MANDERA COUNTY HEALTH DEPARTMENT

RAPID SMART SURVEY

NUTRITIONAL SMALL SCALE SURVEY REPORT

MANDERA COUNTY,

KENYA

February 2017

Funded By;

unicef

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- to Kenya Red cross for provision of logistical and technical support
- to the national information working group for their technical guidance in implementing the survey

Last but not least, our gratitude goes to the entire survey respondent's and enumerators for their kind cooperation in providing the information required for the study

Abbreviations & Acronym

CHMT	County Health Management Team
CI	Confidence Interval
ENA	Emergency Nutrition Assessment
GAM	Global Acute Malnutrition
HAZ	Height for Age Z-score
ID	Index of Dispersion
IMAM	Integrated Management of Acute Malnutrition
MAM	Moderate Acute Malnutrition
MIYCN	Maternal Infant and Young Child Nutrition
MUAC	Mid Upper Arm Circumference
NIWG	Nutrition Information Working Group
ODK	Open Data Kit
PPS	Probability Proportional to Size
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SMART	Standardized Monitoring and Assessment in Relief and Transitions
UNICEF	United Nations Children's Fund
WAZ	Weigh for Age Z-score
WFP	World Food Program
WHO	World Health Organization
WHZ	Weight for Height Z-score

1 INTRODUCTION

1.1 Geographic Description of the Survey Area

Mandera County is located in the North Eastern part of Kenya. It is composed of six sub- counties namely Mandera East, Mandera North, Lafey, Mandera South, Mandera West and Banisa. Mandera County covers an area of 25,991.5Km2 which is sparsely populated making accessibility of resources a challenge for the populations living in the county. It has 1300 km of classified road network of earth surface which becomes impassable when impounded with rains.

Mandera County has three main livelihood zones i.e. a pastoral economy zone in the east and agro-pastoral economy zone in the west and an irrigated cropping zone in the north along the Daua River. Mandera County has a population of 711,117 people according to KNBS. The population ratio in these zones represent pastoral zone of 28.4%, agro pastoral zone of 39.2% and irrigated cropping zone of 32.4% (there is mixed livelihood of agro-pastoralism). Rainfall is scanty and unpredictable averaging at 255mm per year. It has hot temperatures ranging at a mean annual average of 24^{0}C in July to a high of 42^{0}C in February. The county is prone to unpredictable climate changes, leading to either severe droughts or heavy rains.

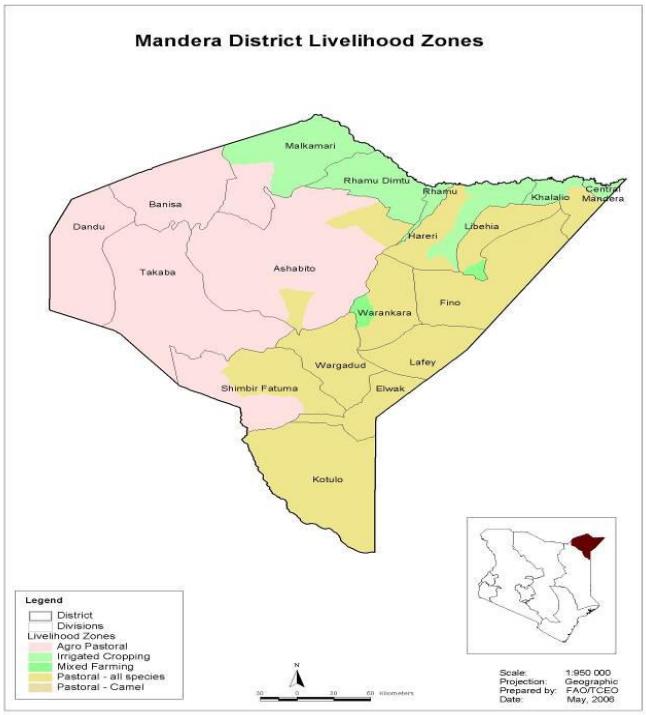


Figure 1: Mandera county livelihood zones

1.2 Health and Nutrition situation:

The nutrition status of the community is associated with many factors that range from poor socio-economic and civil security, food insecurity, poor child care practices and limited access to healthcare, water, sanitation and hygienic infrastructure which lead to a cycle of malnutrition that only reduces slightly during the post rain season. Since majority of the household income is from livestock and livestock sales the performance of rains has a direct bearing on household income hence nutrition status of the family.

1.3 Justification

The SMART nutrition surveys conducted in July 2016 showed an insignificant decline in global acute malnutrition rates from 24.7% in 2015 to 22.6% in 2016. The nutrition situation remained at emergency threshold. With the poor performance of the short rains October to December 2016 the nutrition situation is worsening with routine NDMA surveillance data indicating a steady increment in number of children at risk of acute malnutrition since June 2016. A rapid SMART nutrition survey is therefore critical to assess the current nutrition status for the population, feed into the short rains assessment and assist in planning emergency response actions.

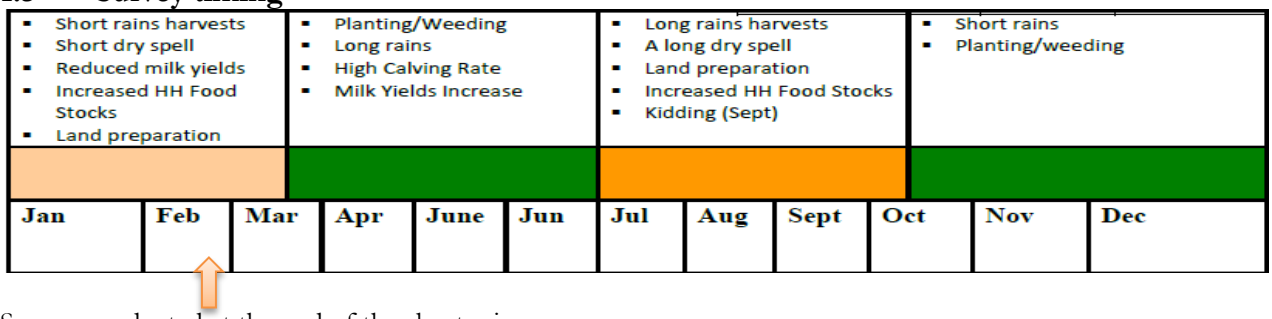
1.4 Survey Objectives

The overall objective of the survey was to determine the prevalence of acute malnutrition in children aged between 6-59 months in Mandera County

Specific Objectives were:
The survey objectives were:

1. To determine the prevalence of acute malnutrition among children (6-59 Months
2. To estimate the retrospective morbidity rate amongst children 0-59 months
3. Estimate coverage of acute malnutrition

1.5 Survey timing



Survey conducted at the end of the short rain season

2 METHODOLOGY

2.1 Sample size

A sample of 25 clusters by 10 household was selected for the surveillance methodology and this was expected to be enough for representation and achieve the required precision.

2.2 Survey Design

A cross-sectional descriptive nutrition SMART survey was conducted for children aged 6-59 months.Validated semi structured questionnaires in built in the Open Data Kit (ODK) software, were used to collect aanthropometric data and two-week retrospective morbidity data.

2.3 Sampling procedure

The study area and population were drawn from the entire residents/ inhabitants of the six sub-counties of Mandera County. A multi stage sampling technique was used for this purpose. The first stage was assignment of clusters based on proportion to population size (PPS), the population for each location/ village was established based on the 2016 projected population. Clusters were defined as villages within Mandera County. A sampling frame of 152 villages was used and based on PPS, 25 clusters were randomly generated using ENA for SMART.

At the second stage, random selection of households, and selection was done as per the National guidelines for Nutrition and Mortality Assessments in Kenya. Simple random method was employed to select the surveyed households. Updated list of households in the villages were developed in conjunction with the village chiefs and elders, while excluding abandoned households. A household was defined as a group of people living together and sharing same cooking arrangement. Using a table of random numbers 10 households were randomly selected from the updated household lists. In case the village had a large number of households, segmentation was done after which one segment would be randomly selected to represent the village.

All children aged between 6 - 59 months of the same household were included in the anthropometric survey. In cases where there was no eligible child, the household was still considered part of the sample though no questionnaires were administered. Revisits were done to households in which eligible under five child or entire family were absent at first visit.

2.4 Survey Team Composition

The survey had ten teams of three members each (1 team leader and 2 survey measurers). At the village level, the team was joined by a village guide who is knowledgeable of the village. Each team visited 10 households all for anthropometry and morbidity survey in a cluster. The survey teams would visit one cluster per team per day. All children aged 6-59 months were measured in the 10 households.

2.4.1 Survey Team Training and supervision

Survey enumerators were trained for two days with emphasis on survey objective, anthropometric measurements, morbidity interviews, familiarization with the questionnaire by reviewing the purpose for each question; recording of data using ODK software and field procedures, measurements. Possible problematic situations that might arise during the training were described and solutions for them given.

2.5 Data Collection and field work

Data collection took three days starting on 6th - 8th February 2017 under the supervision of two CHMT members and two officers from both Save the Children and Kenya Red Cross. During data collection, all the field procedures were followed to select eligible households, identify children for anthropometric measurement as well as the respondents for the interviews.

Survey teams first reported to the area chief or village elder for the respective selected clusters/villages updated the list of households and were then assigned a village guide. Using table of random numbers, households to be visited were randomly selected. Village guide then took teams around the village to the selected households.

Each day after data collection, all the teams were able to submit the data electronically. A central data manager was on stand-by to be able receive, review, export data, filter and give feedback teams through the field supervisors and team leaders

2.6 Data Processing & Analysis

Anthropometric and mortality data entry and processing was done using the ENA for SMART software 9th July, 2015 where the World Health Organization Growth Standards (WHO-GS) data cleaning and flagging procedures were used to identify outliers which enabled data cleaning as well as exclusion of discordant measurements from anthropometric analysis. The SMART/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. Additional analyses for frequencies, descriptive, correlations, cross–tabulations and regressions were conducted using Epi-Info, ENA Epi Info and Excel. Indices were expressed both in terms of z scores that represent the difference between observed weight and median weight of the reference population expressed in standard deviation. The result of this survey was compared to WHO standard cut-off points

2.7 Survey Limitations

The main challenges were:

a) determination of accurate age for children,
b) poor records to verify information
c) exclusion of some clusters before sampling due to insecurity

Age determination was done by use of health cards, birth certificates and recall (calendar of local events was used). Determining the exact age of some children was a major challenge particularly with the use of calendar of events. The main difficulties relate to accuracy on recall (recall bias) and at some villages, respondents could not relate well with some of the events. The challenge in determination of accurate age may impact of some survey findings.

There was poor recording of vitamin A, Iron folate and de-worming in the health cards and recall issues. During sampling five villages - Damasa, Elram, Harwale, Burjon, Alungu and Wante - were excluded from the sampling frame due to insecurity.

3 SURVEY RESULTS

3.1 Anthropometric Results

A total of 416 children, 211 boys and 201 girls aged 6-59 months were surveyed through anthropometric measurements from 238 households out of 250 households included in the survey, twelve households had no children 6-59 months. The data analysis was done with 412 children (4 SMART flags excluded). The overall data quality was excellent (score 8%, see annex 3 plausibility check on anthropometric results), and the standard deviation (SD) for WHZ was 1.06.

3.1.1 Distribution by age and sex

Among the surveyed children, boys and girls were equally represented (boys/girls ratio was 1.0). The age ratio of 6-29 months to 30-59 months was 0.85 (within the expect value around 0.85).

Table 3-1: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy: girl**
6-17	49	49.5	50	50.5	99	23.8	1.0
18-29	51	55.4	41	44.6	92	22.1	1.2
30-41	45	51.1	43	48.9	88	21.2	1.0

42-53	47	46.5	54	53.5	101	24.3	0.9
54-59	20	55.6	16	44.4	36	8.7	1.3
Total	212	51.0	204	49.0	416	100.0	1.0

3.1.2 Anthropometric data analysis

Estimation of prevalence of malnutrition was done based on WHO 2006 standards. The prevalence of Global Acute Malnutrition (GAM) was 32.8 % (26.3 - 40.0 95% C.I.) and the prevalence of Severe Acute malnutrition (SAM) was 8.7 % (5.3 - 14.1 95% C.I.). The nutrition situation is critical (GAM exceeding 15% according to the WHO classification),

Table 3-2: Summary of anthropometric analysis

Classification	All	Boys	Girls
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(135) 32.8 % (26.3 - 40.0 95% C.I.)	(71) 33.6 % (25.0 - 43.6 95% C.I.)	(64) 31.8 % (24.9 - 39.7 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(99) 24.0 % (19.4 - 29.3 95% C.I.)	(53) 25.1 % (19.2 - 32.1 95% C.I.)	(46) 22.9 % (17.6 - 29.2 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(36) 8.7 % (5.3 - 14.1 95% C.I.)	(18) 8.5 % (4.4 - 15.8 95% C.I.)	(18) 9.0 % (4.5 - 17.0 95% C.I.)
Prevalence of global malnutrition (< 125 mm and/or oedema)	(47) 11.3 % (7.4 - 16.9 95% C.I.)	(22) 10.4 % (6.7 - 15.7 95% C.I.)	(25) 12.3 % (7.0 - 20.6 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(37) 8.9 % (5.8 - 13.3 95% C.I.)	(18) 8.5 % (5.4 - 13.1 95% C.I.)	(19) 9.3 % (5.6 - 15.2 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(10) 2.4 % (1.2 - 4.9 95% C.I.)	(4) 1.9 % (0.6 - 6.1 95% C.I.)	(6) 2.9 % (1.1 - 7.4 95% C.I.)
Prevalence of underweight (<-2 z-score)	(119) 28.7 % (22.4 - 36.1 95% C.I.)	(66) 31.3 % (23.2 - 40.7 95% C.I.)	(53) 26.1 % (18.4 - 35.6 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(81) 19.6 % (15.4 - 24.5 95% C.I.)	(50) 23.7 % (17.0 - 32.0 95% C.I.)	(31) 15.3 % (10.3 - 22.1 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(38) 9.2 % (5.4 - 15.2 95% C.I.)	(16) 7.6 % (4.0 - 13.8 95% C.I.)	(22) 10.8 % (5.6 - 20.1 95% C.I.)
Prevalence of stunting (<-2 z-score)	(63) 15.5 % (11.7 - 20.3 95% C.I.)	(37) 17.8 % (12.9 - 24.0 95% C.I.)	(26) 13.1 % (8.1 - 20.6 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(46) 11.3 % (8.3 - 15.2 95% C.I.)	(27) 13.0 % (9.1 - 18.2 95% C.I.)	(19) 9.6 % (5.7 - 15.6 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(17) 4.2 % (2.6 - 6.6 95% C.I.)	(10) 4.8 % (2.5 - 9.2 95% C.I.)	(7) 3.5 % (1.6 - 7.6 95% C.I.)

The findings indicate a shift to the left of the sample curve, with a mean score of -1.48 and a standard deviation of 1.06, which indicates that overall, the population exhibits a poor nutritional status compared with the WHO reference population. The standard deviation was good and is within acceptable range of 0.8 to 1.2. The design effect determined was 2.07 which indicate a slight existence of intra cluster differences.

The cases of malnutrition appeared to be aggregated into certain clusters as indicated by index of dispersion (ID) values for WHZ < -2: ID=1.73 (p=0.015) and WHZ < -3: ID=1.97 (p=0.003)[1].

The prevalence of acute malnutrition (WHZ<-2 and/or oedema) by age is presented in Table 3-3 and shows a higher proportion of acutely malnourished among the children aged 30-59 months compared to 6-29 months. This could be attributed to declining child care practices as mothers concentrate on the younger children. However the prevalence of severe malnutrition seems to be evenly distributed across the age groups

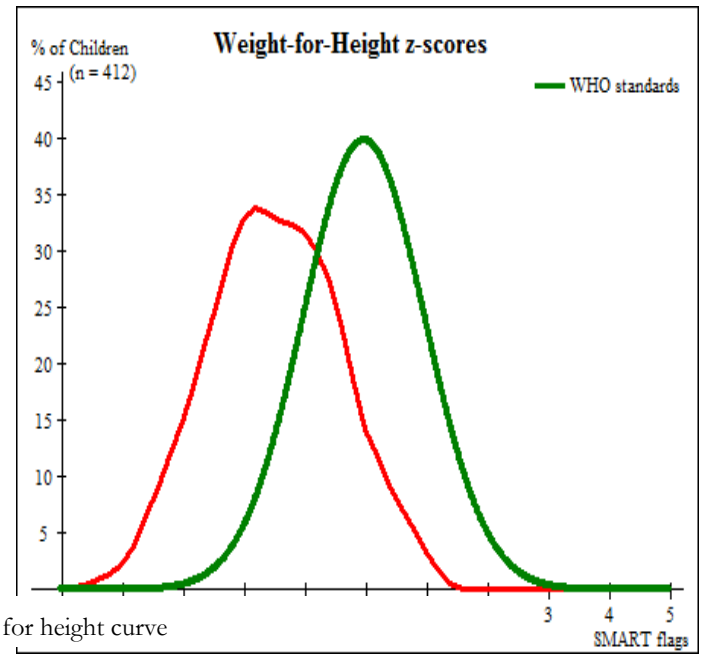


Figure 2: Weight for height curve based on weigh for height

Table 3-3: Prevalence of acute malnutrition by age

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
		No.	%	No.	%	No.	%
6-17	98	10	10.2	13	13.3	75	76.5
18-29	90	7	7.8	21	23.3	62	68.9
30-41	87	13	14.9	19	21.8	55	63.2
42-53	101	3	3.0	30	29.7	68	67.3
54-59	36	3	8.3	16	44.4	17	47.2
Total	412	36	8.7	99	24.0	277	67.2

The mean Z scores for wasting (WHZ), underweight (WAZ) and stunting (HAZ) are outlines in Table 3-4 below. The data shows poor nutrition status compared to WHO reference population. The standard deviations for WHZ and WAZ were within the acceptable range of 0.8-1.2. The sample design effect values of 2.07 (WHZ) and 2.26 (WAZ) show inter cluster variability. Height for age though was normally distributed across the clusters.

Table 3-4: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	412	-1.49±1.06	2.07	0	4
Weight-for-Age	414	-1.40±1.09	2.26	0	2
Height-for-Age	406	-0.71±1.26	1.36	0	10

* contains for WHZ and WAZ the children with oedema.

[1] The Index of Dispersion (ID) indicates the degree to which the cases are aggregated into certain clusters (the degree to which there are "pockets"). if ID is higher than 1 and p is less than 0.05 the cases are aggregated into certain cluster (there appear to be pockets of cases)

3.2 Children's Morbidity and health seeking behaviour

Retrospective morbidity data was collected among 6-59 months children to assess the occurrence of main diseases. The survey established that 52.9% (220 children) had been sick two weeks prior to survey period see Table 3.2. Disease is a risk factor to severe acute malnutrition. Most children (66.8%) suffered from fever, followed by ARI at 65.5% and diarrhea (23.2%). This may be linked to the high prevalence of Severe Acute Malnutrition in the community.

Table 3-5: Prevalence of reported child illness and health-seeking behaviour

Child Morbidity in two weeks prior to survey (N=416)	n	%
Prevalence of reported illness (6-59 months)	220	**52.9%**
Symptom breakdown in children reported ill (N=220):		
Fever	147	66.8%
ARI/Cough	144	65.5%
Watery Diarrhoea	51	23.2%
Others – vomiting	9	4.1%

Majority of the caregivers 75.0% with sick children sought treatment, For the care givers who sought treatment majority are likely to seek treatment from appropriate places i.e. public health clinics (50.3%), private clinic/pharmacy (18.3%) and community healthcare workers (26.1%). The results also show risks of mismanagement of diseases as slightly over 5.5% of the population either seek assistance from traditional healers or perform self-treatment. Figure 3.2 below summarizes health seeking behaviors

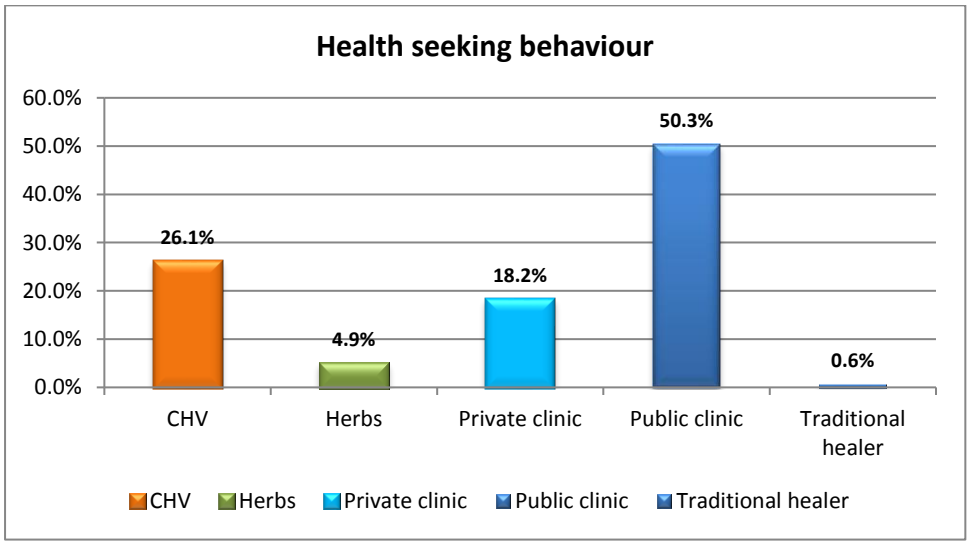


Figure 3: Health seeking practices

Zinc supplementation in diarrhoea

Zinc supplementation has been shown to reduce the duration and severity of diarrhoeal episodes as well as the prevention of subsequent episodes. Zinc supplementation for children with diarrhoea in Mandera County was found to be optimal 82.4% (N=51) of children with diarrhoea were reported to have been treated with Zinc and ORS.

3.3 Vitamin A supplementation and Deworming

In Kenya the government has set a target of 80% coverage of vitamin A Supplementation (VAS) among children aged 6-59 months. The national guideline recommends that a child should be supplemented at-least every six months. The survey established that vitamin A supplementation is at 32.9 % for children 6-59 months (one dose) and 13.5% for children 6-59 months (two doses); far much below the national target. Low coverage could be attributed to care givers not take their children for supplementation after measles

vaccination, health workers not exploiting opportunities to supplement some health and recall issues as mostly results were based on recall.

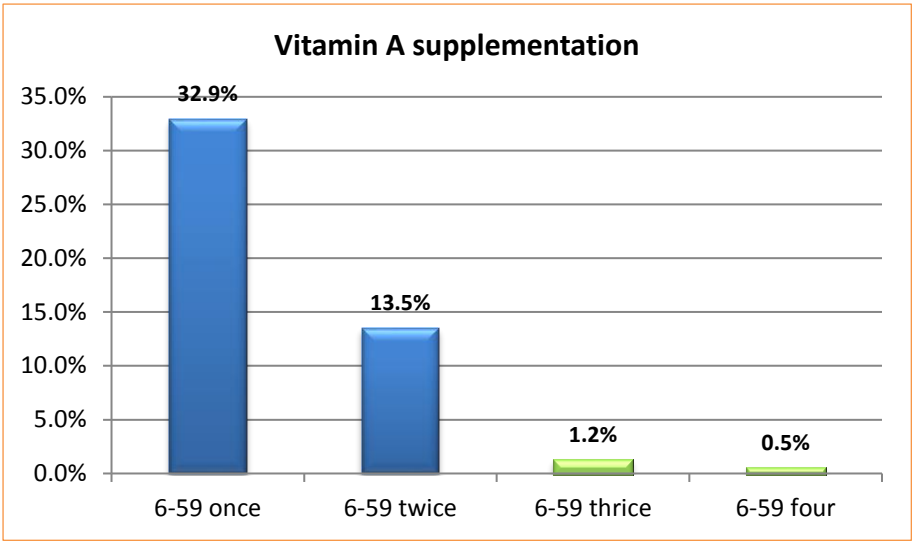


Figure 4: Vitamin A supplementation

3.4 Coverage of IMAM programme

Category	Number	on treatment
Total children screened	416	147
Eligible for OTP	36	6
Eligible for SFP	111	23

4 CONCLUSIONS

The malnutrition rates in Mandera County are Very Critical as per the WHO classification **(phase 5; Global Acute Malnutrition ≥30 percent).** Morbidity results also indicated high occurrence of diseases with 52.9% of the children having had an episode of illness two weeks prior to the survey. Main illnesses reported were fever with chills like malaria, ARI/ cough and diarrhoea

Efforts should be put towards scaling up of health and nutrition services coverage (health facility based and through additional integrated outreach services) as well as scale up of WASH interventions.

5 Recommendations and priorities

The ***very critical*** nutrition situation in the county is attributed to multiple and interrelated factors that call for continued integrated intervention efforts to address both immediate needs in addition to developing long-term strategies to enhance access to basic services. Specific recommendations include:

Recommendation	Activities	Time frame	Responsible person(s)
Scale-up implementing of integrated management of acute malnutrition (IMAM) program and where applicable start up new outreach sites to increase coverage and reach all malnourished children	• Conduct initial and quarterly mass screening for six months. • Continuous active case finding and referral • Involvement of local leaders and CHW in community mobilization for nutrition services. • Scale up of integrated outreach services • Sustained supply chain of nutrition commodities and • Implement blanket supplementary feeding to cushion population from effects of drought	Feb 2017 Monthly Ongoing Feb – Apr 2017 Ongoing March 2017	CNC, KRC, SCI Nutritionists and facility in-charges Facility in-charges CHD, KRCS, SCI, AMREF CHD, UNICEF, WFP, KEMSA CHD, Partners,
Management of child illnesses	• Provision of essential drug supplies • Supply of potable water for domestic use •	Feb –Jun 2017 Ongoing	CHD Department of water, Partners

Future nutrition monitoring

It will be necessary to carry out another a full SMART nutrition survey for surveillance purposes, to assess the level of implementation of this survey recommendations and if there have been improvements in GAM. The survey should be led by MOH and involve other partners in the county. The survey should be timed for at a similar period for comparability i.e. June – July.

6 References

i. National guidelines for Nutrition and Mortality Assessments in Kenya
ii. The Kenya National Technical Guidelines for Micronutrient Deficiency control, August 2008.
iii. The Sphere Handbook, Humanitarian Charter and Minimum Standards in Humanitarian Response, 2011
iv. Rapid SMART surveys for emergencies

7 APPENDICES

Appendix 1: Plausibility Report

.Plausibility check for: KEN_04022017_MANDERACOUNTY_CHD.as

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)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	**0** (1.0 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0.695)
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0.989)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (7)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (10)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (8)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	

```
.                                        and   and      and       or
.                         Excl    SD    >0.9  >0.85    >0.80    <=0.80
                                          0     5        10       20        0 (1.06)

Skewness  WHZ             Excl    #     <±0.2 <±0.4    <±0.6    >=±0.6
                                          0     1         3        5        0 (0.00)

Kurtosis  WHZ             Excl    #     <±0.2 <±0.4    <±0.6    >=±0.6
                                          0     1         3        5        3 (-0.43)

Poisson dist WHZ-2        Excl    p     >0.05 >0.01    >0.001   <=0.001
                                          0     1         3        5        1 (p=0.015)

OVERALL SCORE WHZ =                      0-9  10-14    15-24     >25        8 %
```

The overall score of this survey is 8 %, this is excellent.

Appendix 2: Assigned Clusters

Sub county	Cluster	Pop	Cluster #
Mandera West	Dandu	17661	1
	Didkuro	9334	RC
	Hardahalo	9858	2
	Bulla hamabala	7567	3
Banisa	Malkamari	10375	4
	Goljo	6913	5
	Eymole	20043	6
	Burashum	1920	7
Mandera north	Bulla Dana	4738	8
	Bulla Qodi	1751	9
	Darika	7571	10
	Bulla Marir	2060	11
	Kubi	2214	12
	Tossi	1946	13
	Afya	2884	14
Mandera East	Sarohindi	2862	RC
	Lamandid	1271	15
	Bulla Power	9070	16
	Township	10607	17
	Shafshefy	16243	18
Lafey	Lafey	26256	19
	Warankara	13404	20
Mandera south	Bulla Afya	3165	21
	Bulla Power /Tawakal	3471	22
	Dabacity	5769	23
	Kutayu	4380	24
	Wargadud town	2088	25