents the data used in calculations of estimated caseload.

Table 3 Data used to estimate caseload and determine sample size & number of villages required

District	Total Population[11]	Average village population[12]	Population 6-59 months[13]	SAM rate (%)[14]	Estimated caseload	Sample size required[15]	Required # of villages to sample
Kaabong	169,274	302	5,431	2.8	853	40	27
Abim	109,039	352	6,331	3.0	589	40	22
Kotido	178,909	922	16,600	3.1	998	40	8
Moroto	104,539	692	12,462	3.7	696	40	9
Napak	145,219	407	7,322	4.0	1,046	40	14
Nakapiripirit	169,691	812	14,615	4.9	1,497	40	6
Amudat	111,758	963	17,342	0.6	121	29	28
TOTAL	988,429	636	80,102	3.2	5,799	269	114

[9]Wamani, H. (2016). *Food security and nutrition assessment (FSNA) in Karamjoa Region*.

[10] Myatt M et al, Semi-Quantitative Evaluation of Access and Coverage (SQUEAC) / Simplified Lot Quality Assurance Evaluation of Access and Coverage (SLEAC) Technical Reference, Food and Nutritional Technical Assistance III Project (FANTA-III), FHI 360 / FANTA, Washington, DC, October 2012

[11] Government of Republic of Uganda, 2014

[12] Average village size was calculated using the number of villages provided at district level and the district population from the 2014 census.

[13] According to WHO Neo Natal and Child Health Profile Uganda (2013) the population of <59 months is 19%. Therefore we took an estimate of 18% for 6-59 months.

[14] FSNA, 2016

[15] According to Table 5 in the SLEAC/SQUEAC Technical Reference

5.2. First Stage Sampling

In order to attain the required number of SAM cases needed to make sure we sampled enough villages. The required number of villages was calculated using the formula below and presented in Table 3.

$$n_{villages} = \left\lceil \frac{n}{average\ village\ population_{all\ ages} \times \frac{percentage\ of\ population_{6-59 months}}{100} \times \frac{SAM\ prevalence}{100}} \right\rceil$$

The numbers of villages that need to be sampled for each zone are also presented in Table 3. A list of villages for each district obtained from various sources[16] was then used to randomly select the required number of villages to ensure spatially representative sample. The spatial systematic sampling method (or 'list method') was used to select the villages. With this method villages are ordered according to sub-county, a sampling interval is then calculated as well as a random starting point on the list. This allows for the correct amount of villages to be selected both randomly and produces a spatially representative sample (since they are ordered geographically on the list). This process was done separately for each district. The sampled villages for each district can be found in Annex 3.

5.3. Second Stage Sampling

Once first stage sampling was conducted for a given district the assessment team split into 6 teams of 3 or 4. Eachteam was assigned a team supervisor and each visited one or two villages in one day. In each village the team was required to find each and every MAM and SAM child and to determine if they were enrolled in a feeding programme or not. Each team was equipped with an electronic Salter scale, a height/length board, MUAC tapes, questionnaires (for the caregivers of covered and uncovered cases) and pens.

Upon arrival in the village, the team spoke with the village leader in order to first explain the reason for the visit and second to identify the boundaries of the village. Often a guide was found to ensure the teams covered all houses and in some cases a translator was necessary[17]. Door-to-door case finding involved teams going to every household within each specified village. This sampling method was selected as the alternative to active and adaptive case finding which is more appropriate for SAM case identification. This snowballing sampled involves collecting information from informants on the possible location of SAM children. Since the SLEAC's primary focus was to find MAM children, which are not easy to identify visually, the door-to-door method was more appropriate.

At each household all children 6-59 months were first measured by MUAC. For all children with MUAC measurements less than 14cm, weight and height measurements were then taken. Weight and height measurements required taking the child's weight using an electronic Salter scale and height or length using a height board, and the weight-for-height z-score was calculated using the WHZ chart.

Children with MUACs less than 11.5cm and/or with presence of bilateral pitting oedema were automatically classified as a SAM case. Additionally, children with WHZ scores less than -3 standard deviation were classified as SAM, regardless of their MUAC. Any child who was identified as SAM by either MUAC, or WHZwas classified as such.

For those children 6-59 months not classified as SAM, with MUACs equal to or greater than 11.5cm and less than 12.5cm were classified as MAM. Additionally, children with WHZ scores equal to or greater than -3 and less than -2 were classified as MAM.

Caregivers were also asked whether they were currently undergoing treatment for either MAM or SAM. It is possible that children were not classified as MAM or SAM but were undergoing treatment in either OTP or SFP. These are referred to as recovering cases. A recovering case is any child that is no longer MAM or SAM, but has not

[16]Abim, Kaabong, Kotido and Moroto = District Health Offices;Nakapiripirit, Napak = Concern Worldwide;Amudat = ACF-Uganda

[17] For example in Kaabong there were Ik speakers and the team were not able to communicate in this language

yet been discharged from the SFP or OTP. The soon-to-be-released 2016 IMAM guidelines state that a child may be released as cured once it has achieved a MUAC of 12.5cm.
The caregivers of SAM, MAM or recovering cases that were in the programme were then given the questionnaire for covered cases. This allowed us to determine how the child ended up receiving treatment. The questionnaire can be found in Annex 4. The caregivers of SAM or MAM children not undergoing treatment were also given a questionnaire. The questionnaire for uncovered cases allowed us to find out the reasons the child was not being treated. This questionnaire can be found in Annex 5.

Each district took between 3 and 6 days to cover all the sampled villages. The districts were all sampled from 19 April to 13 May, which included some days rest for team.

Results

The results to the SLEAC are threefold. First the classification of each district according to the SAM and MAM cases found, second the coverage estimation for the entire district based on the combined sample size and third the findings for reasons for covered and non-covered cases taken from the questionnaires.

Single coverage estimator

The most up-to-date and reliable coverage estimator available is single coverage[18]. With this estimator covered cases, non-covered cases and recovering cases found are used as the denominator, and recovering and covered case as the numerator. In order to under represent coverage, those recovering cases that are not in the programme are estimated and also added to the denominator. See the formula below, where C_{in}= covered case, C_{out}= uncovered case R_{in} = recovering cases in the programme and R_{out} recovering cases not in the programme.

$$Single\ coverage = \frac{Cin + Rin}{Cin + Rin + Cout + Rout}$$

Recovering cases not being treated were calculated by using recovering cases still being treated, those identified during the assessment. The number of recovering cases not in the programme (R_{out}) are estimated using the formula below:

$$Rout \cong \frac{1}{3} \times (Rin \times \frac{Cin + Cout + 1}{Cin + 1} - Rin)$$

1/3 is the correction factor calculated using the median length of stay for a treated SAM or MAM case (2.5 months) and an estimated length of an untreated episode of SAM or MAM (7.5 months)[19].

Cases found and calculation of total cases

In total, 491 MAM cases, including 27 recovering cases, and 100 SAM cases, including 9 recovering SAM cases, were found in Karamoja. The results for each district, estimates for recovering cases not in the programme, calculations of the decision rules and final classifications are presented in Tables 4 (MAM) and 5 (SAM).

Table 4 Table showing MAM cases and recovering cases found by district and estimated uncovered recovering cases

District	Covered MAM cases (C_{in})	Recovering cases (R_{in})	Uncovered MAM cases (C_{out})	Recovering cases not in programme (R_{out})	Total cases (C_{in}+R_{in} +C_{out}+R_{out})
Moroto	28	4	33	1	66

[18] Myatt, M et al, (2015) A single coverage estimator for use in SQUEAC, SLEAC, and other CMAM coverage assessments, p.81 Field Exchange 49

[19]Belegamire S.et. al (2016) Testing the use of the single coverage estimator for assessing the coverage of selective feeding (Unpublished)

Napak	29	3	82	2	116
Nakapiripirit	12	0	16	0	28
Amudat	25	6	29	2	62
Kotido	20	4	49	3	76
Abim	5	2	14	1	22
Kaabong	35	8	87	6	136
TOTAL	**154**	**27**	**310**	**15**	**506**

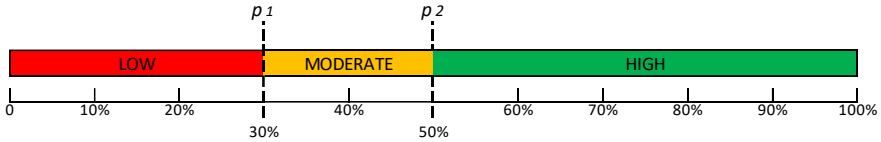
Table 5 Table showing SAM cases and recovering cases found by district and estimated uncovered recovering cases

District	Covered SAM cases (C_{in})	Recovering cases (R_{in})	Uncovered SAM cases (C_{out})	Recovering cases not in programme (R_{out})	Total cases (C_{in}+R_{in} +C_{out}+R_{out})
Moroto	1	1	6	1	**9**
Napak	6	0	31	0	**37**
Nakapiripirit	3	0	2	0	**5**
Amudat	2	3	3	1	**9**
Kotido	5	1	6	0	**12**
Abim	0	0	3	0	**3**
Kaabong	1	4	22	14	**41**
	18	**9**	**73**	**16**	**116**

Coverage classification

Prior to the assessment, it was determined that a three tier classification would be most appropriate, to identify high, moderate and low performing districts. The thresholds were set at 30% (P_1) and 50% (P_2). See Figure 7. P_2 was chosen to identify those districts that are achieving the SPHERE standard of 50% coverage for rural community based management of acute malnutrition programmes. P1 was set at 30% as this was deemed to be the best threshold in order to distinguish between those programmes that are under performing (<50%) with those that are failing (<30%). Coverage estimations from the 2015 coverage assessment in Karamoja[20] were used to forecast expected coverage levels.

Figure 7 Diagram showing coverage classifications and thresholds used during the SLEAC assessment

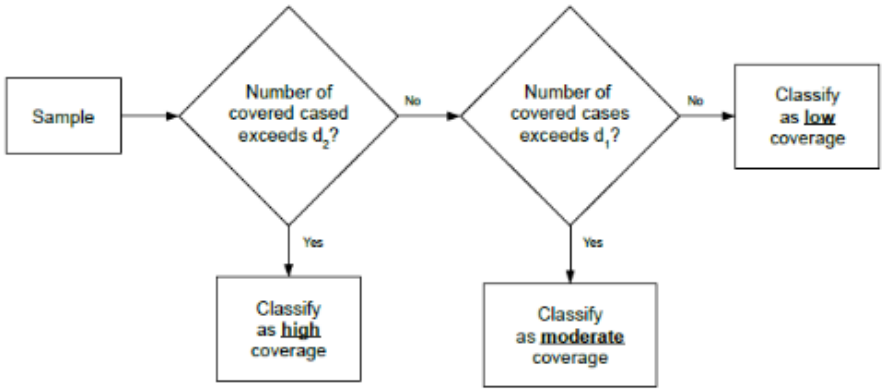


In order to determine the classification of coverage for each zone, the decision rule (d_1 and d_2) for each district is first calculated using the following formulae where *n* = total cases (C_{in}+ C_{out} +R_{in} + R_{out})

$$d_1 = \left\lfloor n \times \frac{30}{100} \right\rfloor \quad \text{and} \quad d_2 = \left\lfloor n \times \frac{50}{100} \right\rfloor$$

Then following algorithm is then used to determine the classification:

[20] Prentice & Hockenhull, 2015



The total cases for each district, total covered cases, calculations of the decision rules and final classifications are presented in Tables 6 (MAM) and 7 (SAM).

Table 6 Table showing total MAM cases, total covered cases, decision rule calculations and classifications by district

District	Total cases (C_{in}+R_{in} +C_{out}+R_{out})	Total covered cases (C_{in} + (R_{in})	D_1(30%)	D_2 (50%)	Classification
Moroto	66	32	20	33	Moderate
Napak	116	32	35	58	Low
Nakapiripirit	28	12	8	14	Unclassified
Amudat	62	31	19	31	High
Kotido	76	24	23	38	Moderate
Abim	22	7	7	11	unclassified
Kaabong	136	43	41	68	Moderate
TOTAL	**506**				

Table 7 Table showing total SAM cases, total covered cases, decision rule calculations and classifications by district

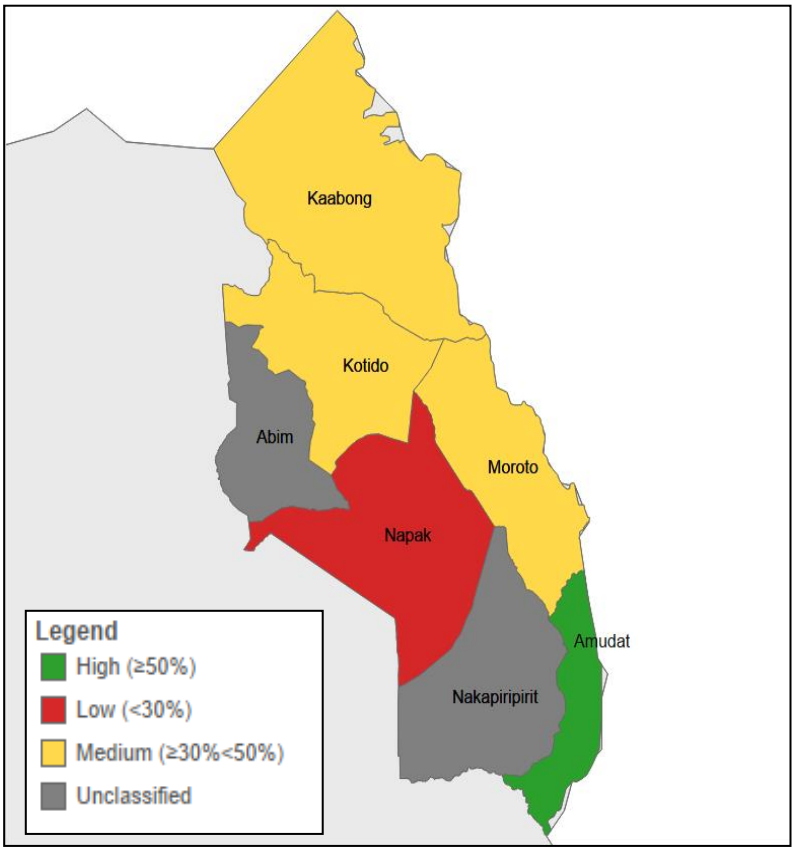
District	Total cases (C_{in}+R_{in} +C_{out}+R_{out})	Total covered cases (C_{in} + (R_{in})	D_1(30%)	D_2 (50%)	Classification
Moroto	**9**	**2**	3	5	unclassifed
Napak	**37**	**6**	11	19	Low
Nakapiripirit	**5**	**3**	2	3	Unclassified
Amudat	**9**	**5**	3	5	Unclassified
Kotido	**12**	**6**	4	6	Unclassifed
Abim	**3**	**0**	1	2	unclassifed
Kaabong	**41**	**5**	12	21	Low
	116				

In order to classify coverage as being low, moderate or high, a minimum of 40 cases were required in each district for both MAM and SAM.In terms of MAM, we were unable to classify in Nakapiripirit and Abim. The errors were also calculated using these sample sizes, however, they were not acceptable in order to use these sample sizes.[21]

In terms of SAM, the minimum sample size was only met in one district (Kaabong). However, we were also able to classify coverage for SAM in Napak as well since with the eventual sample (n=37) a classification can be made with acceptable errors.[22]

Figure 8illustrates the classifications of each district for coverage of MAM cases in a map.

Figure 8 Map showing MAM coverage classifications of each district



Regional coverage estimation

Acoverage estimation for the region for MAM treatment was also calculated. Due to the unreliable nature of the amount of SAM cases found from district to district, we were unable to reliably provide an estimate for SAM treatment coverage. The calculations are however presented in Annex 8.

A weight was first calculated for each district based on the estimated MAMpopulation in the surveyed areas (see Table 4).

[21] See Annex 6 for calculations
[22] See Annex 7 for calculations

Table 4 Calculation of weight allocation for each district according to MAM rate

District	Total population	Population 6-59 months[23]	MAM rate (WHZ)[24]	Estimated point MAM case load	weight=N/∑N
Abim	109,039	19,627	6.7%	1,315	0.084151212
Amudat	111,758	20,116	9.4%	1,891	0.121006915
Kaabong	169,274	30,469	10.4%	3,169	0.202781024
Kotido	178,909	32,204	8.8%	2,834	0.181350424
Moroto	104,539	18,817	8.0%	1,505	0.096332325
Nakapiripirit	169,691	30,544	5.9%	1,802	0.115322629
Napak	145,219	26,139	11.9%	3,111	0.199055471
SUM	**988,429**	**207,570**		**15,627**	**1**

This weight is then applied to the coverage found in each district (covered cases/total cases) in order to allocate a relevant weight to each district.

Table 5 Calculation of weight according to MAM prevalence and MAM cases found for each district

	Total cases (C_{in}+R_{in}+C_{out} +R_{out})	Cases covered (C_{in} + R_{in})	Covered cases/total cases	Weight x covered cases/total cases
Abim	22	7	0.318181818	0.026775386
Amudat	62	31	0.5	0.060503458
Kaabong	136	43	0.316176471	0.064114588
Kotido	76	24	0.315789474	0.057268555
Moroto	66	32	0.484848485	0.046706582
Nakapiripirit	28	12	0.428571429	0.049423984
Napak	116	32	0.275862069	0.054911854
SUM	506	181		**35.97%**

The credibility interval must then be calculated using the formula below, where coverage =**35.97**% and total MAM cases = 506:

$$Lower\ and\ upper\ credibility\ intervals = coverage\ \mp 1.96\ x\ \sqrt{\frac{Coverage\ \times\ (1-coverage)}{Total\ MAM\ or\ SAM\ cases}}$$

Therefore, the coverage estimation for SFP can be estimated at **35.97% (CI 95%: 32.87% - 39.06%).**

In order to ensure that the coverage across the region was sufficiently uniform, a chi square test was performed and can be found in Annex 9.

[23] According to WHO Neo Natal and Child Health Profile Uganda (2013) the population of <59 months is 19%. Therefore we took an estimate of 18% for 6-59 months

[24] FSNA 2016

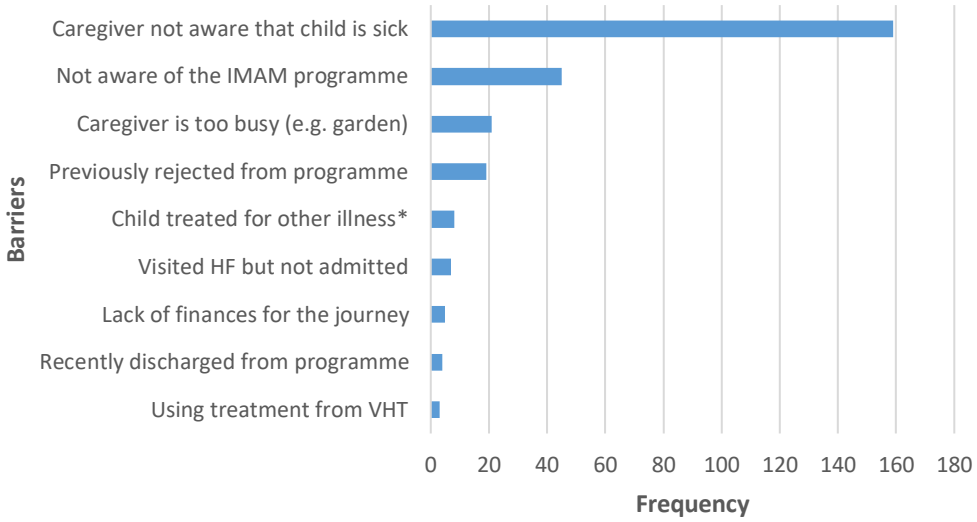
Qualitative information

During the SLEAC training, two questionnaires were designed by the assessment team; one for children who were enrolled (covered) in the IMAM programme (either OTC or SFP) and one for children who were not enrolled (uncovered). The majority of questions asked with open-ended in order to avoid leading the interviewee. Strong attempts were made to interview primary caregivers. However, other family members and neighbours were interviewed in the absence of the primary caregiver. From the questionnaires, qualitative information related to knowledge of the child's sickness, knowledge of the IMAM programme and factors affecting access to MAM treatment services was collected.

Primary barriers to access

In each case, a primary barrier to access was determined for each case using simple decision logic (see Annex 10). These barriers are presented in Figures 9 and 10, and give a clear indication of the top line reasons why individual MAM or SAM cases were not in the treatment programme.

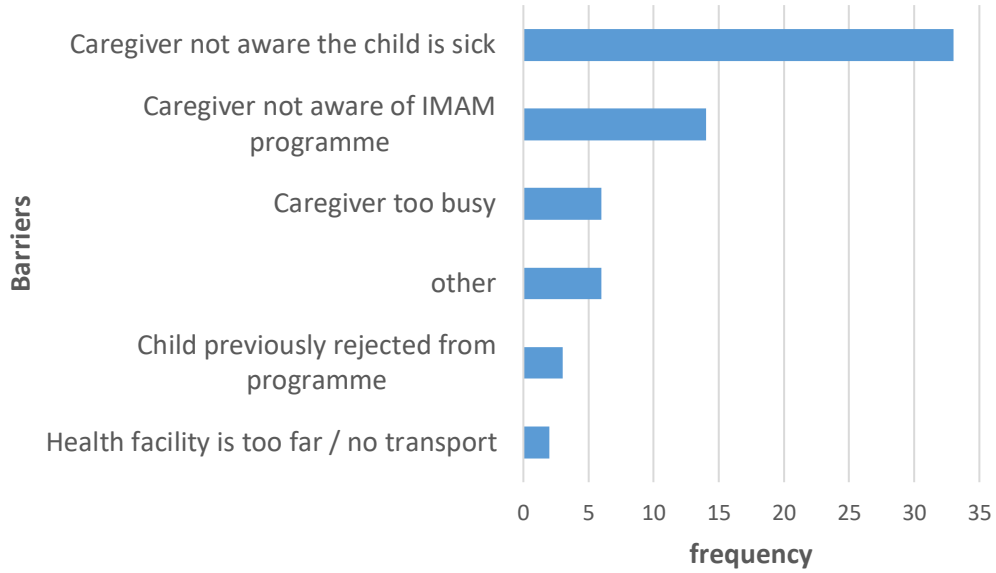
Figure 9 Primary barriers to access MAM treatment (n=271[25])



*In most cases, the child was taken to the health facility and treated for another illness, but not for MAM.

[25] This does not equal 310 uncovered MAM cases, as caregivers were not always available and/or the questionnaires were incomplete.

Figure 10 Primary barriers to access SAM treatment (n=64[26])



For both uncovered MAM and SAM, the primary barriers to programme access are the caregiver's lack of awareness that thechild is sick (MAM n=159 and SAM n=33) and the caregiver's lack of IMAM programme awareness (MAM n=45and SAM n=14). Other popular responses included being too busy to take the child to the health facility (MAM n=21and SAM n=6) and having previously been rejected from being admitted from the programme (MAM n=19and SAM n=3). For SAM, 'other' responses included having no one to accompany the caregiver and child to the health facility, no finances to pay for the health facility journey, rejection of another known child (for example, a neighbour's child), and the child being treated for another illness, such as malaria, at the health facility.

Additional information from uncovered cases

Table 6 presents the range of responses from uncovered questionnaire respondents for MAM children only. Of the uncovered MAM cases (n=310), over half (51%) were not aware that the child was sick and almost one third (30%) were not aware of the IMAM programme. Therefore we can confidently say that the biggest barrier to access relates to awareness of the child's condition and the treatment services available.

Only 6% of the respondents across the region cited distance as being an inhibiting factor for accessing treatment and an insignificant amount of respondents cited transportation as a reason for not accessing treatment. 10% mentioned the fact that they were too busy prevented them from accessing treatment. This was markedly higher in the districts of Moroto, Napak and Nakapiripirit where over 10% in each district cited being too busy as a barrier.

Table 6 Table showing responses relating to reasons for not being covered from uncovered MAM cases (n=310)

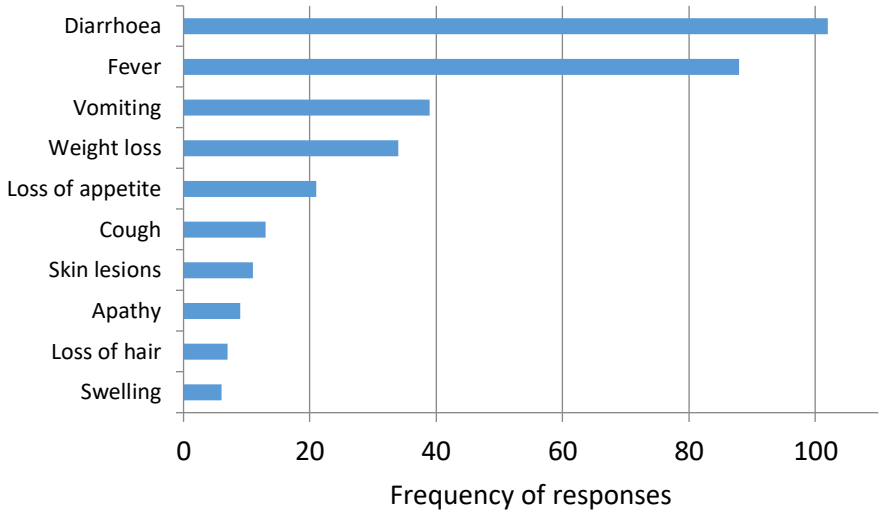
	Moroto	Napak	Nakapiripirit	Amudat	Kotido	Abim	Kaabong	Total KaramojaRegion
Coverage Classification	Mod	Low		High	Mod		Mod	

[26] idem

Total uncovered MAM cases	33	82	16	29	50	14	87	**310**
Caregiver does not realise the child is sick	39%	44%	25%	69%	42%	43%	68%	**51%**
Caregiver does not knows about IMAM programme	21%	43%	38%	21%	30%	7%	26%	**30%**
Reason for not bringing child to HF:								
Distance from the health facility - too far	3%	17%	0%	3%	0%	0%	2%	**6%**
No availability of transportation	0%	1%	0%	3%	0%	0%	2%	**1%**
No finances for the journey	0%	4%	6%	0%	0%	0%	1%	**2%**
Too busy to bring child to health facility	21%	13%	19%	3%	4%	7%	7%	**10%**
Previously rejected from IMAM programme	9%	1%	0%	0%	4%	0%	1%	**2%**

For the uncovered cases who recognised that the child was sick (49%), they were then asked what signs and symptoms they had identified to lead them to draw this conclusion. Respondents were allowed to cite multiple signs and symptoms. Figure 11 below presents the frequency that each sign or symptom was cited.

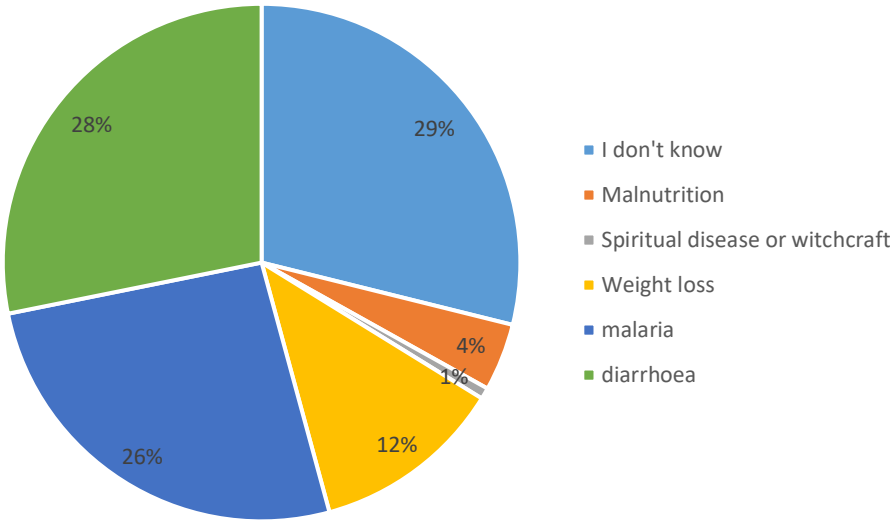
Figure 11 Frequency of responses for each sign and symptom given by caregivers who recognised their child was sick (n=152)



Symptoms directly related to malnutrition, weight loss and loss of appetite, were among the top responses, with diarrhoea (often a cause of malnutrition) being the most frequently cited reason. Fever, associated with various diseases, was the second most frequently cited symptom.

The same caregivers (49% of uncovered MAM cases) were then asked what the causes of those symptoms were. Figure 12 represents those responses.

Figure 12 Pie chart showing proportions of responses to what caused the signs and symptoms (n=152)



The majority of causes for the symptoms given were malaria and diarrhoea. Significantly, only 4% related the signs and symptoms as being caused by malnutrition. This provides further evidence that that a lack of awareness of malnutrition is one of the key reasons that children are not admitted into the programme.

Finally, the same caregivers (n=152) were also asked whether they had sought treatment, and what treatment, for their sick child. Table 7 shows that,across the region, four distinctive treatments were used instead of going to the health facility.

Table 7 Bar chart showing types of treatment used by caregivers of uncovered MAM children who knew their child was sick

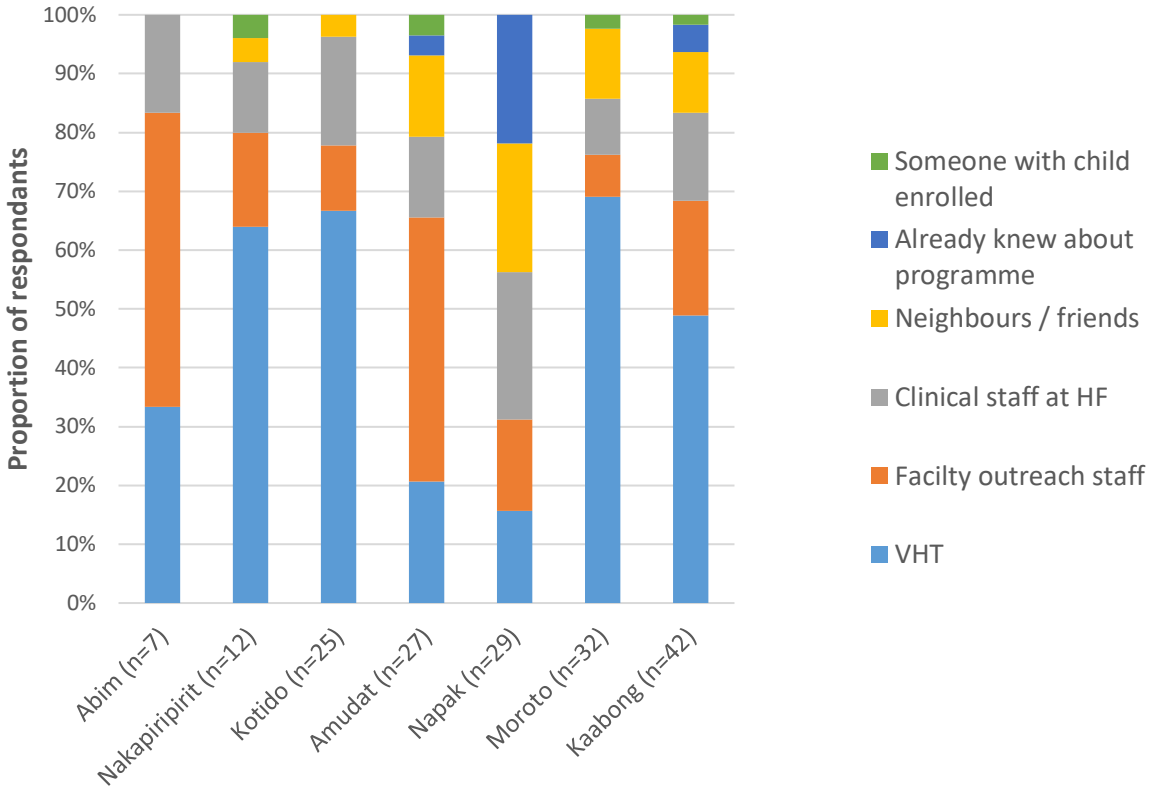
	Total KaramojaRegion (n=152)	
Medicinalherbs	10	7%
Enrichedmeals	7	5%
Medicinalproducts (frommarket)	7	5%
Medicinalproducts (frompharmacy)	29	20%

This data demonstrates that there are alternative health seeking pathways for sick children. The most significant being the use of the pharmacy. This presents a potential opportunity to admit more children if screening was able to taken at pharmacies when treatment is sought.

Information from covered cases

MAM cases that were covered by the programme (n=154) and recovering cases in the programme (n=27) were also interviewed. This allowed us to gain an understanding of how covered cases found out about the programme.

Figure 13 Bar chart showing source of information about programme for caregivers of covered cases (n=174[27])



In each district, either the village health team (VHT) or facility staff at distribution points (outreach) were the main SFP informers for covered cases. This is encouraging and indicates that increased VHT and outreach activity is likely to lead to higher coverage. It is also encouraging that facility staff are informing patients of the programme, which is resulting in admissions.

6. SQUEAC Assessment

The SQUEAC (semi-quantitative evaluation of access and coverage) methodology was employed in order to investigate factors effecting coverage in the selected district of Kaabong in more detail and to provide recommendations to improve coverage as well as rich body of evidence to underpin them.

The SQUEAC team consisted of three ACF staff, six participants nominated by MoH, one nutritionist from Community Action for Health (CAFH), one nutritionist from Cuamm and five enumerators. All five enumerators also participated in the SLEAC assessment and attended all training sessions. The SQUEAC took place in the period from 18 to 31 May 2016 (see Annex 1 for work plan).

Context: Kaabong focus

The SQUEAC conducted in Kaabong focuses on the SFP component of IMAM services. This component of IMAM treatment services is managed and implemented by CAFH who use CSB++ (Corn Soya Blend) for treating cases of MAM at distribution sites which operate every two weeks. There are around 3 to 4 sites per sub-county and most are based at a health facility, but some are hosted by primary schools. There are also very few that are held at outposts, which are set up only for SFP distribution days. A full list of distribution sites in Kaabong can be found in Annex 11.

Distribution days are conducted by government health workers with supervision and support from nutrition specialists from CAFH. At each distribution day children are screened by MUAC and enrolled if MUAC is found to be

[27] The sample does not equal n=181 (154+27) since some questionnaires were misplaced or damaged.

less than 12.5 cm. Caregivers of all MAM cases are then provided a sensitisation session and are given key messages before being provided with two packets of CSB++ (each providing enough treatment for one week).

Co-ordination between key stakeholders of IMAM components occurs at a monthly meeting organised by the District Health Office (DHO). At the time of the assessment, this meeting had not occurred for 6 months due to the impact of the national elections on time capacity for all parties.

Stage One: Analysis of quantitative and qualitative data

Quantitative data analysis was done on two different levels.

1. Analysis of monthly programme monitoring data
2. Analysis of SFP treatment cards of discharged patients and registers

Although HMIS (Health Monitoring Information System) has been introduced in Uganda, currently the SFP implementing partners have not started using it. Instead, implementing partners prepare monthly reports at facility level which are sent to WFP.

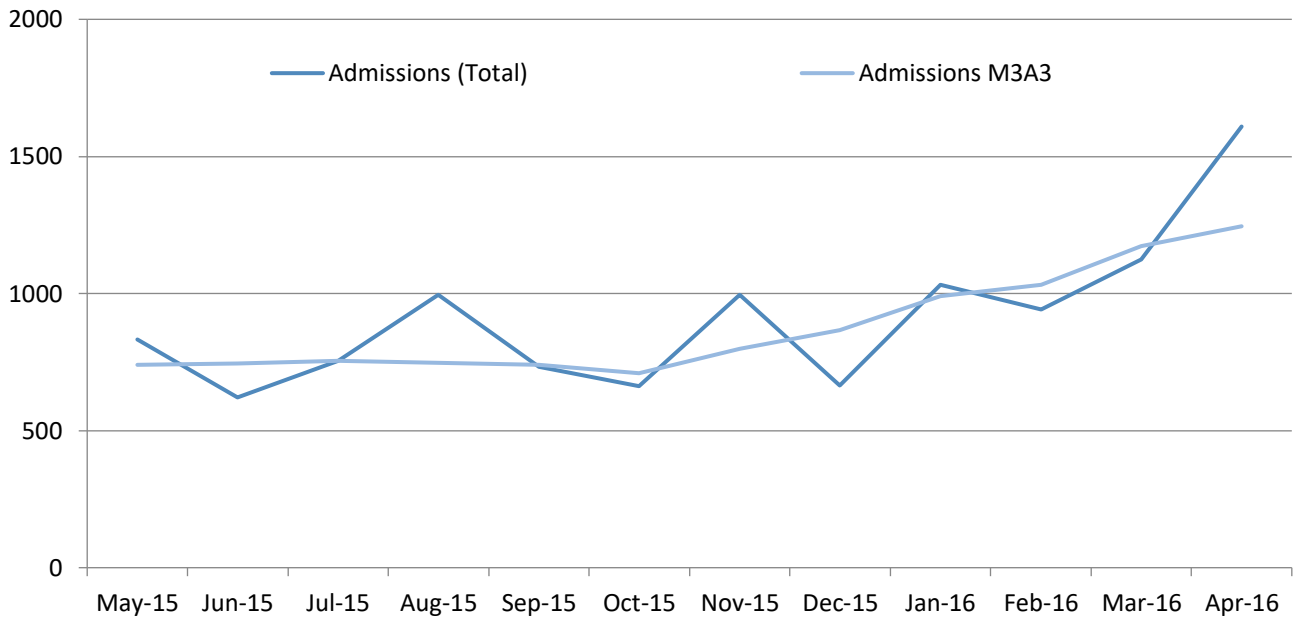
Routine programme data

Routine monthly admissions and discharge data at health facility level was difficult to obtain. Monthly data provided by WFP at first related to 'beneficiaries' (i.e. number of people seen at distribution days). Further data included monthly data with ages aggregated, and finally admissions and discharge outcomes for 6-59 months were provided as percentages. Once the team met with CAFH in Kaabong, these monthly records were made available however, these also included some inconsistent recording between months (e.g. aggregated between ages or not). To ensure accurate, reliable data for this analysis, a small group from the team visited CAFH offices and collected and recorded the number of monthly admissions and each clinical outcome for the last 12 months (April 2015 to May 2016).

Admissions

Admissions were plotted over time in order to identify seasonal trends and changes in admissions. A seasonal calendar was also developed from the knowledge of local residents, programme staff, consultation with local government departments and some desk research.

Figure 14 Admissions over time from CAFH monthly programme monitoring data (April 2015 to May 2016)



	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April
Disease (malaria, diarrhea, RTI)												

Crops/produce												
Staple food price	$$					$	$$	$$$	$$$	$$$	$$	$$
Food availability (BUT NO HARVEST 2015)												
Labour demand												
Rainfall (Rain / dry season)												

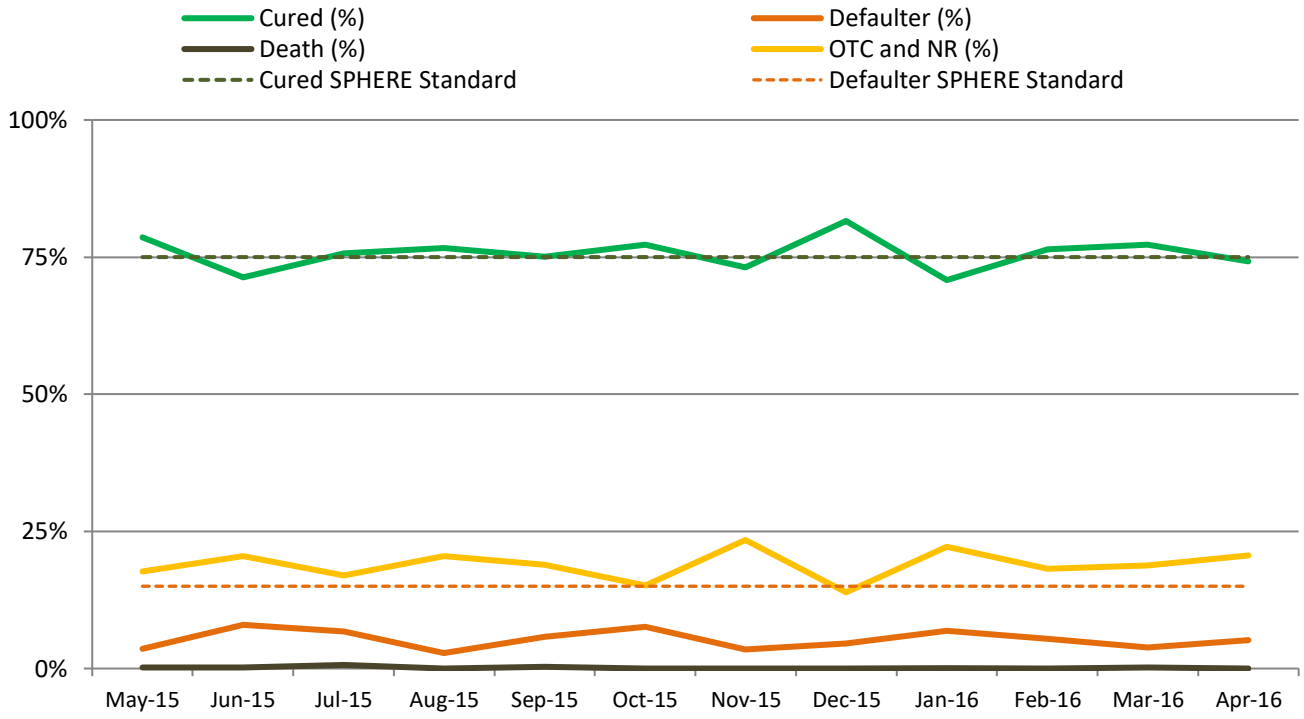
Figure 14 shows an increasing trend in admissions as food prices increase and with the onset of the dry season. In the year shown (April 2015-May 2016), there was also no harvest to boost food availability as would normally coincide with these negative factors for nutrition in the region. There also seems to be an uplift in admissions during periods, which corresponds to a period with high disease burden (i.e. March to May).

It is important to note that in 2015 the rainy season did not present with sufficient rain for agriculture and this negatively impacted the harvest period.

Discharge outcomes

Discharge outcomes for SFP (cure, default, death and non-response or transfer to OTC) were also plotted over time and in parallel with the seasonal calendar.

Figure 15 Clinical outcomes from CAFH monthly programme monitoring data



	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April
Disease (malaria, diarrhea, RTI)												
Crops/produce												
Staple food price	$$					$	$$	$$$	$$$	$$$	$$	$$
Food availability (BUT NO HARVEST 2015)												

Labour demand												
Rainfall (Rain / dry season)												

The clinical outcomes show no significant seasonal trends except for an indication of increased defaulting in May. This is when planting begins for the year's agricultural cycle and therefore it is likely that the increase in work load for caregivers means that they are no longer able to take their child for treatment. On the whole though the defaulter rate easily meets SPHERE standard of being well below 15%.

The outcomes of non-response and also transfer to OTC two outcomes were aggregated as both show low effectiveness of treatment. Disaggregation of the non-response and transfer to OTC shows that:

- Cases transferred to OTC are at a steady rate of between 4% and 5% of outcomes
- The rate of cases not responding is most closely (inversely) reflective of cure rates

Although no SPHERE standard exists for non-response rates, the IMAM guidelines for Uganda state the rate should be less than 10% for SFP treatment programmes. The rates for SFP in Kaabong (across all sites) showed non-response rates of between 10% and 19% over the year. This therefore far exceeds the target rate.

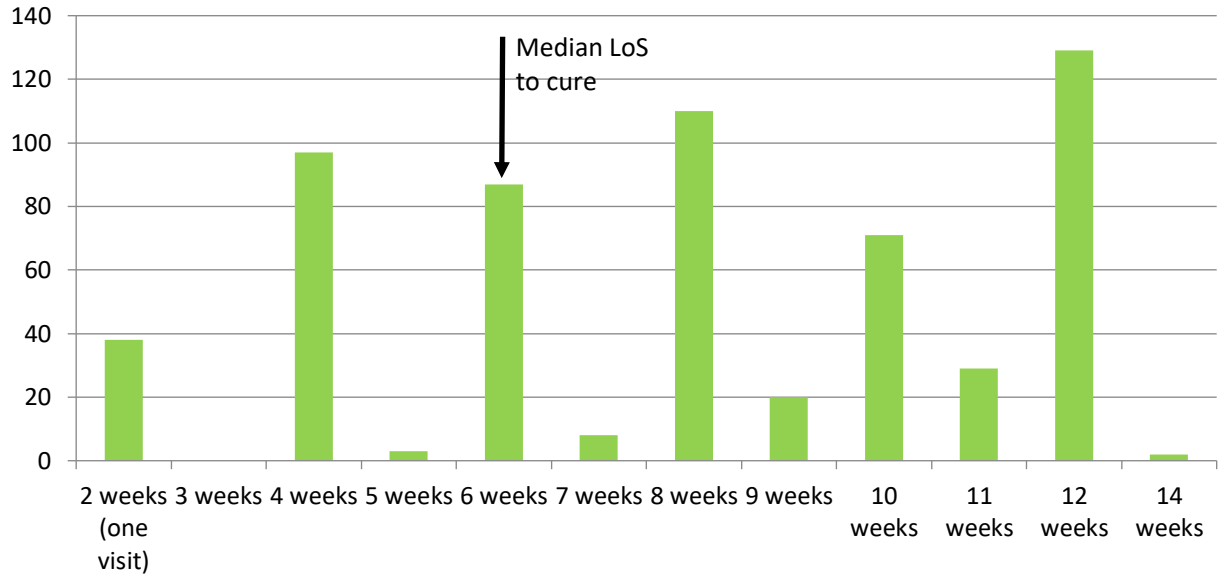
Treatment card and register analysis

Treatment cards and registers were collected from 10 out of 42 SFP sites in Kaabong and around 700 card or register entries were reviewed. This revealed that:

- Some registers were incomplete and many updated retrospectively
- Opportunities for data capture are lost where treatment cards are not comprehensively filled out. For example, where source of referral or relapse / return data fields were not completed (from a sample of cards cross-checked with registers)
- Admission and discharge records indicate incorrect or inconsistent protocol used across SFP sites where there were:
    - No admissions (or outcomes) recorded by WHZ indicating that children are not admitted by WHZ
    - Inconsistent use of MUAC measurements and target weightsfor discharge

Length of stay

Figure 16 Length of stay to cure from treatment card analysis (n=700)

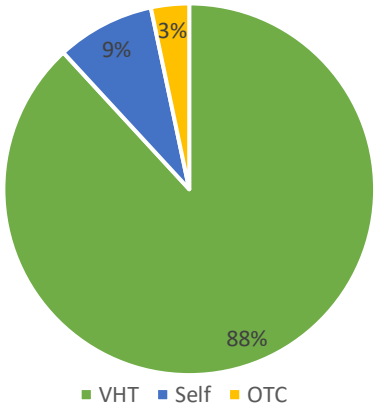


The records analysed from these ten supplementary feeding centres showed an average (median) length of stay in the SFP programme before cure is 6 weeks (around 42 days). However, as shown above, there are many cases with significantly longer length of stay. In particular, cure at 12 weeks is the most frequently observed period, which is the last distribution a case is eligible for before being discharged as non-responsive.

The data also shows most discharges on even weeks reflecting that the SFP programme only operates on one day every two weeks. It was confirmed by programme management staff that this includes admissions (i.e. that MAM cases can only be enrolled onto the programme every other Wednesday). The data showing discharges on other (odd) weeks was usually due to administration practices in registers (for example where in some places the first visit was only marked with a single tick and subsequent visits with two).

Origin of referrals

Figure 17 Origin of referral from treatment card analysis



The treatment cards allowed for the origin of referral to be determined. On one hand, it is encouraging that a significant proportion are coming from VHTs demonstrating that VHTs are functioning. But on the other hand the low proportion of self-referrals indicates that there is a low level of awareness of malnutrition and/or the programme that would lead to self-referrals.

Qualitative research and findings

Following the quantitative data review, the SQUEAC team embarked on collecting and analysing qualitative data. This took place over the course of three days and was conducted by eight supervisors and five enumerators. All participants were trained in qualitative data collection techniques, including group discussions and structured and semi-structure interviews.

During the training key informants were identified who were then targeted for interviews in the field. These included caregivers of malnourished children, women and men in the community, VHTs and other community figures such as, local council members and traditional healers.

A total of 8 villages and 6 health facilities were visited. These were purposively selected in order to ensure an even geographical spread and villages with a variety of characteristics (e.g. in both mountainous areas and on flat land). At health facilities mothers of children in the programme were interviewed, as well as health centre staff who both do and do not deal with MAM treatment.

The teams were given five different questionnaire guides, aimed at caregivers in programme, men/women in community, VHTs, health workers, traditional healers / birth attendants. The teams that visited the health facilities were given an additional interview guide for health staff.

The questionnaires were designed in order to collect various pieces of information, including the quality of the service provided, the knowledge of malnutrition and the programme, and other issues related to coverage. A variety of factors with both negative and positive effects on coverage were identified. They will be treated individually here, and then weighted in the section below *building the prior*.

Information for some factors was neither exclusively positive nor negative and have been included here as both negative and positive factors.

Both negative and positive factors	
Health seeking behaviour	Informants were questioned about what they do when they need advice on health matters. Health workers, VHTs, caregivers and women's groups all described that people in their community go to VHTs as a first point of contact. From the broader group of informants (including teachers, local council members and traditional healers) it was suggested that although people tend not to visit witchdoctors, many use traditional healers and methods such as herbs and cactus leaves and that some people do not like to visit health facilities because of their traditional beliefs.
Health worker support	The level of support provided to health workers at health facilities seemed to be varied. Many health workers said that their workload was too high and were expected to fill multiple roles. Some also reported that they felt alone in fulfilling the obligations of their role, but that they felt a social responsibility to provide services. The high workload was reiterated by the implementing partner, which presents this reason for not implementing a WHZ stage in the screening process. An observational study also revealed a high volume of visitors to facilities on distribution days. There were also varied reports of training provision with three health worker informants stating that they had received training within the year and two saying that they had never received training relating to IMAM. There were positive findings however relating to supervision from the implementing partners CAFH and some capacity management provided between nearby health facilities.
IMAM protocol	From the qualitative data, it seems that parts of protocol, such as delivering clear messages with treatment and joint decision making with the mother whether to enrol the child (i.e. the consultation parts) are being followed correctly, however there was also incorrect and inconsistent practice regarding the (non) use of WHZ, discharge criteria for cured cases (especially use of target weights) and lack of guidance relating to tracking and advising on repeating or chronic cases, or checking for double enrolment (at two different sites).

Positive factors	
Frequent sensitisation	This topic drew the largest number of comments in the qualitative data collection where a broad range of informants (including caregivers, health workers, local council members, traditional healers) described that programme sensitisation sessions occur every distribution day. Some described topics covered such as use of latrines, hygiene and food preparation demonstrations and some described this as the information point for the programme itself, targeted to mothers and PLWs. Many suggested that these sessions should be targeted to a broader group including older people and council members in particular and should include more educational content regarding malnutrition. The only other sources of information about the programme mentioned were VHTs and CAFH only. Informants suggested communication channels such as radio and town criers should also be used more as they are for other topics.
Good perception of programme	Mostly health worker or caregiver informants described how there was a positive perception of the programme stating that there was no stigma to being enrolled and a good relationship on the whole with those running the programme. Discussed

	mostly by caregivers, it was acknowledged that the condition of a malnourished child was noticeably improved when using the treatment provided and it was popular amongst people. In this regard some also suggested that the ration should be increased as it is not enough There was acknowledgement from both from both health staff and caregivers that waiting times are too long with high volume visitors but also with distribution days being too lengthy, having a negative effect on the perception of the programme.
Frequent screening at community level	Informants from the community (women, men, caregivers) and from programme staff (health workers, VHTs) all commented that MUAC measurements are being conducted regularly in the community and at health facilities on distribution days. During the qualitative research informants were familiar with the MUAC tape supporting this conclusion. Because it is not expected that children should be screened for malnutrition by WHZ or that they should have access to SFP non-distribution days, these were not mentioned.
Low defaulting	Informants supported the quantitative findings that very few people default from the SFP. This view was shared amongst men and women in the community as well as health workers and VHTs.
Good stock management	Reported by health workers and local council members, stock outs of treatment at facility level have happened in the past, but are now managed well through close monitoring and surge forecasting

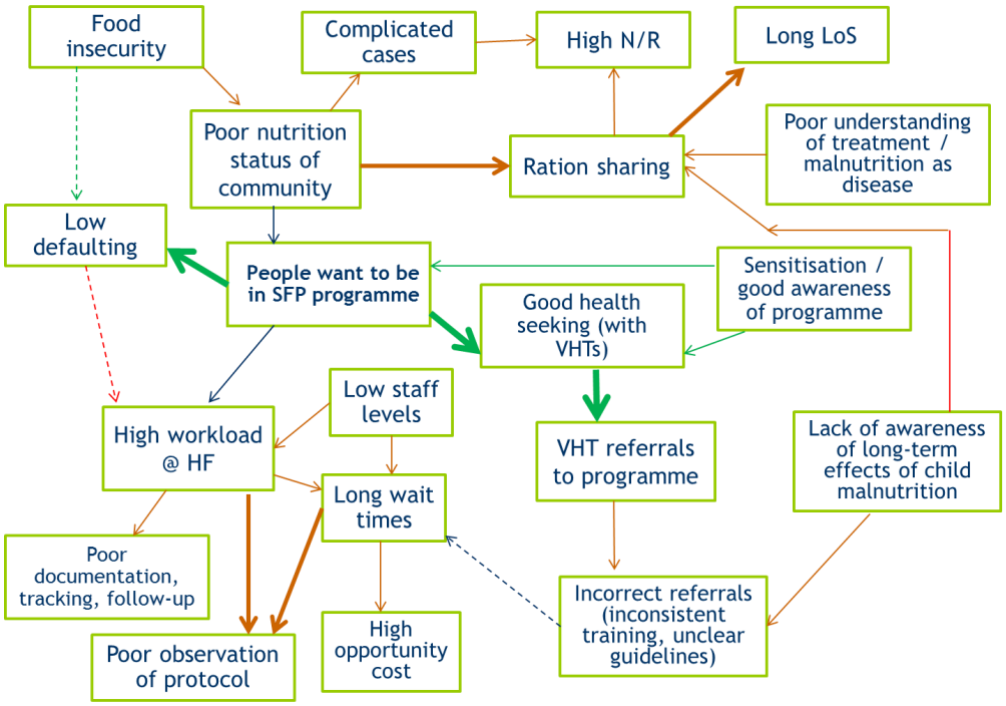
Negative factors	
Poor awareness of malnutrition	Amongst men and women in the community, caregivers of malnourished children mothers groups, DHO, local council members, health workers and VHTs, there was strong assertion about malnutrition relating to lack of food and general food insecurity, however other causes related to morbidity or poor hygiene were lesser known. Some were also able to able to identify signs and symptoms for malnutrition such as being thin and having a swollen belly, although this was mostly health workers and caregivers of children in the SFP. Most other informants (including more caregivers) identified signs and symptoms relating to malaria and other diseases rather than those related to malnutrition. Aside from those who described malnutrition is caused by lack of food, other causes such as, eating cold food, early pregnancy, breastmilk, and witchcraft were highlighted. This indicates that causes of malnutrition are not well known.
Poor VHT performance	Frequently discussed was this issue that VHTs are taking incorrect MUAC measurements and are referring cases incorrectly to the SFP. It was also suggested that there is pressure on VHTs due to power relations in the community and that VHTs are sometimes forced to refer as a favour. Many VHTs were also not clear about official protocol, or familiar with best practice for follow up, or data recording and reporting tools. These comments were made by health workers and VHTs but also caregivers and observation (where some VHTs were asked to measure MUAC for the team).
Low levels of VHT support	There were mixed reports about the level of training and tools provision from VHTs with several reporting that they had received none of this support. The process for appointing VHTs also seemed to be varied between different locations. With some selected in a collaborative manner between the health centre and the village leaders, and others selected solely by the village leader. VHTs meet regularly to coordinate with health facilities but felt that they had a high workload and were not paid enough for the amount of work they do (10k UGS per month). This view was shared by health workers.
Follow up of absent and defaulter cases	There are very few mechanisms in place to facilitate follow up of absent, defaulting or referred cases. Similarly, there is not currently any way to track a case from screening to cure (including relapses and chronic cases) should they fail to attend a

	scheduled distribution. Although some VHTs accompany cases of malnutrition to distribution sites (to ensure admission), when this does not happen there is no process for the SFP site to report back to the VHT or for the VHT to ensure they arrive. Similarly there is no transfer mechanisms between IMAM components to ensure cases arrive when they are transferred (e.g. between OTC and SFP). These issues were acknowledged also by the implementing partners, local council members and VHTs.
Co-ordination and collaboration	Co-ordination amongst key nutrition stakeholder is weak. Although monthly meetings are intended, these often do not happen or are poorly attended. This results in inconsistent approaches across the IMAM components. For example, Cuamm and CAFH have different understanding of when to transfer cases between the OTC and SFP components, which results in cases cured at OTC are referred to SFP but are not then enrolled because they are no longer eligible for admission. The lack of collaboration is also evident in dealing with human resources such as VHTs and health workers where implementing partners sometimes take action with MoH / DHO but independently of eachother.
Ration sharing	A range of informants from the implementing partner, health workers, caregivers and the survey team reported the rations provided to treat cases of MAM are shared amongst the household as common practice. This is perhaps unsurprising given the way in which families eat (in a shared pot), the way the CSB must be prepared (in a pot) and the general food insecurity in the region.
Physical access	Some areas do have issues with physical access to health facilities, for example where scattered villages are located in mountains with bad, or no, roads. This was raised by people within the community only (traditional healers and birth attendants, local council members and VHTs) and is isolated to those places with physical access issues.
Opportunity costs	Mothers and health workers reported that mothers are sometimes too busy with garden work to visit health facilities, and sometimes to look after their children. The quantitative data showed an increase in defaulting during the planning season for example. Although not a major issue, this should be considered in sensitisation messaging.
Insecurity	In Kamion, Timu and Loyoro health workers and traditional healers said that insecurity prevents people from accessing health facilities. This insecurity exists because of neighbouring tribes undertaking cattleraids which were common until recently. The thread of being court up in violence has been known to discourage caregivers from attending distribution sites.

Concept Map

The following concept map was developed with the SQUEAC team. This map serves to illustrate the factors that have a negative (red arrows) and positive (red arrows) effect on coverage. The participatory process of developing the map allowed the team to reflect on the relevant weight for each barrier and booster.

Figure 18 Concept map showing the relationship between factors effecting coverage



Stage Two: Hypothesis testing

Stage 2 is aimed at investigating ideas on coverage by forming and testing hypotheses related to particular issues. Based on evidence from Stage 1, the team believed that there were three important factors impacting programme coverage. For each, further investigation was undertaken to support or reject these hypotheses.

Hypothesis 1: Health centres with systematic screening, community sensitisation and constant enrolment ensure good coverage in their catchment area

Rationale - Stage 1 revealed that the SFP programme distributes CSB++ on assigned days every two weeks. At most sites this is the only time that a child can be enrolled onto the programme, and the only time that screening takes place at the site. Similarly, regarding sensitisation sessions, which were generally well regarded by those consulted in Stage 1, it was clear that these sessions are only conducted over the course of distribution days every two weeks, and therefore target only those caregivers of malnourished children already enrolled in the SFP programme. These practices limit the outreach of the programme and sensitisation activities to those who are successfully referred and enrolled.

Methods – a small area survey was conducted in catchment areas of two health facilities with different screening and sensitisation practices, as follows:

General practice at health facility	Timu health facility	Kapedo health facility
Systematic screening	✓	×
Enrolment on non-distribution days	✓	×
Community level sensitisation	✓	×

Systematic screening here means that all children visiting the health facility are screened for malnutrition as part of their health assessment and regardless of their reason for visiting.

Enrolment on non-distribution days means that cases which present at the health facility on any other day than the bi-weekly distribution day are enrolled onto the programme rather than being asked to return on the distribution day, which is common practice across most of the district.

Community level sensitisation means that sensitisation sessions, whether they are about the IMAM programme or education sessions about malnutrition, are conducted at village level with communities rather than being conducted only at the distributions.

Of the health facilties visited in Stage 1, Timu was the only one found to be operating positively in these aspects. And it was a combination of these three factors that was seen to contribute too much better coverage.

2 villages within each catchment area were then purposively selected for case-finding. In each village an exhaustive search of SAM and MAM children was conducted using a door-to-door sampling method. Children were screened for both MUAC and weight-for-height. When a MAM/SAM child was found a structured interview was conducted with the caregiver. The questionnaire for the caregivers of cases focused on awareness and attendance at any sensitisation or education sessions (see Annex 12).

Results

The cases found were as follows:

Location	Number of villages	Covered	Uncovered	Total
Timu catchment area	2	6	4	10
Kapedo catchment area	2	0	10	10

Of the 20 cases found, 4 were SAM cases and 16 MAM.

The results were analysed using simplified-LQAS (lot-quality assurance sampling) whereby a decision rule for each sample is calculated. The SPHERE standard for coverage of rural IMAM programmes of 50% was used as the threshold to determine acceptable coverage.

To determine the decision rule for this hypothesis, the following formula was used:

$$d = \left\lfloor n * \frac{p}{100} \right\rfloor$$

where*d* = decision rule, *n* = number of cases found, *p* = coverage standard defined

Table 8 Table of results for Small Area Survey to investigate effect of screening and sensitisation practices on coverage

	Positive screening and sensitisation activities (Timu catchment)	Limited screening and sensitisation activities (Kapedo catchment)
Total cases (n)	10	10
Decision rule (d)	5	5
Covered cases	6	0
Coverage conclusion	Higher than decision rule therefore acceptable coverage	Lower than decision rule therefore not acceptable coverage
Conclusion for hypothesis	Supporting	Supporting

Since the area with all positive screening and sensitisation activities reached the decision rule, and those without did not reach the decision rule, this hypothesis is strongly supported.

Responses to the questionnaire applied revealed further notable information as follows:

- Of the 4 uncovered cases found in the Timu catchment area, 3 were recently discharged from the SFP programme. Indicating a high relapse rate or early discharge.
- The other uncovered case in the Timu catchment area was the only caregiver who said that they had not attended any health education sessions. The others (of 3 uncovered and 6 covered cases all had attended health education sessions). This suggests that there is some correlation with attendance of health sessions and admission into treatment.
- Across both groups (20 cases), all but one caregiver said that they knew their child is malnourished, however, only seven said that they knew the child was sick showing that the others did not recognise malnutrition as an illness. Some also added that the child was not sick only hungry. This further adds to the conclusion that knowledge of malnutrition is not always complete.
- All cases across both areas knew their VHT and said that they did MUAC screening in their village. This further adds to the conclusion that VHT activity (in terms of screening) is generally strong.
- Five covered or recently discharged cases (out of 9) said that they share the ration provided between all children and some even with the rest of the family or with neighbours.

Conclusion – The results and analysis show that more positive screening and sensitisation activities, such as systematic screening at health facilities, enrolment of cases between distribution days and community / village level sensitisation sessions result in higher coverage.

The additional information from the questionnaires also indicate that the sensitisation sessions that do happen are not effective in teaching people about malnutrition as an illness, however they do seem to sensitise on the availability of treatment.

Hypothesis 2: The work load of mothers prevents them from attending treatment days and therefore has a negative effect on coverage

Rationale - From the qualitative data in Stage 1, and supported by initial regional findings during the SLEAC, it was suggested that caregivers of malnourished children do not have time to go to the distribution points every two weeks to receive CSB++ for their child, and this was a cause for coverage failure. This seemed to be supported during the fieldwork for the assessments when many caregivers of malnourished children were not available for interview and had left children in the care of their siblings or elderly relatives. It was thought that this would have an impact on coverage as it would be an obstacle to mothers taking their child to be enrolled.

Methods – To investigate this hypothesis further a small study involving semi-structured interviews and focus group discussions were conducted in three villages. These villages were chosen to ensure some level of geographical representation. Mothers were asked about their daily activities, what kind of work they are doing and what help is available to them and who from when they are busy.

The methods and sampling are summarised as follows:

Table 9 Methods for qualitative study to investigate impact of mother's workload on coverage

Sub-county	SSI	FDG
Sidok	3	0
Lodiko	2	1 (6 mothers)
Kapedo	2	1 (14 mothers)

SSI = semi-structured interview
FDG = focus group discussion

Results

Results from the three sub-counties were similar, revealing that mothers do experience high workloads which make them busy throughout each day. Daily activities include fetching water, preparing porridge or other food, gardening and foraging for wild vegetables and collecting firewood. Some economic activities were also mentioned such as charcoal burning and brewing.

When asked about what help is available, there was some variation in responses where some mothers said that men (husbands) help with heavy work such as digging and gardening. Others said that they did not get help and prefer to complete their own workload themselves.

When asked about how this affects their attendance at the IMAM programme or visits to the health facility, the responses across all three areas were aligned and are summarised as follows:

1. Workloads are high, but it is seen as normal and **distribution days are prioritized over other work**
   Sidok (3 x SSI), Lodiko (1 x FGD), Kapedo (1 x FGD, 1 x SSI)

2. Although there are often other people to help, **mothers are the only caregivers allowed to receive SFP**
   Sidok (3 x SSI), Lodiko (1 x SSI), Kapedo (1 x FGD, 2 x SSI)

3. Preference for being on the program: Some mothers are **envious of mothers with children in the programme**, especially where there are protective rations because they have to work less hard to find food
   Sidok (1 x SSI), Lodiko (1 x FGD)

Only one mother (in Sidok) suggested that she might ever be too busy to be able to visit the health facility for a distribution.

It was also advised during this part of data collection that only mothers are able to receive treatment at the distribution days and that other family members (even fathers) are likely to be refused. Programme staff advised that this was the case in some sites in an effort to improve controls on distribution of CSB++ and avoid double distributions.

Conclusion – Although it is clear that mothers have a heavy work load, it cannot be said that this prevents them from attending the treatment days. Therefore these results would seem to oppose the hypothesis that the high workload of mothers has any impact on coverage of the SFP and the hypothesis should therefore be rejected.

Building the prior

As a step toward obtaining an overall coverage estimate for Kaabong district, a prior belief of coverage, based on the evidence from Stage 1 and 2, was developed. For this purpose, factors that affect coverage in a positive (boosters) and a negative (barriers) way were drawn out of the prior analysis and are listed in Table 4.

A statistical representation of what the team believed the coverage was most likely to be was developed through three different methods. First, through adding simple weighting to each factor second, through the weighting of positive and negative factors effecting coverage according to their relative importance and third through developing a histogram prior with the SQUEAC team. An average of the prior produced by these different methods was then used.

Simple weighting of barriers and boosters

In this case each factor was given a weighting of 5 (see Table 4). This is a simple method that ensures only the number of factors that influence prior mode, not the relative importance of the factors. The mode is then calculated using the sum of the simple weights. In this case five was chosen as the value for each factor.

100% - the sum of negative factors = 100 – 40 = 60

and

0% + the sum of the positive factors = 0 + 40 = 40

Therefore, the mode calculated from the simple weighting is:

$$\frac{60\% + 40\%}{2}$$

$$= \underline{50\%}$$

Table 10 List of positive and negative factors used to inform prior belief on coverage with triangulation

	Triangulation		Weighting			Triangulation		Weighting	
Positive Factors (Boosters)	**Sources**	**Methods**	**Simple**	**Weighted**	**Negative Factors (Barriers)**	**Sources**	**Methods**	**Simple**	**Weighted**
Willingness to be enrolled on the program and to prioritise attendance on distribution days leads to low default and absences	A, B, C, D, F, H, M	1, 2, 3, 4, 5, 7	5	5	Household food insecurity causes ration sharing leading to poor effectiveness (long LoS / high non-response, relapses, poor health status, complicated cases)	A, B, C, D, E, F, H, I, M	1, 2, 3, 4, 6	5	5
Use of community communication channels (e.g. MCGs) for sensitisation about distribution days leads to good awareness of the programme	B, C, D, F	1, 4, 5, 9	5	5	Revised IMAM guideline dissemination and training delayed resulting in incorrect and inconsistent use of protocol	C, H, I	1, 2, 3, 4, 6, 8	5	5
VHT activities (screening & referral) lead to good awareness of the program	A, B, C, D, E, F, H, M	3, 4, 9	5	4.5	High workload and low staffing levels at distribution sites (with lack of clarity on guidelines) causes WHZ to be omitted as admission criteria	C, H, I	1, 2, 3, 4, 6, 9	5	4.5
Good geographical coverage of distribution sites	C, H, I	1, 4, 9	5	4	Poor use of monitoring tools for follow up between facility and community (VHTs) and poor case management	C, D, F	1, 4	5	4
Provision of technical supervision and nutrition advisory by implementing partner (e.g. for distribution and sensitisation sessions)	A, C, H, I	1, 4, 5	5	4	Low level of clinical understanding of child malnutrition as an illness with treatment in the community	A, B, D, F, G, M	4, 5, 9	5	4
Good supply management of CSB++ at facility level	C, H	4	5	3	Childcare is often done by child siblings, grandparents etc leading to poor childcare practices and lack of healthcare action	A, B, C, D, F, H, K	1, 4, 5, 6, 7, 9	5	4
Systematic MUAC screening at contact points in health facilities leads to increased referrals from within health system	I	4	5	3	Inaccurate MUAC measurements and incorrect referrals by VHT cause disappointment to caregivers	A, B, C, D, H	2, 4	5	3
					Weak collaboration / co-ordination between key nutrition stakeholders involved in IMAM programming leading to gaps, duplications and inconsistencies between IMAM components (e.g. transfers, VHT activities, mutual technical practice)	H, I, M	1, 4	5	3
Totals			**35**	**28.5**				**40**	**32.5**

Table 11 Triangulation legend for positive and negative factors effecting coverage

	Source		Methodology
A	Caregivers of malnourished children	**1**	SWOT Analysis
B	Women in the community	**2**	Programme Monitoring Data Analysis
C	Health workers	**3**	Treatment Card Analysis
D	Village Health Teams	**4**	Semi-Structured Interview
E	Men in the community	**5**	Focus Group Discussions
F	Local Council Members (LC1, 2)	**6**	Observational Study
G	Teachers	**7**	Small Study (Stage 2)
H	Programme staff (CAFH)	**8**	Small Area Survey (Stage 2)
I	Programme staff (CUAMM)	**9**	SLEAC Data Analysis
J	Mothers groups		
K	Traditional healers		
L	Traditional birth attendants		
M	District Health Officer		

Weighted barriers and boosters

In this case a score between 1 (low importance) and 5 (high importance) was given to each factor, depending on how significant the factor was as an influencer of coverage. This score reflected the evidence presented in Stage 1. Each team member considered the strength of evidence (the more sources, the more methods, the higher frequency) in support of that factor andproposed a weighting from 0 to 5. In most cases there was consensus about the weighting and where there was not, the team came to consensus through discussion. How the finding was triangulated is also presented in Table 4, with the triangulation legend in Table 5.

100% - the sum of negative factors = 100 – 32.5 = 67.5

and

0% + the sum of the positive factors = 0 + 28.5 = 28.5

Therefore, the mode calculated from the simple weighting is:

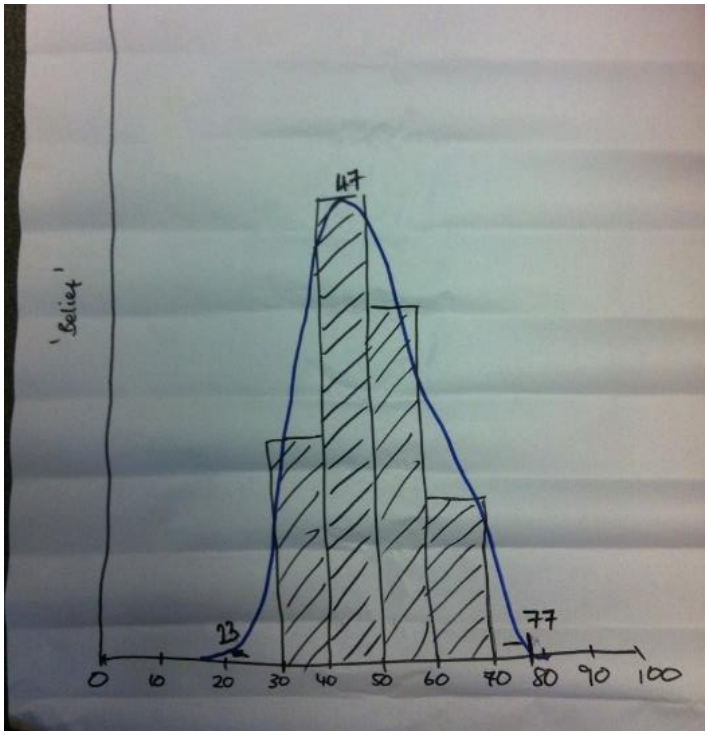
$$\frac{67.5\% + 28.5\%}{2}$$

$$= \underline{48\%}$$

Histogram

As a third method for considering a prior belief of an overall coverage estimate, the team worked together to construct a histogram representing the relative level of belief held for programme coverage being within each 10% category.

Figure 19 Photograph of histogram of belief developed for building prior mode



Here the mode is seen to be <u>47%</u> and the minimum and maximum values were noted to be 23% (minimum) and 77% (maximum).

Bayes prior

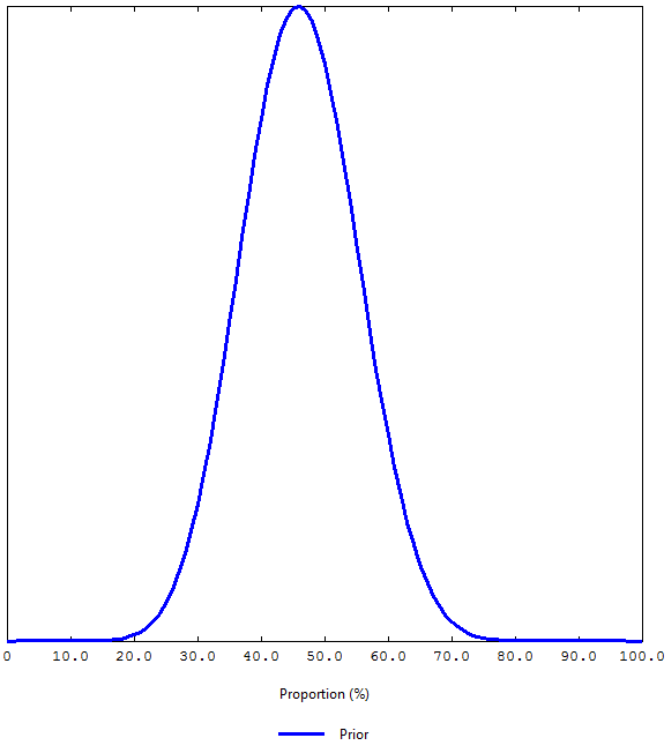
The prior mode was calculated by taking the mean of the three modes

$$Prior\ mode = \frac{50\% + 48\% + 47.5\%}{3}$$

= **48.5%**

With a prior mode of 48.5% and the maximum and minimum values above, shape parameters were calculated and used with the Bayes SQUEAC calculator to make our estimation of coverage based on our prior information. This is represented by the following curve.

Figure 20 Representation of the prior probability



Stage Three: Coverage Estimation

In order to produce a posterior coverage estimate from conjugate analysis, which combines the prior and *likelihood*, the SLEAC data for Kaabong was used. A wide area survey, which would usually be used to develop the likelihood, uses the same methodology as the SLEAC, and therefore achieves both a random, exhaustive and spatially representative sample. This is achieved by using the same formula to decide the number of villages required for the sample size, followed by selecting villages using stratified systematic random sampling , using door-to-door case finding at each village to find all cases of malnourished children and then establishing whether they are enrolled in the SFP or not.

The difference between the methods relates to the sample size required. For Stage 3 of the SQUEAC, the Bayes SQUEAC calculator is used to decide the required sample size for the conjugate analysis to be reliable. In this case, the sample size required is 60 (with 10% precision). Using the single coverage calculator (see SLEAC results above), the SLEAC assessment in Kaabong district found 136 MAM cases (including recovering cases enrolled in the SFP and estimated recovering cases not enrolled). This therefore allows for an even more precise estimation of coverage.

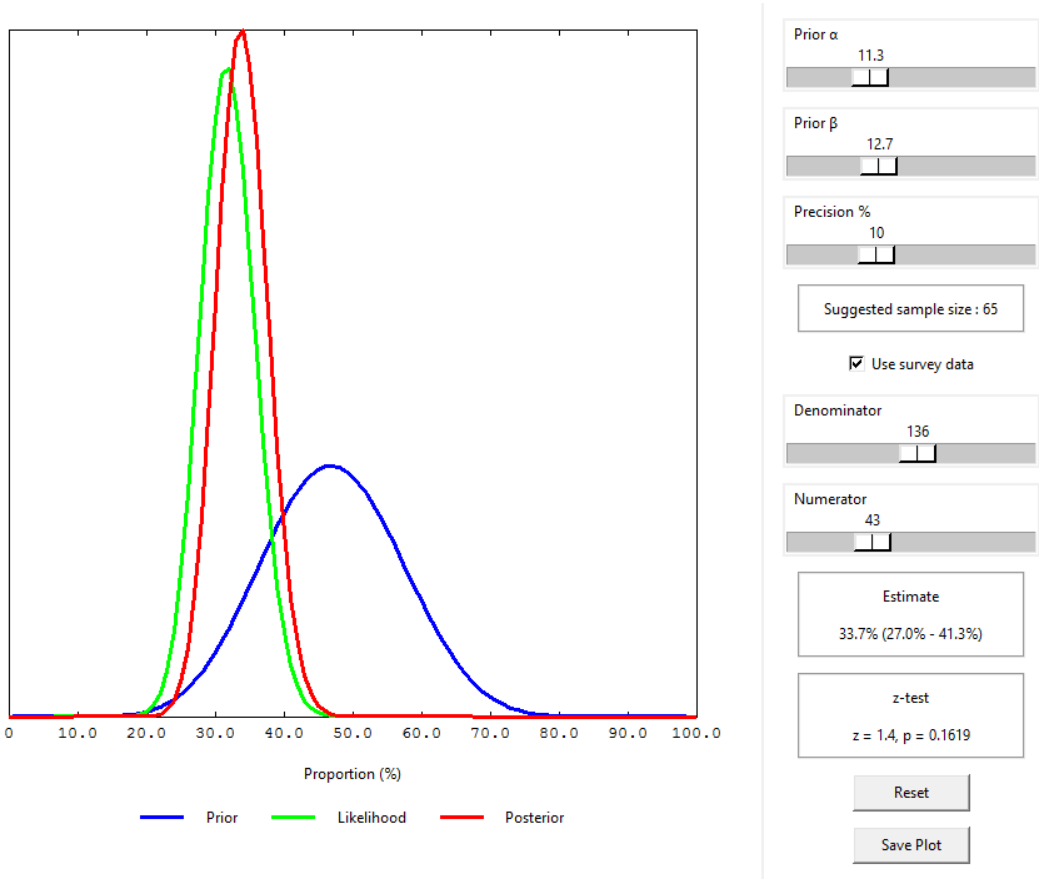
The single coverage estimation was calculated as:

33.7% [*CI* 95%: 27.0% - 41.3%]

The estimation is below SPHERE standard for rural IMAM programmes (50%) and therefore represents justification for programme reform.

The BayesSQUEAC calculator presents the following posterior curve (red), based on the prior (blue) and the likelihood (green) information through Bayesian conjugate analysis.

Figure 21 Conjugate analysis with coverage estimation for SFP in Kaabong



The conjugate analysis does not present significant conflict between the prior and the likelihood (refer to p value, which is not <0.05). As the green curve is taller than the blue curve the likelihood evidence (SLEAC data) is stronger than the one produced by the prior. Since the posterior curve is narrower than the prior, the conjugate analysis has increased the reliability of the estimate and as the curves overlap in range they are in accordance.

The fact that the prior includes a significant area to the right of the other curves shows that the prior developed an over-estimate of coverage. This likely down to the fact that the assessment team did not adequately consider the fact that they programmes are not attempting to admit weight-for-height children and the effect this has on overall coverage.

Implementing partners justify excluding this practice from programming since there is said not to be resources for implementation of weight and height measurements at distribution sites. Furthermore, although the requirement for WHZ screening and admissions is clear in the revised version of the national IMAM guidelines, this document and complimentary information and updates have not yet been disseminated to key stakeholders. Therefore, the implementing partners do not consider exclusion of WHZ as an important factor affecting coverage. However, of the 136 cases found in Kaabong, 39 were MAM cases by WHZ only, showing that the omission of these cases does have a significant impact on coverage.

7. Conclusions

A regional single coverage estimation for SFP of **35.97% (CI 95%: 32.87% - 39.06%)**and a coverage estimation for SFP in Kaabong of **33.7**%**(CI 95%: 27.0% - 41.3**%**)** are both below SPHERE standards for rural IMAM treatment programmes (50%) and therefore represent justification for programme reform and improvement.

- The low number of SAM cases found meant that we could not measure coverage of the OTC programme. However the two districts (Kaabong and Napak) where we were able to classify coverage indicate coverage is low.
- The classifications of MAM treatment coverage in the seven districts were high (Amudat), moderate (Moroto, Kotido and Kaabong) and low (Napak). We are unable to reliably classify the districts of Abim and Nakapiripirit however the cases found suggest a moderate coverage for both districts.

- The main barriers to access across the region were found to be related to awareness, whether that be awareness that the child is sick, awareness that the illness is malnutrition or awareness of the IMAM services.
- Another factor that has negative effect on coverage is the lack of weight-for-height used. The number of WHZ only MAM cases found highlights how many acutely malnourished children are not being enrolled due to WHZ not being implemented
- The importance of this is not clear to health workers or implementing partners for IMAM components because they have not received clear instruction or training from Ministry of Health since the revised national IMAM guidelines have not been disseminated
- One of the main reasons for covered cases being admitted is screening by outreach post staff or VHTs. This is encouraging as it indicates that VHTs/staff are causing admissions however the lack of self-referrals indicates a lack of awareness of malnutrition and the services to refer themselves.
- Communities are using VHTs extensively, however, there is a question over the level of support provided to them and therefore their ability to accurately and effectively screen and refer cases to be enrolled on the SFP
- Mothers and communities are not educated about malnutrition as a health concern with long term consequences and medical treatment. Therefore, mothers are very keen for their child to be eligible for enrolment and there are generally very low levels of defaulting. However, the tendency share rations (due to general household food insecurity and a lack of understanding that malnutrition is a disease that needs to be treated) also has an impact on the effectiveness of the treatment.
- High non response rates also indicate that the treatment is often not effective. This could be down to high levels of sharing however could also be due to other underlying factors such as high morbidity, poor hygiene and poor quality of drinking water – which would not be addressed through a supplementary feeding programme alone. The nutrition causal analysis currently underway will shed some light on this.
- Low staffing and frequency of distribution days creates a high burden for health workers in implementation of SFP on those days. Consequently, there is not capacity for following best practice, for example conducting WHZ measurements for screening and enrolment, completing records and registers comprehensively, delivering education sessions and optimising use of sensitisation materials. Existing communication methods would provide an opportunity to promote this. It should also be considered that commodity such as RUSF which can be delivered in daily ready-to-use rations would allow enrolment on any day so that cases can be treated between their first and second visit to a health facility.

8. Recommendations

The following recommendations were developed initially with the assessment team and are based on the findings from the assessments. Preliminary recommendations were then shared during the dissemination workshop in Moroto and further developed based on feedback from stakeholders.

	Recommendation	Findings	Actions	Responsible people	Level of priority
1	**Disseminate revised IMAM guidelines and train all health centre staff and partners' staff in new protocol**	- Lack of awareness of new protocol and guidelines amongst actors - Inconsistent and incorrect use of IMAM protocol - Enrolment by MUAC only and no use of weight-for-height - Discharge by target weight used (old guidelines) - Lack of training on guidelines - Lack of follow-up or support on protocol	- Begin consultation process for clear and consistent dissemination of use of protocol and plausibility of full implementation	MoH	High
			- Develop and implement training plan for health workers on revised IMAM guidelines	MoH, UNICEF, WFP	High
			- Implement regular supervision and mentorship for following up on adherence and practice	MoH, UNICEF, WFP, IPs	High
			- Disseminate printed and electronic copies of revised IMAM guidelines to all stakeholders with clear advice for technical queries	MoH	High
2	**Improve conditions of health staff working on SFP distribution days**	- High workload and low staffing levels at distribution sites -	- Review staffing levels at health facilities using current recommended guidance and recruit accordingly	MoH	Medium
			- Identify active, effective VHTs and lead mothers for supporting SFP distribution days, for example in conducting systematic screening	MoH, IPs	High
3	**Improve performance of VHT system**	- No mechanism for follow up on referrals, absences or defaulters - No up to date information available on the current active VHTs - VHTs conducting activities without training - Inaccurate MUAC measurements and therefore referrals	- Ensure information on active VHTs is kept up to date and compile up-to-date list of villages with active VHTs	MoH, IPs	High
			- Plan and implement periodic training plan for VHTs on MUAC measurement and how to use reporting tools (e.g. screening recording and referrals slips)	MoH, IPs, VHTs	High
			- Introduce regular monitoring and on-the-job coaching and supervision of health workers and VHTs	IPs, VHTs	Medium
4	**Improve and expand sensitisation and community engagement, to increase understanding**	- Low level of understanding that MAM or SAM children are sick - Low level of understanding of child malnutrition as an illness with treatment	- Expand sensitisation sessions at village level to caregivers not in the programme and engage a wider variety of actors (grandparents, fathers etc.)	IPs	Medium

	of malnutrition and treatment and therefore uptake and effectiveness	- Sensitisation tends to only cover enrolled carers - Childcare is often done by child siblings, grandparents etc. leading to poor childcare practices and lack of healthcare action - Household food insecurity causes ration sharing, long length of stay / high non-response, increase chance of relapses, chronic malnutrition, poor health status / vulnerability, high complicated cases - Previous rejections from health centres discouraging caregivers from going again - Some alternative health seeking pathways	-	Encourage involvement of men in childcare	All	Medium
			-	Strengthen nutrition education at all health centres including developing IEC materials, visual aids and conducting sensitisation sessions	All	High
			-	Investigate including nutrition education in Functional Adult Literacy and Alternative Basic Education for the Karamoja education programmes	MoH, IPs	Medium
7	**Increase screening points**	- Pharmacy used for searching for treatment - Lack of engagement from community leaders in treatment	-	Identify and train key community figures in screening and referral. These could include village leaders, alternative health practitioners and grand parents	MoH, IPs	Medium
			-	Identify pharmacies and market traders of medicinal products to train and equip with MUAC tapes	MoH, IPs	Medium
8	**Improve monitoring and nutrition information management from health centre to national level**	- Poor use of monitoring tools (for follow up and tracking) between facility and community (VHTs) - Poor management and use of programme monitoring data	-	Review and agree best practice amongst stakeholder partners of IMAM components and select on a package of appropriate tools	MoH, IPs	Medium
			-	Consultation with each VHT and health worker involved in IMAM to ensure sufficient supply and familiarisation	MoH, IPs	High
			-	Identify relevant human resource for conducting monitoring and evaluation on a regular basis which can be reviewed and considered at stakeholder meetings and shared with interested parties	All	Medium

10. Annexes

Annex 1 SLEAC-SQUEAC Work plan (April 11th- June 30th)

Activity	Week											
	1	2	3	4	5	6	7	8	9	10	11	12
SLEAC workshop												
SLEAC training												
SLEAC data collection - Moroto												
SLEAC data collection - Napak												
SLEAC data collection - Nakapiripirit			`									
SLEAC data collection - Amudat												
SLEAC data collection - Abim												
SLEAC data collection - Kotido												
SLEAC data collection - Kaabong												
SLEAC debrief - Moroto												
SQUEAC training - Kaabong												
SQUEAC data collection - Kaabong												
SQUEAC workshop - Moroto												
SQUEAC workshop - Kampala												
Reporting												

The assessment began and ended in Moroto. A final workshops was conducted in Moroto on 2 June and a final Stakeholder Debrief was conducted in Kampala on 6 June.

Annex 2 SLEAC assessment participant list

No	Name	Position	Sex
1	Martha Wahu Kega	Nutritionist - ACF	F
2	Ondoga Simon*	Nutritionist - MoH	M
3	KiryaIzizinga Perez*	Nutritionist - MoH	M
4	NagawaMaragret*	Nutritionist - MoH	F
5	Sempingga Ivan*	Social Scientist - MoH	M
6	Lunkuse Gertrude*	Counsellor - MoH	F
7	Wanyama Lillian*	Social Scientist - MoH	F
8	Namuswa Charity	Clinician - MoH	F
9	Owomuhendo Rebecca	Planner - MoH	F
10	Atim Beatrice*	Enumerator	F
11	Kodet Leonard*	Enumerator	M
12	LokwangHadija*	Enumerator	F
13	Ochan Isaac Newton Bahaati*	Enumerator	M
14	Luke Logiro*	Enumerator	M
15	Okure Alfred	Enumerator	M
16	Odoki Eric	Enumerator	M
17	Akot Rose Mary	Enumerator	F
18	Aleper Solomon	Enumerator	M
19	Akidi Jennifer**	Enumerator	F

*Participants who participated in both SLEAC and SQUEAC assessments

** Participant who only participated in SLEAC for 2 weeks

Annex 3 List of sampled villages for SLEAC assessment

District	Subcounty	Parish	Village
ABIM	ABIM	AREMBWOLA	AREMBWOLA EAST
ABIM	ABIM	ATUNGA	OCEK ABUK
ABIM	ABIM TC	KALAKALA	AYWEE WEST
ABIM	ABIM TC	KIRU	OBANGANGEO EAST
ABIM	ABIM TC	AGWATA	ENTEBBE
ABIM	ABIM TC	WIAWER	ABIM WEST
ABIM	ALEREK	Mobile	KULODWONG
ABIM	ALEREK	WILELA	WILELA CENTRAL
ABIM	ALEREK	LOYOROIT	OLEM WEST
ABIM	LOTUKE	ARIDAI Mobile	BAR- KALAM
ABIM	LOTUKE	AWACH	PEMKWORO
ABIM	LOTUKE	BARLYECH	BARLYECH VILLAGE
ABIM	LOTUKE	GOTAPWOU	MAMKAI
ABIM	LOTUKE	OPOROTH	BAR-OTUKEI VILLAGE
ABIM	LOTUKE	ORWAMUGE	LOKETO EAST
ABIM	MORULEM	ANGOLEBWAL	OMORU WEST
ABIM	MORULEM	AREMO	AREMO CENTRAL
ABIM	MORULEM	KATABOK WEST	RACHKOKO NORTH
ABIM	NYAKWAE	OPOPONGO	OKWANGALUK
ABIM	NYAKWAE	ORETA	GEREGERE SOUTH
ABIM	NYAKWAE	PUPU KAMUYA	**OTHU-THUA**
MOROTO	Tapac	KATIKEKILE	NAKONYEN
MOROTO	Tapac	NAKWANGA	NAUT
MOROTO	KatikeKile	Kakingol	NAMEJA
MOROTO	KatikeKile	Narengenya	KAABONG
MOROTO	Nadunget	Loputuk	APETAOI
MOROTO	Nadunget	Lotirir	NANGORIKIPI
MOROTO	Nadunget	NAITAKWAE	NABOKAT
MOROTO	Nadunget	PUPU	NAOI
MOROTO	Nadunget	Musopo	NATURUMURUM
MOROTO	Nadunget	Boma south	SENIOR QUARTERS
Napak	Iriiri	Tepeth	Nakayot
Napak	Iriiri	Tepeth	Alakas Camp
Napak	Lokopo	Longalom	Lotede
Napak	Lokopo	Apeitolim	Naparot
Napak	Lokopo	Lorikitae	Lojojore
Napak	Lokopo	Apeitolim Reset.	Lokwasinyon
Napak	Lokopo	Apeitolim Reset.	Nakou-Elob
Napak	Lopeei	Lopeei	Lorunget
Napak	Lotome	Kalokengel West	Naitakwae
Napak	Matany	Lokuwas	Matanywest
Napak	Matany	Morulinga	Nathinyonoit
Napak	Matany	Morulinga	Lokongo
Napak	Matany	Lokupoi	Nakoelelei

Napak	Ngoleriet	Narengemoru	Ajokomaliteny
Nakapiripirit	Kakomongole	Tokora	Lodoketangitom
Nakapiripirit	Lolachat	Sakale	Nangamiit
Nakapiripirit	Loregae	Nakaale	Namorupus
Nakapiripirit	Moruita	Katabok	Nakoo
Nakapiripirit	Namalu	Kokuwaum	Arurumacholui
Nakapiripirit	Namalu	Kokuwam	Nakoriasat
Amudat	Amudat	Towncouncil	Amudat
Amudat	Amudat	Towncouncil	Apamuto
Amudat	Amudat	Towncouncil	Cheporoyo
Amudat	Amudat	Towncouncil	Kamukon
Amudat	Amudat	Towncouncil	Kreswo
Amudat	Amudat	Towncouncil	Lokodi
Amudat	Amudat	Towncouncil	Naremit
Amudat	Amudat	Towncouncil	Ngongosowon
Amudat		Katabok	Katopoten
Amudat		Katabok	Kapetawol
Amudat		Katabok	LokwangaSunut
Amudat		Dingdinga	Abusian
Amudat		Dingdinga	**Apopongio**
Amudat		Dingdinga	Cheptoron
Amudat		Dingdinga	Kodiaka
Amudat		Lokales	Lokales A
Amudat		Abiliyep	Abiliyep
Amudat		Abiliyep	Murut
Amudat		loroo	Lowan
Amudat		Achorichor	Iwakai
Amudat		Achorichor	Babatian
Amudat		Abiliyep	Namaniaka
Amudat		Karita	Chepinyniny
Amudat		Losidok	Dokodikais
Amudat		Losidok	Kanarion
Amudat			Karita
Amudat		Losidok	Kompas
Amudat		Karita	Lopoloin
Amudat		Losidok	Natira
KOTIDO	KACHERI	KACHERI	KAGOLE WEST
KOTIDO	KACHERI	LOSAKUCHA	NATIR
KOTIDO	KOTIDO	LOSILANG	NARIWO
KOTIDO	KOTIDO TC	KOTIDO WEST WARD	GOVERNMENT QUARTERS
KOTIDO	NAKAPELIMORU	WATAKAU	LOMUKURA
KOTIDO	PANYANGARA	LOLETIO	NAPUTIR
KOTIDO	RENGEN	KOTYANG	LOMINIT
KOTIDO	**RENGEN**	**NAKWAKWA**	**KANALOBAE**
KAABONG	Kaabong T/C	Campswailiward	Campswaili East
KAABONG	Kaabong T/C	Pajar Ward	Lobulio
KAABONG	Lodiko	Kotome	Komiska
KAABONG	Kathile	Kathile	Lopelpel

KAABONG	Kathile	Nachukul	Kapelimong
KAABONG	Kathile	Narube	Usake
KAABONG	**Kapedo**	**Kapedo**	**Kanyikwar**
KAABONG	**Kapedo**	**Kumet**	**Lorengechora**
KAABONG	Kapedo	Sangar	Nangolemoru
KAABONG	Sidok	Kasimeri	Karichor
KAABONG	Sidok	Morunyang	Moruengatuny
KAABONG	Kalapata	Kachemuchem	Moruita
KAABONG	Kalapata	Kaloboki	Kacharik
KAABONG	Kalapata	Lotim	Lorengechora
KAABONG	Kalapata	Moroto	Kangalita
KAABONG	Kawalakol	Kokoro	Nagolopak
KAABONG	Kawalakol	Naoyagum	Naapong
KAABONG	Lolelia	Lolelia	Lolelia Centre
KAABONG	Kaabong East	Kalongor	Morunyao
KAABONG	Kaabong East	Morulem	Morulem
KAABONG	Lobalangit	Pire	Pire
KAABONG	Kamion	Lokwakaramoe	Lotinyam
KAABONG	Kamion	Timu	Timu Forest Reserve
KAABONG	Napore (Karenga)	Loyoro	Geremech
KAABONG	Kaabong West	Kaabong	Kangisute
KAABONG	Kaabong West	Lokerui	Karimojong
KAABONG	Loyoro	Lokanayona	Ligot

District:	Name:	MUAC:
Village:	Age:	Weight:
Programme OTC or SFP	Sex:	Height / Length:
Team:	Person interviewed:	Z-score: SAM or MAM
Date:		Oedema (+, ++, +++):

Annex 4 Questionnaire for covered cases

1. How many times has your child been enrolled in this programme?	
☐ This is the first time. Go to Q3	Number of times:

2. Where do you go for treatment and how frequently?	
Name of HF / Outreach:	Number of times: per

3. Why has your child returned to the programme?	
☐ i. Child discontinued and returned	Why?
☐ ii. Child was cured and relapsed	Why?

4. Do you have other children enrolled in the IMAM programme?		
☐ Yes	How many?	☐ No

5. Who gave you information about the IMAM programme and that your child could be enrolled?		
☐ i. VHT	☐ ii. Clinical staff at HF	☐ iii. Staff at outreach centre
☐ iv. Neighbours / friends	☐ v. Someone else with a child enrolled	☐ vi. Village doctor
☐ vii. Already knew about the programme	☐ viii. Other	

6. Why did you decide to enrol your child in the IMAM programme?	
☐ i. Recognised the disease	☐ ii. Diagnosed by health staff
☐ iii. Traditional treatment failed	☐ iv. Referred by traditional healer
☐ v. The clinic is nearby. Distance:	☐ vi. Accessible (no seasonal barriers)
☐ vii. Transport readily available	☐ viii. Free service
☐ ix. Programme respected by community	☐ x. Availability of RUTF / CSB++
☐ xi. Known a child who was cured	☐ xii. Efficiency of treatment
☐ xiii. Encouraged by others. Who?	

☐ xiv. Other:

***Please note that the original questionnaires included an additional section at the bottom for comments**

District:	Name:	MUAC:
Village:	Age:	Weight:
Programme OTC or SFP	Sex:	Height / Length:
Team:	Person interviewed:	Z-score: SAM or MAM
Date:		Oedema (+, ++, +++):

Annex 5 Questionnaire for non-covered case

7. Do you think your child is sick?	
☐ Yes	☐ No (to directly to Q2)

1. a) What signs / symptoms is your child suffering from?		
☐ iii. Vomiting	☐ iv. Fever	☐ v. Diarrhoea
☐ vi. Weight loss	☐ vii. Loss of appetite	☐ viii. Apathy
☐ ix. Swelling	☐ x. Loss of hair	☐ xi. Skin Lesion
☐ Other		

1. b) What illness has caused these signs / symptoms?		
☐ i. I don't know	☐ ii. Malnutrition	☐ iii. Spiritual disease / witchcraft
☐ iv. Weight loss	☐ v. Malaria	☐ vi. Diarrhoea
☐ Other:		

1. c) How have you tried to treat this illness?		
☐ ix. Medicinal herbs/roots	☐ x. Enriched meals	☐ xi. Fasting
☐ xii. Medicinal products (from the market)	☐ xiii. Medicinal products (from the pharmacy)	☐ xiv. Prayer
☐ xv. Consultation with a traditional healer	☐ xvi. Visit to HF (what happened?)	
☐ xvii. No treatment	☐ Other	

1. d) Who makes the decision about the choice of treatment?

2. Do you know that there is a service at the health facility dedicated to the treatment of malnutrition?	
☐ Yes, What details?	☐ No

3. (Only ask this question if the carer knows the child is sick) **Why didn't you bring your child to the health facility?**	
☐ xv. Too far? Distance:	☐ xvi. Insecurity
☐ xvii. Inaccessibility (seasonal flooding etc)	☐ xviii. No availability of transportation
☐ xix. No availability of company for the journey	☐ xx. No finances for the journey
☐ xxi. Husband / family refusal	☐ xxii. No finances for the treatment
☐ xxiii. Carer ill	☐ xxiv. Family member ill
☐ xxv. Too busy. Reason:	☐ xxvi. No one to look after other children
☐ xxvii. Ashamed to enrol in the programme	☐ xxviii. Don't think the programme will help the child
☐ xxix. Fear of hospital stay	☐ xxx. Preference for traditional medicine
☐ xxxi. Previous rejection. When?	☐ xxxii. Rejection of a known child
☐ xxxiii. Quantity of RUTF / CSB++ not worth the journey	☐ xxxiv. Other:

4. Has your child been enrolled in an IMAM programme before?	
☐ Yes	☐ No. (STOP)

4 a) Why isn't your child still enrolled in the programme?		
☐ i. Defaulted	When?	Why?
☐ ii. Discharged cured	When?	
☐ iii. Discharged not cured	When?	Why?
☐ iv. Other reason:		

Thank you. Referral. Information.

Any further team comments:

Annex 6 MAM classification error calculation

[to be inserted later]

Annex 7SAM classification error calculation

[to be inserted later]

Annex 8 Attempted calculation for SAM treatment coverage estimation

As with MAM treatment, the estimation needs to respond to the weights allocated to each district that relate to SAM population and the cases found during the survey. First a weight was calculated for each district based on the estimated SAM population in the surveyed areas (Table A) and second this weight was applied to the actual cases found for each district to allocate a relevant weight to each district when calculating the regional calculation (Table B).

Table A Calculation of weight allocation for each district according to SAM rate

	Total population	6-59 months population (18%)	SAM Rate (WHZ)[28]	Estimated Point SAM case load (N)	weight=N/∑N
Abim	109,039	22,898	3.0%	687	0.09049865
Amudat	111,758	21,234	1.4%	297	0.03916336
Kaabong	169,274	33,855	3.5%	1,185	0.15610183
Kotido	178,909	32,204	3.8%	1,224	0.16121595
Moroto	104,539	20,908	5.2%	1,087	0.14322914
Nakapiripirit	169,691	33,938	5.4%	1,833	0.24143614
Napak	145,219	29,044	4.4%	1,278	0.16835492
SUM	**988,429**	**194,080.43**		**7,591**	**1**

Table B Calculation of weight according to MAM prevalence and MAM cases found for each district

	Total cases (Cin+Rin+Cout+Rout)	Cases covered (Cin + Rin)	(Cin + Rin)/n	weight* Cin+Rin /n
Abim	3	0	0	0
Amudat	9	5	0.555555556	0.021757423
Kaabong	41	5	0.12195122	0.019036809
Kotido	12	6	0.5	0.080607974
Moroto	9	2	0.222222222	0.031828698
Nakapiripirit	5	3	0.6	0.144861682
Napak	37	6	0.162162162	0.027300798
SUM	116			**32.5%**

Finally the credibility interval was calculated using the same formula, where coverage = 32.5% and total SAM cases =116:

Therefore, the coverage estimation for OTP can be estimated at **32.5% (CI 95%: 29.53% - 35.47%).**

However the results did not pass the Chi squared test. The critical value for a survey area of 7 districts is 12.59. In order to pass the Chi squared test the Chi squared value must not exceed this number. As Table C shows the chi squared value is 14.27.

[28]FSNA 2015

Table C Chi squared test for SAM coverage estimation

	Sample size	Observed (Covered cases)	E	$(O-E)^2$	$(O-E)^2/E$
Abim	3	0	0.70	0.488	0.6983
Amudat	9	5	2.09	8.440	4.0290
Kaabong	41	5	9.54	20.640	2.1628
Kotido	12	6	2.79	10.284	3.6820
Moroto	9	2	2.09	0.009	0.0043
Nakapiripirit	5	3	1.16	3.372	2.8971
Napak	37	6	8.61	6.823	0.7922
SUM	116	27	27	**x^2 =**	**14.27**

Annex 9 Chi Squared test for MAM treatment

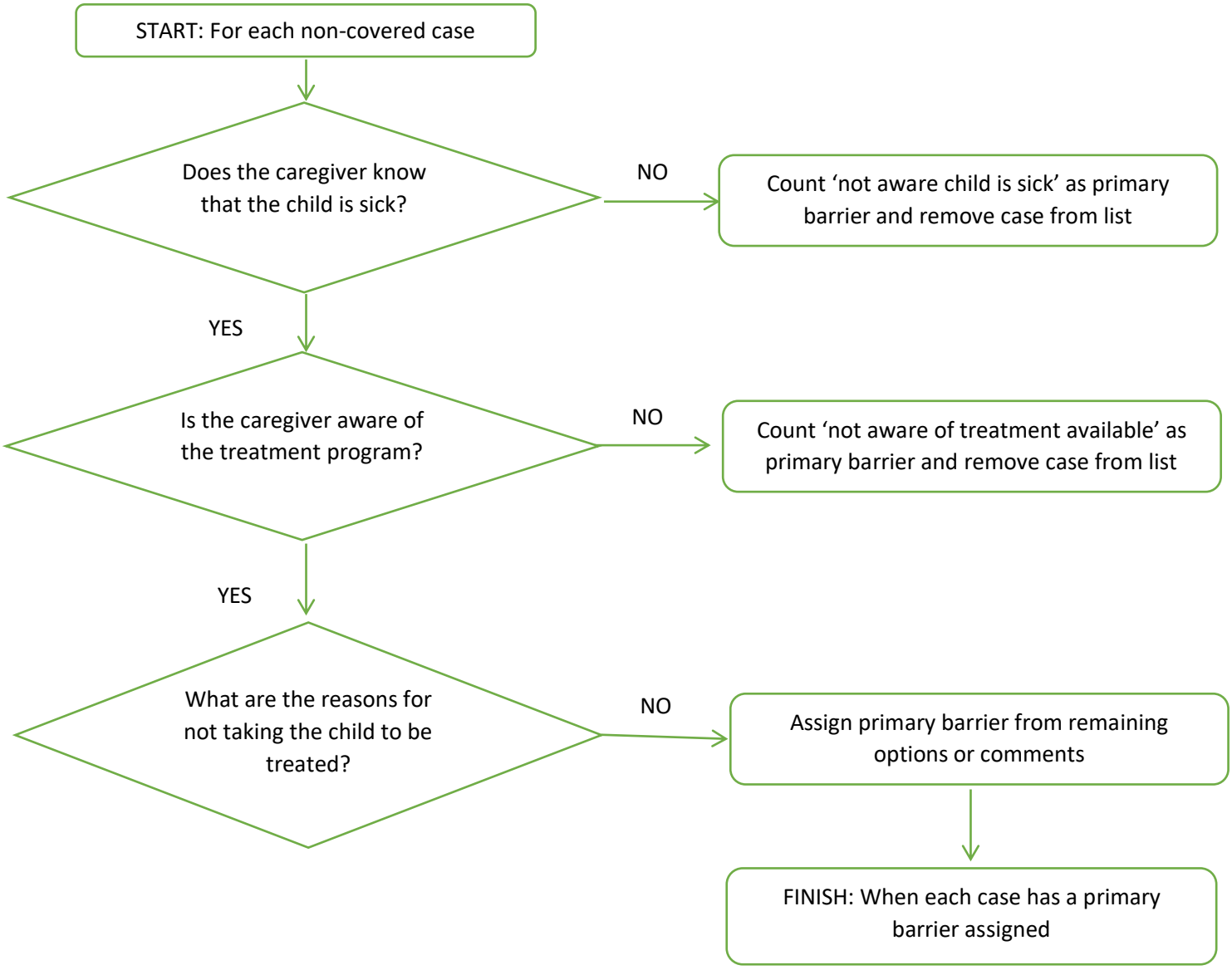
The Chi squared test was performed for both the SAM and the MAM treatment coverage estimations to ensure that coverage is sufficiently uniform across the region. The following table presents the calculations where O = observed data and E = expected data.

	Total sample (Rin+Rout+Cin+Cout)	O(Covered : Rin +Cin)	E	$(O-E)^2$	$(O-E)^2/E$
Abim	22	7	7.87	0.756	0.0961
Amudat	62	31	22.18	77.830	3.5094
Kaabong	136	43	48.65	31.902	0.6558
Kotido	76	24	27.19	10.149	0.3733
Moroto	66	32	23.61	70.414	2.9825
Nakapiripirit	28	12	10.02	3.937	0.3931
Napak	116	32	41.49	90.137	2.1723
SUM	506	181	181	**x^2 =**	**10.18**

The critical value for 7 survey areas is 12.59 and since the chi squared statistic is less than the critical value (9.68) coverage is not considered patchy and we can use the estimation as a fair representation of coverage in the region.

Annex 10 Logical analysis for derivation of primary barriers from uncovered questionnaires

The following diagram represents the hierarchy of barriers that prevent children from reaching admission to the MAM treatment program. This logic allows allocation of a single barrier to each case and is based on the flow of standard form non-covered questionnaires for coverage assessments.



Annex 11 List of distribution sites in Kaabong District

Kaabong	Kapedo	Kapedo HC III	106	Lokasangate
			107	St.Jude
			108	Kapedo HC III
			109	Kalimon HC III
	Kathile	Kathile HC III	110	Kathile HC III
			111	Kamacharikol P/S
			112	Narengepak HC II

			113	Nariamaoi P/S
	Lolelia	Lolelia HC II	114	Lomodoch HC II
			115	Kaimese HC II
	Kalapata	Kalapata HC III	116	Lotim HC II
			117	Kalapata HC III
			118	Morukori
	Kamion	Kamion HC II	119	Kamion HC II
			120	Usake SFC
			121	Lokwakaramoe HC II
			122	Timusfc
	Kaabong East	Lokolia HC III	123	Lokolia HC III
			124	Lodwar P/S
	Kaabong West	Lomeris HC II	125	Lomusian P/S
			126	Lomeris HC II
			127	Lokerui HC II
	KaabongTown Council	KaabongHospital	128	Kaabong mission
			129	Kaabonghospital
	Loyoro	Loyoro	130	Loyoro HC II
			131	Lokanayona HC II
	Sidok	Kopoth HC III	132	Lochom HC II
			133	Kakamar HC II
			134	Kopoth HC III
			135	Locherep
	Karenga	Karenga HC IV	136	Karenga HC1V
			137	Lokori HC
			138	Kalokudo
			139	Kidepo HC II
			140	Kakore P/S
	Lobalangit	Lobalangit HC II	141	Pire H/C
			142	Lobalangit HC II
			143	Sarachom P/S
			144	Kakwanga P/S
	Lodiko		145	Kotome P/S
	Kawalakol	Kocholo HC II	146	Kocholo HC II
			147	Kawakalol P/S

Annex 12 Questionnaire for small study on screening and sensitisation

At facility:

Name of facility **Location**

1) Do you do systematic screening? (what happens when a child is screened as MAM and it's not a distribution day)
2) Do you use WHZ? (If no, why not? If yes, do you enroll by WHZ and what criteria?)
3) What discharge criteria do you use?
4) Do you experience incorrect referrals from VHTs? How many?
5) Who attends the sensitization sessions? Are these held only on distribution days and at the SFC?

_ _ _

At village:

Screen for MAM children (by MUAC and WHZ) and ask **caregivers of uncovered cases:**

Village: **MUAC:**

Weight: **Height:** **Sex:**

1) Do you know that your child is sick?
2) Do you know your child is malnourished?
3) Do you know there is a program to treat this condition?
4) Have you ever attended any health education sessions about nutrition or child's malnutrition? (If yes, when and where?)
5) Do you have a VHT in the village? What activities do they do? Do they screen your child?

For covered children:

How did you come to enrol in the program?
Do you ever share the ration from this program?