TANA RIVER COUNTY

Semi Quantitative Evaluation on Access and Coverage Report

JANUARY 2020

Acknowledgement

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Acronyms and Abbreviations

BBQ	Barrier Booster Question
BSFP	Blanket Supplementary Feeding Program
CC	Community Conversation
CBRAs	Community Birth Referral Agents
CHV	Community Health Volunteer
CMAM	Community Management of Acute Malnutrition
CNC	County Nutrition Coordinator
CU	Community Units
IMAM	Integrated Management of Acute Malnutrition
LQAS	Lot quality Assurance Sampling
MAM	Moderate Acute Malnutrition
MUAC	Mid Upper Arm Circumference
OFDA	Office of Foreign Disaster Assistance
OTP	Outpatient Therapeutic Program
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Program
SQUEAC	Semi Quantitative Evaluation on Access and Coverage
UNICEF	United Nations Children's Fund

Table of Contents

List of Tables

List of Figures

Executive Summary

Introduction

Concern Worldwide in conjunction with Tana River County Government Department of Health conducted coverage assessment for OTP and SFP program in Tana River County. The County has over the years suffered the burden of malnutrition. It was among the worst hit by prolonged drought between 2018 and 2019. Major ethnic groups; the Pokomo (predominantly agriculturalists and fishermen living along the Tana River). Then, the Orma (semi-nomadic shepherds) found in hinterland, Wardey (an ethnic Somalia pastoralist community along River Tana) and the Watta (previously hunters and gatherers, but now taking small menial jobs and businesses) and other populations comprise of different minor ethnic communities who have settled in Hola town to do business. The County has 51 health facilities, in which 50 of them offer full IMAM services and implement surge model to monitor the performance of both outpatient therapeutic Program (OTP) as well as well as the supplementary feeding program (SFP).

The main objectives of the assessment was to assess the overall coverage for OTP and SFP in County, to identify barriers and boosters for OTP and SFP uptake, as well as providing recommendations for future programming. This assessment was carried out in the entire Tana River County between 16th January and 6th February 2020. SQUEAC methodology was used.

The single coverage of Tana North Sub County of OTP was **62.4 %(50.2%-73.0%) and for SFP was 60.6 %(53.4%-67.1%)** was unveiled by the assessment, which was above the 50% SPHERE standard for coverage in rural set ups.

The Single Coverage of Galole Sub County of OTP was **53.7 %(39.1%-67.1%) and for SFP was 48.9 %(38.5%-59.6%)** where OTP was above the 50% SPHERE standards while SFP program was below the 50% SPHERE standards.

The Single Coverage of Tana Delta Sub County of OTP was **45.5 %(32.7%-59.3%) and for SFP was 39.1 %(31.6%-47.4%)** which was below the 50% SPHERE standards.

Methodology and Key Findings

SQUEAC is a 3-stage methodology that combines an array of qualitative information about access and the perception of CMAM program with small sample quantitative surveys. Stage one involved collection of quantitative (routine program data) as well as qualitative data.

Some of the barriers identified to affect the program negatively included; distance (due to the vastness of the county) which couple with poor road network, which makes Health facility inaccessible. Sharing of the commodities in the community was a big challenge of the IMAM program. Stigmatization at the community level was also a major challenge for IMAM program, which make a family refuse to admit their children in the program. The nomadic lifestyle of the community highly affected the IMAM program where they keep migrating hence resulting to high defaulter rate. Other barriers included; weak defaulter tracing mechanism in the county, language barrier between the community and the health workers, Irregular sensitization meeting at the community Insecurity especially intertribal clashes and also stock out of IMAM commodities at the health facility. It is therefore necessary to put more resources in strengthening, community units, outreaches as well as mobile clinics.

Some of the boosters identified that positively affect the program that need to be strengthened included; availability of tools like MUAC tapes and referral forms at the community. Presence of the integrated outreaches, which brings the services to the community close to them, availability of nutrition commodities at the health facility, encourages mothers to enrol their children to the IMAM program. In additional, Existence of defaulter tracing mechanism by the CHVs, which reduces the children defaulting from the IMAM program and active case finding by the CHV, encourages early detection of malnutrition among children.

Chapter one: Context of Tana River County

1.1 Background

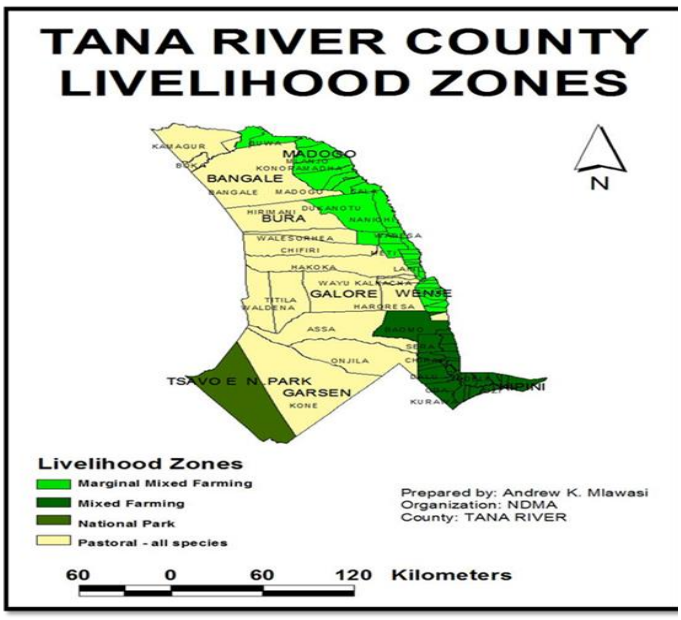

Figure 1: Tana River County Livelihood Zones

Tana River County is located in the coastal region of the Republic of Kenya. It borders borders Kitui County to the West, Garissa County to the North East, Isiolo County to the North, Lamu County to the South East and Kilifi County to the South. It has three Sub Counties namely; Tana North, Galole and Tana Delta. Tana River County occupies an area of approximately 38,437 km2, with an estimated population of 324,054[1] people. The Population of Under-five is approximately 20% of the Total Population which 64,811 Children.

Tana River County has four main livelihood zones namely; National Park, pastoral all species, marginal mixed and mixed farming livelihoods as shown in figure 1 below. The County has only one water source (River Tana) that traverses the County from the northern border all the way to the Indian Ocean in the south. The County experiences bimodal rainfall pattern with long rains falling between April and June and short rains between October and December.

Tana River County is classified at Serious Phase (IPC for acute malnutrition), with GAM and SAM prevalence of 14.8% and 2.6% respectively (Integrated SMART survey of February 2019). The Prevalence of Acute malnutrition by MUAC is 2.7% with SAM being 0.3%. According to the NDMA bulletin Drought, phase classification is Alert on Worsening trend with VCI being at moderate vegetation deficit with any changes highly dependent on the onset of the short rains.

1.2. Rationale of Coverage Assessment.

According to IPC analysis and classification, the county is classified in the stressed food security phase classification (IPC Phase 2) in mixed farming zones of Tana Delta and crisis (IPC Phase 3) in pastoral and marginal mixed farming zones of Galole and Tana North. This is attribute to lower than normal rains with late onset, amounts and early cessation characterized by water, pasture scarcity, low household stocks, high maize prices, and increased malnutrition with a possibility of drought, hence there is need to understand IMAM program performance and effectiveness in order for program implementers to know the un-met program needs. In addition, as part of nutrition emergency response in Kenya, Concern Worldwide was funded by UNICEF to implement an assess coverage in Tana River County. This is to help the county program teams from the ministry of health and partners, to understand their program effectiveness especially during the deteriorating food security and nutrition situation following failed rains and generate reconditions and action points to improve coverage. Lastly, there was need to assess the progress of implementation of previous (2013) SQUEAC assessment recommendations.

[1] KNBS 2019

Table 1: 2018 Recommendation and Status

BARRIER	RECOMMEDATION	STATUS
Health workers absence (Absenteeism & nurses strike)	• Routine spot checks and supervision need to be done by health managers (SCHMT/CHMT) to health facilities and address staff absenteeism • Map out county health work force (nurses and nutritionist available) and advocate for county government for employ more staff (at least 2 health workers in every health facility). County government and Health managers to work out on ways to retention staff.	• 21 nutrition officers were employed in 2017 • Mapping done but no retention strategy adopted by the county government
Inaccessibility of the service (health facility location, outreach service inconsistency and nomadic lifestyles)	• Consistent integrated medical outreaches • Open closed facilities and equip new facilities in the county • County government to employ more staff for use within new facilities. • Logistical and financial support need to be provided	• More facilities have been opened and staffs deployed • Funding for nutrition program is still low
Lack of active case finding due to dormant or no community Units	• Train CHEWs & CHVs on nutrition module and MUAC taking then Supply MUAC tapes to all CHVs within the CUs for HH case finding • Strengthen and establish more community units in order for CHWs to reach out to many community members • County government to invent in integrated medical outreaches especially in hard to reach areas. • Involve lead mothers from MTMSGs in community nutrition screening and referral. • County to factor CHWs incentives/payments within the health budget.	• All CHAs have been trained on nutrition module, all CHVs have MUAC tapes • More CUs have been established • Integrated outreaches are ongoing although they are supported by partners • The county is in the process of developing the CHS bill where CHV incentives will be included • No incentives for CHVs
Poor health seeking behaviors (children taken to local herbalist other than the health facility)	• Health educate the community on good health seeking behaviors through existing community structures (Chief's baraza's, community dialogues) • Involve religious leaders (IMAMs/Pastors) to educate the community on good health seeking behaviors	• Currently on going during the dialogue days at the CUs

Negative opinions & cultural beliefs and stigmatization (pregnant mothers with malnourished child, malnutrition caused by infidelity by husband)	• Health educate the community on malnutrition through existing community structures (Chief's baraza's, community dialogues) • Involve religious leaders (IMAMs/Pastors) to educate the community on malnutrition • There is need to make community and community leaders aware of what malnutrition is all about	• Ongoing during the dialogue days
Lack of Defaulter tracing and defaulting by clients	• Thorough health education on malnutrition need to be given to the caregivers/mothers • There is a need to strengthen defaulter tracing mechanism within all the facilities • Regular home visits need to be done by the CHWs • Inter facility linkages need to be enhanced to curb defaulting that results from nomadism	• Ongoing at the health facilities through health education • Defaulter tracing is done by CHAs

1.3. Coverage Objectives

The overall objective of the coverage assessment was to estimate the single coverage of IMAM program in Tana North, Tana Delta and Galole Sub Counties.

Specifically the assessment aimed at achieving the following objectives;

- To assess the overall coverage for OTP and SFP in Tana North, Tana Delta and Galole Sub Counties
- To identify barriers and boosters for OTP and SFP uptake
- To come up with recommendations to improve on OTP and SFP coverage in the Sub Counties

Chapter Two. Investigation Process

2.0. Introduction

Semi Quantitative Evaluation on Access and Coverage (SQUEAC) methodology was used in the assessment. SQUEAC method is a comprehensive, iterative tool to analyze the barriers and boosters to coverage and gives estimate coverage. SQUEAC also provides succinct actions for improving access and coverage (CMN). The method is a low resource 3 stage model. Stage 1 involved identifying areas of low and high coverage as well as reasons for coverage failure using routine program data, any other existing data and qualitative data. Quantitative routine program data was obtained from the IMAM registers of health facilities from the three Sub- counties. Qualitative information was obtained from various sources that included health facility in charges and nutrition officials, religious leaders, caregivers, health facility nurses, traditional birth attendants (TBAs), Traditional healers, CHWs/CHEWs, program staff, community members and local leaders.

Stage 2 involved confirming the location of areas of high and low coverage and the reasons for coverage failure identified in stage 1. This was done using the small studies, small surveys and small-area surveys.

Stage 3 involved providing an estimate of overall program coverage using Bayesian techniques. The prior mode was computed using the average of the total sum of weighted boosters and barriers plus unweighted barriers and boosters, concept map plus the belief (histogram). This combination both identifies key issues affecting presentation and program uptake real implementation whilst also establishing the actual levels of coverage attained. Vitally, all this can be done in time, allowing the tool to be of immediate practical use to tweak program design and in response to the information obtained (Mark Mayatt 2012).

2.1 Tana North Sub County

2.1.1. Stage One: Identification of Program Low and High Coverage Areas in Tana North Sub County.

In order to identify areas of high and low coverage, analysis of routine program data was done. Data was collected in all 11 sites that offer OTP and SFP program in the entire sub county for a period of 12 months (From January 2019 to December 2019). Data collected from the sites included; OTP and SFP admissions per month, admission MUAC , exits (cured, defaulters, deaths, non-responses) on monthly basis, defaulters based on their villages of residence and defaulting visits, disease calendar. The investigation team also developed seasonal calendar during the first stage. Qualitative data was also collected using a number of methods and sources to a point of *sampling redundancy* as it will be described later in the report.

2.1.2. Quantitative Data Collection and Analysis

2.1.2.1 Admission Trends

Analysis was also done for program admission for OTP and SFP program from January 2019 to December 2019. This was plotted as indicated in figures 2 and 3 below. The investigation team developed a seasonal and events calendar. The calendar included all the events that may have contributed to coverage and access of IMAM program in Tana North Sub County. Low admissions were recorded during the month of October 2019 to December 2019. This was as a result of floods which rendered the roads impassable for the community to access health care. High admissions were recorded between the months of August and October 2019 due to ongoing emergency response which included integrated outreach activities and mass screening resumed during this period.

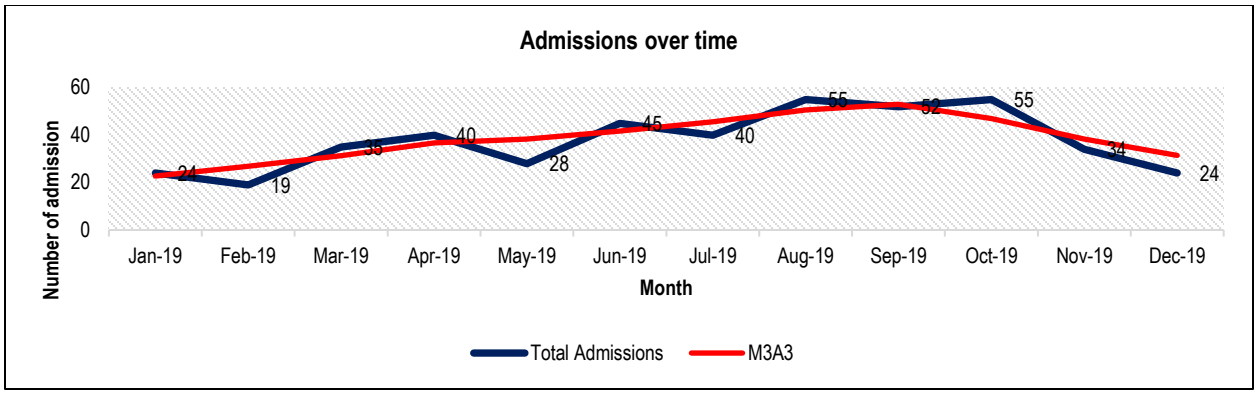

Figure 2: Tana North OTP Admission Trend

Table 2: Seasons and events Calendar

Events	Jan-19	Feb-19	Mar-19	Apr-19		May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition		Diarrhoea	Malaria and	Malaria and Pneumonia	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea/ Malaria/	Diarrhoea /Malaria/
Food/Milk availability													
Wet & Dry Seasons													
Planting /weeding													
Long & Short rains harvest													
Workload & Land prep													
Insecurity/Conflicts													
Migration (lean period)													
High Food Prices													
Floods													
Festive seasons						Ramadhan	Iddul fitri		Circumcision	Iddul Adha	Maulid	Circumcision	Christmas /Circumci
Outreaches	+	+	+	+		+	+	+	+++	+++	+++	+++	+++
Drought													

Analysis of SFP admission revealed the same trends as OTP as illustrated in figure 3 below, with admission spikes being noted in September and October 2019 with similar explanations as the one provided for OTP program. Bura and Madogo health facilities had the highest number of admissions in both OTP and SFP.

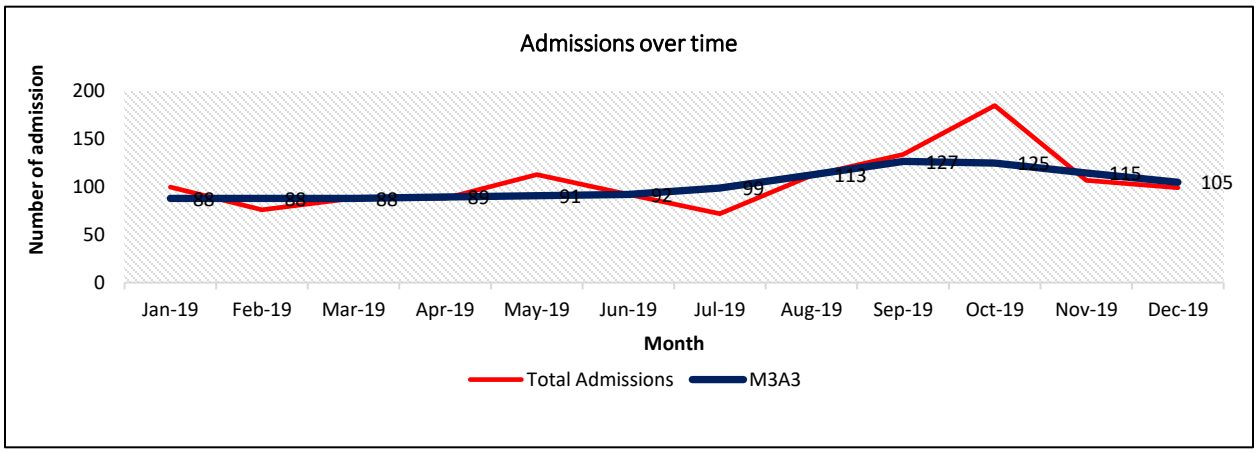

Figure 3: Tana North SFP Admission Trends

Events	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition	Diarrhoea	Malaria and Pneumonia	Malaria and	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea /Malaria/	Diarrhoea /Malaria/
Food/Milk availability												
Wet & Dry Seasons												
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Outreaches	+	+	+	+	+	+	+	+++	+++	+++	+++	+++
Drought												

2.1.2.2. MUAC on Admission

Plotting admission overtime is useful but ignores the issue of timeliness of admission. Children with MUAC below the admission criteria (<11.5cm or 115mm), or with nutrition oedema should be in the program. If many of these are not in program, then program coverage is low. Children who are admitted to the program after they have met program criteria after a considerable period are said to be late admissions. Late admission is associated with the need for inpatient care, longer treatment, defaulting and poor treatment out comes (including death). These can lead to poor program opinion by the host community leading to late presentation and program admission in a negative feedback cycle.

Analysis of OTP admission time indicated that majority of children are admitted in OTP early with the mean median admission MUAC being 110mm as illustrated in figure 4 below. In this regard, children admitted in OTP program are likely to have good outcome (cure). They are also unlikely to develop complications, default and take a shorter period in the program. As such, the community is likely to have a positive program opinion and hence early presentation in the program. Early admission was therefore one of the program booster in this program.

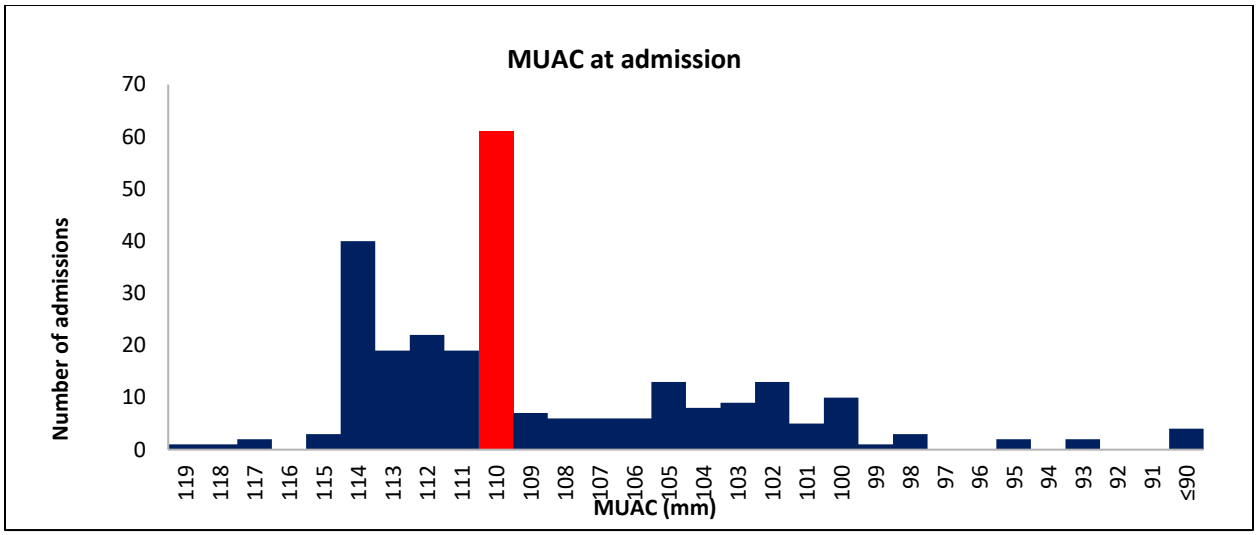

Figure 4: Tana North OTP MUAC at Admission

Similarly early admission was also noted in SFP program where the median admission MUAC was 120mm. In case of SFP, the admission where MUAC is the criteria should be 125mm, which is attributed to continuous screening by CHVs at the community. Similar benefits as described in OTP will be accrued in case of SFP, ultimately leading to positive opinion by the community.

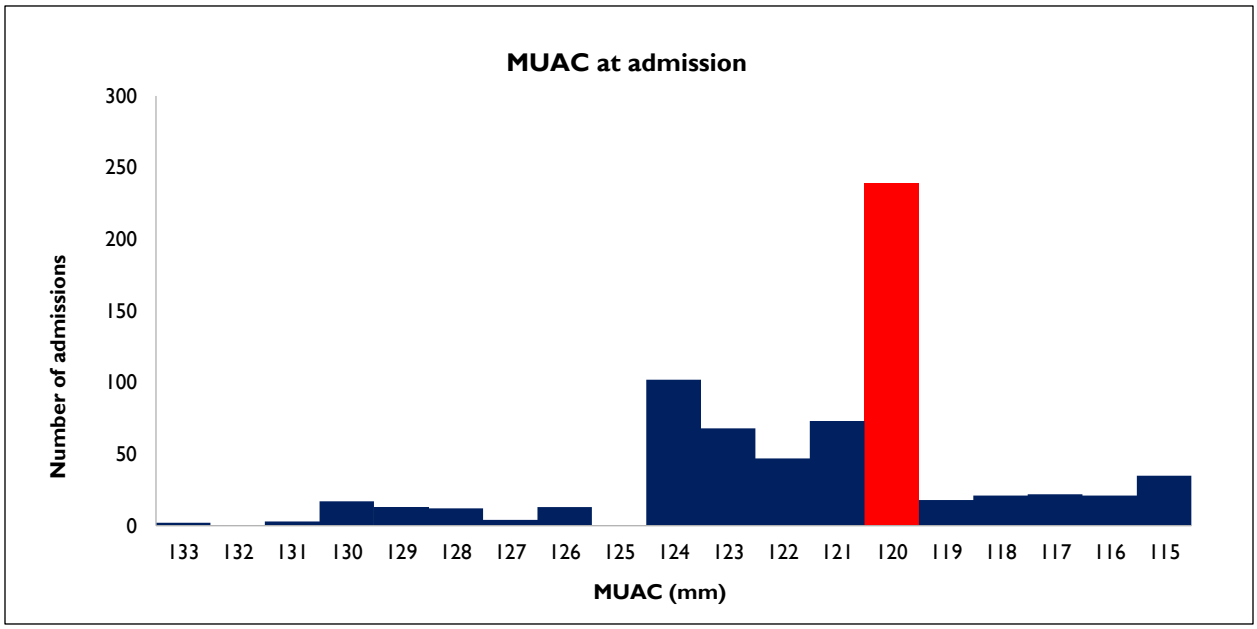

Figure 5: Tana North SFP MUAC at Admission

2.1.3. Standard Program Indicators (Outpatient Therapeutic Program)

High number of admissions does not guarantee a good coverage. Program coverage should be determined by examination of program exists. High defaulting rate is associated with low program coverage. When plotted overtime, a healthy program in which the sphere standards are being met have the cure line along the top of the graph while the defaulter and the death line at the bottom of the graph in a mirror image. In case the percentage of defaulters is more than 15%, then there is a cause of concern. Cure line should be above 75% while death line should be below 10%.

As illustrated in figure 6 below, the OTP program cure rate over time surpassed the 75% threshold in the months of March, May, June, July October and November 2019. High defaulter rate were reported in the month of January, February, April, August September and December 2019, this is attributed High food prices since it was on the peak of drought and in October due to floods immediately when short rains began making some roads impassable.

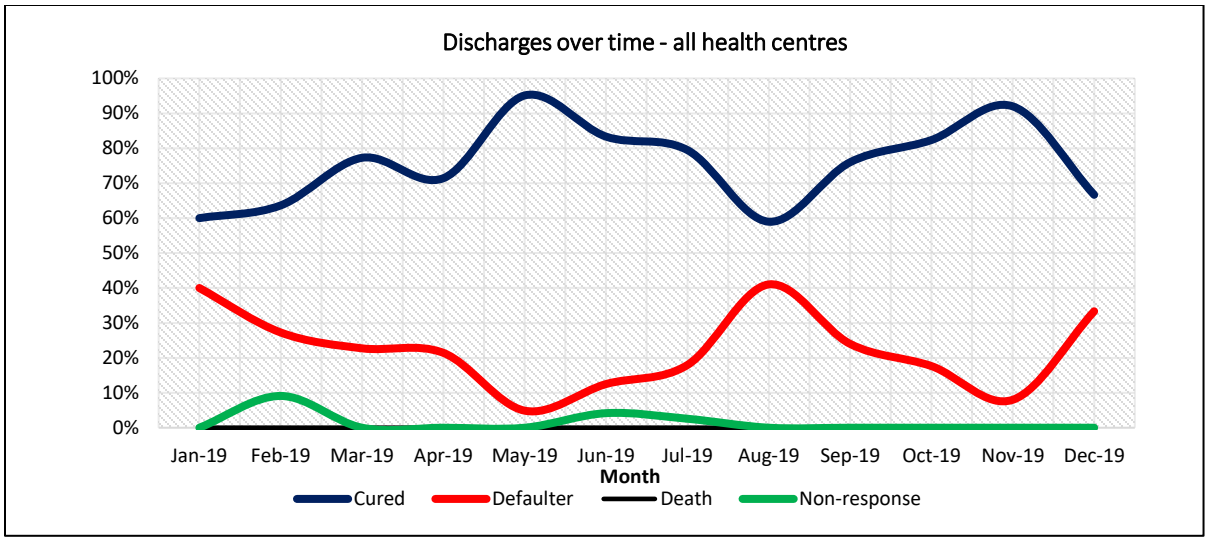

Figure 6: Tana North OTP Discharge over time

2.1.3.1 Program Exits (Supplementary Feeding Program)

In case of supplementary feeding program, there has been continuous high cure rate except April, June and September up to December 2019 .High defaulter rate was recorded in April, June, and September through to December 2019. This was because of High food prices in the month of January and February 2019 coupled with drought. In the months of September through to December were highly affected by floods making some roads impassable hence little access to Health services.

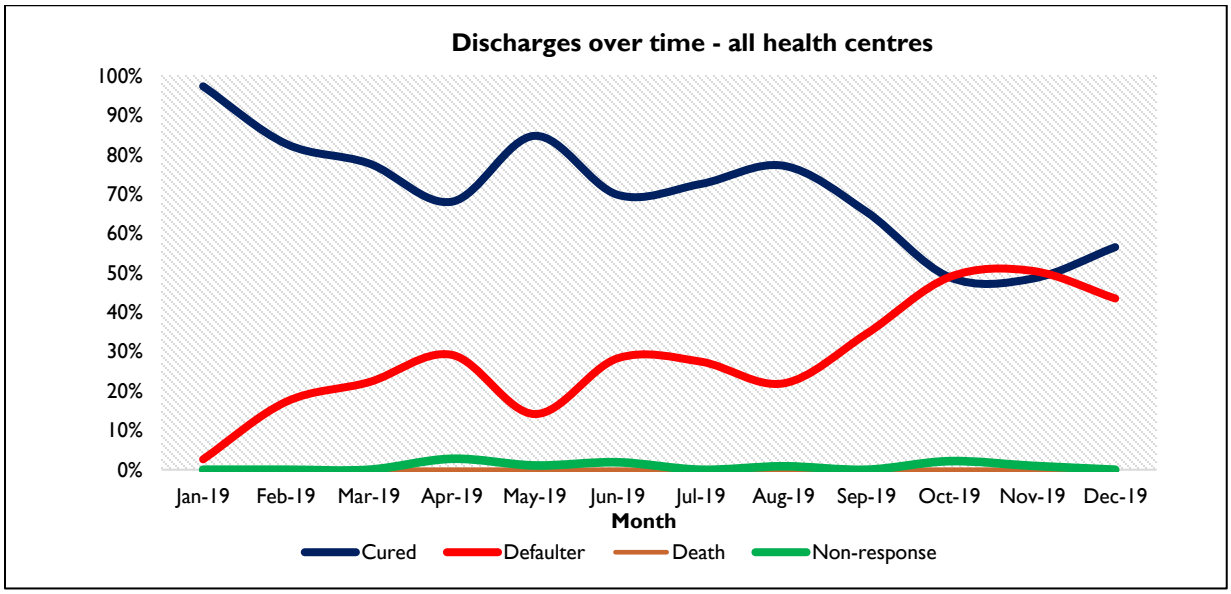

Figure 7: Tana North SFP Discharge Over Time

2.1.3.2. Program Defaulting

Program defaulting is a major barrier to both therapeutic and supplementary feeding programs. Defaulting interferes with program effectiveness as well as contact coverage (people that use a service). Defaulters are children who were enrolled into the programme, but have missed three consecutive visits. High defaulting rates are an indication of poor program coverage. IMAM program indicators should show a consistently low rate of defaulters.

Program defaulter rates might be contributed by various factors; deterioration in the security situation, leading to reduced access and availability of services, impacts of climatic conditions e.g. droughts, floods etc. that affect how populations can access services or patterns of labor demand. Therefore, the graph of the defaulters should be compared to the seasonal calendar of the region.

When the program has a high number of defaulters it will be important to know when the beneficiaries defaulted from the program.

2.1.3.3 Defaulting Trends

Outpatient Therapeutic Program (OTP)

Comparing the defaulting trends with seasonal and events calendar shows that there was a defaulting spikes in July to August 2019. During this season, there was high maternal workload as most mothers were preparing land for planting season ahead of the short rains; migration is experience leading to defaulting as illustrated in figure 10 below. The most affected sites included Mulanjo and Madogo health facilities.

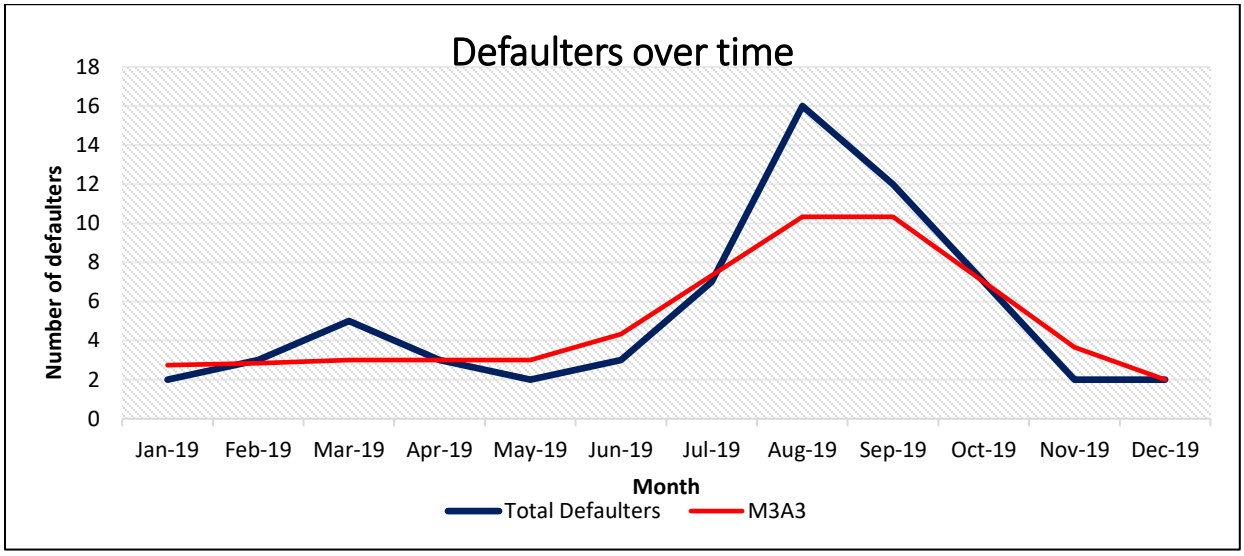

Figure 8: Tana North OTP Defaulters Over Time

Events	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition	Diarrhoea	Malaria and Pneumonia	Malaria and Pneumonia	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea /Malaria/	Diarrhoea /Malaria/
Food/Milk availability												
Wet & Dry Seasons												
Planting /weeding												
Long & Short rains harvest												
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Insecurity/Conflicts												
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Outreaches	+	+	+	+	+	+	+	+++	+++	+++	+++	+++
Drought												

Supplementary Feeding Program (SFP)

Defaulting was a major challenge in SFP program. Defaulting spikes were noted in July to November 2019. This can be attributed to migration of livestock hence population moves together as they look for pasture and water as illustrated in figure 11 below.

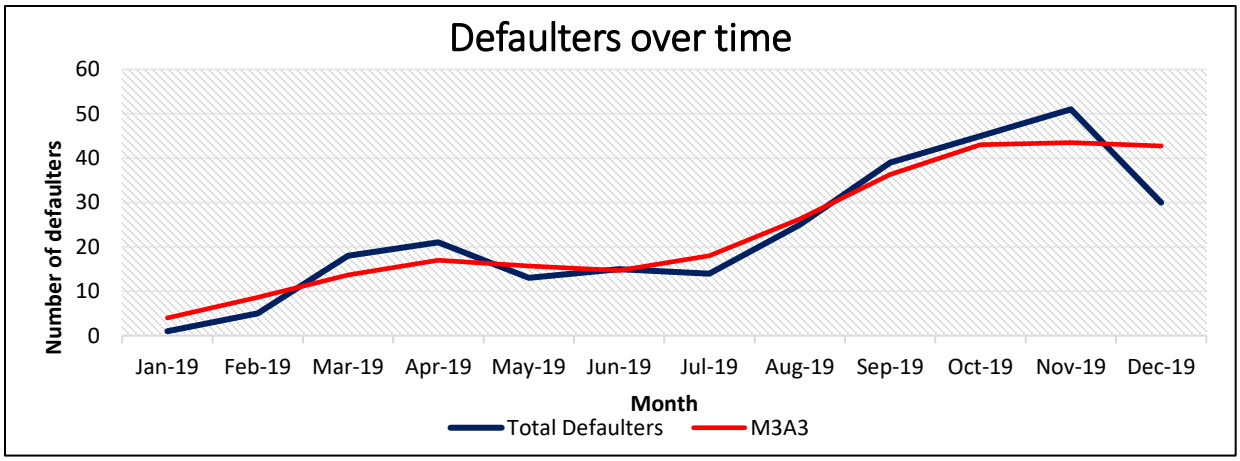

Figure 9: Tana North SFP Defaulter over time

Events	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition	Diarrhoea	Malaria and	Malaria and Pneumonia	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea/ Malaria/	Diarrhoea /Malaria/
Food/Milk availability												
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Outreaches	+	+	+	+	+	+	+	+++	+++	+++	+++	+++
Drought												

2.1.3.4. Length of Stay

Length of stay refers to the duration between the admission and discharge from the program. It is the duration of treatment episode (Mark Mayatt 2011). Long treatment episodes can be attributed to late admission or poor adherence to the treatment protocols. Programs with long treatment episodes tend to be unpopular with beneficiaries and tend to suffer from late treatment seeking and high defaulting rates.

The duration of treatment episode can be investigated using a tally plot. The tally plot makes it easier to see the distribution of the duration of treatment episodes and to calculate the median duration of treatment episodes. The *median* is the value that divides the distribution into two equally sized parts. It is not appropriate to use the arithmetic mean to summarize the duration of treatment episodes, since the arithmetic mean is strongly influenced by extreme values. Higher coverage programs tend to have a median duration of treatment episodes of less than or equal to about 8 weeks.

Length of Stay (Outpatient Therapeutic Program/Supplementary Feeding Program)

Analysis of length of stay for OTP indicated that the median length of stay for the program was 5 weeks, which is not appropriate for OTP. Only a few number of children stayed in the program for 12 weeks or more as illustrated in figure 12 below. This means that children are discharged at the earliest week meaning there is high risk of readmission in the OTP Program. The median length of stay for SFP Program was 8 weeks. The early discharge from the program with good understanding of the IMAM protocol.

Analysis of defaulting cases also showed that the median length of stay before defaulting was 2 weeks for the OTP Program. Early defaulting was recorded which is attributed to the distance to the health facilities and nomadic Lifestyles and in additional Inconsistence Outreaches. In case of SFP, the median length of stay was 4 weeks indicating early defaulting, which is negative to SFP showing poor adherence of the IMAM program. This was resulted by the fact most children left the program before they were cured which could be attributed to the floods which led to some roads being impassable and hence they could not access the health Facilities and outreaches.

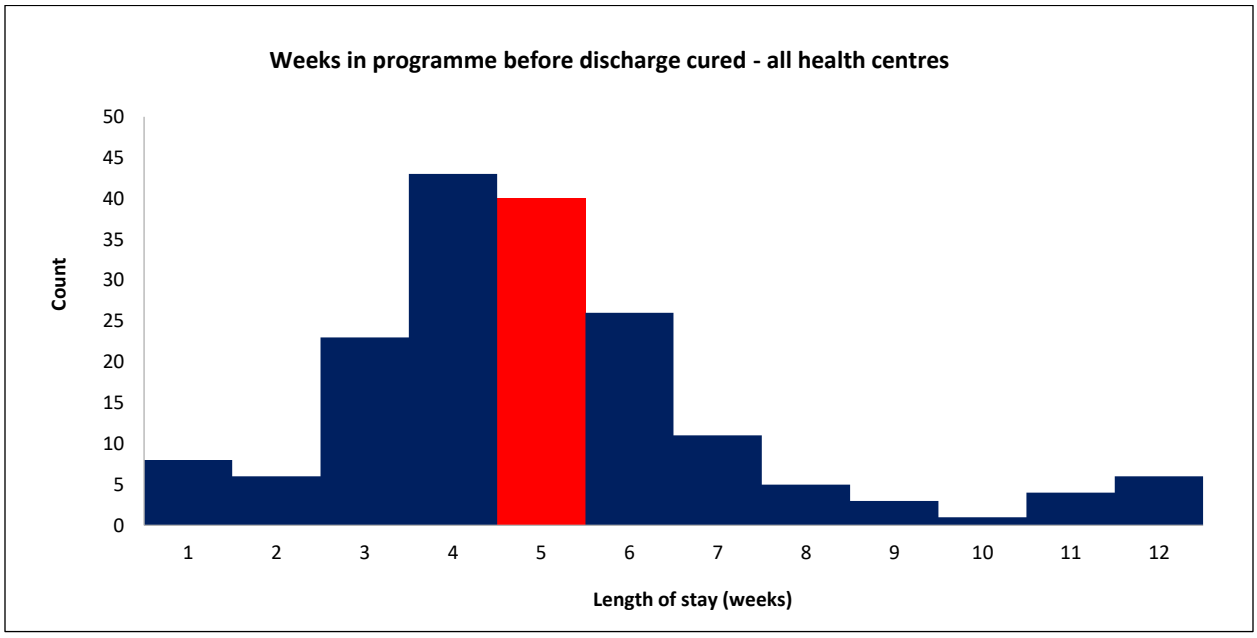

Figure 10: Tana North OTP length of stay discharge cured

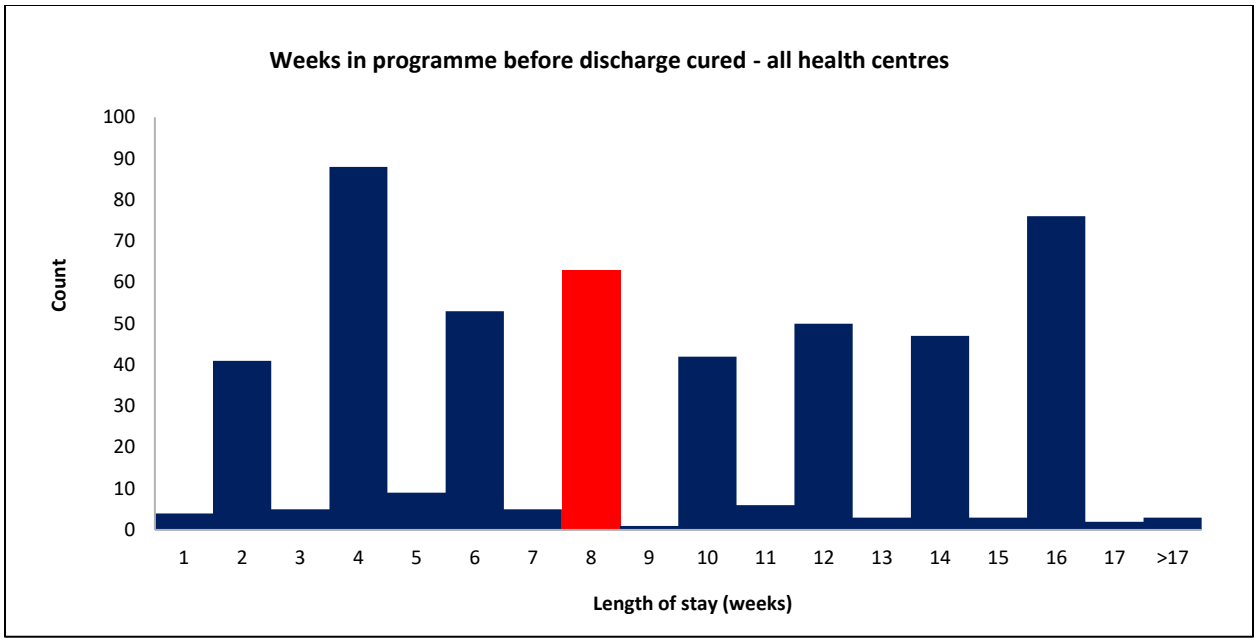

Figure 11: Tana North SFP length of stay discharge cured

2.1.4. Qualitative Data (Community Assessment)

Qualitative data was collected from different sources using various methods. These methods included; Informal Group discussions, Semi structured interviews, In-depth interviews and Observation. The data was collected from CHV, Nutritionist, Health worker, Lay people, Health Facility data, and Community leaders, Carers of beneficiaries, CBRAs, Religious Leaders and NGO agent

Four survey teams collected qualitative data from the community level. Each team comprised of 2 members.

2.1.4.1. Booster, Barrier and Question (BBQ) Development

The BBQ is a simple tool, which allows the assessment team to organize key elements, representing factors with a positive or negative effect on access and coverage, in a table format and triangulate each by source and method. It helps the team to visualize the problematic and its recurrence in key informants' answers. In consequent stages, the factors with the highest periodicity are weighted higher than elements mentioned occasionally.

The use of the BBQ tool was initiated on the first day of the community assessment, revised and modified each following day. BBQ listing was done on daily basis. Upon arrival of all teams from the field, all identified barriers and boosters were presented and discussed during a feedback session facilitated by the team leader. The BBQ is a very organic tool, demanding constant redrafting as teams add new data, combine it or discard invalidated findings. Once the final list of barriers and boosters is established and all sources, methods and demographic information are noted, the team can proceed with the weighting of individual elements in order to prioritize which are the most important barriers and boosters influencing coverage, which comes at the end of Stage 2

Simultaneously, the team leader copied each barrier and booster onto a flipchart paper, adding sources and methods every time they are mentioned by the teams. Owing to the fact that certain barriers and boosters are likely to be cited numerous times, a legend of barrier, booster methods and sources was developed. If, at the end of the day, certain barriers and boosters were mentioned only once, they were shifted to another flipchart entitled Questions. These points were further investigated and should be kept in mind for the next day's data collection.

Table 3: Tana North OTP Boosters and Barriers

OTP Boosters	Unweighted	Weighted	OTP Barriers	Unweighted	Weighted
MAM Empowers Mothers with Knowledge on Nutrition	1	2	Inadequate Staffing	1	3
Availability of tools like MUAC Tapes and referral Forms	1	4	Community prefer the commodities to be	1	1

			supplied to all children bring conflict of interest		
Good relationship with the Link Facility	1	2	Stock Out of IMAM Commodities	1	3
Presence of Outreaches	1	5	Lack of Motivation through incentives	1	2
There are TBA groups which are good avenues for the community on Nutrition	1	2	Lack of transport to reach the community	1	2
IMAM program is good and useful to the community	1	2	Irregular Sensitization Meetings	1	3
No stigmatization	1	4	No involvement of TBAs on IMAM Program	1	1
Availability of Nutrition Commodities at the Facility	1	4	Cultural Belief	1	3
Sensitization meeting held regularly	1	3	Distance from the Facility	1	4
Good attitude of the Health Worker	1	3	Poor roads hence Inaccessibility	1	4
Supervision by the SCHMT/CHMT	1	3	Sharing of the Commodities	1	4
Free services for IMAM Program	1	1	No follow up is done for the defaulting children	1	3
IMAM program is educative and Promotes nutrition to the community	1	3	Knowledge gap on management of Malnutrition	1	2
Good Relationship between the health workers and the community	1	2	Poor relationship between health workers and community	1	1
IMAM has good monitoring Tools	1	2	Faulty Anthropometric Tools in the facility	1	2
IMAM Program improves lives of People	1	2	Nomadic Lifestyle	1	4
Existence of good referral Mechanism	1	4	Language Barrier	1	3
Accompanying cases to the facility by CHV	1	1	Community Perceive Malnutrition as witch craft	1	1
Existence of Defaulter tracing Mechanism	1	4	Insecurity	1	3
Active case finding by the CHV encourages Early detection of Malnutrition	1	4	Long waiting time and queue at the facility	1	1
Total	**20**	**57**	Believe in Herbal treatment	1	1
			Ignorance by the Carer	1	1
			Payment at the Facility for growth monitoring causing defaulting	1	1
			Time spent with the client at the Facility is inadequate	1	1
			Stigmatization	1	4

			Poor storage of Registers at the Facility	1	1
			Lack of Stock Control Cards at the Health Facility	1	1
			Total	**27**	**60**

Table 4: Tana North SFP Boosters and Barriers

SFP Boosters	Unweighted	Weighted	SFP Barrier	Unweighted	Weighted
IMAM Empowers Mothers with Knowledge on Nutrition	1	2	Nomadic Lifestyle	1	4
Availability of tools like MUAC Tapes and referral Forms	1	4	Language Barrier	1	3
Good relationship with the Link Facility	1	2	Community Perceive Malnutrition as witch craft	1	1
Presence of Outreaches	1	5	Insecurity	1	3
There are TBA groups which are good avenues for the community on Nutrition	1	2	Long waiting time and queue at the facility	1	1
IMAM program is good and useful to the community	1	2	Believe in Herbal treatment	1	1
No stigmatization	1	4	Ignorance by the Carer	1	1
Availability of Nutrition Commodities at the Facility	1	4	Payment at the Facility for growth monitoring causing defaulting	1	1
Sensitization meeting held regularly	1	3	Time spent with the client at the Facility is inadequate	1	1
Good attitude of the Health Worker	1	3	Stigmatization	1	4
Supervision by the SCHMT/CHMT	1	3	Poor storage of Registers at the Facility	1	1
Free services for IMAM Program	1	1	Lack of Stock Control Cards at the Health Facility	1	1
IMAM program is educative and Promotes nutrition to the community	1	3	Inadequate Staffing	1	3
Good Relationship between the health workers and the community	1	2	Stock Out of IMAM Commodities	1	3
IMAM has good monitoring Tools	1	2	Lack of Motivation through incentives	1	2
IMAM Program improves lives of People	1	2	Lack of transport to reach the community	1	2
Existence of good referral Mechanism	1	4	Irregular Sensitization Meetings	1	3
Accompanying cases to the facility by CHV	1	1	No involvement of TBAs on IMAM Program	1	1
Existence of Defaulter tracing Mechanism	1	4	Cultural Belief	1	3
Active case finding by the CHV encourages Early detection of Malnutrition	1	4	Distance from the Facility	1	4
Total	**20**	**57**	Poor roads hence Inaccessibility	1	4
			Sharing of the Commodities	1	4

			No follow up is done for the defaulting children	1	3
			Poor relationship between health workers and community	1	1
			Faulty Anthropometric Tools in the facility	1	2
			Total	**25**	**57**

2.1.5. Program Concept Maps

Concept mapping is a graphical data-analysis technique that is useful for representing relationships between findings. Concept-maps show findings and the connections (relationships) between findings (Mark Mayyat 2011). Qualitative and quantitative data collected was further analyzed and organized in a concept map as shown in figures 14 and 15 below. The investigation team linked barriers and boosters in to 2 concepts maps i.e. OTP and SFP

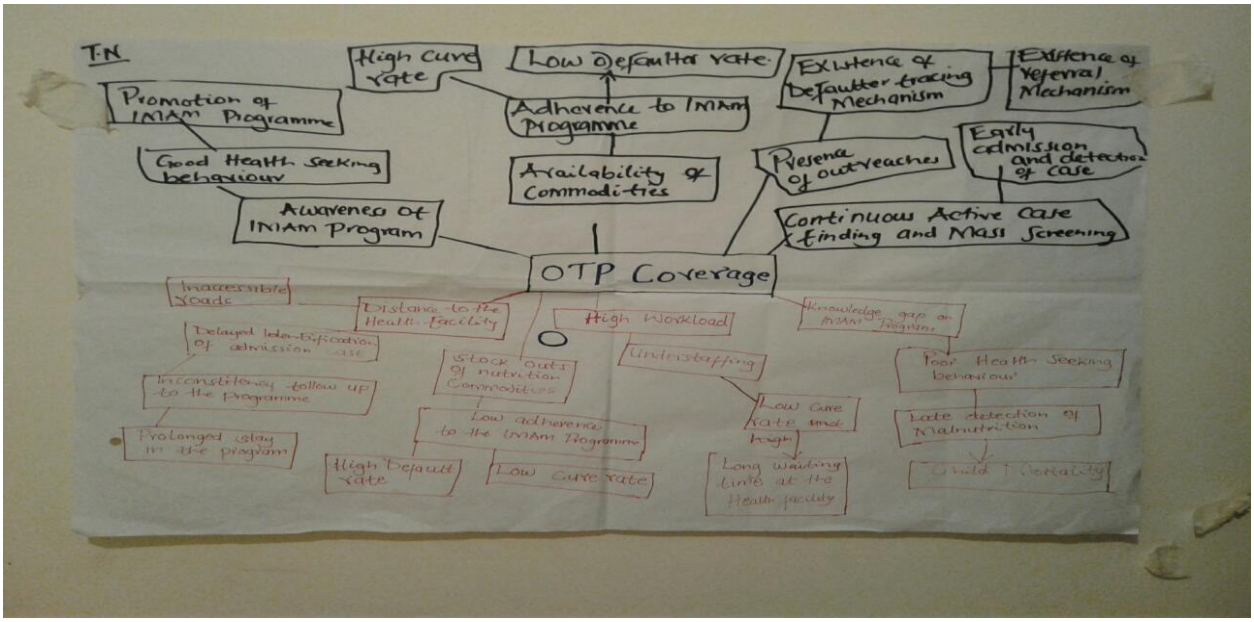

Figure 12: Tana River OTP Concept Map

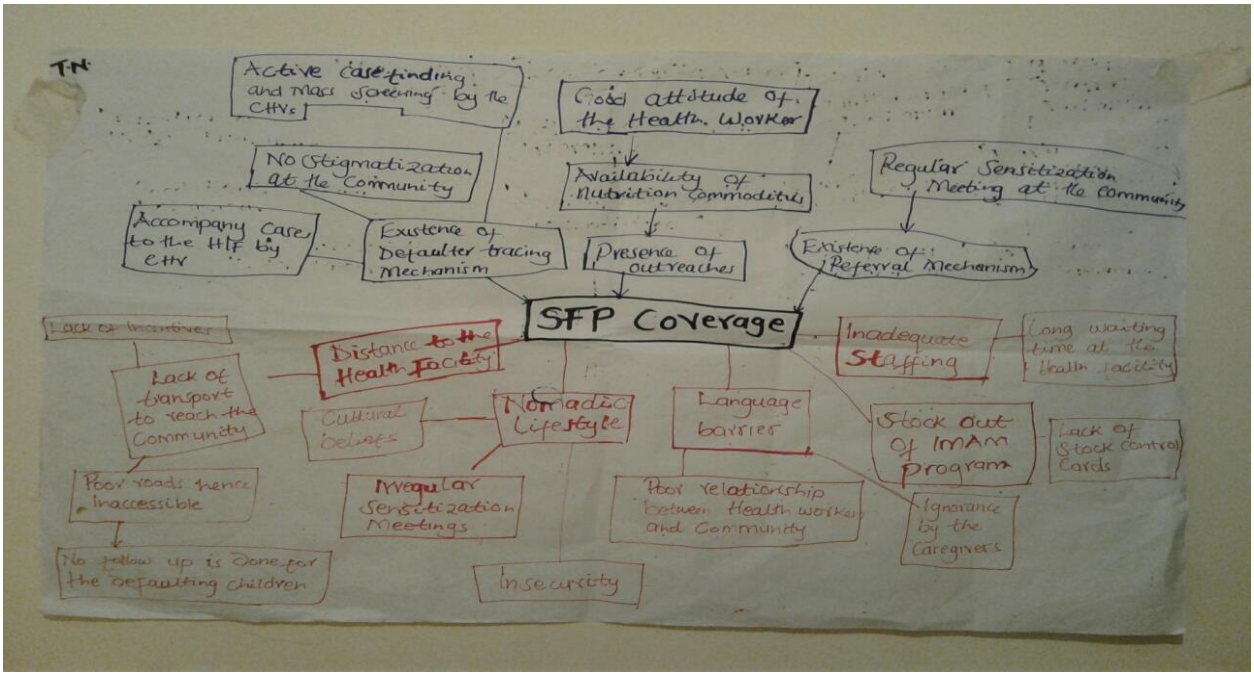

Figure 13: Tana North SFP Concept Map

2.1.6. Stage two: Coverage Hypothesis formulation and Testing

The objective of this stage was to confirm areas of high and low coverage based on the data collected from stage 1.

The hypothesis formulated:

Program Coverage is High in Villages Close to a Service Delivery Point (<3 KMs or 1 Hours)" compared to Villages Far from a Service Delivery Point (>5 KMs or 1 Hours)"

Rationale of the hypothesis was:

- Qualitative data indicated that distance was a challenge for client retention
- Inconsistent outreach services

The hypothesis was tested using simplified LQAS formula d= |n/2| in comparison with 50% threshold for rural areas.

2.1.6.1. Small Area Study

A small area study was conducted in nine purposively selected villages; Manyatta, Type G, Mulanjo, Bura Chumvi and Madogo B are the villages classified as high coverage village. The second villages were Lagjiha, Korhei, Maramtu, and Village 4 were the villages classified as low coverage village. Two teams (each with 4 members), visited the four villages. Each team was provided with a MUAC tape and packets of RUTF and RUSF. When they reached the village, they looked for a key informant who lead them to household of caregivers of children under five years of age where they asked whether they were aware of any program that treat malnutrition. They confirmed by showing them MUAC and RUTF.

Small area Study Results

Table 5 and 6 below summarizes the small area study results

Table 5: Tana North OTP Small area Study results

Purposively sampled villages	Characteristic (s)	No of SAM cases in program	No of SAM cases not in program	Total

High Coverage (Manyatta,Type G,Mulanjo, Bura Chumvi,Madogo B)	Program Coverage is High in Villages Close to a Service Delivery Point (<3 KMs or 1 Hours)"	3	0	3
Low coverage (Lagjiha,Korhei,Maramtu,Village 4)	Program Coverage is Low in Villages Far from a Service Delivery Point (>5 KMs or 1 Hours)"	1	4	5
High Coverage (Manyatta,Type G,Mulanjo, Bura Chumvi,Madogo B)	Program coverage Standard) p	50%	Number of SAM cases in program = 3 which is more than 1.	The hypothesis is confirmed
	Decision rule (d)	d= [3/2] = 1.5=1		
	Number of SAM cases in program	1		
Low coverage (Lagjiha,Korhei,Maramtu,Village 4)	Program coverage standard p	50%	Number of SAM cases in program is 0 which is less than 1	The hypothesis is confirmed
	Decision rule d	d= [1/2]=0.5		
	No of SAM Cases in program	0		

Table 6: Tana North SFP Small area study results

Purposively sampled villages	Characteristic (s)	No of MAM cases in program	No of MAM cases not in program	Total
High Coverage (Manyatta,Type G,Mulanjo, Bura Chumvi,Madogo B)	Program Coverage is High in Villages Close to a Service Delivery Point (<3 KMs or 1 Hours)"	27	5	32
Low coverage (Lagjiha,Korhei,Maramtu,Village 4)	Program Coverage is Low in Villages Far from a Service Delivery Point (>5 KMs or 1 Hours)"	3	7	10
High Coverage (Manyatta,Type G,Mulanjo, Bura Chumvi,Madogo B)	Program coverage Standard) p	50%	Number of MAM cases in program = 27 which is more than 13.	The hypothesis is confirmed
	Decision rule (d)	d= [27/2] = 13.5=13		

	Number of MAM cases in program	27		
Low coverage (Lagjiha,Korhei,Maramtu,Village 4)	Program coverage standard p	50%	Number of MAM cases in program is 1 which is less than 3	The hypothesis is confirmed
	Decision rule d	d= [3/2]=1.5		
	No of MAM Cases in program	1		

2.1.7. Prior Development

The analysis of routine program data (quantitative), qualitative data and the findings of small area survey provided a numerical representation of a belief about the program coverage (prior). Program barriers and boosters were organized and weighted based on the number of sources. Qualitative data was categorized as booster (positives) or a barrier (negatives) to the program. The prior mode was determined as an average of boosters (build up from 0%) and barriers (knockdowns form 100%) as shown in the table below. Four Methods were used to determine the prior mode. They included; simple barriers, boosters, weighted barriers, boosters, and concept map which were described earlier. Histogram which method was also used. This is a "best" coverage estimate by the investigators as illustrated in figure 16 below.

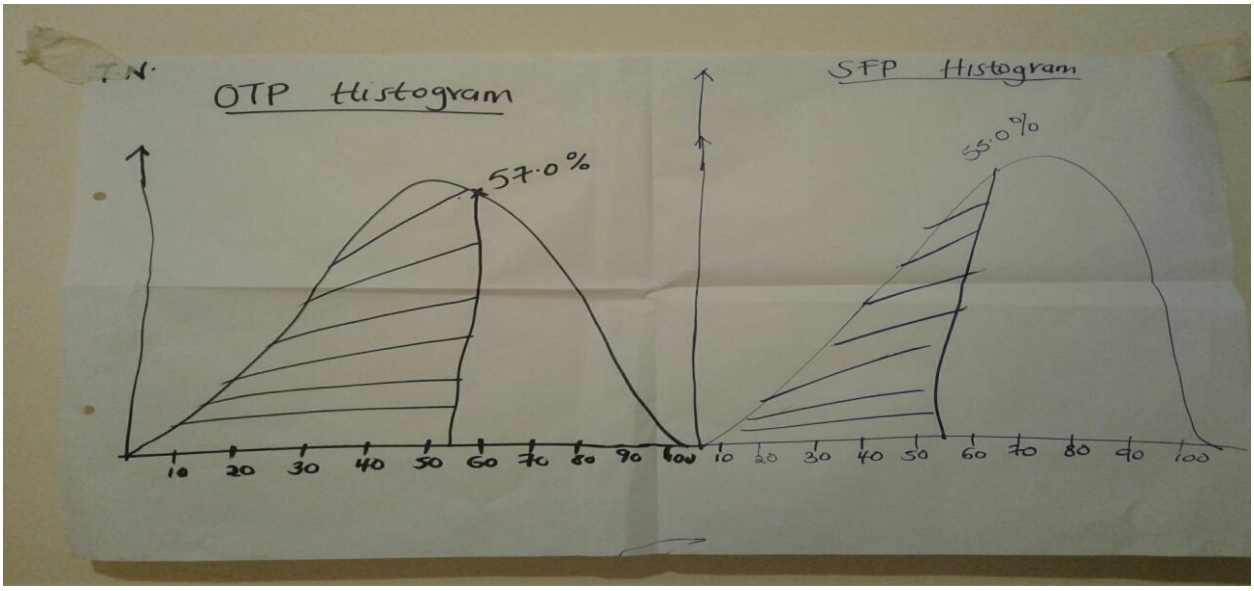

Figure 14: Tana North Histograms

Table 7: Tana North OTP Prior Calculation

OTP Method	Boosters	Barriers	Prior Mode (%)
Simple BBQ	20	27	46.5
Weighted BBQ	57	60	48.5
Concept Map	18	12	51.5

Histogram			57.0
Average Prior Mode			50.9

Table 8: Tana North SFP Prior Calculation

SFP Method	Boosters	Barriers	Prior Mode (%)
Simple BBQ	20	25	47.5
Weighted BBQ	57	57	50.0
Concept Map	17	9	54.0
Histogram			55.0
Average Prior Mode			51.6

The above information was fed in SQUEAC Bayes calculator to come up with Bayes plots. This was done by adjusting the α and the ß values of Bayes calculator until the prior mode (50.9 and 51.6) was achieved. Figures 17 and 18 below

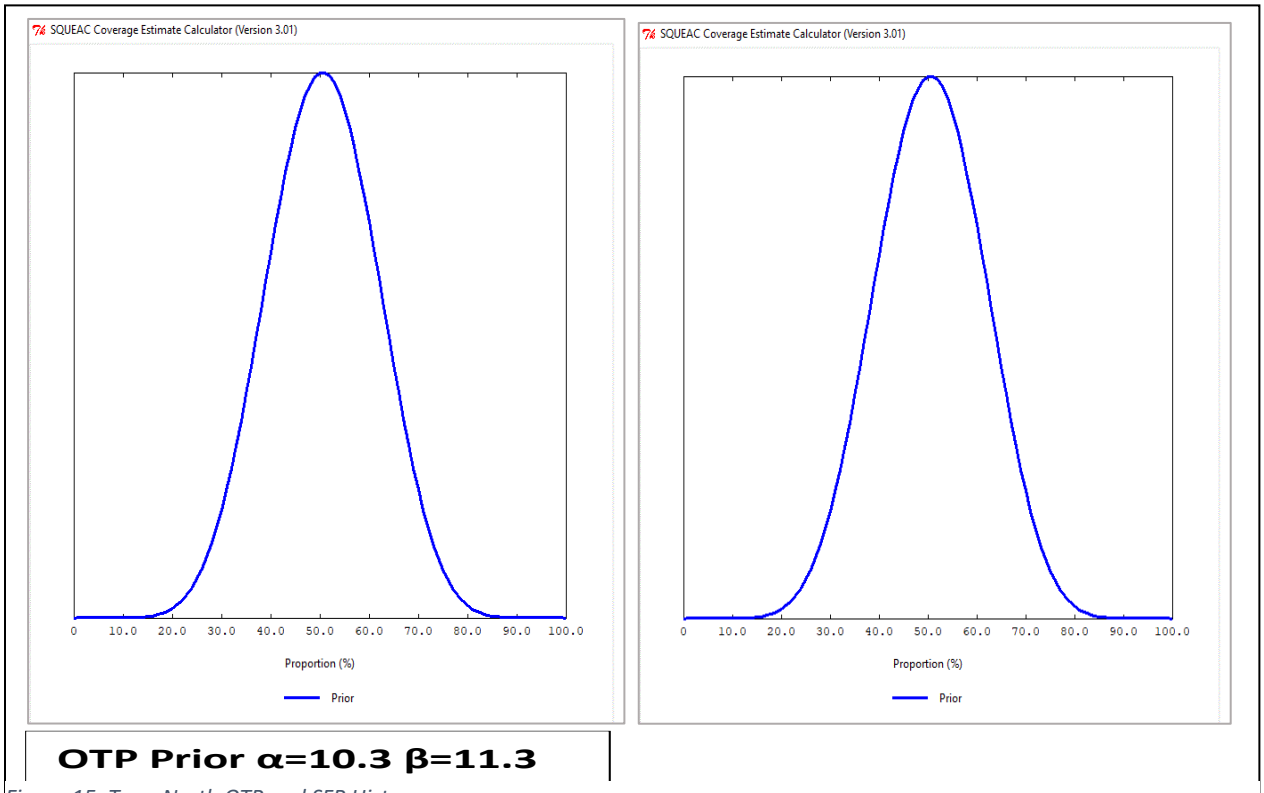

Figure 15: Tana North OTP and SFP Histogram

illustrates the Bayes plots for SFP and OTP. The plots are graphical representation of estimated coverages based on the information so far collected in stage 1 and 2.

2.1.8. Stage three: Wide Area (Likelihood) Survey)

Once the prior mode had been finalized and its shape parameters entered into the Bayes calculator (a recommended sample size was be generated. This figure is the recommended minimum number of acutely malnourished children, which need to be found during the likelihood survey to achieve the desired level of confidence in the posterior, or the overall coverage estimate.

2.1.8.1. SAM Sample size calculation

According to the Bayesian calculator, the sample size for SAM cases was 20 and MAM cases was 45.Since it was logistically impossible to search the cases in the entire sub county, it was prudent to randomly sample a number of villages where such cases were to be found. The number of villages was depended on the number of cases, average population per village, proportion of children 6- 59 months in the population as well as the current estimate of SAM prevalence by MUAC as summarized in the formula below.

$$n\ villages = \frac{n}{[average\ village\ population * (\%Children\ 6-59m) * \%\ SAM\ Prevalence\ by\ MUAC}$$

Where n = 20

Average village population = 677

% children 6 – 59 m = 20.03

SAM prevalence by MUAC = 0.3%

MAM Prevalence by MUAC=2.4%

Therefore;

$$n\ villages = \frac{20}{[677 * (0.2003) * 0.003]}$$

$$n\ villages = 49$$

In case of MAM;

$$n\ villages = \frac{45}{[677*(0.2003)*0.024]} = 14 \text{ villages}$$

2.1.8.2. Sampling Method

Two-stage sampling was applied in likelihood survey. Stage 1 involved selection of villages (smallest administrative units) based on the health facility catchments. Since a recent village list based on the health facility catchment was available, Population Proportional to size was used in this stage to avoid bias. Each village was linked to a health facility catchment. In Total, there were 196 villages in Tana North Sub County. The number of villages calculated in section 2.5.1 divided this. That is 49 (The highest between SAM and MAM) villages. The villages were selected using the updated population estimate from KNBS into ENA for SMART and 49 Villages were selected.

In stage 2 active case finding was used where MAM and SAM cases were actively searched from the sampled villages. The survey was carried out in 49 villages for 6 days. All children 6 to 59 months had their MUAC measured. Those children who met the admission criteria for SAM (MUAC< 115mm) and MAM (MUAC ≥115mm and < 125mm) and were not in program were referred to the nearest health facility. Five teams, each with 2 measurers were involved in the data collection. Forty five (45) SAM cases and 145 MAM cases were identified as summarized in table 13 below.

Table 9: Tana North Likelihood Survey Results

	OTP	SFP
Covered in the prog (Cin)	20	90
Non-covered out (Cout)	12	48
Recovering in the program (Rin)	11	3
Recovering Out of the prog (Rout)	2	5
Total	45	145

2.1.9. Single Coverage Estimate

Single coverage estimator was used to estimate the program coverage. Single coverage estimator includes both recovering cases that are admitted and those that are not in the program as illustrated below.

$$Single\ Coverage = \frac{Ci + Ri}{Ci + Ri + Cout + Rout}$$

Where Ci= Active cases in program

Cout= Active cases not in program

Ri= Recovery cases in program

Rout = Recovery cases not in program

Sum of Active and recovering cases in program was used as the numerator (31 for SAM and 93 for MAM) while Active and recovering cases in and out of OTP program (45 for SAM and 145 for MAM) was used as a denominator. This information was fed in a Bayes Coverage Estimator Calculator. Combining prior estimate and likelihood information in the calculator generated a posterior which showed the overall coverage for OTP in Tana North Sub County as **62.4 %(50.2%-73.0% 95% CI)** and for SFP as **60.6 %(53.4-67.1 95% CI)** as illustrated in figure 19 and 20 below.

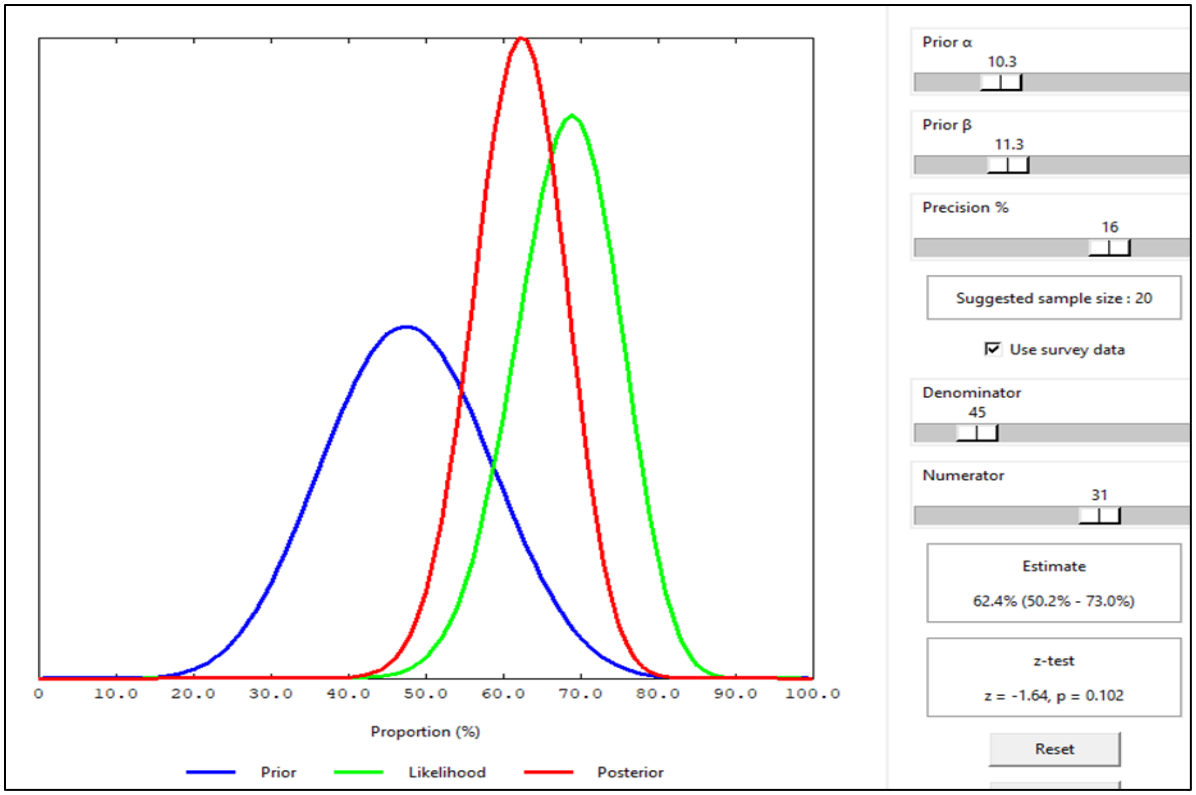

Figure 16: Tana North OTP Single Coverage Estimate

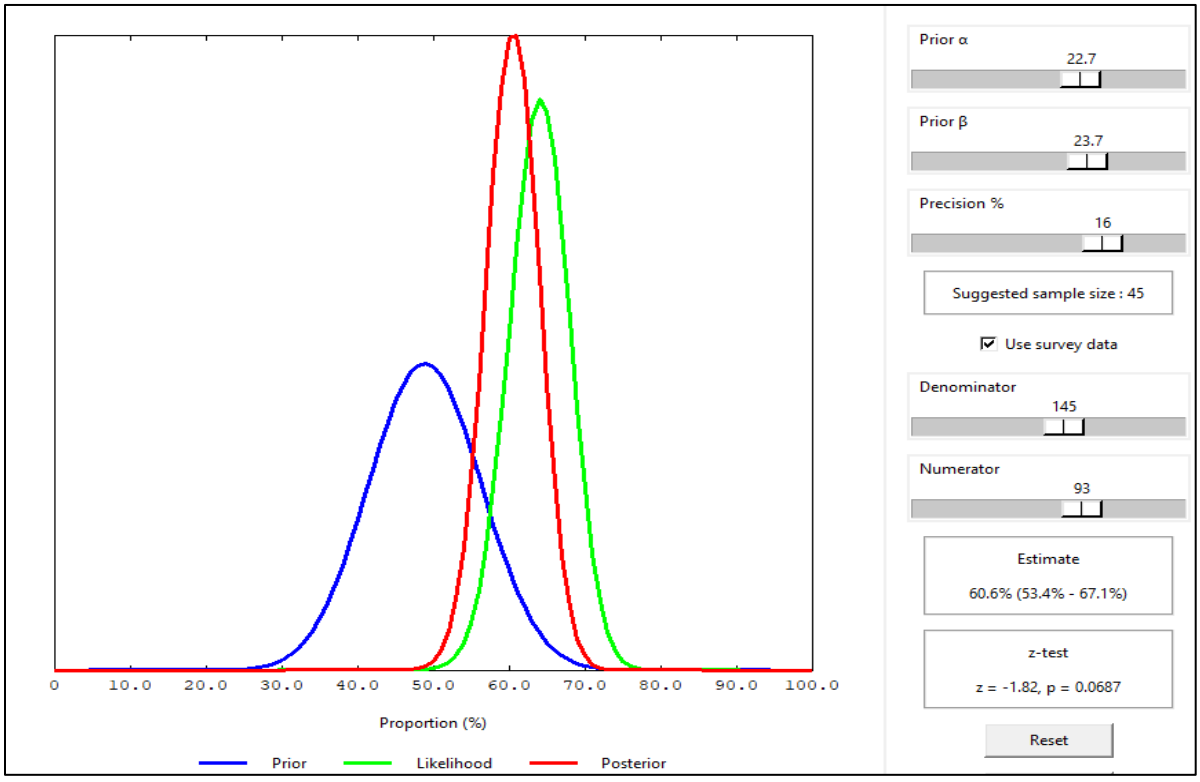

Figure 17: Tana North SFP Single Coverage Estimate

2.1.10 Reasons for Non Attendance

For those children who were not admitted in the program, a questionnaire was administered to the caregivers to establish why they were not admitted in the program. Majority of the caregivers said husband /family refusal, distance to the health facility especially during rainy season which renders the roads impassable. Secondly they said non-availability of means of transportation and too busy with farm work as shown in the table below.

Table 10: Tana North Reasons for child not being in program

Reasons for child not being in program	OTP	SFP
Non availability of financial resources for the treatment	1	5
Lack of conviction that the programme can help the child	1	4
No one to look after other children	1	2
Husband away and he is the decision Maker	1	2
Non availability of means of transportation	2	6
Inaccessibility	2	6
Too busy	2	5
Distance	3	7
Husband /family refusal	3	8
Mother was ill and died	0	1
Too long queues at the facility	0	1

2.2 Galole Sub County

2.2.1. Stage One: Identification of Program Low and High Coverage Areas in Galole Sub County.

In order to identify areas of high and low coverage, analysis of routine program data was done. Data was collected in all 11 sites that offer OTP and SFP program in the entire sub county for a period of 12 months (From January 2019 to December 2019). Data collected from the sites included; OTP and SFP admissions per month, admission MUAC , exits (cured, defaulters, deaths, non-responses) on monthly basis, defaulters based on their villages of residence and defaulting visits, disease calendar. The investigation team also developed seasonal calendar during the first stage. Qualitative data was also collected using a number of methods and sources to a point of *sampling redundancy* as it will be described later in the report.

2.2.2. Quantitative Data Collection and Analysis

2.2.2.1. Admission Trends

Analysis was also done for program admission for OTP and SFP program from January 2019 to December 2019. This was plotted as indicated in figures 2 and 3 below. The investigation team developed a seasonal and events calendar. The calendar included all the events that may have contributed to coverage and access of IMAM program in Galole Sub County. Low admissions were recorded during the month of October 2019 to December 2019. This was as a result of floods which rendered the roads impassable for the community to access health care. High admissions were recorded between the months of, March and April 2019 due to drought while in September and October 2019 due to ongoing emergency response which included integrated outreach activities and mass screening resumed during this period.

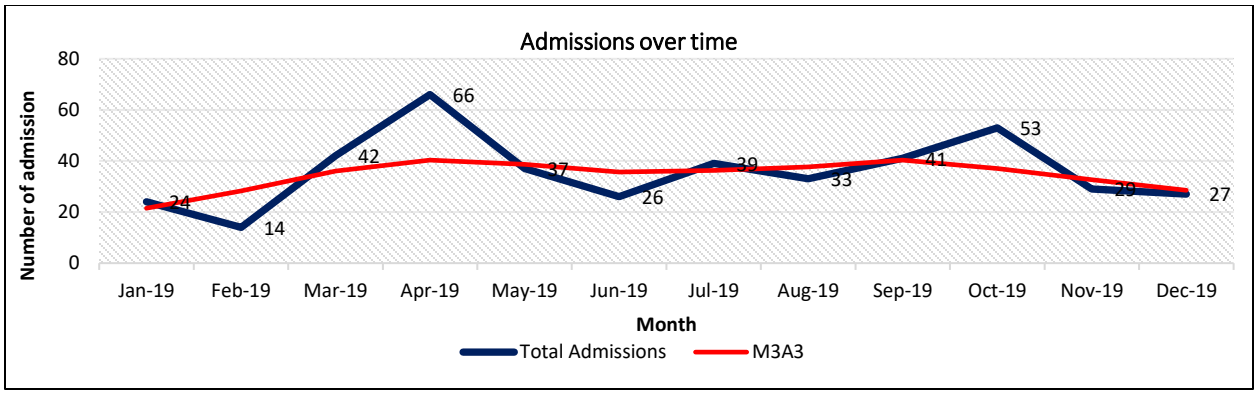

Figure 18: Galole OTP Admission Trends

Events	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition	Diarrhoea	Malaria and Pneumonia	Malaria and Pneumonia	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea/ Malaria/	Diarrhoea/ Malaria/
Food/Milk availability												
Wet & Dry Seasons												
Planting /weeding												
Long & Short rains												
Workload & Land prep												
Insecurity/ Conflicts												
Migration (lean												
High Food Prices												
Floods												
Festive seasons					Ramadhan	Iddul fitri		Circumcision	Iddul Adha	Maulid	Circumcision	Christmas/ Circumcisio
Outreaches	+	+	+	+	+	+	+	+++	+++	+++	+++	+++
Drought												

Analysis of SFP admission revealed the same trends as OTP as illustrated in figure 3 below, High Cases reported in the month of April and August this due to Drought and Floods experienced during those periods. Coupled with ongoing response on the ground of integrated Outreaches. Waldena, Hola referral Hospital and Chifiri health facilities had the highest number of admissions in both OTP and SFP.

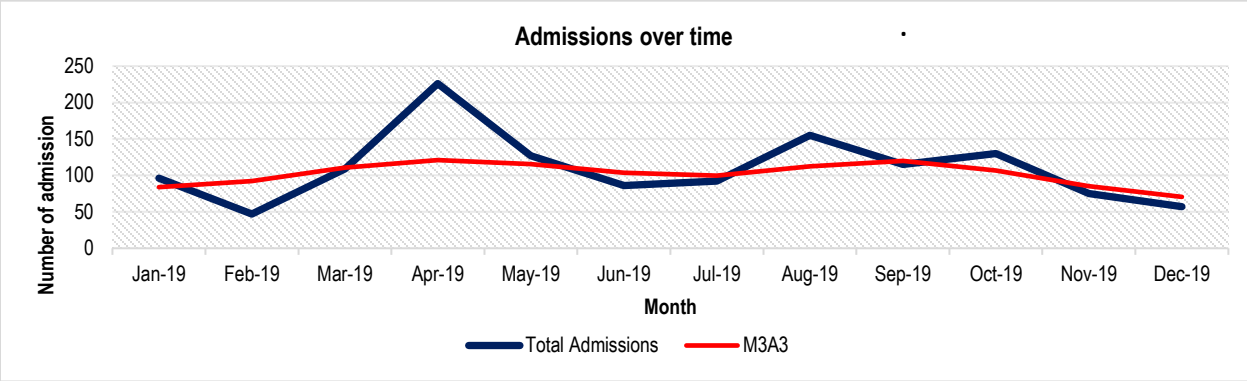

Figure 19: Galole SFP Admission Trend

Events	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition	Diarrhoea	Malaria and Pneumonia	Malaria and Pneumonia	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea/ Malaria/	Diarrhoea/ Malaria/
Food/Milk availability												
Wet & Dry Seasons												
Planting /weeding												
Long & Short rains harvest												
Workload & Land prep												
Insecurity/Conflicts												
Migration (lean period)												
High Food Prices												
Floods												
Festive seasons					Ramadhan	Iddul fitri		Circumcision	Iddul Adha	Maulid	Circumcision	Christmas/ Circumcisio
Outreaches	+	+	+	+	+	+	+	+++	+++	+++	+++	+++
Drought												

2.2.2.2. MUAC on Admission

Analysis of OTP admission time indicated that majority of children are admitted in OTP early with the mean median admission MUAC being 115mm as illustrated in figure 4 below. In this regard, children admitted in OTP program are admitted very late.

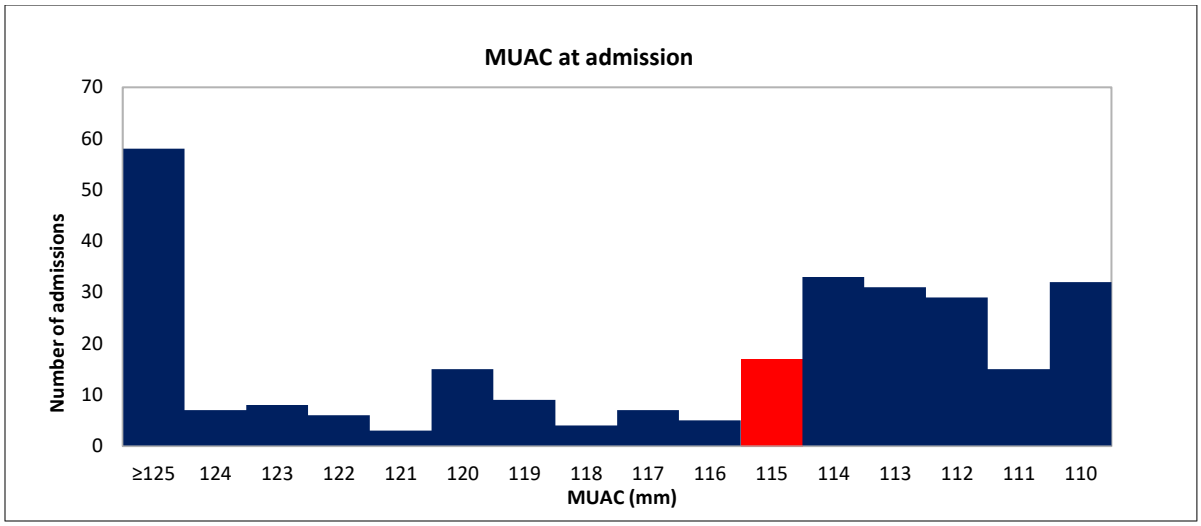

Figure 20: Galole OTP MUAC at admission

Similarly early admission was also noted in SFP program where the median admission MUAC was 123mm. In case of SFP, the admission where MUAC is the criteria should be 125mm, which is attributed to continuous screening by CHVs at the community.

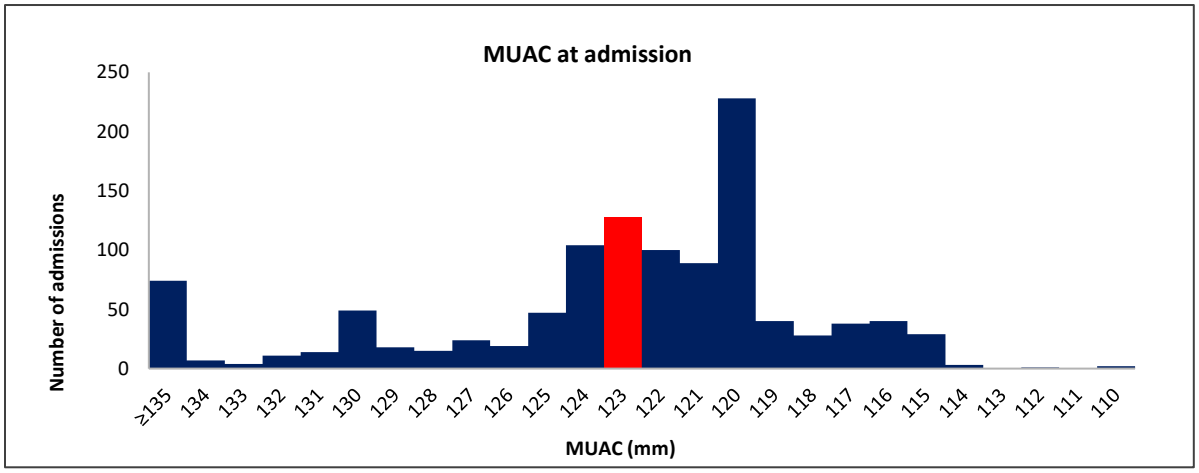

Figure 21: Galole SFP MUAC at admission

2.2.3 Standard Program Indicators

2.2.3.1 Program Exits

As illustrated in figure 6 below, the OTP program high cure rate were recorded in the month of Feb 2019, May 2019 and Sept 2019 this is attributed to Milk availability at the community and scale up of Outreaches in August 2019. High defaulter rate were reported in the month of August and October 2019, this is attributed migration since it was on the peak of drought and in October due to floods immediately when short rains began. Non response was also on rise in the month of Nov 2019 due to the floods which led to a lot of people being displaced.

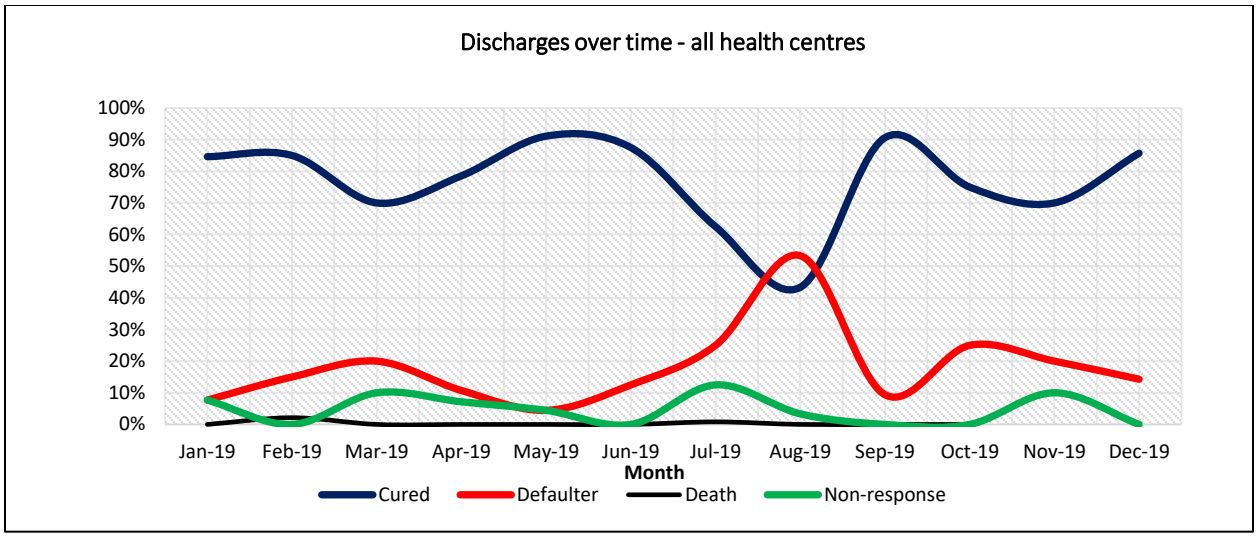

Figure 22: Galole OTP Discharges over time

In case of supplementary feeding program, there has been continuous high cure rate throughout the year except May, June and October 2019 .High defaulter rate was recorded in May to June 2019 and also Oct 2019. This was as a result too much work load due to land preparation for planting in the month of June and in the month of Oct 2019 the Sub County started experiencing floods.

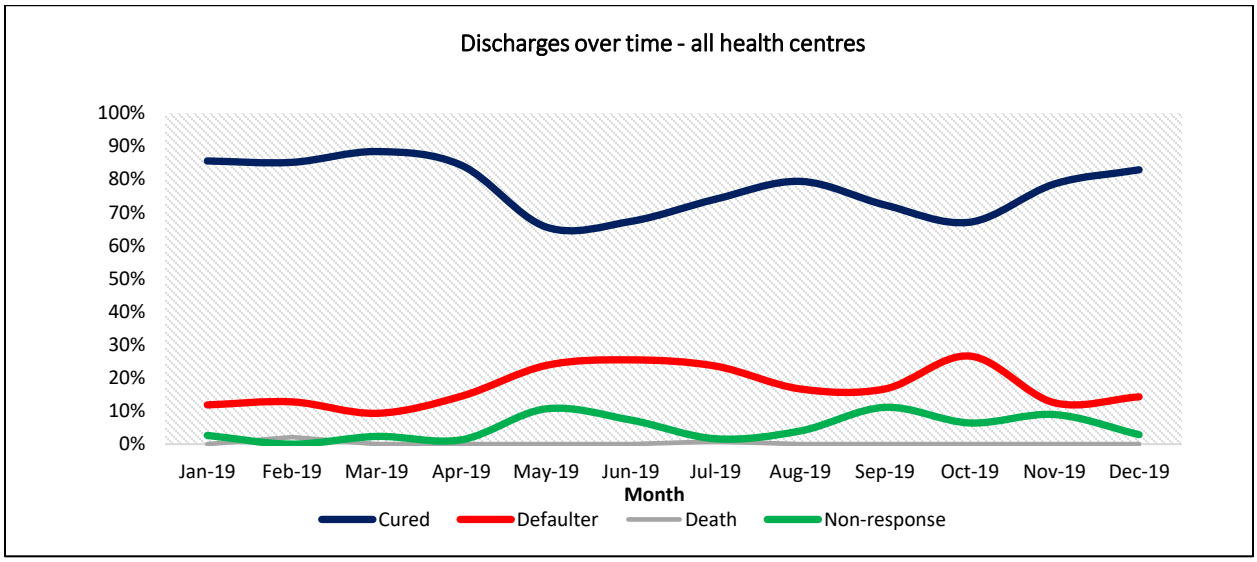

Figure 23: Galole SFP Discharges over time

2.2.3.2 Defaulting Trends

Outpatient Therapeutic Program (OTP)

Comparing the defaulting trends with seasonal and events calendar shows that there was a defaulting spikes in July to August 2019. During this season, there was high maternal workload as most mothers were preparing land for planting season ahead of the short rains; migration is experience leading to defaulting as illustrated in figure 10 below. The most affected sites included Hola Referral Hospital and Waldena health facilities.

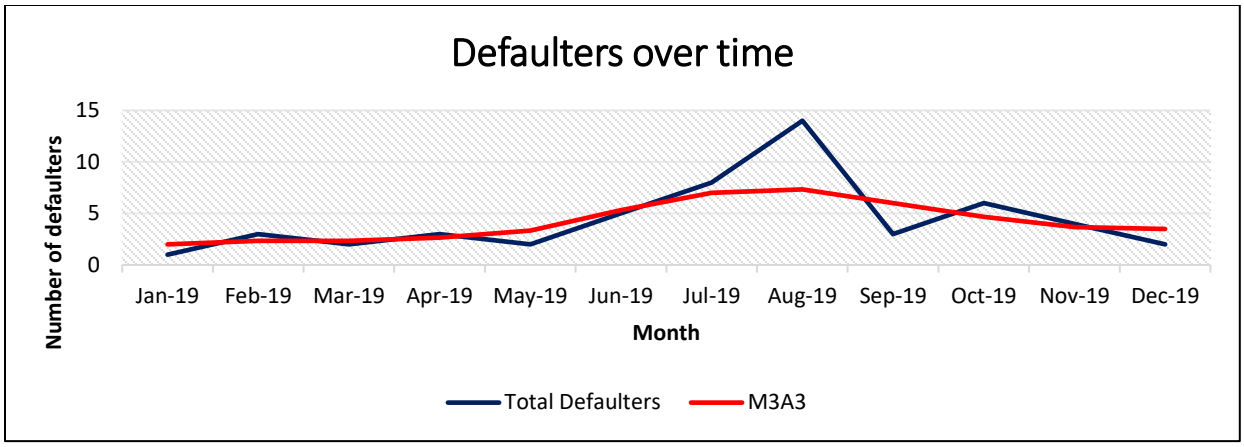

Figure 24: Galole OTP Defaulters over time

Events	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition	Diarrhoea	Malaria and	Malaria and Pneumonia	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea/Malaria/	Diarrhoea /Malaria/
Food/Milk availability												
Wet & Dry Seasons												
Planting /weeding												
Long & Short rains harvest												
Workload & Land prep												
Insecurity/Conflicts												
Migration (lean period)												
High Food Prices												
Floods												
Festive seasons					Ramadhan	Iddul fitri		Circumcision	Iddul Adha	Maulid	Circumcision	Christmas /Circumci
Outreaches	+	+	+	+	+	+	+	+++	+++	+++	+++	+++
Drought												

Supplementary Feeding Program (SFP)

Defaulting was a major challenge in SFP program. Defaulting spikes were noted in May to July 2019. This can be attributed to low coverage of outreaches in the Sub County and drought which highly affected the community as illustrated in figure 11 below.

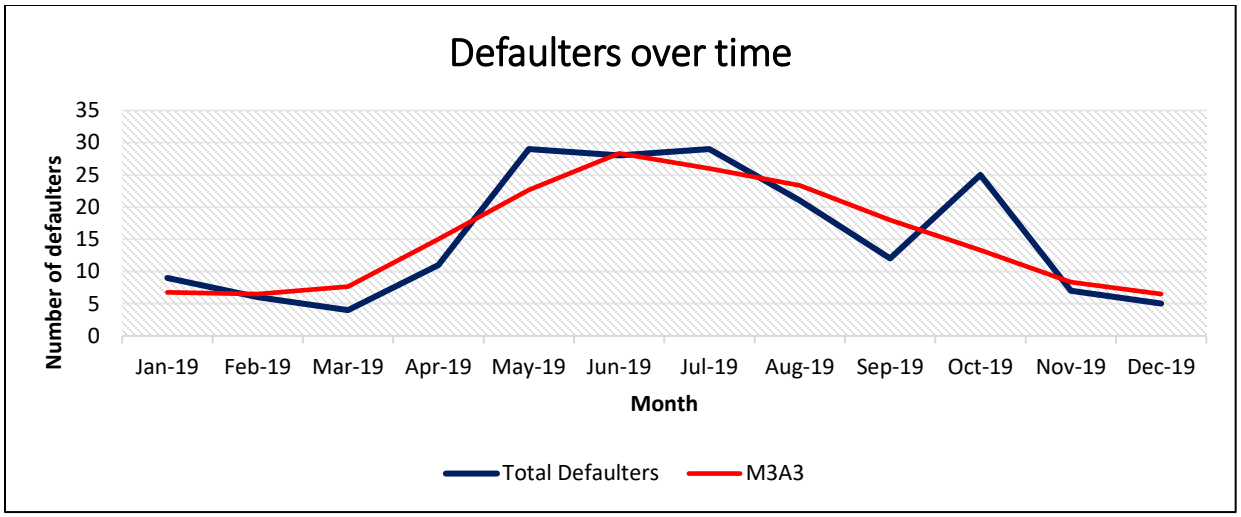

Figure 25: Galole SFP Defaulters over time

Events	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition	Diarrhoea	Malaria and	Malaria and Pneumonia	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea/ Malaria/	Diarrhoea /Malaria/
Food/Milk availability												
Wet & Dry Seasons												
Planting /weeding												
Long & Short rains harvest												
Workload & Land prep												
Insecurity/Conflicts												
Migration (lean period)												
High Food Prices												
Floods												
Festive seasons					Ramadhan	Iddul fitri		Circumcision	Iddul Adha	Maulid	Circumcision	Christmas /Circumci
Outreaches	+	+	+	+	+	+	+	+++	+++	+++	+++	+++
Drought												

2.2.3.3 Length of Stay

Analysis of length of stay for OTP indicated that the median length of stay for the program was 7 weeks, which is not appropriate for OTP. Only a few number of children stayed in the program for 12 weeks or more as illustrated in figure 12 below. This means that children are discharged at the earliest week meaning there is high risk of readmission in the OTP Program. The median length of stay for SFP Program was 14 weeks. This indicating late discharges from SFP programs. Poor data recording, staff not conversant with discharge criteria and poor understanding of the IMAM protocol.

Analysis of defaulting cases also showed that the median length of stay before defaulting was 3 weeks for the OTP Program. Early defaulting was recorded which is attributed to the distance to the health facilities and nomadic Lifestyles and in additional Inconsistence Outreaches. In case of SFP, the median length of stay was 10 weeks indicating that the fact that caretakers felt their children were cured when the MUAC measurement was above 13cm there is poor program monitoring and poor adherence to IMAM protocol.

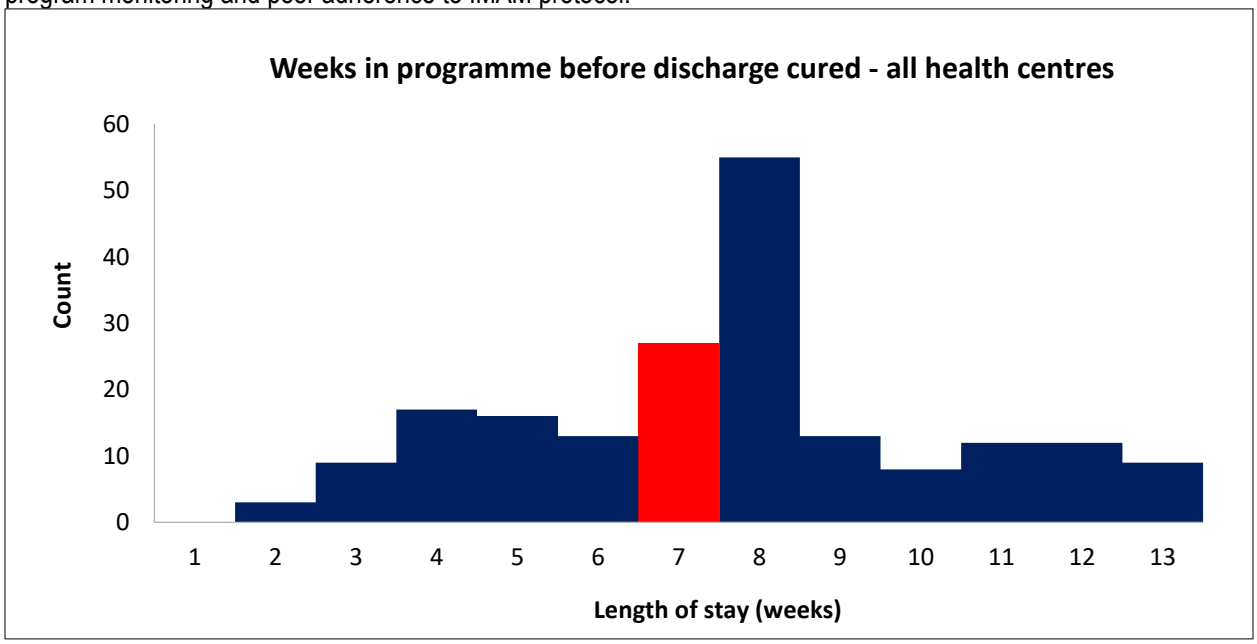

Figure 26: Galole OTP length of stay discharged cured

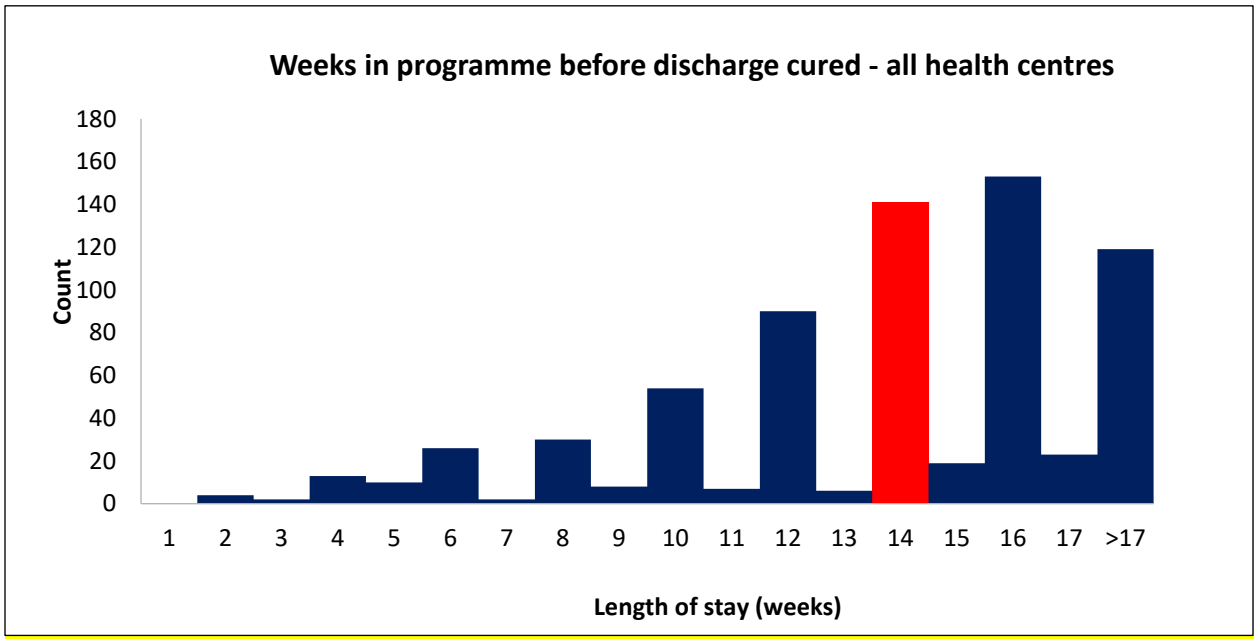

Figure 27: Galole SFP length of stay discharge cured

2.2.4. Qualitative Data (Community Assessment)

Qualitative data was collected from different sources using various methods. These methods included; Informal Group discussions, Semi structured interviews, In-depth interviews and Observation. The data was collected from CHV, Nutritionist, Health worker, Lay people, Health Facility data, and Community leaders, Carers of beneficiaries, CBRAs, Religious Leaders and NGO agent

Four survey teams collected qualitative data from the community level. Each team comprised of 2 members. The following Boosters and barriers were identified:

Table 11: Galole OTP boosters and barriers:

OTP Booster	Unweighted	Weighted Score	OTP Barriers	Unweighted	Weighted Score
Availability of stocks	1	4	Heavy Workload	1	2
Presence of Outreaches	1	5	Inadequate Staffing	1	2
Continuous Active Case finding and Mass Screening	1	3	Inconsistent Outreaches	1	5
Capacity Building on IMAM through Trainings	1	2	Language Barrier	1	2
Good collaboration between health workers and other staff	1	2	Religion and Cultural Practices	1	4
Routine Supervision by CHMT/SCHMT/CHAs	1	3	Absenteeism of Staff at the Health Facility	1	3
Existence of defaulter tracing Mechanism	1	3	Reshuffling of staff	1	1
Existence of Good referral mechanism	1	3	Poor infrastructure-Inaccessible Roads during rainy Season	1	4
Health Education /advice to the Community Members	1	2	Distance from the Health Facility to the Village	1	5
Awareness of the IMAM Program by the Community Members	1	2	Lack of involvement during IMAM Programming for the Nurses	1	1
No sharing of Nutrition Commodities	1	1	Lack of Motivation/Incentives	1	5
Good relationship with the stakeholders	1	3	Stock out	1	3
Trained CHVs on CHS	1	1	Poor quality of Anthropometric measurement	1	2
Communication Channels available and effective e.g. IPC, Community dialogues	1	1	Poor Documentation at the Health Facility	1	2
Good Health Seeking Behaviour	1	4	Nomadic Lifestyle-Keep Migrating	1	4
Family MUAC at the Community Level leads to Self-Referral	1	1	Low of Knowledge on Health and Nutrition Issues	1	2
Presence of IMAM Guideline	1	1	Mothers prefer female nurses to male Nurses	1	1
Community appreciate the IMAM Program	1	2	Bad attitude of the Health Workers	1	2
Good reception at the health facility	1	3	High usage of Herbal treatment	1	3
Short waiting time	1	3	Lack of Facilitation by the County Government	1	1

Good storage and Maintenance of the Registers	1	2	Low Economic status of the community	1	1
Total	**21**	**51**	Lack of collaboration with the CBOs	1	1
			Stigmatization at the community Level	1	3
			Lack of Anthropometric tools	1	2
			Enmity between the community and CHV due to lack of understanding Admission Criteria	1	1
			Lack of Awareness of the IMAM Programme	1	3
			Sharing of Nutrition Commodities	1	3
			Poor health Seeking Behaviour	1	2
			Poor storage of Registers at the Facility	1	3
			Lack of Stock Control Cards at the Health Facility	1	1
			Total	**30**	**74**

Table 12: Galole SFP boosters and Barriers

Booster	Unweighted	Weighted Score	Barriers	Unweighted	Weighted Score
Existence of defaulter tracing Mechanism	1	3	Heavy Workload	1	2
Existence of Good referral mechanism	1	3	Inadequate Staffing	1	2
Health Education /advice to the Community Members	1	2	Inconsistence Outreaches	1	5
Awareness of the IMAM Program by the Community Members	1	2	Language Barrier	1	2
Good relationship with the stakeholders	1	3	Religion and Cultural Practices	1	4
Trained CHVs on CHS	1	1	Absenteeism of Staff at the Health Facility	1	3
Availability of stocks	1	4	Reshuffling of staff	1	1
Presence of Outreaches	1	5	Poor infrastructure-In accessible Roads during rainy Season	1	4
Continuous Active Case finding and Mass Screening	1	3	Distance from the Health Facility to the Village	1	5
Capacity Building on IMAM through Trainings	1	2	Lack of Motivation/Incentives	1	5
Good collaboration between health workers and other staff	1	2	Stock out	1	3
Routine Supervision by CHMT/SCHMT/CHAs	1	3	Poor Documentation at the Health Facility	1	2
Short waiting time	1	3	Nomadic Lifestyle-Keep Migrating	1	4
Good storage and Maintenance of the Registers	1	2	Low of Knowledge on Health and Nutrition Issues	1	2

Communication Channels available and effective e.g. IPC, Community dialogues	1	1	Bad attitude of the Health Workers	1	2
Good Health Seeking Behaviour	1	4	High usage of Herbal treatment	1	3
Family MUAC at the Community Level leads to Self-Referral	1	1	Lack of Facilitation by the County Government	1	1
Presence of IMAM Guideline	1	1	Lack of collaboration with the CBOs	1	1
Community appreciate the IMAM Program	1	2	Stigmatization at the community Level	1	3
Good reception at the health facility	1	3	Enmity between the community and CHV due to lack of understanding Admission Criteria	1	1
Total	**20**	**50**	Lack of Awareness of the IMAM Programme	1	3
			Sharing of Nutrition Commodities	1	3
			Poor health Seeking Behaviour	1	2
			Poor storage of Registers at the Facility	1	3
			Lack of Stock Control Cards at the Health Facility	1	1
			Total	**25**	**67**

2.2.5. Program Concept Maps

Qualitative and quantitative data collected was further analyzed and organized in a concept map as shown in figures 14 and 15 below. The investigation team linked barriers and boosters in to 2 concepts maps i.e. OTP and SFP

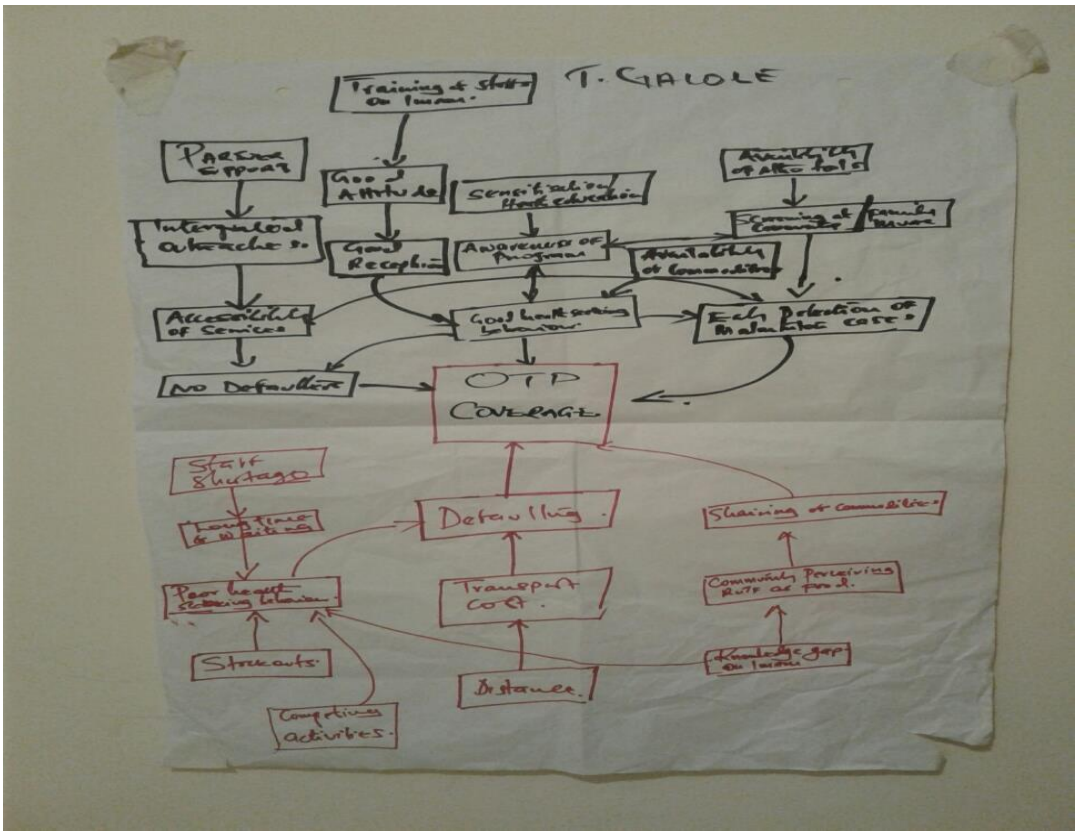

Figure 28: Galole OTP concept Map

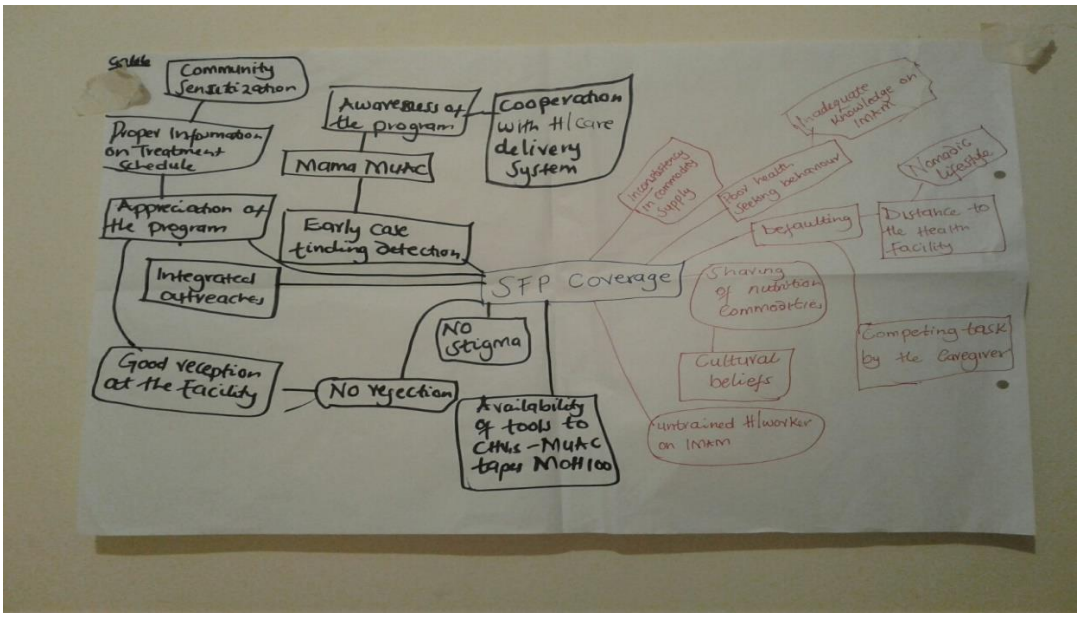

Figure 29: Galole SFP Concept Map

2.2.6. Stage two: Coverage Hypothesis formulation and Testing

The objective of this stage was to confirm areas of high and low coverage based on the data collected from stage 1.

The hypothesis formulated:

Program Coverage is High in Villages Close to a Service Delivery Point (<3 KMs or 1 Hours)" compared to Villages Far from a Service Delivery Point (>5 KMs or 1 Hours)"

Rationale of the hypothesis was:

- Qualitative data indicated that distance was a challenge for client retention
- Inconsistent outreach services

The hypothesis was tested using simplified LQAS formula d= |n/2| in comparison with 50% threshold for rural areas.

2.2.6.1. Small Area Study

A small area study was conducted in six purposively selected villages; Hola Sec, Matagala and Laza Mtoni are the villages classified as high coverage village. The second villages were Dayale,Moti and Abanefa were the villages classified as low coverage village. Two teams (each with 4 members), visited the three villages. Each team was provided with a MUAC tape and packets of RUTF and RUSF. When they reached the village, they looked for a key informant who lead them to household of caregivers of children under five years of age where they asked whether they were aware of any program that treat malnutrition. They confirmed by showing them MUAC and RUTF.

Small area Study Results

Table 13 and 14 below summarizes the small area study results

Table 13: Galole OTP small area study results

Purposively sampled villages	Characteristic (s)	No of SAM cases in program	No of SAM cases not in program	Total

High Coverage (Hola Sec, Matagala and Laza Mtoni)	Program Coverage is High in Villages Close to a Service Delivery Point (<3 KMs or 1 Hours)"	1	1	2
Low coverage (Dayale,Moti,Abanefa)	Program Coverage is Low in Villages Far from a Service Delivery Point (>5 KMs or 1 Hours)"	1	3	4
High coverage Area (Hola Sec, Matagala and Laza Mtoni)	Program coverage Standard) p	50%	Number of SAM cases in program = 1 which is more than 0.5.	The hypothesis is confirmed
	Decision rule (d)	d= [1/2] = 0.5=3		
	Number of SAM cases in program	1		
Low Coverage (Dayale,Moti,Abanefa)	Program coverage standard p	50%	Number of SAM cases in program is 0 which is less than 1	The hypothesis is confirmed
	Decision rule d	d= [1/2]=0.5		
	No of SAM Cases in program	1		

Table 14: Galole SFP small area study results

Purposively sampled villages	**Characteristic (s)**	**No of MAM cases in program**	**No of MAM cases not in program**	**Total**
High Coverage (Hola Sec, Matagala and Laza Mtoni)	Program Coverage is High in Villages Close to a Service Delivery Point (<3 KMs or 1 Hours)"	11	3	14
Low coverage (Dayale,Moti,Abanefa)	Program Coverage is Low in Villages Far from a Service Delivery Point (>5 KMs or 1 Hours)"	1	3	4
High coverage Area (Hola Sec, Matagala and Laza Mtoni)	Program coverage Standard) p	50%	Number of MAM cases in program = 11 which is more than 5.	The hypothesis is confirmed
	Decision rule (d)	d= [112] = 5.5=5		
	Number of MAM cases in program	11		
	Program coverage standard p	50%		

Low Coverage (Dayale,Moti,Abanefa)	Decision rule d	d= [1/2]=0.5	Number of MAM cases in program is 0 which is less than 1	The hypothesis is confirmed
	No of MAM Cases in program	1		

2.2.7 Prior Development

The analysis of routine program data (quantitative), qualitative data and the findings of small area survey provided a numerical representation of a belief about the program coverage (prior). Program barriers and boosters were organized and weighted based on the number of sources. Qualitative data was categorized as booster (positives) or a barrier (negatives) to the program. The prior mode was determined as an average of boosters (build up from 0%) and barriers (knockdowns form 100%) as shown in the table below. Four Methods were used to determine the prior mode. They included; simple barriers, boosters, weighted barriers, boosters, and concept map which were described earlier. Histogram which method was also used. This is a "best" coverage estimate by the investigators as illustrated in figure 16 below.

Figure 30: Galole Histogram belief

Table 15: Galole OTP prior Development

OTP Method	Boosters	Barriers	Prior Mode (%)
Simple BBQ	21	30	45.5
Weighted BBQ	51	74	38.5
Concept Map	18	12	53.0
Histogram			50.0
Average Prior Mode			46.8

Table 16: Galole SFP Prior development

SFP Method	Boosters	Barriers	Prior Mode (%)
Simple BBQ	20	25	47.5
Weighted BBQ	50	67	41.5
Concept Map	11	9	51.0
Histogram			51.5
Average Prior Mode			47.9

The above information was fed in SQUEAC Bayes calculator to come up with Bayes plots. This was done by adjusting the α and the ß values of Bayes calculator until the prior mode (46.8 and 47.9) was achieved. Figures 17 and 18 below illustrates the Bayes plots for SFP and OTP. The plots are graphical representation of estimated coverages based on the information so far collected in stage 1 and 2.

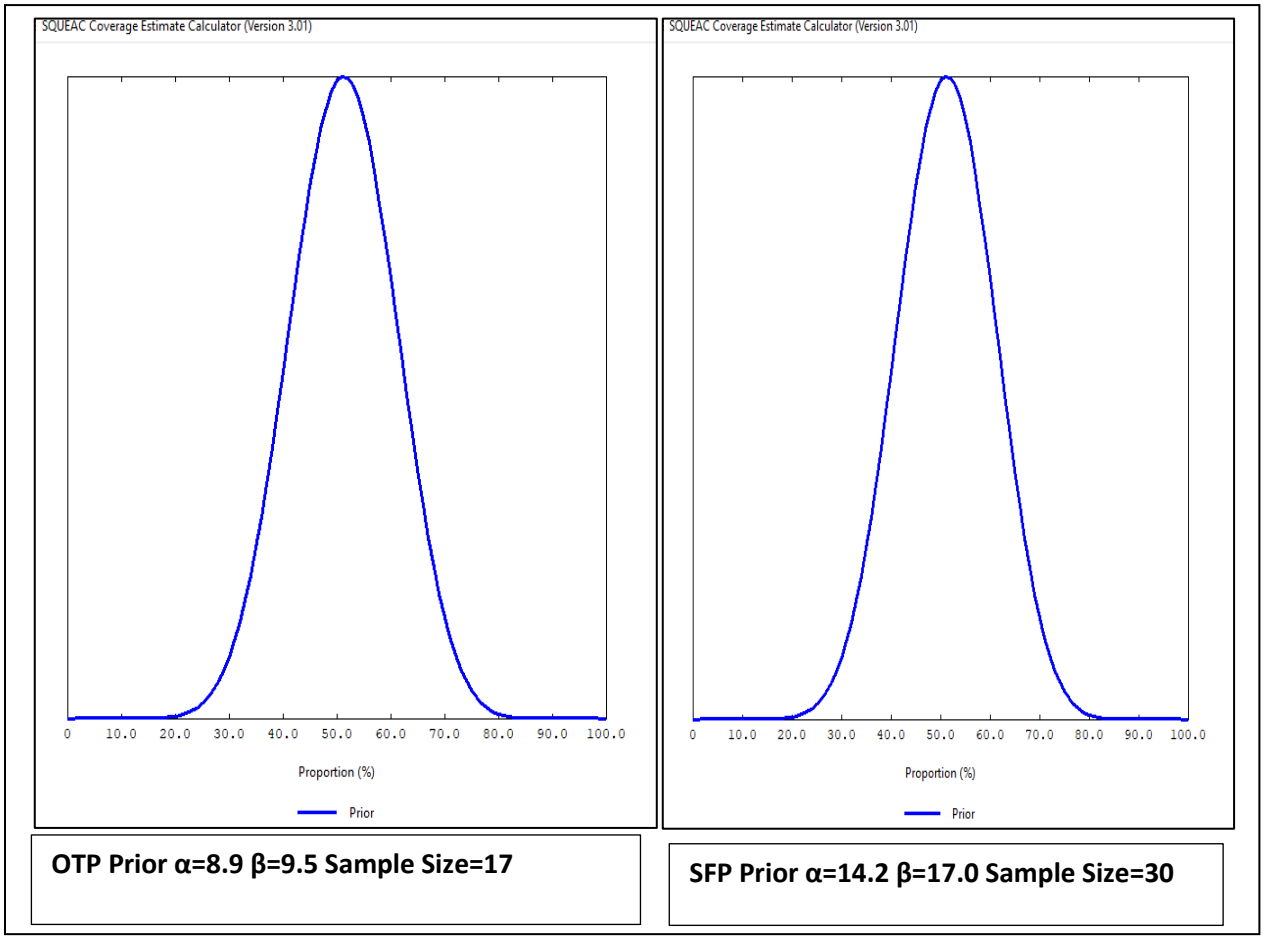

Figure 31: Galole OTP and SFP Histogram

2.2.8. Family MUAC Findings

During the coverage we sampled 100 mothers on Family MUAC and most mothers reported to be measuring their children once in two weeks and a CHV keeps monitoring once a month and so happy about this project since they

were able to monitor the nutrition of their children right at the household level rather than waiting to go to the health facility. Moreover, for the mothers who self-referred themselves at the Health Facilities they were happy since the health workers did not reject them. However, they were some challenges that affected the implementation of Family MUAC where most children currently are not being taken for Growth monitoring hence missing other antigens that are provided at the health facility and some mothers said they were trained then the MUAC tapes came very late hence they had forgotten to take the Measurement which became a challenge for them and finally, some mothers were too busy in the Farm field and forgot to monitor on the MUAC measurement of their children

2.2.9 Stage three: Wide Area (Likelihood) Survey)

Once the prior mode had been finalized and its shape parameters entered into the Bayes calculator (a recommended sample size was be generated. This figure is the recommended minimum number of acutely malnourished children, which need to be found during the likelihood survey to achieve the desired level of confidence in the posterior, or the overall coverage estimate.

2.2.9.1. Sample size calculation

According to the Bayesian calculator, the sample size for SAM cases was 20 and MAM cases was 45.Since it was logistically impossible to search the cases in the entire sub county, it was prudent to randomly sample a number of villages where such cases were to be found. The number of villages was depended on the number of cases, average population per village, proportion of children 6- 59 months in the population as well as the current estimate of SAM prevalence by MUAC as summarized in the formula below.

$$n\ villages = \frac{n}{[average\ village\ population * (\%Children\ 6-59m) * \%\ SAM\ Prevalence\ by\ MUAC}$$

Where n = 17

Average village population = 594

% children 6 – 59 m = 20.03

SAM prevalence by MUAC = 0.3%

MAM Prevalence by MUAC=2.4%

Therefore;

$$n\ villages = \frac{17}{[594 * (0.2003) * 0.003]}$$

$$n\ villages = 50$$

In case of MAM;

$$n\ villages = \frac{30}{[594*(0.2003)*0.024]} = 11 \text{ villages}$$

2.2.9. 2. Sampling Method

Two-stage sampling was applied in likelihood survey. Stage 1 involved selection of villages (smallest administrative units) based on the health facility catchments. Since a recent village list based on the health facility catchment was available, Population Proportional to size was used in this stage to avoid bias. Each village was linked to a health facility catchment. In Total, there were 141 villages in Galole Sub County. The number of villages calculated in section 2.5.1 divided this. That is 50 (The highest between SAM and MAM) villages. The villages were selected using the updated population estimate from KNBS into ENA for SMART and 50 Villages were selected.

In stage 2 active case finding was used where MAM and SAM cases were actively searched from the sampled villages. The survey was carried out in 50 villages for 6 days. All children 6 to 59 months had their MUAC measured. Those children who met the admission criteria for SAM (MUAC< 115mm) and MAM (MUAC ≥115mm and < 125mm) and were not in program were referred to the nearest health facility. Five teams, each with 2 measurers were involved in the data collection. Thirty (30) SAM cases and 53 MAM cases were identified as summarized in table 13 below.

Table 17: Galole Likelihood Survey Results

	OTP	SFP
Covered in the prog (Cin)	12	22

Non-covered out (Cout)	5	20
Recovering in the program (Rin)	2	5
Recovering Out of the prog (Rout)	11	6
Total	30	53

2.2.10. Single Coverage Estimate

Single coverage estimator was used to estimate the program coverage. Single coverage estimator includes both recovering cases that are admitted and those that are not in the program as illustrated below.

$$Single\ Coverage = \frac{Ci + Ri}{Ci + Ri + Cout + Rout}$$

Where Ci= Active cases in program

Cout= Active cases not in program

Ri= Recovery cases in program

Rout = Recovery cases not in program

Sum of Active and recovering cases in program was used as the numerator (14 for SAM and 27 for MAM) while Active and recovering cases in and out of OTP program (30 for SAM and 53 for MAM) was used as a denominator. This information was fed in a Bayes Coverage Estimator Calculator. Combining prior estimate and likelihood information in the calculator generated a posterior which showed the overall coverage for OTP in Galole Sub County as **53.7 %(39.1%-67.1% 95% CI)** and for SFP as **48.9 %(38.5%-59.6% 95% CI)** as illustrated in figure 19 and 20 below.

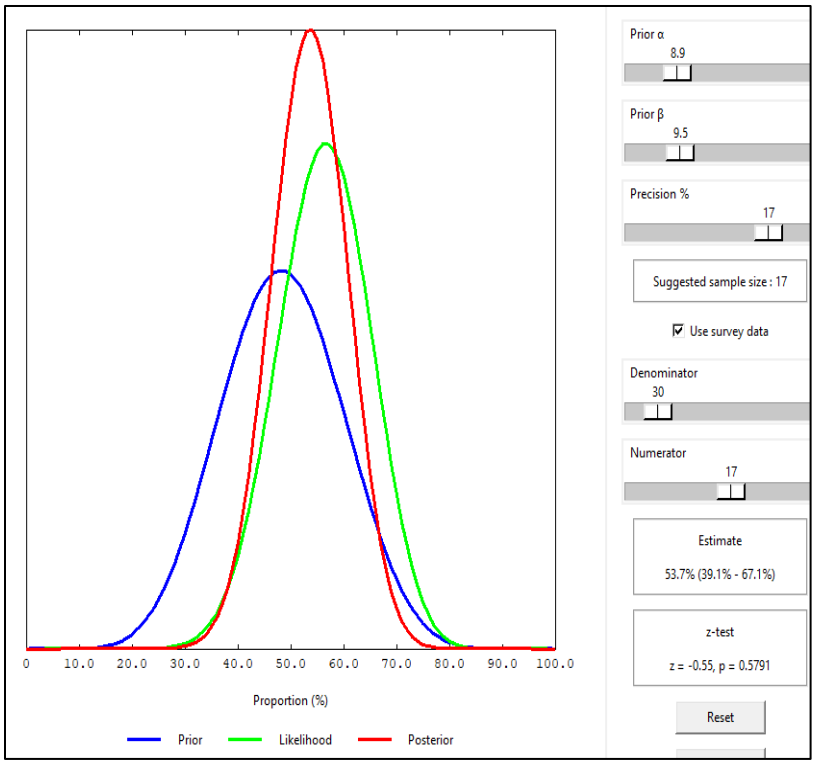

Figure 32: Galole OTP Single coverage estimate

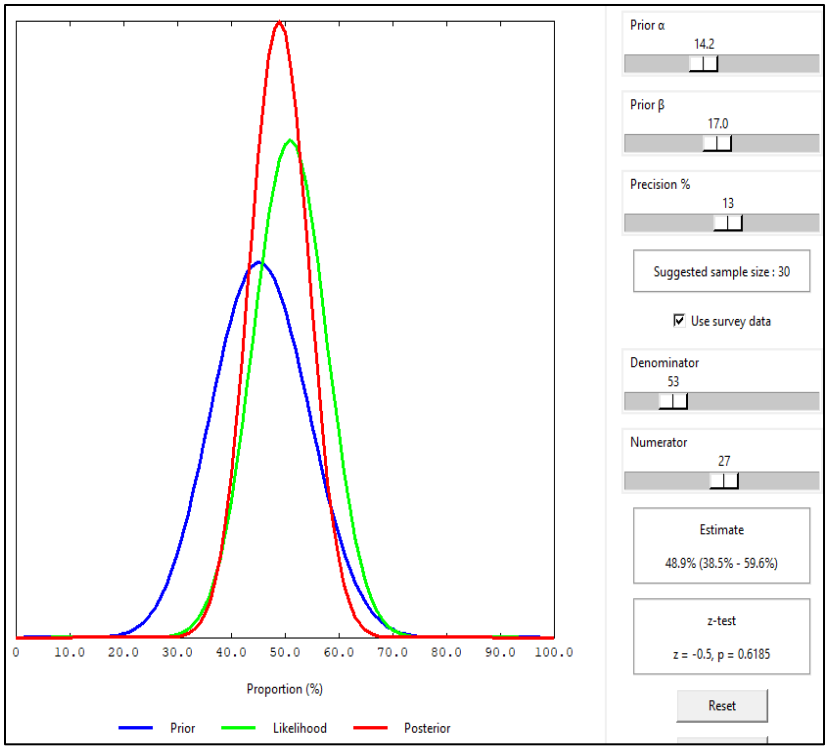

Figure 33: Galole SFP Single coverage Estimate

2.2.11. Reasons for Non Attendance

For those children who were not admitted in the program, a questionnaire was administered to the caregivers to establish why they were not admitted in the program. Majority of the caregivers said too busy working in the farm and businesses, followed by ashamed to enrol in the programme and then they also preferred traditional treatment as shown in the table below.

Table 18: Galole reasons for child not being in program

Reasons for child not being in program	SAM	MAM
Distance	1	1
Preference of traditional Treatment	1	1
Ashamed to enrol in the programme	2	0
Too busy	3	2
Non availability of financial resources for the treatment	0	1
Previous rejection of the child	0	1
No one to look after other children	0	1

2.3. Tana Delta Sub County

2.3.1. Stage One: Identification of Program Low and High Coverage Areas in Tana Delta Sub County.

In order to identify areas of high and low coverage, analysis of routine program data was done. Data was collected in all 15 sites that offer OTP and SFP program in the entire sub county for a period of 12 months (From January 2019 to

December 2019). Data collected from the sites included; OTP and SFP admissions per month, admission MUAC , exits (cured, defaulters, deaths, non-responses) on monthly basis, defaulters based on their villages of residence and defaulting visits, disease calendar. The investigation team also developed seasonal calendar during the first stage. Qualitative data was also collected using a number of methods and sources to a point of *sampling redundancy* as it will be described later in the report.

2.3.2. Quantitative Data Collection and Analysis

2.3.2.1 Admission Trends

Analysis was also done for program admission for OTP and SFP program from January 2019 to December 2019. This was plotted as indicated in figures 2 and 3 below. The investigation team developed a seasonal and events calendar. The calendar included all the events that may have contributed to coverage and access of IMAM program in Galole Sub County. Low admissions were recorded during the month of November 2019 to December 2019. This was as a result of floods which rendered the roads impassable for the community to access health care. High admissions were recorded between the months of, February and March 2019 due to drought while in July 2019 and October 2019 due to ongoing emergency response which included integrated outreach activities and mass screening resumed during this period.

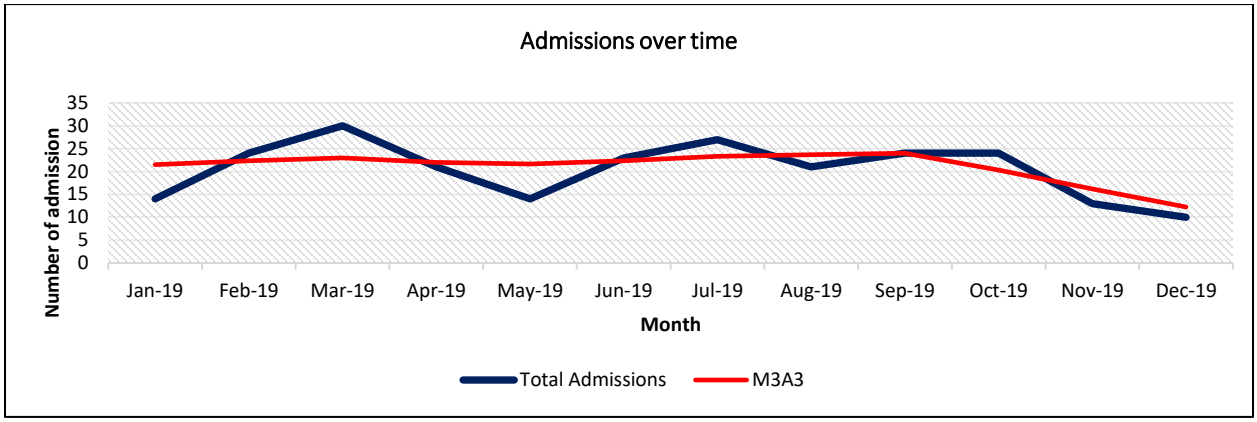

Figure 34: Tana Delta OTP admission trends

Events	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition	Diarrhoea	Malaria and Pneumonia	Malaria and	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea/ Malaria/	Diarrhoea/ Malaria/
Food/Milk availability												
Wet & Dry Seasons												
Planting /weeding												
Long & Short rains harvest												
Workload & Land prep												
Insecurity/Conflicts												
Migration (lean period)												
High Food Prices												
Floods												
Festive seasons					Ramadhan	Iddul fitri		Circumcision	Iddul Adha	Maulid	Circumcision	Christmas/ Circumcisio
Outreaches	+	+	+	+	+	+	+	+++	+++	+++	+++	+++

Drought												

Analysis of SFP admission revealed the same trends as OTP as illustrated in figure 3 below, High Cases reported in the month of March 2019 this due to Drought and in September 2019 due to ongoing response on the ground of integrated Outreaches. Sera, Garsen and Oda health facilities had the highest number of admissions in both OTP and SFP.

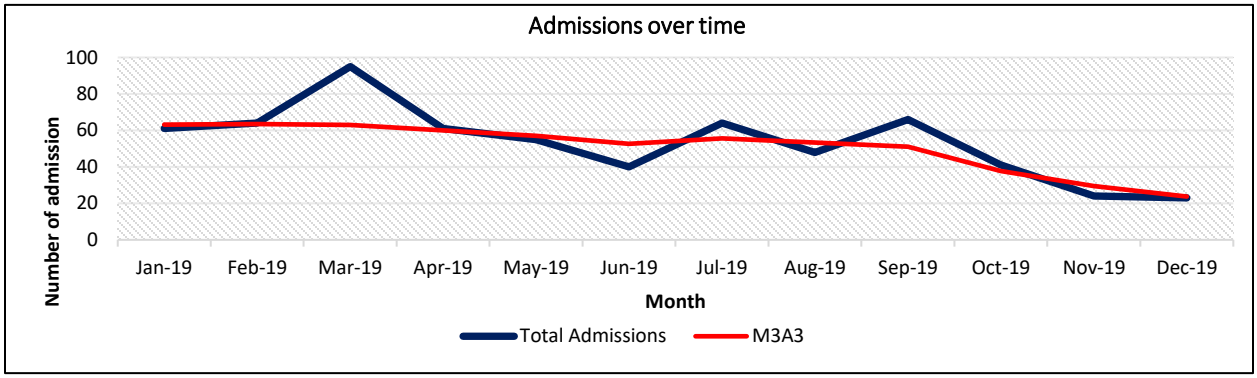

Figure 35: Tana Delta SFP admission Trends

Events	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition	Diarrhoea	Malaria and Pneumonia	Malaria and Pneumonia	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea/ Malaria/	Diarrhoea /Malaria/
Food/Milk availability												
Wet & Dry Seasons												
Planting /weeding												
Long & Short rains harvest												
Workload & Land prep												
Insecurity/Conflicts												
Migration (lean period)												
High Food Prices												
Floods												
Festive seasons					Ramadhan	Iddul fitri		Circumcision	Iddul Adha	Maulid	Circumcision	Christmas /Circumci
Outreaches	+	+	+	+	+	+	+	+++	+++	+++	+++	+++
Drought												

2.3.2.2 MUAC on Admission

Analysis of OTP admission time indicated that majority of children are admitted in OTP early with the mean median admission MUAC being 112mm as illustrated in figure 4 below this indicated early admissions. Late admissions were also recorded. However admissions by W/H Z-Score was recorded where 114 Cases were admitted using WHZ.

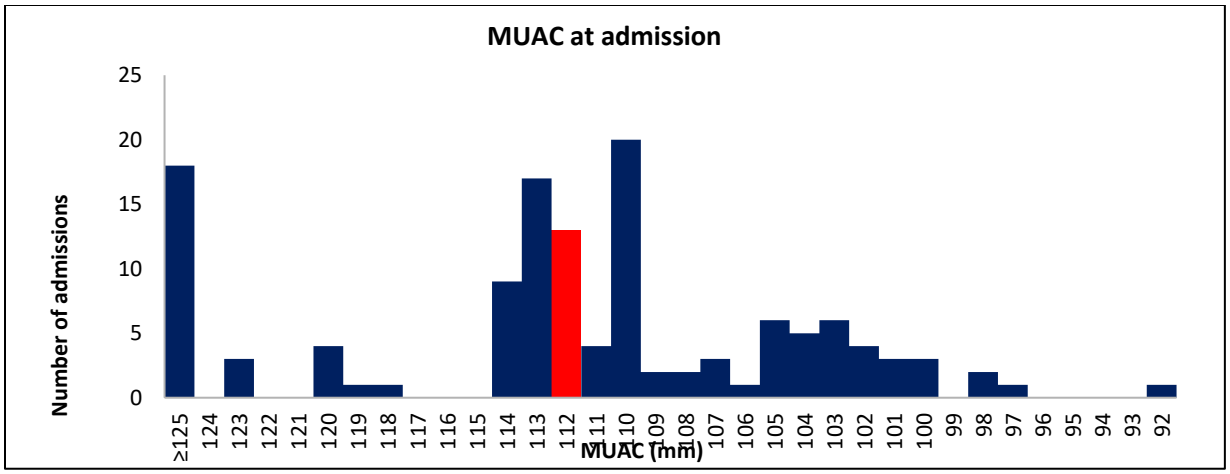

Figure 36: Tana Delta OTP MUAC at admission

Similarly early admission was also noted in SFP program where the median admission MUAC was 123mm. In case of SFP, the admission where MUAC is the criteria should be 125mm, which is attributed to continuous screening by CHVs at the community and mass screening. 222 Children were admitted in the program using WHZ

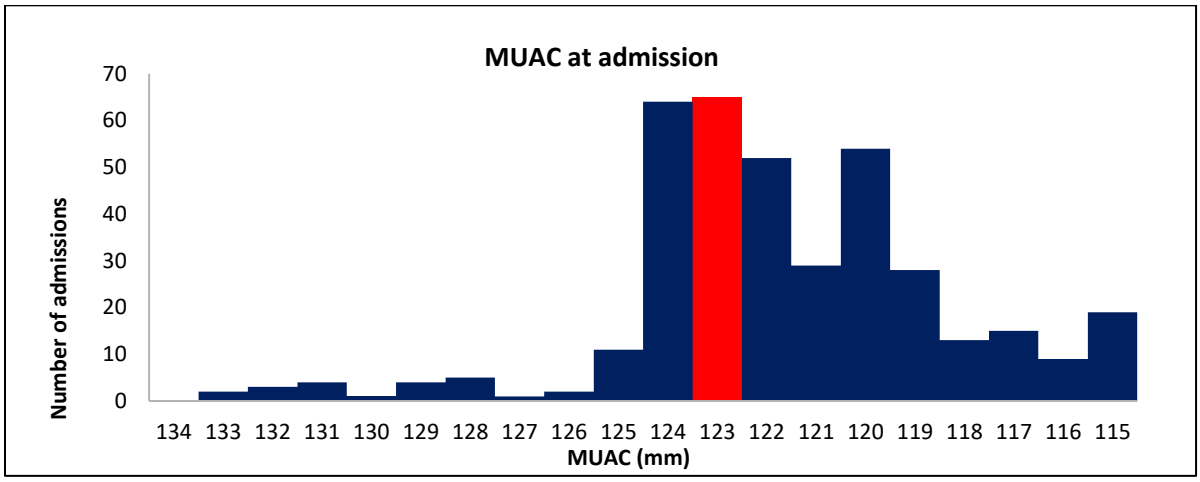

Figure 37: Tana Delta SFP MUAC at Admission

2.3.3 Standard Program Indicators

2.3.3.1 Program Exits

As illustrated in figure 6 below, the OTP program high cure rate were recorded throughout the year except January and February 2019. High defaulter rate were reported in the month of January, February, April and October 2019, this is attributed High food prices since it was on the peak of drought and also in October due to floods immediately when short rains began making some roads impassable. Non response was also on rise in the month of January 2019 due to the availability of foods and milk although it was very expensive.

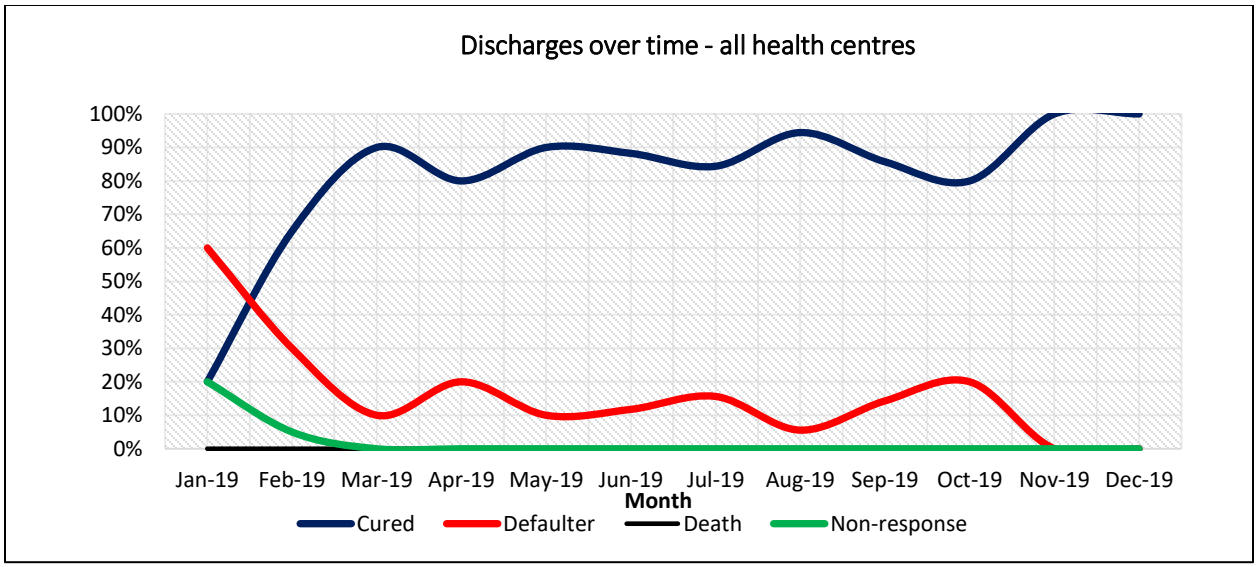

Figure 38: Tana Delta OTP Discharge over time

In case of supplementary feeding program, there has been continuous high cure rate throughout the year except January February and April 2019 .High defaulter rate was recorded in January, February, April and August 2019. This was as a result of High food prices in the month of January and February 2019 coupled with drought.

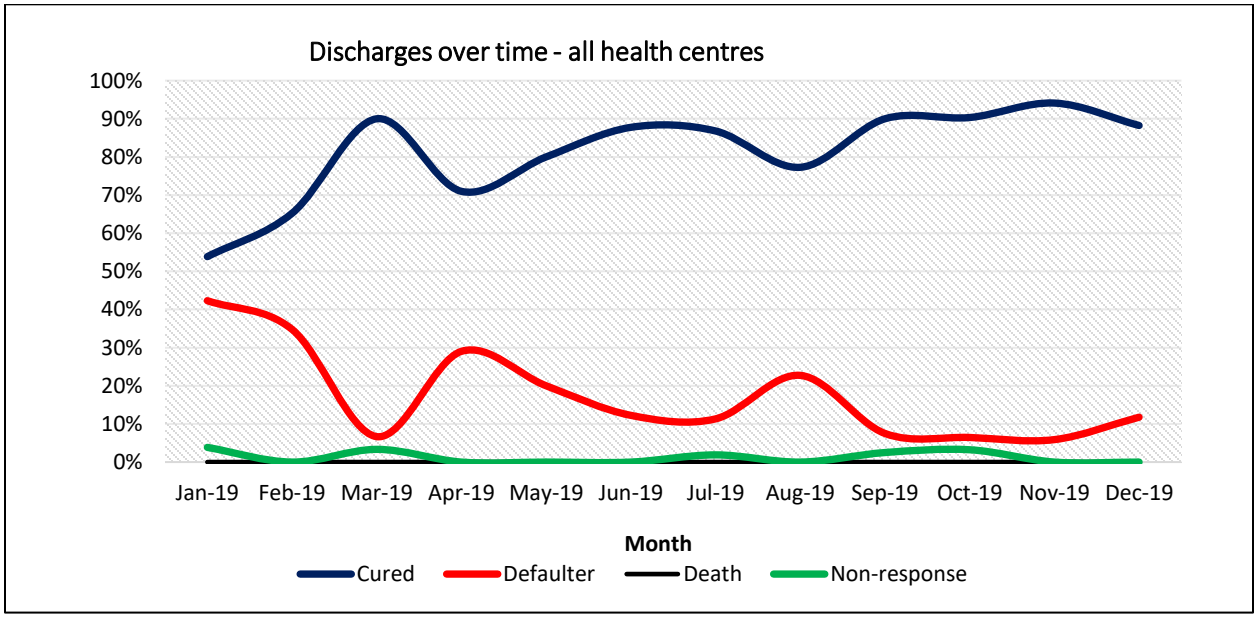

Figure 39: Tana Delta SFP Discharge over time

2.3.3.2 Defaulting Trends

Outpatient Therapeutic Program (OTP)

Comparing the defaulting trends with seasonal and events calendar shows that there was a defaulting spikes in February, July and October 2019. During this season, there was high food prices, migration is experience leading to defaulting and also flooding in the month of October as illustrated in figure 10 below. The most affected sites included Shirikisho and Mnazini health facilities.

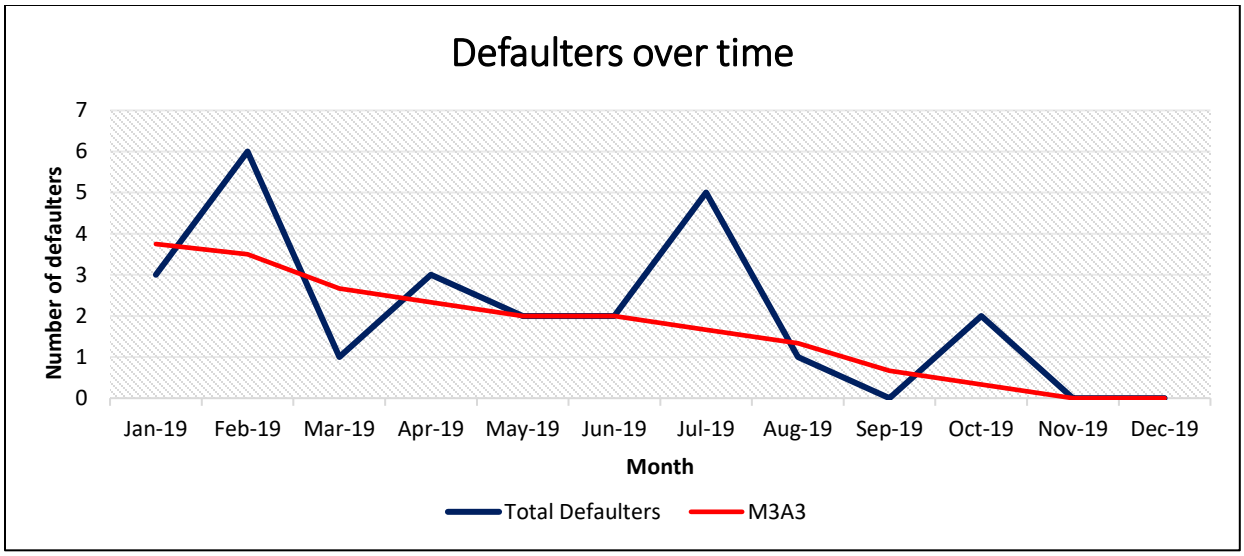

Figure 40: Tana Delta OTP Defaulter Over time

Events	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition	Diarrhoea	Malaria and	Malaria and Pneumonia	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea/Malaria/	Diarrhoea /Malaria/
Food/Milk availability												
Wet & Dry Seasons												
Planting /weeding												
Long & Short rains harvest												
Workload & Land prep												
Insecurity/Conflicts												
Migration (lean period)												
High Food Prices												
Floods												
Festive seasons					Ramadhan	Iddul fitri		Circumcision	Iddul Adha	Maulid	Circumcision	Christmas /Circumci
Outreaches	+	+	+	+	+	+	+	+++	+++	+++	+++	+++
Drought												

Supplementary Feeding Program (SFP)

Defaulting was a major challenge in SFP program. Defaulting spikes were noted in January, April, May and July 2019. This can be attributed to high maternal workload since it was the period of planting and weed coupled with land preparation as they awaited short rains as illustrated in figure 11 below.

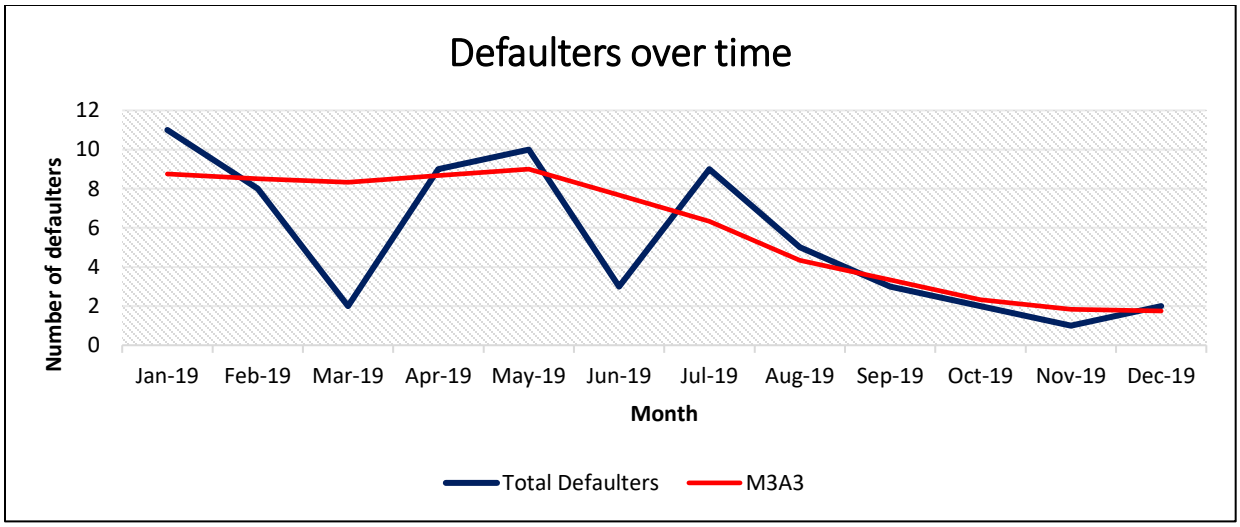

Figure 41: Tana Delta SFP Defaulter Over time

Events	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Diseases	Skin Diseases/	Skin Diseases/	Malnutrition	Malnutrition	Diarrhoea	Malaria and	Malaria and Pneumonia	Skin Diseases	Skin Diseases	Skin Diseases	Diarrhoea/ Malaria/	Diarrhoea/ Malaria/
Food/Milk availability												
Wet & Dry Seasons Rains												
Planting /weeding												
Long & Short rains harvest												
Workload & Land prep												
Insecurity/Conflicts												
Migration (lean period)												
High Food Prices												
Floods												
Festive seasons					Ramadhan	Iddul fitri		Circumcision	Iddul Adha	Maulid	Circumcision	Christmas/ Circumcisio
Outreaches	+	+	+	+	+	+	+	+++	+++	+++	+++	+++
Drought												

2.3.3.3 Length of Stay

Analysis of length of stay for OTP indicated that the median length of stay for the program was 4 weeks, which is not appropriate for OTP. None of children stayed in the program for 12 weeks or more as illustrated in figure 12 below. This means that children are discharged at the earliest week meaning there is high risk of readmission in the OTP Program. The median length of stay for SFP Program was 8 weeks. This indicating early discharge from the program with good understanding of the IMAM protocol.

Analysis of defaulting cases also showed that the median length of stay before defaulting was 3 weeks for the OTP Program. Early defaulting was recorded which is attributed to the distance to the health facilities and nomadic Lifestyles and in additional Inconsistence Outreaches. In case of SFP, the median length of stay was 6 weeks this was resulted by the fact most children left the program before they were cured which could be attributed to the floods which led to some roads being impassable and hence they could not access the health Facilities and also outreaches.

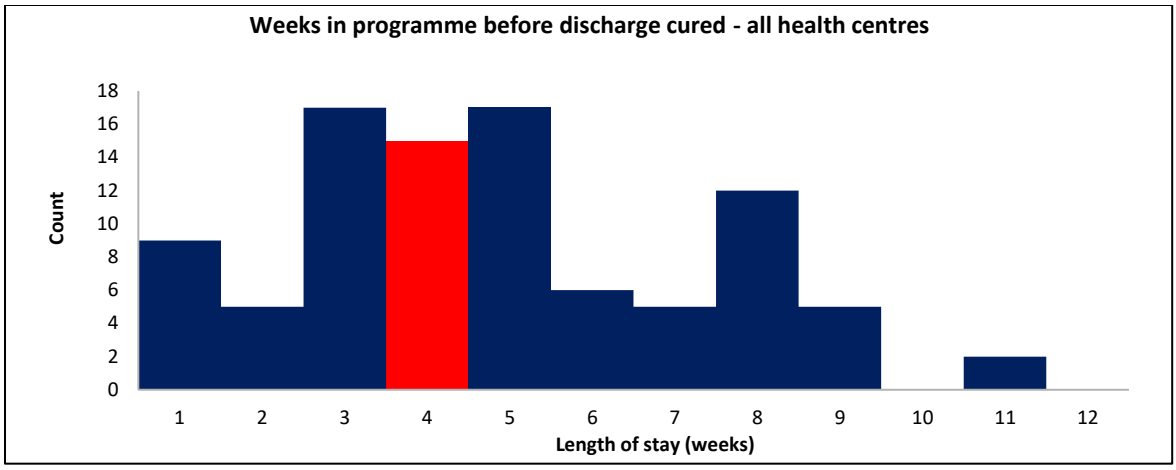

Figure 42: Tana Delta OTP length of stay discharge cured

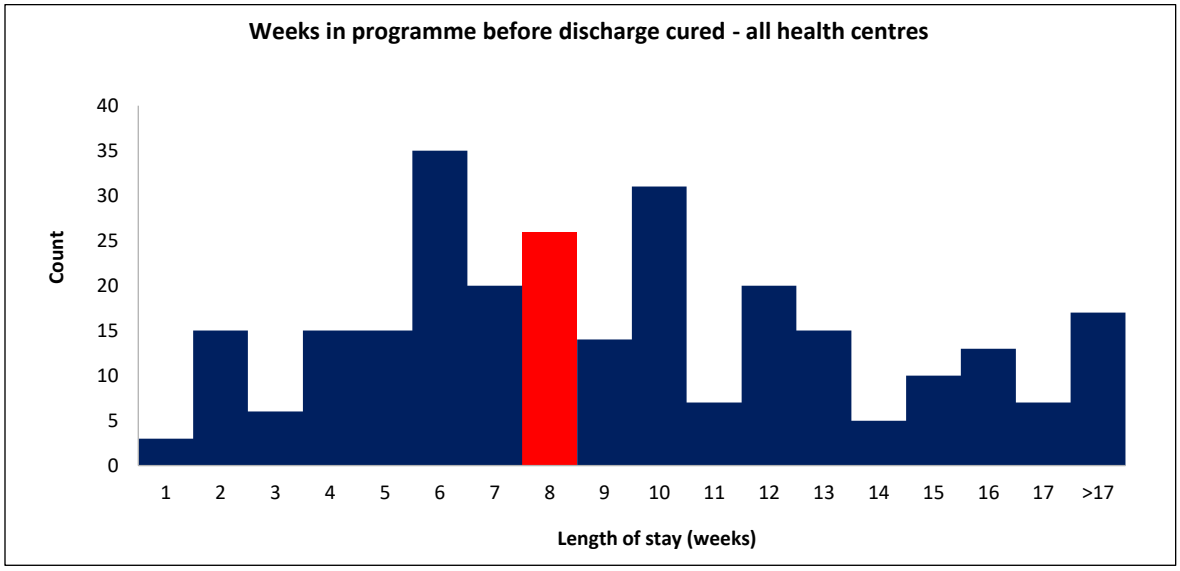

Figure 43: Tana Delta SFP Length of stay discharge cured

2.3.4. Qualitative Data (Community Assessment)

Qualitative data was collected from different sources using various methods. These methods included; Informal Group discussions, Semi structured interviews, In-depth interviews and Observation. The data was collected from CHV, Nutritionist, Health worker, Lay people, Health Facility data, and Community leaders, Carers of beneficiaries, CBRAs, Religious Leaders and NGO agent

Four survey teams collected qualitative data from the community level. Each team comprised of 2 members. The following Boosters and barriers were identified:

Table 19: Tana Delta OTP Booster and Barrier

OTP Booster	Unweighted	Weighted Score	OTP Barrier	Unweighted	Weighted Score
Coordination and In charges meeting held to improve quality on IMAM Data	1	2	Lack of supervision funds to supervise the facilities	1	1
Availability of Partner Support	1	2	Poor Motivation of the CHV	1	3
Awareness of IMAM Programs by Sub County Management/Community	1	3	Inaccessible roads during rainy seasons	1	4

Increased community Units facilitate good service Delivery	1	2	Perceive social status among different community members affect mobilization of the resources	1	1
Regular Communication with staff which enhance supervision	1	1	Stigmatization	1	3
Existence of referral Mechanism	1	4	Low knowledge on IMAM Program by the community and some Health Workers	1	2
Presence of Outreaches	1	5	Language Barrier	1	4
Positive Outcomes after being treated using Nutrition Commodities	1	2	Inadequate Staffing	1	4
Good Documentation	1	1	Stock Out of IMAM Commodities	1	4
Following of right admission Criteria	1	2	Believe in Herbal treatment	1	1
Existence of Defaulter tracing Mechanism	1	4	Poor attitude of the Health Workers	1	3
Active case finding by the CHV encourages Early detection of Malnutrition	1	4	Low ownership of IMAM Program by the Health Workers	1	2
Health Education on IMAM Program	1	2	Poor coordination between the Health worker and CHV	1	2
Collaboration with other TBAs and Health Workers	1	3	Community feel that they are not appreciated	1	1
Encourage other Mothers with malnourished children to seek Medical attention	1	1	Distance from the Facility	1	5
Availability of Nutrition Commodities at the Facility	1	4	Absenteeism of the Health Workers at the Health Facility	1	5
Sensitization meeting held regularly	1	3	Long waiting time and queue at the facility	1	4
No stigmatization	1	2	Inadequate information from the Health Worker	1	2
No sharing of the Nutrition Commodities	1	2	Sharing of the Commodities	1	5
Good Health Seeking Behaviour	1	4	Nomadic Lifestyle	1	5
Good Reception at the Health Facility	1	4	Most men do not allow women to take their children to the H/F without their Consent	1	1
Less Waiting time at the Facility	1	4	Too much Workload	1	2
Total	**22**	**61**	Refusal by Caregiver to admit child	1	1
			Cultural Belief	1	3
			Poor Health Seeking Behaviour	1	3
			Poor storage of Registers at the Facility	1	3
			Lack of Stock Control Cards at the Health Facility	1	2
			Total	**27**	**76**

Table 20: Tana Delta SFP Booster and Barrier

SFP Booster	Unweighted	Weighted Score	SFP Barrier	Unweighted	Weighted Score
Coordination and In charges meeting held to improve quality on IMAM Data	1	2	Lack of supervision funds to supervise the facilities	1	1
Availability of Partner Support	1	2	Poor Motivation of the CHV	1	3
Awareness of IMAM Programs by Sub County Management/Community	1	3	Inaccessible roads during rainy seasons	1	4
Increased community Units facilitate good service Delivery	1	2	Stigmatization	1	3
Regular Communication with staff which enhance supervision	1	1	Low knowledge on IMAM Program by the community and some Health Workers	1	2
Existence of referral Mechanism	1	4	Language Barrier	1	4
Presence of Outreaches	1	5	Inadequate Staffing	1	4
Good Documentation	1	1	Stock Out of IMAM Commodities	1	4

Following of right admission Criteria	1	2	Poor attitude of the Health Workers	1	3
Existence of Defaulter tracing Mechanism	1	4	Low ownership of IMAM Program by the Health Workers	1	2
Active case finding by the CHV encourages Early detection of Malnutrition	1	4	Poor coordination between the Health worker and CHV	1	2
Health Education on IMAM Program	1	2	Distance from the Facility	1	5
Collaboration with other TBAs and Health Workers	1	3	Absenteeism of the Health Workers at the Health Facility	1	5
Availability of Nutrition Commodities at the Facility	1	4	Long waiting time and queue at the facility	1	4
Sensitization meeting held regularly	1	3	Inadequate information from the Health Worker	1	2
No stigmatization	1	2	Sharing of the Commodities	1	5
No sharing of the Nutrition Commodities	1	2	Nomadic Lifestyle	1	5
Good Health Seeking Behaviour	1	4	Too much Workload	1	2
Good Reception at the Health Facility	1	4	Refusal by Caregiver to admit child	1	1
Less Waiting time at the Facility	1	4	Cultural Belief	1	3
Total	**20**	**58**	Poor Health Seeking Behaviour	1	3
			Poor storage of Registers at the Facility	1	3
			Total	**22**	**70**

2.3.5. Program Concept Maps

Qualitative and quantitative data collected was further analyzed and organized in a concept map as shown in figures 14 and 15 below. The investigation team linked barriers and boosters in to 2 concepts maps i.e. OTP and SFP

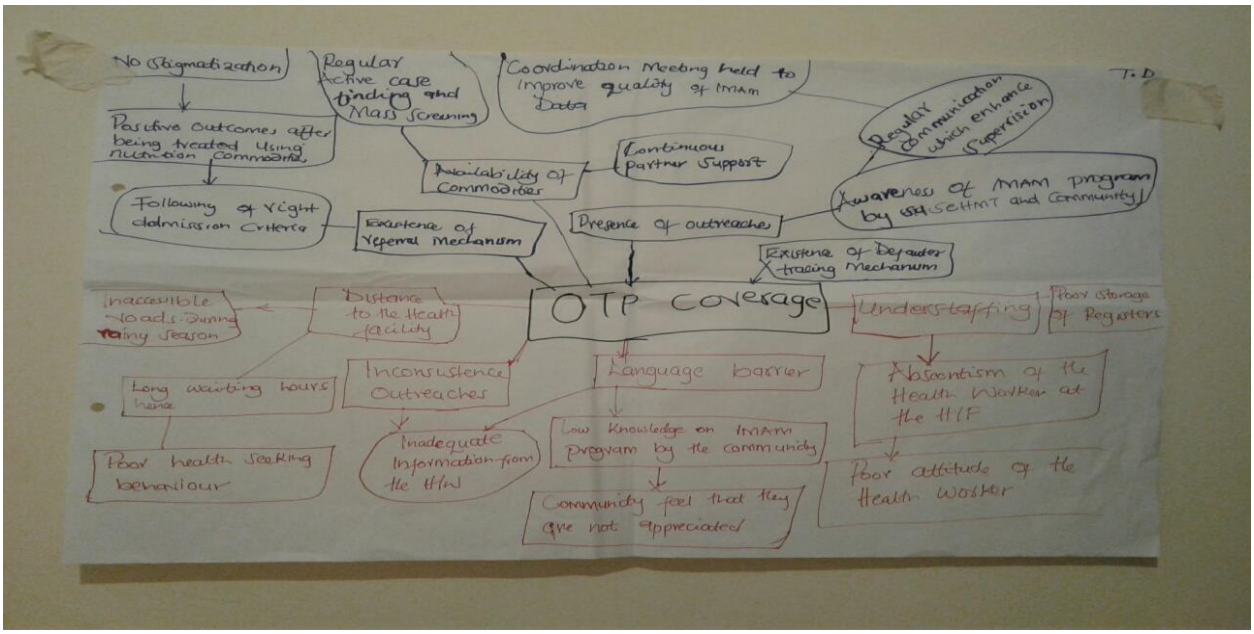

Figure 44: Tana Delta OTP Concept map

Figure 45: Tana Delta SFP Concept Map

2.3.6. Stage two: Coverage Hypothesis formulation and Testing

The objective of this stage was to confirm areas of high and low coverage based on the data collected from stage 1.

The hypothesis formulated:

Program Coverage is High in Villages Close to a Service Delivery Point (<3 KMs or 1 Hours)" compared to Villages Far from a Service Delivery Point (>5 KMs or 1 Hours)"

Rationale of the hypothesis was:

- Qualitative data indicated that distance was a challenge for client retention
- Inconsistent outreach services

The hypothesis was tested using simplified LQAS formula d= |n/2| in comparison with 50% threshold for rural areas.

2.3.6.1 Small Area Study

A small area study was conducted in eight purposively selected villages; Bura Imani,Maziwa B and Oda are the villages classified as high coverage village. The second villages were Garsen High,feji,Dabale,Sera and Dume were the villages classified as low coverage village. Two teams (each with 4 members), visited the three villages. Each team was provided with a MUAC tape and packets of RUTF and RUSF. When they reached the village, they looked for a key informant who lead them to household of caregivers of children under five years of age where they asked whether they were aware of any program that treat malnutrition. They confirmed by showing them MUAC and RUTF.

Small area Study Results

Table 21 and 22 below summarizes the small area study results

Table 21: Tana Delta OTP Small area study result

Purposively sampled villages	Characteristic (s)	No of SAM cases in program	No of SAM cases not in program	Total
High Coverage (Bura Imani,Maziwa B,Oda)	Program Coverage is High in Villages Close to a Service Delivery Point (<3 KMs or 1 Hours)"	1	1	2
Low coverage (Garsen High,feji,Dabale,Sera,Dume)	Program Coverage is Low in Villages Far from a Service Delivery Point (>5 KMs or 1 Hours)"	0	2	2
High coverage Area ((Bura Imani,Maziwa B,Oda)	Program coverage Standard) p	50%	Number of SAM cases in program = 1 which is more than 0.5.	The hypothesis is confirmed
	Decision rule (d)	d= [1/2] = 0.5		
	Number of SAM cases in program	1		
Low Coverage (Garsen High,feji,Dabale,Sera,Dume)	Program coverage standard p	50%	Number of SAM cases in program is 0 which is less than 0	The hypothesis is confirmed
	Decision rule d	d= [0/2]=0		
	No of SAM Cases in program	0		

Table 22: Tana Delta SFP Small area study Results

Purposively sampled villages	Characteristic (s)	No of MAM cases in program	No of MAM cases not in program	Total
High Coverage (Bura Imani,Maziwa B,Oda)	Program Coverage is High in Villages Close to a Service Delivery Point (<3 KMs or 1 Hours)"	8	6	14
Low coverage (Garsen High,feji,Dabale,Sera,Dume)	Program Coverage is Low in Villages Far from a Service Delivery Point (>5 KMs or 1 Hours)"	0	2	2
High coverage Area (Bura Imani,Maziwa B,Oda)	Program coverage Standard) p	50%	Number of MAM cases in program = 8 which is more than 4.	The hypothesis is confirmed
	Decision rule (d)	d= [8/2] = 4		
	Number of MAM cases in program	8		
Low Coverage (Garsen High,feji,Dabale,Sera,Dume)	Program coverage standard p	50%	Number of MAM cases in	The hypothesis

	Decision rule d	d= [0/2]=0	program is 0 which is less than 0	is confirmed
	No of MAM Cases in program	0		

2.3.7. Prior Development

The analysis of routine program data (quantitative), qualitative data and the findings of small area survey provided a numerical representation of a belief about the program coverage (prior). Program barriers and boosters were organized and weighted based on the number of sources. Qualitative data was categorized as booster (positives) or a barrier (negatives) to the program. The prior mode was determined as an average of boosters (build up from 0%) and barriers (knockdowns form 100%) as shown in the table below. Four Methods were used to determine the prior mode. They included; simple barriers, boosters, weighted barriers, boosters, and concept map which were described earlier. Histogram which method was also used. This is a "best" coverage estimate by the investigators as illustrated in figure 16 below.

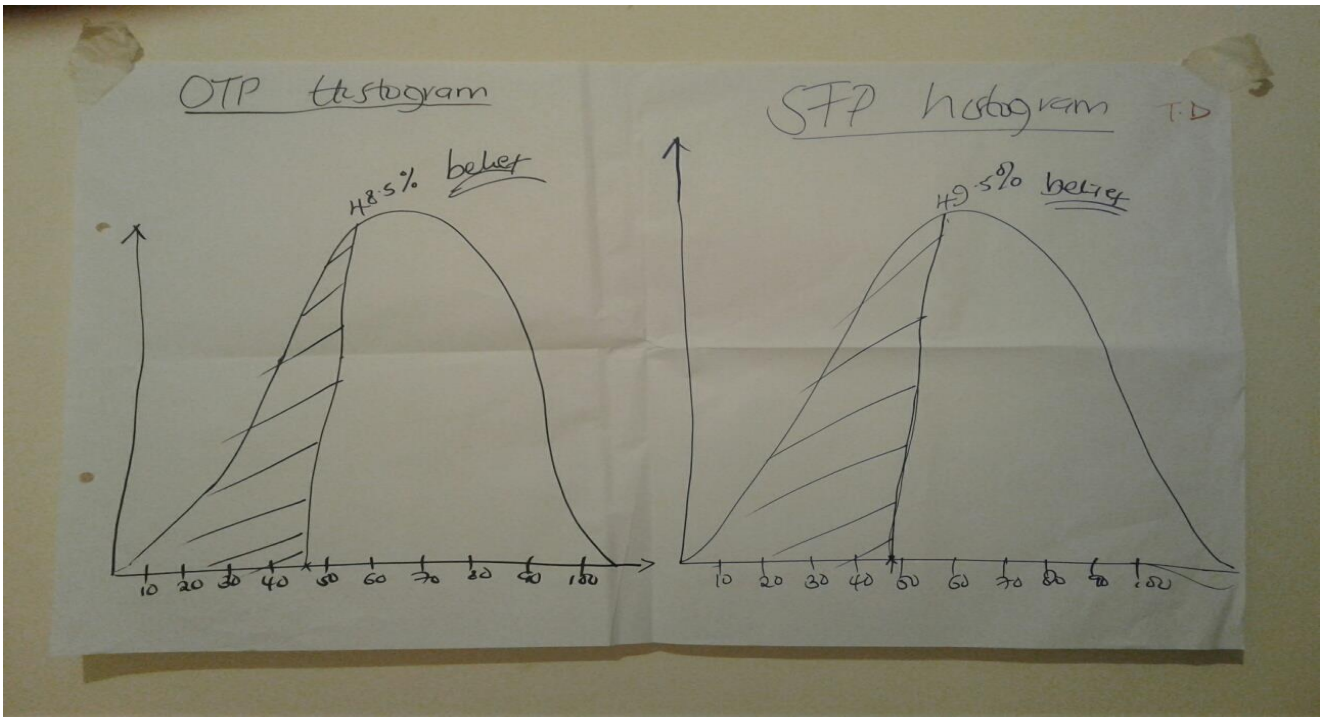

Figure 46: Tana Delta Histogram Belief

Table 23: Tana Delta OTP Prior Development

OTP Method	Boosters	Barriers	Prior Mode (%)
Simple BBQ	22	27	47.5
Weighted BBQ	61	76	42.5
Concept Map	12	14	49.0
Histogram			48.5
Average Prior Mode			46.9

Table 24: Tana Delta SFP Prior Development

SFP Method	Boosters	Barriers	Prior Mode (%)
Simple BBQ	20	26	49.0
Weighted BBQ	64	66	44.0
Concept Map	12	15	48.5
Histogram			49.5
Average Prior Mode			47.8

The above information was fed in SQUEAC Bayes calculator to come up with Bayes plots. This was done by adjusting the α and the ß values of Bayes calculator until the prior mode (46.9 and 47.8) was achieved. Figures 17 and 18 below illustrates the Bayes plots for SFP and OTP. The plots are graphical representation of estimated coverages based on the information so far collected in stage 1 and 2.

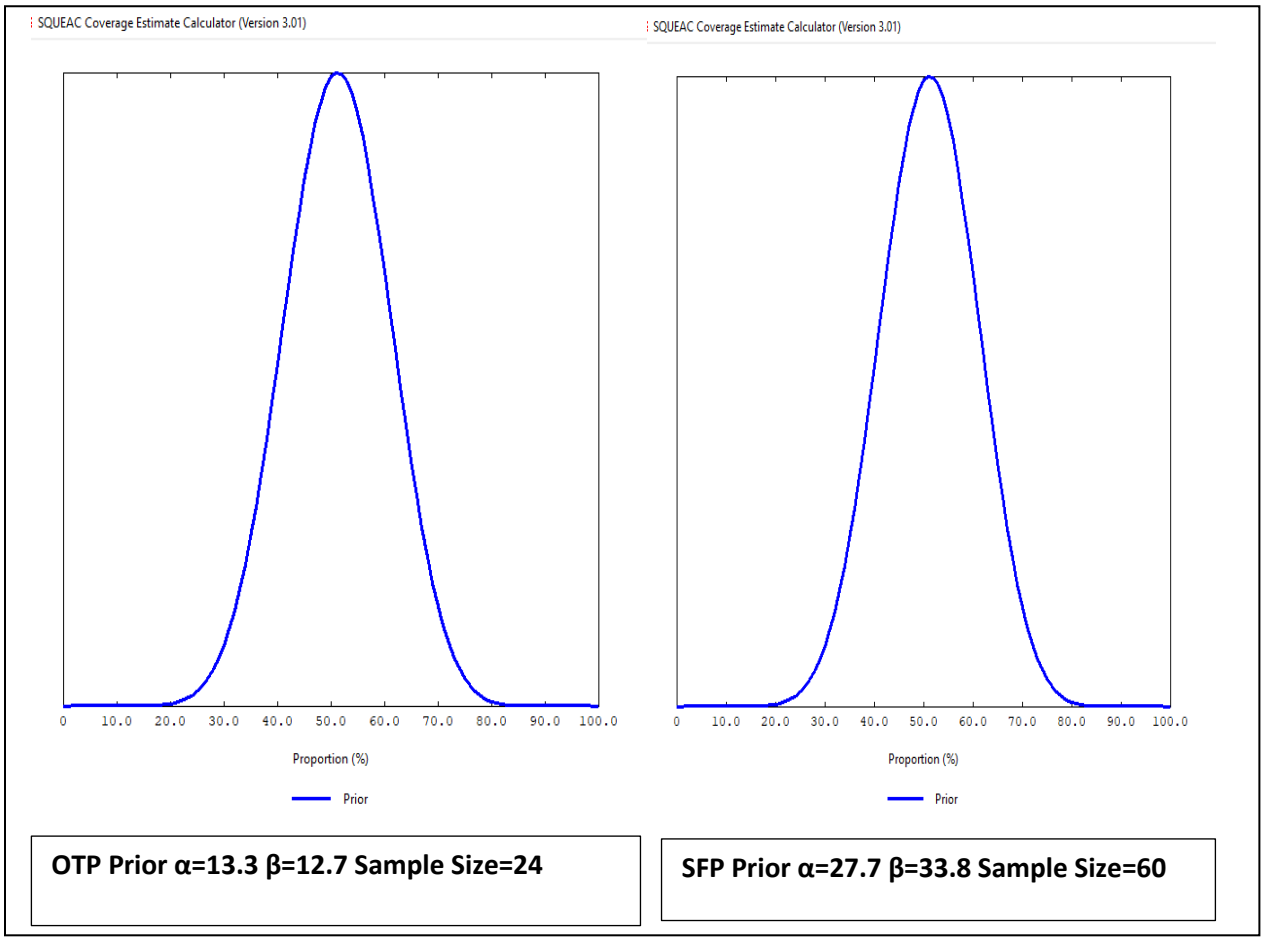

Figure 47: Tana Delta Histograms

2.3.8. Stage three: Wide Area (Likelihood) Survey)

Once the prior mode had been finalized and its shape parameters entered into the Bayes calculator (a recommended sample size was be generated. This figure is the recommended minimum number of acutely malnourished children, which need to be found during the likelihood survey to achieve the desired level of confidence in the posterior, or the overall coverage estimate.

2.3.8.1. Sample size calculation

According to the Bayesian calculator, the sample size for SAM cases was 24 and MAM cases was 60.Since it was logistically impossible to search the cases in the entire sub county, it was prudent to randomly sample a number of villages where such cases were to be found. The number of villages was depended on the number of cases, average population per village, proportion of children 6- 59 months in the population as well as the current estimate of SAM prevalence by MUAC as summarized in the formula below.

$$n\ villages = \frac{n}{[average\ village\ population * (\%Children\ 6-59m) * \%\ SAM\ Prevalence\ by\ MUAC}$$

Where n = 24

Average village population = 754

% children 6 – 59 m = 20.03

SAM prevalence by MUAC = 0.3%

MAM Prevalence by MUAC=2.4%

Therefore;

$$n\ villages = \frac{24}{[754 * (0.2003) * 0.003]}$$

$$n\ villages = 53$$

In case of MAM;

$$n\ villages = \frac{60}{[754*(0.2003)*0.024]}$$ = 17 villages

2.3.8.2. Sampling Method

Two-stage sampling was applied in likelihood survey. Stage 1 involved selection of villages (smallest administrative units) based on the health facility catchments. Since a recent village list based on the health facility catchment was available, Population Proportional to size was used in this stage to avoid bias. Each village was linked to a health facility catchment. In Total, there were 228 villages in Tana Delta Sub County. The number of villages calculated in section 2.5.1 divided this. That is 53 (The highest between SAM and MAM) villages. The villages were selected using the updated population estimate from KNBS into ENA for SMART and 53 Villages were selected.

In stage 2 active case finding was used where MAM and SAM cases were actively searched from the sampled villages. The survey was carried out in 53 villages for 6 days. All children 6 to 59 months had their MUAC measured. Those children who met the admission criteria for SAM (MUAC< 115mm) and MAM (MUAC ≥115mm and < 125mm) and were not in program were referred to the nearest health facility. Five teams, each with 2 measurers were involved in the data collection. Twelve six (26) SAM cases and 88 MAM cases were identified as summarized in table 13 below.

Table 25: Tana Delta Likelihood Survey Results

	OTP	SFP
Covered in the prog (Cin)	8	21
Non-covered out (Cout)	5	40
Recovering in the program (Rin)	2	10
Recovering Out of the prog (Rout)	11	17

Total	26	88

2.3.9. Single Coverage Estimate

Single coverage estimator was used to estimate the program coverage. Single coverage estimator includes both recovering cases that are admitted and those that are not in the program as illustrated below.

$$Single\ Coverage = \frac{Ci + Ri}{Ci + Ri + Cout + Rout}$$

Where Ci= Active cases in program

Cout= Active cases not in program

Ri= Recovery cases in program

Rout = Recovery cases not in program

Sum of Active and recovering cases in program was used as the numerator (14 for SAM and 27 for MAM) while Active and recovering cases in and out of OTP program (30 for SAM and 53 for MAM) was used as a denominator. This information was fed in a Bayes Coverage Estimator Calculator. Combining prior estimate and likelihood information in the calculator generated a posterior which showed the overall coverage for OTP in Galole Sub County as **45.5 %(32.7%-59.3% 95% CI)** and for SFP as **39.1 %(31.6%-47.4% 95% CI)** as illustrated in figure 19 and 20 below.

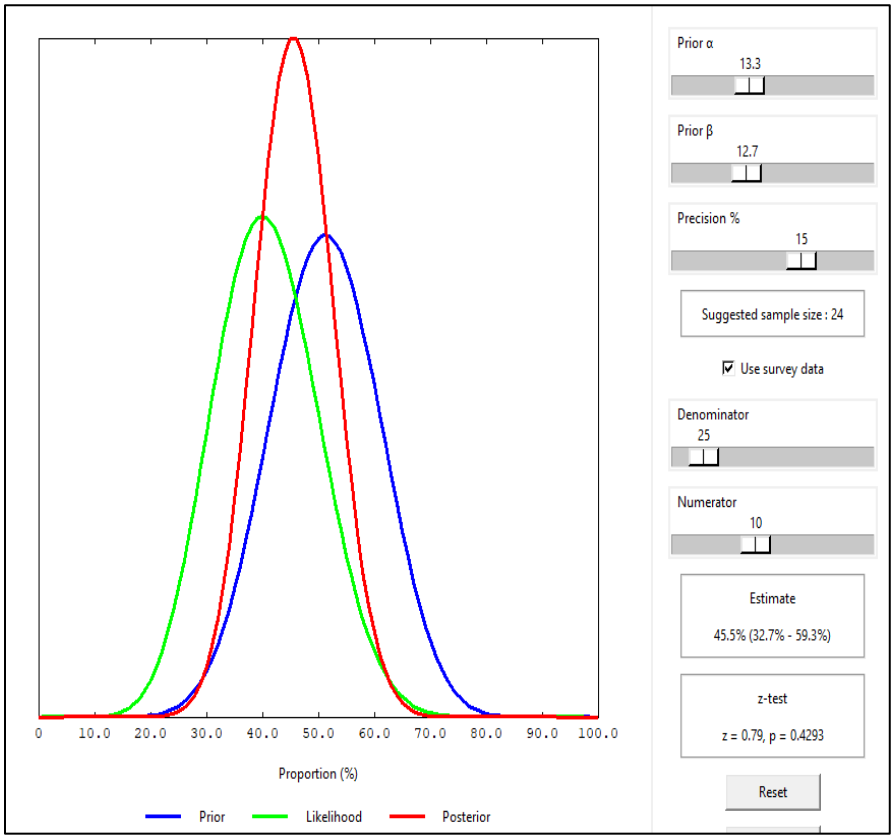

Figure 48: Tana Delta OTP Single Coverage estimate

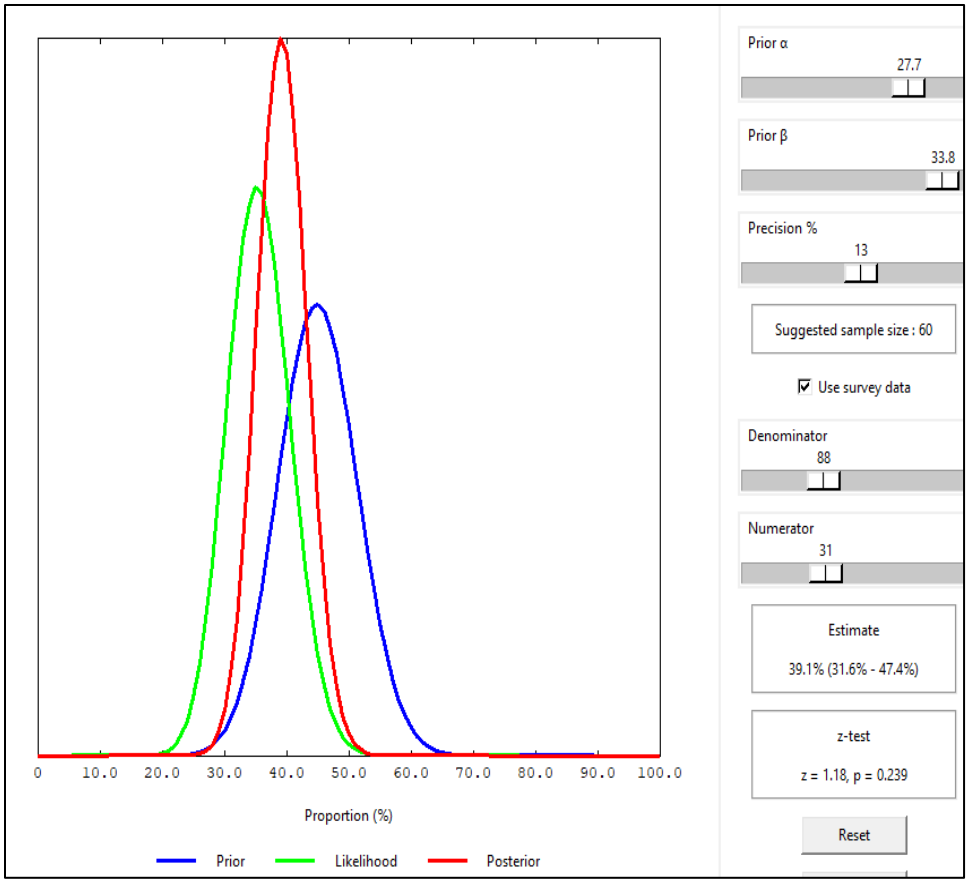

Figure 49: Tana Delta SFP Single Coverage Estimate

2.3.10 Reasons for Non Attendance

For those children who were not admitted in the program, a questionnaire was administered to the caregivers to establish why they were not admitted in the program. Majority of the caregivers said distance, Inaccessibility and Non Availability of means of transportation as the major barriers, as shown in the table below.

Table 26: Tana Delta Reasons for Non Attendance

Reason	MAM	SAM
Lack of conviction that the programme can help the child	1	0
Quantity Of RUTF/RUSF is too little to justify the journey	1	1
Family member ill	1	0
Too busy	1	0
No one to look after other children	2	0
Carer ill	3	0
Non availability of means of transportation	10	2
Inaccessibility	15	0
Distance	15	3
Non availability of financial resources for the treatment	0	2

2.4 Outreach Coverage.

In Tana River County had a total of 68 outreach sites. In Tana North Sub County has 35 outreach sites supported by 2 nutrition partners, Tana Delta has 25 outreaches Supported by 2 nutrition partners and Galole has 8 outreach sites supported by 1 nutrition partner .The partners supporting nutrition outreaches include; Concern Worldwide and Kenya Red Cross as from the month of August, 2019 in Tana North and Galole. Tana Delta from November 2018 to May, 2019. The longest distance from the Health Facility to the Outreach site was 100km, while the shortest distance was 9 km in Tana North. In Tana Delta, the longest distance from the Health Facility to the Outreach site was 84km, while the shortest distance was 5 km. In Galole, the longest distance from the Health Facility to the Outreach site was 130km, while the shortest distance was 5 km.

Chapter three: Discussion, Conclusion and Recommendations

3.1. Discussion

Tana North Sub County

Overall, the IMAM coverage was above 50% SPHERE threshold in Tana North sub County. The overall coverage was 62.4% and 60.6% for OTP and SFP respectively. From Bayes calculator, the p value for OTP and SFP was 0.0687 and 0.102 meaning there was no conflict between the prior and the posterior

The main program boosters that contribute to a relative high coverage included; the presence of integrated outreaches in all IMAM sites attached to them. In all the outreach sites, IMAM services were offered to children under 5 years as well as pregnant and lactating women. CHVs supported with tools especially MUAC tapes and referral forms to conduct regular screening of the children at the community came out as a strong program booster which enhanced good referral mechanism. In additional, this also gave boost to defaulter tracing mechanism at the community. Active case finding by the CHVs encourages early detection of cases in the community. The community appreciated and acknowledge that IMAM program is educative and promotes nutrition to the community. Community confirmed that sensitization meeting are held regularly which is a major booster in passing information to the community.

The major barriers to the program were sharing of RUTF/RUSF, distance to the health facility especially due to poor road network making roads inaccessible, high workload at the health facilities, high maternal workload, personalized stigmatization which make them ashamed to enrol in the IMAM program and scale down of the outreaches especially due to funding which affect the community living very far from the health facility.

Although the outreach coverage was high, defaulting was high in July to November 2019. This can be attributed to migration of livestock hence population moves together as they look for pasture and water. During this season, there was high maternal workload as most mothers were preparing land for planting season ahead of the short rains.

Semi structured interviews with health facility staff, nutritionists, NGO agent as well as informal group discussion with carers of children in program indicated that, inadequate staffing at the health facility and language barrier were major barrier to the IMAM program. In addition, nomadic lifestyle of the community was also a major barrier in high defaulter rate.

Galole Sub County

In Galole Sub County, is the Sub County where family MUAC was being piloted and unfortunately the coverage did not improve from the baseline for both OTP and SFP Nutrition program. The survey conducted in March 2018 which was the baseline the *single coverage estimates* for OTP and SFP was 52.6% (40.1%-65.0%) and 43.2% (36.6%-49.9%) respectively as calculated by the Bayes Calculator while the end line the OTP coverage was above 50% SPHERE threshold at 53.7 %(39.1%-67.1%) and for SFP was 48.9 %(38.5%-59.6%) which was below the SPHERE threshold.

During the coverage we sampled 100 mothers on Family MUAC and most mothers reported to be measuring their children once in two weeks and a CHV keeps monitoring once a month and so happy about this project since they were able to monitor the nutrition of their children right at the household level rather than waiting to go to the health facility. Moreover, for the mothers who self-referred themselves at the Health Facilities they were happy since the health workers did not reject them. However, they were some challenges that affected the implementation of Family MUAC where most children currently are not being taken for Growth monitoring hence missing other antigens that are provided at the health facility and some mothers said they were trained then the MUAC tapes came very late hence they had forgotten to take the Measurement which became a challenge for them and finally, some mothers were too busy in the Farm field and forgot to monitor on the MUAC measurement of their children.

The major barriers affecting the IMAM program is inconsistent outreaches, religion and cultural beliefs where some members in community belief that first treatment is from a traditional healer then hospital. Distance to the health facility was an issue especially during rainy seasons where the roads are rendered impassable. In terms of community engagement, most CHVs lack motivation for continues screening and referral and also sensitization at the community is very low. In Galole, nomadic lifestyle is a major issue since they keep migrating resulting to high defaulter rate.

The major boosters of the IMAM Program, presence of outreaches especially when there is funding from donors and availability of nutrition commodities at the health facility. Semi structured interviews with health facility staff, nutritionists, NGO agent as well as informal group discussion with carers of children in program indicated that, good relationship with stakeholders promoted IMAM program especially health workers which through observation there was good reception at the health facility between the mothers and health workers which minimises the waiting time.

Tana Delta Sub County

Tana Delta Sub County was the sub County that was highly affected by floods and insecurity due to continuous terror attacks on the roads towards Lamu County the end of the year 2019 and beginning of 2020. This contributed to so many people being displaced and some ward especially Kipini East being completely inaccessible.

On IMAM nutrition program, the coverage was below SPHERE threshold of 50%. The *single coverage estimates* for OTP and SFP was 45.5 %(32.7%-59.3%) and 39.1 %(31.6%-47.4%) respectively as calculated by the Bayes Calculator the p value for OTP and SFP was 0.4293 and 0.239 meaning there was no conflict between the prior and the posterior.

The major barriers that affected IMAM program were, absenteeism of the health workers at the health facility which contributed to low coverage due to long waiting time and queues at the facility. The poor attitude of the health workers at the facility affected largely the IMAM coverage since the mothers are comfortable being attended by them resulting to low coverage. There was poor relationship between the health workers and community health volunteers which further affected the IMAM coverage. Insecurity and distance to the health facility especially during rainy seasons which rendered roads impassable. Sharing of RUTF/RUSF is one of the major barriers that is affecting the cure rate of the children in program since they do not get required rations. Language barrier also affected coverage since the mothers are not able to explain themselves to the health workers.

The major boosters of the IMAM program, was presence of Outreaches when funding is available which is coupled with partners support. There was existence of referral system and defaulter tracing mechanism although it is highly affected by lack of motivation of the CHVs which highly affect the nutrition program coverage. Sensitization meeting on IMAM are regularly held at the community level which make the community to be aware on IMAM program.

3.2 Conclusion

Across all the Sub Counties in Tana River County, IMAM program major boosters are presence of integrated outreaches which enhance access to health care for the community living far from the health facility. However has this outreaches are implemented, the issue of impassable roads still affect access especially during rainy season. In terms of community engagement, all the sub Counties have existence channels for defaulter tracing and also referral the only issue affecting continuous monitoring of CHVs by CHAs is lack of motivation of CHVs through monthly stipends and CHAs are not facilitated to do continuous monitoring of CHVs hence undermining CHS.

High illiteracy level in Tana River County have highly contributed to low coverage because from management to the lower level services are provided by people who are not from Tana River County hence the issue of language barrier. This creates a bridge between the community and health worker where they are not able to communicate.

In Tana River there is a cultural belief that when a mother comes with some food at home, there are supposed to share with other children to remove bad eyes which encourage sharing of RUTF/RUSF at the household level which as highly contributed to low cure rate of the children in the program due to taking less ration as compared to the recommended.

Stigmatization at the community level is another barrier to IMAM program especially in Galole Sub County, where mothers were ashamed to enrol their children for IMAM program for fear of what will others say or think. In other Sub Counties what came out clearly was some parents/family refusing to enrol their children in program due to lack of conviction that the program can help the child.

Finally, IMAM Program was majorly dependent on donor funding that compromises the sustainability of the program. Most of the outreaches were donor funded, the distribution of IMAM commodities also depended on partners as well as payment of CHVs.

3.3 Recommendations

Table 27: Tana North recommendations

SNO	BARRIER	RECOMMENDATIONS
1	Stock out of IMAM commodities	Train HCW on commodity management Train HCW on LMIS Integrate supply chain pipeline for all nutrition commodities
2	Distance to health facility	Conduct integrated outreaches
3	Sharing of commodity	Link mothers with malnourished children to social protection programs/IGAs Adequate counselling of mothers with malnourished children Sensitize the community on IMAM program
4	Cultural beliefs	Sensitize community on causes and management of malnutrition in Barraza's, local radio stations and in facilities
5	No defaulter training	Strengthen CHS
6	Nomadic lifestyle	Identify focal persons among the pastoralists to share information on their movements Use mobile clinics to reach the migrating communities
7	Stigmatization	Sensitize community on causes and management of malnutrition

Table 28: Galole Sub County Recommendations

SNO	BARRIER	RECOMMENDATION
1	Inconsistent outreaches	Include outreach plans in AWP
2	Inaccessible roads	Use of motorbikes to access the hard to reach areas where vehicles cannot access
3	Distance to facility	Conduct integrated outreaches
4	Lack of incentives	Provide incentives to CHVs
5	Stock out	Train HCW on commodity management Train HCW on LMIS Integrate supply chain pipeline for all nutrition commodities
6	Inadequate staffing	Lobby for recruitment of more nutritionists
7	Stigmatization	Sensitize the community on the causes and management of malnutrition
8	Sharing of commodities	Link mothers with malnourished children to social protection programs/IGAs Adequate counselling of mothers with malnourished children Sensitize the community on IMAM program

9	Poor health seeking behavior	Sensitize the community on importance of seeking medical attention.
10	Inaccessible roads	Use of motorbike outreaches to access inaccessible areas Use mobile clinics

Table 29: Tana Delta Sub County Recommendations

SNO	BARRIER	RECOMMENDATION
1	Distance to health facilities	Conduct integrated outreaches
2	Inadequate staffing	Lobby for recruitment of more nutritionist
3	Stock out of nutrition commodities	Train HCW on commodity management Train HCW on LMIS Integrate supply chain pipeline for all nutrition commodities
4	Stigmatization	Sensitize community on causes and management of malnutrition
5	Inaccessible roads	Procure motorbikes for outreaches Use of CHVs to conduct house
6	Staff Absenteeism	Frequent support supervision Discipline absent HCW
7	Cultural beliefs	Sensitize community on causes and management of malnutrition in Barraza's, local radio stations and in facilities
8	Low knowledge on IMAM	Train HCW on IMAM Sensitize community on IMAM program

Annexes


Quantitative-Data-Collection_Tana Nort


Quantitative-Data-Collection_Galole _20


Quantitative-Data-Collection_Tana Delta


Galole%20Clusters.xlsx


Tana%20Delta%20Clusters.xlsx


Tana%20North%20Clusters.xlsx


Stage 1 and 2 Data Collection Tools.zip


OUTREACH SITES TANANORTH,TANAD


Coverage%20Survey%20Team.xlsx


ACTION%20POINT%20for%20Tana%20Ri