STANDARDISED EXPANDED NUTRITION SURVEY (SENS) FINAL REPORT

KAKUMA REFUGEE CAMPS
(Kakuma I, II, III, IV and Kalobeyei settlement)

Survey conducted: 22nd November– 3rd December 2017

Report finalised: 18th April 2018

UNHCR

IN COLLABORATION WITH

IRC, KRC, UNICEF and WFP

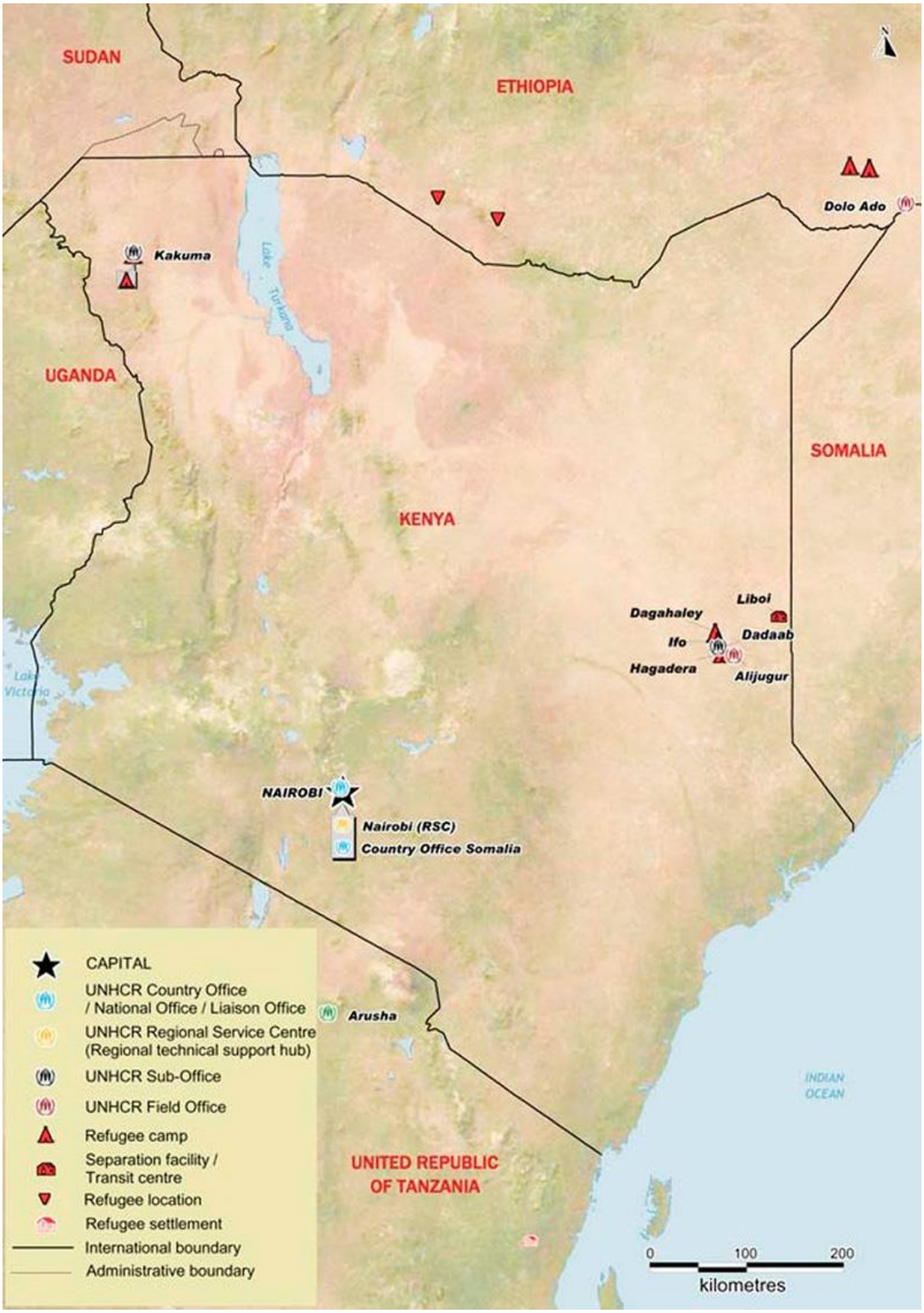

Figure 1: Kenya map showing location of Kakuma Refugee camps

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ACRONYMS AND ABBREVIATIONS

ANC	Ante Natal Clinic
BSFP	Blanket Supplementary Feeding Programme
CDR	Crude Death Rate
CI	Confidence Interval
CHP	Community Health Promoter
CSB	Corn-Soya Blend
CTC	Community Therapeutic Care
DEFF	Design effect
ENA	Emergency Nutrition Assessment
ENN	Emergency Nutrition Network
EPI	Expanded Programme on Immunization
Epi Info	CDC software for epidemiological investigations
GAM	Global Acute Malnutrition
GFD	General Food Distribution
GFR	General Food Ration
GIZ	German Development Cooperation
GoK	Government of Kenya
HAZ	Height-for-Age z-score
Hb	Haemoglobin
HH	Household
HIS	Health Information System
IPs	Implementing Partners
IYCF	Infant and Young Child Feeding
IRC	International Rescue Committee
IRS	Indoor Residual Spraying
KAP	Knowledge Attitude and Practice
KRCS	Kenya Red cross Society
LLIN	Long-lasting insecticidal net
Lpppd	Litres per Person per Day
MAM	Moderate Acute Malnutrition
MCH	Maternal and Child Heath
MOH	Ministry of Health
MUAC	Middle Upper Arm Circumference
NCHS	National Centre for Health Statistics
OTP	Out-patient Therapeutic Programme
PDM	Post Distribution Monitoring
PLWHA	Persons Living with HIV/AIDS
PPS	Probability Proportional to Size
ProGres	Registration database for refugee population data
RSC	Regional Service Centre
SAM	Severe Acute Malnutrition
SC	Stabilization Centre
SD	Standard Deviation
SFP	Supplementary Feeding Programme
SMART	Standardised Monitoring and Assessment of Relief and Transitions
TFP	Therapeutic Feeding Programme
U5	Children under 5 years old
U5CDR	Under-5 Crude Death Rate

UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation and Hygiene
WAZ	Weight-for-Age z-score
WHZ	Weight-for-Height z-score
WFP	World Food Programme
WHO	World Health Organization

1 EXECUTIVE SUMMARY

1.1 Introduction

The 2017 annual Standardised Expanded Nutrition Survey (SENS) at the Kakuma Refugee Camps was conducted from 22nd November to 3rd December 2017. It was coordinated by the United Nations High Commission for Refugees (UNHCR) with support from World Food Programme (WFP), International Rescue Committee (IRC) and Kenya Red Cross (KRC). The survey used SMART methodology and UNHCR SENS guidelines version 2 (2013) for implementation. While previous surveys indicated a steady decline in GAM prevalence between April 2010 and November 2014.
There was a considerable increase in GAM prevalence in Kakuma from November 2015 and 2016. Though the difference was not statistically significant. However, in 2017 there has been a significant reduction in GAM prevalence in both Kakuma and Kalobeyei. There has also been a significant change in stunting for Kalobeyei, the same reduction was observed for Kakuma where stunting prevalence has reduced to below the 40% threshold of public health significance. Anaemia in children 6-59 months remains above the 40% threshold of public health significance for both survey areas but anaemia in women, 15-59 years was below 40%. A slight increase was observed in Kakuma while a reduction was observed in Kalobeyei. The November 2017 survey also shows an improvement in Vitamin A supplementation coverage, and water availability. Mosquito net ownership reduced for Kakuma and increased slightly in Kalobeyei. Mosquito net coverage for Kalobeyei remains far below the recommended 80% UNHCR target.

This report summarises the results of standardised expanded nutrition survey (SENS) for Kakuma I, II, III, IV and Kalobeyei conducted from 22nd November – 3rd December 2017, coordinated by UNHCR in collaboration with WFP, UNICEF, IRC and KRC. The overall aim of this survey was to assess the general nutrition and health status of refugee population and formulate workable recommendations for appropriate nutritional and public health interventions. Objectives of the survey were as follows:

Primary Objectives:

1. To determine the prevalence of acute malnutrition amongst children aged 6-59 months;
2. To determine the prevalence of stunting among children aged 6-59 months;
3. To assess the prevalence of anaemia among children aged 6-59 months and non-pregnant women of reproductive age (15-49 years);
4. To assess the two week period prevalence of diarrhoea among children 6-59 months;
5. To assess the coverage of vitamin A supplementation in the last 6 months in children aged 6-59 months;
6. To determine the coverage of measles vaccination in children 9-59 months;
7. To investigate IYCF practices among children 0-23 months.
8. To assess the coverage of ration cards and the duration of the general food ration lasts for the recipient's.
9. To determine the extent to which negative coping strategies are used by the households
10. To assess household dietary diversity.
11. To determine the ownership of mosquito nets (all types and Long-lasting insecticidal (LLINs)) in households;

12. To determine the utilization of mosquito nets (all types and LLINs) by the total population, children 0-59 months, and pregnant women;
13. To determine the population's access to, and use of improved water, sanitation and hygiene facilities;
14. To identify priority areas in programme implementation and propose informed recommendations for future programming.

Secondary Objectives:

1. To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women.
2. To assess the enrolment coverage of selective feeding programme includes targeted supplementary feeding programmes (TSFP), blanket supplementary feeding programme (BSFP) and therapeutic feeding programmes (TFP) for children aged 6-59 months.
3. To assess the nutritional status of pregnant and lactating women using MUAC.

METHODOLOGY:

A two-stage cluster sampling was used to select representative sample for both Kakuma and Kalobeyei. First stage entailed dividing the population into smaller units (blocks for Kakuma, neighborhoods for Kalobeyei. Probability Proportion to Size was used to select 36 clusters. On the Second stage, 18 households selected randomly using simple random sampling by way of random number generator.

All children interviewed in each sampled household (children aged 6-59 months for anthropometric, health and anaemia modules, and children 0-23 months for IYCF module). Following SENS recommendation WASH module completed for all households, Food security, Mosquito net coverage and women questionnaire completed for half of households (sub-sample). In total 6 survey teams in each camp completed 18 households each day over a period of 12 days.

Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology to collect and analyse data on child anthropometry and UNHCR's Standardised Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations (Version 2, 2013) was used to guide data collection and analysis for other indicators.

The sample size for children, 6-59 months, was calculated using ENA for SMART software (version 2011, updated 9th, July 2015) according to UNHCR survey guidelines (Table 2). The calculation was based on the expected prevalence of global acute malnutrition (GAM) in children, 6-59 months. The upper limits of prevalence from SENS November 2016 was 17.6% For Kakuma and 12.4% for Kalobeyei. (95% CI).

A precision of 4 for Kakuma and 3.5 for Kalobeyei; a design effect (DEFF) of 1.5 for Kakuma and 1 for Kalobeyei; an average household size of 6.6 for Kakuma and 4.8 for Kalobeyei and percentage of children under the age of five years was estimated at 15.2% in Kakuma and 20.6% in Kalobeyei using the UNHCR ProGres data, October 2017. A two-stage cluster survey was conducted using the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology to collect and analyse data on child anthropometry. Information on other indicators was collected and analysed using UNHCR's Standardised Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations (Version 2 2013) (see www.sens.unhcr.org).

The questionnaires for all six modules were adopted from SENS guidelines; 3 of these questionnaires were used to collect information on the different population target groups, namely children 6-59 months, infants 0-5 months, women of reproductive age 15-49 years; and 3 questionnaires were used to collect household information on food security, WASH, and mosquito net ownership (see Appendix 5 for all questionnaires). Peripheral blood was obtained in all sampled children, and half of women surveyed, and tested for haemoglobin using a portable HemoCue 301 analyser. The survey used Android mobile phones and Open Data Kit (ODK) software for data collection and submission. A total of eight teams collected data during the survey, each comprising of 6 members.

1.2 Summary of Results

The nutrition situation showed improvement compared to 2016. The prevalence of global acute malnutrition in both Kakuma (10.6%) and Kalobeyei (5.8%) in comparison to the acceptable threshold of <. In both camps, GAM decreased in 2017 compared to 2016. The same trend was observed for stunting, which decreased in both Kakuma and Kalobeyei. In Kakuma, stunting has been on a decreasing trends since 2014. Data quality for anthropometry in both camps was of very good standard.

The coverage of measles vaccination in both Kakuma (97.3%) and Kalobeyi (96.3%) met the standard of ≥95%. However, the coverage of Vitamin A supplementation in both camps (86.2% in Kakuma, 76.6% in Kalobeyei) was below the 90% standard.

Around 21.5% and 13.8% of children aged 6-59 months in Kakuma and Kalobeyei reported have had diarrhoea in the last two weeks prior to survey.

The intake of CSB+ and CSB++ in Kakuma was 8.7 (0.9-16.5) and 78.7 (71.0-86.5) respectively. In Kalobeyei, the intake of CSB+ and CSB++ was 25.2 (12.3-38.0) and 84.9 (77.4-92.4) respectively.
The prevalence of anaemia among children 6-59 months remained above the critical threshold in both Kalobeyei (57.8 %%), where it, however, decreased compared to 2016, and in Kakuma (59.2%), where it increased compared to 2016. The prevalence of anaemia among non-pregnant women decreased in Kalobeyei (34.1%) compared to 2016, but remained virtually unchanged in Kakuma (38.5%) The prevalence of anaemia is significantly high among children aged 6-23 months group in both the locations 75.3% and 73.3%. There is urgent need for improvement and enhancement of preventive blanket SFP for this age group to increase the coverage and utilization of fortified food (CSB++) and as well consider micronutrient supplementation for children aged 24 – 59 months.

A high proportion of children in both camps (85.0% in Kalobeyei and 82.4% in Kakuma) were introduced to the breastmilk within an hour of birth. The prevalence of exclusive breastfeeding was also high in both Kalobeyei (84.1%) and Kakuma (86.0%). Continued breastfeeding was high in both camps at 1 year, but much lower at 2 years. Introduction of solid foods at 6 months was also low (45.5% in Kalobeyei, 29.2% in Kakuma). Bottle feeding was low. Consumption of CBS++ was high in both camps (84.9% in Kalobeyei and 78.7% in Kakuma).

The average duration of the food ration was 18.4 in Kalobeyei and 16.4 in Kakuma, which is 56.1% and 52.6% of the theoretical duration, respectively. The average household dietary diversity score was 4.0 in Kakuma and 4.5 in Kalobeyei. The categories of food most commonly consumed were cereals, oils/fats, and pulses. Only 24.1% of households in

Kalobeyei and 30.3% in Kakuma consumed a plant or animal source of Vitamin A, and 19.6% of households in Kalobeyei and 15.1% in Kakuma consumed food sources of haem iron.

All households in both camps were using an improved drinking water source. However, the proportion using an improved excreta disposal facility was only 2.8% in Kalobeyei and 56.4% in Kakuma. The average litres of water used per person per day were 16.7 in Kalobeyei and 18.5 in Kakuma compared to UNCHR target of >20 lpppd. Only 37.3% of households in Kalobeyei and 46.3% in Kakuma were satisfied with their drinking water source.

The proportion of households with at least one long lasting insecticide treated net (LLIN) was 53.6% in Kalobeyei and 73.3% in Kakuma. Average persons per LLIN were 4.9 in Kalobeyei and 3.5 in Kakuma. The proportion of respondents who had slept under a LLIN was 45.2% in Kalobeyei and 58.6% in Kakuma.

1.3 Recommendations

Immediate

- Strengthen or enhance support, promotion and protection of IYCF practices through the integration of UNHCR multi-sectoral IYCF friendly framework. UNHCR and partners staff has been trained on IYCF-E and the roll out of mentioned framework. Continued, active case finding and screening of acutely malnourished children should be maintained, to improve OTP and TSFP and BSFP coverage. Improve active case finding, referral and follow up of SAM and MAM cases through community based approach. Strengthen Anemia/ micronutrient deficiency screening and treatment programme as immediate response to the rising Anemia prevalence and consider micronutrient supplementation.
- Ensure increased awareness and sensitization for proper use of Food voucher (BAMBA CHAKULA) to ensure dietary diversity. This can be achieved through household visits, education, and mother-to-mother support groups
- Improvement of prevention and treatment of malaria should be prioritised as there high mortality rates associated with malaria.
- NRC to strongly advocate for malaria prevention activities such as indoor residual spraying (IRS) in order to control the high prevalence of Malaria observed in 2017.
- NRC to improve the latrine coverage and continue with health education activities that could prevent the occurrence of diarrhea.

Medium term

- Partners to reinforce activities to improve dietary diversity at household level, including continued scale up of home gardening projects. NRC to continue improvements and scale up kitchen gardening activities, especially important in helping to diversify the diet.
- IRC to continue and scale up MTMSG's to improve infant and young child feeding practices and link growth monitoring to monitor the outcome.
- WASH partners to continue with Knowledge Attitude and Practice (KAP) survey which provides useful information to support nutrition findings.
- NRC to continue with installation, coverage and maintenance of household latrines. Attention needs to be paid to new arrival areas.
- WFP to continue conducting food security Food Security Outcome monitoring and respond to findings
- Health agencies to conduct qualitative assessments of the health-seeking behavior of new arrivals, with the aim of improving uptake of services and preventing a deterioration of their nutritional status

Long term

- Improve and scale up the livelihood opportunities for the refugees through development-oriented initiatives to improve their economic status
- All partners to improve monitoring of programmes to aid with end-term impact evaluations
- Health partners to maintain integrated approach to programming, and ensure sufficient training for new Community Health Workers and timely re-fresher training where necessary

Table 1: SUMMARY OF RESULTS KAKUMA AND KALOBEYEI SENS November 2017

	Kakuma		Kalobeyei		Classification of public health significance or target (where applicable)
	Number of cases/ sample size	% (95% CI)	Number of cases/ sample size	% (95% CI)	
CHILDREN 6-59 months					
Acute Malnutrition (WHO 2006 Growth Standards)					
Global Acute Malnutrition (GAM)	53/501	10.6 (7.8-14.3)	31/531	5.9 (3.8-8.9)	Critical if ≥ 15%
Moderate Acute Malnutrition (MAM)	49/501	9.8 (7.2-13.2)	27/531	5.1 (3.4-7.6)	
Severe Acute Malnutrition (SAM)	4/501	0.8 (0.3-2.1)	4/531	0.8 (0.3-2.0)	
Oedema	0/501	0.0	0/531	0.0	
Mid Upper Arm Circumference (MUAC)					
MUAC <125mm	9/513	1.8 (0.8-3.9)	1/534	0.2 (0.0-1.4)	
MUAC 11.5-12.4 cm	9/513	1.8 (0.8-3.9)	1/534	0.2 (0.0-1.4)	
MUAC <11.5 cm	0/513	0.0	0/534	0.0	
Stunting[1] (WHO 2006 Growth Standards)					
Total Stunting	77/486	15.8 (12.0-20.7)	132/504	26.2 (21.6-31.4)	Critical if ≥ 40%
Severe Stunting	18/486	3.7 (1.9-7.1)	46/504	9.1 (6.4-12.9)	
Programme coverage/enrolment					
Measles vaccination with card or recall (9-59 months)	477/495	96.3 (94.1-98.6)	511/525	97.3 (95.7-99.0)	Target of ≥ 95%
Vitamin A supplementation within past 6 months with card or recall	395/516	76.6 (68.0-85.1)	462/537	86.2 (79.2-93.2)	Target of ≥ 90%
Therapeutic feeding program (based on all	1/5	20.0 (0.0-75.5)	0/6	0	Target >90%

[1] Note that z-scores for height-for-age require accurate ages to within two weeks (CDC/WFP: A manual: Measuring and Interpreting Mortality and Malnutrition, 2005).

	Kakuma		Kalobeyei		Classification of public health significance or target (where applicable)
	Number of cases/ sample size	% (95% CI)	Number of cases/ sample size	% (95% CI)	
admission criteria WHZ, oedema and MUAC)					
TSFP (based on all admission criteria WHZ and MUAC)	4/53	7.5 (0.0-16.4)	1/27	3.7 (0.0-11.7)	Target >90%
BSFP (children aged 6-23 months)	137/174	78.7 (71.0-86.5)	146/172	84.9 (77.4-92.4)	Target >90%
Diarrhoea					
Diarrhoea in last 2 weeks	111/516	21.5 (15.5-27.5)	74/536	13.8 (9.6-18.0)	
Anaemia					
Total Anaemia (Hb <11 g/dl)	302/510	59.2 (50.8-67.6)	309/535	57.8 (51.1-64.4)	High if ≥ 40%
Mild (Hb 10-10.9)	102/510	20.0 (15.8-24.2)	130/535	24.3 (20.2-28.4)	
Moderate (Hb 7-9.9)	188/510	36.9 (29.8-43.9)	174/535	32.5 (25.7-39.4)	
Severe (Hb <7)	12/510	2.4 (0.8-3.9)	5/535	0.9 (0.0-1.9)	
CHILDREN 0-23 months					
IYCF indicators					
Timely initiation of breastfeeding	182/221	82.4 (71.9-92.8)	164/193	85.0 (76.5-93.4)	
Exclusive breastfeeding under 6 months	49/57	86.0 (76.4-95.5)	37/44	84.1 (72.4-95.8)	
Continued breastfeeding at 1 year	30/32	93.8(84.5-100.0)	38/41	92.7(82.2-100.0)	
Continued breastfeeding at 2 years	20/40	50.0(31.9-68.1)	34/45	75.6(62.5-88.6)	
Introduction of solid, semi-solid or soft foods	7/24	29.2(7.2-51.1)	5/11?	45.5(16.2-74.7)	
Consumption of iron-rich or iron-fortified foods	141/175	80.6 (74.1-87.0)	149/172	86.6 (79.5-93.7)	
Bottle feeding	12/231	5.2 (2.2-8.1)	7/216	3.2 (0.0-6.5)	
WOMEN 15-49 years					
Anaemia (non-pregnant)					
Total Anaemia (Hb <12 g/dl)	115/299	38.5 (31.6-45.3)	65/190	34.2 (26.6-41.6)	High if ≥ 40%
Mild (Hb 11-11.9)	61/299	20.4 (15.2-25.6)	38/190	20.0 (14.5-25.5)	
Moderate (Hb 8-10.9)	49/299	16.4 (11.7-21.1)	25/190	13.2 (8.2-18.1)	
Severe (Hb <8)	5/299	1.7 (0.3-2.1)	2/190	1.1 (0.0-2.5)	
Programme coverage					

	Kakuma		Kalobeyei		Classification of public health significance or target (where applicable)
	Number of cases/ sample size	% (95% CI)	Number of cases/ sample size	% (95% CI)	
Pregnant women currently enrolled in the ANC	22/23	95.7 (86.8-100.0)	16/16	100	
Pregnant women currently receiving Iron-folic acid pills	19/23	82.6 (64.3-100.0)	16/16	100	
Prevalence of undernutrition in Pregnant women and Lactating mothers by MUAC (?? Add the cut-off used)	0/307	0	0/192	0	
FOOD SECURITY					
Food distribution					
Proportion of HH with a ration card	291/291	100.0	271/271	**100**	
Average number of days GFR lasts out of 31 days	16.4 (15.2-17.5)		18.4 (17.4-19.4)		
Negative household coping strategies					
Proportion of HH reporting using none of the coping strategies over the past month	63/304	20.7 (15.3-26.2)	45/286	15.7 (9.4-22.1)	
Borrowed cash, food or other items with or without interest	114/289	39.4 (31.7-47.2)	111/271	41.0 (31.5-50.5)	
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	26/290	9.0 (5.2-12.7)	21/271	7.7 (2.6-12.9)	
Requested increased remittances or gifts as compared to normal	24/291	8.2 (3.2-13.3)	13/270	4.8 (2.2-7.4)	
Reduced the quantity and/or frequency of meals and snacks	190/291	65.3 (56.3-74.3)	206/271	76.0 (69.7-82.3)	
Begged	66/291	22.7 (13.7-31.7)	72/270	26.7 (18.0-35.3)	
Household dietary diversity					
Average HDDS	4.0 (3.5-4.5)		4.5 (4.2-4.8)		

	Kakuma		Kalobeyei		Classification of public health significance or target (where applicable)
	Number of cases/ sample size	% (95% CI)	Number of cases/ sample size	% (95% CI)	
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	13/304	15.7 (9.4-22.1)	116/286	40.6 (28.7-52.4)	
WASH					
Water quality					
Proportion of households using improved drinking water source	583/583	100	569/569	100	
Proportion of households that use a covered or narrow necked container for storing their drinking water	505/583	86.6 (78.6-94.7)	461/569	81.0 (72.2-89.9)	
Water quantity					
Proportion of households that use:					Average quantity of water available per person / day ≥ 20 litres
≥ 20 lpppd	221/583	37.9 (30.7-45.2)	174/569	30.6 (23.2-37.9)	
15 - <20 lpppd	61/583	10.5 (8.3-12.7)	86/569	15.1 (12.1-18.2)	
<15 lpppd	301/583	51.6 (44.3-59.0)	309/569	54.3 (46.2-62.4)	
Average lpppd (95% C.I)	18.5 (16.0-21.0)		16.7 (14.8-18.6)		
Satisfaction with drinking water supply					
Proportion of households that say they are satisfied with drinking water supply	270/583	46.3 (37.0-55.7)	212/569	37.3 (24.4-50.1)	
Safe excreta disposal					
Proportion of households using an improved excreta disposal facility	325/576	56.4 (48.2-64.7)	16/568	2.8 (0.5-5.2)	
Proportion of HH using a shared family toilet	121/576	21.0 (15.5-26.5)	100/568	17.6 (11.2-24.0)	
Proportion of HH using a communal toilet	108/576	18.8 (12.9-24.6)	429/568	75.5 (66.5-84.6)	
Proportion of HH using an unimproved toilet	22/576	3.8 (2.1-5.6)	23/568	4.0 (0.0-8.4)	
Proportion of HH with children <3 yrs disposing of faeces safely	137/142	96.5 (93.0-100.0)	181/183	98.9 (97.4-100.0)	
MOSQUITO NET					
Mosquito net ownership					

	Kakuma		Kalobeyei		Classification of public health significance or target (where applicable)
	Number of cases/ sample size	% (95% CI)	Number of cases/ sample size	% (95% CI)	
Proportion of HHs owning at least one LLIN	222/303	73.3 (66.2-80.3)	155/289	53.6 (47.4-59.9)	Target of >80%
Average number of persons per LLIN	3.5		4.9		2 persons per LLIN
Mosquito net utilisation					
Total HH members (all ages) who slept under an LLIN	1,145/1,953	58.6	652/1,442	45.2	
Children 0-59 months who slept under an LLIN	215/288	74.7	177/297	59.6	
Pregnant women who slept under an LLIN	25/26	96.2	22/31	71.0	
Indoor residual spraying					
Indoor Residual Spraying HH Coverage	53/291	81.8 (71.8-91.8)	15/275	5.5 (0.0-11.1)	

2 INTRODUCTION

This report is a synthesis of standardized expanded nutrition survey (SENS) carried out from 22nd November – 3rd December 2017, at the Kakuma Refugee Camp and Kalobeyei settlement, Turkana County in northwestern Kenya. The survey's general objectives were to:
(i) To assess the prevalence of malnutrition and to monitor selected indicators of programme performance., and (ii) make, based on the findings, relevant recommendations to the UNHCR, IRC, WFP, KRC and other partners at the camp. This survey was funded by the UNHCR and UNICEF. It was coordinated by the UNHCR. Other partners who provided technical support and helped in facilitation of the survey included the world Food Programme (WFP) International Rescue Committee and the Kenya Red Cross (KRC).This report provides information from the annual nutrition survey in Kakuma refugee camps and conducted by UNHCR, IRC, WFP and KRC.

1.1 Background

The Kakuma Refugee Camp was established in 1991 in the then Turkana County, formerly Turkana district in Kenya's northwest. The United Nations High Commission for Refugees (UNHCR) is the lead agency coordinating humanitarian affairs at the camp. It works closely with the Government of Kenya through the Department for Refugee Affairs (DRA); which has an overall responsibility for the provision of protection and assistance to refugees in Kenya. The World Food Programme (WFP) is responsible for the provision of food assistance to all refugees, while the International Organization of Migration (IOM) is in charge of refugee movements as part of UNHCR resettlement process to third countries. The main cooperating partners for UNHCR and WFP are national and international Non-Governmental Organizations (NGOs), which support in the implementation of a wide range of programmes: World Vision

International works with WFP in food distribution; Norwegian Refugee Council (NRC) provides all water and sanitation related services; and, the Lutheran World Federation (LWF) is tasked with providing primary education, early childhood development, child protection and sustainable livelihoods programmes. The International Rescue Committee (IRC) is the primary healthcare provider in Kakuma camp while Kenya Red Cross (KRC) is mandated to provide primary health care to Kalobeyei settlers; Jesuit Refugee Services (JRS) provides psychological counselling and vocational training; while, the National Council of Churches of Kenya (NCCK), provides services such as advocacy on reproductive health, HIV/AIDS, peace education and girl guiding, sanitation and hygiene promotion and Shelter provision. Windle Trust Kenya (WTK) runs the secondary education programme. Film Aid International runs mobile cinemas that provide critical life information for refugees and creates opportunities for technical skill development for refugee youth. The Salesians of Don Bosco in Kenya provide vocational training to camp residents.

Kalobeyei camp/settlement established in June 2016 is located 40 km from Kakuma town and along the main highway to Lokichoggio. It measures 3km by 5km (=1,500ha; 600ha for settlement and 900ha for farming) and it will be used to establish a model camp/settlement. The allocation of Kalobeyei site is an initiative between the UNHCR, host community and the County Government of Turkana that was done with a joint vision of breaking from the norm of encampment. The site was established as an integrated settlement (for both refugees and host community) with a broader concept of providing opportunities for diversifying livelihoods, addressing over-reliance on humanitarian aid and promoting refugee self-reliance. The first group to be settled at the site comprises of refugees from Eastern Equatorial State in South Sudan, who have been residing at the reception centre adjacent to Kakuma 4 refugee camp as well as those at the reception centre in Nadapal. The combined population of this group was estimated at 3,000 people, and there has been gradual increment that is expected to rise to about 15,000 people including refugees who are targeted to be relocated from the older camps in Kakuma as part of the broader decongestion plan. In addition, the site expects to receive about 13,000 refugees of nationalities other that Somalis from Dadaab, as part of immediate measures for acceleration of voluntary repatriation process as envision under the Tri-Partite Agreement (between the Governments of Kenya, Federal Republic of Somalia and the UNHCR). Its anticipated that between 4,000 and 5,000 people from the site neighbourhood (host community) will be accessing services at the site.

The camp has grown considerably since 1992 and at the time of the survey, the camp was hosting 184,938 refugees originating from 18 countries, comprised of 53.2% (86,244) males and 46.8% (75,812) females. These represented 146,768 from Kakuma and 38,170 from Kalobeyei and originating from 19 nationalities. The number of children under 5 years of age is currently estimated to be 21,194 from Kakuma and 8,377 from Kalobeyei or 16% of the total population. Women of reproductive age were 31,390 from Kakuma and 7,614 from Kalobeyei. According to the United Nations High Commission for Refugees (UNHCR) HIS database (Dec 2017), the main countries of origin are currently South Sudan, 56.8 %, and Somalia, 19.2 %, with the remaining percent originating from various countries in the region including Democratic republic of Congo (6.2%), Ethiopia (5.7%), and Burundi (5.5%) among others. Throughout 2017, Kakuma has received a large number of refugees feeling conflict from South Sudan and re-located from Dadaab camp.

The surrounding area is inhabited by the Turkana community, a river/lake Nilotic group of north-western Kenya. The local community and the refugee population intersect at the social and economic levels in many different permutations. For instance, while many locals are

employed by the myriad international and local nongovernmental organizations (including United Nations organizations like the UNHCR and the WFP) within the camp, others engage in a wide range of trading activities, both within and outside the refugee camp. As well, in other instances, the interactions have been a source of conflict between the local community and the refugee community.

1.1.1 Food security

The World Food Summit (1996) specifies that food security is achieved when all people at all times have access to food for healthy and active living. Furthermore, such access must entail nutritional value and meet the people's dietary needs (WFP Emergency Food Security Assessment Handbook, 2009.) Analysing food security is premised on four key pillars: food availability, food access, food utilization. And stability Additionally, Sphere (2011) unpacks food access into: Food transfers; Cash and voucher transfers and Livelihoods. In Kakuma and Kalobeyei, food security is handled through mixed modality that entail in-kind food transfers and voucher transfers, with an attempt to scale up livelihoods especially in Kalobeyei settlement.
This round those households with poor food consumption are higher compared to the same months since 2014. In May 2017, some 71% of households had acceptable consumption and 20% had unacceptable consumption. (WFP, Food Security and Outcomes Monitoring report of September 2017).

Kalobeyei settlement which was set in 2016 was sampled for the first time this round and 63% of households reported having acceptable food consumption while 36% had unacceptable food consumption (poor 10% and borderline 10%). (WFP, Food Security and Outcomes Monitoring report of September 2017).

The Coping Strategies Index (CSI) is an indicator of household food security covering food consumption related strategies that house-holds engage in to cope with food consumption shortfall. In September 2017, the consumption based CSI continued to show a reduced trend in Kakuma since September 2015, from 22 to current 13, an indication that households were employing coping strategies less frequently over this period. In Kakuma, CSI was more stable despite a slight increase from 12 to 13 comparing September 2016 and 2017, which is comparable to the same month in other years except 2015. Similar index was observed in Kalobeyei at 15. (WFP, Food Security and Outcomes Monitoring report of September 2017).

Prices of key commodities - wheat flour, maize, beans, vegetable oil and sugar - have been on the rise since March/April 2017, due to the reduced supplies from within the country and neighbouring, Uganda and Tanzania, which are key cross-border sources, for cereals and pulses to Kenya. Informal cross border (WFP, Food Security and Outcomes Monitoring report of September 2017).

The cost of the Minimum Acceptable Healthy Food Basket (MAHFB) – in September 2017 - was 6 percent higher in Kakuma, as compared to the same time last year. The depressed rains in the high potential production areas, as well as in the arid and semi-arid regions of Kenya, led to reduction in crops and livestock production, thus reduced supplies. The basket cost was 5% lower in Kakuma, as compared to average cost (69 Ksh/capita/day), in the North-western pastoral livelihood zone, where it is situated. (WFP, Food Security and Outcomes Monitoring report of September 2017).

The percentage of households – in Kakuma camp – that were not able to afford the minimum acceptable healthy food basket, increased to 96% compared to 82% in September 2016 and stood at 93% in Kalobeiyei settlement - indicating a worsening household's economic vulnerability. In Kakuma, the poor purchasing power has remained the same, for the past five years. (WFP, Food Security and Outcomes Monitoring report of September 2017).

The population relies almost entirely on rations provided by the WFP. Livelihood activities are restricted by inadequate water for agriculture in Kalobeyei and inadequate space in Kakuma; Restricted movement outside the camp for traders; Inadequate employment opportunities where refugees are confined to incentive work cadre.(2017 AGDM- participatory Assessment Findings) A number of food assistance programmes such as the general food distribution (GFD); voucher transfers; targeted curative programmes; and, blanket supplementary feeding programs (BSFP) have, nonetheless, helped to maintain relatively adequate nutrition and food security among refugees living in the camp.

All these programmes are relevant in sustaining the refugees, considering the encampment and restricted movement policy by the Government of Kenya on the refugees. This, in turn, limits recourse to alternative livelihood pathways for the refugee population.

Households in Kakuma camp spend on average 76% of their income on food, while households in Kalobeiyei settlement spend 78% of their income on food. Expenditure on essential food items recorded a mixed pattern, but largely dropped on a year on year comparison, as a result of the increase in prices. In Kakuma, fish and meat were top expenditure items - at 15% - together with sugar, milk and other cereals, than the WFP ration. The high expenditure on fish in Kakuma - as well as 5% expenditure recorded in Kalobeiyei - can be attributed to the increased supplies - thus reduced prices - as a result of the WFP supported market access and linkage project for Lake Turkana fisher folk to access the Kakuma market. Maize was the top expenditure item in Kalobeiyei, considering that the households there receive 100% cash assistance, with Corn soya blend in-kind distribution. Issued (WFP, Food Security and Outcomes Monitoring report of September 2017).

2.1 Health situation

The 2017 UNHCR HIS database for Kakuma and Kalobeyei indicate that Watery diarrhoea, malaria and acute respiratory infections persist as the highest contributors to morbidity with increased incidences recorded during rainy seasons. An outbreak of Cholera occurred in May 2017 and persisted until December 2017 associated with deteriorating WASH situation, specifically low latrine coverage in both Kakuma and Kalobeyei camps and overcrowding in specific blocks in Kakuma one, zone 2 which overstretch the WASH facilities allocated to serve these blocks.

In January 2017, NRC conducted a latrine census in Kakuma and Kalobeyei where the findings indicated that the total (communal + household) latrine coverage for Kakuma camp is at 39.79% (Kakuma, 41.45% and Kalobeyei 27.98%). Household latrine coverage for the camp as per the census exercise stands at 25.15% (Kakuma 30.16% and Kalobeyei 0%). Latrine user ratio for the entire camp was 1:13 (1:12 and Kalobeyei 0%) as compared to the ideal latrine user ratio of 1:5 for Household latrines.

The Kakuma camp has one level 4 hospital that serves both Kakuma and Kalobeyei

population, one health centre (former main hospital) and 5 clinics that provide both curative and preventive services located in various sections of the camp. In Kalobeyei, one clinic with a maternity under construction is located in village one and one temporary clinic in village 2 that mainly give outpatient health and nutrition services. The health partner at Kakuma is IRC whereas Kenya Redcross Society covers Kalobeyei. Generally, Kakuma indicates a shortage of health personnel that keep reducing every year due to resource constraints. The current ratio of community health workers (CHWs) to refugees stands at 1:1055, which although is slightly above the acceptable and way below the required standard of 1:500. This shortage has been exacerbated by the heightened inflow of refugees from South Sudan and relocation of refugees from Dadaab over 2017 and previous years. Most of the arrivals are in need of immediate health and nutritional attention. There is an urgent need to increase the number of CHWs in Kakuma 4, where the health and nutrition intervention needs are most needful.

Malaria, Watery diarrhoea, Lower and upper respiratory tract infections have remained the main causes of morbidity among under 5 children. According to the January to November, 2017 HIS report, the < 5 morbidity rates are as follows: URTI (39.7%), LRTI (16%), Watery diarrhoea (15.5%), Malaria (6.6%). the mortality rates recorded in Kakuma camp have been fairly low and stable for several years. Throughout 2017, crude mortality rate remained low at approximately 0.2/1000/month. The under-five mortality rate was 0.7/1000/month. The combined infant mortality (IMR) rate was relatively high at 27.4/1000 live births/month. The neonatal mortality rate (NNMR) was 10/100,000 livebirths/month.

2.2 Nutrition

HIS database indicates that the incidence of malnutrition has increased in 2017 partly due to the increase in the general camp population as a result of natural population growth as well as the influx of new arrivals and relocated refugees from Dadaab. Seasonal changes are observed in May – June and August - September, resulting in an increase in acute malnutrition associated with the rainy season that trigger upsurge in Malaria and Watery diarrhoeal cases. This implies that there is still need for an integrated approach in addressing Acute Malnutrition. A sharp increase in both incidence of MAM and SAM has been observed and is mostly attributed to new asylum seekers that are arriving from South Sudan while already in dire nutrition status.
From the annual SENS results, trends in prevalence of global acute malnutrition (GAM) have been on the rising trend over the past three years since 2014. Though these remains below the 15% emergency threshold, the trend is not encouraging and measures need to be put in place.

Current Nutrition Services and Activities
The International Rescue Committee (IRC) maternal and child health nutrition programme in Kakuma runs a number of programmes including preventative and curative nutrition interventions such as Integrated Management of Acute Malnutrition (IMAM), Maternal Infant and Young Child Nutrition (MIYCN), Nutrition Surveillance & Assessments, Blanket Supplementary Feeding Programmes (BSFP) and Hospital in-patient therapeutic feeding programme. The therapeutic inpatient services are offered in the Stabilization Centre (SC) located in the IRC main hospital and general hospital. Others include Outpatient Therapeutic Program (OTP) sites; Targeted Supplementary Feeding Programmes (TSFP). Comprehensive care clinics for HIV/AIDS and Tuberculosis patients are at general and the main hospitals. The program also operates the hospital feeding program that provides meals to all in-patients admitted at the IRC general and main hospital and Stabilization Centre.

A number of nutrition programmes and activities are implemented by KRC in Kalobeyei settlement among them as detailed below: preventative and curative nutrition interventions such as Integrated Management of Acute Malnutrition (IMAM), Maternal Infant and Young Child Nutrition (MIYCN), Nutrition Surveillance & Assessments, Blanket Supplementary Feeding Programmes (BSFP). Children with severe acute malnutrition with complication are referred to Stabilization Centre (SC) located in the IRC main hospital.

These activities are supported by UNHCR, UNICEF and WFP.

Community-based Management of Acute Malnutrition (CMAM): The CMAM programme includes the Targeted Supplementary feeding programme (TSFP), outpatient therapeutic Programme (OTP) and stabilization Centre (SC). The nutrition programme also runs a supplementary feeding programme for specific chronic medical cases such as HIV and tuberculosis. Community mobilisation and active case finding is conducted in the community by CHPs.

Targeted Supplementary Feeding Programme: Supports moderately acute malnourished children aged 6-59 months, pregnant and lactating women (PLW) and medical cases in need of nutritional support.

Children enrolled receive 14 sachets of Plumpy'sup® twice monthly and 1 sachet is taken daily. Malnourished PLWs receive 3.85kg of CSB+ per cycle (i.e.14 days).

Outpatient Therapeutic Programme: The five outpatient therapeutic feeding centres cater for severely acute malnourished children without medical complications. Enrolled children receive a weekly supply of Plumpy'nut®.

Stabilization Centre: Kakuma camp hosts two SC in the general and main hospital. IRC provides in-patient feeding for severely acute malnourished children with medical complications, both from the refugee population and from the host community. Children receive F75, F100 and Plumpy'nut® through UNHCR support.

Blanket Supplementary Feeding Programme: for children 6-23 months of age and PLWs: Children 6-23 months are currently receiving 6 kg of CSB++ on a monthly basis from all clinics. Based on the recommendations of JAM 2017 that considered the fast pace in the increase in the number of the beneficiaries served vis- a –vis the receding number of nutrition staffing, BSFP targeting children 6 to 23 months will be provided together the General Food Rations at the respective food distribution centres. PLWs receive 1.61 kgs of CSB+ per cycle (i.e. for 14 days) through the nutrition sites.

Infant and young child feeding (IYCF): Improved knowledge and practice is promoted through the CHP led mother-to-mother and father-to-father support groups, and IYCF counselling in antenatal clinics, postnatal clinics, maternity, paediatric and SC wards.

Vitamin A supplementation and deworming: Mass campaigns are held bi-annually to administer vitamin A and deworming supplementation. In addition, children receive vitamin A supplementation when enrolled in a feeding programme, as do new arrivals to the camp.

Mass MUAC screening of children 6-59 months: All eligible children in the camp are screened four times per year using MUAC. All acute malnourished children identified by the

screening are referred to the relevant feeding programme.

Nutrition support for HIV/AIDS (PLWHA), tuberculosis: Provided super cereals plus. Each beneficiary receives 140/10g per person day (CSB and oil).

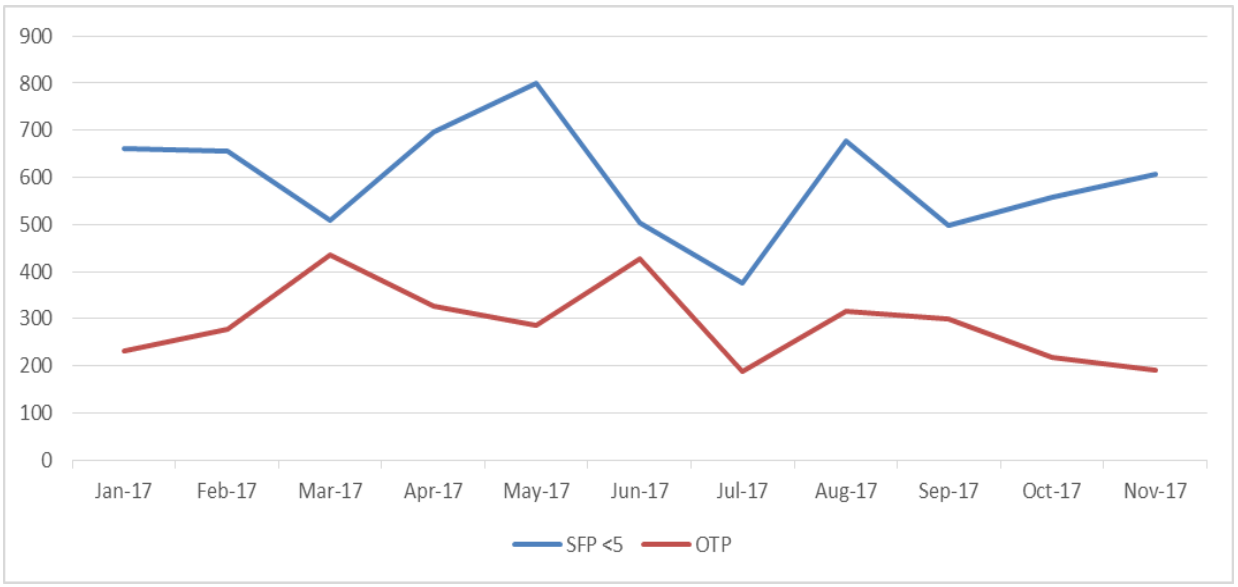

Figure 2: Kakuma Admission trends for the TSFP and OTP, Jan 2017 - Nov 2017 (UNHCR Health Information system)

The trend of new admissions of Moderate acute malnutrition cases to TSFP and Severe acute malnutrition cases to OTP remained relatively stable over the year in Kakuma with peaks observed May, June and August associated with the seasonal upsurge in Malaria and Watery diarrhoea.

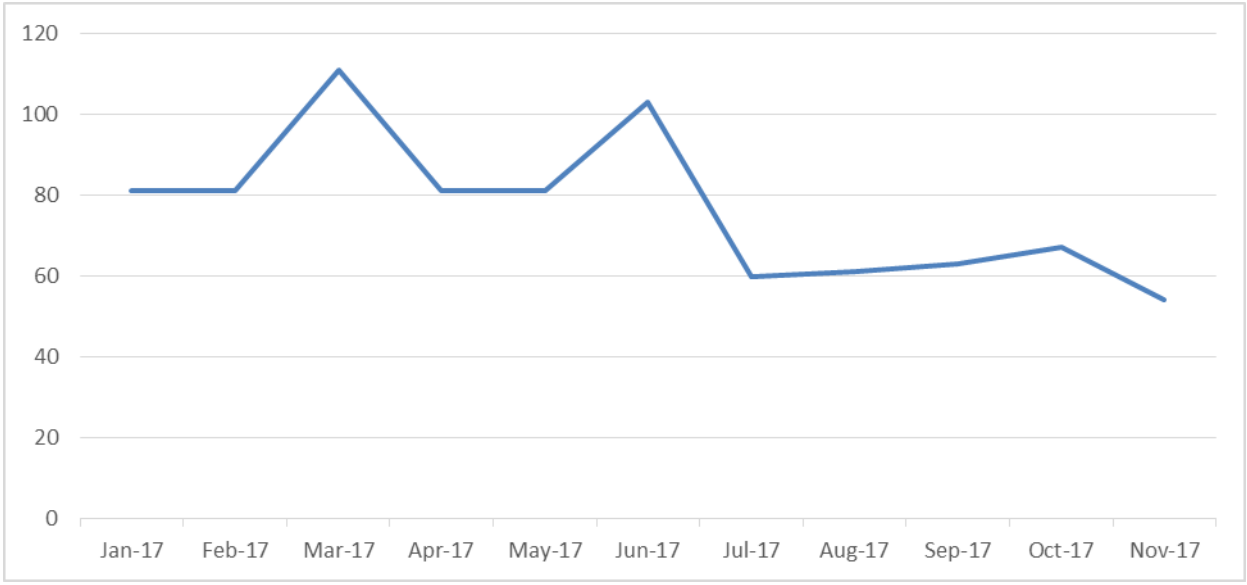

Figure 3: Kakuma Admission trends for the Stabilization Centre Jan 2017 - Nov 2017 (UNHCR Health Information system)

The stabilization centre located at the IRC General Hospital serves severely malnourished children that present with medical complication from Kakuma, Kalobeyei and the surrounding host community. Peaks in admissions were observed in March and June.

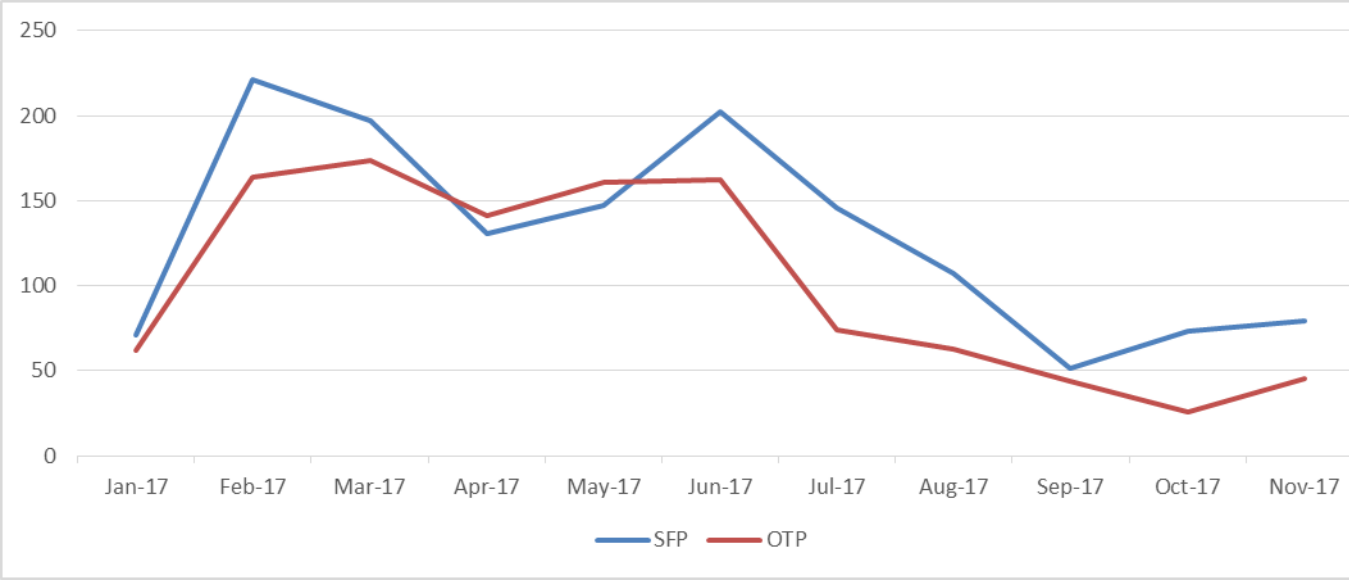

Figure 4: Kalobeyei Admission trends for the SFP and OTP Jan 2017 - Nov 2017 (UNHCR Health Information system)

Kalobeyei nutrition programme experienced peaks in admissions to TSFP and OTP in February, March and June primarily linked to upsurge in Watery diarrhoeal cases that were observed due the water shortage experience during that period. Kalobeyei also has extremely low latrine coverage that keeps receding by day due to resource constraint that has been preventing timely replacement of filled up communal latrines.

2.3 Survey Objectives

Primary objectives:

- To measure the prevalence of acute malnutrition in children aged 6-59.
- To measure the prevalence of stunting in children aged 6-59 months.
- To determine the coverage of measles vaccination among children aged 9-59 months (or context-specific target group e.g. 9-23 months).
- To determine the coverage of vitamin A supplementation received during the last 6 months among children aged 6-59 months.
- To assess the two-week period prevalence of diarrhoea among children aged 6- 59 months.
- To measure the prevalence of anaemia in children aged 6-59 months and in women of reproductive age between 15-49 years (non-pregnant).

- To investigate IYCF practices among children aged 0-23 months.
- To determine the coverage of ration cards and the duration the general food ration lasts for recipient households.
- To determine the extent to which negative coping strategies are used by households.
- To assess household dietary diversity.
- To determine the population's access to, and use of, improved water, sanitation and hygiene facilities.
- To determine the ownership of mosquito nets (all types and LLINs) in households.
- To determine the utilisation of mosquito nets (all types and LLINs) by the total population, children 0-59 months and pregnant women.
- To determine the household coverage of indoor residual spraying.
- *Include other additional objectives negotiated for the survey*
- To establish recommendations on actions to be taken to address the situation in *[insert refugee setting]*

Secondary objectives:

- To determine the coverage of therapeutic feeding and targeted supplementary feeding programmes for children 6-59 months.
- To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women.

3 METHODOLOGY

A two-stage cluster survey with probability proportion to size sampling was employed in this survey. Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology to collect and analyse data on child anthropometry and UNHCR's Standardised Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations was used to guide data collection for other indicators.

3.1 Sample size

The sample size for children, 6-59 months, was calculated using ENA for SMART software (version July 9th, 2015) and according to UNHCR SENS guidelines version 2 (2013), (**Table 1**). The calculation was based on the expected prevalence of global acute malnutrition (GAM) in children, 6-59 months. The prevalence for November 2016 was 7.9 % (5.1-12.0 95% CI). Ideally the upper limit of 12% should have been used. However, it was expected to rise due to a high number of refugees seeking asylum in Kenya following the December 2013 outbreak of civil strife in South Sudan. The expected prevalence rate was inflated to 15%, the maximum possible according to WHO guidelines. A precision of 3; a design effect (DEFF) of 1.5; an average household size of 6.3; and, percentage of children under the age of five was estimated

at 16.9% using the 2016 Nutrition Survey results. This was also corroborated using (UNHCR ProGres data, November 2014 showing 16.4%).

Table 1 Sample size calculation, Kakuma, November 2017

	Population	Prevalence	Precision	Design effect	Ave HH size	% <5	NRR	No of children	No of HH
Kakuma	146,367	17.6%	4.0%	1.5	6.6	15.2%	5.0%	**569**	**663**
Kalobeyei	37,834	12.40%	3.50%	1	4.8	20.6%	5.0%	**325**	**384**

[1] Design effect
[2] Non-response rate

The same households sampled by SMART were used in all indicators. Anaemia sample was drawn from the SMART sample size, as recommended by the UNHCR Standardised Expanded Nutrition Survey (SENS) Guidelines.

For each of the indicators used, households and individuals were sampled as follows:

Household-level indicators:
- WASH: every household
- Food Security: every other household
- Mosquito net: every other household

Individual-level indicators:
- Children 0-59 months: all eligible children in *all* households were assessed (based on the above calculations)
- Women 15-49: all eligible women in every other household were assessed.

3.2 Sampling procedure: selecting clusters

The sample was drawn largely from population data in UNHCR ProGress as of xx/xx/xxxx. The IRC and KRCS CHP Census data were used for verification and adjustments,

The sample size for children, 6-59 months, was calculated using ENA for SMART software (version 2011, updated 9th, July 2015) according to UNHCR SENS guidelines (version 2 (2013). The calculation was based on the expected prevalence of global acute malnutrition (GAM) in children, 6-59 months. The prevalence from last SENS conducted in November 2016 was 13.5% (10.6 -17.6) (95% CI) for Kakuma and 8.9% (6.3 -12.4) (95% CI) for Kalobeyei. The expected prevalence used the upper limit of the prevalence from last SENS conducted in 2016 malnutrition prevalence was expected to change much from previous year based on admission trend for the last one year. A precision of 3; a design effect (DEFF) of 1.5; an average household size of 6.9; and, percentage of children under the age of five was estimated at 15% using the UNHCR ProGres data, October 2016. A two-stage cluster survey was conducted using the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology to collect and analyse data on child anthropometry. Information on other indicators was collected and analysed using UNHCR's Standardised Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations (Version 2 2013) (see www.sens.unhcr.org).

3.3 Sampling procedure: selecting households and individuals

ENA for SMART selects the clusters (blocks), once done a team was sent to a block to label the households numerically with indelible pens. Population density varies across the blocks at Kakuma. If a block contained 100 households or less, all households in the block were marked. If a Block contained more than 100 households then the team walked around the block to identify a path that divided the block into approximately two halves. One portion of the block was selected randomly. In the selected segment of the block the team proceeded to number all households from the first to the last. If there was more than one household in a particular compound, this was indicated at the entrance of the compound (e.g. 2017 SENS HH1). The numbering and labelling was done two days prior to commencement of the survey.

If there was more than one household in a particular compound, this was indicated at the entrance of the compound (e.g. HH1-HH6). The numbering and labelling was done three days prior to commencement of the survey.

After the labelling, Microsoft Excel was used to divide the total number of households in the cluster (block) with the number of household required to be sampled: 18 day. The quotient is the interval number. A number was then randomly chosen through lottery between one and the interval number, the chosen number would be the first household to visit in the cluster. Subsequent households would be chosen as appropriate using the interval number.

All teams followed standardised procedures. If an individual or an entire household was absent, the teams were instructed to return to the absent household or revisit the absent individual up to two times on the same survey day. If these subsequent visits were unsuccessful, the individual/household was recorded as absent and was not replaced with another household/individual. If an individual/household refused to participate, then it was considered a refusal and the individual or the household was not replaced with another. If a selected household was abandoned, the household was not replaced by another. If a selected child was disabled with a physical deformity preventing certain anthropometric measurements, the child was still included in the assessment of the other indicators.

3.4 Questionnaires and measurement methods

Questionnaires

Six module specific questionnaires were designed to provide information on the relevant indicators for the different target groups (Appendix **7).** Questionnaires were prepared in English and administered in the language best understood by the household selected by way of translators. All questionnaires were pre-tested. Questionnaires covered all SENS modules and included the following areas and measurements:

1) **Children 6-59 months (SENS Modules 1-2):** Anthropometric status, oedema, enrolment in selective feeding programmes and blanket feeding programmes (CSB++), immunisation (measles), vitamin A supplementation in last six months, morbidity from diarrhoea in past two weeks, haemoglobin assessment.
2) **Children 0-23 months (SENS Module 3):** Questions on infant and young children feeding practices.
3) **Women 15-49 years (SENS Module 2):** Pregnancy status, coverage of iron-folic acid pills and post-natal vitamin A supplementation, MUAC measurements for pregnant and lactating women (PLW), and haemoglobin assessment for non-pregnant women.

4) **Food Security (SENS Module 4):** Access and use of the general food ration (GFR), coping mechanisms when the GFR ran out ahead of time and household food dietary diversity using the food consumption score.
5) **Water, sanitation and hygiene (SENS Module 5):** Access to improved drinking water source, storage of water, quantity of water used per household, satisfaction with the water supply, type and quality of excreta disposal facilities in use and safe disposal of young children's stool.
6) **Mosquito Net Coverage (SENS Module 6):** Ownership of mosquito nets, utilization of nets of all types and long-lasting insecticidal net (LLIN), and Indoor Residual Spraying (IRS).

3.5 Measurement methods

Household level indicators

- **Food security, WASH and Mosquito net:** The questionnaire was based on the standard SENS questionnaires.

Individual-level indicators

- **Sex of children:** Gender was recorded as male or female.
- **Birth date or age in months for children 0-59 months:** The exact date of birth (day, month, and year) was recorded from either a child health card or birth notification if available. If no reliable proof of age was available, age was estimated in months using a local event calendar or by comparing the selected child with a sibling whose ages were known, and was recorded in months on the questionnaire. If the child's age could absolutely not be determined by using a local events calendar or by probing, the child's length/height was measured and a cut off, 65-110 cm, was used for inclusion. The UNHCR Manifest was not reliable in determining age therefore it was not used.
- **Age of women 15-49 years**: Reported age was recorded in years.
- **Weight of children 6-59 months:** Measurements were taken to the nearest 100 grams using an electronic scale (SECA scale) with a wooden board to stabilise it on the ground. The double-weighing technique was used to weigh young children unable to stand on their own or unable to understand instructions not to move while on the scale. Clothes were removed during weighing although where necessary, light undergarments were allowed.
- **Height/Length of children 6-59 months:** Children's height or length was taken to the closest millimetre using a wooden height board. A height stick was used to decide on whether a child should be measured lying down (length) or standing up (height). Children less than 87cm were measured lying down, while children ≥ 87cm were measured standing up.
- **Oedema in children 6-59 months:** The presence of bilateral oedema was determined by applying gentle thumb pressure on to the tops of both feet of the child for three seconds. If a shallow indent remained in both feet, oedema was recorded as present. The survey coordinators verified all oedema cases reported by the survey teams.
- **MUAC of children 6-59 months and women 15-49 years (PLWs only):** MUAC was measured at the mid-point of the left upper arm between the elbow and the shoulder and taken to the closest millimetre using standard tapes.
- **Child enrolment in selective feeding programme for children 6-59 months:** This was assessed for the outpatient therapeutic programme and for the supplementary feeding programme using card or recall.

- **Measles vaccination in children 9-59 months:** Measles vaccination was assessed by checking for the measles vaccine on the EPI card or by carers recall if no EPI card was available. For ease of data collection, all children, 6-59 months were assessed for measles but analysis was only done on children, 9-59 months.
- **Vitamin A supplementation in last 6 months in children, 6-59 months*:*** Whether the child received a vitamin A capsule over the past six months was recorded from an EPI card or health card if available, or by asking the caregiver to recall if no card was available. A vitamin A capsule was shown to the caregiver when asked to recall.
- **Haemoglobin (Hb) concentration in children 6-59 months and women 15-49 years (non-pregnant):** Hb concentration was taken from a capillary blood sample from the fingertip and recorded to the closest gram per decilitre by using the portable HemoCue Hb 301 Analyser.
- **Diarrhoea in last 2 weeks in children, 6-59 months:** an episode of diarrhoea was defined as three loose stools or more in 24 hours. Caregivers were asked if their child had suffered episodes of diarrhoea in the past two weeks.
- **ANC enrolment and iron and folic acid pills coverage in pregnant women:** Whether the woman was enrolled in the ANC programme and was receiving iron-folic acid pills was assessed by recall. An iron-folic acid pill was shown to the pregnant woman when asked to recall.
- **Infant and young child feeding practices in children, 0-23 months**: Infant and young child feeding practices were assessed based on standard WHO recommendations (WHO 2007). Infant formula feeding was also assessed.
- **Referrals:** Children, 6-59 months were referred to the health post for treatment when MUAC was <12.5cm, and those < -2 z-score; oedema was present; or when haemoglobin was <7.0g/dL. Women of reproductive age were referred to the hospital for treatment if haemoglobin was < 7.0 g/dL. PLW were referred to the health post if MUAC <210mm.

3.6 Case definitions, inclusion criteria and calculations

Indicators of Nutritional Status and Anaemia

Table 2 shows the definition and classification of the nutritional indicators used. Main results are reported according the WHO Growth Standards 2006. Results using the NCHS Growth Reference 1977 are reported in **Appendix 4**.

Table 1 Nutritional Status and Anaemia indicators and cut-offs used

Indicator		Children 6-59 months	Women 15-49 years		
			Non-Pregnant	Lactating	Pregnant
Acute Malnutrition[1]	Global acute malnutrition	WHZ <-2 and/or oedema	--	--	--
	Moderate acute malnutrition	WHZ <-2 and ≥-3	--	--	--
	Severe acute malnutrition	WHZ <-3 and/or oedema	--	--	--
Stunting[1]	Total stunting	HAZ <-2	--	--	--
	Moderate stunting	HAZ <-2 and ≥-3	--	--	--
	Severe stunting	HAZ <-3	--	--	--
Underweight	Total underweight	WAZ <-2	--	--	--

[1]					
	Moderate underweight	WAZ <-2 and ≥-3	--	--	--
	Severe underweight	WAZ <-3	--	--	--
Malnutrition (MUAC)	--	<12.5cm and/or oedema	--	--	--
	--	≥11.5cm and <12.5cm	--	MUAC <210mm[2]	
	--	<11.5cm and/or oedema	--	--	--
Anaemia	Total anaemia	Hb <11.0 g/dL	Hb <12.0 g/dL	Hb <12.0 g/dL	--
	Mild anaemia	Hb 10.0 - 10.9 g/dL	Hb 11.0 - 11.9 g/dL	Hb 11.0 - 11.9 g/dL	--
	Moderate anaemia	Hb 7.0 - 9.9 g/dL	Hb 8.0 - 10.9 g/dL	Hb 8.0 - 10.9 g/dL	--
	Severe anaemia	Hb <7.0 g/dL	Hb <8.0 g/dL	Hb <8.0 g/dL	--

[1] Calculated using NCHS Growth Reference 1977 and WHO Growth Standards 2006
WHZ: weight-for-height z-score, **HAZ:** height-for-age z-score, **WAZ:** weight-for-age z-score

Selective Feeding Programme Coverage (children, 6-59 months)
Selective feeding programme coverage was assessed using the direct method as follows:

Targeted supplementary feeding programme

Coverage of TSFP programme (%) =

$$100x \quad \frac{\text{No. of surveyed children with MAM according to SFP Admission criteria who reported being registered in SFP}}{\text{No. of surveyed children with MAM according to SFP admission criteria}}$$

Therapeutic feeding programme

Coverage of OTP programme (%) =

$$100x \quad \frac{\text{No. of surveyed children with SAM according to OTP Admission criteria who reported being registered in OTP}}{\text{No. of surveyed children with SAM according to OTP admission criteria}}$$

Infant and Young Child Feeding (IYCF) Indicators (children 0-23 months)
Infant and young child feeding practices were assessed based on standard WHO recommendations (WHO, 2007) as follows:

[2]Ministry of Medical Services & Ministry of Public Health and Sanitation. National Guideline for the Integrated Management of Acute Malnutrition (2009).

- **Timely initiation of breastfeeding: WHO core indicator 1 -**Proportion of children, 0-23 months of age who were put to the breast within one hour of birth.

Children 0-23 months of age who were put to the breast within one hour of birth
Children 0-23 months of age

- **Exclusive breastfeeding under 6 months: WHO core indicator 2 -** Proportion of infants 0–5 months of age who are fed exclusively with breast milk: (including milk expressed or from a wet nurse, ORS, drops or syrups (vitamins, minerals, medicines).

Infants 0–5 months of age who received only breast milk during the previous day
Infants 0–5 months of age

- **Continued breastfeeding at 1 year: WHO core indicator 3 -** Proportion of children 12–15 months of age who are fed breast milk.

Children 12–15 months of age who received breast milk during the previous day
Children 12–15 months of age

- **Introduction of solid, semi-solid or soft foods: WHO core indicator 4 -** Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods.

Infants 6–8 months of age who received solid, semi-solid or soft foods during the previous day
Infants 6–8 months of age

- **Consumption of iron-rich or iron-fortified foods: WHO core indicator 8 -** Proportion of children 6–23 months of age who receive an iron-rich or iron-fortified food that is specially designed for infants and young children, or that is fortified in the home.

Children 6–23 months of age who received an iron-rich food or a food that was specially designed for infants and young children and was fortified with iron, or a food that was fortified in the home with a product that included iron during the previous day
Children 6–23 months of age

- **Continued breastfeeding at 2 years: WHO optional indicator 10 -** Proportion of children 20–23 months of age who are fed breast milk.

Children 20–23 months of age who received breast milk during the previous day
Children 20–23 months of age

- **Bottle feeding: WHO optional indicator 14 -** Proportion of children 0-23 months of age who are fed with a bottle.

Children 0–23 months of age who were fed with a bottle during the previous day
Children 0–23 months of age

Household food security

- **Household dietary diversity score**
  A household dietary diversity score was calculated according to FANTA 2006 and FAO 2011 guidelines (adapted to refugee settings) by summing the number of food groups consumed by any household member in and outside the house over the last 24 hour period, out of a maximum of 12 food groups (below).

  1. Cereals
  2. White roots and tubers
  3. Vegetables (combination of 3 sub-groups: vitamin A rich vegetables and tubers, dark green leafy vegetables and other vegetables).
  4. Fruits (combination of 2 sub-groups: vitamin A rich fruits and other fruits)
  5. Meat(combination of 2 sub-groups: organ meat and flesh meat)
  6. Eggs
  7. Fish and other seafood
  8. Legumes, nuts and seeds
  9. Milk and milk products
  10. Oils and fats
  11. Sweets
  12. Spices, condiments and beverages

WASH

The table below provides an overview of the definitions of drinking water and sanitation (toilet) facilities used in the survey and available in Kakuma refugee camp.

Table 2 WASH Indicators

Drinking Water	**Improved source**	**Unimproved source**
	Public tap	Small water vendor (cart with small tank or drum)
	Protected dug well with hand pump	
		Bottled water*
		Surface water (river, dam, lake, pond, stream, canal, irrigation channels). Rainwater collection from surface run off.
*Bottled water is considered improved only when the household uses it by choice rather than because they are obliged to or when it can be guaranteed that this water is not contaminated.		
Sanitation facility definition		
	Improved category	**Unimproved category**
	Pit latrine with slab	Pit latrine without slab (slab with holes) /open pit

		No facilities or bush or field
Sanitation facility classification based on definition and sharing		
Improved excreta disposal facility	A toilet in the above "improved" category **AND** one that is **not shared** with other families*,**	
Shared family toilet	A toilet in the above "improved" category **AND** one used by 2 families / households only (for a maximum of 12 people)**	
Communal toilet	A toilet in the above "improved" category **AND** one used by 3 families / households or more	
Unimproved toilet	A toilet in the above "unimproved" category **OR** a **public toilet** which any member of the public can use e.g. in hospitals or markets	
***To maintain consistency with other survey instruments (e.g. the multiple indicator cluster survey), UNHCR SENS WASH module classifies an **"improved excreta disposal facility"** as a toilet in the above "improved" category **AND** one that is **not shared** with other families / households. ****According to UNHCR WASH monitoring system, an **"improved excreta disposal facility"** is defined differently than in other survey instruments and is defined as a toilet in the above "improved" category **AND** one that is shared by a *maximum* of 2 families / households or with no more than *12 individuals*. Therefore, the following two categories from the above SENS survey definitions are considered "improved excreta disposal facility" for UNHCR WASH monitoring system: "improved excreta disposal facility" and "shared family toilet".		

Safe excreta disposal for children aged 0-3 years: The safe disposal of children's faeces is of particular importance because children's faeces are the most likely cause of faecal contamination to the immediate household environment. It is also common for people to think that children's faeces are less harmful than adult faeces. "Safe" is understood to mean disposal in a safe sanitation facility or by burying. This is the method that is most likely to prevent contamination from faeces in the household.

3.7 Classification of public health problem and targets

Anthropometric data: UNHCR states that the target for the prevalence of global acute malnutrition (GAM) for children 6-59 months of age by camp, country and region should be <10% and the target for the prevalence of severe acute malnutrition (SAM) should be <2%. **Table 3** below shows the classification of public health significance of the anthropometric results for children under-5 years of age.

Table 3 Classification of public health significance for children under 5 years of age (WHO 1995, 2000)

Prevalence %	Critical	Serious	Poor	Acceptable
Low weight-for-height	≥15	10-14	5-9	<5
Low height-for-age	≥40	30-39	20-29	<20
Low weight-for-age	≥30	20-29	10-19	<10

Selective feeding programmes: UNHCR Strategic Plan for Nutrition and Food Security 2008-2012 includes the following indicators:

Table 4 Performance indicators for selective feeding programmes (UNHCR Strategic Plan for Nutrition and Food Security 2008-2012)*

	Recovery	Case fatality	Defaulter rate	Coverage		
				Rural areas	Urban areas	Camps
SFP	>75%	<3%	<15%	>50%	>70%	>90%
SC/OTP	>75%	<10%	<15%	>50%	>70%	>90%

* Also meet SPHERE standards for performance

Measles vaccination and vitamin A supplementation in last 6 months coverage: UNHCR recommends the following target:

Table 5 Recommended targets for measles vaccination and vitamin A supplementation in last 6 months (UNHCR SENS Guidelines)

Indicator	Target Coverage
Measles vaccination coverage (9-59m)	95% (also SPHERE)
Vitamin A supplementation in last 6 months coverage	90%

Anaemia data: The UNHCR Strategic Plan for Nutrition and Food Security (2008-2010) states that the targets for the prevalence of anaemia in children 6-59 months of age and in women 15-49 years of age should be low i.e. <20%. The severity of the public health situation for the prevalence of anaemia should be classified according to WHO criteria as shown in the Table below.

Table 6 Classification of public health significance (WHO, 2000)

Prevalence %	High	Medium	Low
Anaemia	≥40	20-39	5-19

WASH: Diarrhoea caused by poor water, sanitation and hygiene accounts for the annual deaths of over two million children under five years old. Diarrhoea also contributes to high infant and child morbidity and mortality by directly affecting children's nutritional status. Refugee populations are often more vulnerable to public health risks and reduced funding can mean that long term refugee camps often struggle to ensure the provision of essential services, such as water, sanitation and hygiene. Hygienic conditions and adequate access to safe water and sanitation services is a matter of ensuring human dignity and is recognised as a fundamental human right. The following standards apply to UNHCR WASH programmes:

Table 7 UNHCR WASH Programme Standard

UNHCR Standard	Indicator
Average quantity of water available per person/day	> or = 20 litres

Mosquito nets: WHO defines a long-lasting insecticidal net as a factory-treated mosquito net

made with netting material that has insecticide incorporated within or bound around the fibres. The net must retain its effective biological activity without re-treatment for at least 20 WHO standard washes under laboratory conditions and three years of recommended use.

Table 8 UNHCR Mosquito Net Programme Standards

UNHCR Standard	Indicator
Proportion of households owning at least one Long-Lasting Insecticide treated bed net (LLIN)	>80%
Average number of persons per LLIN	2 persons per LLIN

3.8 Training, coordination and supervision

Survey teams and supervision

The survey was coordinated by 2 UNHCR nutritionists (Blessing Mureverwi and Breege Erukudi) and technical support was given by UNHCR RSC.

A total of six teams were recruited for data collection during the survey. Each team comprised 6 members: a supervisor, a team leader; assistant team leader; two measurers; and one for taking haemoglobin measurements testing. For effective communication during the study, teams were constituted to reflect language differentials in the camp. The team leader was responsible for administering individual level questionnaires while the assistant team leader responsible for the household level questionnaires. Both worked alongside the rest of the team. One team member was responsible for taking all haemoglobin measurements, two members took anthropometric measurements, and the final member assisted with sampling, age determination and reading of health/vaccination cards or birth certificates, etcetera.

Team leaders were from IRC and KRCS of national national staff cadre. Other team members were CHPs with basic education (primary or secondary education certificates) with the ability to read and write in the English language. Supervisors came from UNHCR, WFP, UNICEF, IRC nutrition coordinator and KRCS nutrition coordinator and the main role of a supervisor was to provide onsite technical support during the entire survey process and ensure quality of the data collected.

Training

A five-day standardised training was conducted by the coordination team. Four days were allocated for the standardised survey training and one day for training on the android phones used for data collection. Topics covered included anthropometric and haemoglobin measurements (including a practical standardisation test for both), interview techniques, sampling and questionnaire administration procedures. This was followed by a one-day pilot test during which teams visited a minimum of 4 households (in blocks not included in the final cluster selection) to administer questionnaires and perform measurements. After the pilot an assessment session was held to identify and rectify point of weakness and to review data collection tools.

3.9 Data collection

The data collection exercise took 12 days, 22nd November – 3rd December 2017. The survey teams explained the purpose and objectives of the survey, assured confidentiality and obtained verbal consent. All teams were supported by six supervisors who were present at different

points of data collection: team supervisors from WFP, UNICEF, IRC, KRCS and two UNHCR nutritionists.

3.9.1 Android Phones

The use of mobile phones using the Android operating system, and Open Data Kit (ODK) software for data collection and entry was applied to this survey. Questionnaires were first developed and adapted on paper and then coded in ODK.

3.10 Data validation and analysis

During supervision in the field, and at the end of each day, supervisors manually checked the phone questionnaires for completeness, consistency and accuracy. This check was also used to provide feedback to the teams to improve data collection as the survey progressed. At the end of each day, and once supervisors had completed their checks, the phones were each synchronised to the server and the data collected was downloaded; once all data was uploaded, there was no need for any further data entry. Any questionnaires with discrepancies / mistakes however were temporarily left on the phone in order to verify the data with the relevant team. The SMART plausibility report was generated daily in order to identify any problems with anthropometric data collection such as flags and digit preference for age, height and weight, to improve the quality of the anthropometric data collected as the survey was on-going. Teams needing the most support from the supervision and coordination team were identified; mistakes were corrected before start of data collection the next day.

All data files were cleaned before analysis, android phones reduced the amount of cleaning needed due to restrictions programmed to reduce data entry errors. Anthropometric data for children 6-59 months was cleaned and analysed using ENA for SMART software (version July 9th, 2015) by the coordination team.

The nutritional indices were cleaned using flexible cleaning criterion (+/- 3 SD from the observed mean; also known as SMART flags in the ENA for SMART software). This flexible cleaning approach is one that is recommended in the UNHCR SENS (Version 1.2, June 2011) in accordance with SMART recommendations. A summary of the key quality criteria from the anthropometric data is shown in **Appendix 1**.

Additional data for children aged 6-59 months, data for infants aged 0-5 months, women aged 15-49 years, WASH and food security indicators were cleaned using excel and analysed using Epi Info 7 Software (Centres for Disease Control).

4 RESULTS KAKUMA CAMP

The demographic characteristics of the population are presented in **Table 9**.

A total of 603 households were surveyed, translating to a population of 3.875, giving an average household size of 6.6.

Table 9: Demographic characteristics of the study population

Total households surveyed	603
Total population surveyed	3,875
Total U5 surveyed (0-59)	577
Average household size	6.6
% of U5	14.9%
Total number of clusters	36

- The NRR rate was 9.0%

4.1 Children 6-59 months

4.1.1 Sample size and clusters

520 children between 6-59 months were interviewed, compared to the planned 569 (Table 10).

Table 10 Target and actual number captured

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	569	520	91.4%
Clusters	36	36	100%

Table 11 shows the distribution of age and sex in the sample, which was almost equal, with an acceptable ratio of boys and girls.

Table 11 Children 6-59 months - distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy: girl**
6-17	67	60.9	43	39.1	110	21.2	1.6
18-29	59	48.4	63	51.6	122	23.5	0.9
30-41	59	57.3	44	42.7	103	19.8	1.3
42-53	59	50.4	58	49.6	117	22.5	1.0
54-59	29	43.3	38	56.7	67	12.9	0.8
Total	273	52.6	246	47.4	519	100.0	1.1

Boys and girls are equally presented in the survey (expected ratio 0.8 – 1.2).

4.1.2 Anthropometric results (based on WHO Growth Standards 2006; NCHS Growth Reference 1977 shown in Appendix)

The prevalence of global acute malnutrition (GAM) was 10.6% (7.8-14.3, 95% C.I), with a severe acute malnutrition (SAM) prevalence of 0.8% (0.3-21, 95% C.I) as shown in Table 12.

Table 12 Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 501	**Boys** n = 265	**Girls** n = 236
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(53) 10.6 % (7.8 - 14.3 95% C.I.)	(34) 12.8 % (9.2 - 17.6 95% C.I.)	(19) 8.1 % (4.6 - 13.6 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(49) 9.8 % (7.2 - 13.2 95% C.I.)	(30) 11.3 % (8.1 - 15.5 95% C.I.)	(19) 8.1 % (4.6 - 13.6 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(4) 0.8 % (0.3 - 2.1 95% C.I.)	(4) 1.5 % (0.6 - 4.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

The prevalence of oedema is 0.0 %

As Figure 5 shows, the prevalence of GAM and SAM decreased in 2017 compared to 2016 after having increased between 2014 and 2016. However, the decrease was not statistically significant.

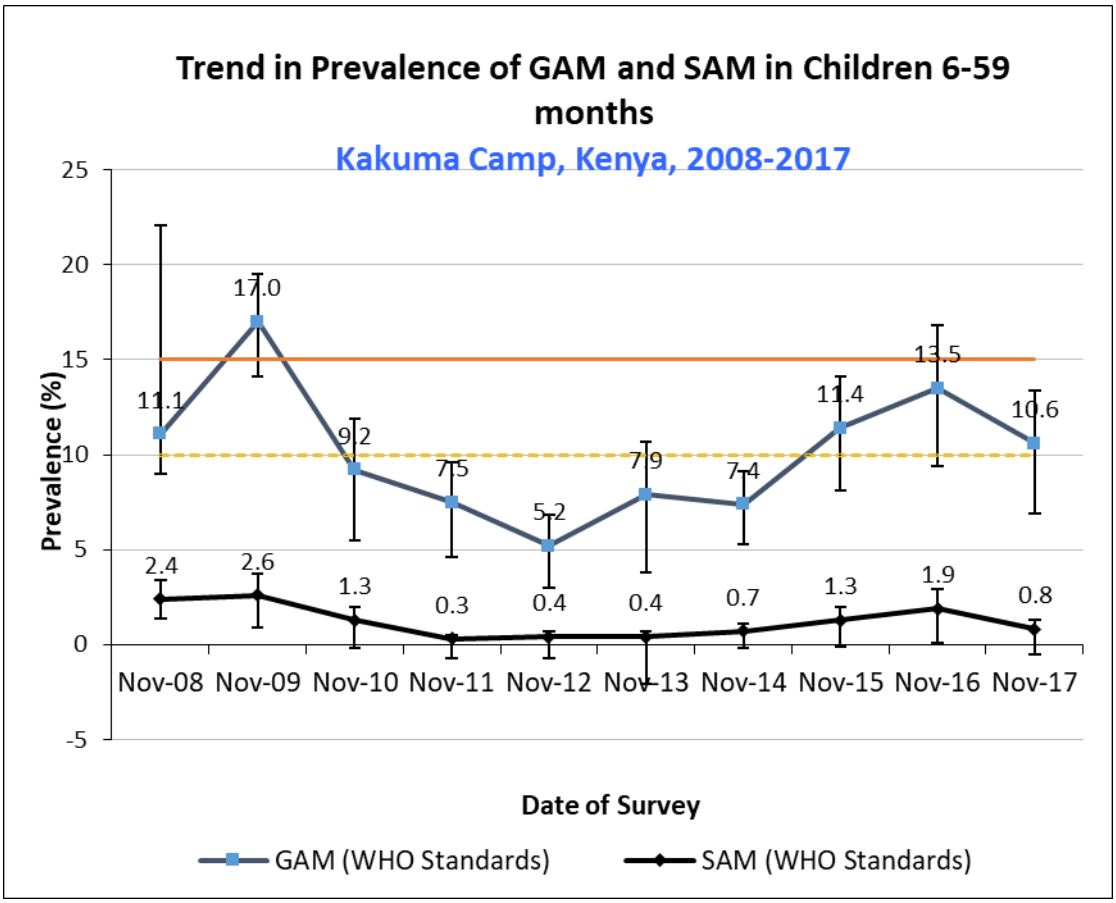

Figure 5: Trends in the prevalence of global and severe acute malnutrition based on WHO growth standards in children, 6-59 months, from 2008-2017

Table 13 shows the prevalence of moderate and severe wasting by age. Moderate and severe wasting were both highest in the 54-59 months age group.

Table 13 Prevalence of acute malnutrition by age, based on weight-for-height z-scores 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	108	1	0.9	12	11.1	95	88.0	0	0.0
18-29	118	0	0.0	9	7.6	109	92.4	0	0.0
30-41	99	1	1.0	6	6.1	92	92.9	0	0.0
42-53	111	0	0.0	12	10.8	99	89.2	0	0.0
54-59	65	2	3.1	10	15.4	53	81.5	0	0.0
Total	501	4	0.8	49	9.8	448	89.4	0	0.0

The same indicators are analyses in Table 14 using the 6-11, 12-23, 24-35, 36-47 and 48-59 age categories. Moderate and severe wasting were both highest in the 6-11 and then 48-59 months age groups.

Table 14: Prevalence of acute malnutrition by age based on height-for-age z-scores (WHO IYCF age category Indicators)

		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.**	**%**
6-11	55	1	1.8	7	12.7	47	85.5	0	0.0
12-23	115	0	0.0	10	8.7	105	91.3	0	0.0
24-35	105	1	1.0	6	5.7	98	93.3	0	0.0
36-47	110	0	0.0	12	10.9	98	89.1	0	0.0
48-59	116	2	1.7	14	12.1	100	86.2	0	0.0
Total	501	4	0.8	49	9.8	448	89.4	0	0.0

The analysis of prevalence of wasting by age is displayed in Figure 6.

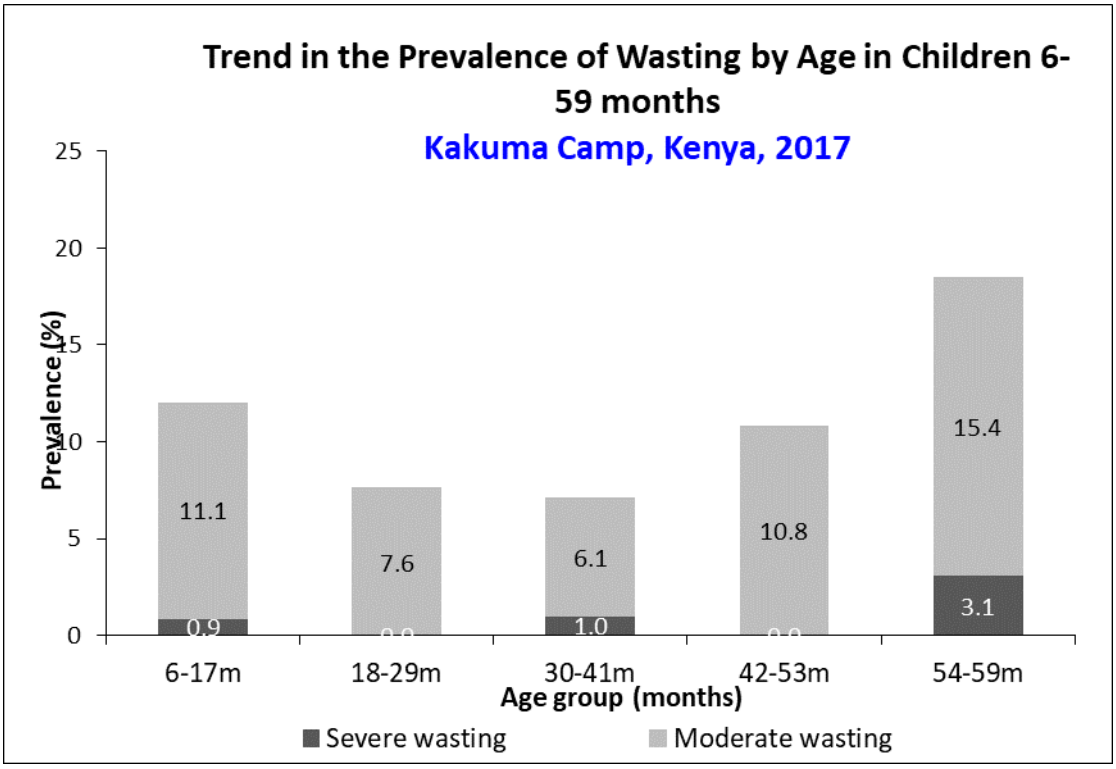

Figure 6: Trends in prevalence of moderate and severe wasting by age in children 6-59 months

All cases of acute malnutrition were due to marasmus (Table 15).

Table 15 Distribution of severe acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 5 (1.0 %)	Not severely malnourished No. 506 (99.0 %)

Figure 7 shows the distribution of z-scores of the survey sample compared to the WHO standard curve. The two graphs were similar in shape, with the survey curve to the left of the WHO standard curve.

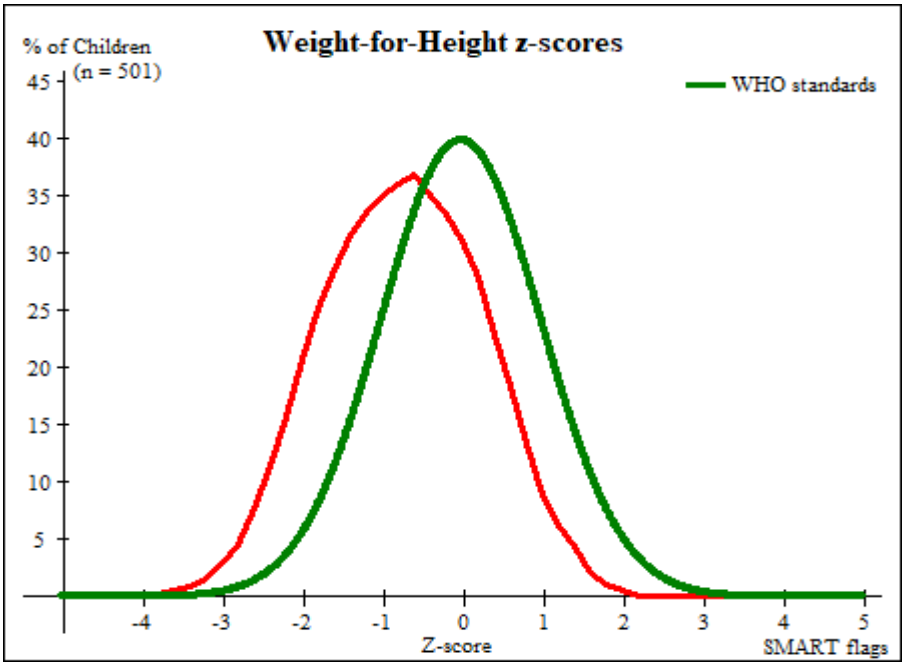

Figure 7: Distribution of weight-for-height z-scores of survey population (red) compared to reference population (green) (based on WHO Growth Standards)

The prevalence of MUAC malnutrition was 1.8% (0.8-3.9, 95% C.I), with no SAM cases (Table 16).

Table 16: Prevalence of MUAC Malnutrition

	All n = 513	**Boys** n = 270	**Girls** n = 242
Prevalence of global malnutrition (< 125 mm and/or oedema)	(9) 1.8 % (0.8 - 3.9 95% C.I.)	(4) 1.5 % (0.4 - 4.8 95% C.I.)	(5) 2.1 % (0.9 - 4.6 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(9) 1.8 % (0.8 - 3.9 95% C.I.)	(4) 1.5 % (0.4 - 4.8 95% C.I.)	(5) 2.1 % (0.9 - 4.6 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

As Table 17 shows and as is expected, acute malnutrition was higher among younger children (Table 17).

Table 17 Prevalence of MUAC malnutrition ranges by age, based on MUAC cut off and/or oedema

		Severe wasting (< 115 mm)		**Moderate wasting (>= 115 mm and < 125 mm)**		**Normal (> = 125 mm)**		**Oedema**	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	109	0	0.0	3	2.8	106	97.2	0	0.0
18-29	121	0	0.0	4	3.3	117	96.7	0	0.0
30-41	101	0	0.0	2	2.0	99	98.0	0	0.0

42-53	117	0	0.0	0	0.0	117	100.0	0	0.0
54-59	65	0	0.0	0	0.0	65	100.0	0	0.0
Total	513	0	0.0	9	1.8	504	98.2	0	0.0

The prevalence of underweight (Table 18) was 12.1% (9.4-15.3, 95% C.I), with a severe underweight prevalence of 2.8% (1.5-4.9%, 95% C.I).

Table 18 Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 506	**Boys** n = 265	**Girls** n = 241
Prevalence of underweight (<-2 z-score)	(61) 12.1 % (9.4 - 15.3 95% C.I.)	(37) 14.0 % (10.4 - 18.5 95% C.I.)	(24) 10.0 % (6.9 - 14.2 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(47) 9.3 % (7.0 - 12.2 95% C.I.)	(27) 10.2 % (7.1 - 14.5 95% C.I.)	(20) 8.3 % (5.7 - 12.0 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(14) 2.8 % (1.5 - 4.9 95% C.I.)	(10) 3.8 % (2.1 - 6.7 95% C.I.)	(4) 1.7 % (0.6 - 4.3 95% C.I.)

The prevalence of stunting (Table 19) was 15.8% (12.0-20.7, 95% C.I), with a severe stunting prevalence of 3.7% (1.9-7.1, 95% C.I).

Table 19 Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 486	**Boys** n = 252	**Girls** n = 234
Prevalence of stunting (<-2 z-score)	(77) 15.8 % (12.0 - 20.7 95% C.I.)	(42) 16.7 % (11.8 - 23.0 95% C.I.)	(35) 15.0 % (10.2 - 21.5 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(59) 12.1 % (9.1 - 15.9 95% C.I.)	(31) 12.3 % (9.1 - 16.5 95% C.I.)	(28) 12.0 % (7.5 - 18.5 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(18) 3.7 % (1.9 - 7.1 95% C.I.)	(11) 4.4 % (2.2 - 8.6 95% C.I.)	(7) 3.0 % (1.3 - 6.8 95% C.I.)

As Figure 8 shows, stunting decreased from 2016 to 2017, which has been the trend since 2015.

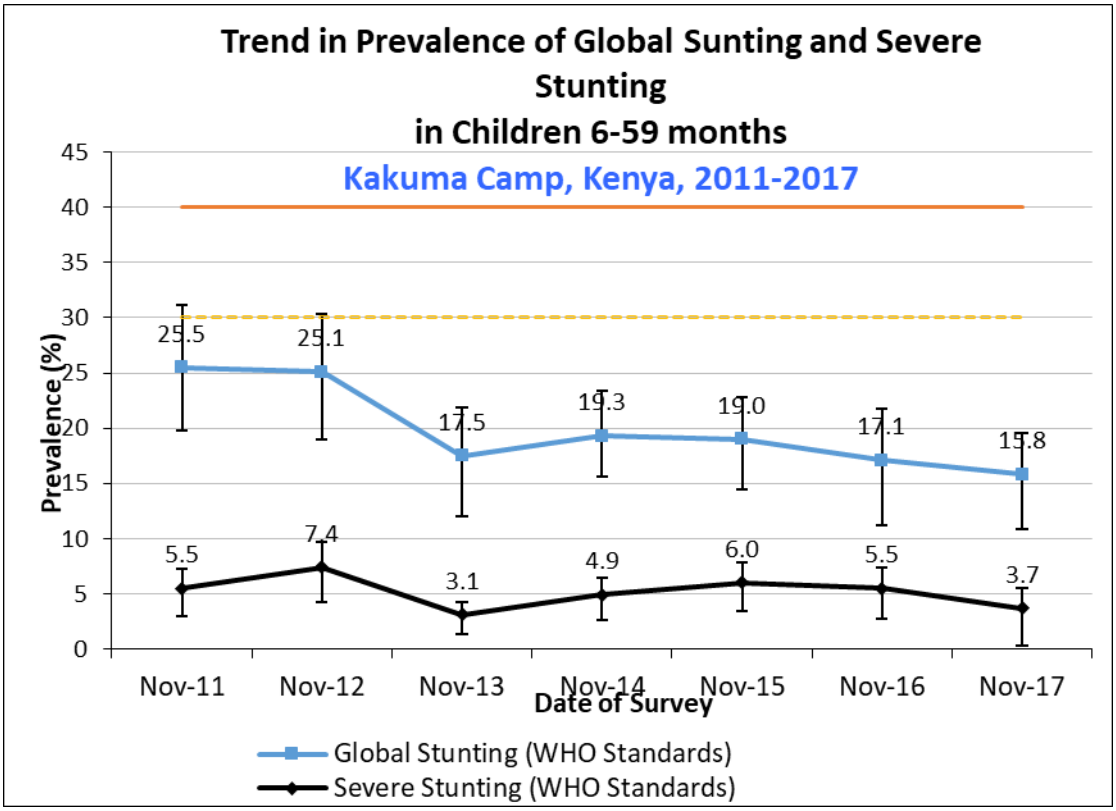

Figure 8: Trends in the prevalence of global and severe stunting based on WHO growth standards in children, 6-59 months from 2011-2017.

Table 20 is an analysis of stunting by age. Moderate and severe stunting were highest in the 18-29 months age group.

Table 20: Prevalence of stunting by age based on height-for-age z-scores

		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	104	3	2.9	8	7.7	93	89.4
18-29	111	6	5.4	22	19.8	83	74.8
30-41	96	4	4.2	12	12.5	80	83.3
42-53	111	2	1.8	11	9.9	98	88.3
54-59	64	3	4.7	6	9.4	55	85.9
Total	486	18	3.7	59	12.1	409	84.2

Table 21 further breaks down stunting in terms of 6-11, 12-23, 24-35, 3-47 and 48-59 months. Severe stunting was highest in the 12-23 age group while moderate stunting was highest in the 24-35 age group (Table 21).

Table 21: Prevalence of stunting by age based on height-for-age z-scores (WHO IYCF age category Indicators)

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-11	51	1	2.0	4	7.8	46	90.2
12-23	111	6	5.4	14	12.6	91	82.0
24-35	101	5	5.0	17	16.8	79	78.2
36-47	106	2	1.9	13	12.3	91	85.8
48-59	117	4	3.4	11	9.4	102	87.2
Total	486	18	3.7	59	12.1	409	84.2

Figure 9 shows that stunting, as expected, increased from 6-17 to 18-29 then decreased.

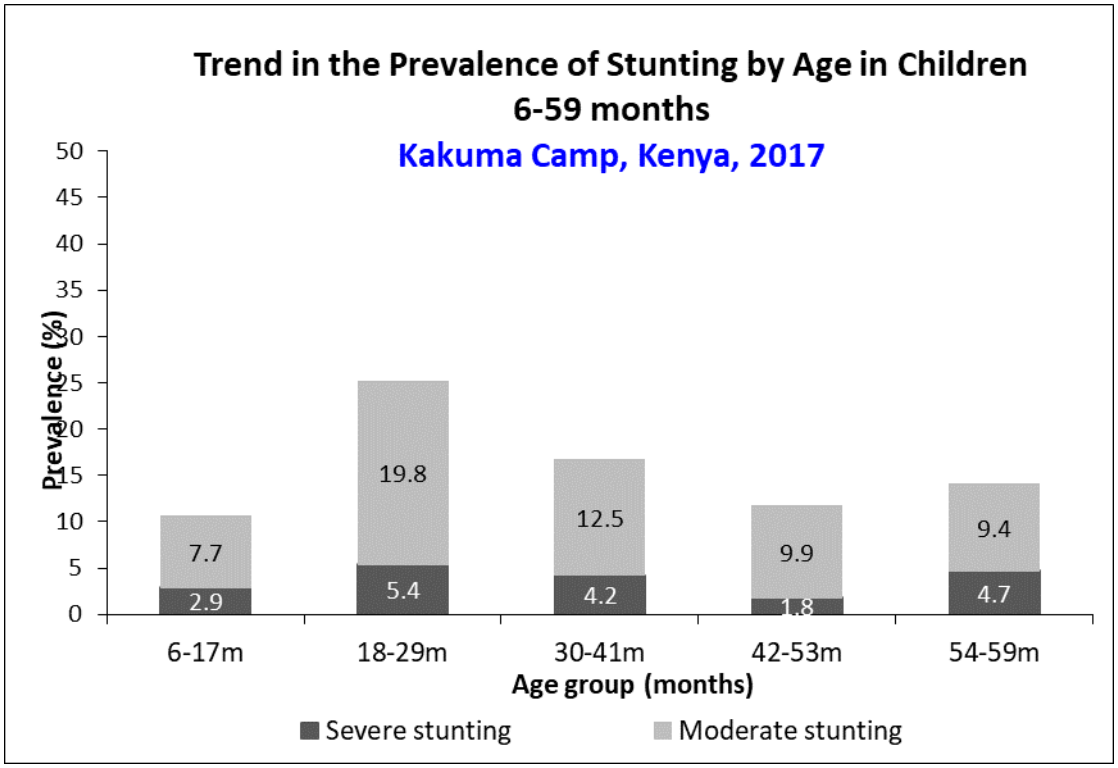

Figure 9: Trends in the prevalence of stunting by age in children, 6-59 months

Figure 10 is a comparison of the survey and WHO height-for-age z-score curves.

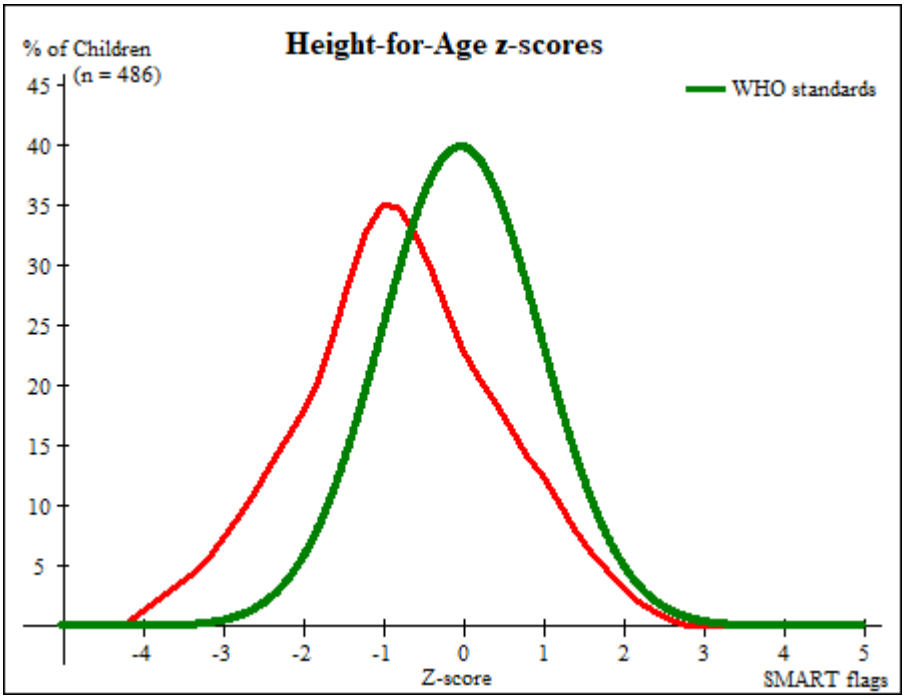

Figure 10: Distribution of height-for-age z-scores of survey population (red) compared to reference population (green)

The mean z-scores and design effect are shown in Table 22. The weight-for-height SD was within an acceptable range (0.8-1.2).

Table 22: 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	501	-0.75±0.97	1.33	9	10
Weight-for-Age	506	-0.90±0.97	1.00	7	7
Height-for-Age	486	-0.78±1.21	1.66	9	25

4.2 Feeding programme coverage results

The results below **(Table 23, 24)** show the feeding programme coverage, this results should be interpreted with caution as the sample size is not sufficient to give a representative sample of the general population.

Table 23: Programme coverage for acutely malnourished children based on all admission criteria (weight-for-height, MUAC, oedema)

	Number/total	% (95% CI)
Supplementary feeding programme coverage	4/53	7.5 (0.0-16.4)
Therapeutic feeding programme coverage	1/5	20.0 (0.0-75.5)

*WHZ flags excluded from analysis

The enrolment coverage for SAM and MAM cases in TFP and TSFP is significantly low as per the expected target of >90%.

Table 24: Targeted selective feeding programme coverage for acutely malnourished children 6-59m based on MUAC and oedema only

	Number/total	% (95% CI)
Supplementary feeding programme coverage	4/9	44.4 (4.5-84.4)
Therapeutic feeding programme coverage	*	*

*No data in sample

4.3 Vaccination and supplementation programmes

4.3.1 Measles vaccination coverage results

The coverage of measles was 96.3% (94.1-98.6, 95% C.I), which achieved the 95% target. The coverage of Vitamin A was, however, below the target of 90%, at 76.6% (68.0-85.1, 95% C.I) as shown in Table 25 and 26.

Table 25: Measles vaccination coverage for children aged 9-59 (n=495)

	Measles (with card) n=203	**Measles (with card or confirmation from mother) n= 477**
YES	41.0% (28.3-53.7, 95% C.I)	96.3% (94.1-98.6, 95% C.I)

4.3.2 Vitamin A supplementation coverage results

Table 26: Vitamin A supplementation for children, 6-59 months within past 6 months (*or other context-specific target group*) (n=516)

	Vitamin A capsule (with card) n=82	**Vitamin A capsule (with card or confirmation from mother) n=395**
YES	15.9% (8.1-23.6%, 95% C.I)	76.6% (68.0-85.1, 95% C.I)

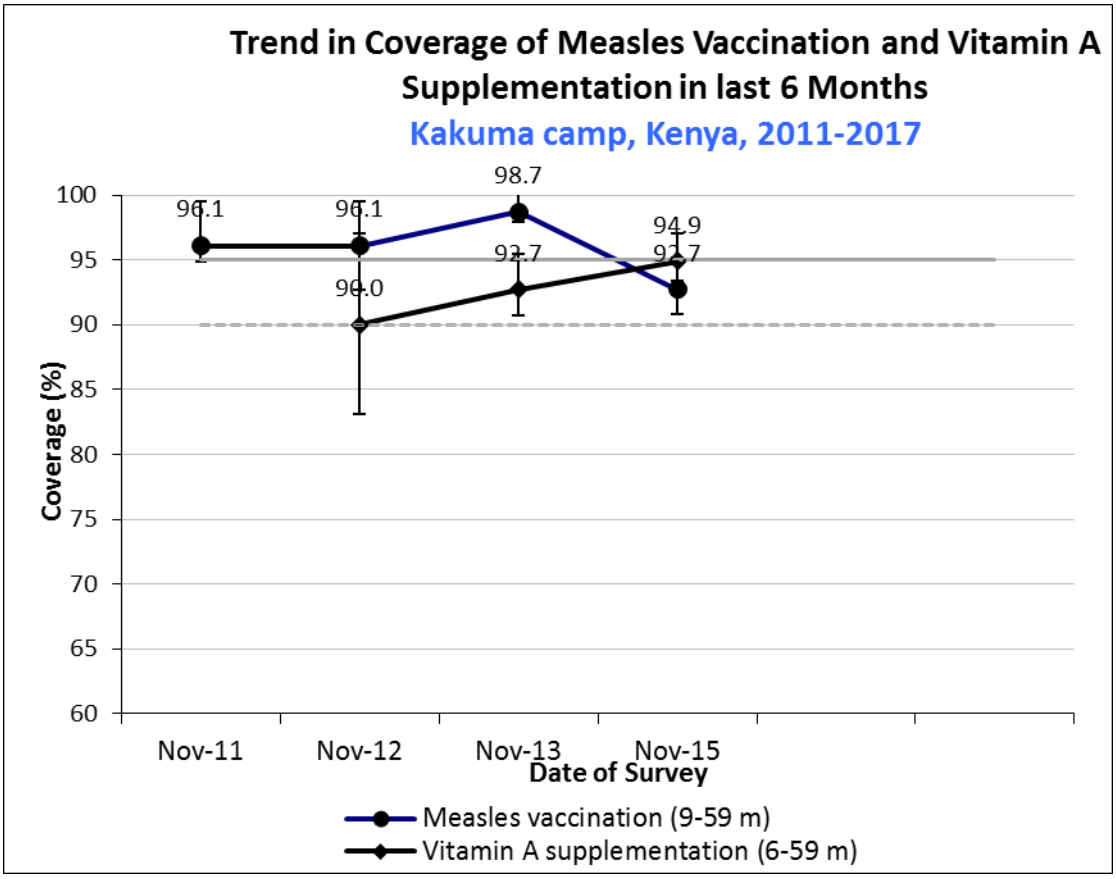

Figure 11: Trends in the coverage of measles vaccination and Vitamin A supplementation in children, 6-59 months from 2008-2017

About a fifth of sampled children reported having experienced diarrhoea (Table 27).

4.4 Diarrhoea results

Table 27: Period prevalence of diarrhea

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	111/516	21.5% (15.5-27.5)

4.5 Anaemia in children, 6-59 months

The prevalence of anaemia for children 6-59 months (Table 28) was 59.2% (50.8-67.6, 95% C.I). The prevalence was highest in the 6-23 months age group and decreased with age.

Table 28: Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group

	6-59 months n = 510	**6-23 months** n = 170	**24-35 months** n = 108	**36-59 months** n = 232
Total Anaemia (Hb<11.0 g/dL)	(302) 59.2% (50.8-67.6, 95% C.I)	(128) 75.3% (67.4-83.2, 95% C.I)	(67) 62.0% (49.8-74.2, 95% C.I)	(107) 46.1% (35.5-56.7, 95% C.I)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(102) 20.0% (15.8-24.2, 95%C.I)	(31) 18.2% (12.4-24.1, 95% C.I)	(26) 24.1% (16.2-31.9, 95% C.I)	(45) 19.4 (13.7-25.1, 95% C.I)
Moderate Anaemia (7.0-9.9 g/dL)	(188) 36.9% (29.8-43.9, 95% C.I)	(88) 51.8% (43.7-59.9, 95% C.I)	(40) 37.0 (26.9-47.1, 95% C.I)	(60) 25.9% (17.3-34.4, 95% C.I)
Severe Anaemia (<7.0 g/dL)	(12) 2.4% (0.8-3.9%, 95% C.I)	(9) 5.3% (1.9-8.7, 95% C.I)	(1) 0.9% (0.0-2.8, 95% C.I)	(2) 0.9% (0.0-2.1, 95% C.I)
Mean Hb (g/dL) (SD / 95% CI)	10.3 (10.0-10.7)			

The prevalence of moderate and severe anaemia (Hb <10g/dl) is shown in Table 29.

The prevalence of anaemia is the highest 75.3% among children aged 6-23 months.

Table 29: Prevalence of moderate and severe anaemia in children, 6-59 months of age and by age group

	6-23 months n=170	**24-35 months** n = 108	**36-59 months** n=232	**All** n=510
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(97) 57.1% (48.8-65.3, 95% C.I)	(41) 38.0% (27.9-48.0, 95% C.I)	(62) 26.7% (18.0-35.4, 95% C.I)	(200) 39.2% (32.0-46.5, 95% C.I)

Figure 12 and 13 reveal that the prevalence of anaemia has been increasing since 2014.

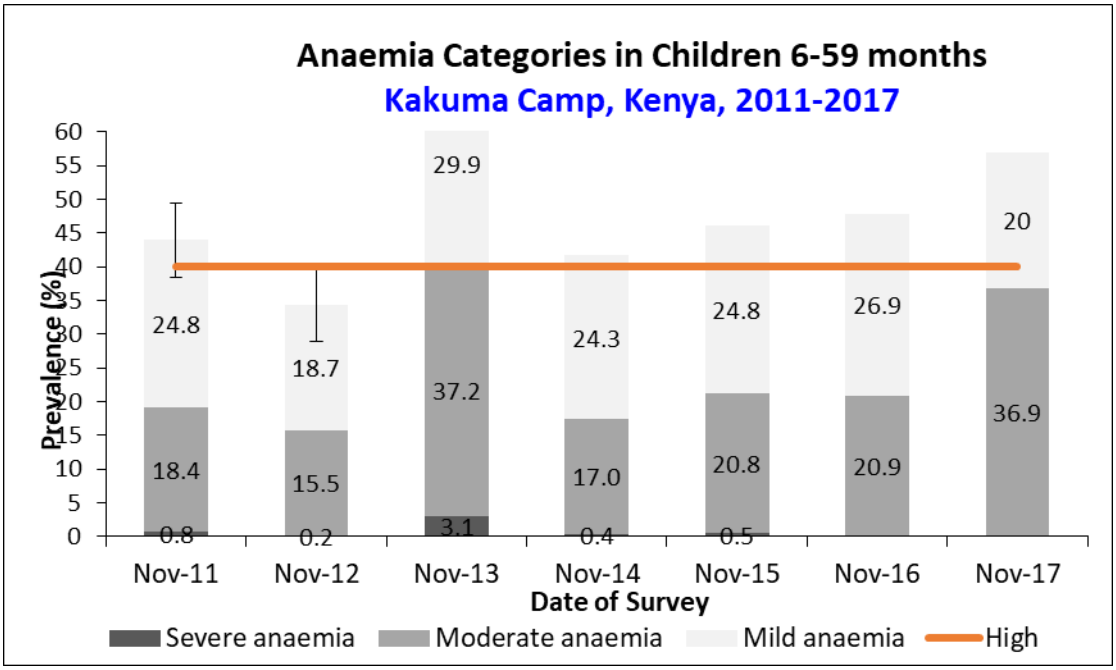

Figure 12: Trends in anaemia categories in children 6-59 months from 2011-2017.

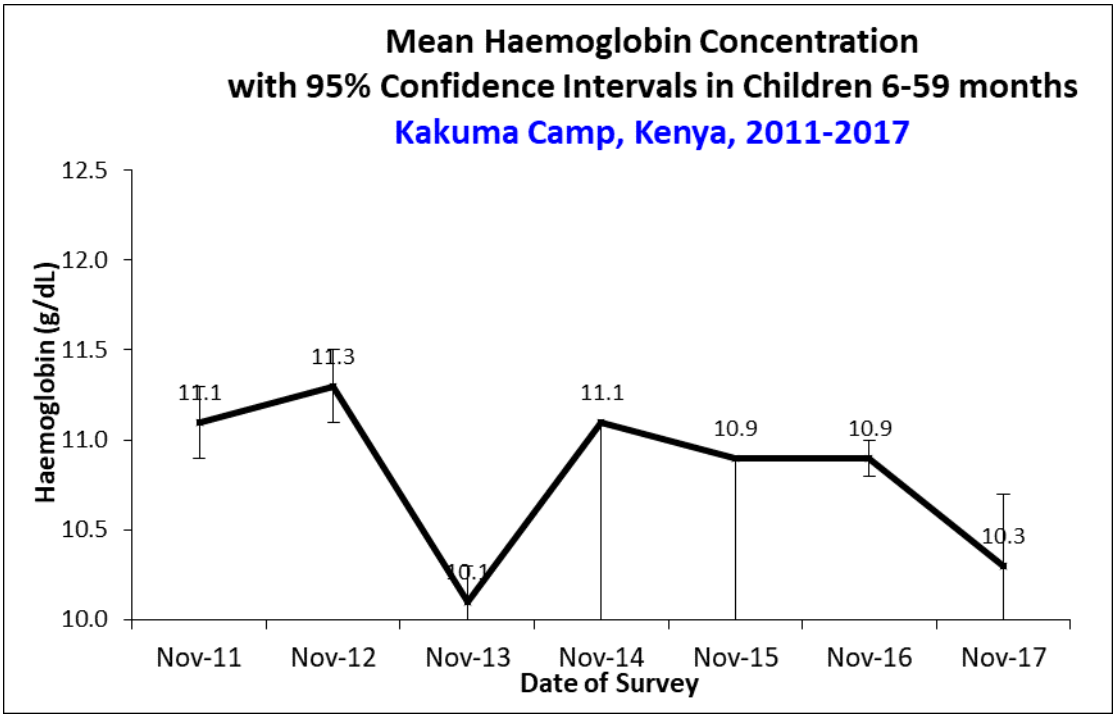

Figure 13: Trend in mean haemoglobin concentration in children, 6-59 months from 2011-2017.

4.6 Children 0-23 months

More than three quarters of sampled children had been introduced to the breast within the first hour. The rate of exclusive breastfeeding was also very high at 86.0% (76.4-95.5, 95% C.I). Continued breastfeeding at 1 year was very high at 93.8% (84.5-100.o, 95% C.I). However, at 2 years, only half of children continued to breastfeed. The consumption of iron-rich foods was also above three quarters, mainly due to consumption of CSB++. Only 5.2% (2.2-8.1, 95% C.I) were bottle fed (Table 30).

Table 30: Prevalence of Infant and Young Child Feeding Practices Indicators

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	**0-23 months**	182/221	82.4	71.9-92.8
Exclusive breastfeeding under 6 months	**0-5 months**	49/57	86.0	76.4-95.5
Continued breastfeeding at 1 year	**12-15 months**	30/32	93.8	84.5-100.0
Continued breastfeeding at 2 years	**20-23 months**	20/40	50.0	31.9-68.1
Introduction of solid, semi-solid or soft foods	**6-8 months**	7/24	29.2	7.2-51.1
Consumption of iron-rich or iron-fortified foods	**6-23 months**	141/175	80.6	74.1-87.0
Bottle feeding	**0-23 months**	12/231	5.2	2.2-8.1

The analysis of the trend in IYCF indicators (Figure 14), shows a general progressive improvement.

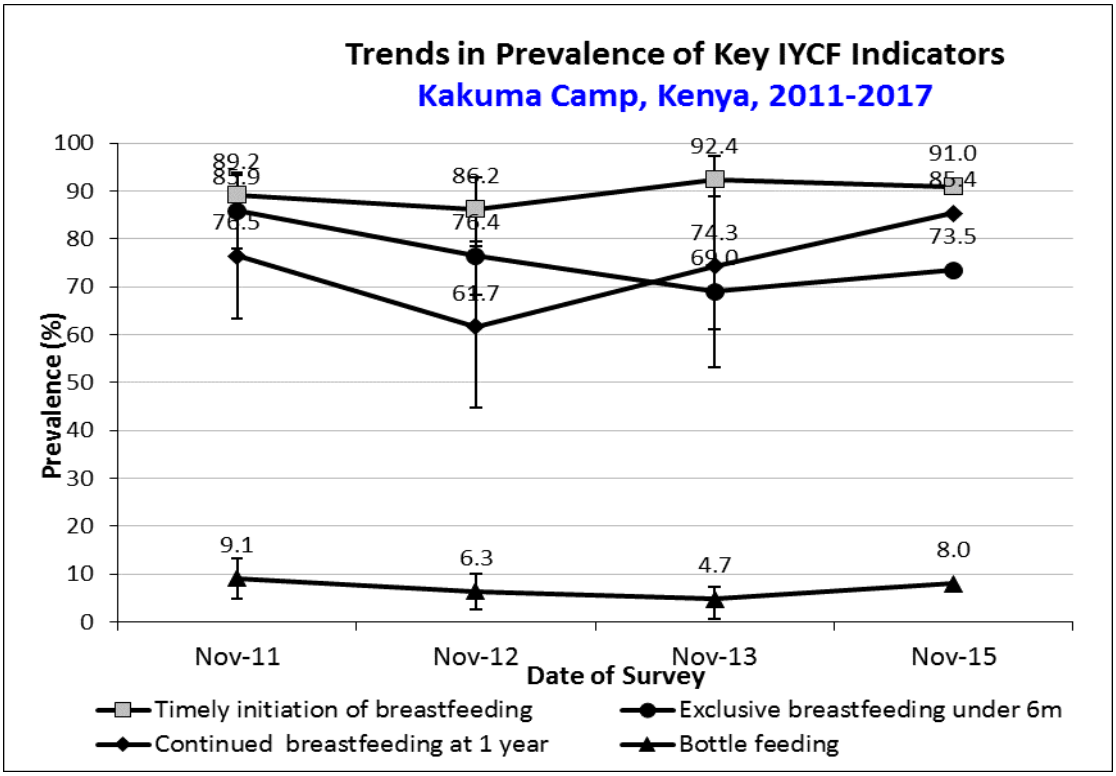

Figure 14: Nutrition survey results (IYCF indicators) since 2011

4.7 Prevalence of intake

4.7.1 Prevalence of Blanket Supplementary Feeding Programme and Infant formula

Only 3.9% (0.0-8.0%, 95% C.I) of children consumed infant formula (Table 31).

Table 31: Infant formula intake in children aged 0-23 months

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	9/231	3.9 (0.0-8.0)

Fortified blended foods

Table 32 and 33 show the intake of CSB+ and CSB++. It was pleasing to note that consumption of CSB++ was very high at 78.7% (71.0-86.5, 95% C.I).

Table 32: CSB+ (super cereal) intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB+	15/173	8.7 (0.9-16.5)

Table 33: CSB++ (super cereal plus) intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB++	137/174	78.7 (71.0-86.5)

4.8 Women 15-49 years

In the sample of women of reproductive age, 7.0% (3.6-10.4, 95% C.I) were pregnant, with a mean age of 27.5 (Table 34).

Table 34: Women physiological status and age

Physiological status	Number/total	% (95% CI)
Non-pregnant	307/330	93.0 (89.6-96.4)
Pregnant	27/330	7.0 (3.6-10.4)
Mean age (range)	27.5 (15-49)	

4.8.1 Anaemia in non-pregnant women (15-49 years)

The prevalence of anaemia among non-pregnant women was 38.5% (31.6-45.3, 95% C.I), with a mean Hb of 12.3 (Table 35).

Table 35: Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years)

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n = 299
Total Anaemia (<12.0 g/dL)	(115) 38.5% (31.6-45.3, 95% C.I)
Mild Anaemia (11.0-11.9 g/dL)	(61) 20.4% (15.2-25.6, 95% C.I)
Moderate Anaemia (8.0-10.9 g/dL)	(49) 16.4% (11.7-21.1, 95% C.I)
Severe Anaemia (<8.0 g/dL)	(5) 1.7% (0.3-3.1, 95% C.I)
Mean Hb (g/dL) (confidence interval)	12.3 (12.0-12.5)

As Figure 15 shows, anaemia has been on a decreasing trend since 2013.

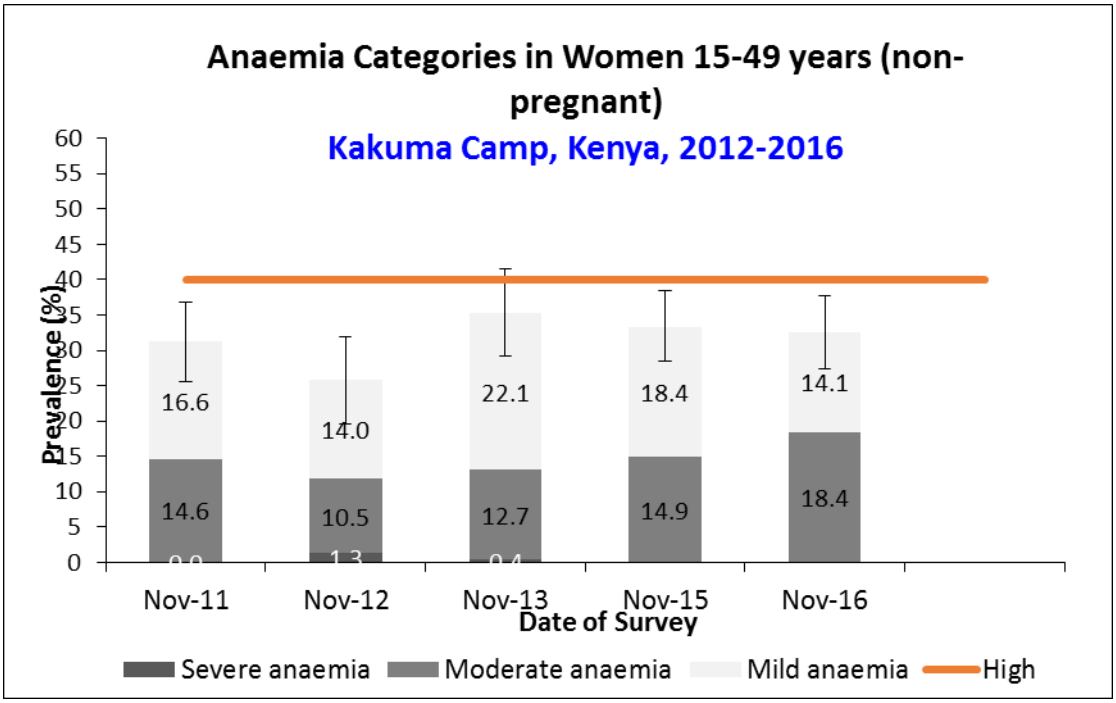

Figure 15: Trends in anaemia categories in women of reproductive age (non-pregnant) from 2011-2017.

A high proportion of pregnant women were enrolled in ANC and also receiving iron-folic acid pills (Table 36).

Table 36: ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	22/23	95.7 (86.8-100.0)
Currently receiving iron-folic acid pills	19/23	82.6 (64.3-100.0)

4.9 Food security

The table below shows the proportion of the population surveyed for Food Security.

Table 37: Food security information

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	331	303	91.5%

4.9.1 Access to food assistance results

The period for general food distribution covered was the month of October. All person interviewed had a ration card.

Table 38: Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	291/291	100%

The average duration of the food ration was 16.4, which translates to 52.6% of the theoretical ration (Table 39).

Table 39: Reported duration of general food ration

Average number of days the food ration lasts (Standard deviation or 95% CI)	Average duration (%) in relation to the theoretical duration of the ration*
16.4 (15.2-17.5)	52.6%

**Intended duration =31 days

Only 2.0% (0.0-4.0) reported that the food ration lasted for the entire duration (Table 40).

Table 40: Reported duration of general food ration 2

	Number/total	% (95% CI)
Proportion of households reporting that the food ration lasts the entire duration of the cycle	6/304	2.0 (0.0-4.0)
Proportion of households reporting that the food ration lasts <31days	298/304	98.0 (96.0-100.0)
Proportion of households reporting that the food ration lasted:		
≤75% of the cycle	263/304	86.5 (81.2-91.8)
>75% of the cycle	41/304	13.5 (8.2-18.8)

4.9.2 Negative coping strategies results

The main negative coping strategy was reducing the quantity and/or frequency of meals (65.3%, 56.3-74.3, 95% C.I). A significant proportion also reported borrowing and begging. About a fifth (20.7%, 15.3-26.2, 95% C.I) reported none of the coping mechanisms (Table 41).

Table 41: Coping strategies used by the surveyed population over the past month

	Number/total	% (95% CI)
Proportion of households reporting using the following coping strategies over the past month*:		
Borrowed cash, food or other items *with or without interest*	114/289	39.4 (31.7-47.2)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	26/290	9.0 (5.2-12.7)
Requested increased remittances or gifts as compared to normal	24/291	8.2 (3.2-13.3)
Reduced the quantity and/or frequency of meals	190/291	65.3 (56.3-74.3)
Begged	66/291	22.7 (13.7-31.7)
Proportion of households reporting using none of the coping strategies over the past month	63/304	20.7 (15.3-26.2)

4.9.3 Household dietary diversity results

The average household dietary diversity score was 4.0 (3.5-4.5, 95% C.I) out of 12 food groups (Table 42).

Table 42: Average HDDS

	Mean (95% C.I)
Average HDDS*	4.0 (3.5-4.5)

* Maximum HDDS is 12.

The consumption of cereals was highest, followed by oils/fats and pulses, which reflects the items included in the general food distribution (Figure 16).

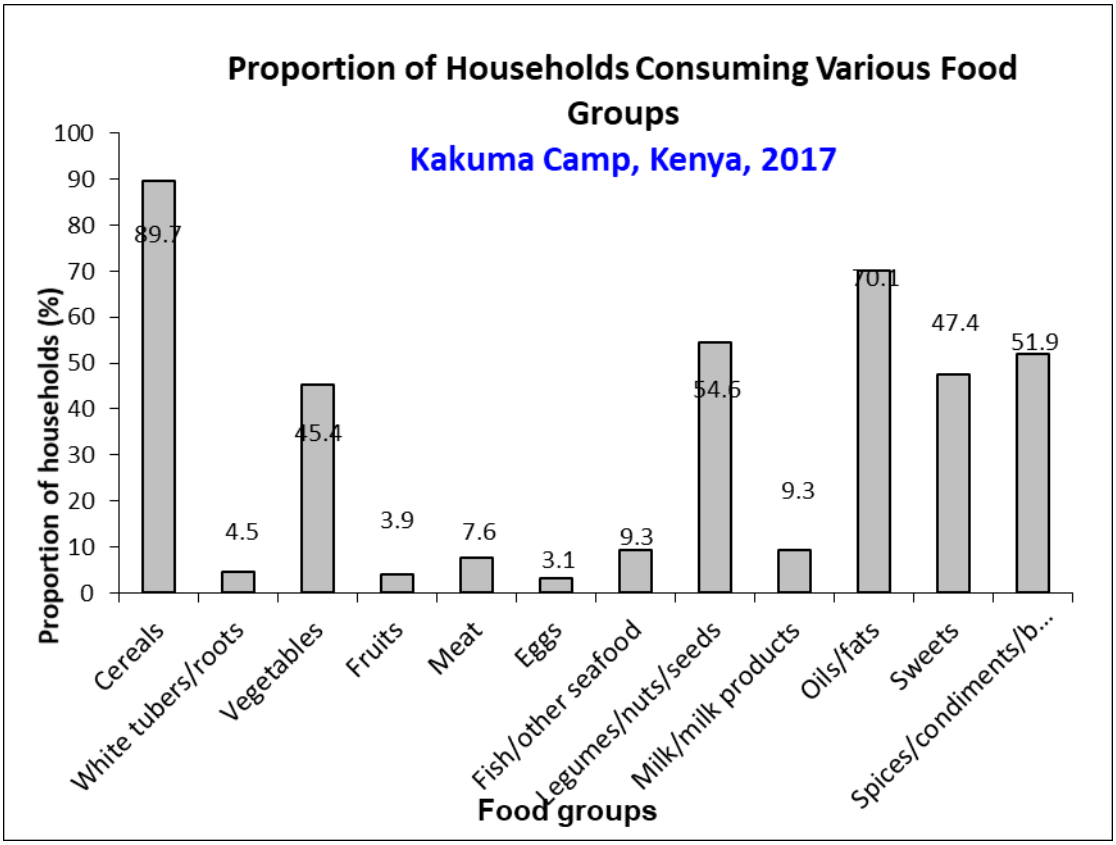

Figure 16: Proportion of households consuming different food groups within last 24 hours

Nearly a third (30.3%, 23.0-37.5, 95% C.I) of households consumed either plant or animal sources of Vitamin A, whilst only 15.1% (8.7-21.6, 95% C.I) consumed food sources of haem haem iron. 15.7% (9.4-22.1, 95% C.I) of households did not consume any vegetables, fruits, meat, eggs, fish/seafood or milk/milk products (Table 43).

Table 43: Consumption of micronutrient rich foods by households

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	137/304	15.7 (9.4-22.1)
Proportion of households consuming either a plant or animal source of vitamin A	92/304	30.3 (23.0-37.5)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	46/304	15.1 (8.7-21.6)

4.10 WASH

The table below shows total number of household visited in WASH.

Table 44: WASH information

Household data	Planned	Actual	% of target
Total households surveyed for WASH	663	603	91.0%

All households reported use of an improved drinking water source

Table 45: Water Quality

	Number/total	% (95% CI)
Proportion of households using an improved* drinking water source	583/583	100
Proportion of households that use a covered or narrow necked container for storing their drinking water	505/583	86.6 (78.6-94.7)

*According to UNHCR's SENS Improved drinking water sources are; public tap/standpipe, protected dug well or rain-water collection. All other sources were considered un-improved.

The average amount of water used per household per day was 18.5 (16.0-21.0, 95% C.I), which is slightly below the UNHCR standard of 20 (Table 46).

Table 46: Water Quantity: Amount of litres of water used per person per day

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	221/583	37.9 (30.7-45.2)
15 – <20 lpppd	61/583	10.5 (8.3-12.7)
<15 lpppd	301/583	51.6 (44.3-59.0)
Average water usage per Lpppd mean (95% C.I)	18.5 (16.0-21.0)	

The proportion of households who were satisfied was below half (46.0%, 37.0-55.7, 95% C.I) as shown in Table 47.

Table 47: Satisfaction with water supply

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	270/583	46.3 (37.0-55.7)

The main reasons for lack of satisfaction (Figure 17) were: not enough (46.3%), long waiting queue (41.7%) and long distance (12.0%)

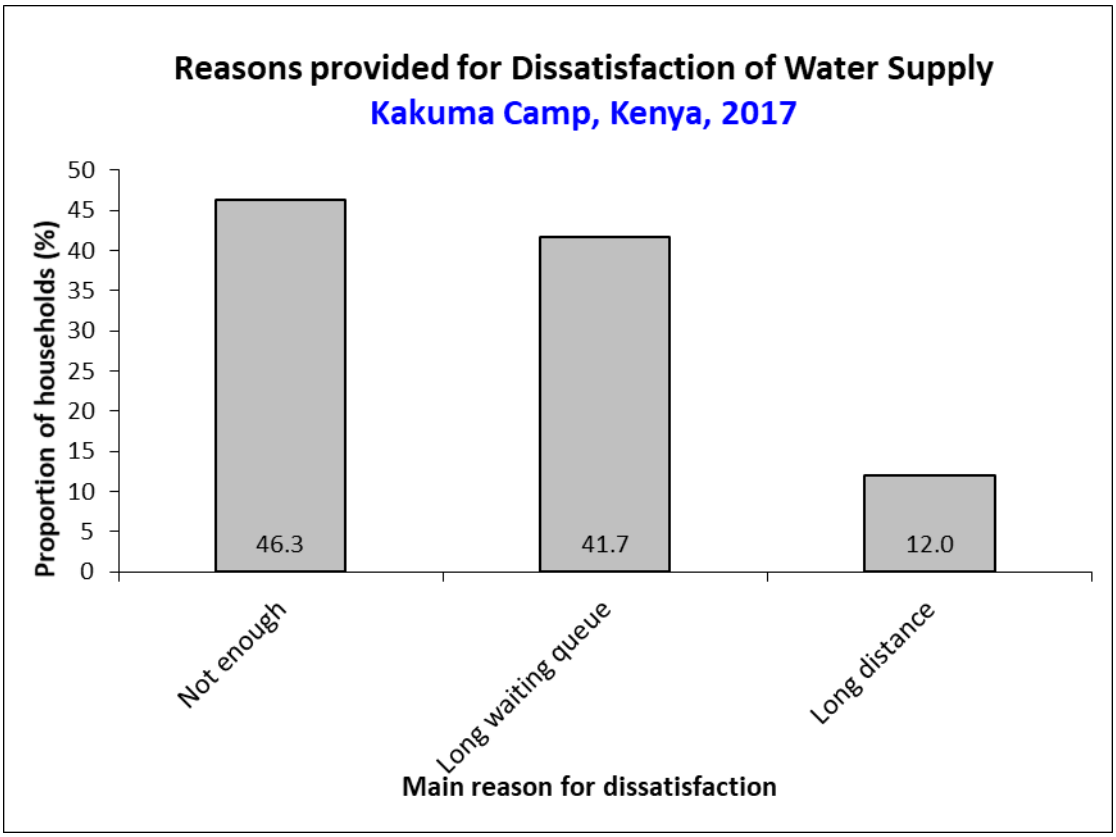

Figure 17: Main reason for dissatisfaction among households not satisfied with water supply

Just over half of households (56.3%, 48.2-64.7, 95% C.I) were using an improved excreta disposal facility (Table 48). Nearly all households (96.5%, 93.0-100.0, 95% C.I) disposed the faeces of children below 3 years of age safely.

Table 48: Safe excreta disposal

	Number/total	% (95% CI)
Proportion of households that use:		
An improved excreta disposal facility (improved toilet facility, 1 household)*,**	325/576	56.4 (48.2-64.7)
A shared family toilet (improved toilet facility, 2 households)**	121/576	21.0 (15.5-26.5)
A communal toilet (improved toilet facility, 3 households or more)	108/576	18.8 (12.9-24.6)
An unimproved toilet (unimproved toilet facility or public toilet)	22/576	3.8 (2.1-5.6)
Proportion of households with children under three years old that dispose of faeces safely	137/142	96.5 (93.0-100.0)

4.11 Mosquito Net Coverage

The table below shows the total number of households covered in the mosquito net coverage.

Table 49: Mosquito net coverage information

Household data	Planned	Actual	% of target
Total households surveyed for mosquito net coverage	331	303	91.5%

As Table 50 and Figures 18 and 19 show, the proportion of the sampled households with at least one mosquito net was 82.5% (76.2-88.7, 95% C.I), whilst 73.3% (66.2-80.3, 95% C.I) owned at least one long lasting insecticide treated net (LLIN).

Table 50: Household mosquito net ownership

	Number/total	% (95% CI)
Proportion of total households owning at least one mosquito net of any type	240/291	82.5 (76.2-88.7)
Proportion of total households owning at least one LLIN	222/303	73.3 (66.2-80.3)

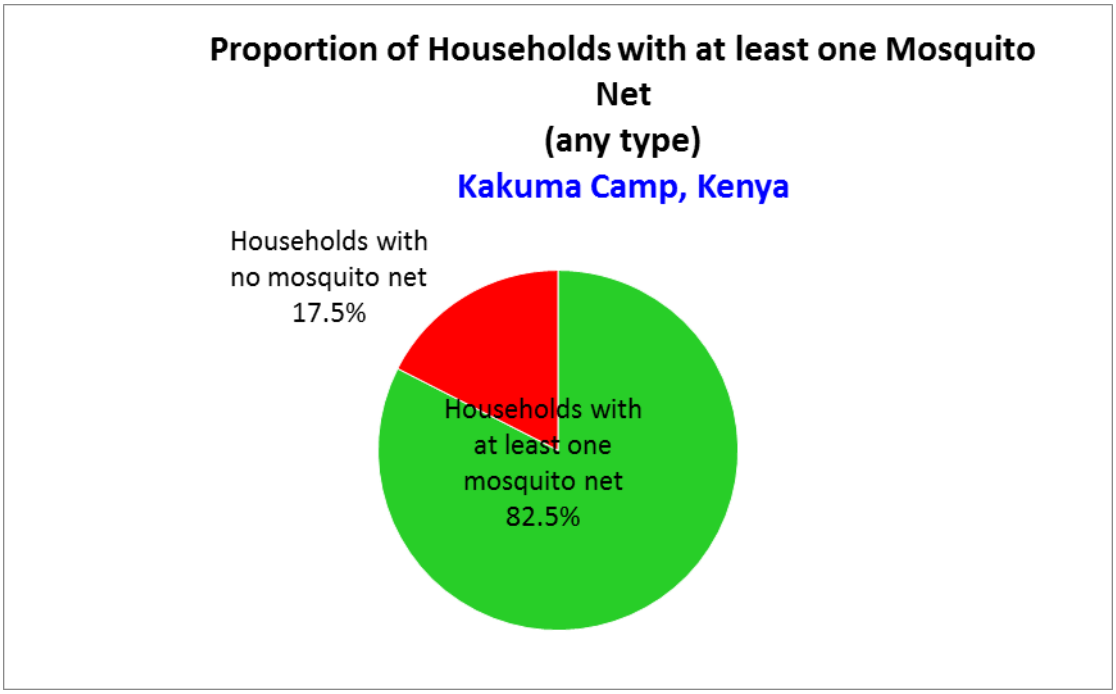

Figure 18: Household ownership of at least one mosquito net (any type)

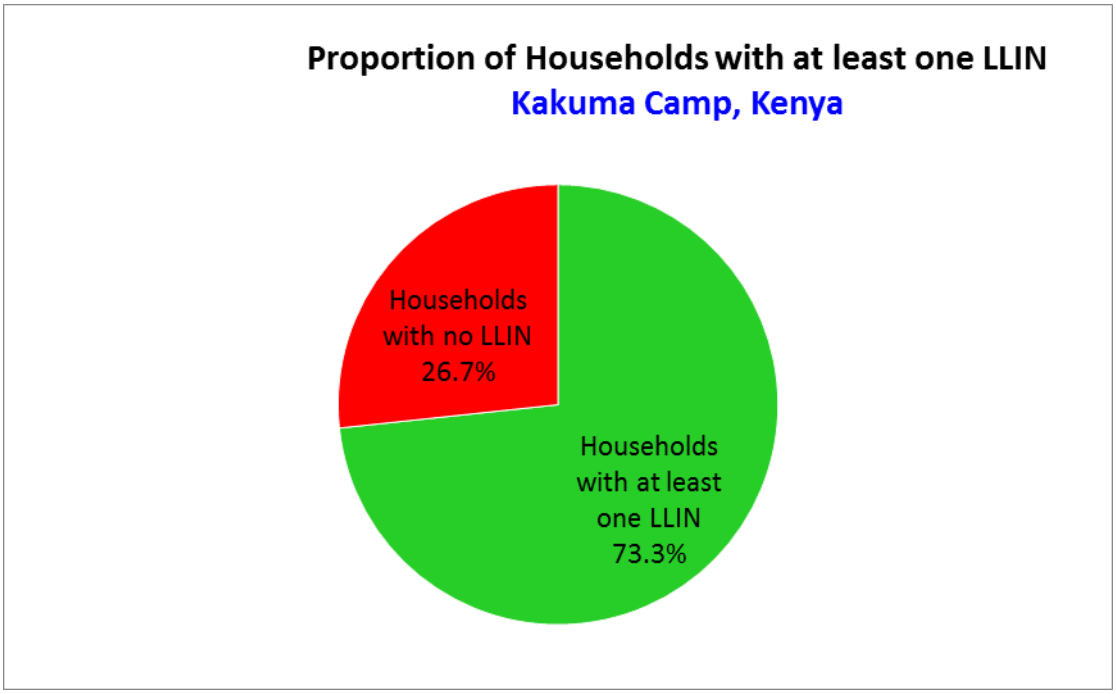

Figure 19: Household ownership of at least one Long-Lasting Insecticide Net (LLIN)

There was an average number of LLINs per household was 1.8, whilst the average number of persons per LLIN was 3.5, which did not meet the UNHCR target of 2 persons per LLIN (Table 51).

Table 51: NUMBER of nets

Average number of LLINs per household	Average number of persons per LLIN
1.8	3.5

In terms of mosquito net utilisation (Table 52 and Figure 20), 67.5% of all household members slept under a net of any type, and 58.6% under a LLIN. The proportion of children and pregnant women who slept under a LLIN were 74.7% and 96.2%, respectively.

Table 52: Mosquito net utilisation.

	Proportion of total population (all ages)		Proportion of 0-59 months		Proportion of pregnant women	
	Number/total	%	Number/total	%	Number/total	%
Slept under net of any type	1318/1953	67.5%	242/288	84.0%	25/26	96.2%
Slept under LLIN	1145/1953	58.6%	215/288	74.7%	25/26	96.2%

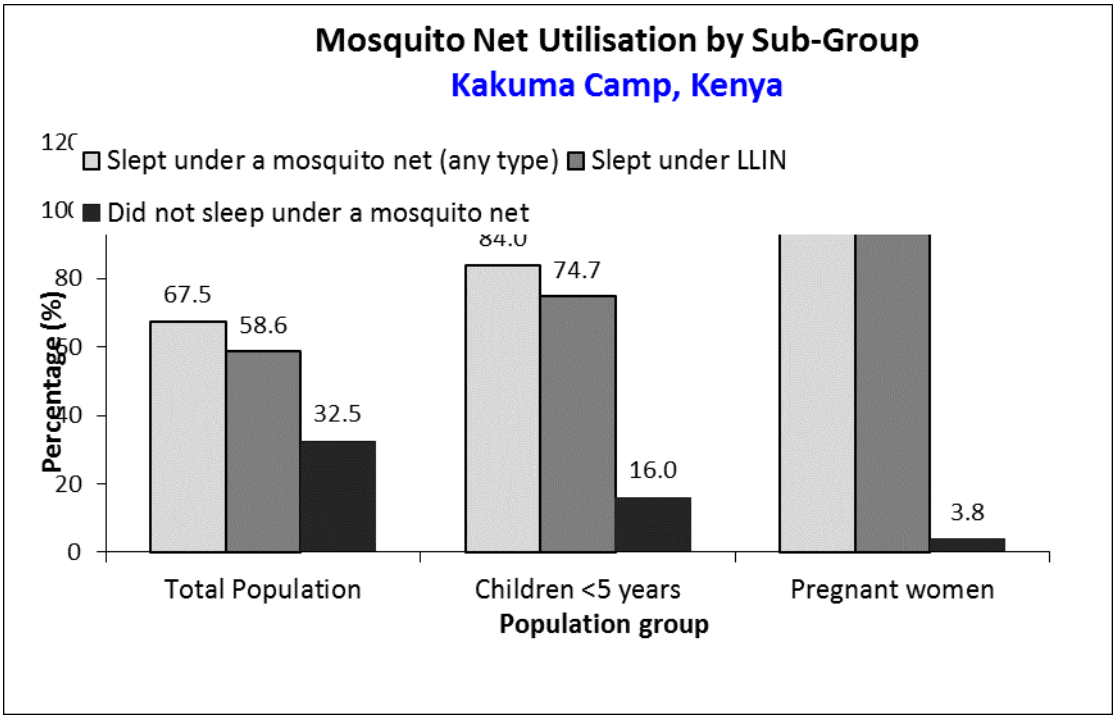

Figure 20: Mosquito net utilisation by sub-groups

The proportion of households who reported indoor residual spraying (Table 53) was 81.8% (71.8-91.8, 95% C.I).

Table 53: Indoor Residual Spraying

	Number/total	% (95% CI)
Proportion of households covered by IRS	53/291	81.8 (71.8-91.8)

5 RESULTS KALOBEYEI CAMP

The demographic characteristics of the population are presented in Table 54. A total of 581 U5 children in 598 households, with a population of 2,973, giving an average household size of 5.2. In the sample, 19.5% were children below 5 years.

Table 54: Demographic characteristics of the study population

Total households surveyed	598
Total population surveyed	2,973
Total U5 surveyed (0-59)	581
Average household size	5.2
% of U5	19.5%
Total number of clusters	36

- The NRR rate was 2.0%

5.1 Children 6-59 months

5.1.1 Sample size and clusters

A total of 537 children 6-59 months were surveyed, which represents 104% of the target of 515 (Table 55).

Table 55: Target and actual number captured

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	515	537	104%
Clusters	36	36	100%

The ratio of different age groups, as well as boys to girls, was acceptable (Table 55).

Table 56: Children 6-59 months - distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy: girl**
6-17	53	57.6	39	42.4	92	17.1	1.4
18-29	69	54.8	57	45.2	126	23.5	1.2
30-41	66	52.4	60	47.6	126	23.5	1.1
42-53	63	55.8	50	44.2	113	21.0	1.3
54-59	38	47.5	42	52.5	80	14.9	0.9
Total	289	53.8	248	46.2	537	100.0	1.2

The ratio of boys to girl is more or less the same.

The prevalence of GAM in Kalobeyei was 5.8% (3.8-8.9, 95% .C.I), with a SAM prevalence of 0.8% (0.3-2.0, 95% C.I) based on WHO standards (Table 57).

5.1.2 Anthropometric results (based on WHO Growth Standards 2006; NCHS Growth Reference 1977 shown in Appendix)

Table 57: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 531	**Boys** n = 285	**Girls** n = 246
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(31) 5.8 % (3.8 - 8.9 95% C.I.)	(22) 7.7 % (4.6 - 12.6 95% C.I.)	(9) 3.7 % (2.0 - 6.5 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(27) 5.1 % (3.4 - 7.6 95% C.I.)	(19) 6.7 % (4.1 - 10.7 95% C.I.)	(8) 3.3 % (1.7 - 6.2 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(4) 0.8 % (0.3 - 2.0 95% C.I.)	(3) 1.1 % (0.3 - 3.4 95% C.I.)	(1) 0.4 % (0.1 - 2.9 95% C.I.)

The prevalence of oedema is 0.0 %

The analysis of the trend shows a decrease in 2017 compared to 2016 (Figure 21).

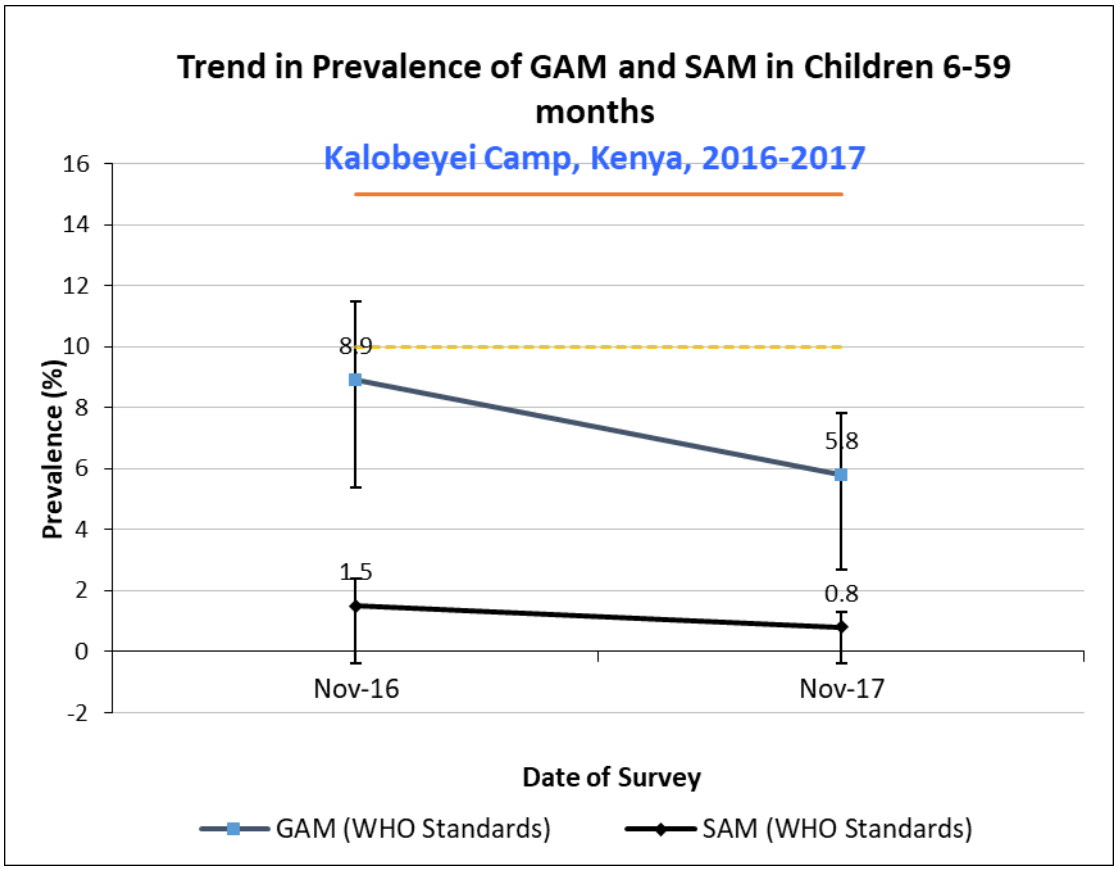

Figure 21: Trends in the prevalence of global and severe acute malnutrition based on WHO growth standards in children, 6-59 months, from 2016-2017

The prevalence of severe wasting was generally similar in different age categories, but moderate wasting was higher in older children (Table 58 and 59).

Table 58: Prevalence of acute malnutrition by age, based on weight-for-height z-scores 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	92	1	1.1	2	2.2	89	96.7	0	0.0
18-29	125	1	0.8	3	2.4	121	96.8	0	0.0
30-41	124	0	0.0	7	5.6	117	94.4	0	0.0
42-53	111	1	0.9	10	9.0	100	90.1	0	0.0
54-59	79	1	1.3	5	6.3	73	92.4	0	0.0
Total	531	4	0.8	27	5.1	500	94.2	0	0.0

Table 59: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema (WHO IYCF age category indicators)

		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.**	**%**
6-11	34	0	0.0	2	5.9	32	94.1	0	0.0
12-23	138	1	0.7	1	0.7	136	98.6	0	0.0
24-35	127	1	0.8	7	5.5	119	93.7	0	0.0
36-47	113	1	0.9	6	5.3	106	93.8	0	0.0
48-59	119	1	0.8	11	9.2	107	89.9	0	0.0
Total	531	4	0.8	27	5.1	500	94.2	0	0.0

Overall, wasting generally increased with age (Figure 22).

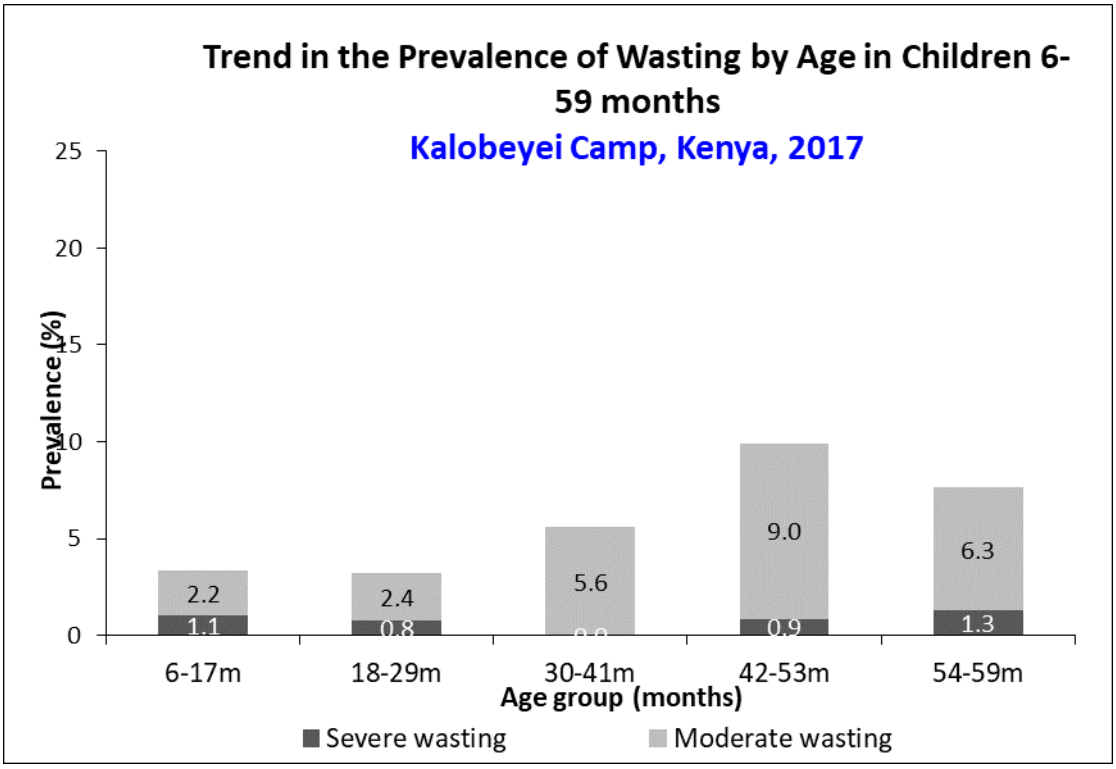

Figure 22: Trends in prevalence of moderate and severe wasting by age in children 6-59 months

All cases of SAM were due to marasmus (Table 60).

Table 60: Distribution of severe acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 5 (0.9 %)	Not severely malnourished No. 527 (99.1 %)

The survey and WHO WHZ curves are compared in Figure 23.

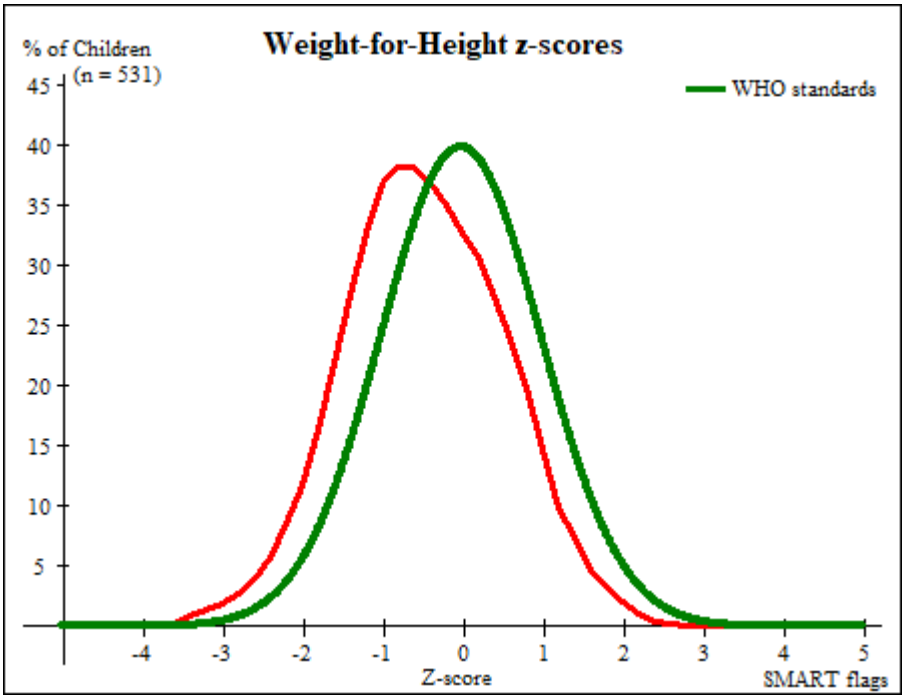

Figure 23: Distribution of weight-for-height z-scores of survey population (red) compared to reference population (green) (based on WHO Growth Standards)

The prevalence of acute malnutrition based on MUAC was very low (Table 61), with a GAM prevalence of 0.2% (0.0-1.4, 95% C.I) and a SAM prevalence of 0.0%.

Table 61: Prevalence of MUAC Malnutrition

	All n = 534	**Boys** n = 287	**Girls** n = 247
Prevalence of global malnutrition (< 125 mm and/or oedema)	(1) 0.2 % (0.0 - 1.4 95% C.I.)	(1) 0.3 % (0.0 - 2.6 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(1) 0.2 % (0.0 - 1.4 95% C.I.)	(1) 0.3 % (0.0 - 2.6 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

Table 62: Prevalence of MUAC malnutrition ranges by age, based on MUAC cut off's and/or oedema

		Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	92	0	0.0	0	0.0	92	100.0	0	0.0
18-29	125	0	0.0	0	0.0	125	100.0	0	0.0
30-41	125	0	0.0	1	0.8	124	99.2	0	0.0
42-53	113	0	0.0	0	0.0	113	100.0	0	0.0
54-59	79	0	0.0	0	0.0	79	100.0	0	0.0
Total	534	0	0.0	1	0.2	533	99.8	0	0.0

The prevalence of underweight (Table 63) was 15.5% (12.5-19.0, 95% C.I), with a severe underweight prevalence of 2.6% (1.6-4.5, 95% C.I),

Table 63: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 529	**Boys** n = 284	**Girls** n = 245
Prevalence of underweight (<-2 z-score)	(82) 15.5 % (12.5 - 19.0 95% C.I.)	(60) 21.1 % (16.5 - 26.6 95% C.I.)	(22) 9.0 % (5.9 - 13.4 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(68) 12.9 % (10.3 - 16.0 95% C.I.)	(49) 17.3 % (12.9 - 22.8 95% C.I.)	(19) 7.8 % (4.9 - 12.0 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(14) 2.6 % (1.6 - 4.5 95% C.I.)	(11) 3.9 % (2.2 - 6.7 95% C.I.)	(3) 1.2 % (0.4 - 3.7 95% C.I.)

The stunting prevalence (Table 64) was 26.2% (21.6-31.4, 95% C.I), with a severe underweight prevalence of 9.1% (6.4-12.9, 95% C.I).

Table 64: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 504	**Boys** n = 265	**Girls** n = 239
Prevalence of stunting (<-2 z-score)	(132) 26.2 % (21.6 - 31.4 95% C.I.)	(80) 30.2 % (24.0 - 37.2 95% C.I.)	(52) 21.8 % (16.7 - 27.8 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(86) 17.1 % (13.7 - 21.1 95% C.I.)	(51) 19.2 % (14.7 - 24.8 95% C.I.)	(35) 14.6 % (11.0 - 19.2 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(46) 9.1 % (6.4 - 12.9 95% C.I.)	(29) 10.9 % (7.5 - 15.8 95% C.I.)	(17) 7.1 % (4.1 - 11.9 95% C.I.)

The prevalence of stunting decreased from 2016 to 2017, and is now poor according to the sphere standards (Figure 24).

Figure 24: Trends in the prevalence of global and severe stunting based on WHO growth standards in children, 6-59 months from 2016-2017.

The prevalence of stunting was highest in the 18-29 and 12-23 age groups (Table 65 and 66 and Figure 25).

Table 65: Prevalence of stunting by age based on height-for-age z-scores

		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	84	5	6.0	9	10.7	70	83.3
18-29	121	18	14.9	21	17.4	82	67.8
30-41	114	8	7.0	25	21.9	81	71.1
42-53	107	7	6.5	15	14.0	85	79.4
54-59	78	8	10.3	16	20.5	54	69.2
Total	504	46	9.1	86	17.1	372	73.8

Table 66: Prevalence of stunting by age based on height-for-age z-scores (WHO IYCF age category indicators)

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-11	28	2	7.1	1	3.6	25	89.3
12-23	133	18	13.5	21	15.8	94	70.7
24-35	119	10	8.4	26	21.8	83	69.7
36-47	105	7	6.7	21	20.0	77	73.3
48-59	119	9	7.6	17	14.3	93	78.2
Total	504	46	9.1	86	17.1	372	73.8

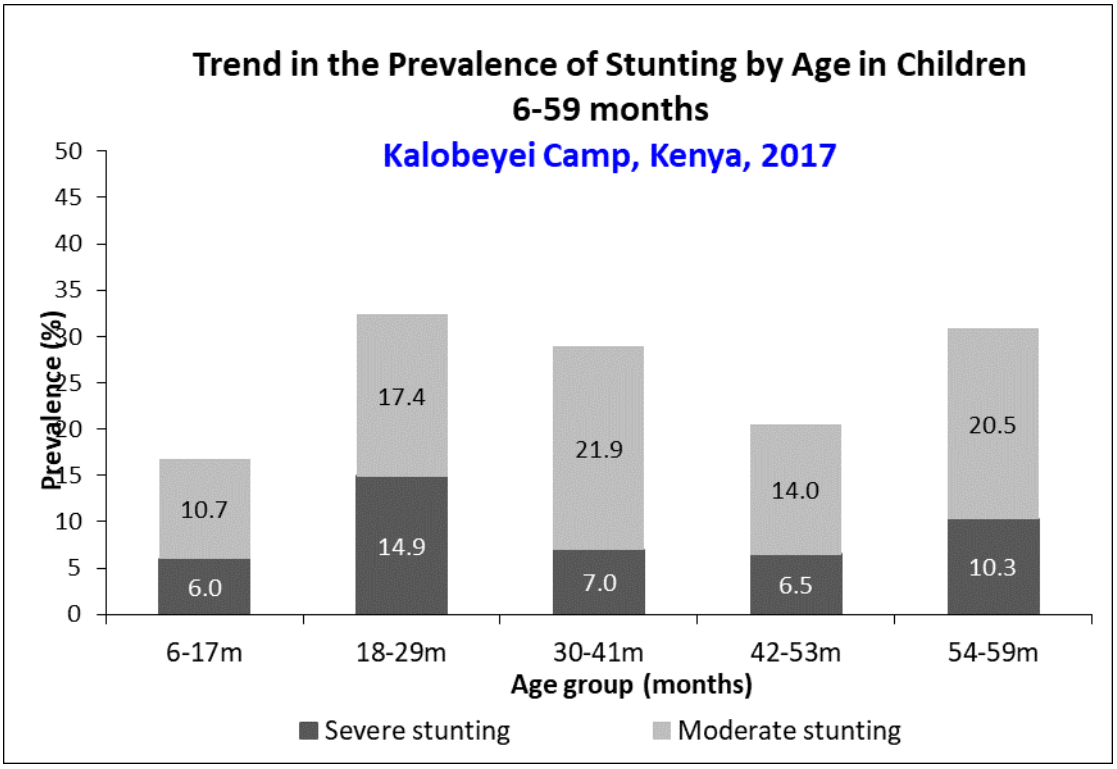

Figure 25: Trends in the prevalence of stunting by age in children, 6-59 months

The survey and WHO HAZ curves are compared in Figure 26.

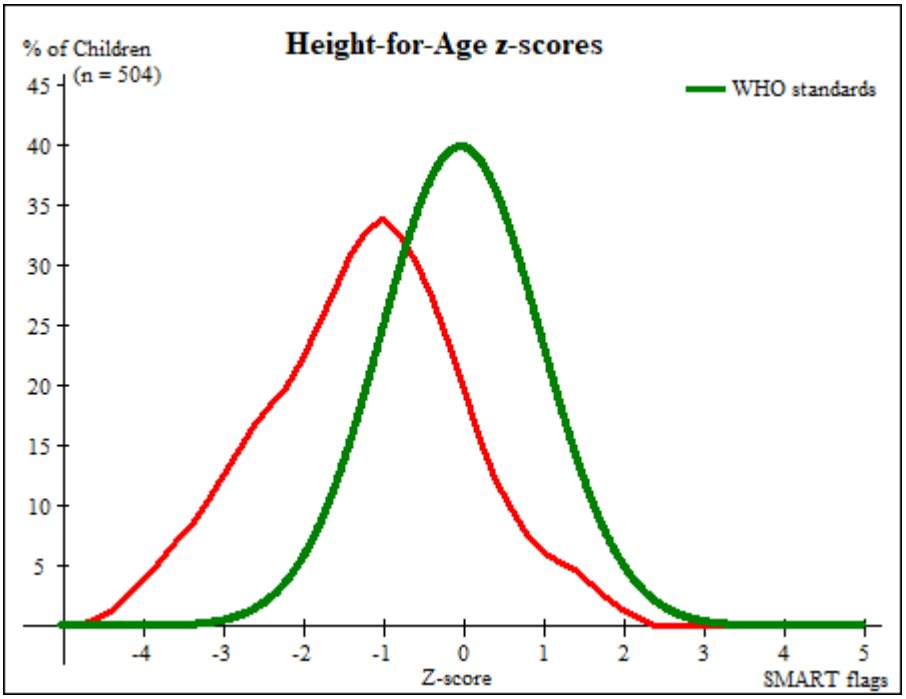

Figure 26: Distribution of height-for-age z-scores of survey population (red) compared to reference population (green)

The mean z-scores, design effects and excluded subjects are shown in Table 67.

Table 67: 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	531	-0.47±0.98	1.45	5	1
Weight-for-Age	529	-0.99±1.00	1.02	3	5
Height-for-Age	504	-1.21±1.22	1.54	5	28

* contains for WHZ and WAZ the children with oedema.

5.2 Feeding programme coverage results

The results below **(Table 68, 69)** show the feeding programme coverage, this results should be interpreted with caution as the sample size is not sufficient to give a representative sample of the general population.

Table 68: Programme coverage for acutely malnourished children based on all admission criteria (weight-for-height, MUAC, oedema)

	Number/total	% (95% CI)
Supplementary feeding programme coverage	1/27	3.7 (0.0-11.7)
Therapeutic feeding programme coverage	0/6	0%

The enrolment coverage for SAM and MAM cases in TFP, and TSFP is significantly low compared to expected target of >90%.

Table 69: Targeted selective feeding programme coverage for acutely malnourished children 6-59m based on MUAC and oedema only

	Number/total	% (95% CI)
Supplementary feeding programme coverage	4/9	44.4 (4.5-84.4)
Therapeutic feeding programme coverage	*	*

***No children in sample**

5.3 Vaccination and supplementation programmes

5.3.1 Measles vaccination coverage results

The coverage of measles vaccination was well above the 95% target (Table 70).

Table 70: Measles vaccination coverage for children aged 9-59 (n=525)

	Measles (with card) n= 251	**Measles (with card or confirmation from mother) n= 511**
YES	47.8% (35.9-59.7, 95% C.I)	97.3% (95.7-99.0, 95% C.I)

5.3.2 Vitamin A supplementation coverage results

The coverage of Vitamin A supplementation, however, was slightly below the 90% target (Table 71).

Table 71: Vitamin A supplementation for children, 6-59 months within past 6 months (*or other context-specific target group*) (n= 537)

	Vitamin A capsule (with card) n=115	**Vitamin A capsule (with card or confirmation from mother) n=462**
YES	21.4% (12.4-30.4, 95% C.I)	86.2% (79.2-93.2, 95% C.I)

Both the coverage of measles vaccination and Vitamin A supplementation increased in 2017 compared to 2016 (Figure 27).

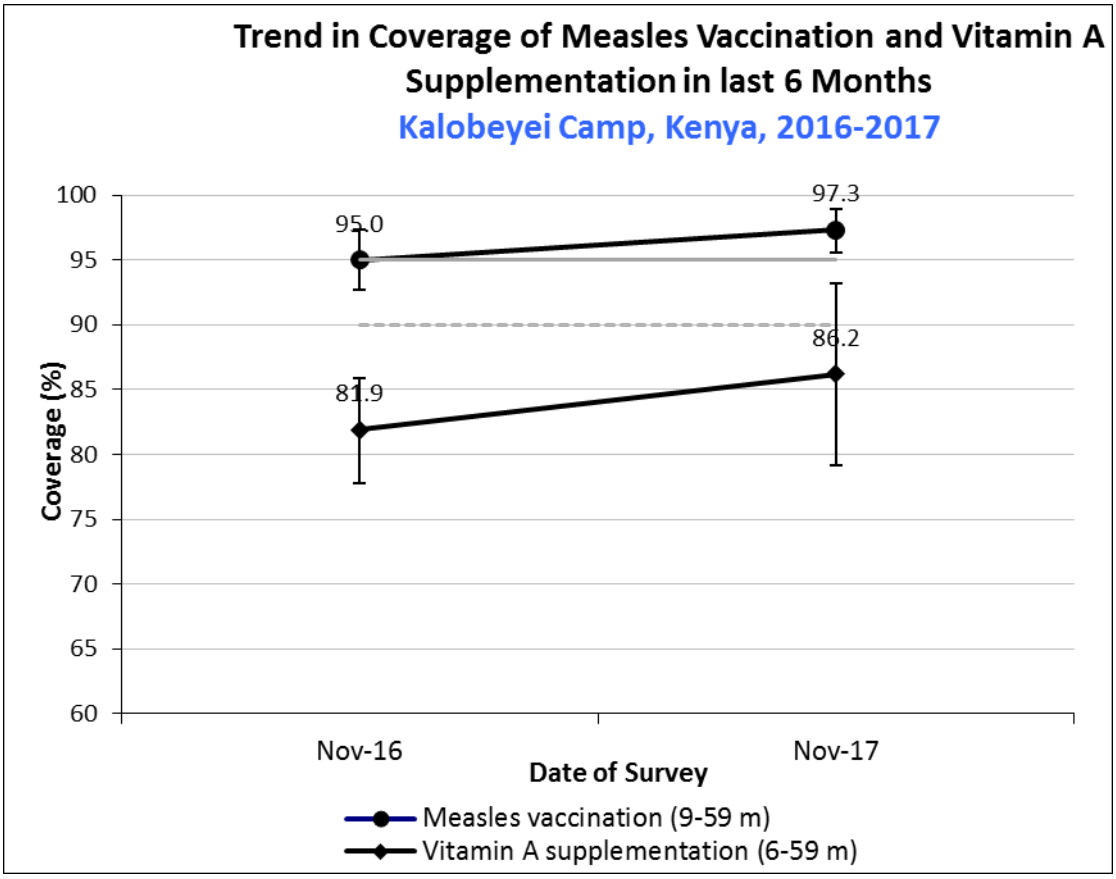

Figure 27: Trends in the coverage of measles vaccination and Vitamin A supplementation in children, 6-59 months from 2016-2017

5.4 Diarrhoea results

The proportion of children who reported having experienced diarrhooea in the last 2 weeks (Table 72) was 13.8% (9.6-18.0, 95% C.I).

Table 72: Period prevalence of diarrhea

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	74/536	13.8 (9.6-18.0)

5.5 Anaemia in children, 6-59 months

The prevalence of anaemia among children 6-59 months was 57.8% (51.1-64.4, 95% C.I), with a mean Hb of 10.6 (10.3-10.8, 95% C.I). The prevalence of anaemia was highest in the 6-23 months age group and then decreased with age (Table 73).

Table 73: Prevalence of total anaemia, anaemia categories, and mean haemoglobin concentration in children 6-59 months of age and by age group

	6-59 months n = 535	**6-23 months** n=172	**24-35 months** n=129	**24-35 months** n=234
Total Anaemia (Hb<11.0 g/dL)	(309) 57.8% (51.1-64.4, 95% C.I)	(126) 73.3% (65.2-81.3, 95% C.I)	(86) 66.7% (58.3-75.1, 95% C.I)	(97) 41.5% (32.5-50.4, 95% C.I)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(130) 24.3% (20.2-28.4, 95% C.I)	(45) 26.2% (18.6-33.8, 95% C.I)	(38) 29.5% (21.6-37.3, 95% C.I)	(47) 20.1% (15.6-24.6, 95% .C.I)
Moderate Anaemia (7.0-9.9 g/dL)	(174) 32.5% (25.7-39.4, 95% C.I)	(77) 44.8% (33.9-55.6, 95% C.I)	(47) 33.3% (24.9-41.7, 95% C.I)	(50) 21.4% (13.8-28.9, 95% C.I)
Severe Anaemia (<7.0 g/dL)	(5) 0.9% (0.0-1.9, 95% C.I)	(4) 2.3% (0.0-4.7, 95% C.I)	(1) 0.8% (0.0-2.3, 95% C.I)	(0) 0.0%
Mean Hb (g/dL) (95% CI)	10.6 (10.3-10.8)			

The prevalence of anaemia is highest 73.3% among children aged 6-23 months.

The analysis of moderate and severe anaemia prevalence (Hb <10g/dl) is shown in Table 74.

Table 74: Prevalence of moderate and severe anaemia in children, 6-59 months of age and by age group

	6-23 months n = 172	**24-35 months** n=129	**36-59 months** n=234	**All** n=535
Moderate and Severe Anaemia (Hb<10.0 g/dL)	(81) 47.1% (36.6-57.6, 95% C.I)	(48) 37.2% (26.7-47.7, 95% C.I)	(50) 21.4% (13.8-28.9, 95% C.I)	(179) 33.5% (26.6-40.3, 95% C.I)

Anaemia was lower in 2017 compared to 2016 as Figure 28 and 29 show.

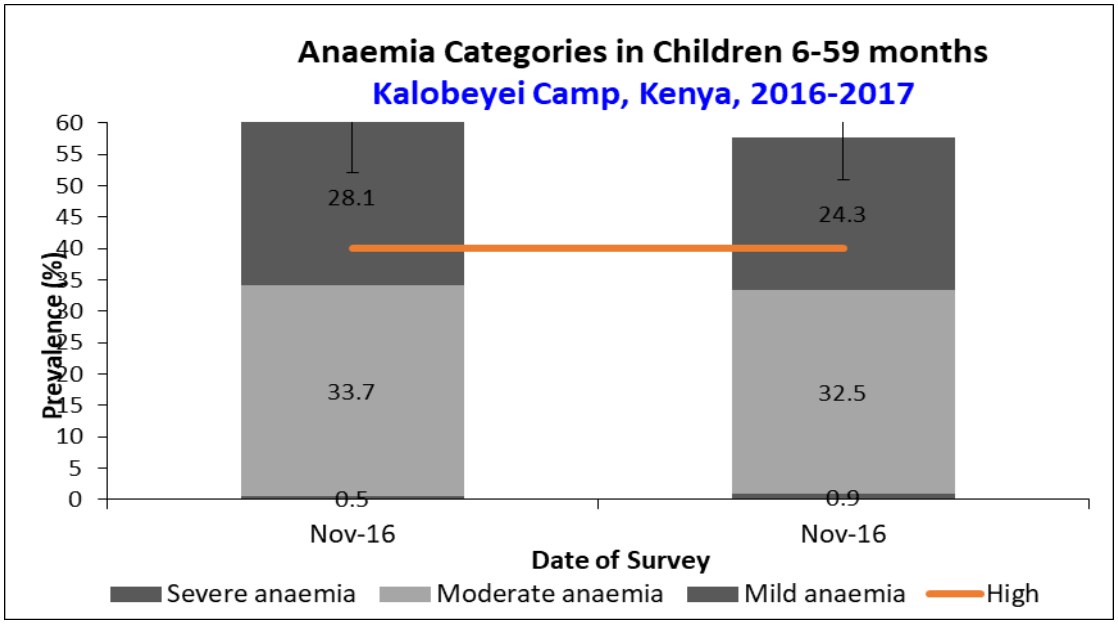

Figure 28: Trends in anaemia categories in children 6-59 months from 2008-2017.

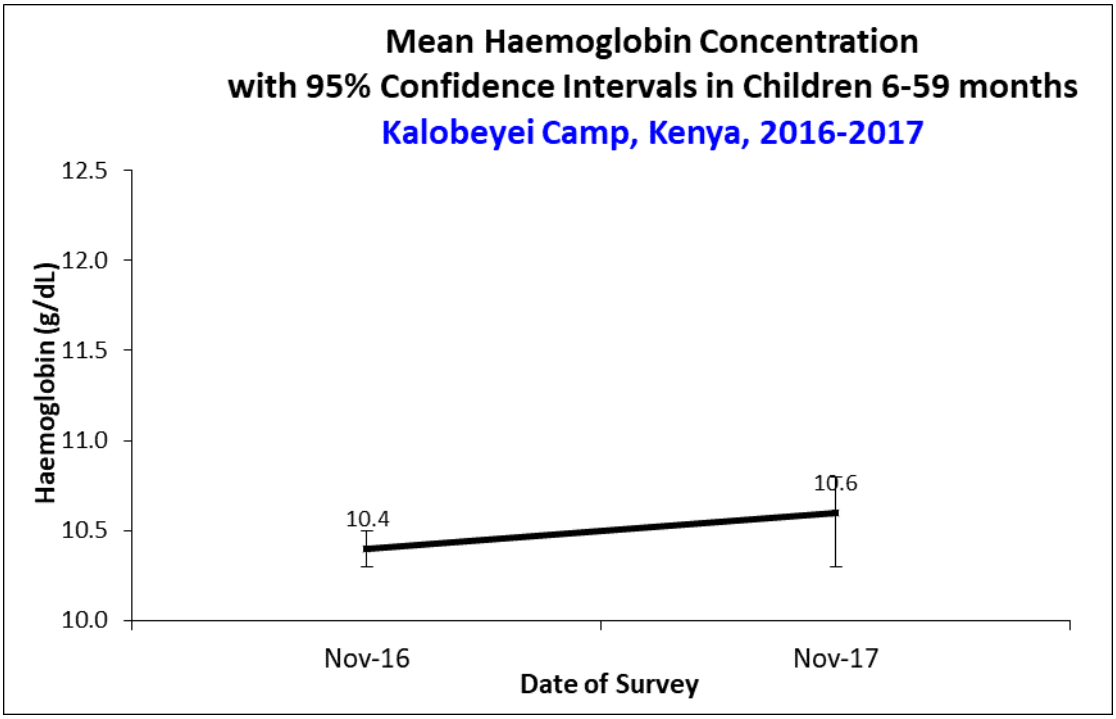

Figure 29: Trend in mean haemoglobin concentration in children, 6-59 months from 2016-2017.

5.6 Children 0-23 months

IYCF indicators are shown in Table 75. A high proportion of children were introduced to the breast within the first hour of birth and the proportion of children exclusively breastfed was 84.1% (72.4-95.8, 85% C.I). Nearly all children continued to breastfeed at 1 year, whilst about three quarters continued to breastfeed up to 2 years. However, less than half of children 6-8 months had been introduced to solid foods.

Table 75: Prevalence of Infant and Young Child Feeding Practices Indicators

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	164/193	85.0	76.5-93.4
Exclusive breastfeeding under 6 months	0-5 months	37/44	84.1	72.4-95.8
Continued breastfeeding at 1 year	12-15 months	38/41	92.7	82.2-100.0
Continued breastfeeding at 2 years	20-23 months	34/45	75.6	62.5-88.6
Introduction of solid, semi-solid or soft foods	6-8 months	5/11	45.5	16.2-74.7
Consumption of iron-rich or iron-fortified foods	6-23 months	149/172	86.6	79.5-93.7
Bottle feeding	0-23 months	7/216	3.2	0.0-6.5

There was a marked improved improvement in exclusive breastfeeding in 2017 compared to 2016. However, the remaining indicators showed deterioration (Figure 30).

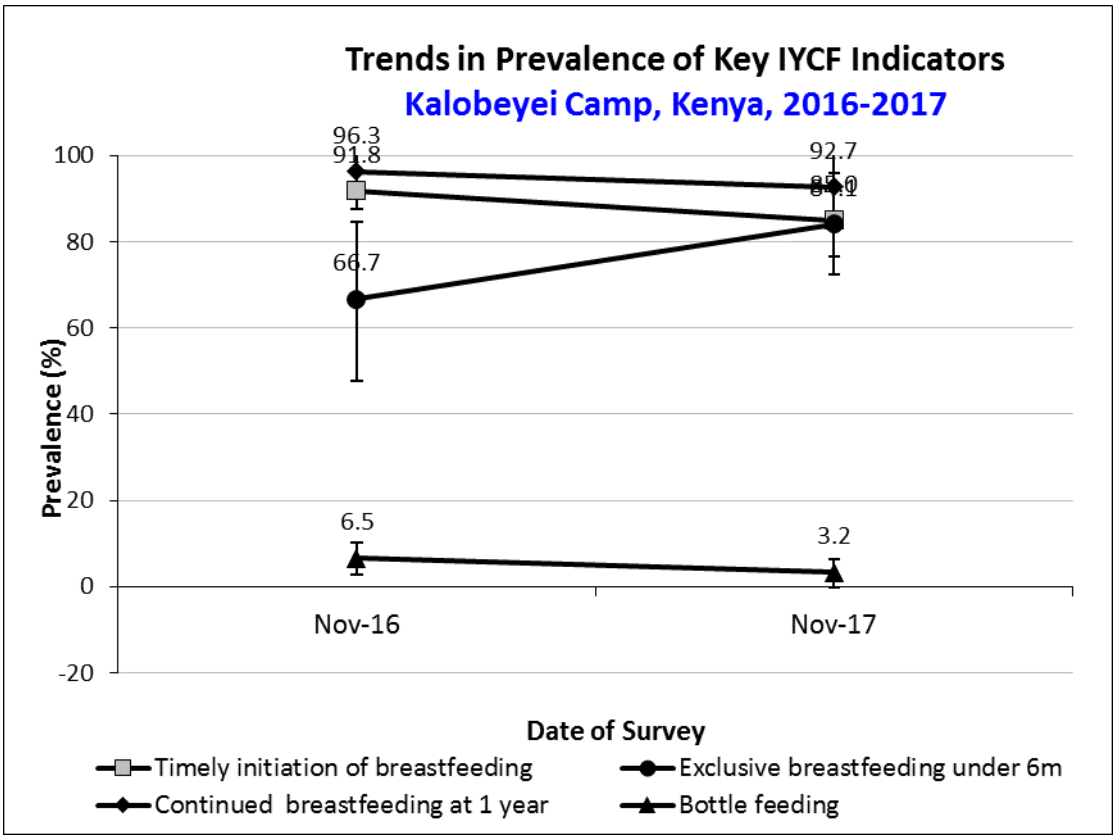

Figure 30: Nutrition survey results (IYCF indicators) since 2016

5.7 Prevalence of intake

5.7.1 Prevalence of Blanket Supplementary Feeding Programme and Infant formula

Only 1.9% (0.0-4.8%, 95% C.I) had consumed infant formula (Table 76).

Table 76: Infant formula intake in children aged 0-23 months

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who receive infant formula (fortified or non-fortified)	4/216	1.9 (0.0-4.8)

Fortified blended foods

About a quarter of children had consumed CSB+, whilst 84.9% (77.4-92.4, 95% C.I) had consumed CSB++ (Table 77 and 78).

Table 77: CSB+ (super cereal) intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB+	40/159	25.2 (12.3-38.0)

Table 78: CSB++ (super cereal plus) intake in children aged 6-23 months

	Number/total	% (95% CI)
Proportion of children aged 6-23 months who receive CSB++	146/172	84.9 (77.4-92.4)

5.8 Women 15-49 years

Out of the total of 208 women of reproductive age, 7.7% (4.0-11.3, 95% C.I) were pregnant, with a mean age of 28.3 (Table 79).

Table 79: Women physiological status and age

Physiological status	Number/total	% (95% CI)
Non-pregnant	192/208	92.3 (88.7-96.0)
Pregnant	16/208	7.7 (4.0-11.3)
Mean age (range)	28.3 (15-49)	

5.8.1 Anaemia in non-pregnant women (15-49 years)

The prevalence of anaemia among non-pregnant women was 34.2% (26.6-41.8, 95% C.I). The mean Hb was 12.5 (Table 80).

Table 80: Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years)

Anaemia in non-pregnant women of reproductive age (15-49 years)	All n = 190
Total Anaemia (<12.0 g/dL)	(65) 34.2% (26.6-41.8, 9% C.I)
Mild Anaemia (11.0-11.9 g/dL)	(38) 20.0% (14.5-25.5, 95% C.I)
Moderate Anaemia (8.0-10.9 g/dL)	(25) 13.2% (8.2-18.1, 95% C.I)
Severe Anaemia (<8.0 g/dL)	(2) 1.1% (0.0-2.5, 95% C.I)
Mean Hb (g/dL) (95% C.I)	12.5 (12.2-12.7)

The prevalence of anaemia was lower in 2017 than in 2016 (Figure 31).

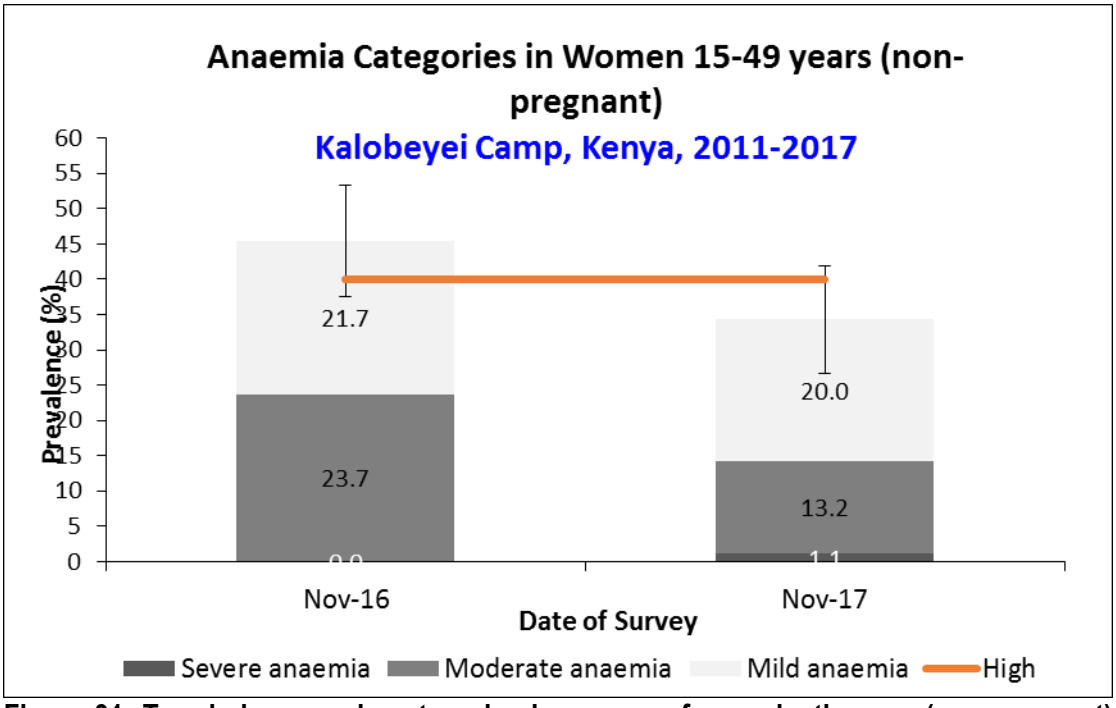

Figure 31: Trends in anaemia categories in women of reproductive age (non-pregnant) from 2008-2017.

All sampled pregnant women were enrolled in ANC and receiving iron-folic acid pills (Table 81).

Table 81: ANC enrolment and iron-folic acid pills coverage among pregnant women (15-49 years)

	Number /total	% (95% CI)
Currently enrolled in ANC programme	16/16	100%
Currently receiving iron-folic acid pills	16/16	100%

5.9 Food security

The table below shows the proportion of the population surveyed for food security.

Table 82: Food security information

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	305	286	93.8%

5.9.1 Access to food assistance results

The period for general food distribution covered was the month of October. All households interviewed had a ration card (Table 83).

Table 83: Ration card coverage

	Number/total	% (95% CI)
Proportion of households with a ration card	271/271	100%

The average duration of the general food ration was 18.4, which translates to 56.1% of the theoretical duration (Table 84).

Table 84: Reported duration of general food ration 1

Average number of days the food ration lasts (Standard deviation or 95% CI)	Average duration (%) in relation to the theoretical duration of the ration*
18.4 (17.4-19.4)	56.1%

**Intended duration =31 days

Only 1.0% (0.0-2.6, 95% C.I) of households' food ration had lasted the entire duration (Table 85).

Table 85: Reported duration of general food ration 2

	Number/total	% (95% CI)
Proportion of households reporting that the food ration lasts the entire duration of the cycle	3/286	1.0 (0.0-2.6)
Proportion of households reporting that the food ration lasts <31days	283/286	99.0 (97.4-100.0)
Proportion of households reporting that the food ration lasted:		
≤75% of the cycle	233/286	81.5 (75.4-87.5)
>75% of the cycle	53/286	18.5 (12.5-24.6)

Negative coping strategies are shown in Table 86. The main coping mechanism was reduction of frequency/quantity of meals, with a much lower proportion of households reporting begging and much fewer reporting selling of assets and increased remittances.

5.9.2 Negative coping strategies results

Table 86: Coping strategies used by the surveyed population over the past month

	Number/total	% (95% CI)
Proportion of households reporting using the following coping strategies over the past month*:		
Borrowed cash, food or other items *with or without interest*	111/271	41.0 (31.5-50.5)
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	21/271	7.7 (2.6-12.9)
Requested increased remittances or gifts as compared to normal	13/270	4.8 (2.2-7.4)
Reduced the quantity and/or frequency of meals	206/271	76.0 (69.7-82.3)
Begged	72/270	26.7 (18.0-35.3)
Proportion of households reporting using none of the coping strategies over the past month	45/286	15.7 (9.4-22.1)

5.9.3 Household dietary diversity results

The average household dietary diversity (Table 87) score was 4.5 (4.2-4.8, 95% C.I).

Table 87: Average HDDS

	Mean (95% C.I)
Average HDDS*	4.5 (4.2-4.8)

* Maximum HDDS is 12.

The proportion of households consuming cerals, oils/fats and pulses was very high, corresponding to the items which are included in the general food basket (Figure 32).

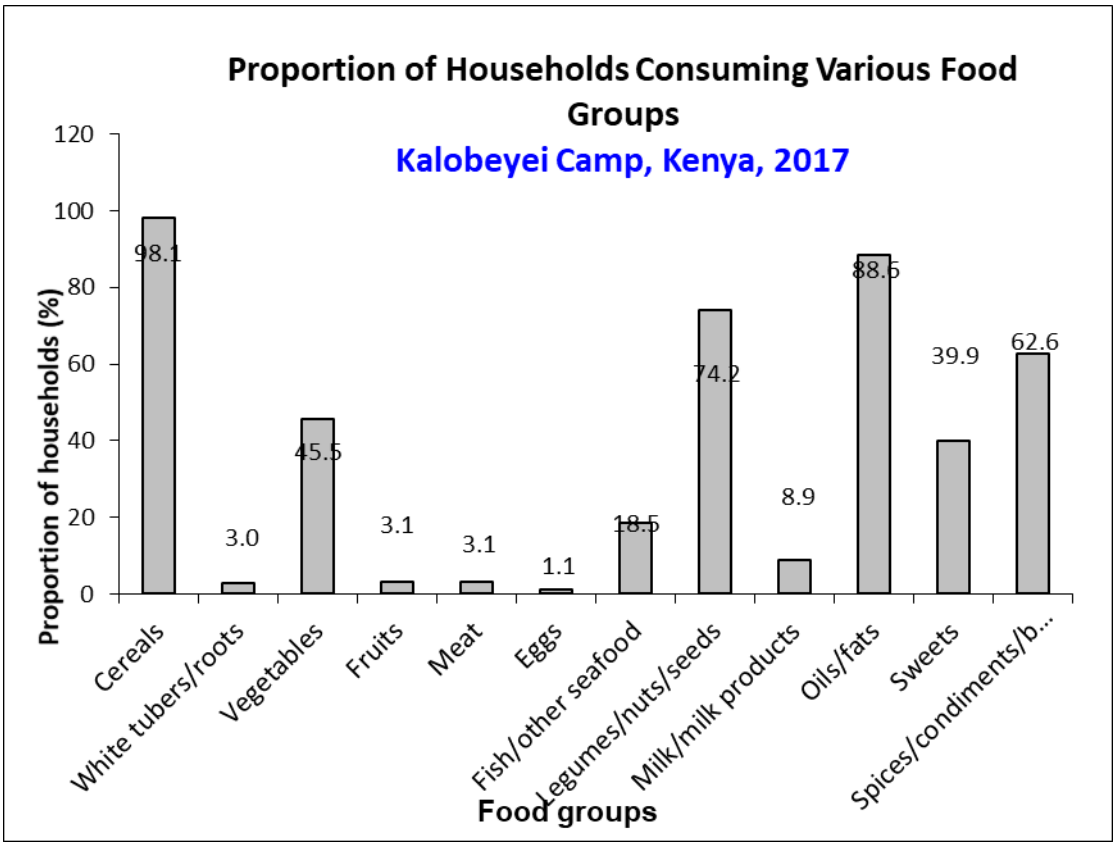

Figure 32: Proportion of households consuming different food groups within last 24 hours

Less than a quarter of households consumed plant or animal sources of Vitamin A, and just under a fifth consumes food sources of haem iron (Table 88).

Table 88: Consumption of micronutrient rich foods by households

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	116/286	40.6 (28.7-52.4)
Proportion of households consuming either a plant or animal source of vitamin A	69/286	24.1 (15.0-33.3)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	56/286	19.6 (12.2-27.0)

5.10 WASH

The table below shows total number of household interviewed for the WASH module (Table 89).

Table 89: WASH information

Household data	Planned	Actual	% of target
Total households surveyed for WASH	610	598	98.0%

All households reported use of an improved drinking water source (Table 90).

Table 90: Water Quality

	Number/total	% (95% CI)
Proportion of households using an improved* drinking water source	569/569	100%
Proportion of households that use a covered or narrow necked container for storing their drinking water	461/569	81.0 (72.2-89.9)

*According to UNHCR's SENS Improved drinking water sources are; public tap/standpipe, protected dug well or rain-water collection. All other sources were considered un-improved.

The average number of litres used per person per day was 16.7 (14.8-18.6, 95% C.I), which falls below the target of 20 (Table 91).

Table 91: Water Quantity: Amount of litres of water used per person per day

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	174/569	30.6 (23.2-37.9)
15 – <20 lpppd	86/569	15.1 (12.1-18.2)
<15 lpppd	309/569	54.3 (46.2-62.4)
Average water usage per Lpppd mean (95% C.I)	16.7 (14.8-18.6)	

Only 37.3% (24.4-50.1, 95% C.I) of households were satisfied with the water supply (Table 92).

Table 92: Satisfaction with water supply

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	212/569	37.3 (24.4-50.1)

The reason for lack of satisfaction for three quarters of those who were not satisfied was "not enough", with a lower proportion reporting: "irregular supply", "long waiting queue" and 'long distance" (Figure 33).

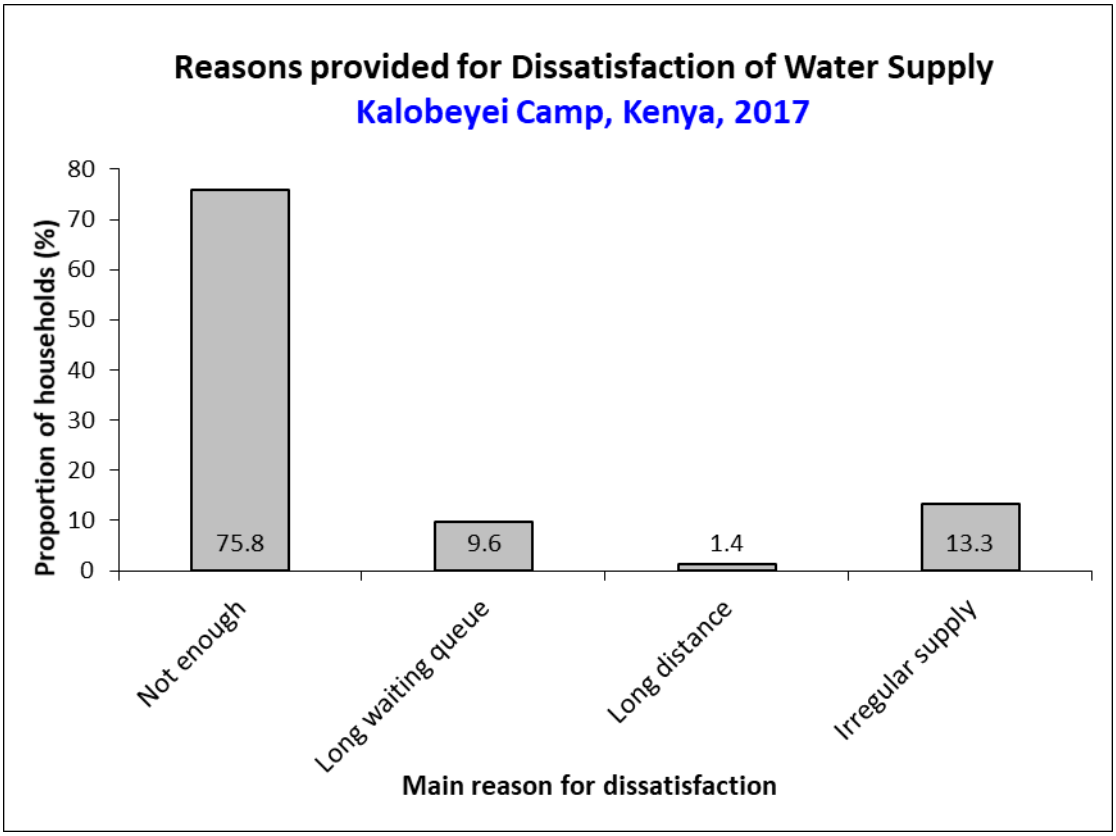

Figure 33: Main reason for dissatisfaction among households not satisfied with water supply

Only 2.8% (0.5-5.2, 95% C.I) of households were using an improved excreta disposal facility, as about three quarters were using a communal toilet (3 or more households sharing). Nearly all households safely disposed the faeces of children below 3 years (Table 93).

Table 93: Safe excreta disposal

	Number/total	% (95% CI)
Proportion of households that use:		
An improved excreta disposal facility (improved toilet facility, 1 household)*,**	16/568	2.8 (0.5-5.2)
A shared family toilet (improved toilet facility, 2 households)**	100/568	17.6 (11.2-24.0)
A communal toilet (improved toilet facility, 3 households or more)	429/568	75.5 (66.5-84.6)
An unimproved toilet (unimproved toilet facility or public toilet)	23/568	4.0 (0.0-8.4)
Proportion of households with children under three years old that dispose of faeces safely	181/183	98.9 (97.4-100.0)

5.11 Mosquito Net Coverage

The table below shows the total number of households covered in the mosquito net coverage.

Table 94: Mosquito net coverage information

Household data	Planned	Actual	% of target
Total households surveyed for mosquito net coverage	305	289	94.8%

Table 95: Household mosquito net ownership

	Number/total	% (95% CI)
Proportion of total households owning at least one mosquito net of any type	163/275	59.3 (53.2-65.4)
Proportion of total households owning at least one LLIN	155/289	53.6 (47.4-59.9)

Of the sampled households, 59.3% (53.2-65.4, 95% C.I) owned at least one mosquito net, and 53.6% (47.4-59.9, 95% C.I) owned at least one LLIN (Table 95, and Figure 35 and 35).

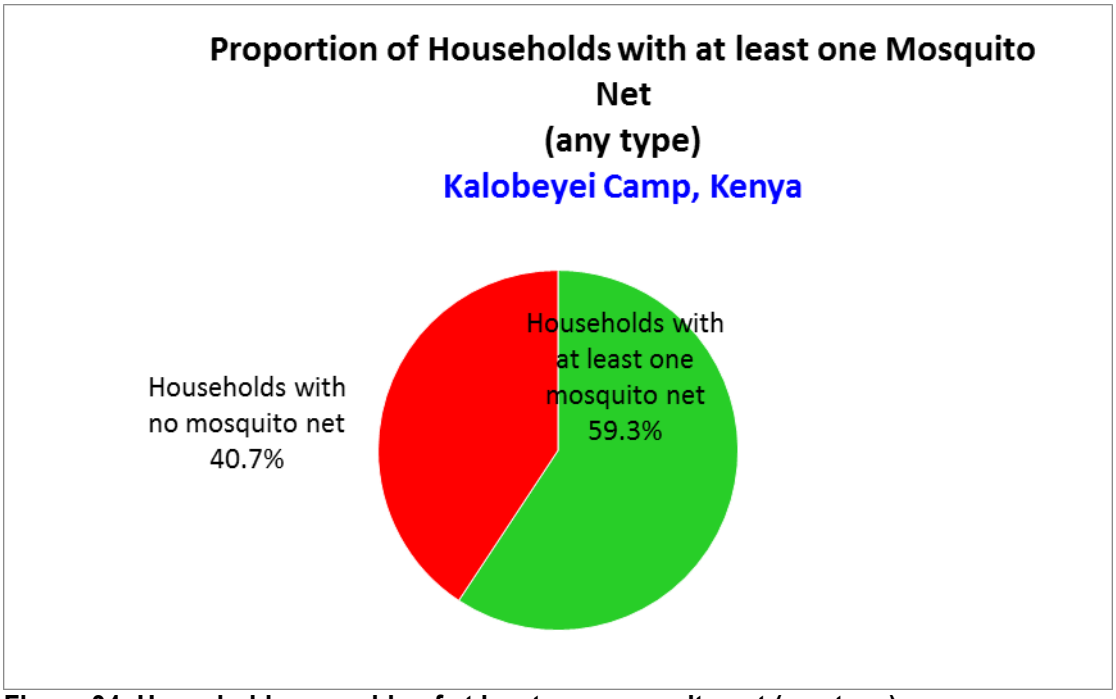

Figure 34: Household ownership of at least one mosquito net (any type)

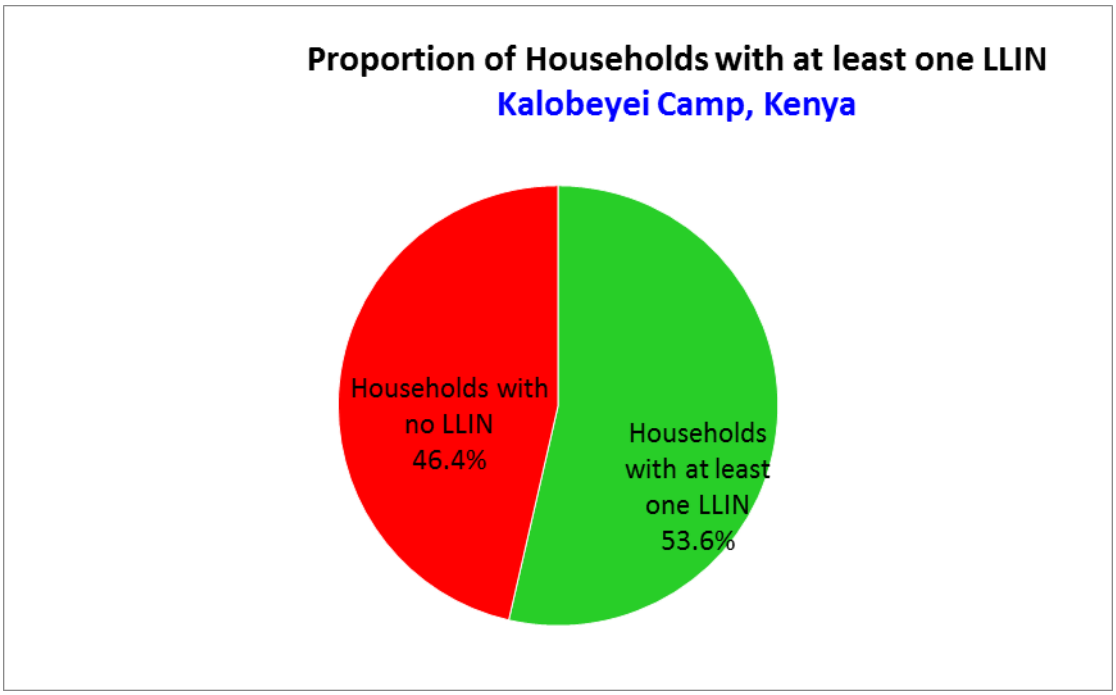

Figure 35: Household ownership of at least one Long-Lasting Insecticide Net (LLIN)

There was an average of 1 LLIN per household and 4.9 persons per LLIN, which was well above the recommended 2 per households (Table 96).

Table 96: Number of nets

Average number of LLINs per household	Average number of persons per LLIN
1.0	4.9

Mosquito net utilisation is shown in Table 97 and Figure 36. Out of the total population, 47.1% had slept under a net of any type, with 45.2% sleeping under a LLIN. For children below 5 years and pregnant women, 59.6% and 71.0% slept under a LLIN, respectively.

Table 97: Mosquito net utilisation.

	Proportion of total population (all ages)		Proportion of 0-59 months		Proportion of pregnant women	
	Number /total	%	Number /total	%	Number /total	%
Slept under net of any type	679/1442	47.1	187//297	63.0	23/31	74.2
Slept under LLIN	652/1442	45.2	177/297	59.6	22/31	71.0

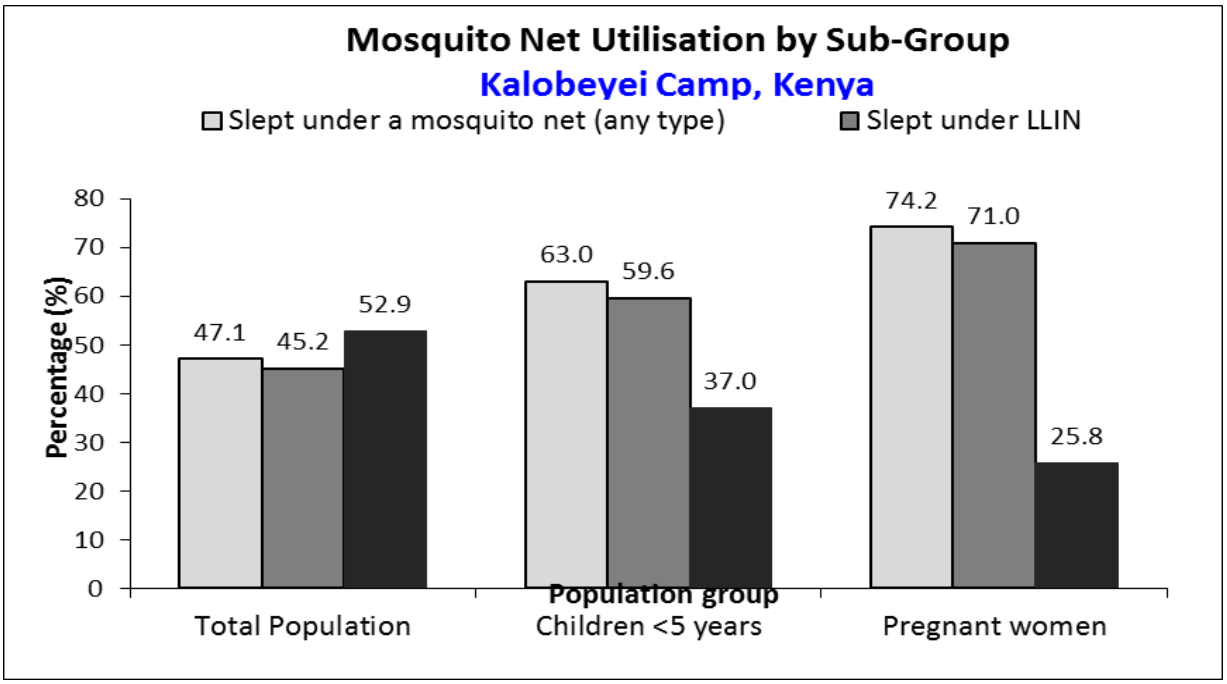

Figure 36: Mosquito net utilisation by sub-groups

Only 5.5% (0.0-11.1, 95% C.I) of households reported indoor residual spraying, which is linked to the type of shelter in Kalobeyei.

Table 98: Indoor Residual Spraying

	Number/total	% (95% CI)
Proportion of households covered by IRS	15/275	5.5 (0.0-11.1)

6 LIMITATIONS

- **Data quality:** The overall quality of the data collected was good as indicated by the ENA plausibility score of 4% (see **Annex 1)**. The majority of negative points were due to the overall age distribution. There were considerably less children in the 54-59 month age group as frequently seen in Kakuma nutrition surveys.

- **Accuracy of population data:** UNHCR's ProGres data was used for planning and cluster selection. Specific to Kalobeyei, Census data that was conducted by KRCS was used to give actual population and number of households in each neighbourhood.

- **Selective feeding programme coverage for young children and Infant and young Child feeding data:** Selective feeding programme coverage results as well as some indicators of Infant and young child feeding should be interpreted with caution due to the small survey sample size.

- **Programme coverage for women:** The coverage of ANC enrolment of and iron and folic acid supplementation to pregnant women, and MUAC in PLW should be interpreted with caution due to the small number of beneficiaries that were sampled during the survey.

- **Languages:** Efforts were made to ensure that each team was made up of individuals who could speak each of the languages within the Kakuma Refugee Camp. In some rare cases, none of the team spoke the household language, and were instead reliant on the block leaders within the daily survey clusters for translation which may have introduced inaccuracies in interpretation.

7 DISCUSSION

7.1 Nutritional status of young children

- The prevalence of GAM in Kakuma was 10.6 %(7.8 – 14.3 95% CI) with 0.8% severe acute malnutrition (SAM) in 2017 compared to GAM prevalence of 13.5% (10.2- 17.6 95% CI) with SAM prevalence of 1.9% in 2016 which shows a slight decrease in GAM from 2016 though not statistically significant. Trend analysis shows that the prevalence of GAM in Kakuma in 2015 -2016 has been between 10 -14 percent indicating serious nutrition situations as per WHO classification, whereas in previous years 2010-2014, the prevalence of GAM has been 5-9 percent classified as poor nutrition situation. Kalobeyei GAM prevalence was 5.8% (3.8 -8.9 95% CI) classified as poor nutrition situation a reduction from 2016 GAM prevalence of 8.9% (6.3 -12.4 95% CI) Considering that new arrivals have joined Kakuma refugee camp in 2017 and upsurge in morbidity: Malaria, Watery diarrhoea and cholera was experienced during the year, it is an indication that intervention programmes and response initiatives put in place worked thus reducing the effect of the crisis. The acceptable level for GAM prevalence is lower than 5% which is the acceptable range as per WHO classification.
- In KakumaThe highest prevalence of severe wasting was seen in the 54 -59 months age group at 3.1 %. This is different from the results of the previous survey where highest prevalence was seen in the 6-17 months age group at 3.3% of children

affected. When this age groups were disaggregated for WHO IYCF AGE indicators. The highest prevalence was in the 6 – 17 month age group at 0.9% and 30-41 at 1%. This is important as the 6 – 23 month age group is most vulnerable to effects of malnutrition. Moderate wasting was highest in the 54-59 months age group (15.4%) and the 6-17 months age group (11.1%).

- In Kalobeyei the highest prevalence of severe wasting was seen in the 54-59 months age group at 1.3%, followed by 6 -17 months at 1.1% and 42 -53 months at 0.9%.
- Oedema was absent in both Kakuma and Kalobeyei this shows timely interventions were in place to prevent children deteriorating to severe malnutrition.
- The prevalence of stunting in Kakuma was 15.8% (12.0 – 20.7 95% C.I.), there is no significant difference compared to 2016 (17.1% (12.4 – 23.0 95% CI).
- In Kalobeyei prevalence of stunting decreased from 43.3% (38.0 – 49.0 95% C.I.) in 2016 to 26.2% (21.6 – 31.4 95% C.I)
- Stunting could be attributed to inadequate consumption of a nutritious diet, over the years most survey results show limited consumption of fruits, vegetables and animal source food. This year for example only 19.6% consumed animal source foods. Although children 6-23 months are provided with supplements CSB++, it is know that this food is shared among family members therefore may not benefit the child.
- The prevalence of Diarrhoea in past two weeks was 21.5% (15.5 -27.5) in Kakuma and (13.8% (95% CI 9.6-18.0) in Kalobeyei compared to last year's prevalence in Kakuma was 19.9% (16.7-23.2) and 22.6 (18.4-26.8) in Kalobeyei. The difference for Kakuma is not statistically significant but the reduction in Kalobeyei is significant. Diarrhoea is often associated with poor sanitation practices and the quality and coverage of water and sanitation resources. Due to fast rate of increase in the population of refugees, there has been a strain in available resources as indicated by NRC KAP survey on WASH. Another problem is movement of population from assigned area e.g the movement of population from Kakuma four to Kakuma one thereby adding more to the strain. Such as strain of available resources may lead to inadequate water supply and poor solid waste management which in turn could lead to diseases such as diarrhoea. With diarrhoeas there is a compromised nutritional status. Watery Diarrhoeas was one of the most common causes of morbidity and mortality in 2017 (HIS data January 2017–November 2017)

7.2 Prevalence of intake

Prevalence of Blanket Supplementary Feeding Programme and Infant formula

- In Kakuma 3.9% of children of age group 0 -23 months consumed infant formula while in Kalobeyei 1.9% of the same age group consumed infant formula. This is good indication of knowledge and practice of exclusive breastfeeding and continuation until 24 months.

- In Kakuma 8.7% of children aged 6 -23 months consume CSB+ whereas 78.7% of the same age group consume CSB++. In Kalobeyei about a quarter of this age group consume CSB+ and 84.9% consume CSB++.

- The results from Coverage for measles vaccination, vitamin A supplementation within last 6 months show that 96.3 %(94.1-98.6) 95% CI) and 77.6 % (68.0 -85.1)95%) of the population received measles a vaccination and vitamin A supplementation respectively. Compared to November 2016 where measles vaccination was 96.1% and

95% for Kakuma and Kalobeyei and vitamin A supplementation was 86.5 % and 81.9% in 2016 in Kakuma and Kalobeyei respectively. . It is worth noting that a small proportion of the population with measles vaccination (Kakuma 41% and Kalobeyei 47.8%) and vitamin A supplementation (Kakuma 15.9% and Kalobeyei 21.4%) could be verified by card. Therefore more efforts should be put into proper documentation. Trends since 2014 show an increase in measles vaccination rates in Kakuma and have since remained above 90%. A reduction of vitamin A supplementation during the same period however has been above 80%. Efforts to maintain measles coverage and improve Vitamin A coverage should be put in place.

- The coverage for ANC enrolment was 95.7% for Kakuma and 100% for Kalobeyei and for iron folic acid pills is 82.6% for Kakuma and 100% for Kalobeyei. There is improvement as compared to 2016 where the coverage for ANC enrolment was 84.1% for Kakuma and 76.9% for Kalobeyei and Iron folic acid pills coverage was 77.3% for Kakuma and 61.5% for Kalobeyei.

Anaemia in young children and women

- Prevalence of anemia in children 6-59 months was 59.2 %(50.8 -67.6 95% C.I) in Kakuma and 57.8% (51.1- 64.4 95% C.I) in Kalobeyei compared to 48.4% and 62.3% in Kakuma and Kalobeyei respectively in 2016. The difference is not statistically significant for Kakuma however the reduction is significant for Kalobeyei. Anaemia prevalence levels are above the critical public health threshold of >40% which indicate that anaemia continues to be a major public health problem in Kakuma and Kalobeyei Refugee Camp which uncovers the existing problem with micronutrient deficiency as Anaemia is used as a proxy indicator for micronutrient situation. Despite interventions in place meant to address anaemia such as fortified blended foods CSB++ targeting children of age group 6 to 23 months, low dietary diversity which minimizes the bio availability of iron in the gut and diseases such as Malaria affect iron absorption. The prevalence of anaemia is significantly high among children aged 6-23 months group in both the locations 75.3% and 73.3%. There is urgent need for improvement and enhancement of preventive blanket SFP for this age group to increase the coverage and utilization of fortified food (CSB++) and as well consider micronutrient supplementation for children aged 24 – 59 months.
- Anaemia prevalence among non-pregnant women aged 15-49 years was 38.5% for Kakuma and 34.2% for Kalobeyei. Compared to November 2016 results that observed 33.12% in Kakuma and 45.3%. The difference was not statistically significant. The results are below the 40% of WHO/UNHCR threshold for critical prevalence, but still between the 20-39% for medium public health significance.
- There is need for nutrition sensitive interventions in order to address the micronutrient deficiency problem in Kakuma and Kalobeyei. Households use food voucher primarily for buying cereals, as a result the purpose of the food voucher to enable dietary diversity is diluted.

7.3 IYCF indicators

- Children 0-23 months are most vulnerable to the detrimental effects of malnutrition, at this age there is a rapid growth spurt and lack of adequate nutrition may result in growth retardation. As shown in this survey, the stunting rate was at 15.8% and 26.2% in Kakuma and Kalobeyei respectively. Proper infant and young child feeding practices goes a long way in preventing this.

- It is important to note that the IYCF sample for this survey was drawn from ENA for SMART sample size calculation for acute malnutrition. In order to calculate prevalence of IYCF indicators, each age group should have a representative sample size. The surveys main objective was to determine the rate of malnutrition. Time constraints and numerous indicators assessed in the survey would not have allowed for this type of sampling to be done. The IYCF sample is therefore underrepresented. As such these results will give us a general overview of the situation but not an accurate assessment.
- Timely initiation of breastfeeding is important as, the first milk, colostrum, contains antibodies which help to build a child's immune status. In November2017, timely initiation was 82.4% and 85% in Kakuma and Kalobeyei and was not significantly different from the November 2016 at 90.9% and 91.8% in Kakuma and Kalobeyei respectively. These results are indicative of reduced awareness by mothers on importance of early start to breastfeeding and barriers to practicing the knowledge acquired by the mothers. There are Mother to Mother Support Groups in existence, although it does not cover the entire camp, this results should encourage scale up of this type of intervention.
- The rate of exclusive breastfeeding was 86% and 84.1% for Kakuma and Kalobeyei respectively which is a reduction for Kakuma from 90% and increase for Kalobeyei from 66.7% in 2016. The confidence intervals however overlap therefore the difference is not statistically significant. Exclusive breastfeeding should be highly encouraged as it helps to build a child's immunity. It is also a cheap, highly nutritious and hygienic way of feeding a child.
- Consumption of iron rich foods was 80.6% for Kakuma and 86.6% for Kalobeye, an improvement as compared to the previous survey which had 70.9% for Kakuma and 59.4% for Kalobeyei. CSB++ was the biggest contributor to the iron rich food as the food security and dietary diversity data show low consumption of protein and micronutrient rich foods.
- A very small percentage of the respondents bottle-fed their children 5.2% in Kakuma and 3.2% in Kalobeyei an improvement as compared to 2016 which had 12.9% for Kakuma and 6.5% for Kalobeyei. This is an encouraging trend.

7.4 Food security

- All respondents interviewed had a ration card an excellent stride as compared to 2016 when only 97.7% in Kakuma and 95.5% in Kalobeyei had a ration card. The average number of days that the food ration lasted was 16.4 days for Kakuma and 18.4 days for Kalobeyei out of the 30 days. This meant that 11- 13 days were spent without GFD. In the November 2016 survey the food ration lasted for 17.88 days in Kakuma and 15.67 days for Kalobeyei. The Join Assessment Mission report shows that often there is more strain being experienced in smaller households and a differential allocation of Bamba Chakula value has been employed to bridge food strain among household sizes one and two. Additionally food is also sold off to meet other needs such as buying fuel or non-food items.
- A large proportion of the population did not consume micronutrient rich foods in Kalobeyei at 40.6% as compared to Kakuma where 15.7% did not consume micronutrient rich foods as compared to 2016, In Kakuma, 30.4% and Kalobeyei 36.9% consumed micro nutrients rich foods
- The proportion of the households that did not use any negative coping strategy was 20.7% in Kakuma and 15.7% in Kalobeyei as compared to 12.4% for Kakuma and 12.1% for Kalobeyei in 2016. This indicates that there is a slight improvement in food

availability in household levels as lesser families are practicing coping mechanism.The most common coping strategies are Borrow cash, food and other items at 39.4% in Kakuma and 41% in Kalobeyei, followed by selling NFIs at 9% in Kakuma and 7.7% in Kalobeyei.

- For household dietary diversity, the average diversity was 4/12 foods for Kakuma and 4.5/12 foods for Kalobeyei. This was higher than in 2016 where HDDS score for Kakuma was 3.03/12 foods and Kalobeyei 2.81/12 foods. The most commonly consumed food were cereals, followed by oil/fats and pulses. Least consumed were fruits, eggs and meat. This could be due to increased prices of these products in Kakuma and Kalobeyei markets and also explain the low consumption of micronutrients observed among children and women.

7.5 WASH

- Adequate water, good sanitation and hygiene practices are essential for health. Nutritional status deteriorates with poor sanitation. Diarrhoea is mainly caused by contaminated water sources and poor sanitary practices.
- The proportion of households with access to an improved drinking water source was at 100% in both Kakuma and Kalobeyei, an increase from 99.8% and 98.2% in Kakuma and Kalobeyei respectively. This results are not surprising as the main source of water in Kakuma is standing taps which are safe to drink. During periods of shortage they may access water from the unsafe sources.
- The proportion of households with a Narrow necked container was 86.6% in Kakuma and 81% in Kalobeyei, a great improvement as compared to at 44.7% and 47.6% for Kakuma and Kalobeyei respectively in 2016 attributed to a recent general distribution of core relief items to the old refugee population. Additionally, most water containers were covered with a cloth to keep it cool, a way in which germs could be introduced into the water.
- The proportion of household with less than 15 lpppd was 51.6% and 54.3% in Kakuma and Kalobeyei respectively which is a slight improvement in Kakuma from 53.5% and a significant improvement un Kalobeyei from 81% in 2016. Previously Kalobeyei population relied on water trucking as water infrastructure was under development.
- In Kakuma, only 37.9% and 30.6% in Kalobeyei reported being satisfied with water supply compared to 34.5% and 13.9% in Kakuma and Kalobeyei respectively in 2016. Those dissatisfied with water supply cited the main reason as insufficiency (46.3% and 75.8% for Kakuma and Kalobeyei) and long waiting at the que. In the year 2015 and 2014, this same reason was reported in Kakuma thus shows that problems associated with inadequate water supply still persist in the camps.
- The proportion of households that used an improved excreta facility was 56.4% and 2.8% in Kakuma and Kalobeyei respectively compared to 59.5% and 0.6% in Kakuma and Kalobeyei respectively 2016. The results are not significantly different. About 21% in Kakuma and 17.6% in Kalobeyei shared family toilet with two other households compared to 14.9% in Kakuma and 7.9% in Kalobeyei in 2016.
- The proportion of households that had an unimproved toilet facility was 3.8% and 4% in Kakuma and Kalobeyei respectively. This is a significant development probably an indication of overstretched facilities.
- Safe disposal of excreta is an important preventative measure against the contamination of water supplies or the food chain. The safe disposal of children's faeces is of particular importance because children's faeces are the most likely cause of faecal contamination to the immediate household environment. "Safe" is

understood to mean disposal in a safe sanitation facility or by burying. In 2017 the proportion of households that safely disposed the faecal waste of children under 3 was: in Kakuma 96.5% and 98.9% in Kalobeyei as compared to the previous survey that had 97.8% in Kakuma and 98.1% in Kalobeyei. NRC is responsible for solid and liquid waste management, vector and pest control, sanitation, food quality monitoring hygiene promotion. The effect of the influx on delivery of these services was strained resources as a result of a high population arriving at the same time. Additionally because the focus was mainly on the new arrivals, the old population suffered as it was a strain on the available resources. For example households in the old population whose toilets are filled up and this could explain why more refugees used unimproved toilet facilities in this year's survey.

7.6 Mosquito net coverage

- A total of 73.3% in Kakuma and 53.6% in Kalobeyei owned at least one LLIN mosquito net in 2017 as compared to 76.5% and 51.85% respectively in 2016. Additionally, in Kakuma 58.6 %, 74.7% and 96.2% of all households, children 0-59 months and pregnant women respectively slept under an insecticide treated mosquito net compared to 68.9%, 63.2% and 97.9% in 2016. In Kalobeyei, 45.2%, 59.6% and 71% of all households, children 0-59 months and pregnant women respectively slept under an insecticide treated mosquito net compared to 34.5%, 27.3% and38.1% in 2016. , it's worth noting use of LLIN among pregnant women is very encouraging, probably because they are routinely issued given during the antenatal clinics. (ANC).This results is below the >80% recommended by UNHCR.
- Additionally, there was an average of 1.8 and 1 mosquito nets per household in Kakuma and Kalobeyei respectively. Average number of persons per LLIN was 3.5 and 4.5 for Kakuma and Kalobeyei respectively. This was below the UNHCR target of <2 people per mosquito net. The incidence of malaria as well as mortality associated with malaria was high in 2016. This is could be the results of shortage of mosquito nets or poor quality of the nets available, although the survey did not asses the quality of nets, observations showed that very few households had received new nets in the past year and quality of existing nets in some of the households was extremely poor.

8 CONCLUSION

The results of the survey show there has been no significant change in the public health and nutrition situation at the Kakuma Refugee Camp but slight reduction in acute malnutrition and significant reduction in stunting in Kalobeyei settlement.

Dietary diversity is higher in Kalobeyei as compared to Kakuma and has improved in the two survey sites as compared to 2016.

There is noted areas of deterioration mainly associated with strain of resources, this mostly affected WASH and Mosquito net and food Security. Given the situation in 2016, intervention put in by agencies in ground seem to have worked otherwise the situation would have been worse. More efforts will be required to maintain and strengthen existing programmes and activities; and to reduce under nutrition to acceptable levels (according to WHO classifications this is <5% for wasting, <20% for stunting and <20% for anaemia), whilst continuing to protect the nutritional well-being and health of the general population.

Documentation process for this should be improved, there is a high percentage of children whose vaccination, vitamin A supplementation could not be confirmed by card. To ensure adequate coverage good records should be maintained. There need for continued screening and active case finding of malnourished children, as shown the coverage is not up to the recommended standard.

Anaemia prevalence among children aged 6-59 months remains at the above 40% threshold for critical, more specifically significantly high among children aged 6-23 months (75.3% and 73.3% in Kakuma and Kalobeyei). Women anaemia status lowers than 40% but still relatively high. Although a number of intervention are in place to combat malnutrition such as providing CSB++ to children and CSB to pregnant and lactating women, check and balances should be in place to ensure that this products are consumed by intended persons. Additionally a scale up of kitchen gardening programmes to ensure they reach all parts of the camp. One of the major setbacks for this programme is lack of land and inadequate water supply, more support should be provided to the kitchen gardening programme.

IYCF indicators showed a poor timely initiation of breastfeeding, continued breastfeeding and timely introduction of solid and semisolid foods. However exclusive breastfeeding rates and consumption of iron rich foods was high. Continuation of and scaling up of programmes such as MTMSG, hygiene promotion, ANC and other education related programmes would be beneficial. Focus should be on improving infant and young child feeding indicators.
There was poor dietary diversity as shown in previous surveys and the population primarily consumed cereals due to affordability. Continued provision of GFD and BSFP will prevent the situation from deteriorating.

WASH indicators, especially those associated with excreta disposal showed a decline. It shows that the high population as a results of the refugee influx has strained existing resources and there is need for a scale up of resources to meet the needs of the growing population.

Mosquito net coverage continues to deteriorate, as no nets have been distributed in the last two year most household did not have adequate coverage except for pregnant women who are provided with nets. This is important as malaria continues to be one of the leading causes of morbidity. Mosquito net coverage needs to be addressed as the available nets are old and worn out with no replacement.

9 RECOMMENDATIONS AND PRIORITIES

- Enhance support, promotion and protection of IYCF practices through the integration of UNHCR multi-sectoral IYCF friendly framework. UNHCR and partners staff has been trained on IYCF-E and the roll out of mentioned framework.
- Continued, active case finding and screening of acutely malnourished children should be maintained, to improve OTP and TSFP and BSFP coverage.
- Improve active case finding, referral and follow up of SAM and MAM cases through community based approach.
- Strengthen Anemia/ micronutrient deficiency screening and treatment programme as immediate response to the rising Anemia prevalence and consider micronutrient supplementation.
- Ensure increased awareness and sensitization for proper use of Food voucher (BAMBA CHAKULA) to ensure dietary diversity. This can be achieved through household visits, education, and mother-to-mother support groups

- Improvement of prevention and treatment of malaria should be prioritised as there high mortality rates associated with malaria.
- NRC to strongly advocate for malaria prevention activities such as indoor residual spraying (IRS) in order to control the high prevalence of Malaria observed in 2017.
- NRC to improve the latrine coverage and continue with health education activities that could prevent the occurrence of diarrhea.

Medium term

- Partners to reinforce activities to improve dietary diversity at household level, including continued scale up of home gardening projects. NRC to continue improvements and scale up kitchen gardening activities, especially important in helping to diversify the diet.
- IRC to continue and scale up MTMSG's to improve infant and young child feeding practices and link growth monitoring to monitor the outcome.
- WASH partners to continue with Knowledge Attitude and Practice (KAP) survey which provides useful information to support nutrition findings.
- NRC to continue with installation, coverage and maintenance of household latrines. Attention needs to be paid to new arrival areas.
- WFP to continue conducting food security Food Security Outcome monitoring and respond to findings
- Health agencies to conduct qualitative assessments of the health-seeking behaviour of new arrivals, with the aim of improving uptake of services and preventing a deterioration of their nutritional status

Long term

- Improve and scale up the livelihood opportunities for the refugees through development-oriented initiatives to improve their economic status
- All partners to improve monitoring of programmes to aid with end-term impact evaluations
- Health partners to maintain integrated approach to programming, and ensure sufficient training for new Community Health Workers and timely re-fresher training where necessary

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Annex 1: SMART Plausibility check report

Overall data quality: KALOBEYEI

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** (0.2 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**2** (p=0.077)
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**4** (p=0.013)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (4)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (8)
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 and	<1.15 and	<1.20 and	>=1.20 or	
.	Excl	SD	>0.9 0	>0.85 5	>0.80 10	<=0.80 20	**0** (0.98)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (-0.02)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (-0.16)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	**0** (p=0.057)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**10 %**

The overall score of this survey is 10 %, this is good.

Overall data quality: KAKUMA

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** (2.0 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0.236)
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=0.543)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (4)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (8)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (9)
Standard Dev WHZ .	Excl	SD	<1.1 and	<1.15 and	<1.20 and	>=1.20 or	
.	Excl	SD	>0.9 0	>0.85 5	>0.80 10	<=0.80 20	**0** (0.97)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (-0.04)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**3** (-0.42)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	**0** (p=0.139)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**7 %**

The overall score of this survey is 7 %, this is excellent.

Annex 2: Calendar of events

Religious holiday	Local event /Other event	Somali Calendar	Seasons	Month/ year
				November
	Kenya election 2	Arafa	Lean season	October
End ramadan		Sigalal	Lean season	September 2017
	Kenya election 1	Soon fur	Lean season	August 2017
		Soon		July 2017
	World refugee day	Shab'an	Long rains	June 2017
	Rajab		Long rains	May 2017
	Jamadul akhir		Long rains	April 2017
		Jamadul awal		March 2017
		Malmadone		February 2017
		Mowlid		January 2017
		Safar	Short rains	December 2016
	US General election ; Trumph Won Election	Zako	Short rains	November 2016
	Mass mosquito distribution	Arafa	Lean season	October 2016
End ramadan	Head count in Kakuma refugee camp	Sigalal	Lean season	September 2016
Beginning ramadan	Bamba chakula event	Soon fur	Lean season	August 2016
	Electric poles installed in Kakuma			
	Fights breaking out in Juba	Soon		July 2016
	Obamas visit to Kenya			
	-Red cross setting camp in Kalobeyeiyi	Shaba'an/Ramadhan	Long rains	June 2016
	-Opening of Kalobeyei camp -World refugee day - Refugee settlement in Kalobeyei camp. -Fights between Turkana and Somali.			
	Opening of the general hospital	Rajab	Long rains	May 2016
		Jamadul akhir	Long rains	April 2016
Easter (23/03)	Protests of Oromo against the Ethiopian government	Jamadul awal	Long rains	March 2016
		Malmadone		February 2016
		Mowlid		January 2016
Christmas	South Sudan fighting	Safar	Short rains	December 2015

Annex 3: SENS survey Questionnaires November 2017

UNHCR Standardized Expanded Nutrition Survey (SENS) Questionnaire
Kakuma Nutrition Survey, November 2017

Greeting and reading of rights:

THIS STATEMENT IS TO BE READ TO THE HEAD OF THE HOUSEHOLD OR, IF THEY ARE ABSENT, ANOTHER ADULT MEMBER OF THE HOUSE BEFORE THE INTERVIEW. DEFINE A HOUSEHOLD AS A GROUP OF PEOPLE WHO LIVE TOGETHER AND ROUTINELY EAT OUT OF SAME POT. DEFINE HEAD OF HOUSEHOLD AS MEMBER OF THE FAMILY WHO MANAGES THE FAMILY RESOURCES AND IS THE FINAL DECISION MAKER IN THE HOUSE.

Hello, my name is _____ and I work with *[MSF, KRCS, IRK, IRC*]. We would like to invite your household to participate in a survey that is looking at the nutrition and health status of people living in this camp.

- Taking part in this survey is totally your choice. You can decide to not participate, or if you do participate you can stop taking part in this survey at any time for any reason. If you stop being in this survey, it will not have any negative effects on how you or your household is treated or what aid you receive.
- If you agree to participate, I will ask you some questions about your family and I will also measure the weight and height of all the children in the household who are older than 6 months and younger than 5 years In addition to these assessments, I will test a small amount of blood from the finger of the children and women to see if they have anaemia.
- Before we start to ask you any questions or take any measurements, we will ask you to state your consent on this form. Be assured that any information that you will provide will be kept strictly confidential.
- You can ask me any questions that you have about this survey before you decide to participate or not.
- If you do not understand the information or if your questions were not answered to your satisfaction, do not declare your consent on this form. Thank you.

1A. Kakuma Nutrition Survey, November 2017, Household Questionnaire- FOOD SECURITY: (This questionnaire is to be administered to the Main Caretaker WHO IS RESPONSIBLE FOR COOKING THE MEALS). TO BE ADMINISTERED IN EVERY SECOND HOUSEHOLDS-HALF OF HOUSEHOLDS

Date of interview (dd/mm/yyyy)	Cluster Number	Team Number
|___|___|/|___|___|/ |___||___|	|___|___|	|___|
Section/Village: |___| **Zone/Neighbourhood:** |___| **Block/Compound:** |___|	**Camp (tick) Kakuma** |___| **Kalobeyei** |___| **Household** |___|	

No	QUESTION	ANSWER CODES	
SECTION FS1			
FS1	**Consent:**	Yes ..... 1 No ..... 2 Absent 3	
FS2	How many people live in this Household?		|___|
FS3	Does your household have a ration card?	Yes ..... 1 No…. 2	
FS4	Why does your household not have a ration card?	Not given one at registration .....1 Lost card .....2 Traded card .....3 Not registered but eligible .....4 Not eligible .....5 Other..... 98	
FS5	Does your household have a *Bamba Chakula* sim card?	Yes ..... 1 No…. 2	|___|
FS6	Why does your household not have a sim card?	Not given one at registration .....1 Lost card .....2 Traded card .....3 Not registered but eligible .....4 Not eligible .....5 Other..... 98	
FS7	Did you use your Bamba Chakula voucher over the last one month?	Yes ..... 1 No…. 2	

FS8	Why did you not use your Bamba Chakula voucher over the last one month?	No Bamba Chakula secret PIN ..... 1 Lost/damaged Bamba Chakula sim card .. 2 I am saving my Bamba Chakula voucher . 3 Other..... 98	
FS9	How many days did your food ration last from the July distribution cycle (general ration and *Bamba Chakula*)?		|___| |___|
FS10	What was the main reason the general ration/Bamba Chakula did not last until the end of the month? (for FS5 <31)	Food was sold or exchanged……1 Shared with kin/new arrivals .....2 Ration not big enough,.....3 Gave to livestock .....4 Lost due to theft..……..5 Lost due to poor storage……6 Others…… ……98	
FS11	Now I would like to ask about the food items you bought using *Bamba Chakula*. Did you buy the following food items?	Cereals (maize, wheat, sorghum, rice, spaghetti, patsta)…….…..…1 Pulses (peas, beans, lentils).....2 Oil (Vegetable oil etc) .....3 Sugar.....4 Fruits/vegetables…… ……..5 Milk…… ……6 Meat, fish…… ……7 Tea…… ……8 Salt…… ……9 Eggs…… ……..10 Drinks/juice…… ……11	
FS12	In the last month, have you or anyone in your household borrow ed cash, food or other items?	Yes ..... 1 No.....2	|___|
FS13	In the last month, have you or anyone in your household sold any assets (furniture, seed stocks, tools, other NFI, livestock etc.)?	Yes ..... 1 No.....2	|___|

FS14	In the last month, have you or anyone in your household requested increased remittances or gifts as compared to normal?	Yes ..... 1 No 2	|___|
FS15	In the last month, have you or anyone in your household reduced the quantity and/or frequency of meals?	Yes ..... 1 No 2	|___|
FS16	In the last month, have you or anyone in your household begged?	Yes ..... 1 No 2	|___|
	SECTION FS2		

Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night. I am interested in knowing about meals, beverages and snacks eaten or drank inside or outside the home.

FS17	**1**. **Cereals**: Any wheat, corn/maize, sorghum, rice or any foods made from these (e.g. bread, porridge) ***(Canjeero, chapati, Camb uulo, Basto, Baris; rooti,lyo boorash, sarin,*** ugali/sor***)***	**1……..…|___|**
	2. **White roots and tubers**: Any green bananas, lotus root, parsnip, plantains, irish potatoes, white yam, white cassava, or other foods made from roots***.(moos ceyriin, baradho)***	2……..…|___|
	3A. **Vitamin A rich vegetables and tubers**: Any carrot, pumpkin, squash, or sweet potato that are orange inside + other locally available vitamin A rich vegetables (e.g. red sweet pepper) ***(karoot)***	3A……..…|___|
	3B. Dark green leafy vegetables: Any dark green leafy vegetables, including wild forms + locally available vitamin A rich leaves such as amaranth, arugula, cassava leaves, ***spinach (Caleen Ambogi/sular, moxogta caleenteeda, cagaaran sida kosta gooman cagaar, sukuma wiki)***	3B……..…|___|
	3C. **Other vegetables**: Any other vegetables (e.g., cabbage, green pepper, tomato, onion, eggplant, zucchini, okra/) *vegetables* ***(tamata, basal, kabash, basbas cagaar ton, Baamiye, barbarooni, nyanyo)***	3C……..…|___|
	4A. **Vitamin A rich fruits**: Any mango (ripe, fresh and dried), cantaloupe melon (ripe), apricot (fresh or dried), ripe papaya, passion fruit (ripe), dried peach, and 100% fruit juice made from A rich fruits***(canbo kartay, cambe,, papaya,)***	4A……..…|___|
	4B. **Other fruits**: Any other fruits such as apple, avocados, banana, coconut flesh, lemon, , including wild fruits and 100% fruit juice made from these ***(ananas, tufax, afkadho, moos, liin- iwm)***	4B……..…|___|
	5A. **Organ meat**: Any liver, kidney, heart or other organ meats or blood-based foods***.(ber, kilyo, wadna iwm)***	5A……..…|___|
	5B. Flesh meats: Any beef, goat, lamb, mutton, chicken, duck, doves or other small wild bush meat ***(hilib xoola sida ari, lo' geel, ida, digaag ama hilib cidood ,hilib qooley-gaaleed).***	5B……..…|___|

	6. **Eggs**: Any eggs from chicken, duck, guinea fowl or any other egg ***(bet/ukun noc kasta)***	6……..|___|
	7. Fish and seafood: Any fresh or dried fish, canned fish (anchovies, tuna, sardines), or shellfish ***(kaluun, kaluun laqalajijay,, tuna/kaluunka gasacadaha, iwm).***	7……..|___|
	8. **legumes, nuts and seeds**: Any dried peas, lentils, nuts, seeds or foods made from these (eg. hummus, peanut butter) **(Misir, *sida digir , salbuko, digir soomali*).**	8……..……|___|
	9. **Milk and milk products**: Any milk, infant formula, cheese, yogurt or other milk products (e.g. kiefer) (***caano dhamaan, cano fadhi, garoor, susac*** **)**	9……..|___|
	10. **Oils and fats:** Vegetable oil ***(saliida lagabixiyo xarada –sida saliid cadeey). (saliida xarada aan lagabixinin-sida macsaro, sixin, subag iwm)***	10……..|___|
	11. **Sweets**: Any sugar, honey, sweetened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies, sweet biscuits and cakes. ***(macmacaanka (sokor, malab, soda, cabitaan lamacaaneyay, nacnac, buskut, doolsha halwa)***	11……..……..|___|
	12. **Spices, condiments, beverages**: Any spices (black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages**.((*filfil madoow, cusba,heel, basbaas, shah, bun*)**	12……..|___|
	13. Food aid fortified blended food: Have you or anyone else in your household eaten CSB or any food made from these yesterday during the day and at night**?*(Boorash)***	Yes……..1 No……...2 DK……..8

1B. Kakuma Nutrition Survey, November 2017, Household Questionnaire-WASH. TO BE ADMINISTERED IN EVERY HOUSEHOLD

Date of interview (dd/mm/yyyy)	Cluster Number	Team Number
|___|___|/|___|___|/ |___||___|	|___|___|	|___|
Section/Village: |___| **Zone/Neighbourhood:** |___| **Block/Compound:** |___|	**Camp (tick) Kakuma** |___| **Kalobeyei** |___| **Household** |___|	

No	QUESTION	ANSWER CODES	
SECTION WS1			
WS1	How many people live in this household and slept here last night?		|___|
WS2	What is the ***main*** source of drinking water for members of your household? **DO NOT READ THE ANSWERS** **SELECT ONE ONLY**	Public tap/standpipe .....……..01 Small water vendor.....02 Surface water (e.g. river, pond) .....03 Other .....98 Don't know.....99	|___|
WS3	Are you satisfied with the water supply? THIS RELATES TO THE DRINKING WATER SUPPLY	Yes .....1 No.....2 Other 6	|___
WS4	What is the ***main*** reason you are not satisfied with the water supply?	Amount is not enough .....1 Long queue at the tap stand.....2 Water point is far .....3 Water tastes bad .....4 Inadequate water storage containers……5 Other 98	
WS5	What kind of toilet facility does this household use? **DO NOT READ THE ANSWERS** **SELECT ONE ONLY**	Simple pit latrine with floor/slab .....02 Pit latrine without floor/slab.....03 No facility, field, bush, plastic bag……..…04	|___|___|
WS6	How many ***households*** share this toilet? (**THIS INCLUDES THE SURVEYED HOUSEHOLD)**	RECORD NUMBER OF HOUSEHOLDS IF KNOWN (RECORD 96 IF PUBLIC TOILET OR 98 IF UNKNOWN)	|___|___| Households

		SUPERVISOR SELECT ONE ONLY Not shared (**1 HH**) .....1 Shared family (**2 HH**).....2 Communal toilet (**3 HH or more**).....3 Public toilet (**in market or clinic etc**.).....4 Don't know.....8			
WS7	Did you receive soap in the last one month?	Yes…… ……..1 No…… ……2			
WS8	Do you have children under three years old?	Yes .....1 No.....2			|___| **IF ANSWER IS 2 GO TO WS9**
WS9	The last time [NAME OF YOUNGEST CHILD] passed stools, what was done to dispose of the stools? DO NOT READ THE ANSWERS SELECT ONE ONLY	Child used toilet/latrine .....01 Put/rinsed into toilet or latrine .....02 Buried .....03 Thrown into garbage.....04 Put/rinsed into drain or ditch.....05 Left in the open.....06 Other .....96 Don't know 98			|___|___|
WS10	CALCULATE THE TOTAL AMOUNT OF WATER USED BY THE HOUSEHOLD PER DAY THIS RELATES TO ALL SOURCES OF WATER (DRINKING WATER AND NON-DRINKING WATER SOURCES)	Please show me the containers you used yesterday for collecting water ASSIGN A NUMBER TO EACH CONTAINER	Capacity in litres	Number of journeys made with each container	Total litres **SUPERVISOR TO COMPLETE HAND CALCULATION**
		1 E.g. jerry can	25 L	1 x	25
		2 E.g. jerry can	10 L	2 x	20
		3 E.g. jerry can	5 L	2 x	10
		4 E.g Jerry can	5 L	1 x	5
		5 E.g. bucket	50 L	1 x	50
		Total litres used by household			**110**
WS11	Please show me where you store your drinking water. ***(ARE THE DRINKING WATER CONTAINERS COVERED OR NARROW NECKED?)***	All are .....1 Some are.....2 None are……3			|___|___|

1C. Kakuma Nutrition Survey, November 2017, Household Questionnaire-MOSQUITO NET. TO BE ADMINISTERED IN EVERY SECOND HOUSEHOLD (HALF OF HOUSEHOLDS)

Date of interview (dd/mm/yyyy)	Cluster Number	Team Number
|___|___|/|___|___|/ |___||___|	|___|___|	|___|
Section/Village: |___| **Zone/Neighbourhood:** |___| **Block/Compound:** |___|	**Camp (tick) Kakuma** |___| **Kalobeyei** |___| **Household** |___|	

No	QUESTION	ANSWER CODES	
SECTION TN1			
TN1	How many people live in this household and slept here last night? INSERT NUMBER		|___|___|
TN2	How many children 0-59 months live in this household and slept here last night? INSERT NUMBER		|___|___|
TN3	How many pregnant women live in this household and slept here last night? INSERT NUMBER		|___|___|
TN4	Did you have your house sprayed with insecticide in an indoor residual spray campaign in the past 6 months?	Yes..... 1 No 2	|___|
TN5	Do you have mosquito nets in this household that can be used while sleeping?	Yes..... 1 No 2	|___| **IF ANSWER IS 2 STOP NOW**
TN6	How many of these mosquito nets that can be used while sleeping does your household have? INSERT NUMBER	IF MORE THAN 4 NETS, ENTER THE NUMBER AND USE ADDITIONAL NET QUESTIONNAIRE SHEETS ENTERING THE NUMBER OF THE NETS SEQUENTIALLY AT THE TOP.	|___| Nets
TN7	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. IF NETS ARE NOT OBSERVED → CORRECT TN6 ANSWER	NET #|___| NET #|___| NET #|___|	NET #|___|

TN8	OBSERVE NET AND RECORD THE BRANDNAME OF NET ON THE TAG. IF NO TAG EXISTS OR IS UNREADABLE RECORD 'DK' FOR DON'T KNOW.				
TN9	**For surveyor/supervisor only (not to be done during interview)**: WHAT TYPE OF NET IS THIS? BASED ON THE TAG INDICATE IF THIS IS A LLIN OR OTHER TYPE OF NET OR DK.	1=LLIN 2=Other/DK |___|	1=LLIN 2=Other/DK |___|	1=LLIN 2=Other/DK |___|	1=LLIN 2=Other/DK |___|
TN10	**For surveyor/supervisor only (not to be done during interview)**: RECORD THE TOTAL NUMBER OF LLINs IN HOUSEHOLD BY COUNTING THE NUMBER OF '1' IN TN9.				|___| LLINs

SECTION TN2							
Line no	**Household members**	**Sex**	**Age**	**Pregnancy status**	**Slept under net**	**Which net**	**Type of net**
#	**COL1**	**COL 2**	**COL3**	**COL4**	**COL5**	**COL6**	**COL7**
	Please give me the names of the household members who live here and who slept here last night	Sex m/f	Age years	FOR WOMEN 15-49 YEARS, ASK: Is (NAME) currently pregnant? (CIRCLE NOT APPLICABLE OR N/A'99' IF FEMALE <15->49 YEARS OR MALE) Yes No/DK N/A	Did (NAME) sleep under a net last night? Yes No/DK	ASK THE RESPONDENT TO PHYSICALLY IDENTIFY WHICH OF THE OBSERVED NETS THEY SLEPT UNDER. WRITE THE NUMBER CORRESPONDING TO THE NET THEY USED.	**For surveyor/ supervisor only:** BASED ON THE OBSERVED NET BRANDNAME RECORDED (TN8), INDICATE IF IT IS AN LLIN OR OTHER / DON'T KNOW (DK). LLIN OTHER/DK
01		m f	<5 ≥5	1 0 99	1 0	|___|	1 2
02		m f	<5 ≥5	1 0 99	1 0	|___|	1 2

03		m f	<5 ≥5	1 0 99		1 0		1	2
04		m f	<5 ≥5	1 0 99		1 0		1	2
05		m f	<5 ≥5	1 0 99		1 0		1	2
06		m f	<5 ≥5	1 0 99		1 0		1	2
07		m f	<5 ≥5	1 0 99		1 0		1	2
08		m f	<5 ≥5	1 0 99		1 0		1	2
09		m f	<5 ≥5	1 0 99		1 0		1	2
10		m f	<5 ≥5	1 0 99		1 0		1	2
11		m f	<5 ≥5	1 0 99		1 0		1	2
12		m f	<5 ≥5	1 0 99		1 0		1	2
13		m f	<5 ≥5	1 0 99		1 0		1	2
14		m f	<5 ≥5	1 0 99		1 0		1	2
15		m f	<5 ≥5	1 0 99		1 0		1	2

Mosquito net summary (for surveyor / supervisor only, not to be done during interview)

	Total household members		**Total <5**		**Total Pregnant**	
Slept under a net of any type	Count the number of '1' in COL5	**TN11** |___|___|	For children < 5 (COL3 is '<5'), count the number of '1' in COL5	**TN13** |___|___|	For pregnant women (COL4 is '1'), count the number of '1' in COL5	**TN15** |___|___|
Slept under an LLIN	Count the number of '1' in COL7	**TN12** |___|___|	For children <5 (COL3 is '<5'), count the number of '1' in COL7	**TN14** |___|___|	For pregnant women (COL4 is '1'), count the number of '1' in COL7	**TN16** |___|___|

2. Kakuma Nutrition Survey, November 2017, Women Questionnaire (women aged 15 - 49 years) TO BE ADMINISTERED IN EVERY SECOND HOUSEHOLD (HALF OF ALL HOUSEHOLDS)

Date of interview (dd/mm/yyyy)	**Cluster Number**	**Team Number**
|___|___|/|___|___|/ |___||___|	|___|___|	|___|
Section/Village: |___| **Zone/Neighbourhood:** |___| **Block/Compound:** |___|	**Camp (tick) Kakuma** |___| **Kalobeyei** |___| **Household** |___|	

WM1	**WM2**	**WM3**	**WM4**	**WM5**	**WM6**	**WM7**	**WM8**	**WM9**
ID	**HH**	**Consent given** 1=yes 2=no 3=absent	**How old are you?** (years)	**Are you pregnant?** 1=yes 2=no 8=DK	**Are you currently breastfeeding a child below 6 months?** 1=yes 2=no	**Are you currently <u>enrolled</u> in the ANC programme?** 1=yes 2=no 8=DK	**Are you currently <u>receiving</u> iron-folate pills (*SHOW PILL*)?** 1=yes (STOP NOW) 2=no (STOP NOW) 8=DK	**Hb** (g/L or g Questio be aske WM5=N DK

3. Kakuma Nutrition Survey, November 2017, Questionnaire for Children Aged 6-59 months

TO BE ADMINISTERED IN EVERY HOUSEHOLD

Date of interview (dd/mm/yyyy)	Cluster Number
|___|___|/|___|___|/ |___||___|	|___|___|

Section/Village: |___|

Zone/Neighbourhood: |___|

Block/Compound: |___|

Camp (tick) Kakuma |___|

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
HH No	**Child ID**	**Name of child**	**Consent** 1=yes 2=no 3=absent	**Sex** (m/f)	**Birthdate** (dd/mm/yyyy)	**Age** (months) If child is 0-5months, GO TO IF7	**Weight** (kg)	**Height** (cm)	**Bilateral oedema** (y/n)	**MUAC** (mm)	**IS CHILD ENROLED IN NUTRITION PROGRAM ?** 1 = OTP; 2 = SFP; 3=BSFP 4 = None 5=Don't know	**Measles Vaccina 9-59m** 1=Yes with card 2=Yes by recall 3=No or don't kn
	1											
	2											
	3											
	4											
	5											

4. Kakuma Nutrition Survey, November 2017, Questionnaire for children 0-23 months

IF1	IF2	IF3	IF4	IF5			IF6	IF7	IF8	IF9
Child No.	**HH No.**	**Consent** 1=yes 2=no 3=absent	**Birthdate** (dd/mm/yyyy)	**Sex** **1=male** **2=female**			**Age (months)**	**Was [name] ever breastfed?** 1=yes 2=no	**How long after birth did you first put [name] to the breast?** 1 = within 1 hr 2 = >1hr-<24 hrs 3 = 24 hrs or more 99 = don't know	**Wa** 1 = 2 = 99 =
1										
2										

3										
4										

IF10	**IF11**	**1F12**	**IF13**	**IF14**			**IF16**	**IF17**	**IF18**
Plain water 1 = yes 2 = no 99 = don't know	**Infant formula: for example Mamex, Sahar, Nan, S26** 1 = yes 2 = no 99 = don't know	**Milk such as tinned, powdered or fresh animal milk(*anchor,melody , hilwa)*** 1 = yes 2 = no 99 = don't know	**Juice or juice drinks e.g fresh juice or flavoured juices such as (Zeitun, Altuza, Mushakil, vimto, soda, afya, tamu, yahoo, savannah)** 1 = yes 2 = no 99 = don't know	**Clear broth** 1 = yes 2 = no 99 = don't know			**Thin porridge made from CSB+ or CSB++** 1 = yes 2 = no 99 = don't know	**Tea or coffee black or white** 1 = yes 2 = no 99 = don't know	**Any other wat water, herbal fluids)** 1 = yes 2 = no 99 = don't know

IF19	**IF20**	Now I would like to ask you about some particular foods (child) may eat. I'm interested in whether he/she had the item even if it was combined with other foods. Yesterday during the day or at night, did (child) consume any of the following?	**IF21**	**IF22**	**IF23**	**IF24**	**IF25**	**IF26**	**IF27**
Yesterday during the day and night, did (child) eat solid or semi-solid (soft, mushy) food? 1 = yes 2 = no 99 = don't know	**Did (child) drink anything from a bottle with a nipple yesterday during the day or at night?** 1 = yes 2 = no 99 = don't know		**Flesh foods like *hilib, kaluun, digaag, beer, wada, kilyo iwm?*** 1 = yes 2 = no 99 = don't know	**CSB+?** 1 = yes 2 = no 99 = don't know	**CSB++** 1 = yes 2 = no 99 = don't know	**Why did ${NAME} not consume CSB++?** 1=No more left in household 2=Child does not like CSB++ 3=Consumed by adults 4=Sold	**Plumpy nut?** 1 = yes 2 = no 99 = don't know	**Plumpy sup?** 1 = yes 2 = no 99 = don't know	**Infant formula, eg Nan, mamix, cho anchor, S26 (*caa boodhe, sahha*)?** 1 = yes 2 = no 99 = don't know

Annex 4: List of SENS participants

SUPERVISORS	TITLE	ORGANIZATION/NATIONALITY
Blessing Mureverwi	Nutrition Officer	UNHCR
Ekuam Leonard	Nutrition Officer	IRC
Ann Wasafisia	Nutrition Officer	IRC
Judith Ogugu	Nutrition Manager	KRCS
Elizabeth Owino	Nutrition Field Monitor	WFP
Breege Erukudi	Nutrition Associate	UNHCR
Fugicha Arero	Nutrition Officer	KRCS
Team Leaders		
Kennedy Egule Lobuin	Nutrition Officer	KRCS
Julius Mwaniki	Nurse	KRCS
Michael Kipkemboi	Nurse	IRC
Alex Kalatu	Mental Health Officer	IRC
Elizabeth Akiru	Community Health Program officer	IRC
Monica	Clinical Officer	IRC
Anne Mbuthia	Nurse	KRCS
Enumerators		
David Kipngetich Chesire	Public Health Officer	KRCS
Caroline Gitonga	Lab technologist	KRCS
Bugnagina Emmanuel	Community Health Promoter	Congolese
Esperanza Anna	Community Health Promoter	
Gatwitch Wichjong	Community Health Promoter	
Florence Ala	Community Health Promoter	
Hererimana Jean Don Diew	Community Health Promoter	Congolese
Dominic Loboi Joseph	Community Health Promoter	South Sudanese
Lucia Nyunyu Okelo	Community Health Promoter	South Sudanese
Robert Lonyia	Community Health Promoter	South Sudanese
Amona Lona	Community Health Promoter	South Sudanese
Okee Philip	Community Health Promoter	South Sudanese
Rashid Kabwe Suleiman	Community Health Promoter	Congolese
Jackson Yatta Joseph	Community Health Promoter	South Sudanese
Nivel Nibigira	Community Health Promoter	Burundian
Joseph Aiteng	Community Health Promoter	
Alfred Sadiki	Community Health Promoter	
Samuel Makuei	Community Health Promoter	
Christine Sunday	Community Health Promoter	Sudanese
Nduwayesu Joseline	Community Health Promoter	Burundian
Mohamud Mahat	Community Health Promoter	Somali
Patrick Chimanula	Community Health Promoter	Congolese
Gattuak Gai Riek	Community Health Promoter	Sudanese

Kuony Jany	Community Health Promoter	Sudanese
Abdi Mohamed Bilal	Community Health Promoter	Somali
Yusuf Osman Aden	Community Health Promoter	Ethiopian
Malat Miyong Deng	Community Health Promoter	Sudanese
Julio Akon Iwari	Community Health Promoter	Sudanese
Gatwech Wichjong	Community Health Promoter	Sudanese
Jibril Nurani Iftin	Community Health Promoter	Somali
John Lopeyo	Community Health Promoter	Sudanese
Misheck Asukulu	Community Health Promoter	
Abraham Mangar	Community Health Promoter	South Sudanese
John Wan Tap	Community Health Promoter	South Sudanese
Mohamed Abdi Mahile	Community Health Promoter	Somali
Johnson Otongo	Community Health Promoter	South Sudanese
Abdirizak Salat	Community Health Promoter	South Sudanese
Issa Abdi Shuab	Community Health Promoter	Somali