



Tana River County SMART Survey Report

February 2019



ACKNOWLEDGEMENT

Tana River County SMART survey was made successful through the contribution of a number of partners. The County Department of Health led in the survey management.

The County appreciates the immense support accorded by partners at different levels in making this year's SMART survey a success. These partners include; European Union, UNICEF, Concern Worldwide and Kenya Red Cross.

Special gratitude to; The Tana River County Nutrition Technical Forum and Nutrition Information Technical Working Group for their technical guidance during the survey, County government of Tana River for creating an enabling environment during the data collection exercise , Tana River County community for taking time to provide information which will be of importance in making informed decisions in the nutrition sector programming and last but not least the dedicated survey team members who worked hard in ensuring quality data is collected during this exercise.

LIST OF ABBREVIATIONS

ARI	Acute Respiratory Infection
FAO	Food and Agriculture Organization
BCG	Bacillus Chalmette Guerin
CIDP	County Integrated Development Plan
CLTS	Community Led Total Sanitation
CSG	County Steering Group
CHS	Community Health Strategy
CSI	Coping Strategy Index
ENA	Emergency Nutrition Assessment
GAM	Global Acute Malnutrition
IPC	Integrated Phase Classification
KEPI	Kenya Expanded Program on Immunization
MNPs	Micronutrients Powders
MUAC	Mid Upper Arm Circumference
NDMA	National Drought Management Authority
OPV	Oral Polio Vaccine
PLW	Pregnant and lactating women
SAM	Severe Acute Malnutrition
SBCC	Social Behavior Change and Communication
SMART	Standardized Monitoring Assessment on Relief and Transition
SPSS	Statistical Package for Social Sciences
UNICEF	United Nation Children Fund
WASH	Water hygiene and Sanitation
WHO	World Health Organization.
CNC	County Nutrition Coordinator
NSO	Nutrition Support Officer

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EXECUTIVE SUMMARY

Introduction

Tana River County is located in the Kenyan Coastal region and is divided into 3 sub counties namely; Bura, Galole and Garsen. The County has three main livelihood zones namely; Pastoral, Marginal mixed farming and Mixed farming. The County department of health with support from UNICEF and Implementing Partners carried out a SMART survey in the entire County in February 2019. The main objective of the survey was to determine the prevalence of malnutrition among the children aged 6 - 59 months, pregnant and lactating mothers in Tana River County. Specifically, the survey aimed at determining the nutrition status of children 6 to 59 months, the nutritional status of women of reproductive age (15-49 years) based on maternal mid upper arm circumference, immunization coverage; measles (9-59 months), OPV1/3 and Vitamin A for children aged 6-59 months. The survey also was meant to determine deworming coverage for children aged 12 to 59 months, the prevalence of common illnesses as well to assess maternal and child health care practices, water, sanitation and hygiene practices and prevailing food security situation in the County.

Methodology

The survey was cross sectional and descriptive by design. Standardized Monitoring and Assessment on Relief and Transition methodology was adopted in the study. The study applied quantitative approach. Two stage sampling was used in the survey. The first stage involved random selection of clusters from the sampling frame based on probability proportion to population size (PPS)¹. Emergency Nutrition Assessment (ENA) for Standardized Monitoring for Assessment for Relief and Transition (SMART) July 2015 was used in calculation of sample size. Household was used as the sampling unit in the second stage sampling or basic Sampling Unit. The sample size obtained using ENA software (658 households) was used as the survey sample size. Based on logistical factors (time taken to arrive from the clusters, introductions, sampling, inter household movement, lunch and time back to the base), it was possible to visit 16 households per cluster per day translating to a minimum of 42 clusters. Simple random sampling was used in household selection. Led by a village guide, the survey teams developed a sampling frame in each of the village sampled during the first stage sampling in case such a list never existed.

For the data collection purpose, electronic questionnaire was used. Anthropometric data processing was done using ENA software version 2015 (July). All the other quantitative data were analyzed in Ms. Excel and the SPSS (Version 20) computer package.

¹ In this method villages with more population are likely to be selected as compared to those with low population

Table 1: Results Summary

RESULTS SUMMARY				
ANTHROPOMETRIC RESULTS				
WHO 2006 Standards	N	% with 95% CI	N	% with 95% CI
Design effect (WHZ)= 1.13	Feb-18		Feb-19	
Prevalence of GAM based on WHZ (-2 z score)	628	15.6 % (11.6 - 20.6 95%)	644	14.8 % (11.7 - 18.4 95% C.I.)
Prevalence of SAM based on WHZ (-3 z score) and/or edema	628	2.2 % (1.2 - 4.0 95 %.)	644	2.6 % (1.7 - 4.2 95% C.I.)
Prevalence of stunting based on HFA (<-2 z-score)	614	22.6 % (19.3 - 26.4 95%)	630	21.7 % (18.2 - 25.8 95% C.I.)
Prevalence of severe stunting based on HFA(<-3 z score)	614	5.4 % (3.8 - 7.5 95%)	630	6.3 % (4.7 - 8.5 95% C.I.)
Prevalence of underweight based on WFA(<-2 z score)	631	23.5 % (18.6 - 29.1 95%)	653	23.3 % (19.8 - 27.2 95% C.I.)
Prevalence of severe underweight based on WFA(<-3 z score)	631	5.4 % (3.5 - 8.2 95%)	653	4.6 % (3.1 - 6.7 95% C.I.)
CHILD MORBIDITY (Based on 2 Weeks Recall)				
Indicator	Type of Illness	% Feb 2018	Feb 2019 (n)	% Feb 2019
Illness in the last 2 weeks (Children 6 to 59 months)	All	51.3%	233	35.2%
	Fever with Chills	68%	105	37.9%
	ARI	8%	115	41.5%
	Watery diarrhea	19%	35	12.6%
	Bloody diarrhea	1%	0	0%

Therapeutic Zinc supplementation during diarrhea episodes		57%	N (35)	100%
VITAMIN A SUPPLEMENTATION AND DEWORMING				
Indicator	No. of Times	% Feb 2018	Feb 2019 (n)	% Feb 2019
Vitamin A supplementation 6 to 11 Months	At least Once	75%	58	66.7%
Vitamin A supplementation 6 to 59 Months(once)			207	58.1%
Vitamin A supplementation 12 to 59 months (Once)	At least Once	77%	314	56.1%
Vitamin A Supplementation 12 to 59 months	At least twice	41.7%	146	48.0%
Deworming (12 to 59 Months)	At least Once	40.4%	193	33.6%
	At least Twice	12.4%	59	10.3%
IMMUNISATION				
Antigen	Means of Verification	% Feb 2018	Feb 2019 (n)	% Feb 2019
BCG	Presence of a Scar	95.9%	625	94.4%
OPV1	Recall and Card	96.7%	637	96.6%
OPV 3	Recall and Card	92.3%	626	95.0%
Measles at 9 months	Recall and Card	87.9%	568	91.8%
Measles at 18 Months	Recall and Card	71.2%	357	71.8%
MATERNAL NUTRITION				
Indicator	Description	% Feb 2018	Feb 2019 (n)	% Feb 2019
MUAC < 21.0 cm	Women of Reproductive age	6.1%	18	3.1%
MUAC< 21.0 cm	Pregnant and lactating women	4.4%	6	1.7%
Women supplemented with FeFo	Mothers with children less than 2 years	86.3%	298	50.9%
Women Consuming FeFo	At least 270 days	0.5%	1	0.4%
	At least 90 days	73.6%	164	64.8%

Average IFAS Consumption	Mean Number of days FeFo was consumed		57.6 days	
WATER SANITATION AND HYGIENE PRACTISES				
Indicator	Description	% Feb 2018	Feb 2019 (n)	% Feb 2019
Households obtaining water from safe sources	All Households	72.9%	505	75.8
Households obtaining water from sources less than 500m	All Households	69.6%	486	73.0%
Households treating their water	All Households	23.6%	113	17%
Hand washing in 4 critical moments (N= 247)	Households with children under 2 years	9.5%	58	12.6%
Proportion of households that owns a toilet	All Households	43.1%	283	42.9%
Proportion of households practicing open defecation	All Households	56.9%	380	57.1%
HOUSEHOLD AND WOMEN DIETARY DIVERSITY				
FOOD CONSUMPTION SCORE AND COPING STRATEGY INDEX				
Indicator		% Feb 2018	Feb 2019(n)	% Feb 2019
Household within Acceptable food consumption score (>35.5)		66.1%	577	86.6%
Coping Strategy Index		18.1%		18.1%

Conclusion

Overall the nutrition Status of children in Tanariver County remained the same compared to the outcome of a SMART survey conducted in the same season in 2018. There was no significant statistical difference between wasting for children under-five years between the SMART Nutrition survey conducted in February 2018 (GAM 15.6%) and February 2019 (GAM 14.8%) $p=0.7723$ There was also no significant statistical difference between other childhood malnutrition indicators; underweight and stunting. The county is classified to be in phase 2 (Serious) according to IPC classification for acute malnutrition.

Analysis was done on food security and morbidity issues, which would have contributed to changes in acute malnutrition. According to the February 2019 SRA report, Tanariver county food security phase classification is Stressed (IPC phase 2). Pastoral and Marginal mixed farming zones classified to be in crisis phase (IPC phase 3) and on a worsening trend. Mixed farming zone classified to be in stressed phase and the trend worsening. Tana North sub county is currently the worst affected closely followed by Galole and Tana Delta sub counties respectively. Although there was no significant difference between 2018 and 2019 surveys, the stunting and underweight

levels remained relatively high that requires County interventions. There was no significant difference in the two indicators between boys and girls.

Maternal nutrition status based on MUAC measurement among all women of reproductive age and pregnant and lactating women only showed an improvement with the two categories having MUAC of <21cm at 3.1% and 1.7% respectively in 2019 an improvement from 6.1% and 4.4% in 2018 respectively

Average IFAS consumption mean number of days FeFo was consumed was found to be 57.6 days out of the minimum required days of 180. More advocacy on FeFo utilization is needed to help increase the uptake.

In conclusion it was noted that key drivers of poor nutritional status in Tanariver County include; Chronic food insecurity, Inadequate dietary diversity, Poor access to safe water, Diseases, Poor hygiene and sanitation practices.

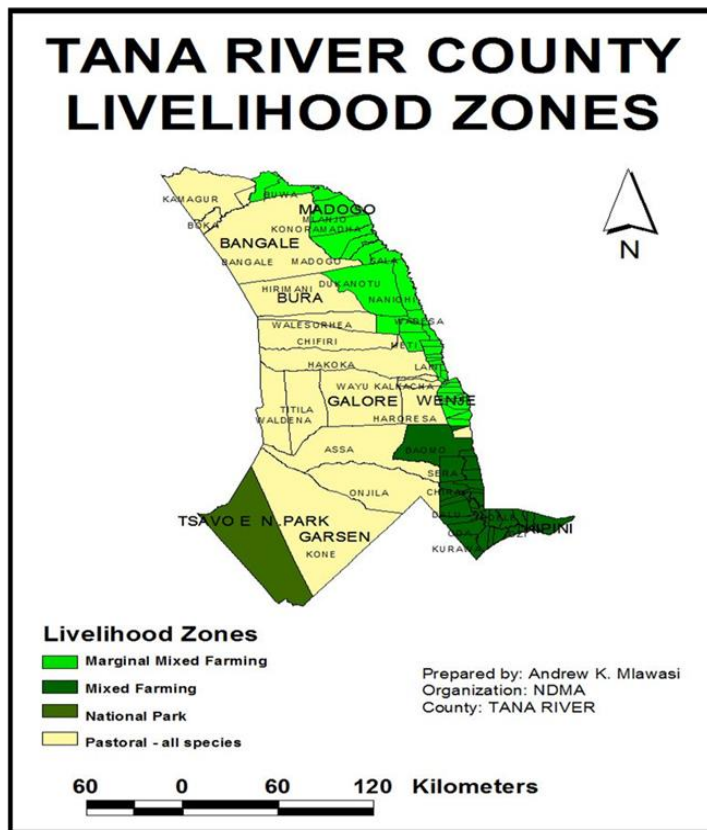
Recommendation

- Active case findings at the community and Nutrition surveillance.
- Scale up of IMAM surge activities at health facilities implementing IMAM.
- Continued scale up of MIYCN activities (BFCI and BFHI) as well as IMAM activities
- Conduct rapid assessment in areas identified as malnutrition hotspots
- Upscale integrated medical outreaches and mobile clinics in the county especially within the two most affected sub counties (Tana North and Tana river)
- Introduce cash transfer program for the affected sub counties for at least three months
 - Establish a Multi-sectoral platform for high level advocacy and coordination of nutrition activities both sensitive and specific and advocate for recruitment of more nutritionist to help boost nutrition service delivery. Sensitize the community on the importance of Vitamin A supplementation and deworming as well as scale up VAS interventions within ECDE, Duks and at the community.
- Sensitize HCP on proper/appropriate documentation
- Strengthen health education to community on important of IFAS uptake and early ANC visit (SBCC)
- Train HCP on IFAS policy guidelines as well as MNPS
- Adopt and fully operationalize CLTS in the county
- Operationalize the community health units to ensure strengthened referral from the community
- Community health education on importance of treated drinking water
- Procurement and distribution of water treatment chemical; as the preferred method of treatment.

1.0. INTRODUCTION

1.1. Background

Tana River County is located in the Coastal region of Kenya, which occupies an area of approximately 38,437 km², has an estimated population of 324,054 people. Tana River County 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. The County has three sub counties namely: Bura, Galore and Garsen. Tana River County has four main livelihood zones namely; Pastoral, Marginal mixed farming, Mixed farming and National park as shown in figure 1.



Generally, the county experiences bimodal rainfall pattern which is mostly erratic with long rains falling between April and June and short rains between October and December.

The pastoral and marginal mixed farming livelihood zones rely on short rains while mixed farming zone rely on long rains. The mean annual rainfall ranges between 220mm and 500mm except the mixed farming zone, which receives rainfall ranging between 750mm and 1250mm. The County is generally hot and dry with temperatures ranging between 21°C and 38°C with the coldest month in July and hottest months in September and January. It therefore experiences

two dry spells every year occurring in December to March and July to October.

Figure 1: Tana River map showing livelihood zones

Most of the County consists of low-lying plains with the highest points being Minjila and Bilbil. The River Tana traverses the County from Tharaka Nithi County in the North to the Indian Ocean in the South passing through Tana Delta and covering a stretch of approximately 500km, situated in the Eastern side of the county, this provides livelihood opportunity to resident population through flood receded crop farming.

1.2. Survey Justification

According to a SMART survey carried out in Tanariver County (January/February 2018), the Global Acute Malnutrition was at critical Phase (15.6 %) while SAM was at 2.2% and Stunting was at 22.6%. The December 2018 NDMA bulletin put the County at Alert phase of drought cycle,

experiencing vegetation deficit within all the 3 sub counties and milk production and consumption at the Household level was poor and below normal. The purpose of the survey was to assess the nutrition situation of children below five years and women of reproductive age in Tana River County. The survey results will feed into the Short Rains Assessments report, which will inform the response plan.

1.2. Survey Objectives

The main objective of the survey was to determine the prevalence of malnutrition among children aged 6- 59 months old, pregnant and lactating mothers in Tana River County.

1.3. Specific Objectives

- To assess current prevalence of acute malnutrition in children aged 6-59 months.
- To determine the nutritional status of women of reproductive age (15-49 years)
- To determine immunization coverage for measles, OPV1 & 3 and Vitamin A for children aged 6-59 months.
- To determine deworming coverage for children aged 12 - 59 months.
- To determine the prevalence of common illnesses (diarrhea, measles and ARI).
- To assess water, sanitation and hygiene practices.
- To establish the coverage of iron/folic acid supplementation and consumption during pregnancy among lactating women
- To assess health seeking behavior among caregivers of children below 5years
- To assess the prevailing situation of household food security in the County.

1.4. Survey Timing

Tana River SMART survey was done in February 2019. According to the County seasonal calendar, this is usually a short dry spell. At this season, communities in the mixed farming livelihood zone have their farm without crop. Pastures depleting to be considered dry season in the pastoral communities. Table 2 below is the seasonal calendar for Tana River County

Table 2: Tana River Seasonal Calendar

Tana River SMART Survey
2019

Short dry spell			Long rains			Long dry spell			Short rains		
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Short rains harvest			Land Preparation	Planting/weeding Lean period for farmers	Crops at green maturity	Long rains harvest	Land Preparation.	Planting/Weeding Lean period for farmers	Crops at green	Maturity	

Source: National Drought Management Authority

2.0. METHODOLOGY

2.1. Survey Design

The survey was cross sectional and descriptive by design. The study adopted Standardized Monitoring & Assessment on Relief and Transition's methodology. The study applied quantitative approach.

2.2. Sampling Procedure

2.2.1. Study Population

The study population included the entire population in Tana River County, estimated at 324,054 people. All villages (clusters/sampling units) in the County, which were accessible, secure and not deserted, were included in the sampling frame.

2.2.2. Sampling methods and sample size calculation

Anthropometric sample size calculation

The survey adopted Two-stage sampling technique. The first stage involved random selection of clusters from the sampling frame based on probability proportion to population size (PPS)². Emergency Nutrition Assessment (ENA) for Standardized Monitoring for Assessment for Relief and Transition (SMART) July 2015 was used in calculation of sample size.

Table 3: Sample size calculation

Parameters for Anthropometry	Value	Assumptions based on context
Estimated Prevalence of GAM (%)	15.6 %	Based on January 2018 prevalence. The County drought status is Alert and the trend is worsening in all the livelihood zones (EWS bulletin December 2018). This status is expected to worsen.
± Desired precision	3.%	Rule of Thumb
Design Effect	1.13	Based on January 2018 SMART Survey
Children to be included	691	
Average HH Size	6	Based on CIDP
% Children under-5	20.06%	Based on 2009 population census projections
%Non-response Households	3 %	Estimated non response based on the current situation population migration
Households to be included	658	
Number of households per day	16	Based on 2018 SMART Survey Experience
Number of clusters	42	Computed from the Number of HHs per Day

² In this method villages with more population are likely to be selected as compared to those with low population

2.2.3. Sample Size Description

Household was used as the sampling unit in the second stage sampling or basic Sampling Unit. The sample size obtained using ENA software (658 households) was used as the survey sample size. Based on logistical factors (time taken to arrive from the clusters, introductions, sampling, inter household movement, lunch and time back to the base), it was possible to visit 16 households per cluster per day translating to a minimum of 42 clusters. Simple random sampling was used in household selection. Led by a village guide, the survey teams developed a sampling frame in each of the village sampled during the first stage sampling in case such a list never existed. From the list, the survey teams randomly selected 16 households where they administered household questionnaire (in all households) and anthropometric, morbidity and immunization questionnaire in household with children aged 6 to 59 months.

2.3. Data Collection

Data Collection was done for 6 days (08th to 13th of February 2019) by seven teams. Every team was composed of four members who included a team leader, 2 measurers and a community guide. Teams were trained for 4 days prior to field work. Teams were trained on, the survey objectives, methodology, malnutrition diagnosis, anthropometric measurements, sampling methods, data collection tools, ODK data collection process as well as interviewing skills. A role play was included in the training to give the teams practical skills on data collection. On the 3rd day standardization test was done. To evaluate team's accuracy and precision in taking anthropometric measurements. SMART data collection tool was piloted / tested in a non-selected cluster to be part of the survey sample. Additionally, during the piloting the enumerators were required to undertake the entire process of the survey, which included household selection, taking anthropometric measurements and filling of the data collection forms.

The overall survey coordination was handled by the Tana River County Nutrition Coordinator with support from the Nutrition Support Officer, 3 sub county nutritionist and Implementing Partners on training and supervision of survey teams, as well as technical guidance from NITWG. Close supervision was conducted to ensure data collected during the survey is of high quality. The supervisor's main responsibilities were to ensure that the methodology was followed, measurements were taken appropriately and tackling any technical issue which came up during data collection. On daily basis plausibility were done and gaps noted were communicated to all the teams before going to the field every morning for corrections and adjustments.

2.4. Data Collection Tools and Variables

For the data collection purpose, electronic questionnaire was used. Each questionnaire consisted of identification information, household information, demographic information, anthropometric information, morbidity, immunization, maternal, WASH and food security data. Household, demographic and food security information were collected in all the sampled households. The rest of the data was collected from only households with children aged 6 to 59 months.

2.5. Data Analysis

Anthropometric data processing was done using ENA software version 2015 (July). World Health Organization Growth Standards (WHO-GS) data cleaning and flagging procedures was used to identify outliers which would enable data cleaning as well as exclusion of discordant measurements from anthropometric analysis. The ENA software generated weight-for-height, height-for-age and weight-for-age z scores to classify them into various nutritional status categories using WHO standards and cut-off points and exported to SPSS for further analysis. All the other quantitative data were analyzed in Ms. Excel and the SPSS (Version 22) computer package.

2.6. Data Quality Control Measures

To ensure data collected was valid and reliable for decision-making, a number of measures were put in place. They included;

- I. Thorough 4 days training conducted to survey participants, the training dealt on SMART methodology, survey objectives, interviewing techniques and data collection tools.
- II. Ensuring all anthropometric equipment were functional and standardized. On daily basis, each team was required to calibrate the tools.
- III. During the training exercise, standardization test was done; in addition, piloting of tools was done to ensure all the information was collected with uniformity.
- IV. Conducting a review of data collection tools during training and after the pilot test.
- V. All the survey teams were assigned a supervisor during data collection.
- VI. The anthropometric data collected was entered daily on ENA software and plausibility check was run. Any issues noted were communicated to the teams before they proceeded to the field the following day.
- VII. Teams were supervised to ensure all errors were rectified on time. More attention was given to the teams with notable weaknesses.
- VIII. Adequate logistical planning beforehand and ensuring the assigned households per clusters were be comfortably survey.
- IX. A whatsapp group was formed to ensure close monitoring of the teams and easier for communication.
- X. Close supervision by the CNC, NSO and IPs during data collection period.

3.0. RESULTS

3.1. General Characteristics of Study Population

The survey involved collection of information from 662 children in 666 households. Only 7 sampled households did not participate in the survey. The response rate was therefore 99.0%. The reason for non-response were absenteeism and refusal to participate. The average household size recorded from this survey was 3.5. All households that participated in the survey were residents.

The main income sources of household heads were Casual labour (26.3%), sale of livestock products (19.4%), Sale of crops (14.9%) and other sources of income are as shown in table 4 below. In terms of occupation, majority of household heads were livestock herders (27.3%), waged laborers (23.6%) as well as own farm laborers as shown in table 5 below. While on school enrolments, 66% of children aged 3 to 18 years are enrolled in school, 34% were not. The reasons for non-enrollment included; parents felt their children to be young for school enrollment, no school was nearby, family labor responsibilities as well as the household could not see the need for the child being in school.

Table 4: Main source of income for household head

Main Source of Income	Number	Percentage
No Income	44	6.6%
Sale of Livestock	129	19.4%
Sale of Livestock Products	40	6.0%
Sale of crops	99	14.9%
Petty trading e.g. sale of firewood	78	11.7%
Casual Labor	175	26.3%
Permanent Job	28	4.2%
Sale of personal assets	2	0.3%
Remittance	8	1.2%
Others (Specify)	63	9.5%

Table 5: Main occupation of household head

Main Occupation of household head	Numbers	Percentage
Livestock herding	182	27.3%
Waged labor (Casual)	157	23.6%
Own farm labor	146	21.9%
Petty trade	62	9.3%
Firewood/charcoal	21	3.2%
Employed (salaried)	34	5.1%
Fishing	6	0.9%
Merchant/trader	5	0.8%
Others (Specify)	53	8.0%

3.2. Distribution of Age and Sex (Under-fives)

The total number of children assessed during the survey was 644 (348 boys and 312 girls). The boy to girl ratio was 1.12 and a p-value of 0.161 (boys and girls equally represented) who participated in the survey. Table 6 below is a summary of sex and age distribution of children who were assessed. Age ratio of 6-29 months to 30-59 months: 0.98 (The value should be around 0.85), p-value = 0.075 which is as expected.

Table 6 Age and sex distribution of children 6 to 59 months

AGE (mo)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:girl
6-17	93	55.4	75	44.6	168	25.5	1.2
18-29	89	56.3	69	43.7	158	23.9	1.3
30-41	85	54.1	72	45.9	157	23.8	1.2
42-53	63	47.0	71	53.0	134	20.3	0.9
54-59	18	41.9	25	58.1	43	6.5	0.7
Total	348	52.7	312	47.3	660	100.0	1.1

3.3. Under-fives Nutrition Status

Under five nutrition status was assessed using anthropometric indicators namely, Weight for Height and MUAC (wasting or acute malnutrition), Height for Age (stunting or chronic malnutrition) and weight for age (underweight). Analysis was based on 2006 WHO reference standards.

3.3.1. Prevalence of Acute Malnutrition (Wasting)

According to UNICEF nutrition glossary (2012), malnutrition is defined a state in which the body does not have enough of the required nutrients (under nutrition) or has excess of the required nutrients (over nutrition). Acute malnutrition is the low weight for height in reference to a standard child of a given age based on WHO growth standards. This form of malnutrition reflects the current form of malnutrition. Acute malnutrition can further be categorized as severe acute malnutrition and moderate acute malnutrition. Severe acute malnutrition is defined as weight for height < -3 standard deviation in comparison to a reference child of the same age. It also includes those children with bilateral edema as well as those with MUAC less than 11.5cm. Moderate Acute Malnutrition on the other hand is defined as weight for height ≥ -3 and < -2 standard deviation in comparison to a reference child of the same age and sex, but also include those children with MUAC < 12.5 cm and ≥ 11.5 cm. The global acute malnutrition (GAM) is the Sum of all children with moderate and severe acute malnutrition in the sample.

Prevalence of Acute Malnutrition based on Weight for Height by Sex

Analysis of acute malnutrition was based on 644 children aged 6 to 59 months (341 boys and 303 girls). There was an exclusion of 16 children who were flagged off as outliers. From the analysis,

Tana River county global acute malnutrition was **14.8% (11.7- 18.4, 95% C.I.)** The SAM rate in the County was **2.6 % (1.7-4.2, 95% C.I.)**.

Table 7 Prevalence of acute malnutrition based on Weight for Height Z- score

Indicator	Total (N)	All (% with 95% C.I)	Boys (% with 95% C.I)	Girls (% with 95% C.I)
Prevalence of global malnutrition (<-2 z-score and/or oedema)	644	(95) 14.8 % (11.7 - 18.4 95% C.I.)	(46) 13.5 % (10.1 - 17.8 95% C.I.)	(49) 16.2 % (12.4 - 20.8 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and ≥-3 z-score, no oedema)	644	(78) 12.1 % (9.2 - 15.7 95% C.I.)	(37) 10.9 % (7.7 - 15.1 95% C.I.)	(41) 13.5 % (9.9 - 18.2 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	644	(17) 2.6 % (1.7 - 4.2 95% C.I.)	(9) 2.6 % (1.5 - 4.7 95% C.I.)	(8) 2.6 % (1.4 - 4.9 95% C.I.)

The prevalence of Oedema was 0.0%

Figure 2 below is a graphical representation of distribution of weight for height of children surveyed in relation to the WHO standard curve (reference children). The curve slightly shifts to the left with a mean of -0.90 SD (± 1.04) an indication of under nutrition in comparison to reference children.

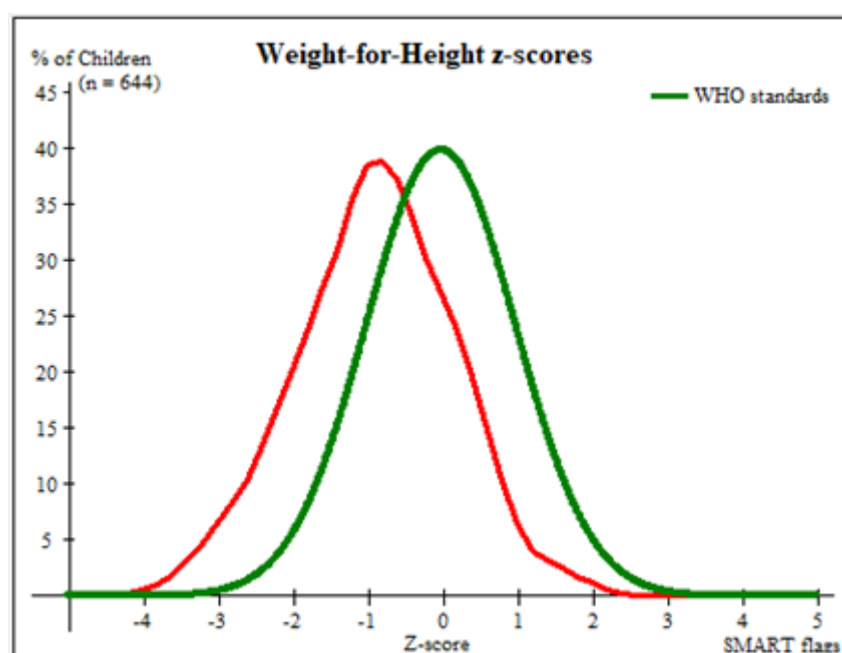


Figure 2: Graphical representation of WFH for children assessed compared to reference children

Analysis of Acute Malnutrition by Age

Further analysis was done on prevalence of acute malnutrition based on sex and age as indicated in table 8 below. From the analysis older children (30 to 59 months) were more affected by severe and moderate malnutrition as compared to younger children (6 to 29 months).

Table 8: Prevalence of acute malnutrition by age based on WFH Z- score and or oedema

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	165	3	1.8	10	6.1	152	92.1	0	0.0
18-29	157	5	3.2	14	8.9	138	87.9	0	0.0
30-41	150	3	2.0	24	16.0	123	82.0	0	0.0
42-53	130	5	3.8	22	16.9	103	79.2	0	0.0
54-59	42	1	2.4	8	19.0	33	78.6	0	0.0
Total	644	17	2.6	78	12.1	549	85.2	0	0.0

Analysis of Acute Malnutrition based on presence of Oedema

Presence of bilateral edema is a sign of severe acute malnutrition. Analysis was therefore done based on this indicator. As shown in table 9 below, no edema case was recorded among the children surveyed.

Table 9: Prevalence of acute malnutrition and Edema based on WFH Z score

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 26 (3.9 %)	Not severely malnourished No. 634 (96.1 %)

Trends of Acute Malnutrition in Tana River County

There was no significant increase in Malnutrition based on WFH Z score compared to February 2018 survey (p=0.7723). The food security situation in Tana River County was classified as “Stressed” (IPC Phase 2) in the mixed farming and marginal farming zones whereas the pastoral livelihood is classified as “Crisis” (IPC Phase 3).

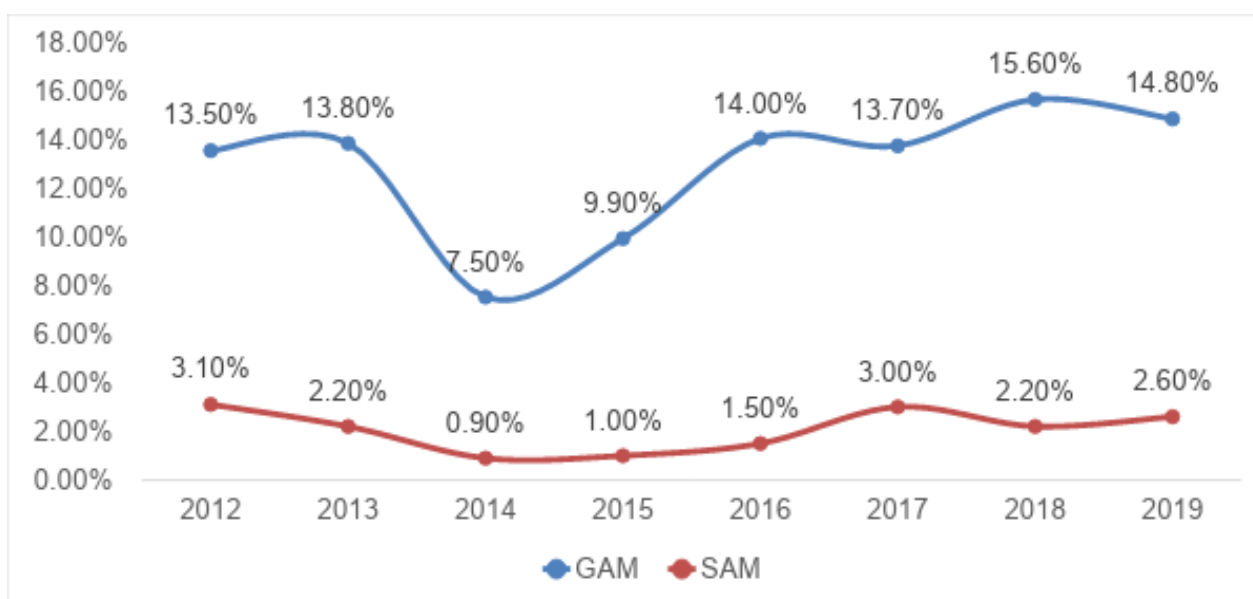


Figure 3: Trends of wasting prevalence in Tana River County

Prevalence of Acute Malnutrition based on MUAC

Malnutrition can also be diagnosed using MUAC. MUAC is a good indicator of muscle mass and can be used as a proxy of wasting (United Nation System Standing Committee on Nutrition). It is also a very good predictor of the risk of death. Very low MUAC (< 11.5 cm for children 6 to 59 months), is considered a high mortality risk and is a criteria for admission of outpatient therapeutic or in patient therapeutic program (when accompanied with complications) for treatment of severe acute malnutrition. A MUAC reading of 11.5 cm to <12.5 cm is considered as moderate malnutrition. Analysis of the nutrition status for children aged 6 to 59 months based on MUAC and or presence of Oedema resulted to GAM of **2.7%** and SAM of **0.3%** as indicated in table 10 below.

Table 10: Prevalence of Acute malnutrition based on MUAC Cut offs (and or Oedema) and by sex

	All n = 660	Boys n = 348	Girls n = 312
Prevalence of global malnutrition (< 125 mm and/or oedema)	(18) 2.7 % (1.6 - 4.6 95% C.I.)	(5) 1.4 % (0.5 - 3.8 95% C.I.)	(13) 4.2 % (2.3 - 7.4 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(16) 2.4 % (1.4 - 4.2 95% C.I.)	(4) 1.1 % (0.3 - 3.7 95% C.I.)	(12) 3.8 % (2.2 - 6.8 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(2) 0.3 % (0.1 - 1.2 95% C.I.)	(1) 0.3 % (0.0 - 2.1 95% C.I.)	(1) 0.3 % (0.0 - 2.3 95% C.I.)

Prevalence of Underweight based on WFA

Underweight is defined as low weight for age relative to National Centre for Health and Statistics or World Health Organization reference median. In this survey, the later was used. Children with weight for age less than -2 SD in relation to a reference child are classified as underweight while those with less than -3 SD are classified as severe underweight. Underweight is a composite form of under nutrition and has elements of both acute under nutrition (wasting) as well as chronic under nutrition (stunting). As indicated in table 11 below, the prevalence of underweight among children aged 6 to 59 months in Tana River County was **23.3%** while those who were severely underweight was **4.6%**.

Table 11: Prevalence of underweight based on WFA Z score and by sex

	All n = 653	Boys n = 344	Girls n = 309
Prevalence of underweight (<-2 z-score)	(152) 23.3 % (19.7 - 27.2 95% C.I.)	(77) 22.4 % (17.5 - 28.1 95% C.I.)	(75) 24.3 % (20.5 - 28.5 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(122) 18.7 % (15.2 - 22.7 95% C.I.)	(63) 18.3 % (13.8 - 23.9 95% C.I.)	(59) 19.1 % (15.6 - 23.1 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(30) 4.6 % (3.1 - 6.7 95% C.I.)	(14) 4.1 % (2.2 - 7.4 95% C.I.)	(16) 5.2 % (3.2 - 8.3 95% C.I.)

Prevalence of Chronic Malnutrition (Stunting) based on Height for Age (HFA).

WHO define stunting as height for age less than - 2 SD from median height for age of reference population. Childhood stunting is an outcome of maternal under nutrition as well as inadequate infant and young child feeding. It is associated with impaired neurocognitive development, a risk maker of non-communicable diseases and reduced productivity later in life (WHO 2013). Analysis of stunting prevalence based on height for age revealed an overall stunting rate of **21.7%** In addition, a severe stunting (HFA< -3 in reference to standard population) rate of **6.3%** as shown in table 12 below. Boys were more stunted than girls were. Table 13 illustrates stunting by age.

Table 12: Prevalence of stunting based on Height for Age Z-score and by sex

	All n = 630	Boys n = 335	Girls n = 295
Prevalence of stunting (<-2 z-score)	(137) 21.7 % (18.3 - 25.7 95% C.I.)	(82) 24.5 % (19.3 - 30.5 95% C.I.)	(55) 18.6 % (14.5 - 23.7 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(97) 15.4 % (12.7 - 18.6 95% C.I.)	(59) 17.6 % (13.7 - 22.3 95% C.I.)	(38) 12.9 % (9.2 - 17.7 95% C.I.)
Prevalence of severe stunting	(40) 6.3 %	(23) 6.9 %	(17) 5.8 %

(<-3 z-score)	(4.7 - 8.5 95% C.I.)	(4.4 - 10.6 95% C.I.)	(3.7 - 8.9 95% C.I.)
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Table 13: Stunting by age

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (>= -2 z score)	
Age (mo)	Total no.	No.	%	No.	%	No.	%
6-17	158	9	5.7	19	12.0	130	82.3
18-29	153	15	9.8	27	17.6	111	72.5
30-41	150	9	6.0	26	17.3	115	76.7
42-53	130	7	5.4	15	11.5	108	83.1
54-59	39	0	0.0	10	25.6	29	74.4
Total	630	40	6.3	97	15.4	493	78.3

Figure 4 below shows the graphical representation of distribution of HFA of surveyed children in relation to reference children (based on WHO standards). There is a slight drift to the left implying that the surveyed children were stunted in comparison to WHO standard curve with a mean± SD of -1.10±1.20.

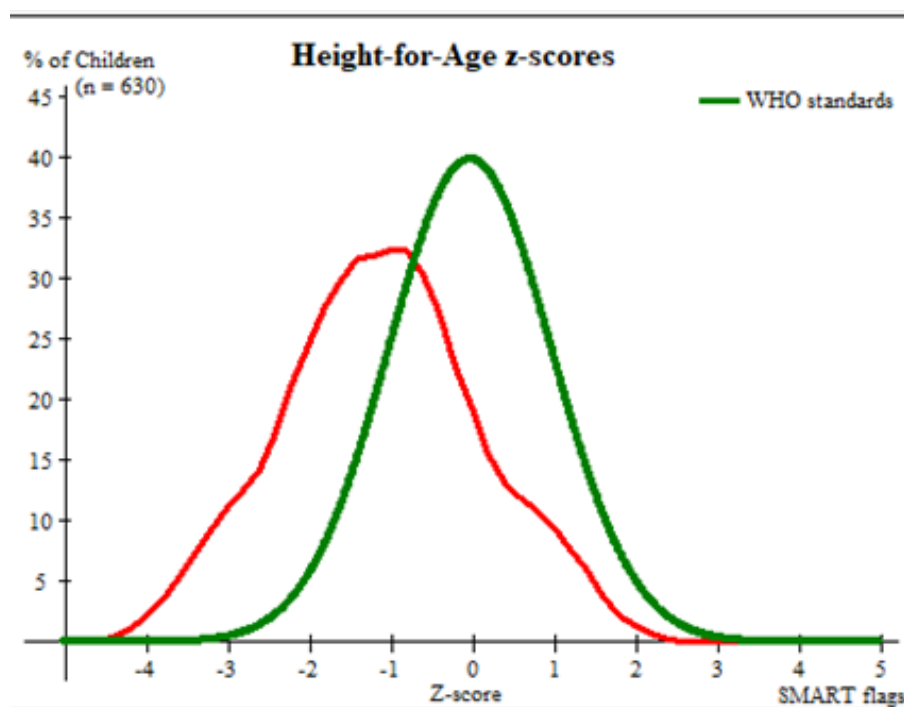


Figure 4: Graphical representation of HFA distribution in comparison with WHO standards

3.4. Children Morbidity and Health Seeking

According to the UNICEF conceptual framework on the causes of malnutrition, disease is categorized as one immediate cause alongside inadequate diet. There is a relationship between the

two whereby disease may alter food intake while inadequate intake of some key nutrients may lead to infection. Ultimately they all lead to one outcome; malnutrition.

Assessment was done on the diseases that affected children 6 to 59 months in the past 2 weeks. Caregivers were asked whether their children had been ill in the past 2 weeks prior to the survey date. Those who gave an affirmative answer to this question were further probed on what illness affected their children and whether they sought assistance and where they sought any assistance when their child/children were ill. Those who indicated that their child/children suffered from watery diarrhea were probed on the kind of treatment that was given to them.

Among the children assessed 41.8% were ill in the past 2 weeks prior to the survey date. Among those who were sick, majority (41.5%) suffered from ARI/Cough, 37.9% fever with chills and 12.6% suffered from watery diarrhea. Table 14 below is a summary of morbidity status of children 6 to 59 surveyed.

Table 14: Children Morbidity

Diseases	% Prevalence			
	February 2019 Survey		February 2018 survey	
	n	Percent	n	Percent
All	277	41.8%	328	51.3%
Fever with chills	105	37.9%	149	68%
ARI/Cough	115	41.5%	175	80%
Watery diarrhea	35	12.6%	42	19%
Bloody diarrhea	0	0.0%	2	1%
Other infections	22	7.9%	0	0%

3.4.1. Therapeutic Zinc Supplementation during watery diarrhea episodes

Based on compelling evidence from studies that, the efficacy of zinc supplementation reduces the duration and severity of diarrhea. In 2004 WHO and UNICEF recommended incorporating zinc supplementation (20 mg/day for 10-14 days for children 6 months and older, 10 mg/day for children under 6 months of age) as an adjunct treatment to low osmolality oral rehydration salts (ORS), and continuing child feeding for managing acute diarrhea. Kenya has adopted these recommendations (Innocent report 2009). According to Kenyan policy guideline on control and management of diarrheal diseases in children below five years in Kenya, all under-fives with diarrhea should be given zinc supplements as soon as possible. The recommended supplementation dosage is 20 milligrams per day for children older than 6 months or 10 mg per day in those below the age six months, for 10–14 days during episodes of diarrhea. This survey sought to establish the number of children who suffered from watery diarrhea and supplemented with zinc. All the children (100%) who suffered from watery diarrhea were supplemented with zinc.

3.4.2. Health Seeking

Majority of caregivers (61.7%) whose children fell ill in the past 2 weeks prior to the survey date sought assistance. Among those who sought assistance, 66.1% did so in public clinic while 25.7% did so in private clinic and 4.7% did so in a shop or kiosk. Overall 93.0% of caregivers whose children were sick sought assistance from appropriate sources such as public clinic, private clinic or mobile clinic as shown in figure 5 below.

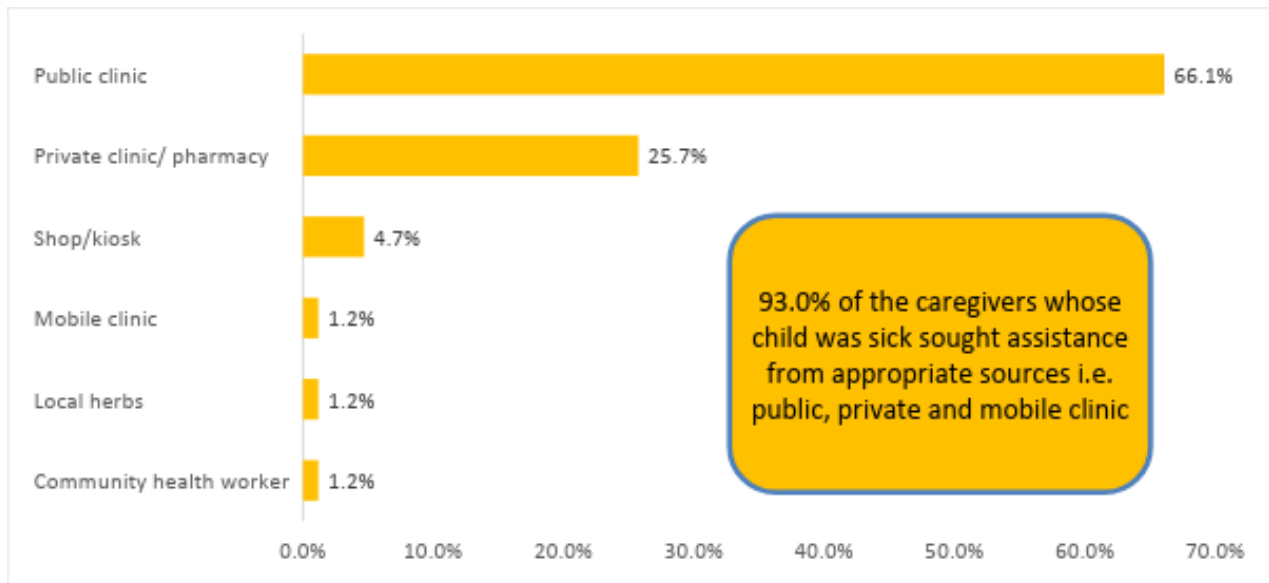


Figure 5: Health Seeking Places

3.5. Child Immunization, Vitamin A and Micronutrients Supplementation and Deworming

3.5.1. Immunization

Kenya aims to achieve 90% under one immunization coverage by the end of second medium term plan (2013- 2017). The Kenya guideline on immunization define a fully immunized child as one who has received all the prescribed antigens **and at least one Vitamin A dose** under the national immunization schedule before the first birthday.

This survey assessed the coverage of 4 vaccines namely, BCG, OPV1, OPV3, and measles at 9 and 18 months. From this assessment, 94.4% of children were confirmed to have been immunized by BCG based on the presence of a scar. Those who were immunized by OPV1 and OPV3 were 96.6% and 95.0% respectively while 91.8% and 71.9% had been immunized for measles at 9 and 18 month respectively, as indicated in figure 6 below.

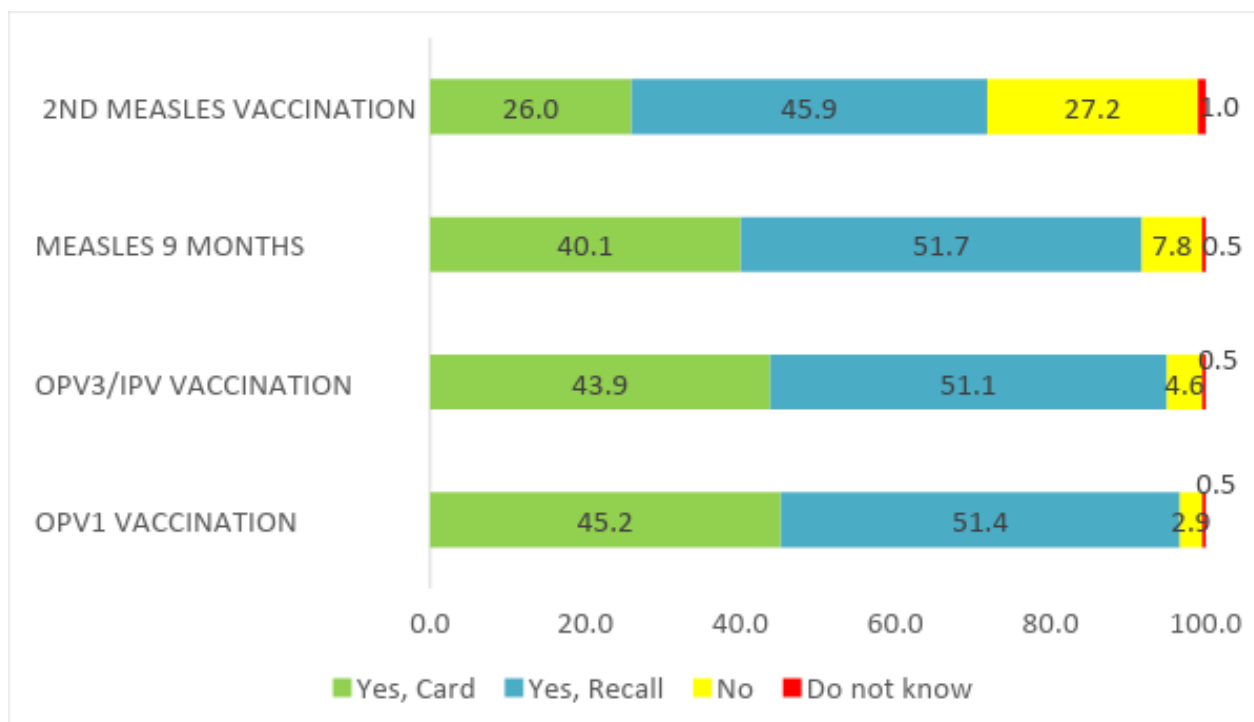


Figure 6: Immunization Coverage

3.5.2. Vitamin A Supplementation and Deworming

Evidence shows that, giving vitamin A supplements to children reduces the rate of mortality and morbidity. Vitamin A reduces mortality risk by 24% (WHO 2011). Guaranteeing high supplementation coverage is critical, not only to eliminating vitamin A deficiency as a public-health problem, but also as a central element of the child survival agenda. Delivery of high-dose supplements remains the principal strategy for controlling vitamin A deficiency. Food-based approaches, such as food fortification and consumption of foods rich in vitamin A, are becoming increasingly feasible but have not yet ensured coverage levels similar to supplementation in most affected areas (UNICEF 2007).

Poor data management on vitamin A logistics, inadequate social mobilization to improve vitamin uptake and placement of vitamin A at lower level of priority among other interventions has been cited as major challenges in achieving the supplementation targets (MOH Vitamin A Supplementation Operational Guidelines for Health Workers 2012).

To assess vitamin A supplementation, parents and caregivers were probed on the number of times the child had received vitamin A in the past one year. Reference was made to the child health card and in case the card was not available recall, method was applied. Among those supplemented, 57.6% was confirmed by the use of health cards with 42.4% who were confirmed by recall. Analysis of vitamin A supplementation for children aged 6-11 months indicates that 66.7% of this age group had been supplemented with vitamin A. Among those aged 12 to 59 months, 56.1% had been supplemented with vitamin A twice in the past one year. Figure 7 illustrates the comparison of vitamin A supplementation between 2018 and 2019 surveys.

Assessment on deworming for children aged 12 to 59 months indicates a small uptake of deworming drugs; only 42.8% had taken de-wormers twice in the past one year. Low Vitamin A supplementation and deworming was attributed to longer distances to the health facilities as children from villages far away from health facilities were more likely not to be supplemented with vitamin A or dewormed.

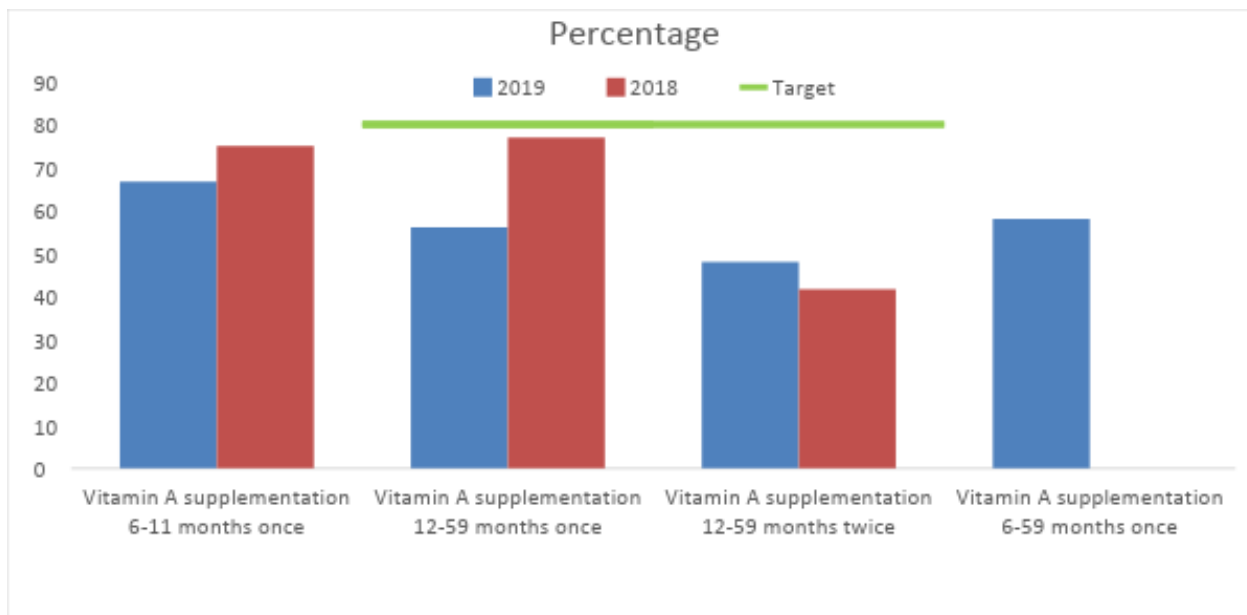


Figure 7: Trends of Vitamin A supplementation

3.6. Maternal Nutrition

Maternal nutrition has a direct impact on child survival. Pre- pregnancy nutrition influences the ability of a woman to conceive determines the fetal growth and development and the size of the fetus and its overall health and that of the mother. Maternal nutrition was assessed using maternal MUAC for all women of reproductive age and iron and folic acid supplementation for women with children under two years of age.

WHO recommends daily consumption of 60mg elemental iron as well as 0.4mg folic acid throughout the pregnancy (WHO 2012). These recommendations have since been adopted by Kenya government in its 2013 policy guidelines on supplementation of FEFO during pregnancy.

Overall 586 women of reproductive age participated in the survey. Almost half of them (45.0%) were lactating. Figure 8 below shows the physiological status of women who participated in the survey.

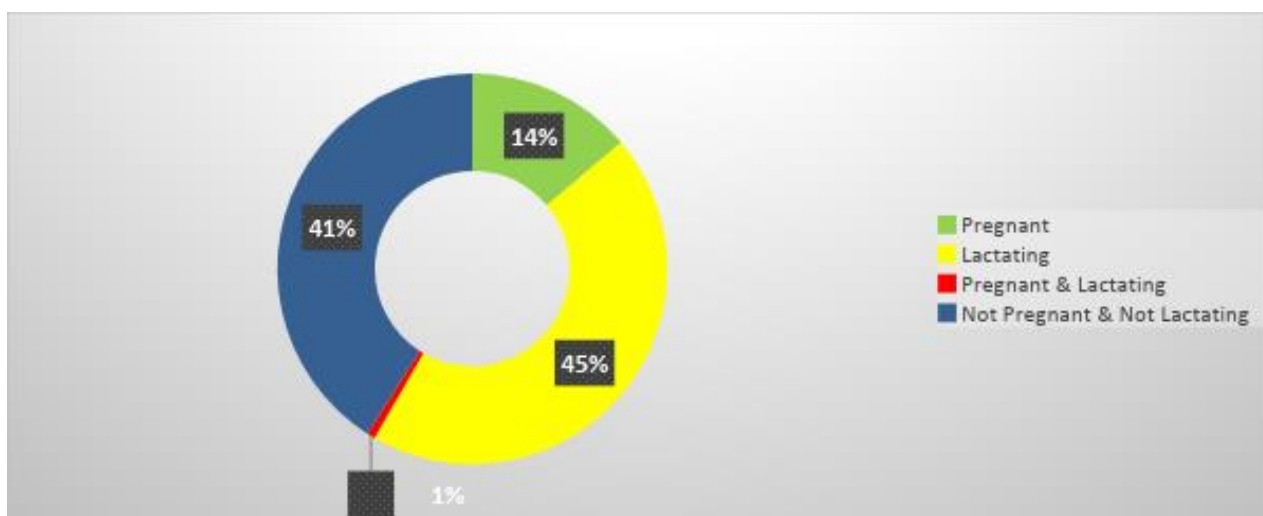


Figure 8: Physiological status of WRA

The nutrition status of women was determined using MUAC. Women with MUAC less than 21 cm are classified as malnourished. Among the women of reproductive age, 3.1% (18) were malnourished. Of these malnourished women, 33.3% (6) were PLW. Table 15 below is a summary of maternal nutrition status.

Table 15: Maternal Nutrition Status

Indicator	N (Total)	n	Percentage
MUAC	All women of reproductive age		
< 21 cm (malnourished)	586	18	3.1%
>21cm	586	568	96.9%
MUAC	Pregnant and lactating women		
< 21 cm (malnourished-PLW)	346	6	1.7%
>21 PLW	346	12	98.3%

50.9% of women with children below 2 years of age had been supplemented with iron and folic acid during their immediate pregnancy. The mean number of days IFAS was consumed by these women was 57.6 days. Table 16 below is a summary of iron and folic acid consumption in days.

Table 16: IFAS Consumption in days

IFAS Consumption in days	n	Percentage
< 90 Days	164	64.8%
90≥180 Days	88	34.8%
> 180 Days	1	0.4%

3.7. Water Sanitation and Hygiene Practices

3.7.1 Main Water Sources, Distance and Time to Water Sources

Everyone has the right to water. This right is recognized in international legal instruments and provides for sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. An adequate amount of safe water is necessary to prevent deaths due to dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking, and personal and domestic hygienic requirements. According to SPHERE handbook for minimum standards for WASH, the average water use for drinking, cooking and personal hygiene in any household should be at least 15 liters per person per day. The maximum distance from any household to the nearest water point should be 500 meters. It also gives the maximum queuing time at a water source which should be no more than 15 minutes and it should not take more than three minutes to fill a 20-litre container. Water sources and systems should be maintained such that appropriate quantities of water are available consistently or on a regular basis.

75% of the households in Tana River County obtained their water from improved water sources such as piped water system, protected boreholes, springs and shallow wells. The rest obtained their

drinking water from unsafe sources such as unprotected shallow well (3.8%), river or spring (7.8%), earth pan/dam (5.4%), as well as water trucking (2.3%) as shown in figure 9 below.

Analysis of distance to water sources showed that most households (73.0%) obtain their water from sources less than 500 meters or less than 15 min. The rest obtained their water from sources between 500 meters to 2km (or 15 minutes to 1 hour) (24.5%) and more than 2km or 1 to 2hours to water sources (2.6%) as shown in table 17 below. With regard to queuing for water, 39.8% of household reported to queue for water. Among those who queue for water, 73.6% queue for less than 30 minutes, 14.7% between 30 and 60 minutes while 11.7% queued for more than 1 hour.

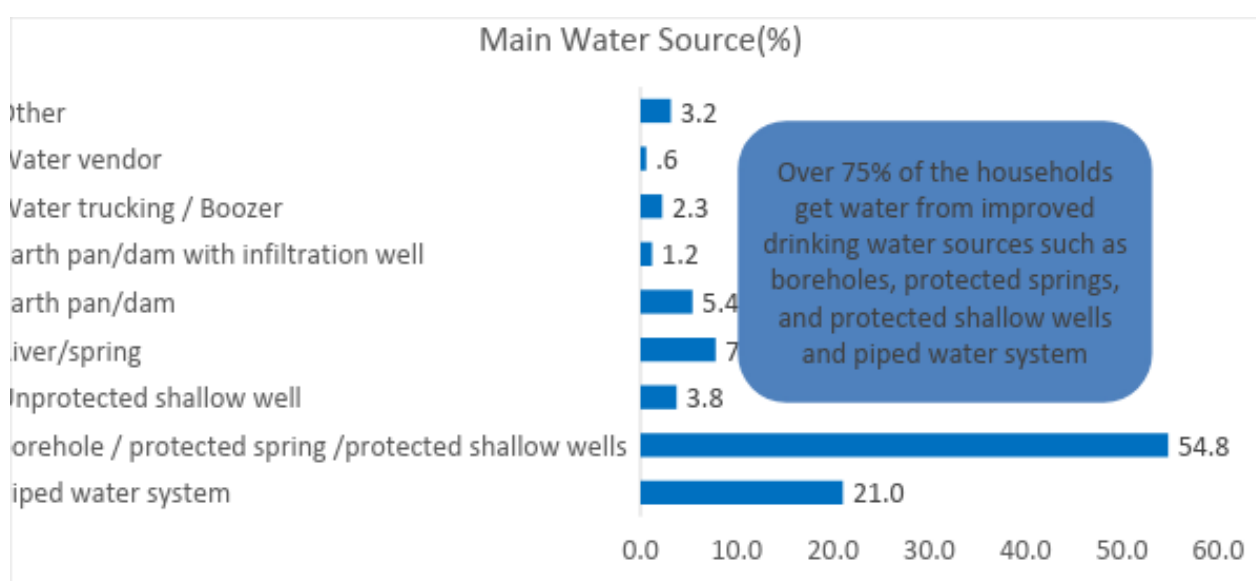


Figure 9: Main sources of drinking water

Table 17: Distances to water sources

Distances to water sources	n(2019)	Percent(2019)	Percent(2018)
Less than 500m (less than 15 min)	486	73.0%	69.6%
500m to 2km (15m to 1hr)	163	24.5%	23.8%
More than 2km	17	2.6%	6.7%

3.7.2. Water Treatment

Only 17% of the household surveyed treated their water. Among those who treated their water, 91.3% used chemicals such as water guard, PUR among others. Others boiled their water (3.5%) and use of traditional herbs (5.2%).

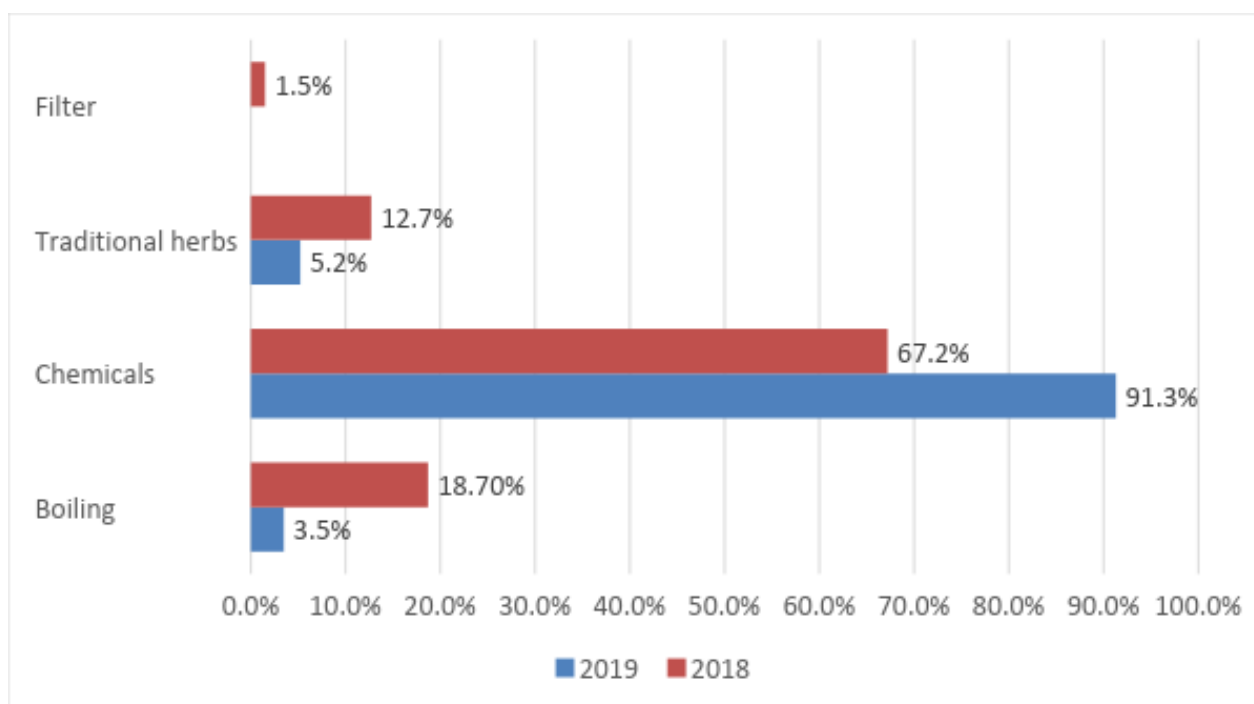


Figure 10: Treatment of drinking water

3.7.3. Water Storage and Payment

Although majority of households do not treat their water, majority of the households store their water in closed containers (95.5%) where it is likely to have physical contamination. The rest (4.5%), store it in open container where it is exposed to physical contamination. 35.4% of households consumed less than 15 liters of water prior to survey date. Among the household surveyed, 58.9% purchased their water. Among those purchasing, 41.8% purchased their water on monthly basis while the rest (58.2%) did it in terms of 20-liter jerry cans.

3.7.4. Hand washing

The importance of hand washing after defecation and before eating and preparing food, to prevent the spread of disease, cannot be over-estimated. Users should have the means to wash their hands after defecation with soap or an alternative (such as ash), and should be encouraged to do so. There should be a constant source of water near the toilet for this purpose. (SPHERE Handbook 2004).

Majority of respondents (69.4%) were aware of hand washing practices. In term of practice and based on 24-hour recall, 35.9% of the respondents washed their hands before eating, while 31.4% did it before cooking. Among the caregivers, only 8.3% washed their hands after taking a child to toilet. Table 18 below is a summary of hand washing practices. Those washing their hands in all 4 critical moments were only 12.6%

Table 18: Hand washing practices

Hand washing Practice	Households	Percentage
HH aware of hygiene practices	462	69.4%

After toilet	365	31.4%
Before cooking	228	19.6%
Before eating	418	35.9%
After taking a child to toilet	97	8.3%
Hand washing in 4 critical moments	58	12.6%
Hand washing with soap and water	306	45.9%

3.7.5. Sanitation Facilities Ownership and Accessibility

If organic solid waste is not disposed of well, major risks are incurred due to fly breeding and surface water pollution, which is a major cause of diarrheal diseases. Solid waste often blocks drainage channels and leads to environmental health problems associated with stagnant and polluted surface water. Analysis of relieving points revealed that, most household are still relieving themselves in bushes and other open places. Open defecation was practiced by 57.1% of the households as indicated in figure 11 below.

Table 19: Household relieving point

Relieving point	No. of HH	Percentage
Flush / pour flush	15	2.3%
Pit latrine	265	39.8%
Composting toilet	1	0.2%
Hanging toilet / hanging latrine	2	0.3%
No facility / bush / field	380	57.1%
Other	3	0.5%

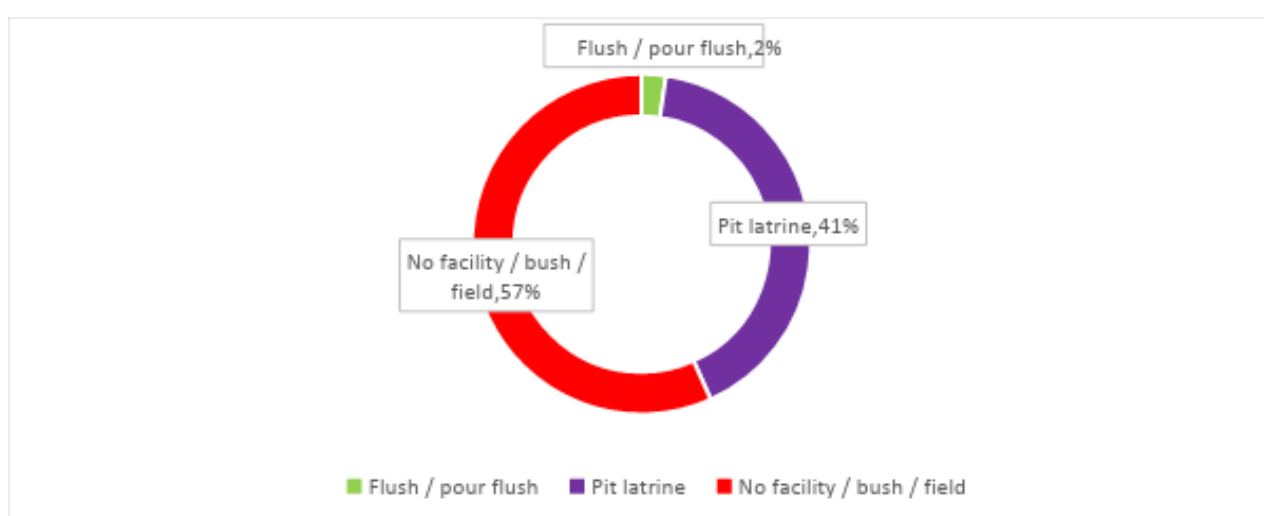


Figure 11: Relieving points

3.8. Household and Women Dietary Diversity

3.8.1. Household Dietary Diversity (HDD)

The household dietary diversity score (HDDS) is meant to reflect, in a snapshot form, the economic ability of a household to access a variety of foods. Studies have shown that an increase in dietary diversity is associated with socio-economic status and household food security (household energy availability) (FAO 2010). The HDDS is meant to provide an indication of household economic access to food, thus items that require household resources to obtain, such as condiments, sugar and sugary foods, and beverages, are included in the score. Individual dietary diversity scores aim to reflect nutrient adequacy. Studies in different age groups have shown that an increase in individual dietary diversity score is related to increased nutrient adequacy of the diet. Dietary diversity scores have been validated for several age/sex groups as proxy measures for macro and/ or micronutrient adequacy of the diet.

Household dietary diversity assessment was based on a 7 days' recall period. At the data collection, 16 food groups as described in FAO 2010 guideline were used. The groups were combined at the analysis stage to come up with 12 food groups. As shown in figure 12 below, there was a high consumption of 4 food groups namely; Cereals (86.3%), milk and milk products (85.4%), Oils and Fats (85.4%), and sweets (85%) Few households (2.3%) consumed eggs.

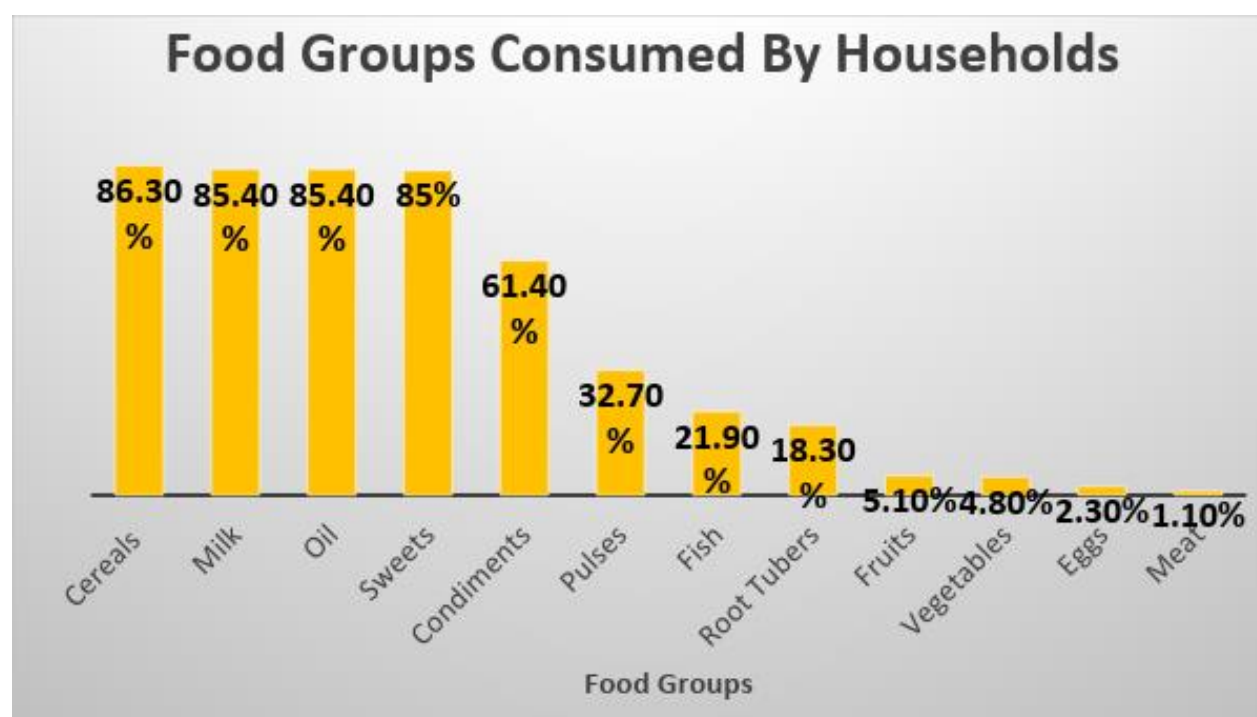


Figure 12: Foods consumed at the household level based on 24 hours recall

The Minimum Dietary Diversity for WRA (MDD-W) indicator is a food group diversity indicator that has been shown to reflect one key dimension of diet quality: micronutrient adequacy. MDD-W is a dichotomous indicator of whether or not women 15–49 years of age have consumed at least five out of ten defined food groups the previous day or night. The proportion of women 15–49 years

of age who reach this minimum in a population can be used as a proxy indicator for higher micronutrient adequacy, one important dimension of diet quality. As indicated in figure 13 below, the most consumed food was grains, white roots and tubers (96.2%) and dairy products (64.5%).

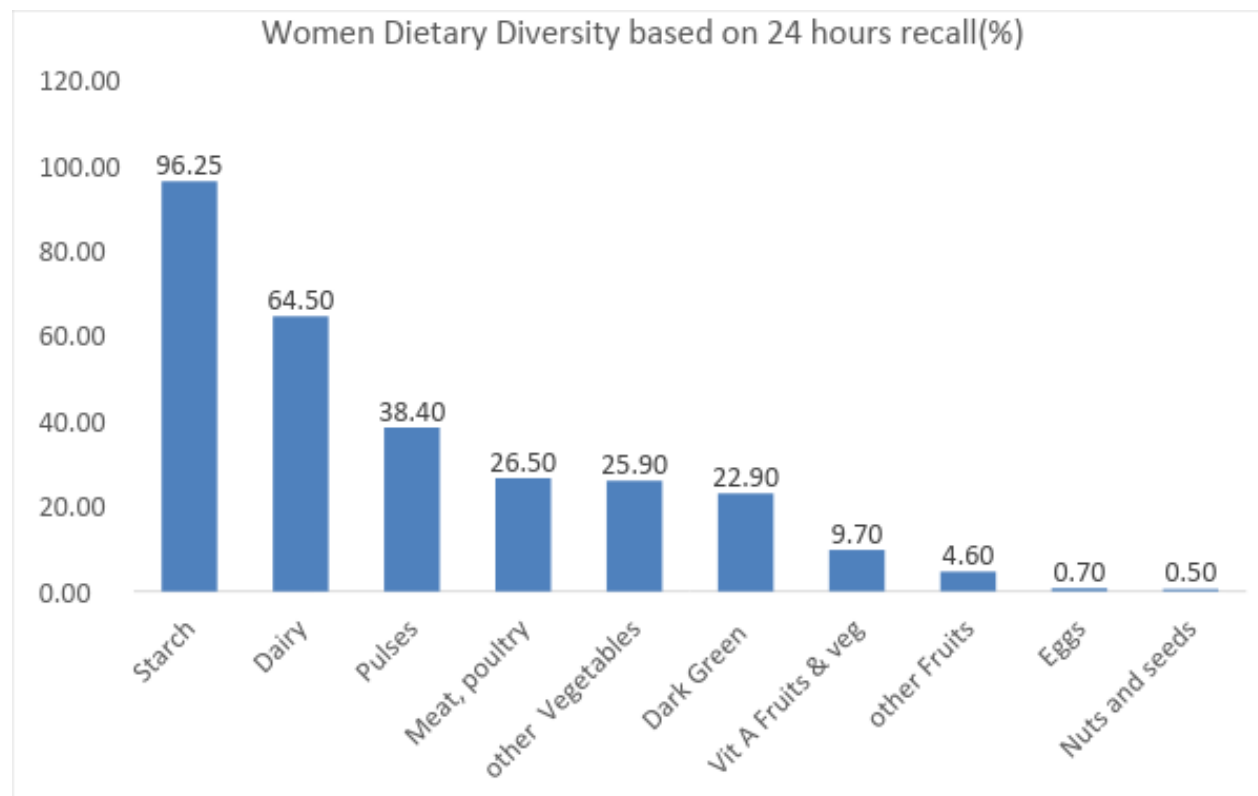


Figure 13: Women Dietary Diversity based on 24 hour recall

Further analysis shows that 6.5% consumed at least 5 food groups which is the Minimum dietary diversity for women as shown in table 20 below.

Table 20: Minimum Women Dietary Diversity

	<i>Number (Feb - 2019)</i>	<i>(Feb. 2019)</i>	<i>(Feb. 2018)</i>
WRA consuming 5 FGs or more	38	6.5%	18.1%
WRA consuming less than 5 food	548	93.5%	81.9%
Mean No. of food groups			2.9

3.9. Food Consumption Score (FCS)

The Food Consumption Score is a composite score based on dietary diversity, food frequency and relative nutrition importance of different food group (WFP 2015). FCS is a proxy for household food security and is designed to reflect the quality of people’s diet. The FCS is considered as an outcome measure of household food security. Food consumption score classifies households in to 3

categories namely, poor, borderline and acceptable. In computing FCS, 16 food groups were collapsed to 8 groups namely; cereals, pulses, vegetables, fruits, meats (meats, fish and eggs), dairies, sugars and oils. The frequency of consumption (maximum 7 days) was multiplied by an assigned weight factor i.e. cereals (2), pulses (3), vegetables (1), fruits (1), meats (4), dairies (4), oils (0.5) and sugar (0.5). Food consumption score (FCS) was obtained by summing up the product of each food item after which classification was done as illustrated in table 21 below.

Table 21: Food consumption score

Households Classification(Thresholds)	N	(%)
Poor (0-21)	32	4.8%
Borderline(21.5-35)	57	8.6%
Acceptable (Above 35.5)	577	86.6%

Further analysis was done on diet quality based on vitamin A rich, iron rich and protein rich diets. As illustrated in figure 14 below, 1.10% of households which were classified under poor and borderline categories consume Vitamin A rich foods, while 4.5% consumed none of Iron rich foods, 3.4% consumed protein rich foods frequently. Among those households classified as acceptable, 73.1% consumed Vitamin A rich foods frequently, 91.3% consumed protein rich foods and only 34% consumed iron rich foods frequently.

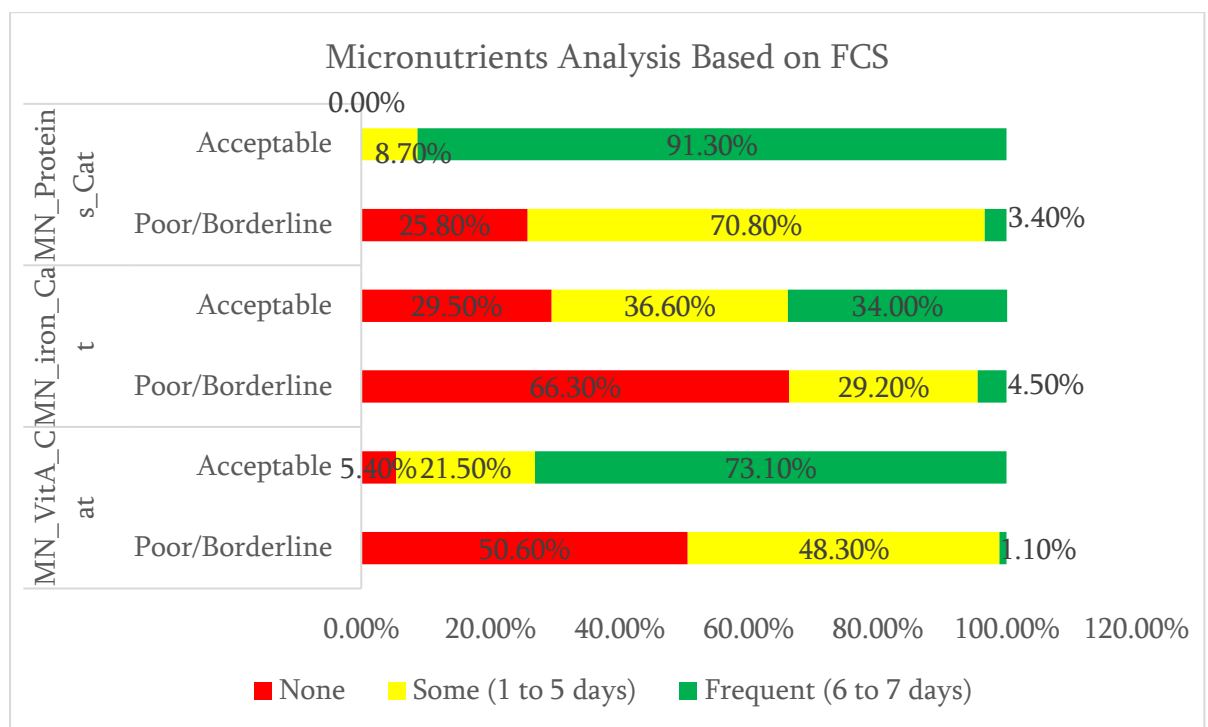


Figure 14: Micronutrient analysis based on FCS

The Coping Strategies Index is a simple and easy-to-use indicator of household stress due to a lack of food or money to buy food. The CSI is based on a series of responses (strategies) to a single question: “What do you do when you don’t have adequate food, and don’t have the money to buy food?” The CSI combines, the frequency of each strategy (how many times was each strategy was adopted) and the severity (how serious is each strategy). This indicator assesses whether there has been a change in the consumption patterns of a given household. For each coping strategy, the frequency score (0 to 7) is multiplied by the universal severity weight. The weighted frequency scores are summed up into one final score (WFP 2012). 43.6% of household were food insecure in the past 7 days (they at one point lacked food or did not have money to buy food at one point. Table 22 below summarizes the coping strategies adopted by the households in such instances.

Table 22: Coping Strategies

Coping Strategy	No. of Households	Frequency Score (0-7)	Severity Score (1-3)	Weighted Score(Feb 2019)
Rely on less preferred or less expensive foods	131	2.7	1	2.7
Borrow foods from relatives or friends	133	2.6	2	5.2
Limit Portion sizes	148	2.9	1	2.9
Restrict consumption by adults so that children can feed	109	2.2	3	6.6
Reduce the number of meals	180	2.5	1	2.5
Total Weighted Coping Strategy Index				19.9

Comparison was also done from June 2014 SMART survey. The total weighted CSI from 2014 SMART survey was 8.3 (Jun2014) lowest and 26.8 (Jul 2016) highest. Figure 15 below illustrates the comparison of 2014 to 2019 assessment. There has been an increase in CSI meaning households are more food insecure in 2019 compared to Jan 2018.

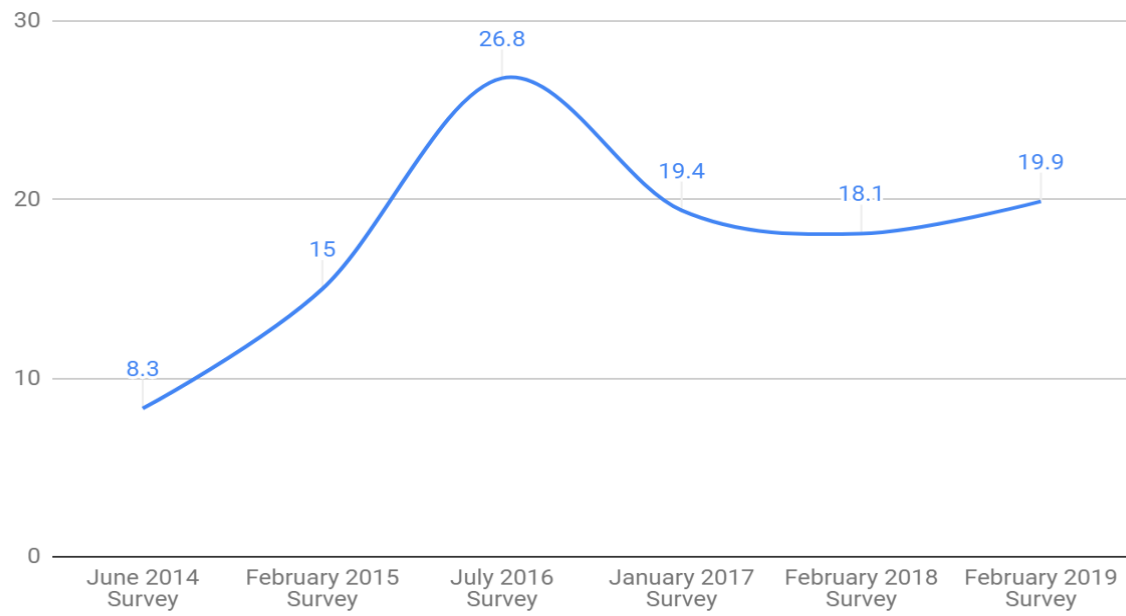


Figure 15: CSI Trend

4.0. CONCLUSION AND RECOMMENDATIONS

4.1. Conclusion.

There was no significant statistical difference between wasting for children under-five years between SMART survey February 2018 (GAM 15.6%) and February 2019 (GAM 14.8%). There was also no significant statistical difference between other childhood malnutrition indicators; underweight and stunting. The county is in phase 3 (Serious) according to IPC classification for acute malnutrition using GAM by WHZ.

Analysis was done on food security and morbidity issues which would have contributed to changes in acute malnutrition. Short rain assessment was done concurrently with the SMART survey. The food security situation in Tana River County was classified as “Stressed” (IPC Phase 2) in the mixed farming and marginal farming zones whereas the pastoral livelihood is classified as “Crisis” (IPC Phase 3).

In terms of morbidity, the proportion of children who were sick in the past 2 weeks reduced from 51.3 % in February 2018 to 35.2% in February 2019. There was a decrease in fever and chill (from 68.0% to 37.9%) and ARI/Cough (from 80%– 41.8 %) was noted.

Although there was no significant difference between 2018 and 2019 surveys, the stunting and underweight levels remained relatively high that requires medium and long term interventions by the county, National and partners to ensure they decrease. There was no significant difference in the two indicators between boys and girls.

71.7% of caregivers whose children were sick sought assistance from appropriate sources such as public clinic, private clinic or mobile clinic a good sign for health seeking behavior. All those who suffered from watery diarrhea were supplemented with zinc in the county. There was low Vitamin A & deworming coverage with only 48.0% had been supplemented with vitamin A twice in the past one year and 11.1% had taken de-wormers twice in the past one year.

Among women with children below 2 years of age, 86.3% had been supplemented with iron and folic acid during their immediate pregnancy. The mean iron and folic acid consumption was 48.1 days. None of the surveyed women had consumed iron and folic acid in the recommended 270 days. Only 17.0% of the household surveyed treated their water and majority of respondents (69.4%) were aware of hand washing practices however, those who practiced hand washing in 4 critical moments were only 12.6%.

Open defecation was practiced by 57.1% of the households while toilet ownership remained low at 42.9%

4.2. Recommendations

Based on the above findings, the following interventions are recommended.

Findings	Recommendations	Actors (By Who)M	Timelines
GAM rate of 14.8%	<ul style="list-style-type: none"> Active case findings at the community and Nutrition surveillance. Scale up of IMAM surge activities at health facilities implementing IMAM. Continued scale up of MIYCN activities (BFCI and BFHI) as well as IMAM activities Conduct rapid assessment in the identified malnutrition hotspots Conduct integrated medical outreaches Establish a Multi-sectoral platform for high level advocacy and coordination of nutrition activities both sensitive and specific and advocate for recruitment of more nutritionist to help boost nutrition service delivery. 	MOH/CONCE RNWORLDWI DE/KRCS	APRIL 2019 June 2019
57.1% of the population practice OD	<ul style="list-style-type: none"> Sensitize communities on WASH Sensitize schools on WASH through school health clubs Scale up CLTS activities in all the CUs within the county 	MOH/CONCE RNWORLDWI DE/KRCS	September 2019
12.6% practice handwashing in 4 critical times	<ul style="list-style-type: none"> Sensitize the community on importance of handwashing in 4 critical times Use local FM radio to sensitize the community on handwashing 	MOH,CONCER NWORLDWID E/KRCS	JUNE 2019
0.4% of pregnant women consume IFAS for >180 days	<ul style="list-style-type: none"> Sensitize the communities of importance of consuming IFAS during pregnancy through media. Train health care providers on IFAS guidelines 	MOH,CONCER NWORLDWID E/KRCS	JUNE 2019
Vitamin A supplementation 12 to 59 months (2 doses)- 51.6%	<ul style="list-style-type: none"> Sensitize the community on the importance of Vitamin A supplementation and deworming as well as scale up VAS interventions within ECDE, Duks and at the community 	MOH,CONCER NWORLDWID E/KRCS	May & November 2019

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APPENDICIES

APPENDIX 1: Overall Score of the Survey

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Indicator	Acceptable values/range	Survey Area
Flagged data (% of out of range subjects)	<7.5	0 (2.4 %)
Overall sex ratio (significant CHI square)	>0.001	0 (p=0.161)
Age ratio (6-29vs 30-59) Significant CHI square	>0.001	2 (p=0.075)
Dig. prevalence score-weight	<20	0 (4)
Dig. prevalence score-height	<20	0 (5)
Dig. prevalence score-MUAC	<20	0 (4)
Standard Dev. Height WHZ	>0.80	0 (1.04)
Skewness WHZ	<±0.6	0 (-0.09)
Kurtosis WHZ	<±0.6	0 (-0.10)
Poisson WHZ -2	>0.001	3 (p=0.005)
OVERALL	<24	5 % (Excellent)

Appendix 2: Sampled Clusters

SUB COUNTY	WARD	VILLAGES	CLUSTER NUMBER
BURA	Bangali	TULA	29
BURA	Bangali	KURITI	30
BURA	Bangali	BOKA/TARA	RC
BURA	Bangali	EL-BOMBI A	31
BURA	Chewele	DUDU MADEO/BILBIL SCHOOL	40
BURA	Chewele	KHOTIOLOW	41
BURA	Chewele	BAWAMA	42
BURA	Hirimani	VI SHIRIKISHO BULA WACHU /V 2	37
BURA	Hirimani	TUMAINI NORTH/MANYATA	38
BURA	Hirimani	BULA MARARA/TYPE CDEF	39
BURA	Madogo	MOYE BUYA	32

BURA	Madogo	BULA KARATASI	33
BURA	Madogo	BARA /KONE BURKITI	36
BURA	Sala	CARLFONIA A	34
BURA	Sala	BAKUYU A	35
GALOLE	Chewani	CHEWANI A	20
GALOLE	Chewani	AMANI	21
GALOLE	Chewani	GHALAMANI	23
GALOLE	Chewani	MWANGAZA A	25
GALOLE	Kinakomba	Maroni	RC
GALOLE	Kinakomba	FANJUA	27
GALOLE	Mikinduni	KONE B	22
GALOLE	Mikinduni	HANDAMPIA MISSION	28
GALOLE	Wayu	TESO	RC
GALOLE	Wayu	KALALANI	24
GALOLE	Wayu	Golecha	26
TANA DELTA	Garsen Central	BANDI	4
TANA DELTA	Garsen Central	Kipao A	14
TANA DELTA	Garsen Central	BURAKRASH	15
TANA DELTA	Garsen North	BAHATI	RC
TANA DELTA	Garsen North	MNAZINI	RC
TANA DELTA	Garsen North	KITERE	1
TANA DELTA	Garsen North	HAMESA C	2
TANA DELTA	Garsen North	CHIRA A	3
TANA DELTA	Garsen North	ABAGANDA	5
TANA DELTA	Garsen South	IDSOWE	6

TANA DELTA	Garsen South	UMOJA	7
TANA DELTA	Garsen South	ODA ORMA	8
TANA DELTA	Garsen west	Assa	9
TANA DELTA	Kipini East	KALO LENI A	16
TANA DELTA	Kipini East	KIBAONI A	17
TANA DELTA	Kipini East	TAZAMALAKO	18
TANA DELTA	Kipini East	ZAMZAM A	19
TANA DELTA	Kipini West	ON WARDEI A	10
TANA DELTA	Kipini West	BAHATI (MNAZINI)	11
TANA DELTA	Kipini West	CHAMWANAMUMA	12
TANA DELTA	Kipini West	SHIRIKISHO	13

Appendix 3: Calender of Events

TANA RIVER COUNTY CALENDER OF EVENTS, February 2019							
MON TH	SEASO NS	2014	2015	2016	2017	2018	2019
JANU ARY			New year/school opening/Animal Migration/ mangoes season/ 49	New year/school opening/Animal Migration/ Elade Attack/ mangoes season 37	New year/school opening/Animal Migration mangoes season/ 25	New year/school opening/Animal Migration/ Nyongoro attack/ mangoes season/ 13	1
FEBR UAR Y	Dry season(Bona)	9TH FEB ONWARDS Mangoes season	Maulid/mango es season/ 48	Cholera Outbreak Delta/ Voter registration/ Drought(Bona/ Ukame/Jilal)/ mangoes season/ 36	Drought (Bona/Ukame/J ilal) /mangoes season/ 24	Long rains/ mangoes season/ 12	0
MAR CH		Death of Deputy Speaker Tana River / 59	47	Easter Holiday/ 35	Drought (Bona/Ukame/J ilal) / 23	Flooding /Handshake / 11	
APRI L	Long rains (Furmat ha/chii mo/Gan n)	Easter Holidays/S chool Holidays/ 58	Garissa University attack/ School holidays/ Easter Holidays/ 46	Lucy Kibaki's Death/School holidays./ 34	Easter Holidays/Scho ol Holidays/ 22	Cholera outbreak in Bura/Hola- Garissa Road carried away by floods/ Easter Holidays/Sc hools holidays/ 10	
MAY		World cup/ Waldena Hyena Attack/ope ning of schools/	Opening of schools/ Labour day/ 45	Opening of schools/Labour day/ 33	Labour day/ Ramadhan/Op ening of schools/ 21	World cup/ Ramadhan/ Labour Day /Opening schools 9	

		Labour day/ 57					
JUNE	Cold Season (Damoch/sika)	Mpeketoni Attack/ Ramadhan / Madaraka Day/56	Ramadhan/ Madaraka Day/ 44	Ramadhan/ Madaraka Day/ 32	Nurses Strike/Cholera Outbreak Delta/Eid -Fitr/ 20	Madaraka Day/Eid - fitr/ 8	
JULY		Eid-Fitr/ 55	Obama Kenya's Visit/ Mosquito nets distribution/Eid-Fitr 43	Eid-Fitr/ Burning of schools/ 31	Nurses Strike/Eid Hajj/ 19	Polio Campaign/ 7	
AUGUST	Dry Season (Odoles)	School Holidays/ Harvesting season/ 54	School Holidays/ Harvesting season/ 42	Beyond Zero / School Holidays/Eid-Hajj/ Harvesting season/ 30	Nurses Strike/Elections/Schools holidays/ Harvesting season/ 18	Eid-Hajj/ Schools Holidays/Polio Campaign/ Harvesting season/ 6	
SEPTEMBER		Opening of schools/Eid-Hajj/ 53	Opening of schools/ 41	Opening of schools/ 29	Nurses Strike/ Opening of schools/ 17	5	
OCTOBER	Short rains (Hagey)	Mashujaa Day/KCPE Exams/ 52	Mashujaa Day/KCPE Exams/Eid-Hajj/ 40	Mashujaa Day/KCPE Exams/ 28	Nurses Strike/Mashujaa Day/KCPE Exams/Repeat Elections/ 16	4	
NOVEMBER		Mandera Teachers attack/ KCPE Exams/ Arrival of fishermen from Pemba to Delta/ 51	KCSE Exams/ Pope Visit to Kenya/ Arrival of fishermen from Pemba to Delta/ 39	KCSE Exams/Arrival of fishermen from Pemba to Delta 27	Nurses Strike/KCSE Exams/ Arrival of fishermen from Pemba to Delta/ 15	3	
DECEMBER		Christmas Holidays/Jamhuri Day / School long holidays/ Marriage ceremonies	Christmas Holidays/Jamhuri Day / School long holidays/Marriage Ceremonies/	Christmas Holidays/Jamhuri Day / School long holidays/Marriage Ceremonies/M	Christmas Holidays/Jamhuri Day/ School Long Holidays/ Marriage Ceremonies/M	2	

	/ Mangoes season/ 50	Mangoes season/38	angoeseason/ 26	angoes season/ 14	
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Appendix 4: SMART Questionnaire

1.IDENTIFICATION		1.1 Data Collector _____			1.2 Team Leader _____		1.3 Survey date	
(dd/mm/yy)-----								
1.4 County	1.5 Sub County	1.6 Ward	1.7 Location	1.8 Sub-Location	1.9 Village	1.10 Cluster No	1.11 HH No	1.12 Team No.
1.13 Household geographical coordinates	Latitude	_____	Longitude	_____				

2. Household Demographics										
2.1	2.2a	2.2b	2.3	2.4	2.5a	2.6	2.7a	2.7b	2.8	2.10a
Age Group	Please give me the names of the persons who usually live in your household.	Please indicate the household head (write HH on the member's column)	Age (Record age in MONTHS for children <5yrs and YEARS for those ≥ 5 years's)	Childs age verified by	Sex	If between 3 and 18 years old, Is the child attending school?	Main reason for not attending school (Enter one code from list)	2.7a, What is the child doing when not in school?	What is the highest level of education attained? (level completed)	If the household owns mosquito net/s, who slept under the mosquito net last night? (Probe- enter all responses mentioned)
			Years Months	1=Health card 2=Birth certificate/ notification 3=Baptism card 4=Recall 5. other _____ _____ specify	1=Male 2=Female	1 = Yes 2 = No (If yes go to 2.8; If no go to 2.7)	1=Chronic Sickness 2=Weather (rain, floods, storms) 3=Family labour responsibilities	1=Working on family farm 2=Herding Livestock 3=Working for payment away from home	1 of 5 yrs and above	1 of 5 yrs and above

								<p>4=Working outside home</p> <p>5=Teacher absenteism/lack of teachers</p> <p>6= Fees or costs</p> <p>7=Household doesn't see value of schooling</p> <p>8 =No food in the schools</p> <p>9 = Migrated/moved from school area (including displacements)</p> <p>10=Insecurity/violence</p> <p>11-No school</p> <p>Near by</p> <p>12=Married</p> <p>13. Pregnant/taking care of</p>	<p>4=Left home for elsewhere</p> <p>5=Child living on the street</p> <p>6: Other specify _____</p>	<p>1 =Primary</p> <p>2=Primary</p> <p>3=Secondary</p> <p>4=Tertiary</p> <p>5=Non e</p> <p>6=others (specify)</p> <p>Go to question to 2.9 ↓</p>	<p><i>applicable) go to question 2.11</i></p>
--	--	--	--	--	--	--	--	--	--	---	---

								her own child 14. attending Duksi/ Madrasa 15. too young for school 13=others (specify)).....			
< 5 YR S	1										
	2										
	3										
	4										
>5 TO <18 YR S	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
AD UL T (18 yea rs and abo ve)	13										
	14)										
	15										
	16										
	2.5c. Total number of ALL people in the Househo		2.5d Total number of children under 5 years (0-	2.5e Total number of children below 2 years (0-23 months) _____							

Fever with Malaria: High temperature with shivering	Cough/ARI: Any episode with severe, persistent cough or difficulty breathing	Watery diarrhoea: Any episode of three or more watery stools per day	Bloody diarrhoea: Any episode of three or more stools with blood per day
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3.	4.	5.	6.	7.	<p align="center">8. CHILD HEALTH AND NUTRITION (ONLY FOR CHILDREN 6-59 MONTHS OF AGE; IF N/A SKIP TO SECTION 3.6)</p> <p align="center">Instructions: <i>The caregiver of the child should be the main respondent for this section</i></p> <p align="center">3.1 CHILD ANTHROPOMETRY 3.2 and 3.3 CHILD MORBIDITY</p> <p align="center"><i>(Please fill in ALL REQUIRED details below. Maintain the same child number as part 2)</i></p>														
A	B	C	D	E	F	G	H	I	J	K	L	M	N	3	3.	3.	3.	3.3	
c														2	2	3	3	c	
h														a	b	a	b		
i																			
d																			
N																			
o																			
.																			
	what is the relationship of the respondent with the child/children 1=M other 2=F	SEX Male... Female... M	AGE In months Birth date	WEIGHT (Kg) XX .X	HEIGHT (Cm) X X	OW W C (M) X X Y =	U A C (C h i l d w e i g h t a t t e n t h ?	C C h i l d w e i g h t a t t e n t h ?	H h i l d w e i g h t a t t e n t h ?	C c h i l d w e i g h t a t t e n t h ?	I i l d w e i g h t a t t e n t h ?	L l i f t h e c h i l d w e i g h t a t t e n t h ?	M m u l t i p l i c i t y ?	N n u m b e r ?	3 3 a	3. 3 b	3. 3 a	3. 3 b	3.3 3 c
																			If the child had watery diarrhoea in the last TWO (2) WEEKS, did the child get:

3.4 Maintain the same child number as part 2 and 3.1 above										
	A1	A2	B	C	D	E	F	G	H	I
Child No.	How many times has child received Vitamin A in the past year? (show sample)	Has the child received vitamin A supplement in the past 6 months?	How many times did the child receive vitamin A capsules from the facility or outreach in the past year	If Vitamin A received how many times in the past year did the child receive verified by Card?	FOR CHIL DREN 12-59 MONTHS How many times has child received drugs for worms in the past year? (<i>show Sample</i>)	Has the child received BCG vaccination? Check for BCG scar. 1 = scar 2=No scar	Has child received OPV1 vaccination? 1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know	Has child received OPV3 vaccination? 1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know	Has child received measles vaccination at 9 months (<i>On the upper right shoulder</i>)? 1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know	Has child received the second measles vaccination (18 to 59 months) (<i>On the upper right shoulder</i>)? 1=Yes, Card 2=Yes, Recall 3 = No 4 = Do not know
01										
02										
03										
04										

3.5 MNP Programme Coverage. *Maintain the same child number as part 2 and 3.1 above. Ask all the relevant questions (3.5.1 to 3.6.4) before moving on to fill responses for the next child. THIS SECTION SHOULD ONLY BE ADMINISTERED IF MNP PROGRAM IS BEING IMPLEMENTED OR HAS BEEN IMPLEMENTED*

3.5 Enrolment in an MNP program	3.6 Consumption of MNPs
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	<p>3.5.1.a Is MNP program available (program running in the past six month) in the survey area? Yes =1 No = 2 If 'No' skip section 3.5 and 3.6 and go to 3.7</p>					
	<p>3.5.1. b Is the child enrolled in the MNP program?(show the example of the MNP sachet) <i>(record the code in the respective child's number)</i></p> <p>Yes =1 No=0</p> <p>If no go to 3.5.2, If yes go to section 3.6.1</p>	<p>3.5.2 If the child, 6-23months, is not enrolled for MNP, give reason. <i>(Multiple answers possible. Record the code/codes in the respective child's number. DO NOT READ the answers)</i></p> <p>Do not know about MNPs1</p> <p>Discouraged from what I heard from others2</p> <p>The child has not fallen ill, so have not gone to the health facility3</p> <p>Health facility or outreach is far4</p> <p>Child receiving therapeutic or supplementary foods5</p> <p>Other reason, specify6</p> <p>Skip to 3.7</p>	<p>3.6.1 Has the child consumed MNPs in the last 7 days?(shows the MNP sachet) <i>(record the code in the respective child's number)</i></p> <p>YES = 1 NO= 0</p> <p>If no skip to 3.6.3</p>	<p>3.6.2 If yes, how frequent do you give MNP to your child? <i>(record the code in the respective child's number)</i></p> <p>Every day1</p> <p>Every other day2</p> <p>Every third day3</p> <p>2 days per week at any day4</p> <p>Any day when I remember.....5</p>	<p>3.6.3 If no, since when did you stop feeding MNPs to your child? <i>(record the code in the respective child's number)</i></p> <p>1 week to 2 weeks ago1</p> <p>2 week to 1 month ago2</p> <p>More than 1 month3</p>	<p>3.6.4 What are the reasons to stop feeding your child with MNPs? <i>(Multiple answers possible. Record the code/codes in the respective child's number. DO NOT READ the answers)</i></p> <p>Finished all of the sachets1</p> <p>Child did not like it2</p> <p>Husband did not agree to give to the child3</p> <p>Sachet got damaged4</p> <p>Child had diarrhea after being given vitamin and mineral powder5</p> <p>Child fell sick.....6</p>

						Forgot7 Child enrolled in IMAM program ...8 Other (Specify)____ _____ ..9
Child 1						
Child 2						
Child 4						

MATERNAL NUTRITION FOR WOMEN OF REPRODUCTIVE AGE (15-49 YEARS) <i>(Please insert appropriate number in the box)</i>				
3.7	3.8	3.9	3.10	3.11
Woman ID. (all women in the HH aged 15-49 years from the household demographics – section 2)	What is the mother's / caretaker's physiological status 1. Pregnant 2. Lactating 3. not pregnant and not lactating 4. Pregnant and lactating	Mother/ caretaker's MUAC reading: _____.__cm	During the pregnancy of the (name of the youngest biological child below 24 months) did you take the following supplements? indicate 1. Yes 2. No 3. Don't know 4. N/A	If Yes, for how many days did you take? (<i>probe and approximate the number of days</i>)

			Iron tabl ets syru p	Folic acid	Combin ed iron and folic acid supple ments	Iron table ts syru p	Fol ic aci d	Combi ned iron and folic acid supple ments

		5. Pot filters..... ___	
4.3a	___	6.	
4.4	Where do you store water for drinking? 1. Open container / Jerrican 2. Closed container / Jerrican ___	4.5 How much water did your household use YESTERDAY (excluding for animals)? (Ask the question in the number of 20 liter Jerrican and convert to liters & write down the total quantity used in liters) ___	
4.6	Do you pay for water? 1. Yes 2. No (If No skip to Question 4.7.1) ___	4.6.1 If yes, how much per 20 liters jerrican _____ KSh/20ltrs	4.6.2 If paid per month how much ___
4.7.1 a	We would like to learn about where members of this household wash their hands. Can you please show me where members of your household <u>most often</u> wash their hands? <i>Record result and observation.</i> OBSERVED FIXED FACILITY OBSERVED (SINK / TAP) IN DWELLING 1 IN YARD / PLOT 2 MOBILE OBJECT OBSERVED (BUCKET / JUG / KETTLE) 3 NOT OBSERVED NO HANDWASHING PLACE IN DWELLING / YARD / PLOT 4 NO PERMISSION TO SEE 5	4.7.1b Is soap or detergent or ash/mud/sand present at the place for handwashing? YES, PRESENT 1 NO, NOT PRESENT2	
4.7.1	Yesterday (within last 24 hours) at what instances did you wash your hands? (MULTIPLE RESPONSE- (Use 1 if "Yes" and 2 if "No") 1. After toilet.....		___ ___ ___ ___ ___

	<p>2. Before cooking.....</p> <p>3. Before eating.....</p> <p>4. After taking children to the toilet.....</p> <p>5. Others.....</p>
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4.7.2	<p>If the caregiver washes her hands, then probe further; what did you use to wash your hands?</p> <ol style="list-style-type: none"> 1. Only water 2. Soap and water 3. Soap when I can afford it 4. traditional herb 5. Any other specify ____ 	<p>4.8 What kind of toilet facility do members of your household usually use?</p> <p style="text-align: center;">If 'Flush' or 'Pour flush', probe: Where does it flush to? ____ </p> <p style="text-align: center;">If not possible to determine, ask permission to observe the facility.</p> <p>flush / pour flush</p> <ul style="list-style-type: none"> flush to piped sewer system 11 flush to septic tank 12 flush to pit latrine 13 flush to open drain 14 flush to DK where 18 <p>pit latrine</p> <ul style="list-style-type: none"> ventilated improved pit latrine 21 pit latrine with slab 22 pit latrine without slab / open pit 23 <p>composting toilet 31</p> <p>bucket 41</p> <p>hanging toilet / hanging latrine 51</p> <p>no facility / bush / field 95</p> <p>1. OTHER (specify) 96</p>
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5.0: Food frequency and Household Dietary Diversity

Type of food	Did members of your household consume any food from these food groups in the last 7 days?(food must have been cooked/served at the household) 0-No 1-Yes	If yes, mark days the food was consumed in the last 7 days? 0-No 1-Yes								What was the main source of the dominant food item consumed in the HDD? 1.Own production 2.Purchase 3.Gifts from friends/families 4.Food aid 5.Traded or Bartered 6.Borrowed 7.Gathering/wild fruits 8.Other (specify)	<u>WOMEN DIETARY DIVERSITY</u> ONLY FOR WOMEN AGE 15 TO 49 YEARS. REFER TO THE HOUSEHOLD DEMOGRAPHICS SECTION Q2.3 AND Q2.5							
		D 1	D 2	D 3	D 4	D 5	D 6	D 7	TOTAL		Woman ID	Woman ID	Woman ID	Woman ID				
Cereals and cereal products (e.g. sorghum, maize, spaghetti, pasta, anjera, bread)?																		

Vitamin A rich vegetables and tubers: Pumpkins, carrots, orange sweet potatoes														
White tubers and roots: White potatoes, white yams, cassava, or foods made from roots														
Dark green leafy vegetables: Dark green leafy vegetables, including wild ones + locally available vitamin A rich leaves such as cassava leaves etc.														
Other vegetables (<i>e.g., tomatoes, egg plant, onions</i>)?														
Vitamin A rich fruits: + other locally available vitamin A rich fruits														

Other fruits														
Organ meat (iron rich): Liver, kidney, heart or other organ meats or blood based foods														
Flesh meats and offals: Meat, poultry, offal (e.g. goat/camel meat, beef; chicken/poultry)?														
Eggs?														
Fish: Fresh or dries fish or shellfish														
Pulses/legumes, (e.g. beans, lentils, green grams, cowpeas)?														
nuts and seeds														
Milk and milk products (e.g. goat/camel/fermented milk, milk powder)?														
Oils/fats (e.g. cooking fat or oil, butter,														

<i>ghee, margarine) ?</i>													
Sweets: Sugar, honey, sweetened soda or sugary foods such as chocolates, sweets or candies													
Condiment s, spices and beverages:													

6. COPING STRATEGIES INDEX		Frequency score: Number of days out of the past seven (0 -7).
	<p>In the past 7 DAYS, have there been times when you did not have enough food or money to buy food? If No; END THE INTERVIEW AND THANK THE RESPONDENT If YES, how often has your household had to: <i>(INDICATE THE SCORE IN THE SPACE PROVIDED)</i></p>	
1	Rely on less preferred and less expensive foods?	
2	Borrow food, or rely on help from a friend or relative?	
3	Limit portion size at mealtimes?	
4	Restrict consumption by adults in order for small children to eat?	
5	Reduce number of meals eaten in a day?	
	<p>TOTAL HOUSEHOLD SCORE: END THE INTERVIEW AND THANK THE RESPONDENT</p>	

HOUSEHOLD HUNGER SCALE

	Question	Response option
1	In the past [4 weeks/30 days], was there ever no food to eat of any kind in your house because of lack of resources to get food?	0 = No (Skip to Q2) 1 = Yes
1A	How often did this happen in the past [4 weeks/30 days]?	1 = Rarely (1–2 times) 2 = Sometimes (3–10 times) 3 = Often (more than 10 times)
2	In the past [4 weeks/30 days], did you or any household member go to sleep at night hungry because there was not enough food?	0 = No (Skip to Q3) 1 = Yes
2A	How often did this happen in the past [4 weeks/30 days]?	1 = Rarely (1–2 times) 2 = Sometimes (3–10 times) 3 = Often (more than 10 times)
3	In the past [4 weeks/30 days], did you or any household member go a whole day and night without eating anything at all because there was not enough food?	0 = No (Skip to the next section) 1 = Yes
3A	How often did this happen in the past [4 weeks/30 days]?	1 = Rarely (1–2 times) 2 = Sometimes (3–10 times) 3 = Often (more than 10 times)

4.2 FOOD FORTIFICATION (FF)/- Please ask the respondent and indicate the appropriate number in the space provided		
1.1	<p>Have you heard about food fortification?</p> <p>1. Yes 2. No 3. Don't know</p>	
1.1.1	<p>If yes, where did you hear or learn about it? (MULTIPLE RESPONSE ARE POSSIBLE- (Use 1 if "Yes" and 2 if "No")</p> <p>6. Radio..... </p> <p>..... </p> <p>7. Road show..... </p> <p>..... </p> <p>8. In a training session attended.....</p> <p>9. On a TV show.....</p> <p>10. Others.....</p> <p>.....</p>	
1.2	<p>Respondent's knowledge on the food fortification logo (Show the food fortification logo to the respondent and record the response). Do you know about this sign?</p> <p>1. Yes 2. No 3. Don't know</p>	
1.3	<p>What is the MAIN source of Maize flour for the household <u>NOW</u>?</p> <p>2. Bought from the shops, supermarket e.t.c 3. Maize is taken for milling at a nearby Posho Mill 4. Bought from a nearby Posho Mill 5. Other (Please specify)</p> <p>_____</p>	<p>1.1b Do you know if the maize flour you consume is fortified or not?</p> <p>1. Yes 2. No 3. Don't know</p>

1.4	<p>What brands of the following foods does your household consume?</p> <ol style="list-style-type: none">1. Maize flour2. Wheat flour3. Margarine4. Oils5. Fats6. Sugar	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
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Appendix 5: Survey teams

Team #	Survey Team Members	
	Team leader	Name
1	Phedis Sanita	Prisillah chepkemei
		Mohamed Safari
2	Kimura Mbaabu	Jamila Dama
		Johora Ali
3	Emily Jarah	Peninnah Makena
		Aden Dubow
4	Doris Adhiambo	AbdirizaQ Ismail
		Sharifa Abdi
5	Joyce Kombe	Ahmed Ibrahim
		Zaituni Bilal
6	Pauline Kamotho	Emily Malika
		Abdi Guyo
7	Racheal Rhaya	Mteti Harry
		Racheal Bada

Appendix 6: Survey coordination

Coordination Team	
Tana River County Department of Health	Makopa Omari (CNC Tana River County and overall survey Coordinator)
	Flora Abio (Galole Sub County nutrition coordinator)
Partner Supervisors	Nicholas Musembi (UNICEF, Nutrition Support Officer), Catherine Mwangi(Concern Worldwide, M&E Officer), Shadrack Njoka (Concern Worldwide, Health and Nutrition Manager) Florence Njambi (Kenya Red Cross, Regional Nutrition Coordinator)
Technical Support	Kibet Chirchir (NITWG)