

**CMAM for SAM and MAM
SQUEAC Assessment
South Sudan, April-May 2017**



Semi-Quantitative Evaluation of Access and Coverage

Gogrial West, Warrap, South Sudan

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ACRONYMS

CMAM	Community-based Management of Acute Malnutrition
CNV	Community Nutrition Volunteer
CNW	Community Nutrition Worker
IOM	International Organisation for Migration
LQAS	Lot Quality Assurance Sampling
MAM	Moderate Acute Malnutrition
MUAC	Mid Upper Arm Circumference
OTP	Outpatient Therapeutic Programme
PHCC	Primary Health Care Centre
PHCU	Primary Health Care Unit
RUSF	Ready to Use Supplementary Food
RUTF	Ready to Use Therapeutic Food
SAM	Severe Acute Malnutrition
SAS	Small Area Survey
SC	Stabilisation Centre
SMART	Standardized Monitoring & Assessment of Relief & Transitions
SQUEAC	Semi Quantitative Evaluation of Access and Coverage
TSFP	Therapeutic Supplementary Feeding Programme
UNICEF	United Nations International Children's Fund
WHO	World Health Organisation
WFP	World Food Programme
WVI	World Vision International

1. EXECUTIVE SUMMARY

In May 2017, a coverage assessment of services to treat both moderate (MAM) and severe (SAM) acute malnutrition was conducted in Gogrial West County, Warrap state in the Republic of South Sudan. The assessment used the SQUEAC (semi-quantitative evaluation of access and coverage) methodology and covered services delivered by Action Against Hunger and World Vision International.

The assessment identified a coverage estimation of **42.2%** [95% CI: 32.1% to 52.9%] for the outpatient therapeutic programme (OTP) to treat SAM and **33.7%** [95%CI: 26.9% to 41.2%] for the targeted supplementary feeding programme (TSFP) to treat MAM. These both fall below suggested minimum SPHERE standard of 50% coverage in rural areas.

The quantitative and qualitative data analysis revealed a **series of boosters and barriers to access giving us information on what was positively and negatively influencing coverage**. This series was similar across the two programmes, although differences recognised due to higher availability of OTP. Positive factors included good adherence to programme and treatment protocol at facilities and clear messaging at point of distribution to mothers. At community level, there was also found to be very high willingness to be enrolled in the programme and good word-of-mouth, particularly amongst mothers. In areas where community nutrition volunteers (CNVs) and outreach activities are implemented (found to be without approximately 3 hours of each distribution site), the understanding of malnutrition (signs and symptoms) was generally better than in other areas with less people holding misleading beliefs or feeling shameful about malnutrition. There was also found to be good awareness of the existence of the treatment programmes.

Factors that affect coverage negatively (or barriers) were found to be more numerous. Those that were found to have the greatest impact were related directly or indirectly to distance. Long distances between sites, and a scattered population, mean that many communities are more than 3 hours by foot from a health facility. This distance was found to be the farthest acceptable distance for caregivers to walk with children and in intense heat. Indirectly, this also affects the scope of outreach workers and CNVs where activities such as sensitisation, screening and referral were found to be implemented only within this radius and CNVs were not found to be supported well in extending activities. Rejection from enrolment was found to be an issue in communities. Although this was sometimes due to a child coming for a long distance and then found not to be eligible, more often this was due to lack of commodity at the health facility. Stock breaks were found to be regular for both SAM and MAM treatment supply, and there was no stock for MAM treatment at WVI sites at the time of the assessment.

At community level, it was found that the perception of health facilities generally, was that they were too far but also inadequate leading to preference for using traditional healers who are not sensitised or trained to screen or refer children to the OTP or TSFP. There are also still traditional beliefs about malnutrition and causes of disease held in many communities that lead to shame and non-disclosure about a child's signs and symptoms.

In collaboration with the assessment and management teams, **the following recommendations** were developed to address these barriers and build on the boosters:

- Improve supply management by avoiding administrative delays and improving forecasting of requirements
- Scale up of CMAM service provision in areas with poor availability, starting with providing OTP service at all TSFP sites (i.e. adding to all WVI TSFP sites)
- Increase geographical coverage of CNV network
- Strengthen support provision for CNVs
- Improve community mobilisation strategy with all key stakeholders
- Develop data management and utilisation
- Implement further ongoing monitoring and assessment

These were coupled with a series of suggested activities and the level of priority in an Action Plan. Action Against Hunger, World Vision International and the Ministry of Health should follow up on these recommended activities in order to improve access and coverage of SAM and MAM treatment services in Gogrial West County.

2. INTRODUCTION

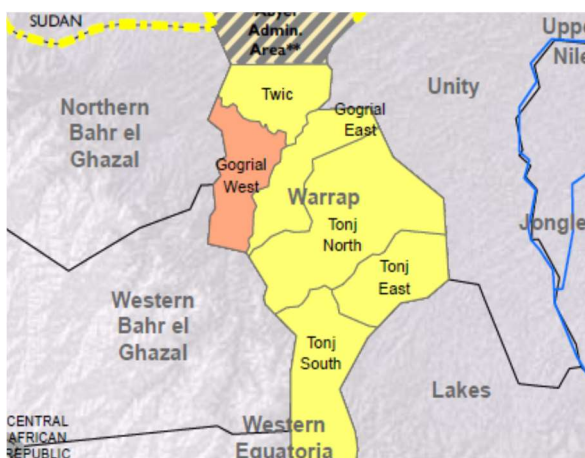
Gogrial West County is one of six counties in former Warrap State in the northern part of South Sudan with an estimated population of 366,170¹. The county is bordered by Gogrial East to the east, Twic County to the north, Aweil South to the north west, and Western Bahr el Ghazal to the south west. The population is predominantly of Dinka Bahr el Ghazal ethnic group who are traditionally agro-pastoralists, with most communities depending on subsistence crop farming for livelihood activity. The county consists of nine payams: Akon North, Akon South, Riau, Alek North, Alek West, Alek South, Gogrial, Kuac North and Kuac South, with the administrative capital at Kuajok in the southern part of the county. Each payam is further divided into 3 or 4 bomas, totalling 32 in the county.

Figure 1 - Map showing location of Warrap state, South Sudan



Action Against Hunger and World Vision International implement nutrition treatment services in Gogrial West County, Warrap State since 2007. The county has 23 sites for the Therapeutic Supplementary Feeding Programme (TSFP) for treatment of Moderate Acute Malnutrition (MAM); and 14 sites for Outpatient Therapeutic Programme (OTP) for treatment of Severe Acute Malnutrition (SAM). All except two sites are hosted at public Primary Health Care Centres (PHCC) or Primary Health Care Units (PHCU). There is also a hospital with a TSFP and OTP in Kuajok, and a stabilisation centre (SC) provided by Action Against Hunger in the town of Alek.

Figure 2 - Map showing location of Gogrial West County, Warrap²



The nutrition situation in the county is critical (GAM by WFH 32.5% (28.3 – 36.9 at 95% C.I.)). The GAM by MUAC was at 14.1% and SAM rate by MUAC of 3.0%³.

A SQUEAC assessment in 2013 was unable to estimate coverage, but provided information relating to boosters (positive influences) and barriers (negative influences) to access and coverage of nutrition services. The main barriers reported included poor screening coverage of Community Nutrition Volunteers (CNV), long distances between sites, lack of awareness of key community figures about malnutrition and services available. An overview of past recommendations is included in Section 15 (p.45)

3. OBJECTIVES

The overall objective of the SQUEAC evaluation in Gogrial West County was to strengthen routine programme monitoring with the following specific objectives.

1. To estimate OTP and TSFP coverage in the area.
2. To identify and rank the main barriers and boosters to access nutrition services.

¹ WHO Population by village, Boma, Payam and County mapping 2016

² IOM Village Assessment Survey, 2013

³ SMART survey, Action Against Hunger and World Vision International final report, Aug 2016

3. To develop in specific recommendations to improve acceptance and coverage of the program in collaboration with Ministry of Health (MoH), Action Against Hunger and other nutrition partners in the area.
4. To enhance competencies of Action Against Hunger nutrition technical team on SQUEAC methodology.

4. METHODOLOGY

A standard SQUEAC methodology was applied to determine the coverage in the county and to provide evidence-based recommendations to improve access and coverage. The assessment comprised of three stages:

Stage 1: An analysis of quantitative data, collection and analysis of qualitative information and the identification of negative and positive factors effecting coverage. During Stage 1 detailed qualitative information was collected to develop a community profile

Stage 2: Development and testing of hypotheses to confirm or deny assumptions related to areas of high or low coverage

Stage 3: Wide-area survey to determine county wide coverage estimate using Bayesian techniques

The study was undertaken through a 23 day period by a core team of five individuals from each nutrition partner (2 from Action Against Hunger, 2 from World Vision International and 1 from MoH) who participated in all aspects of the assessment.

In addition to the core team cited above, four enumerators were employed to assist with data collection activities. Six additional enumerators were employed for the period of the wide area survey and were trained on case-finding, MUAC measurement and applying questionnaires. Due to difficulties in finding appropriate female daily workers (as enumerators), Action Against Hunger in Alek allowed three female programme staff (usually involved in community activities) to participate in collection of qualitative data from communities. A full work-plan for the assessment, as well as a list of participants can be found in Annex 1.

Challenges and Limitations

Logistics and administration were well supported by the Action Against Hunger team at national and base level (in Alek) resulting in an effective implementation. However, the assessment was limited by availability of some key information:

- **Lack of maps and village level data.** The survey team were unable to source a map that includes comprehensively administrative borders, villages and health facilities in the county of Gogrial West. The village assessment survey conducted by IOM in 2013 includes the most detailed mapping available, but could not be used for spatial representation during data analysis in Stage One or village sampling in Stage Three – wide area survey. For village sampling, the list method was therefore used. A comprehensive list of villages stratified by payam and / or boma was only made available on the day that data collection was due to start.
- **Routine programme data from World Vision International.** As the objective of the assessment was to determine coverage for the county, routine programme data would normally be analysed for trends, reliability and investigative direction for all programme components from the start of the assessment. This data for sites operated by World Vision International was however not made available to the team until the beginning of Stage Three, after all other data collection and analysis for developing a prior estimate was completed. For this reason, the level of uncertainty used for the prior estimate was maintained at a higher level despite the rest of the investigation being thorough. No treatments cards were made available for the purposes of data checking or identifying possible issues with adherence to protocol.
- **Stock breaks during the assessment period.** Over the course of the assessment, World Vision International sites were not being supplied with PlumpySup for MAM treatment. This was an ongoing stock break since the beginning of the year and therefore would have had an impact on the

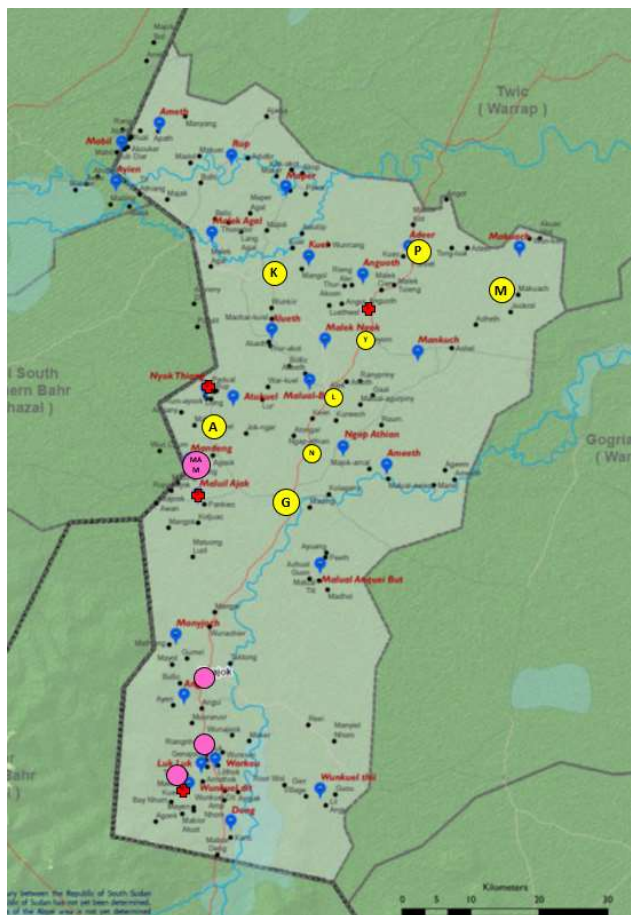
results of the TSFP coverage estimate. OTP sites managed by Action Against Hunger were also not in supply during Stages Two and Three. Although this was a short-term stock break that did not result in discharge from the programme, this may have caused confusion as to whether the child is 'enrolled' or 'not enrolled' for some caregivers. Both stock breaks are likely to have caused some level of underestimation of coverage.

5. STAGE ONE: QUANTITATIVE DATA ANALYSIS

Monthly routine programme data was collected and analysed for the period from January 2016 to most recent available. Admissions and clinical outcomes from the Action Against Hunger sites was available up to end of March 2017. World Vision International data was only available after completion of Stages 1 and 2, and only up to end of December 2016. Therefore, the analysis for World Vision sites could not contribute to Stage 1 of the investigation and has been presented separately in the analyses below.

For supplementary quantitative data (screening data and treatment cards), all analyses and findings are derived from Action Against Hunger data and therefore relate only to Action Against Hunger sites and activities.

Figure 3 - Approximate mapping of CMAM sites (all 8 Action Against Hunger sites (**yellow**), and four of 15 WVI sites where known (**pink**))

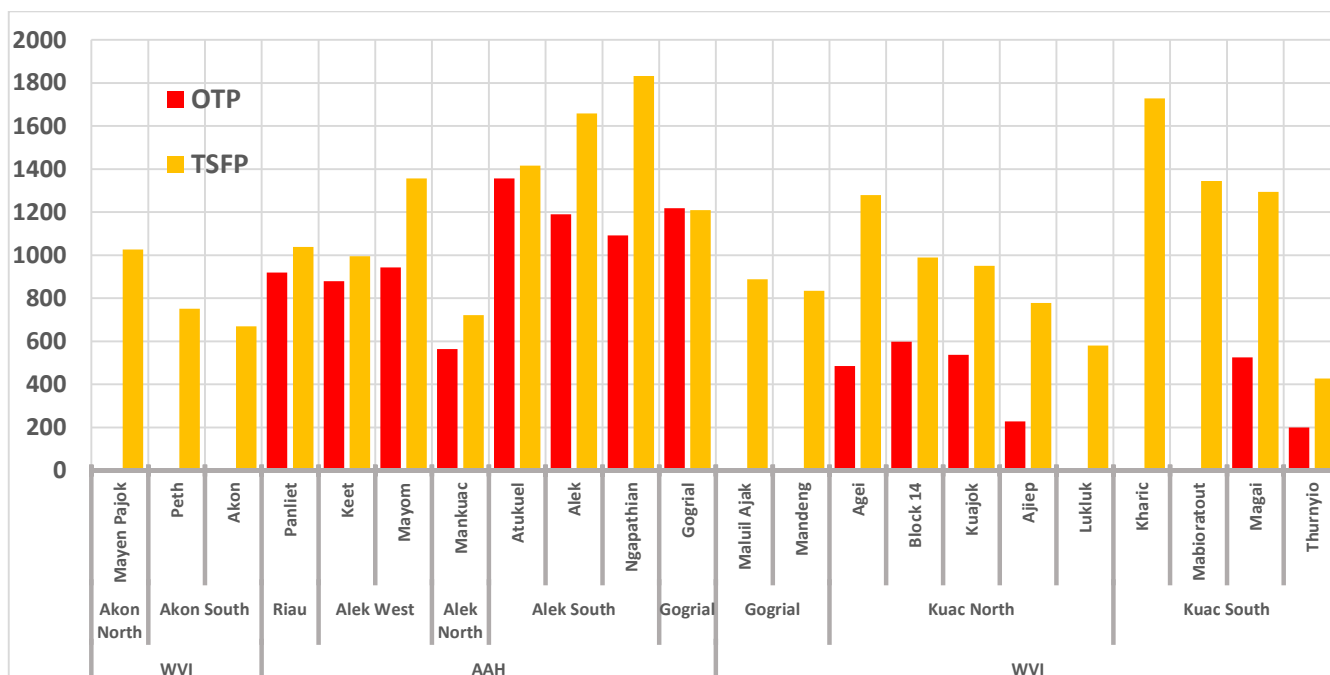


Using information from the survey team, some CMAM sites were identified and plotted on a basic map of the county. Once admissions data was received, it was possible to consider an overview of availability of OTP and TSFP services across the county at payam level.

Figure 4 (below) shows admissions data from each of the CMAM sites in the county and which payam it is in, broadly representing the most northerly on the left hand side and moving south to the right. This shows clearly that, although all payam are being provided a TSFP service, that there are large areas with no OTP for SAM treatment.

This admissions data also suggests that OTP sites that are bordering these large areas are admitting higher numbers of SAM cases than those with other OTP sites in adjacent areas, for example in Panliet, Atukuel and Gogrial.

Figure 4 - Admissions by site (January to December 2016)



It can be noted here that OTP admissions to sites served by Action Against Hunger are generally higher than those served by World Vision International. Figure 6 represents the outcome data for the same period by site, payam and partner.

Figure 5 - Clinical outcomes by site (January to December 2016)



Once this data was received, it shows clearly that there are significant differences in the reporting of outcomes between the implementing partners. Cure rates at World Vision sites are significantly higher showing very few other outcomes, despite stock breaks during the same period. However, the data did

include some omissions (such as months missing for some or all sites) and these were not possible to check against hardcopy reports or treatment cards. Generally, cure rates are shown to be lower for TSFP than for OTP site and very high defaulter rates can be seen, especially at Keet, Ngapathian and Alek.

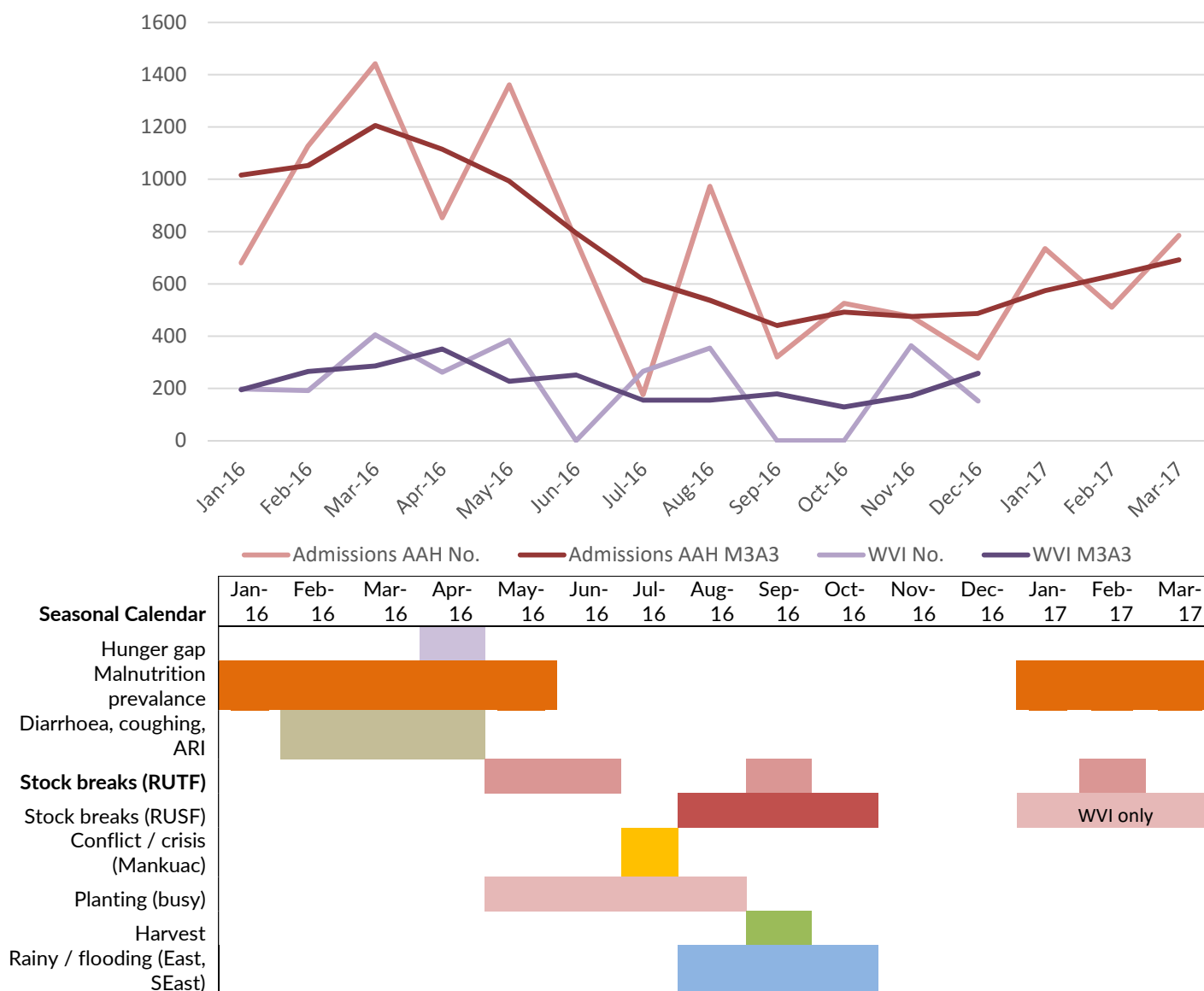
Treatment of Severe Acute Malnutrition (OTP)

Admissions over time

Admission were plotted monthly over the period January 2016 to March 2017. The smoothed (M3A3) lines on the graph below show the seasonal trends in OTP admissions whereby admissions go up during periods of high levels of malnutrition and peak when common diseases are most prevalent (Feb to Apr). Admissions then appear to decrease as these declines and as planting and harvesting seasons begin.

In the monthly data, we can also see the impact of stock breaks with troughs in admissions in June and again in September 2016. It is also clear that admissions to Action Against Hunger sites is higher than at World Vision sites, possibly due to number.

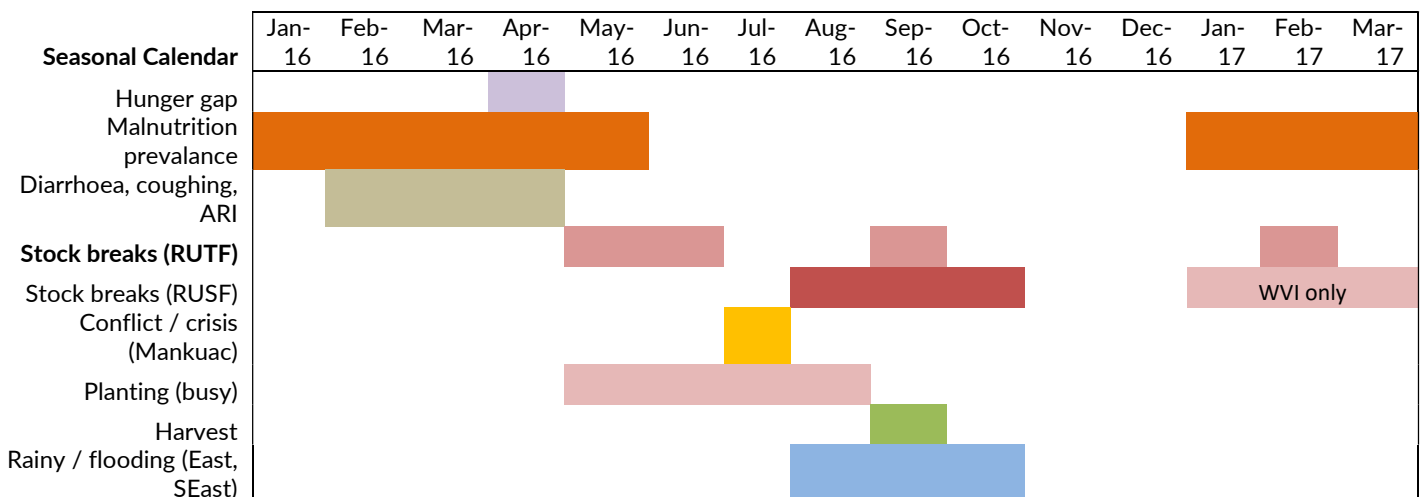
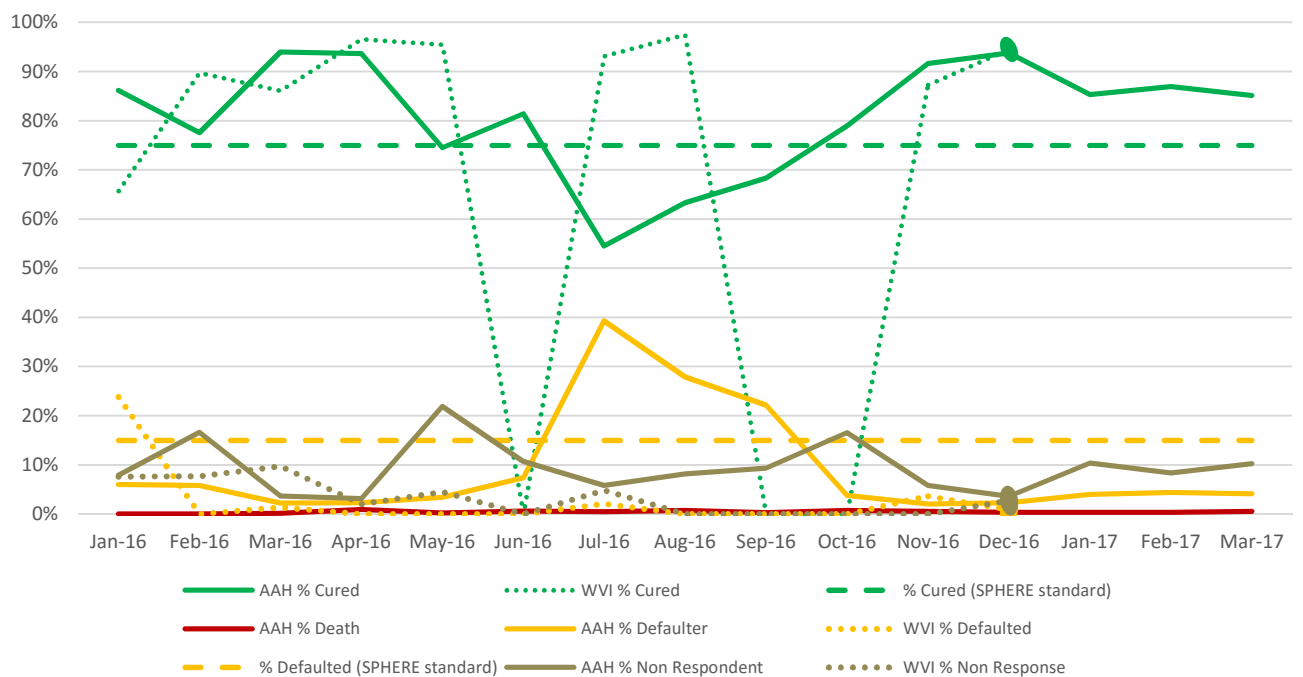
Figure 6: Admissions to OTP from Jan 2016 to Mar 2017 with smoothed (M3A3) curve and seasonal calendar



Outcomes over time

Clinical outcomes were also plotted over the same period. World Vision data is represented by small dotted lines as this was not available during Stage 1 analysis. From the analysis, pipeline breaks have been noted to have impacted the outcomes. Cure rates reduced significantly during the longer stock out in July 2016, matched with the increased default rate as all admitted cases who were not treated for four consecutive weeks were defaulted and readmitted as returned defaulters when stock arrived. This also has an impact on the non-respondent rate which is high before and after this stock out.

Figure 7 – Clinical outcomes to TSFP from Jan 2016 to Mar 2017 with seasonal calendar

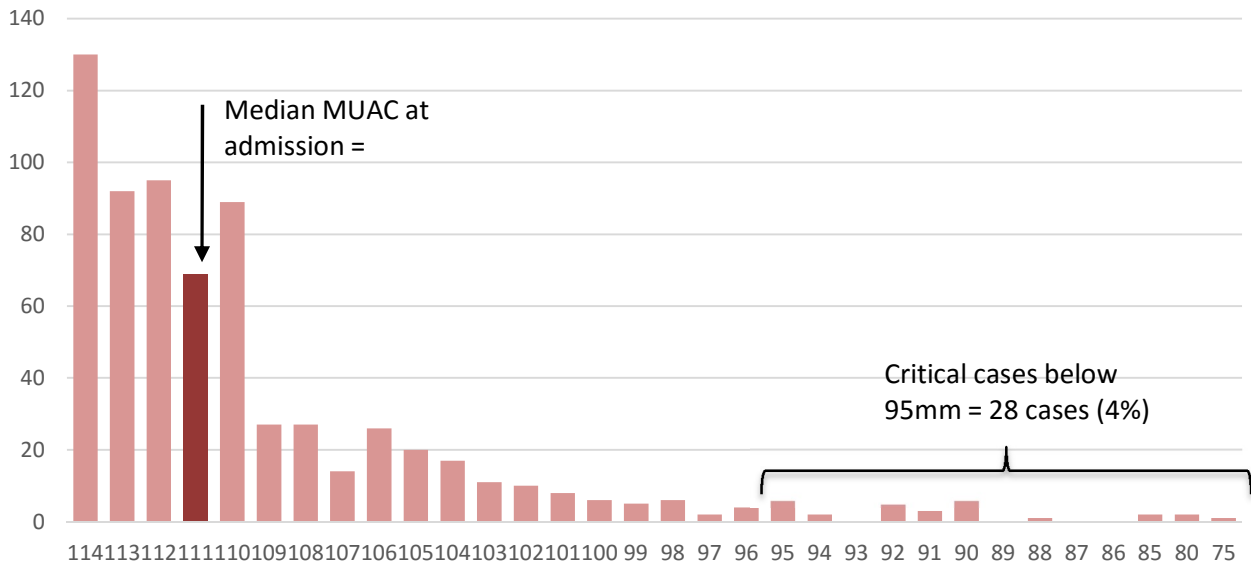


MUAC at admission

Action Against Hunger could provide a significant database of these data points maintained over more than one year, forming a check on clinical adherence to protocol, and the opportunity to develop and refine data management practices. The chart below shows the MUAC at admission for only the most recent three months of admissions, with a median calculated at 111mm.

This would, ideally, be closer to the admission criteria of 11.4mm showing early treatment seeking; however some cases (4%) are admitted with critically low MUAC less than 95mm.

Figure 8 - Bar chart showing MUAC at admission to OTP (data: Jan to Mar 2017, n=686, excludes WHZ admissions)

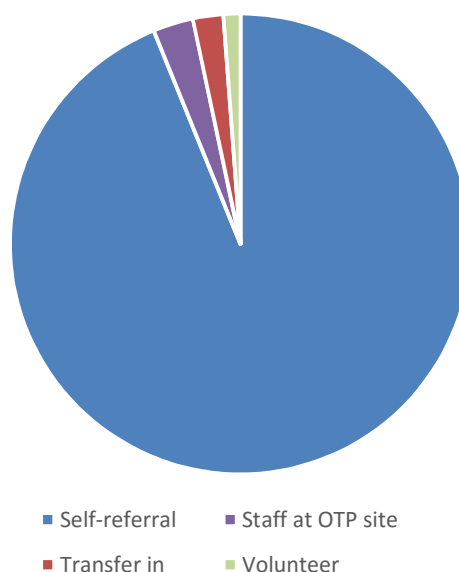


Lastly, the chart shows very little evidence of digit preference (often a sign of inaccurate MUAC measurements and recording), suggesting that MUAC practices at the CMAM sites are being taken and recorded accurately.

Sources of referral

Using the same data from treatment cards, the most common sources of referral were identified. From the pie-chart below, nearly all visits to the CMAM site are recorded as self-referrals. Although passive screening is less likely in this context due to the CMAM programme operating the main course of activities at the health facilities, there is still a distinct lack of referrals by volunteers. It was suggested by the team that this is because the 'referred from' field in the treatment card being left blank and defaulting to 'self-referral' at point of data entry.

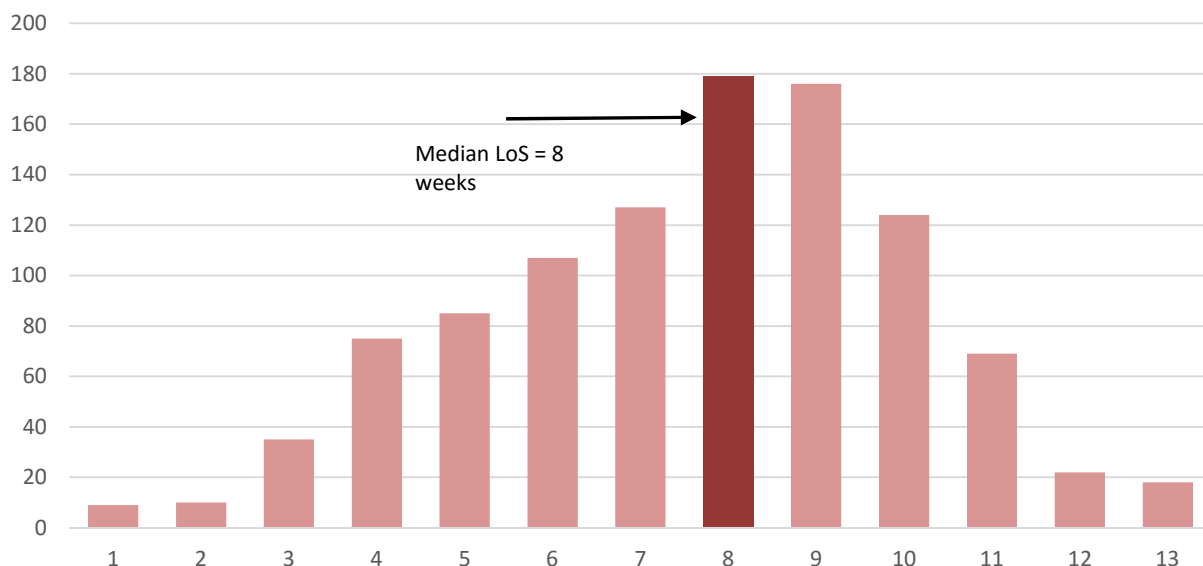
Figure 9 - Sources of referral to OTP services



Length of stay

The median length of stay for a SAM child is ideally 6-7 weeks making the one calculated from the 2017 treatment card data slightly long. This could be explained by stock breaks as short stock breaks allow the child to stay in the programme but not be treated.

Figure 10 - Bar chart showing Length of Stay (LoS) of cured SAM cases (data: Jan to Mar 2017)



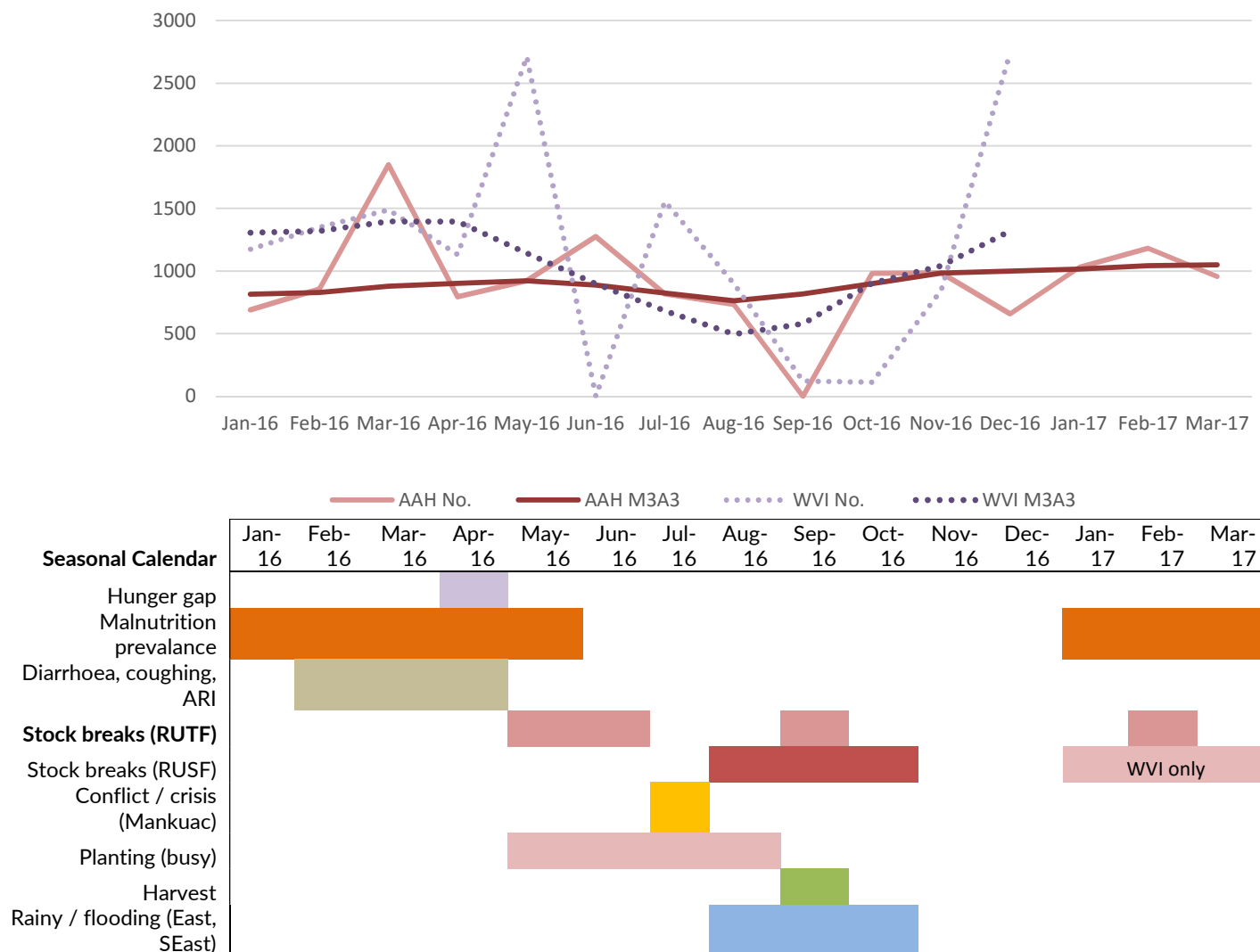
Treatment of Moderate Acute Malnutrition (TSFP)

Admissions over time

Comparative to the equivalent chart for OTP, there are less seasonal trends for admissions to TSFP. However, the impact of stock breaks remains clear with admissions plummeting to zero in September during a long stock out for both partners.

There is a volatile monthly trend in the World Vision admissions data, which should be investigated further, especially to explore more recent months of 2017 for which there is no data available here and no stock at the TSFP.

Figure 11- Admissions to TSFP from Jan 2016 to Mar 2017 with smoothed (M3A3) curve and seasonal calendar



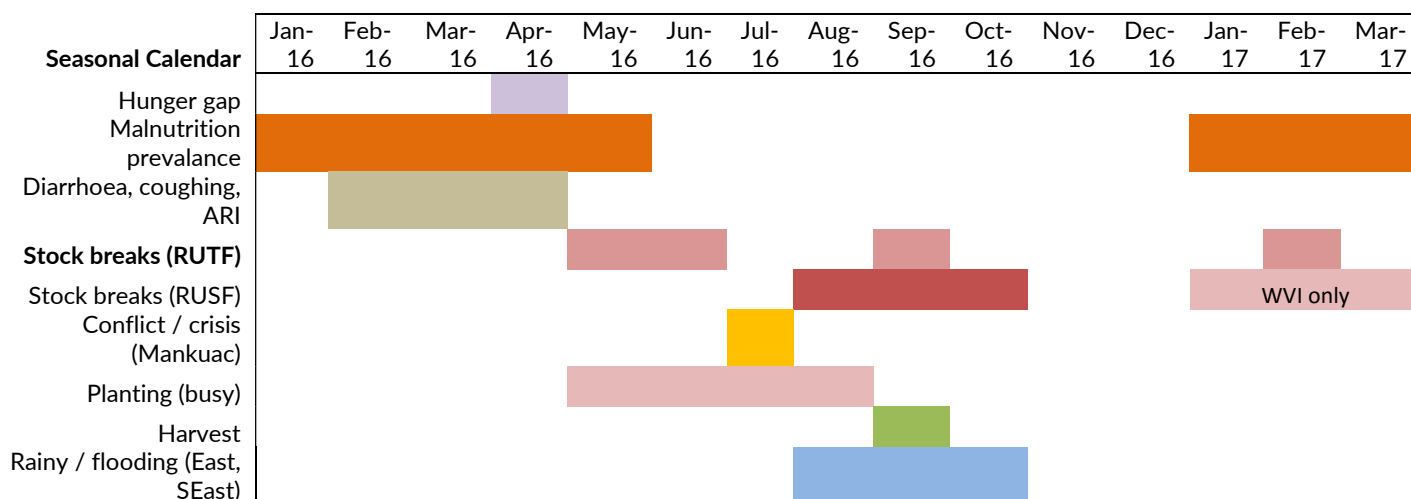
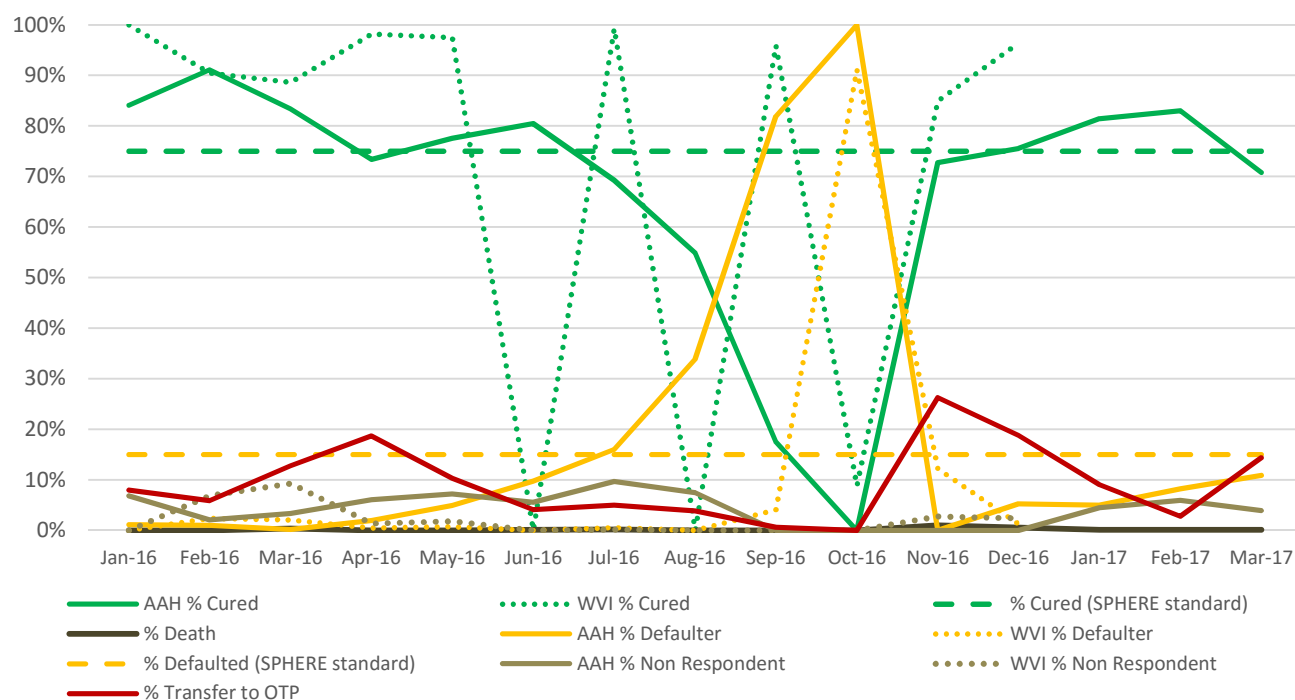
Outcomes over time

Similarly, to the representation for the OTP data, the chart below shows clearly the impact of stock outs resulting in high defaulting. In the case of TSFP however, we can see that this causes cases to deteriorate and the number transferred to OTP increases at this time.

The dotted lines for WVI data show that there are gaps in the reporting mechanism, or that the protocol used by WVI sites at the time of stock out cannot be reflected in NIS (nutrition information system) where data is stored nationally, assisted by UNICEF.

It is also notable here that current (March) transfer and non-response rates are increasing, possibly due to planting season beginning or increased disease burden.

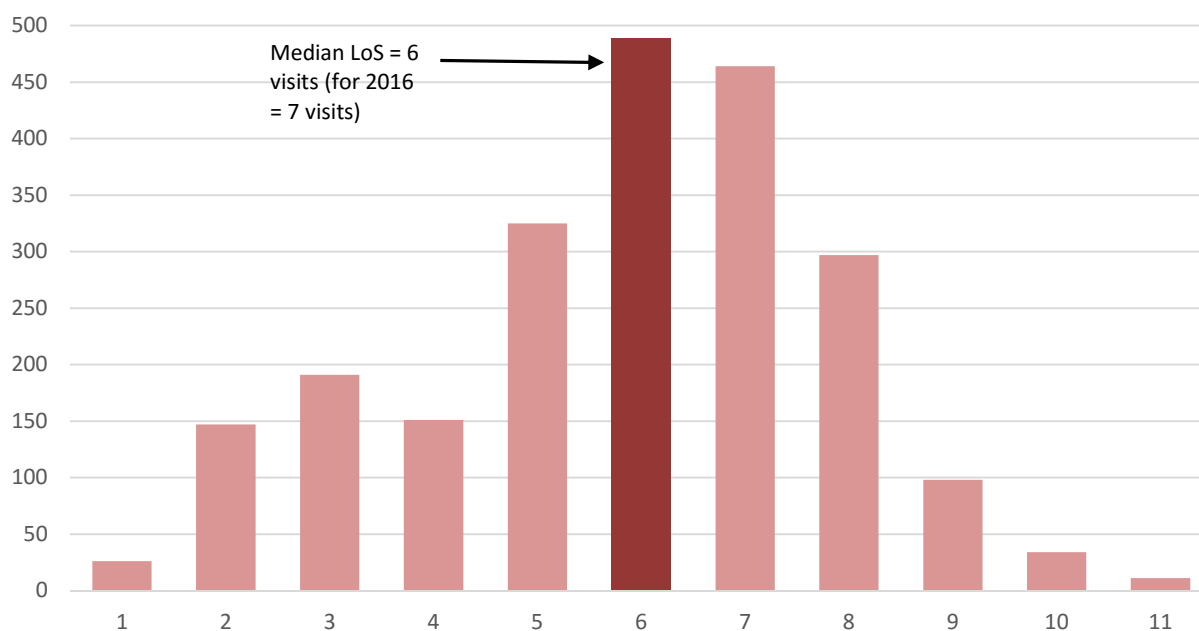
Figure 12 – Admissions to TSFP from Jan 2016 to Mar 2017 with seasonal calendar



Length of stay (TSFP)

The length of stay for each case cured Action Against Hunger TSFP sites January to March 2017 was calculated and a median of 6 visits (every two weeks) was calculated. This was a decrease in length of stay from last year 2016, when the median length of stay was 7 visits.

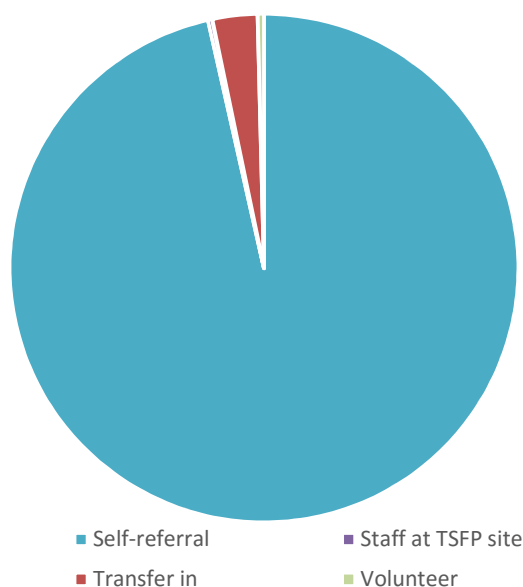
Figure 13 - Bar chart showing Length of Stay (LoS) of cured MAM cases (Jan to Mar 2017)



Sources of referral

Similarly, to the OTP data, in the pie-chart below, nearly all visits to the CMAM site are self-referrals. There is still a distinct lack of referrals by volunteers in the data. This could, as above, be the result of incorrect data entry from this field on the treatment cards. This also shows only a few 'transfers in' given that the TSFP is the place of referral for cured SAM cases.

Figure 14 - Sources of referral to TSFP services



Screening and Referral

Action Against Hunger collect data relating to case-finding activities, both in the community by CNVs (active screening) and at the health facility (passive screening). In this case, the CMAM programme is often the primary function of a health facility, i.e. people usually visit specifically so that their children will be screened for eligibility to enrol to the programme rather than for other health purposes, and therefore the usual meaning of passive screening is altered slightly. Passive screening in this sense is the quantity of children screened, rather than a measure of cases that are captured who might not otherwise have known about the programme or the condition. Data from January to March 2017 was analysed for the most recent view of case-finding effectiveness and compared with admissions for the same period.

Figure 15 - Chart showing children screened, cases found and cases admitted for SAM and MAM treatment

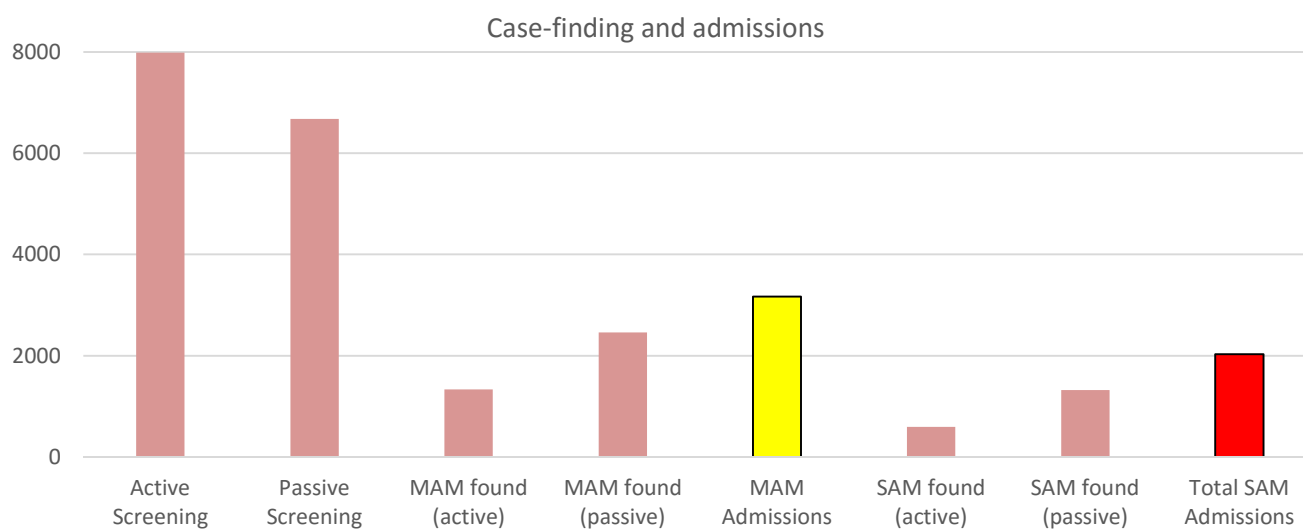
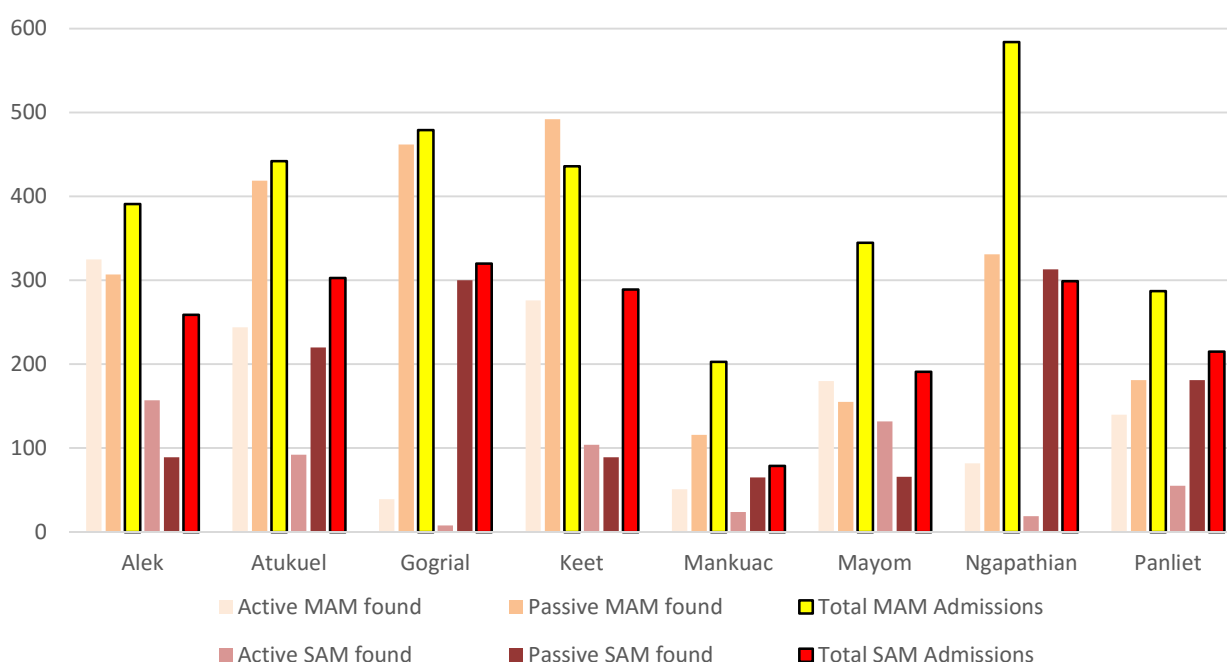


Figure 16 shows that the number of children screened in the community (by active screening) is higher than those visiting the CMAM site. However, the number of cases found is higher by passive screening than active screening in the case of both SAM and MAM cases. This is likely due to the prevalence of malnutrition being higher in those who visit the site than in the community. But it is also notable that number of admissions is higher (in both OTP and TSFP) than the number found by screening. This reflects a good willingness to be enrolled into the programme as cases are visiting without being referred from the community.

It is also possible that there is double counting in screening data where, for passive screening, some caregivers and children visit regularly to check eligibility to enrol and for active screening, some CNVs will screen the same child more than once over a longer period (such as the three months represented above).

Figure 17 shows similar data disaggregated by CMAM site. This also shows that active screening can account for only a small proportion of admissions in all areas with the minor exception of Alek, where Action Against Hunger operations are based.

Figure 16 - Chart showing cases found by active and passive case-finding, and cases admitted, by site (Jan to Mar 2017)



6. STAGE ONE: QUALITATIVE DATA COLLECTION AND ANALYSIS

Qualitative data was gathered to complement the quantitative data.

Sampling

Programme stakeholders were first identified. These included programme participants (carers of SAM and MAM children), community members (village leaders, traditional healers, men and women) and programme staff (management staff, CNWs and CNVs).

Both the OTP and TSFP sites and residential locations were chosen for the qualitative research. Locations for the qualitative data collection were chosen based on the following factors; to ensure good spatial coverage (across the county) and to represent locations near and far from the CMAM sites. CMAM sites were chosen to ensure both Action Against Hunger and World Vision International catchment areas are represented and CMAM sites with OTP and TSFP, as well as TSFP only catchment areas, and areas without CMAM programme services.

Methodology

A day was spent training the team and discussing tools to be used for qualitative data collection. Key data collection methods included focus group discussions and key informant interviews. Five different interview guides were used and adapted according to context or additional focus from quantitative analysis.

Three days of qualitative data collection was conducted and the survey team discussed findings at the end of each day. The team worked in pairs or groups of three, and were supervised for one day during data collection to allow feedback and on-the-job training.

In total 28 different interviews or focus groups were conducted in 10 different locations across the county. A full list of interviews and focus group discussions can be found on Annex 2.

The findings from these interviews were organised according to their relevance to Bottleneck Analysis determinants: Commodity Availability, Geographic Availability, Community Mobilisation, Utilisation and Continuation of services and Quality of Care. For each of these, one or more theme emerged forming sub-categories, which are represented below. A small number of key findings that do not fit easily within these determinants of coverage are presented under the category of Community Assessment (e.g. Household Dynamics, Feeding Practices and Understanding of Malnutrition).

Qualitative findings

The below table summarises the qualitative data collected from the field organised by BNA categorisation and the various sub-categories emerging.

Table 1 - Table of qualitative findings from Stage 1

Determinant	Finding	Description of informant comments
Commodity availability	Lack of stock	Stock supply is on and off and sometimes lasts for long periods causing defaults, deterioration of cases (increasing transfers) and rejection. Supply should be made available on demand, but sometimes information is not available on the expected period of a stock break.
	Sufficiency	There is a need for more nutrition programmes including general food distribution and / or protective rations to stop relapses, defaulting and sharing
Geographic availability	Distance	Many villages are a long distance from the facility (more than 3 hours walking), which causes non-attendance and defaulting
	Road access	Poor geographical access by road and especially during flooding / rainy season (June-Sept)
	Default: migration	Migration of caregivers causes default
	Lack of OTP	Lack of OTP services - referrals are going long distances to OTP, even when there is TSFP
Use of CMAM services	Willingness to be enrolled / high admissions	Children like the therapeutic food and mothers want to be enrolled, even using strategies to increase amount received (sharing one malnourished child and registering at more than one site)
	Good perception of the programme	Mothers appreciate the programme and want it to continue
	Ration sharing	Ration sharing happens because of the lack of food and causes increased non-respondents
	Facilities	Facilities are not adequate for services, where some experience long waiting times, no seating areas or mats and no water available. Also there is overcrowding and staff shortage (esp. Akon)
	Inpatient	Lack of inpatient facility
Community mobilization activities: Community Volunteers	CNV access and support	CNVs do not have enough support or equipment - especially bicycles to cover longer distances, means of communication (e.g. megaphones) for messaging, training and visibility
	Coverage of CNVs	Too few CNVs to cover large areas
	Challenges to CNV activities	CNVs face difficulties in the community including resistance and suspicion about screening, denial of cases on follow up and encountering clashes in the community
Community mobilization activities: screening and referral	No screening or ComMob (or don't know MUAC)	Lack of screening in some communities (especially far)
	Regular active screening	Screenings are conducted regularly, both house-to-house and mass screenings (within 2hrs of sites)

Community mobilization activities: information sharing	Clear messaging	Clear messaging is given when a case is enrolled into the programme including how to use RUTF/RUSF and recognising signs and symptoms of malnutrition
	Word-of-mouth	Good word of mouth about programme, especially amongst mothers
	Information sharing between programme and community / good sensitization (once engaged)	Participants were able to describe the protocol and key messages of using RUTF / RUSF. These were mostly mothers in the programme or community members who were located close to a CMAM location
Community assessment: health status and services	Availability of health services / medicine	Inadequate other health services: no medicines at PHCUs and expensive at market
	Common diseases	Common diseases: (blood diarrhoea Feb-Apr, scurvy, worms, intestinal infections, coughing, ARI), (prevalence in Jan-May is bad with pneu, dia, cough increasing malnutrition)
	Preference for traditional healers / witchdoctors	People prefer to consult traditional healers or witchdoctors first, especially as it is believed a very sick child (diarrhoea, measles, Thiang) should not be moved. Traditional healers are not sensitised to the availability of other treatment and are not familiar with MUAC tapes
	Community WaSH	Poor hygiene practices and provisions in communities with need for assistance with clean water, soap and hygiene products
Community assessment: Understanding of malnutrition	Shame	Child malnutrition is seen as a shameful condition because it is seen as failure to provide / poverty in the household, or as a result of sexual relations by the mother during breastfeeding (see below)
	Understanding of causes of malnutrition	Causes of malnutrition understood to be lack of food / variety, prevalence of disease, poor breastfeeding and poor hygiene practices
Community assessment: Household level	Gender roles	Men are not involved in childcare and often hold women responsible if a child is sick. Men will attend for traditional healer but not a CMAM site and some forbid the woman to go. Suspicion cited as reason, especially of woman returns without treatment
	Mothers busy	Mothers are responsible for a number of daily household activities (childcare, food preparation, cultivation) and cannot make time to go to CMAM services
	Lack of food	Severe lack of food in the area (mostly one meal of sorghum per day)

The qualitative data collection stage also resulted in an understanding of traditional / cultural perceptions about malnutrition and child health. The key terms that were used in the community when discussing malnutrition were:

- **Thiang.** This word was used to describe a child who is thin and suffering from diarrhoea with prefixes according to the believed cause of the condition. This include that the mother of the child has had sexual relations with a man during the period she is still breastfeeding the child. This caused suspicion and judgement on the family by the community, or on the mother by the father. Another form of Thiang is believed to be caused and spread by crows, and another by a particular tree in bloom ("Millat Thiang"). All forms are said to be more common in February and March and it is commonly believed that a child suffering from Thiang should not be moved for risk of death.
- **Arop.** This term was used by traditional healers and witch doctors to describe a child in a malnourished state, and particularly with coughing symptoms, who is believed to be cursed to be

that way, usually due to a deviation from following previous instructions. This condition is said to be cured by a traditional healer or witch doctor, usually by sacrificing an animal / livestock.

- **Wal Bol Pei.** Similar to the above, this term is a curse that causes weight loss and thinness, with diarrhoea and fever. It is believed that a witch doctor can protect children from this and can cure them.
- **Weeth.** Believed to be linked with tuberculosis this condition causes complications such as a hunchback or bulging chest and coughing and high blood pressure. Often also connected with leprosy, this condition results in isolation and exclusion.

7. STAGE TWO: DISTANCE BY SMALL AREA SURVEY

Stage 2 is intended to determine whether we are on the right track in terms of what we think about coverage for this assessment, so that we can progress to the next stage of estimating coverage with confidence that we understand the key influences (boosters and barriers).

Hypothesis: In villages more than 2-3 hours walking distance from the CMAM (both OTP and TSFP) delivery site, coverage will not meet SPHERE standards for rural areas of 50%. In villages within 2-3 hours walking distance from a site, coverage will meet SPHERE standard of 50%

Rationale: Stage One showed that distance from the CMAM delivery site was a significant barrier for mothers of SAM or MAM children, and for outreach and case-finding and referral activities of community volunteers. From Stage One a distance of 2-3 hours walking was indicated as the longest acceptable distance.

Sampling: Tested by Small Area Survey (and LQAS), with catchment communities purposively sampled within 2-3 hours walking distance (3 villages) and beyond 2-3 hours walking distance from a site. Because this hypothesis was being tested for both the OTP and TSFP, areas with sites delivering both services were chosen

Results for OTP: The threshold value (d) depends on the number of cases found (n) and the standard against which coverage is being evaluated (p), in this case 50%

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

Table 2 - Stage Two results for hypothesis on distance for OTP

SAM / OTP		Enrolled	Recovering (Enrolled)	Not Enrolled	Recovering (without being enrolled)	Decision rule	Cases enrolled	
Boukbeet	FAR	0	1	0				2 < 5 therefore coverage low
Mabior-dong	FAR	1	0	3				
Wunkuel dit	FAR	0	0	4				
TOTAL FAR		1	1	7	1	5	2	
Kharic	NEAR	7	4	1				16 > 8 therefore coverage high
Tiar Atong	NEAR	0	1	0				
Mayom Raul	NEAR	4	0	0				
TOTAL NEAR		11	5	1	0	8	16	

These findings support this hypothesis for OTP / SAM treatment coverage

Results for TSFP: The threshold value (d) depends on the number of cases found (n) and the standard against which coverage is being evaluated (p), in this case 50%

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

Table 3 - Stage Two results for hypothesis on distance for TSFP

MAM / TSFP		Enrolled	Recovering (Enrolled)	Not Enrolled	Recovering (without being enrolled)	Decision rule	Cases enrolled	
Boukbeet	FAR	3	5	2				9 < 15 therefore coverage low
Mabior-dong	FAR	0	0	6				
Wunkuel dit	FAR	1	0	8				
TOTAL FAR		4	5	16	5	15	9	
Kharic	NEAR	6	0	6				17 > 14 therefore coverage high
Tiar Atong	NEAR	6	1	3				
Mayom Raul	NEAR	4	0	3				
TOTAL NEAR		16	1	12	0	14	17	

These findings support this hypothesis for TSFP / MAM treatment coverage.

8. STAGE TWO: STOCK OUTS BY SMALL STUDY

Hypothesis: Stock-outs create poor perception of the programme by the community and clinic level programme implementation staff.

Rationale: Several data and information from Stage One showed gaps in supply of RUTF and RUSF since the beginning of 2016. This was also a finding from previous SQUEAC assessments (in 2013 and 2011). Although it has been recognized that these stock outs are occurring, there has not been any studies conducted to investigate the impact of these qualitatively on programme stakeholders. As there were stock outs at the time of the assessment (short term RUTF at Action Against Hunger sites and long term since Jan 2017 RUSF at World Vision sites), the opportunity was taken to explore this.

Method: A small study was conducted using three short interview guides for mothers of SAM/MAM children, CNWs and CNVs. The full interview guides can be found in Annex 3. The objective was to explore the effects of stock outs on community perception and on implementers of programme activities. Two locations were chosen, at and near to Gogrial (Action Against Hunger) and Maluil Ajak (World Vision).

In total, six clinic staff (mostly at Gogrial), nine CNVs (mixed) and six mothers (all at Gogrial) were consulted according to availability and willingness to participate.

Findings:

The most revealing findings were from speaking with **CNVs**. Regardless of the location (and therefore the type of stock out being currently experienced) all CNVs were asked how people react when there are stock outs. In all cases, CNVs described that mothers are unhappy, and most added that mothers and other community members **blame CNVs for lack of stock**, accuse them of lying and that this situation causes mistrust between the community and CNVs. On being asked about the effect on treatment, CNVs highlighted that turn out reduces during stock outs and that cases often deteriorate from MAM to SAM or develop complications. One CNV suggested they would like to be able to inform mothers about stock outs in advance to save them undertaking long journeys with sick children not to receive anything.

All **mothers** interviewed were enrolled in the OTP at Gogrial (currently out of stock for one week). They confirmed that there was usually stock and that this was the only time, but said that they would not have come if they knew there was no stock. **Information about the lack of stock was only shared with them on reaching the health facility** by the staff there. Some mothers described further consequences of making the journey to the health facility and not receiving treatment, including that the husband / father would quarrel and prevent the child going again, and another that the child cries for RUTF over the long distance to the OTP and therefore they are very discouraged. Despite these issues, all mothers interviewed said that they believed in the programme, recognised that it had helped so far and will return, as well as recommending it to other mothers with children having the same condition.

Generally, **staff** at Gogrial clinic **were able to describe the weekly stock consumption report** which is then sent to Action Against Hunger field office. Some also specified that stock can be requested in demand when needed. When asked how long in advance stock is requested from WFP and UNICEF, most staff said one month but added that this was not part of their responsibilities and so could not be certain.

These findings support that those enrolled in CMAM programmes usually have a positive opinion of it, but also that gaps in supply have a detrimental effect on activities conducted by CNVs and other community outreach activities.

9. BUILDING THE PRIOR

A prior belief of coverage was developed using all the information collected during Stage 1 and 2. This was done separately for OTP and TSFP using four different methods for each; unweighted boosters and barriers, weighted boosters and barriers, scoring of concept maps and derivation of an estimated prior as a product of Tanahashi levels of programme coverage (availability, accessibility, acceptability, contact and effectiveness).

OTP prior

Simple (unweighted) scoring of boosters and barriers

A prior was calculated through simple scoring of boosters and barriers. The boosters and barriers were listed and a score of 4 given to each one. The sum of scores of the boosters and the barriers was then taken to calculate a prior mode using the following formula:

$$\text{Prior mode} = \frac{\text{Sum of positive} + (100 - \text{sum of negative})}{2}$$

This method only accounts for the number of boosters and barriers that influence the prior, not the relative importance of each. Table 3 lists the boosters which total a score of 28 and the barriers which total a score of 60. The formula above was then used to calculate a prior mode:

$$\begin{aligned} \text{Prior mode} &= \frac{28 + (100 - 60)}{2} \\ &= 34\% \end{aligned}$$

Table 4 - Boosters and barriers to access OTP with sources and scores

Boosters	Sources / methods			Unweight hted	Weight ted	Barriers	Sources / methods		Unweight hted	Weight ed
Regular active screening	V1, Mi2	V2, 3, 4	4	5	CNV access and support (equipment, communications and visibility)	A1, A2, W1, V1		4	5	
Good understanding of malnutrition: food, disease, breastfeeding	V2, L2	1, 2	4	4	Lack of stock: sometimes long periods, rejections, poor information, deterioration on cases	A1, A2, W1, V1, Mo2, Mi2	4,8	4	5	
Clear messaging when enrolled about signs, symptoms and use of RUTF	V1, Mo2, Mi2	V2, 7,8	4	4	Mothers busy with childcare / feeding, cultivation, house construction	A1, A2, W1, V1, V2, Mi2	7	4	3	
Information sharing between programme and community / good sensitisation (once engaged)	Mi1, Mo2		4	4	Shame of child's condition showing poverty (or judgement on sexual activities)	A1, A2, W1, V1, V2, Mo2, Mh2		4	2	
Willingness to be enrolled / high admissions	A1, A2, W1, L2, Mi1, Mi2	4, 7, 8	4	3	Distance of more than 2-3 hours is too far for regular attendance	A1, A2, W1, L2, Mo2, Mh2	3, 4, 7	4	5	
Good perception of the programme	Mo2, Mi2	8	4	5	Coverage of CNVs: large areas for too few CNVs	A2, W1, V1, Mo2, Mh2		4	4	
Good word-of-mouth	Mi2	7, 8	4	5	Default due to migration	A1, A2, W1, V1		4	1	
TOTALS			28	30	Preference for traditional healers / witchdoctors and beliefs about moving sick children	A2, W1, L2, Mo2, Mi2	7	4	2	
					Lack of OTP in some areas	W1, V1, Mi2, Mo2, Mh2	7	4	4	
					No screening or ComMob (or don't know MUAC) in some areas, especially far	L2, Mo2, Mh2	7	4	5	
					Gender roles: men are not involved in childcare but make household decisions. They attend TH but not CMAM programmes	A1, Mo2, Mi2, Mh2	7	4	3	
					Facilities: some long waiting times and lack of seating area and drinking water (WVI)	A2, W1, Mi2	6	4	3	
					Challenges to CNV activities including suspicion and poor acceptance	A2, W1, V1	8	4	2	
					Poor road access (seasonal flooding)	V1, L2, M1		4	2	
					Lack of inpatient facilities (Alek only)	W1, Mo2	7	4	4	
					TOTALS			60	50	

Table 5 - Legend for triangulation of boosters and barriers

Key	Sources	Key	Methodology
A	ACF staff	1	Semi-structured interview
W	WVI staff	2	Informal group discussion
V	CNV	3	OTP card analysis
L	Village leaders	4	Routine programme data analysis
Mo	Mothers of SAM / MAM children not in the programme	6	Observation
Mi	Mothers of SAM / MAM children in the programme	7	Small area survey
Mh	Mothers of healthy children	8	Small study
T	Traditional healers		

Weighted scoring of boosters and barriers

The next method used for calculating a prior mode took the same list of boosters and barriers but were given a weighted score (between one and five) depending on their relative importance. The team worked together having analysed all the evidence from Stage 1 & 2 to allocate a score that represented the relative effect of that factor on coverage, considering the following factors: How prevalent is the issue? Does it relate only to specific areas, or across the county? How much does it affect coverage? How strong is the evidence?

Using the total of the scores of the boosters (30) and the barriers (50), the same formula was used to calculate a prior mode:

$$\text{Prior mode} = \frac{\text{Sum of positive} + (100 - \text{sum of negative})}{2}$$

Therefore,

$$\begin{aligned} \text{Prior mode} &= \frac{30 + (100 - 50)}{2} \\ &= 40\% \end{aligned}$$

Scoring of concept map (positive and negative relationships)

Another method for contributing to a decision on a suitable prior mode is to consider the relationships between various factors effecting coverage. For this, a visual representation was created by the team of the various influences revealed by Stages 1 and 2. As well as these key factors, the relationships between them were identified and described using labelled connecting lines. Then, the connections were assigned as either positive (with +) or negative (with -) and the formula above used again to calculate a prior mode. The factors were scaled up by four to produce a more sensitive prior mode.

$$\text{Prior mode} = \frac{\text{Sum of positive} + (100 - \text{sum of negative})}{2}$$

Positive relationships = 6 (multiplied by 4 = 24). Negative relationships = 17 (multiplied by 4 = 68)

$$\begin{aligned} \text{Prior mode} &= \frac{24 + (100 - 68)}{2} \\ &= 28\% \end{aligned}$$

[illegible]

Lastly, a novel method was considered by discussing again the Tanahashi levels of coverage in terms of the OTP. This was partly in order to ensure that the OTP and TSFP were considered separately and that the lower availability coverage of the OTP was well reflected. Following broadly the process as presented in the FANTA coverage manual, the following estimation was made, starting with 100% coverage:

Availability: estimated at 70%
 Accessibility: estimated at 85%, for running overall estimate of 63% (85% of 70%)
 Acceptability: estimated at 90%, for running overall estimate of 57% (90% of 63%)
 Effectiveness: estimated at 80%, for overall prior mode of 45% (80% of 63%)

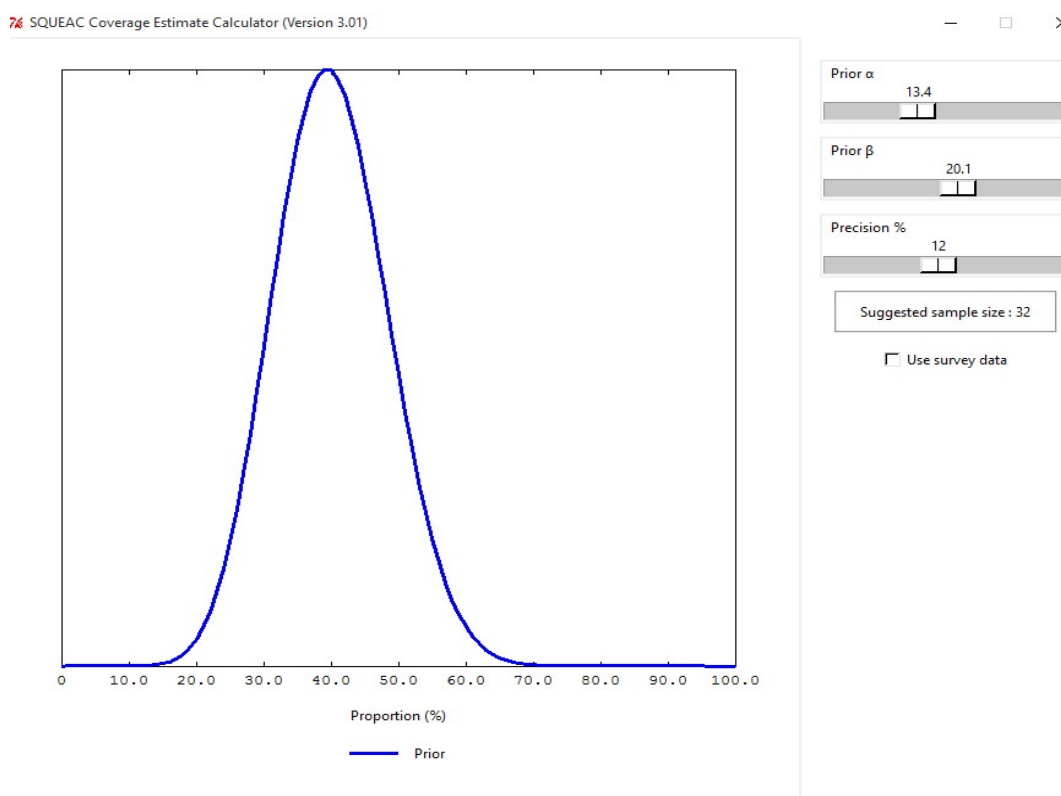
The final prior mode was calculated as a mean average of the four modes calculated from different methods.

OTP	Modes
Concept Map Prior	28
Positive Relationships	24
Negative Relationships	68
Simple BB (scored 4)	34
Sum of Boosters	28
Sum of Barriers	60
Weighted BB	40
Sum of Boosters	30
Sum of Barriers	50

Tanahashi estimate	45
Final prior mode (mean average)	36.8

It was decided to use uncertainty of +/- 25% due to the absence of mapping and some programme data. It was determined, using values for α_{prior} and β_{prior} for different prior modes in the SQUEAC / SLEAC manual⁴, an estimated prior mode of 40% with +/- 25% uncertainty level, that the shape parameters for the prior estimate of OTP coverage are $\alpha_{\text{prior}} = 13.4$ and $\beta_{\text{prior}} = 20.1$. These were entered into the Bayes SQUEAC calculator as illustrated below.

Figure 18 - Representation of the prior probability of coverage of OTP



TSFP prior

Simple (unweighted) scoring of boosters and barriers

A prior was calculated through simple scoring of boosters and barriers. The boosters and barriers were listed and a score of 4 given to each one. The sum of scores of the boosters and the barriers was then taken to calculate a prior mode using the following formula:

$$\text{Prior mode} = \frac{\text{Sum of positive} + (100 - \text{sum of negative})}{2}$$

This method only accounts for the number of boosters and barriers that influence the prior, not the relative importance of each. Table 3 lists the boosters which total a score of 28 and the barriers which total a score of 60. The formula above was then used to calculate a prior mode:

$$\text{Prior mode} = \frac{28 + (100 - 60)}{2} = 34\%$$

⁴ ibid

Table 7 - Boosters and barriers to access TSFP with sources and scores

Boosters	Sources / methods			Unweig hted	Weigh ted	Barriers	Sources / methods		Unweig hted	Weight ed
Regular active screening	V1, Mi2	V2, 3, 4	4	5	CNV access and support (equipment, communications and visibility)	A1, A2, W1, V1		4	5	
Good understanding of malnutrition: food, disease, breastfeeding	V2, L2	1, 2	4	3	Lack of stock: sometimes long periods, rejections, poor information, deterioration on cases	A1, A2, W1, V1, Mo2, Mi2	4,8	4	5	
Clear messaging when enrolled about signs, symptoms and use of RUTF	V1, Mo2, Mi2	V2, 7,8	4	5	Mothers busy with childcare / feeding, cultivation, house construction	A1, A2, W1, V1, V2, Mi2	7	4	2	
Information sharing between programme and community / good sensitisation (once engaged)	Mi1, Mo2		4	5	Shame of child's condition showing poverty (or judgement on sexual activities)	A1, A2, W1, V1, V2, Mo2, Mh2		4	1	
Willingness to be enrolled / high admissions	A1, A2, W1, L2, Mi1, Mi2	4, 7, 8	4	5	Distance of more than 2-3 hours is too far for regular attendance	A1, A2, W1, L2, Mo2, Mh2	3, 4, 7	4	5	
Good perception of the programme	Mo2, Mi2	8	4	4	Coverage of CNVs: large areas for too few CNVs	A2, W1, V1, Mo2, Mh2		4	4	
Good word-of-mouth	Mi2	7, 8	4	5	Default due to migration	A1, A2, W1, V1		4	1	
TOTALS			28	32	Preference for traditional healers / witchdoctors and beliefs about moving sick children	A2, W1, L2, Mo2, Mi2	7	4	1	
					Lack of OTP in some areas	W1, V1, Mi2, Mo2, Mh2	7	4	2	
					No screening or ComMob (or don't know MUAC) in some areas, especially far	L2, Mo2, Mh2	7	4	4	
					Gender roles: men are not involved in childcare but make household decisions. They attend TH but not CMAM programmes	A1, Mo2, Mi2, Mh2	7	4	3	
					Facilities: some long waiting times and lack of seating area and drinking water (WVI)	A2, W1, Mi2	6	4	3	
					Challenges to CNV activities including suspicion and poor acceptance	A2, W1, V1	8	4	2	
					Poor road access (seasonal flooding)	V1, L2, M1		4	1	
					Lack of inpatient facilities (Alek only)	W1, Mo2	7	4	3	
					TOTALS			60	42	

Weighted scoring of boosters and barriers

The next method used for calculating a prior mode took the same list of boosters and barriers but were given a weighted score (between one and five) depending on their relative importance. In this case, some differences with the OTP were also considered and the relative impact on coverage discussed.

Using the total of the scores of the boosters (32) and the barriers (42), the same formula was used to calculate a prior mode:

$$\text{Prior mode} = \frac{\text{Sum of positive} + (100 - \text{sum of negative})}{2}$$

Therefore,

$$\begin{aligned}\text{Prior mode} &= \frac{32 + (100 - 42)}{2} \\ &= 45\%\end{aligned}$$

Scoring of concept map (positive and negative relationships)

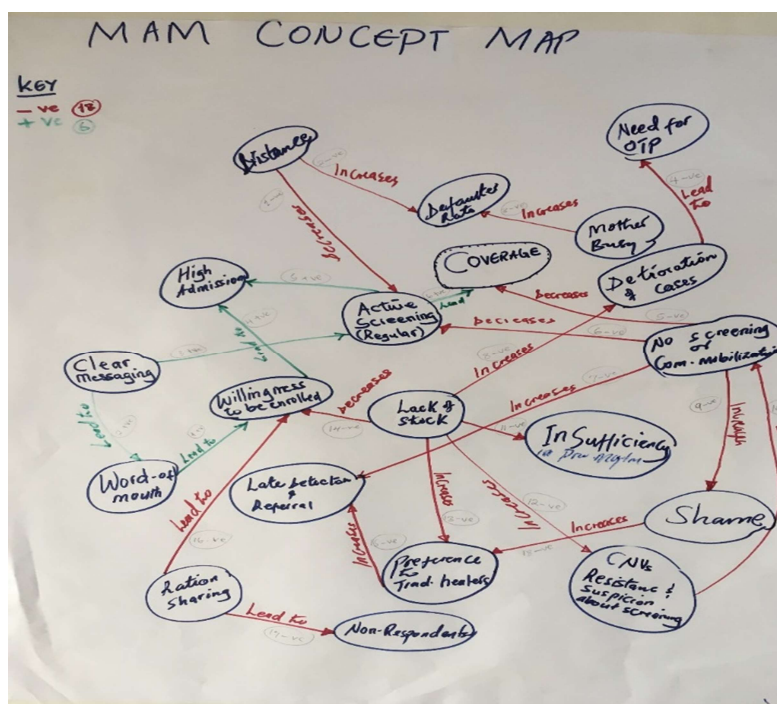
Similarly, but separately from the OTP, a visual representation was created of the various influences revealed by Stages 1 and 2. Again these key factors were presented and the relationships between them identified and described using labelled connecting lines. The factors were scaled up by four here also to produce a more sensitive prior mode.

$$\text{Prior mode} = \frac{\text{Sum of positive} + (100 - \text{sum of negative})}{2}$$

Positive relationships = 6 (multiplied by 4 = 24). Negative relationships = 18 (multiplied by 4 = 72)

$$\text{Prior mode} = \frac{24 + (100 - 72)}{2} = 26\%$$

Figure 19 - Concept map drawn by survey team for TSFP



Product of estimating Tanahashi levels of coverage

Lastly, a similar activity as for OTP, the team discussed the Tanahashi levels of coverage in terms of the TSFP. Starting with 100% coverage:

Availability: estimated at 85%
Accessibility: estimated at 90%, for running overall estimate of 77% (90% of 85%)
Acceptability: estimated at 90%, for running overall estimate of 69% (90% of 77%)
Effectiveness: estimated at 70%, for overall prior mode of 48% (70% of 69%)

This helped the team to appreciate that although the presence of OTP is lower, the estimate of coverage may be similar for TSFP as the latter is considered, from the evidence in Stages 1 and 2 to be less effective.

The final prior mode was calculated as a mean average of the four modes calculated from different methods.

Table 8 - Table of prior estimates for TSFP

TSFP	Modes
Concept Map Prior	26
Positive Relationships	24
Negative Relationships	72
Simple BB (scored 4)	34
Sum of Boosters	28
Sum of Barriers	60
Weighted BB	45
Sum of Boosters	32
Sum of Barriers	42
Tanahashi estimate	48
Final prior mode (mean average)	38

It was again decided to use uncertainty of +/- 25% due to the absence of mapping and some programme data. Using the same process, it was determined that **the shape parameters for the prior estimate of TSFP coverage are also $\alpha_{\text{prior}} = 13.4$ and $\beta_{\text{prior}} = 20.1$ and therefore the same as for the OTP.**

10. STAGE THREE: SAMPLING

The principal objective of Stage 3 is to provide an estimate for coverage across the county. This firstly requires the development of a *likelihood* by of a wide area survey and then, using Bayesian conjugate analysis, combine the prior and the likelihood to produce the *posterior* estimate.

A wide area survey was conducted throughout the area for both OTP and TSFP. A total of 29 villages were sampled.

Sampling calculations

Although the prior for OTP and TSFP were developed separately, the modes and shape parameters calculated were the same, resulting in the same required sample size for Stage 3.

From figure 17 above (the prior probability distribution), the Bayes SQUEAC calculator has returned a minimum sample size of 32 cases of SAM are required. Because the TSFP prior is the same, this is the same for MAM sample size, however, because prevalence of MAM is higher than that of SAM, from here calculations are made on the basis of the minimum SAM requirement since we are likely to find more MAM than SAM cases.

The following calculation was used to determine the number of villages that should be visited in order to achieve a sample size of 32:

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

n =	32	
average village population =	151	From population projections (WHO, 2016)
6-59 months rate =	0.16	Action Against Hunger CNV monitoring data
SAM rate =	0.04	SMART 2016
nvillages =	33	

Practically, it was decided that this number of villages would be achievable within the time allocated and that, based on Stage Two data, there would not be significant challenges to case-finding.

Sampling framework

A two-stage sampling method was used, the first stage ensured the selection of spatially representative sample of villages throughout Gogrial West, and the second stage employed door-to-door case finding to find all SAM and MAM children in each of the selected villages.

First stage: The 33 villages were selected using the spatially stratified sampling method (or list method). A list of 2,419 villages was stratified to Boma level and a sampling interval of 73 was used from a starting point of 31. The list of villages selected is included in Annex 4. Due to irregular bouts of insecurity, four of these villages (in the eastern area) were removed from the list after the team had started data collection at village level. Therefore the remaining villages were visited and the assessment completed without representation of these areas of insecurity in the east of the county.

Second stage: In each village the sampling process identical to the one used for the small area survey in Stage 2 was used. On arrival at each village, the boundaries of the village were confirmed with residents of that village. Door-to-door case finding was employed to ensure that all the children meeting the case definition of SAM or MAM (by MUAC or oedema) were found. Local language was used for case-finding.

For each case found, a questionnaire was administered according to whether then child had been enrolled in a CMAM programme or not to ascertain the reasons. The full questionnaires can be found in Annexes 5 and 6 respectively.

Results of Wide Area Survey

The wide area survey found a total of 48 SAM cases and 136 MAM cases. The total cases found are presented below and the cases found per village can be found in Annex 7.

11. STAGE THREE: RESULTS

The most reliable, unbiased estimate of program coverage currently used is the single coverage estimator, which includes both recovering cases (cases that have reached discharge criteria but are yet to be discharged) that are in the program and recovering cases that are not in the programme:

$$Coverage = \frac{C_{in} + R_{in}}{C_{in} + R_{in} + C_{out} + R_{out}}$$

C_{in} Current cases enrolled

C_{out} Current cases not enrolled

R_{in} Recovering cases enrolled

R_{out} Recovering cases not enrolled

R_{out} (i.e. recovering cases not in the program) is unknown but can be estimated using a simple mathematical model.

$$R_{out} \approx \frac{1}{3} \times \left(R_{in} \times \frac{C_{in} + C_{out} + 1}{C_{in} + 1} - R_{in} \right)$$

OTP coverage

Table 8 below shows the number of cases found in the wide area survey including R_{out} .

Table 9 - Total SAM cases found during wide area survey

SAM	Cin	Rin	Cout	Rout
TOTAL	17	5	26	2

With the single coverage the sample size requires the inclusion of recovering cases (both in and out). Therefore the numerator and denominator used are as below:

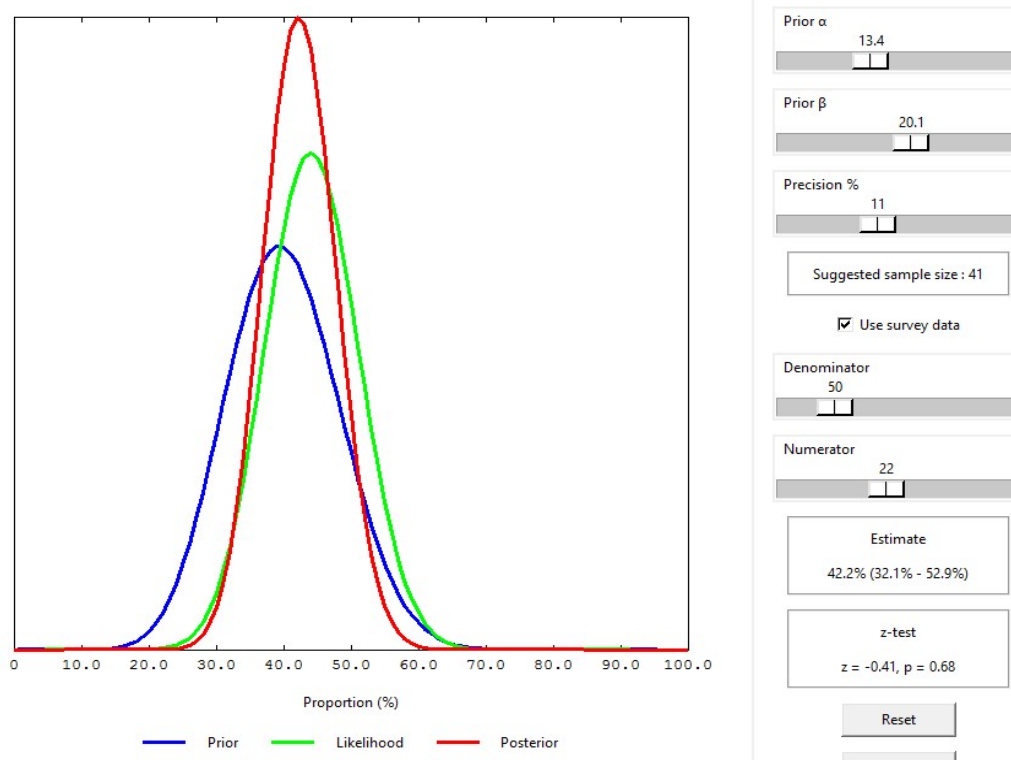
Numerator	22
Denominator	50

With these figures the single coverage was also calculated through the BayesSQUEAC calculator that combines the information from the prior and the likelihood with the following result:

42.2% [95%CI: 32.1% to 52.9%]

This coverage estimate is below the SPHERE standard for rural CMAM programmes of 50%. The Bayes SQUEAC calculator presents the following posterior curve (red), based on the prior (blue) and the likelihood (green) information (through Bayesian conjugate analysis).

Figure 20 - Representation of the single coverage estimate for OTP including the prior, likelihood and posterior



The conjugate analysis does not present any conflict between the prior and the likelihood, meaning they both provide a similar estimation. Therefore the prior is in accordance with the likelihood and we can accept these results.

TSFP coverage

Table 9 below shows the number of cases found in the wide area survey including R_{out} .

Table 9 - Total MAM cases found during wide area survey

MAM	Cin	Rin	Cout	Rout
TOTAL	44	0	92	0

With the single coverage the sample size requires the inclusion of recovering cases (both in and out). Therefore the numerator and denominator used are as below:

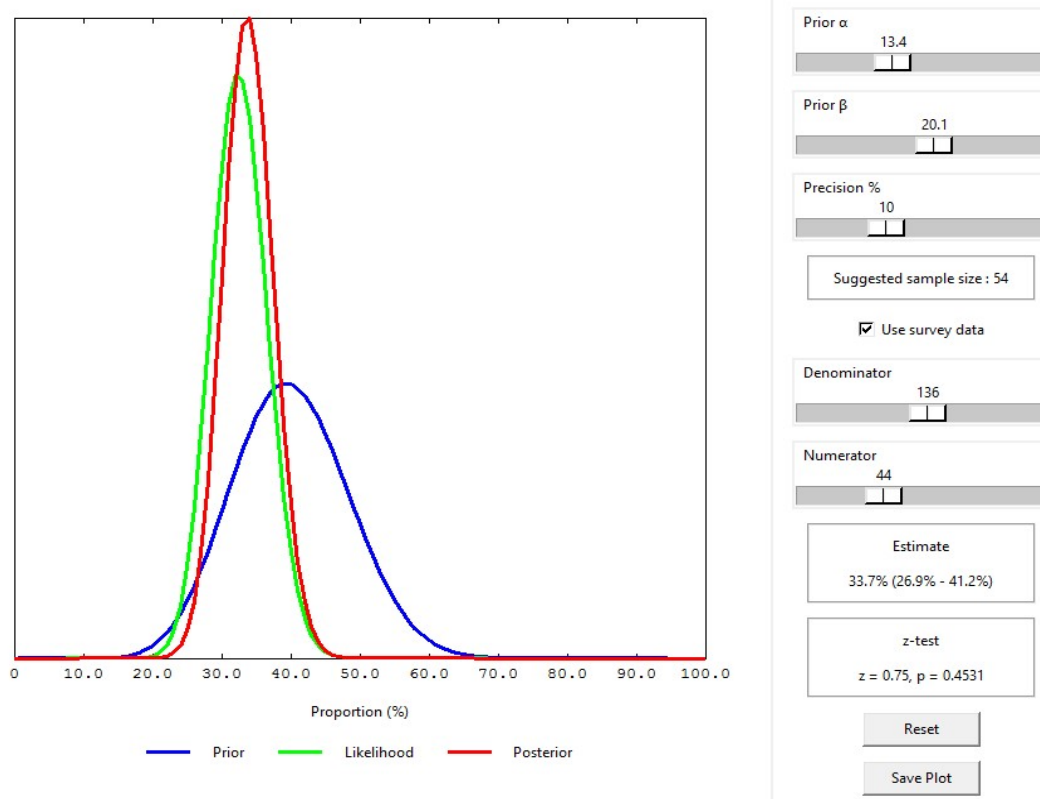
Numerator	44
Denominator	136

With these figures the single coverage was also calculated through the BayesSQUEAC calculator that combines the information from the prior and the likelihood with the following result:

33.7% [95%CI: 26.9% to 41.2%]

This coverage estimate is below the SPHERE standard for rural CMAM programmes of 50%. The Bayes SQUEAC calculator presents the following posterior curve (red), based on the prior (blue) and the likelihood (green) information (through Bayesian conjugate analysis).

Figure 21 - Representation of the single coverage estimate for TSFP including the prior, likelihood and posterior

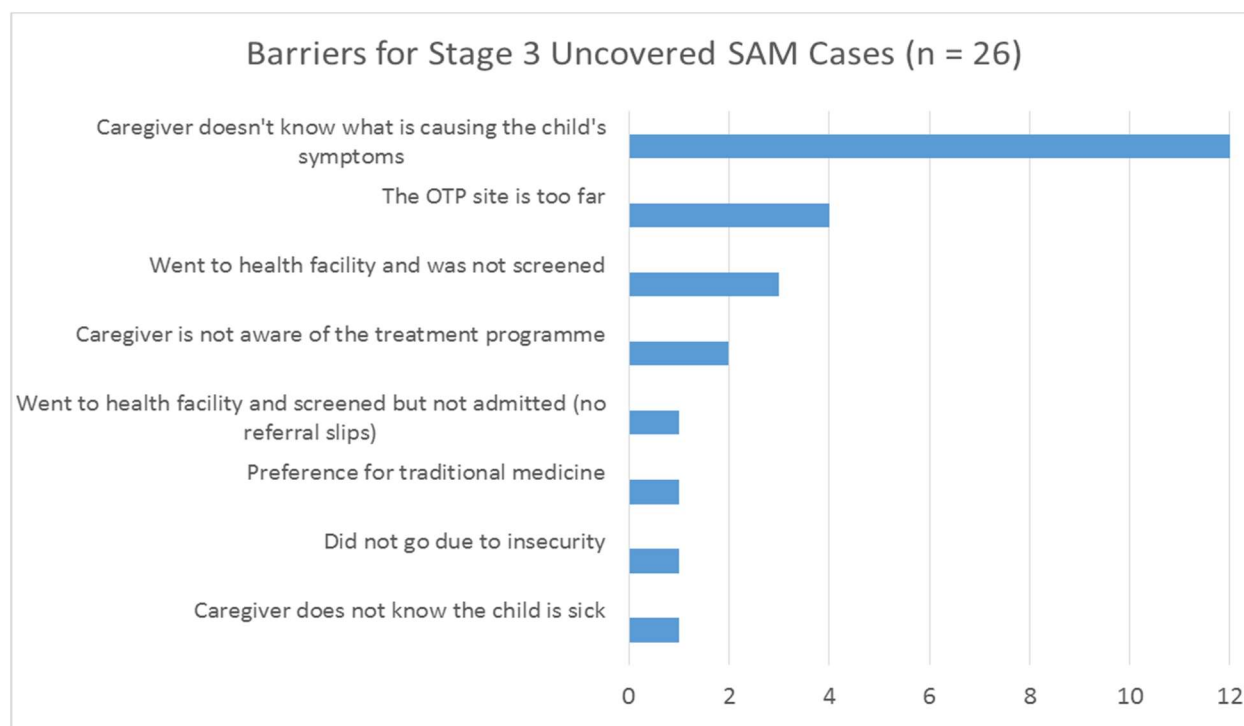


The conjugate analysis does not present any conflict between the prior and the likelihood, meaning they both provide a similar estimation. Therefore the prior is in accordance with the likelihood and we can accept these results.

Reasons for non-attendance

As with the small area survey, the mother of each uncovered case (both SAM and MAM) was administered with a questionnaire in order to determine the primary reason for each case is not receiving treatment. Figures 24 and 26 illustrate the important reasons from the wide area survey.

Figure 22 - Primary barriers experienced by non-covered SAM cases found during the wide area survey



It is shown here that many caregivers are aware that their child is sick, but is often not aware what is causing the symptoms. The next most common barrier relates to distance being too far, and then caregivers trying to use health facilities and not being screened for malnutrition.

The questionnaires also revealed that:

- Of 9 SAM cases, where the caregiver was aware the child was sick and they tried the local health facility for treatment, 6 were not screened. 8 tried consulting a traditional healer and 15 said that they had tried remedies of roots or herbs.
- Although 12 caregivers said they did not know the reason for the child's illness, 6 of the others specified that symptoms were due to malnutrition.
- Of all the caregivers, 14 say they know about the treatment programme

It can be seen from the results that the areas where there are less OTP sites have lower coverage. In the illustration below, the green represent covered and orange uncovered SAM cases. The locations with most covered cases are where there are more OTP sites.

Figure 23 - Chart showing SAM cases found during wide area survey by payam and showing implementing partner

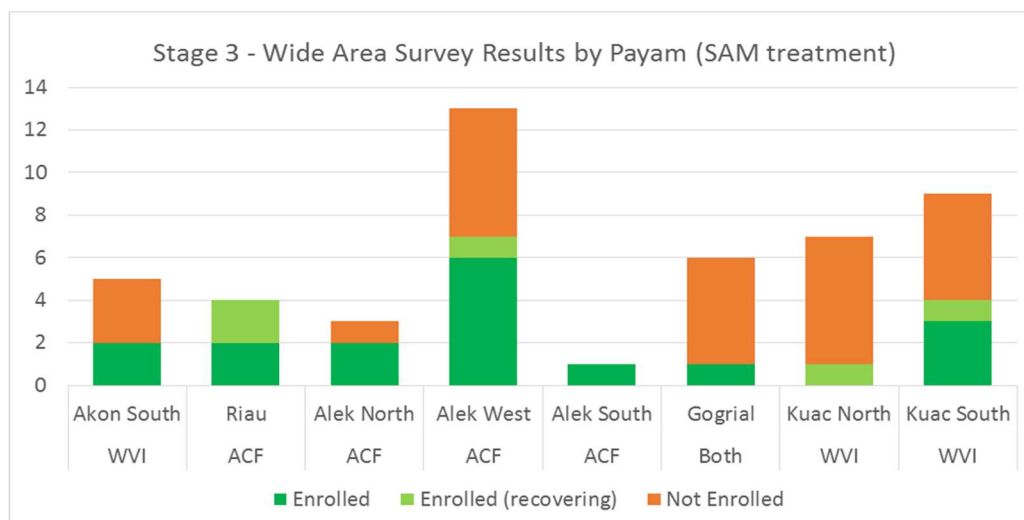
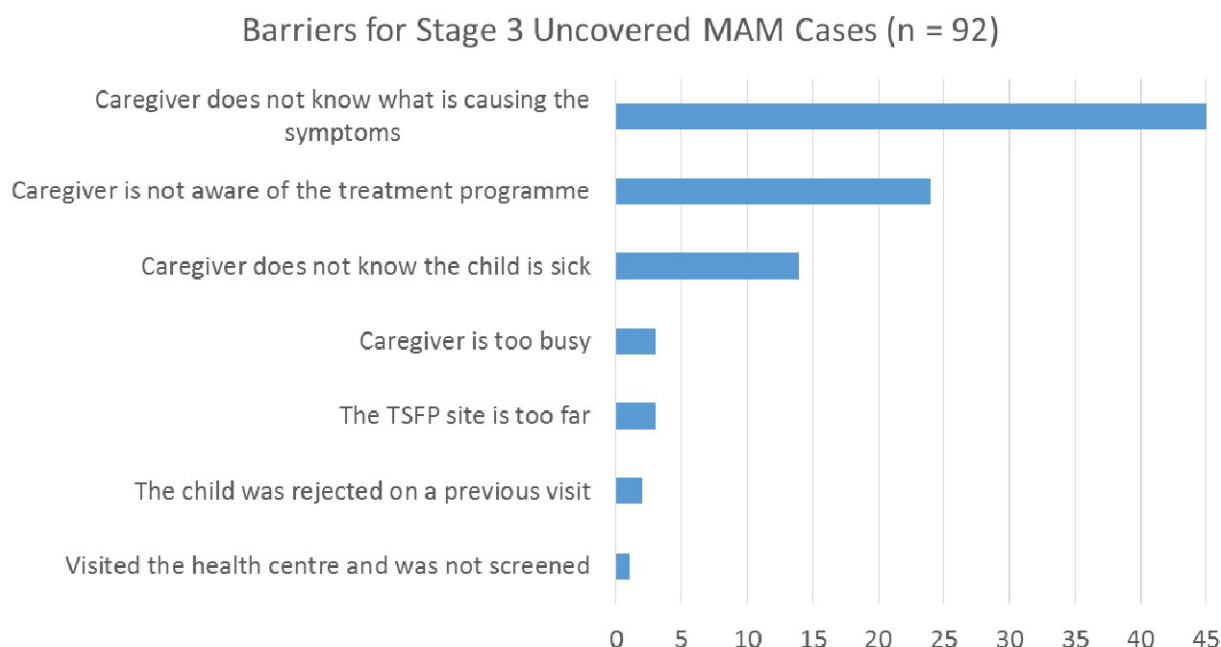


Figure 23 shows some similarities with barriers to accessing the TSFP programme. In particular that the most common barrier is caregivers not understanding the cause of their child's symptoms. The symptoms are also less reported in the MAM cases (average 2 symptoms per case compared with an average of 3 for SAM cases). This may be due to the fact that MAM is less visibly obvious than SAM. Indeed, questionnaires revealed nine mothers who know about the programme and what it is for, but are not aware the child is sick.

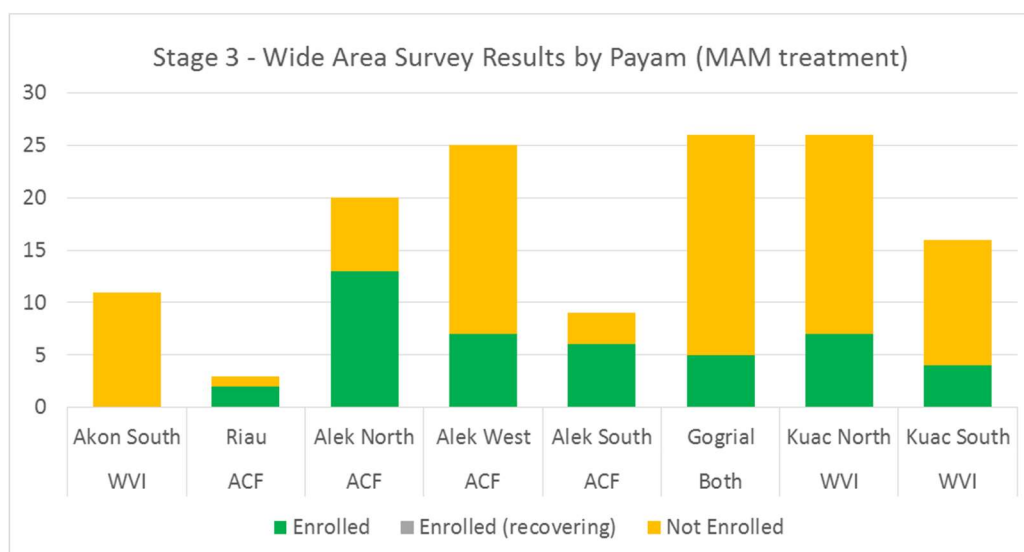
A notable difference with the TSFP is that there are more caregivers who say they are not aware of the MAM treatment services available. There were also several complaints from caregivers who were aware of the programme that their child was measured as healthy at the site. This was mostly perceived as 'rejection'.

Figure 24 - Primary barriers experienced by non-covered MAM cases found during the wide area survey



Due to the long-term stockouts at World Vision TSFP sites, the same representation of cases by payam was created. Figure 24 illustrates the MAM cases found during the wide area survey and shows that such long term stock outs have severely affected coverage.

Figure 25 - Chart showing MAM cases found by wide area survey by payam and showing implementing partner



Enrolled cases

From the questionnaires of enrolled cases (both OTP and TSFP) a few key points to highlight are:

- 9 of 21 (43%) caregivers of SAM cases and 32 of 44 (74%) caregivers of MAM cases said that they have been enrolled in a CMAM programme before
- In the OTP, all but one of the covered cases are relapsed and in TSFP, 25 of 32 are relapsed cases. Discharged not cured are NR or distance defaulters
- When asked: what were the main things that encouraged a caregiver to admit their child in the programme, many caregivers cited support from other parents of malnourished, neighbours and community were cited showing good word of mouth and influence from community members.

12. CONCLUSION

The assessment estimates that coverage of SAM treatment (OTP) in Gogrial West county is **42.2%** [95%CI: 32.1% to 52.9%]. For MAM treatment (TSFP), coverage is estimated at **33.7%** [95%CI: 26.9% to 41.2%]. Both of these estimates are below the SPHERE standard of 50% for rural CMAM programmes. Due to the higher number of TSFP sites delivering services, it was expected that the TSFP coverage would be the higher of the two, however, the ongoing absence of RUSF at all 15 World Vision TSFP sites at the time of the assessment, is reflected in the low estimate of the TSFP. Such stock breaks significantly affect the coverage of these programmes and remain a key barrier to programme activities.

During the assessment, the delivery mechanism of Action Against Hunger was assessed independently and more thoroughly than that of World Vision International due to the availability of extensive data for analysis at Action Against Hunger in Alek. For the community and survey elements (Stage 2 and 3), the entire survey area was assessed in the same way across the county. Therefore, although these final coverage estimates can be seen as reliable (with non-conflicting prior and likelihood estimates), it should be noted that there may be some findings relating to service delivery at World Vision sites that have not been identified. At Action Against Hunger sites, the general recording, reporting and site level practices have been found to be of good quality with good adherence to protocol.

The key barriers to CMAM programmes in Gogrial West include several that relate to the long distances involved in any activity in the area. Caregivers have difficulty travelling to sites further than 2 to 3 hours walking distance without transportation or support at home despite the fact that most who know about the programmes are willing to be enrolled. This issue is worsened when caregivers who overcome the challenges of long distances are disappointed when there is no treatment, or to find, only once at the site that their

child is not eligible for treatment. This occurs when the child has not been screened in the community, or the caregiver has not fully understood the purpose of the programme.

Long distances also have an impact on programme activities in terms of community mobilisation and screening and referral. The assessment found that CNVs are only able to cover relatively small areas around the CMAM sites and that they often are met with resistance from caregivers and community members. The community mobilisation activities suffer similar limitations meaning that those living within 2 to 3 hours of a programme site exhibit better access and awareness of malnutrition and the programmes and those living further away have less knowledge of either.

A further barrier to treatment relates to this awareness of the condition of acute malnutrition. From the qualitative data, although there seems some improvement in the understanding of malnutrition relative to previous assessments (e.g. by those who are enrolled and attend the programmes), there is still work to be done to address that many caregivers still do not link the signs and symptoms they see in their child to the condition of MAM or SAM. Furthermore, the first point of reference for health concerns are traditional healers, who generally do not know about the programmes, their purpose or how they work. This represents an opportunity for accelerating the community mobilisation strategy. In particular, sharing messages that dispel beliefs that lead to shame and stigma, such as breaking perceived linkages between malnourished children and sexual activities.

The low coverage results for both programmes may also be surprising when considering the high number of admissions to these programmes, and in this respect, the analysis of data relating to enrolled cases has also been revealing. In Gogrial West, as touched upon above, many of the admissions are relapses, or individuals who have been admitted before. Although this shows good perception, willingness to be enrolled and message sharing, it also should be considered when reviewing and analysing quantitative data.

The following section outlines a series of recommendations based on the evidence from this assessment and using detail from qualitative data collection and analysis to inform specific activities, particularly relating to community mobilisation in order that Action Against Hunger and World Vision International can continue to address these challenges and improve coverage of SAM and MAM treatment in Gogrial West county.

13. RECOMMENDATIONS

Recommendation	Rationale	Suggested approach / activities	Priority
Improve supply management	- PCA with UNICEF are commonly delayed causing gaps in central distribution - Administration of forecast requirements needs improvement - Seasonal and emergency peaks in supply needs are not anticipated in time to avoid stock breaks	○ Avoid administrative delays. Joint action plan with UNICEF and donors to agree PCAs in good time before cessation of current implementations ○ Improve monitoring, ordering and distribution systems. - Consider including relapse and returning defaulters into supply requests - Review data for rationing to check if higher than average 21 packets used for forecasting ○ Increase contingency / emergency percentage of supply in order to maintain a buffer stock in case of unpredictable peaks in supply needs ○ Prepositioning of stock according to seasonal inaccessibility	High
			High (in progress at Action Against Hunger)
			Medium
			High
Scale up CMAM service provision	- SAM treatment availability is low and sites near areas without OTPs have increased burden - CMAM programmes and services strengthen weakened general health service options	○ More OTP sites should be introduced starting with implementation where TSFPs are already operational (WVI sites) ○ Coordinate with MoH for more hosting facilities as communities already know where PHCUs are and community mobilisation activities can be coordinated ○ Prioritise new locations where communities are far from current programme activities, for example in border areas or inaccessible areas	High
			Medium
			High
CNV network: Increase geographic coverage	- CNVs experience challenges with screening and referring across large areas - CNVs are not able to efficiently communicate due to poor network access and scattered populations	▪ Increase number of CNVs to 10 per site and to continue strategies to have CNVs focused at community more than facility ▪ Distribute bicycles to increase possible geographical area covered by CNVs ▪ Communications (to provide megaphones and support to visit local events / meetings) – and to encourage better use of existing communications channels especially when there are stock breaks	Medium
			High (ongoing at Action Against Hunger)
CNV network: Strengthen support provision for CNVs	- CNVs experience negative responses at village level and often are accused of having other motives, even when sometimes out of pocket for conducting activities - CNVs are not always able to follow up on cases or experiences	▪ Improve feedback loop for cases ▪ Plan acceptance of CNVs into community mobilisation activities, particularly in villages and areas that are not their home, or where they were selected as CNVs ▪ Reimburse out of pocket expenses	Medium
			High
			Medium

Community mobilisation	- Key community figures often commonly not aware of CMAM programme availability and how it works - Several key community members are interested and willing to share information and know households - Traditional healers are often the first point of contact for health issues - Many mothers and other community members have traditional (and misleading) ideas of the signs and symptoms of malnutrition	○ Sensitise key community members of CMAM programme sites and train in MUAC screening and referral. ○ Review structure of sensitisation activities to be more systematic and increase knowledge / information sharing network ○ Health staff at PHCC, PHCU and hospital ○ Traditional healers to get training on CMAM and be given MUAC tapes and referral slips ○ Mothers for MUAC ○ TBAs ○ Increase awareness of key stakeholders about malnutrition (real causes, signs and symptoms, nutrition) and CMAM programmes (where they are, how they work, who can use them, purpose of the programme) to include: ○ Mother to mother support groups (and they should be focused away from sites – in community) ○ Men / fathers ○ Payam administrators, chiefs, religious leaders ○ At schools and teachers to do sensitisation sessions (dramas, role plays) ○ Demonstration plan for mother-to-mother (cooking, washing, breastfeeding demo's)	High
			Medium
			Medium
Develop data management and utilisation	- Poor availability of WVI routine programme data from WVI leading to low level of analysis - No access to WVI programme treatment cards leading to poor verification - Limited recording of accurate community activities	○ WVI need to verify reliability of data by checking processes and procedures through treatment card checks, improved data flow and to check adherence to protocol (CNVs are doing processing at the moment) ○ Strengthen documentation and monitoring of community activities to improve feedback and follow-up mechanisms including rolling out of duplication referral slips from facility to community	High
			High
Ongoing monitoring and assessment	- Data collection and analysis found to be reveal useful insights into programmatic strengths and weaknesses - Geographic data (site locations etc) was not available for spatial patterning	○ Continue to use SQUEAC tools and elements ○ WVI to conduct data analysis ○ Conduct NCA for in depth understanding of causes of malnutrition ○ Collaborative development of joint action plan relating to community activities and monitoring	High / Medium
Quality of care	- CMAM sites varied in terms of facilities and comfort	○ Breastfeeding corner ○ To ensure waterproof shelter ○ Improve facilities, especially seating area and waiting times • Staffing at WVI – review workload and processes at health facility, review of community mobilisation activities currently done just by CNVs	Medium

Previous recommendations for addressing barriers

No.	Barrier	CSAS 2009	SQUEAC 2011	SQUEAC 2013	SQUEAC 2017	Remark
1	Stock breaks	✓	✓	✓	✓	Consistently regular breaks
3	Rejection at health facility	✓	✓	✓	✓	Healthy children not being admitted is still considered rejection showing weak understanding of the program
4	Traditional healers not used to refer malnourished children	✓	✓	✓	✓	Identified over time but not addressed
5	Significant parts of the program area not covered by CNVs or outreach	✓	✓	✓	✓	Improved in parts but generally still a key barrier
2	Poor access to parts of the county seasonally	✓	✓	✓	✓	Stock pre-positioning is beginning to be implemented
6	Shame to attend the program	✓	✓	✓	✓	Exists but weaker – links with poor understanding of malnutrition
7	High opportunity costs for caregivers	✓		✓	✓	Generally roofing, childcare and planting / harvesting
8	Poor understanding of malnutrition	✓	✓	✗	✗	Still exists and links with preferring to use traditional healers
9	Program not known	✓	✗	✗	✗	This is no longer found to be a barrier
10	Limited incentives for caregivers	✓	✗	✗	✗	This is no longer found to be a barrier

✓ = Barrier still exists

✗ = Barrier has been addressed

14. ANNEXES

Annex 1 - Workplan

Annex 2 - List of interviews

Annex 3 - Interview Guides

Annex 4 - Villages selected

Annex 5 - Covered questionnaires

Annex 6 - Uncovered questionnaires

Annex 7 - Villages with results