STANDARDIZED EXPANDED NUTRITION SURVEY (SENS)

DADAAB REFUGEE CAMPS

Dagahaley, Ifo and Hagadera

20 August-8 September 2018

Final Report

ACKNOWLEDGEMENTS

The survey was led by nutrition partners in Dadaab, namely: IRC in Hagadera camp, KRCS in Ifo camp and MSF in Dagahaley camp, in a decentralised approach with only remote support from UNHCR. For this great effort, which is unprecedented, UNHCR appreciates this excellent show of responsibility and successful capacity building which was led by the respective nutrition coordinators/managers, who were Zarah Abdi for KRCS, Robinson Matemo for IRC and Mohamed Ismail for MSF.

Appreciation also goes to the teams who carried out the survey, who were drawn from national agency staff as well as refugee incentive staff. They acquitted themselves very well with a high level of commitment and professionalism. The survey would not be possible with resources and logistical support, for which appreciation goes to the programme, supply and administration units. The security unit deserves special mention for their usual reliable support in ensuring that all safety and security precautions were taken for the respective teams.

The camp leadership graciously allowed the different teams to collect data from all areas of the camps and for this, the team was very grateful. Finally, a special word of appreciation goes towards the respondents, who patiently allowed the teams to collect data and move between households and camp blocks without hindrance.

EXECUTIVE SUMMARY

The Standardised Expanded Nutrition Survey (SENS) was conducted between 20 August and 8 September 2018 in the 3 Dadaab refugee camps (Dagahaley, Ifo and Hagadera) to assess the magnitude and severity of malnutrition, assess trends by comparison with previous years and support programmatic decisions.

Methods: The survey was based on the UNHCR Standardised Expanded Nutrition Survey (SENS) guidelines (http://sens.unhcr.org) and Standardised Monitoring and Assessment of Relief and Transitions (SMART) methodology. The 2-stage cluster sampling method was applied, and 30 clusters were selected in each camp using sampling with probability proportional to size (PPS). Systematic random sampling was used to select households at the second stage.

Results: The weighted prevalence of global acute malnutrition (GAM) decreased to 8.0% from 9.7% in 2017. GAM prevalence decreased in Hagadera and Ifo but slightly increased in Dagahaley. It is important to note that the severe acute malnutrition (SAM) prevalence in Dagahaley increased from 1.1% in 2017 to 2.6% in 2018. The changes were not statistically significant. There was an increase in the prevalence of stunting across the camps, with a weighted prevalence of 21.9%, an increase from 19.6% in 2017. The increases in the prevalence per camp were not statistically significant except in Dagahaley which increased from 18.4% to 27.3% (p=0.024). The prevalence of anaemia among children aged 6-59 months showed a decrease from a weighted prevalence of 60.7% in 2017 to 55.6% in 2018. Further analysis by camp showed that the decrease was only statistically significant in Hagadera, where it decreased from 62.8% to 54.0% (p=0.02). For non-pregnant women aged 15-49 years, however, there was an overall increase from 43.6% in 2017 to 48.9% in 2018 and the increase was across all camps, although not statistically significant. Timely initiation of breastfeeding was generally high, although lower in Dagahaley. Exclusive breastfeeding was quite satisfactory compared to previous assessments. Introduction of solid foods was also very low in Dagahaley, while consumption of ironrich foods was quite low, but unacceptable low in Ifo camp. However, the interpretation must be made with caution given the low sample size. The average number of days which the food ration lasted ranged from 14.9 in Dagahaley to 19.7 in Ifo, which is between 2 to 3 weeks of the theoretical duration. The average household dietary diversity score ranged from 6.5 in Dagahaley to 8.0 in Hagadera. As previous surveys have observed, nearly all households have access to a safe drinking water source, while much fewer have access to an improved excreta disposal facility, mainly due to sharing for some households. In all camps, well over half of households used at least 20 litres per person per day and the average in each camp was well over the accepted standard.

Conclusion: The weighted prevalence of global acutemalnutrition, the most important indicator, was 8.0% overall, falling within the POOR category (5-9%). However, there was a marked improvement from 9.7% in 2017. Only Ifo camp was within the SERIOUS category (10-14%). The high prevalence of anaemia remains a major concern, as shown by the anaemia prevalence among children which remained above the 40% critical threshold, despite having decreased. Anaemia prevalence among non-pregnant women jumped to 48.9% overall, from 43.6% in 2017 and was above the 40% threshold for all camps. Some improvement was recorded in terms of infant and young chid feeding indicators, although there is still room for improvement. The access to safe drinking water also continued to be satisfactory, while gaps were still observed in terms of sanitation. The duration of the food ration and dietary diversity basically reflect what has been observed in recent surveys.

Recommendations

- Sensitize the mothers /caregivers on timely optimal complimentary feeding and dietary diversity focusing on children aged 6 to 23 months.
- Sensitize and educate the mothers on the importance of balanced diets and supplementation with Iron, Folic acid during adolescence, pregnancy and beyond.
- Mentor MTMSG with livelihood options to supplement what they have e.g. Kitchen gardening, selling of surplus produce to compliment the dietary household needs.
- Introduce SBCC activities sensitive to the community to adress myths and misconceptions on MIYCN through local radio spots e.g. Star Fm, Gargaar Fm and Dadaab Fm.
- Educate the community on how to purchase foods that are well diversified based on the food nutritive values using the Bamba Chakula money they receive on a monthly basis from WFP
- Adapt key messages on MIYCN through provision of IEC materials on EBF, Optimal complimentary feeding, dietary diversity, cooking demonstrations on food preparation, food consumption visavi nutrient absorption.
- Train MIYCN counselors, Mentor Mothers and MTMSG on MIYCN curriculum to strengthen the linkage and support given to mothers at antenatal and postpartum care.
- Scale up provision of food items to ensure that they meet 100% food basket requirements, at least 8 food groups and more .Other than sorghum, maize, oil, beans from the food vouchers they receive on a monthly basis.
- Educate and sensitize the gate keepers (block leaders, religious leaders) and the household heads on empowering their women and children prioritizing their nutritional needs.

SUMMARY OF RESULTS SENS 2018 REFUGEE CAMPS DADAAB – KENYA

Camp Date of survey	**Dagahaley** 3-8 September 2018 (95% CI)	**Hagadera** 29 August-3 September 2018 (95% CI)	**Ifo** 27 August-1 September 2018 (95% CI)	**Classification of public health significance or target (where applicable)**
CHILDREN 6-59 months				
Acute malnutrition (WHO 2006 standards)				
Number of children surveyed	518	584	548	
Global Acute Malnutrition (GAM)	8.5 (6.4-11.3)	5.6 (3.5-8.9)	10.1 (7.4-13.5)	Critical if ≥ 15%
Moderate Acute Malnutrition (MAM)	7.0 (5.3-9.1)	5.1 (3.1-8.1)	8.8 (6.1-12.4)	
Severe Acute Malnutrition (SAM)	2.6 (0.7-3.7)	0.5 (0.2-1.6)	1.3 (0.7-2.3)	
Oedema	0	0	0	
Stunting (WHO 2006 growth standards)				
Total stunting	27.3 (21.5-34.0)	18.6 (13.6-27.7)	19.8 (14.4-26.6)	Critical if ≥ 40%
Severe stunting	10.9 (7.5-15.6)	5.1 (3.0-8.5)	2.1 (1.0-4.3)	
MUAC malnutrition				
MUAC<12.5 cm	3.7 (2.5-5.5)	3.1 (1.9-5.0)	9.3 (7.0-12.3)	
MUAC 11.5-12.4 CM	2.7 (1.7-5.5)	2.2 (1.2-4.1)	8.2 (5.9-11.3)	
MUAC <11.5 cm	1.0 (0.5-2.0)	0.9 (0.4-2.0)	1.1 (0.3-3.4)	

Programme coverage				
Measles vacination with card (9-59 months)	75.0 (61.5-88.5)	90.3 (86.3-94.2)	96.4 (93.9-99.0)	Target of ≥95%
Measles vaccination with card or recall (9-59 months)	99.6 (99.0-100.0)	99.5 (98.6-100.0)	99.8 (99.4-100.0)	
Vitamin A supplementation in last 6 months with card or recall (9-59 months)	67.8 (54.2-81.4)	80.6 (72.4-88.8)	95.3 (93.3-97.4)	Target of ≥90%
Deworming in last 6 months (24-59 months)	83.6 (75.5-91.7)	90.9 (86.5-95.4)	98.6 (97.5-99.7)	
Diarrhoea in past 2 weeks	6.6 (3.2-10.1)	8.6 (5.6-11.6)	18.0 (6.5-9.6)	
Anaemia (6-59 months)				
Total Anaemia (Hb <11g/dl)	60.7 (55.9-65.4)	54.0 (48.6-59.3)	51.9 (45.4-58.5)	High if ≥ 40 %
Mild (Hb 10-10.9 g/dl)	29.9 (26.0-33.7)	28.6 (24.9-32.2)	24.3 (21.4-32.0)	
Moderate (Hb 7-9.9 g/dl)	30.3 (25.3-35.4)	25.4 (20.7-30.2)	26.7 (21.4-32.0)	
Severe (Hb <7g/dl)	0.5 (0.0-1.0)	0.0	0.9 (10.6-11.0)	
Mean Hb	10.5 (10.4-10.7)	10.8 (10.6-11.0)	10.8 (10.6-11.0)	
CHILDREN 0-23 MONTHS				
Infant and young child feeding (IYCF) Indicators				
Timely initiation of breastfeeding (0-23 months)	79.1 (65.2-93.0)	85.4 (78.3-92.4)	89.5 (80.1-98.8)	
Exclusive breastfeeding (0-5 months)	62.5 (45.5-79.5)	66.7 (53.5-79.8)	88.1 (79.3-96.8)	
Continued breastfeeding at 1 year	64.2 (40.4-88.0)	72.2 (55.3-89.0)	76.4 (54.6-98.2)	
Continued breastfeeding at 2 years	26.6 (3.7-49.5)	13.9 (1.5-19.1)	3.4 (0.9-5.9)	
Introduction to solid, semi-solid or soft foods (6-	18.2	66.7	60.0	

8 months)	(5.7-30.7)	(46.6-86.7)	(21.9-98.1)	
Consumption of iron-rich foods (6-23 months)	27.6 (15.0-40.2)	38.3 (18.2-38.4)	75.0 (57.8-92.1)	
Children bottle-fed	20.8 (7.9-33.8)	13.9 (1.5-19.1)	0.5 (0.0-1.6)	
WOMEN (15-49 years),%(95%C.I)				
Anaemia (non-pregnant women)				
Total anaemia (Hb <12 g/dl)	53.0 (46.9-59.1)	47.9 (40.3-55.5)	45.7 (40.2-51.3)	High if ≥ 40%
Mild (Hb 11-11.9 g/dl)	29.7 (24.8-34.5)	23.9 (18.6-29.3)	27.1 (21.4-32.8)	
Moderate (Hb 8-10.9g/dl)	23.0 (18.2-27.7)	23.3 (18.7-28.0)	18.0 (13.6-22.4)	
Severe (Hb <8g/dl)	0.4 (0.0-1.1)	0.6 (0.0-1.8)	0.6 (0.0-1.5)	
Mean Hb	11.8 (11.6-12.0)	11.9 (11.7-12.2)	12.0 (11.8-12.2)	
Program coverage, pregnant and lactating women				
Pregnant women currently enrolled in the ANC	95.4 (88.4-102.5)	86.3 (77.7-94.9)	97.9 (93.5-102.3)	
Pregnant women currently receiving iron-folic acid pills	93.1 (84.6-101.7)	86.3 (77.7-94.9)	95.9 (90.1-101.8)	
FOOD SECURITY				
Average number of das GFR (out of 31 days)	14.9 (13.8-16.0)	19.1 (17.5-20.7)	19.7 (18.9-20.6)	
Average HDDS	6.5 (5.2-7.8)	8.0 (7.1-8.9)	7.2 (6.6-7.9)	
Proportion of households reporting using the following coping strategies over the past month				
Borrowed cash, food or other items with or without interest	16.3 (7.6-25.1)	25.7 (16.4-35.1)	24.9 (12.7-37.0)	
Sold any assets that would not have normally sold (furniture, seed stocks, tools, other NFI, livestock etc.)	3.0 (1.0-4.9)	20.8 (12.-29.1)	6,3 (3.1-9.6)	

Requested increased remittances or gifts as compared to normal	13 (4.0-21.9)	24.4 (12.7-30.1)	19.7 (8.9-30.6)	
Reduced the quantity and/or frequency of meals and snacks	19.7 (5.9-33.6)	50.5 (38.4-62.6)	20.0 (9.7-30.3)	
Begged	9.3 (3.1-15.6)	17.4 (11.2-23.6)	7.2 (1.4-13.1)	
WASH				
Water quality				
Proportion of households using an improved water source	99.7 (99.2-100.0)	99.8 (99.5-100.0)	100	
Water quantity				
≥ 20 lpppd	63.2 (49.5-77.0)	60.0 (51.0-69.0)	61.5 (52.9-70.1)	
15-<20 lpppd	14.8 (9.4-20.2)	18.0 (14.2-21.8)	18.9 (14.1-23.8)	
<15 lppd	22.0 (1.8-32.1)	22.0 (14.9-29.1)	19.6 (12.8-26.4)	
Average lpppd	32.5 (26.5-38.5)	23.8 (20.9-26.8)	26.3 (22.8-29.8)	UNHCR target ≥20 lpppd
Safe excreta				
Proportion of HH using an improved excreta disposal facility	36.5 (7.4-65.6)	41.9 (28.6-55.2)	62.0 (43.7-80.4)	
Proportion of HH using a shared family toilet	9.4 (1.2-17.0)	25.8 (18.7-32.8)	11.5 (2.7-20.4)	
Proportion of HH using a communal toilet	2.3 (1.3-6.0)	15.4 (7.4-23.5)	0.4 (0.5-1.4)	
Proportion of HH using an unimproved toilet	51.7 (16.9-86.5)	16.7 (6.6-26.9)	25.9 (7.4-44.3)	
Proortion of HH with children < 3 years disposing off faeces safely	100	85.8 (76.6-95.1)	99.1 (97.3-100.9)	

1 Introduction

1.1 Background

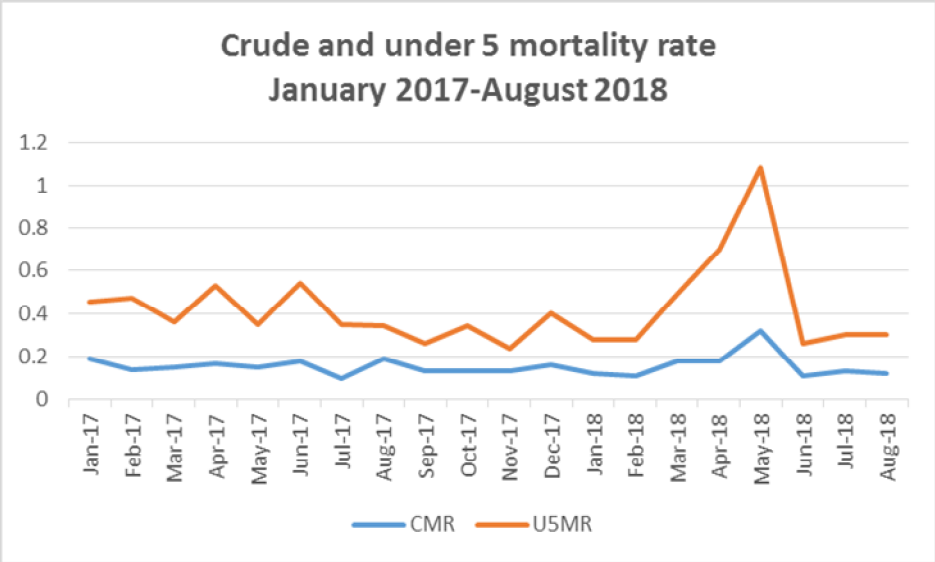
The refugee complex of Dadaab is home to an estimate of 208,000 registered refugees of which the vast majority are Somalis who fled conflict and drought in their home country several decades ago. The Dadaab refugee complex is situated in northeastern Kenya, near the border with Somalia. Dadaab was established in the year 1991 following the beginning of the civil war in Somalia. Somalis were forced to flee as the war worsened, leaving to neighbouring countries including Kenya, Ethiopia and Sudan. Today, Dadaab is home to refugees from many countries in eastern and central Africa, including South Sudan, Burundi, Congo, Ethiopia, Eritrea and Somalia. Somali refugees make up more than 90% of the population. Until early 2017, it consisted of five refugee camps. However, one of the camps, Kambioos, which was also the newest, was closed in March 2017 as refugees began returning to Somalia and the few remaining moved into the other camps. Ifo 2 camp was closed in May 2018 in line with the cam consolidation approach, with refugees either moving to the other camps or being repatriated voluntarily. Refugees live in mud-walled houses with iron sheeting roofs, while some, especially new arrivals, live in tents. The physical set up of the camps is well organized, and sections have administrative leaders who live inside the camps.

1.1.1 Food security situation

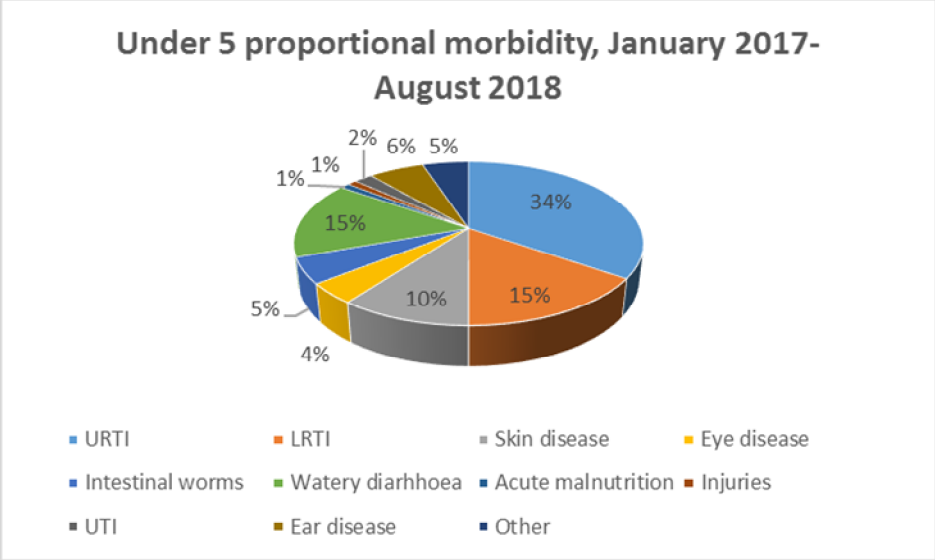
Given limited livelihood opportunities, refugees in Dadaab continue to be heavily dependent on the WFP general food ration, which currently consists of a combined cash and in-kind component, with cash substituting 30% of the cereals. Food is distributed by WFP on a monthly basis to all registered refugees. Over the past year, the food ration has provided approximately 70% of caloric requirements. The dependence on the food ration means that dietary diversity is limited to the items provided in the ration and a few which beneficiaries can afford through the cash voucher. The previously available nutrition support to children 6-23 months, which was a part of the food ration, was stooped during the year, due to funding constraints.

1.1.2 Health situation

There are a total of 3 functional hospitals which serve the refugee population. These are Dagahaley, Hagadera and Ifo. All provide secondary health care services, inclusive of antenatal and post-natal care as well as an average of 100-120 in terms of bed capacity. Health posts in all camps provide primary health care and are situated within the blocks. All health services are provided free of charge and are also available to the local host community. The health status of refugees has continued to be stable, with the major concern being constant cholera outbreaks whenever rains are received. Crude mortality rates have consistently been around 0.2 deaths per 1,000 per month The health situation is generally stable and well below emergency thresholds, which has been the picture in the last several years. Crude mortality rates have remained approximately 0.2 deaths per 1,000 per month, and under 5 mortality rates have hovered around 0.4 deaths per 1,000 per month, with only small peaks here and there.



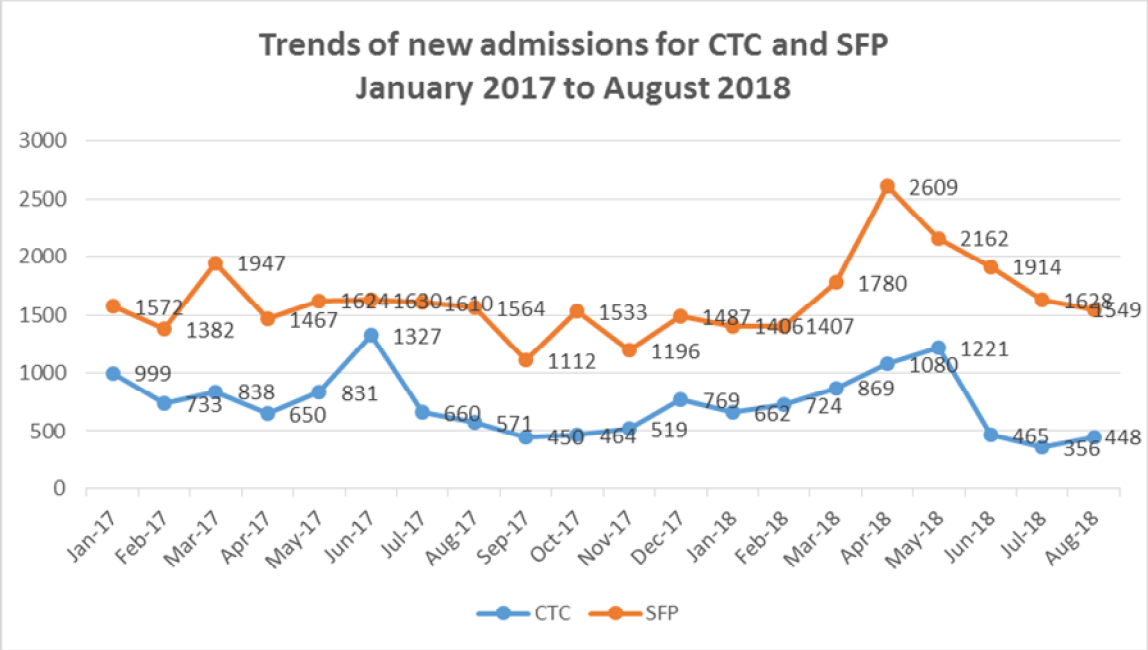
Upper respiratory infection (URTI) continued to be the main cause of morbidity for children below 5 years in Dadaab camps. This is followed by watery diarrhoea and ear disease (15%).



1.1.3 Nutrition situation

The approach to the delivery of nutrition interventions in Dadaab is mainly centred around the integrated management of acute malnutrition (IMAM) and maternal, infant and young child nutrition (MIYCN) interventions. In the IMAM approach, in each health post there is an established outpatient therapeutic care programme (OTP) for the treatment of severe acute malnutrition without medical complications as well as a supplementary feeding programme (SFP) for the treatment of moderate acute malnutrition (MAM). The two programmes are achieved through the collaboration that exists between UNHCR, WFP, UNICEF and relevant implementing partners. In addition, at each hospitals there are established stabilisations centre (SC) for treatment of severe acute malnutrition with medical complications. The MIYCN programme is the preventive compoment, where there are a range of activities which seek to promote and protect breastfeeding and ensure that children are exclusively breastfed from birth until 6 months, followed by the introduction of appropriate complementary foods as they continue to breastfeed

until 2 years or beyond. The data below shows that, with the exception of a few sharp peaks around the rainy parts of the season, admissions for severe and moderate acute malnutrition have been quite constant for the past year, which reflects a relatively stable situation.



1.2 Survey Objectives

Primary objectives

1. To determine the prevalence of acute malnutrition among children 6-59 months.
2. To determine the prevalence of stunting among children 6-59 months.
3. To investigate Infant and Young Children Feeding (IYCF) practices among children 0-23 months.
4. To assess the prevalence of anaemia among children 6-59 months and non-pregnant women of reproductive age (15-49 years).
5. To assess the two week period prevalence of diarrhoea among children aged 6-59 months.
6. To determine the coverage of measles vaccination among children 9-59 months.
7. To determine the coverage of deworming among children 24-59 months and vitamin A supplementation among children 6-59 months in the last six months.
8. To assess the coverage of ration cards and Bamba Chakula sim 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 population's access to, and use of, improved water, sanitation and hygiene facilities.

12. To establish recommendations on actions to be taken to address the health and nutrition situation.

Secondary objectives

1. To assess the coverage of selective feeding programmes (OTP, TSFP) for children 6-59 months
2. To determine enrolment into Antenatal Care clinic and coverage of iron-folic acid supplementation in pregnant women.

2 Methodology

2.1 Sample size

The UNHCR Standardised Expanded Nutrition Survey (SENS) guidelines for refugee populations (http://sens.unhcr.org) and the Standardized Monitoring and assessment of Relief and Transitions (SMART) methodology (www.smartmethodology.org) were used to carry out the survey. The two-stage cluster sampling method was preferred given that the population in the camp is large and households are not arranged in an orderly pattern. In each camp, a representative sample of households and children was selected using ENA-for-SMART, July 9, 2015 version, based on the assumptions shown in Table 1:

Table 1 Assumptions for sample size calculation, Dadaab camps, Kenya, 2018

	Dagahaley	Hagadera	Ifo
Population	69,631	74,058	65,550
Estimated GAM prevalence (%) (survey 2016)	11.8	10.9	16.9
± Desired precision (%)	3.5	3.5	4.0
Average household size	6.6	6.2	6.0
Design Effect	1.5	1.5	1.5
<5 population (%)	19.2	20.4	17.8
Non response households (NRR) (%)	5%	5%	5%
Children to be included	533	497	551
Households to be included	492	460	603

The estimated prevalence of GAM (Global Acute Malnutrition) was based on the upper confidence interval of the estimated 2017 GAM prevalence. The total population was based on the UNHCR ProGress database (as at the beginning of August 2018).

2.2 Sampling procedure: selecting clusters

The 2-stage cluster sampling method was used to select 30 clusters from each of the 3 camps. At the first stage, a list of blocks was made before the required number were selected using sampling with probability proportional to size (PPS) using ENA softwareIn nearly all cases, a cluster was the equivalent of a block. However, there were exceptions where, for some larger blocks, more than 1 cluster was selected. In this case, the blocks were split further to cater for more than one cluster. In the event that a selected block had more than 250 households, according to SMART guidance, segmentation was done, after which one of the segments was randomly selected to be the cluster.

2.3 Sampling procedure: selecting households and individuals

All households in the selected clusters were labelled before data collection. At the second stage, the required number of households were selected using systematic random sampling from a list of

households. A random number was selected between 1 and the sampling interval, which was calculated by dividing the total number of households in the cluster with the required number of households. The selected number became the first household to be surveyed. Subsequent households were selected by adding the sampling interval until the required number of households were completed. All eligible children below 5 years of age from all selected households were surveyed for the Child Anthropometry and Health, and Infant and Young Child Feeding (IYCF), and WASH. Half of the selected households were selected for the Food Security and Women questionnaire. The survey respondents were the primary caretakers of children below 5 years. Abandoned households were not included in the sampling frame. Absent households or households where children were absent were re-visited before the end of the day. If they were found to be empty, they were recorded as missing and were not replaced. Children who were in health centres at the time of the survey were recorded as absent.

2.4 Questionnaire

The questionnaires were prepared in English language and translated to Somali language (Appendix 3). The questionnaires were pre-tested during the pilot test on the 5th day of enumerator training.

Module 1 and 2: Children 6-59 months- Questions and measures for children aged 6-59 months. Information was collected on anthropometric status, oedema, enrolment in selective feeding programmes, immunisation (measles), vitamin A supplementation in the last six months, and morbidity from diarrhoea in past two weeks and haemoglobin measurement.
Module 2*:* ***Women 15-49 years***- Information relating to women's pregnancy status, enrolment in ANC, coverage of iron-folic acid pills and haemoglobin measurement for non-pregnant women.
Module 3*:* ***Children 0-23 months***- Infant and young child feeding practices for children aged 0-23 months.
Module 4*:* ***Food Security***- Questions on access and use of the general food ration, use of negative coping mechanisms and household dietary diversity.
Module 5*:* ***Water, sanitation and hygiene***- Questions on quality and quantity of drinking water, satisfaction with the drinking water supply, and sanitation facilities.

2.5 Measurement methods

2.5.1 Household-level indicators

Household questionnaires for food security and WASH were based on the UNHCR SENS tool with minor modifications.

2.5.2 Individual-level indicators

Sex of children: sex 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 birth certificates or child health cards. A local calendar of events (Appendix 5) was used in the absence of official documentation, and the age in months was recorded.
Age of women 15-49 years: The reported age was recorded in years.
Weight of children 6-59 months: measurements were taken to the nearest 0.1kg using an electronic scale (SECA scale) with a wooden board to stabilise it on the ground. All children were weighed without clothes.
Height/Length of children 6-59 months: children's height or length was taken to the nearest 0.1cm 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 those greater than or equal to 87cm were measured standing up.

Oedema in children 6-59 months: bilateral oedema was assessed by applying gentle thumb pressure on to the tops of both feet of the child for a period of three seconds and thereafter observing for the presence or absence of an indent.

MUAC of children 6-59 months and women 15-49 years: MUAC was measured at the mid-point of the left upper arm between the elbow and the shoulder and taken to the nearest 0.1cm using a standard tape.

Child enrolment in selective feeding programme for children 6-59 months: selective feeding programme coverage was assessed for the outpatient therapeutic programme and for the supplementary feeding programme. This was verified by showing images of the products given in the different programmes

Measles vaccination in children 6-59 months: measles vaccination was assessed by checking for the measles vaccine on the child health card if available or by asking the caregiver to recall if no child health card was available or if it was not recorded. Results were recorded on all children but were only analysed for children aged 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 the child health card if available or by asking the caregiver to recall if no card was available. Vitamin A capsule were shown to the caregivers when asked to recall.

Deworming-children 24-59 months: whether the child received a deworming tablet over the past six months was recorded from the child health card, if available, or by asking the caregiver to recall if no card was available. A deworming tablet was shown to the caregiver when asked to recall.

Haemoglobin concentration in children 6-59 months and women 15-49 years: Hamoglobin 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: if the surveyed woman was pregnant, she was assessed on whether she was enrolled in the ANC programme and was receiving iron-folic acid pills.

Infant and young child feeding practices in children 0-23 months: infant and young child feeding practices were assessed based on the UNHCR SENS guidelines from primary caregiver recall.

Referrals: Children aged 6-59 months were referred to health centre/post for treatment when MUAC was < 12.5 cm, or when WHZ was below -2, or when oedema was present, or when haemoglobin was < 7.0 g/dL. Women of reproductive age and adolescent girls were referred to the hospital for treatment when haemoglobin was < 8.0 g/dL.

2.6 Case definitions, inclusion criteria and calculations

A household was defined as: a group of people who live together and routinely eat out of the same pot. Where two families share the same pot, they were assessed as one household even if they lived in the same compound.

Nutritional Status: Table i shows the definition and classification of the nutritional indicators used. Main results are reported according the WHO Growth Standards 2006.

Table i. Definitions of acute malnutrition using weight-for-height and/or edema in children 6–59 months

Categories of acute malnutrition	Z-scores (NCHS Growth Reference 1977 and WHO Growth Standards 2006)	Bilateral oedema
Global acute malnutrition	< -2 z-scores	Yes/No
Moderate acute malnutrition	< -2 z-scores and ≥ -3 z-scores	No
Severe acute malnutrition	> -3 z-scores	Yes
	< -3 z-scores	Yes/No

Stunting, also known as chronic malnutrition was defined using height-for-age index values and was classified as severe or moderate based on the cut-offs shown in Table ii. Main results are reported according to the WHO Growth Standards 2006.

Table ii. Definitions of stunting using height-for-age in children 6–59 months

Categories of stunting	Z-scores (WHO Growth Standards 2006 and NCHS Growth Reference 1977)
Stunting	<-2 z-scores
Moderate stunting	<-2 z-score and >=-3 z-score
Severe stunting	<-3 z-scores

Underweight was defined using the weight-for-age index values and was classified as severe or moderate based on the cut-offs shown in Table iii. Main results are reported according to the WHO Growth Standards 2006.

Table iii. Definitions of underweight using weight-for-age in children 6–59 months

Categories of underweight	Z-scores (WHO Growth Standards 2006 and NCHS Growth Reference 1977)
Underweight	<-2 z-scores
Moderate underweight	<-2 z-scores and >=-3 z-scores
Severe underweight	<-3 z-scores

Mid Upper Arm Circumference (MUAC) values in children 6-59 months were used to define malnutrition according to the cut-offs shown in Table iv.

Table iv. Classification of acute malnutrition based on MUAC in children 6-59 months (WHO)

Categories of Malnutrition	MUAC Reading
At risk of malnutrition	≥ 12.5 cm and <13.5 cm
Moderate malnutrition	≥ 11.5 cm and <12.5 cm
Severe malnutrition	< 11.5 cm

Infant and young child feeding practices in children 0-23 months: Infant and young child feeding practices were assessed as follows based on standard WHO recommendations (WHO 2007).

Timely initiation of breastfeeding: Proportion of children born in the last 24 months who were put to the breast within one hour of birth.

$$\frac{\text{Children born in the last 24 months who were put to the breast within one hour of birth}}{\text{Children born in the last 24 months}}$$

Exclusive breastfeeding under 6 months: Proportion of infants 0–5 months of age who are fed exclusively with breast milk.

$$\frac{\text{Infants 0–5 months of age who received only breast milk during the previous day}}{\text{Infants 0–5 months of age}}$$

Continued breastfeeding at 1 year: Proportion of children 12–15 months of age who are fed breast milk.

$$\frac{\text{Children 12–15 months of age who received breast milk during the previous day}}{\text{Children 12–15 months of age}}$$

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

$$\frac{\text{Infants 6–8 months of age who received solid, semi-solid or soft foods during the previous day}}{\text{Infants 6–8 months of age}}$$

Children ever breastfed: Proportion of children born in the last 24 months who were ever breastfed.

$$\frac{\text{Children born in the last 24 months who were ever breastfed}}{\text{Children born in the last 24 months}}$$

Continued breastfeeding at 2 years: Proportion of children 20–23 months of age who are fed breast milk.

$$\frac{\text{Children 20–23 months of age who received breast milk during the previous day}}{\text{Children 20–23 months of age}}$$

Bottle feeding: Proportion of children 0-23 months of age who are fed with a bottle

$$\frac{\text{Children 0–23 months of age who were fed with a bottle during the previous day}}{\text{Children 0–23 months of age}}$$

Consumption of iron-rich or iron-fortified foods: Proportion of children 6-23 months of age who received an Iron-rich food or Iron-fortified food that is specially designed for infant and young children or that is fortified in the home.

Children 6-23 months of age who received an Iron-rich food or Iron-fortified food that Is specially designed for infant and young children, or that was fortified in the home with a

Product that included Iron during the previous day
Children 6-23 months of age

Diarrhoea: Three or more loose or watery stools in a 24-hour period.

Under nutrition in women of reproductive age: Mid Upper Arm circumference (MUAC) in women was classified according to cut-offs shown in Table v.

Table v. Classification of under nutrition based on MUAC in women of reproductive age

Categories of Malnutrition	MUAC Reading
Pregnant and lactating women	
Moderate malnutrition	≥18.5 cm and <21 cm
Severe malnutrition	<18.5 cm
Non-pregnant, non-lactating	
Moderate malnutrition	≥16.0 cm and <18.5 cm
Severe malnutrition	<16.0 cm

Anemia was measured using a HemoCue Hb 301 machine and defined and categorized according to WHO recommended cut-offs shown in Table vi to determine the prevalence of anemia.

Table vi. Definition of anemia (WHO 2000)

Age/Sex groups	Categories of Anaemia (Hb g/dL)			
	Total	Mild	Moderate	Severe
Children 6 - 59 months	<11.0	10.9 - 10.0	9.9 - 7.0	< 7.0
Non-pregnant adult females 15-49 years	<12.0	11.9 - 11.0	10.9 - 8.0	< 8.0

According to FANTA (2006), Household dietary diversity (HDDS), the number of different food groups consumed over a given reference period. In the UNHCR SENS, the reference period is 24 hours and the following 12 food groups are assessed: cereals; white roots and tubers; vegetables; fruits; meat; eggs; fish and seafood; legumes, nuts and seeds; milk and milk products; oils and fats; sweets; spices, condiments and beverages. HDDS therefore ranges between 0 and 12. HDDS is important as a more diversified diet is associated with a number of improved outcomes in areas such as birth weight, child anthropometric status, and improved hemoglobin concentrations.

2.7 Classification of public health problems and targets

Anthropometry:

The classification of public health significance for anthropometric results for children aged 6-59 months is shown in Table vii.

Table vii. Classification of public health significance for children under 5 years of age (WHO 1995,

2000).

Prevalence %	Critical	Serious	Poor	Acceptable
Wasting	≥15	10-14	5-9	<5
Stunting	≥40	30-39	20-29	<20

Measles vaccination

UNHCR recommends target coverage of 95% (same as Sphere Standards).

Vitamin A supplementation

UNHCR recommends vitamin A supplementation coverage to be >90% among children aged 6-59 months.

Anaemia

The thresholds for public health significance for anemia prevalence for all groups according to WHO are displayed in Table viii. The Strategic Plan for Nutrition and Food Security (2008-2010) recommends that the prevalence of anemia for all groups must be low (5-19%).

Table viii. Classification of public health significance (WHO 2000)

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

WASH

Relevant UNHCR standards for WASH indicators are shown in Table ix.

Table ix. UNHCR WASH Programme Standards

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

2.8 Training, coordination and supervision

In each camp, a total of 5 survey teams each consisting of 5 team members (anthropometry measurer, anthropometry assistant, haemoglobin measurer, interviewer and team leader) were trained for a total of 3 days, followed by an additional 2 days for the standardisation test and pilot test. Data collection was carried out over 6 days, under the supervision of UNHCR, in collaboration with nutrition partners in each camp (IRC, KRCS, MSF). Mobile phones and tablets were used for data collection, with daily data transfer to an offline server at the end of each day in a decentralised system which was managed by respective partners in the different camps.

2.9 Data analysis

On a daily basis, after synchronizing data from the mobile phones, data quality tests were performed before the next day and feedback was provided to survey teams. In certain instances, this resulted in repeat measurements of children when errors were suspected or re-visiting of households for completion of missing data such as date of birth or sex. Data analysis for anthropometry data was conducted using ENA-for-SMART 9 July, 2015 version, and data analysis for the remaining variables was conducted using EPI INFO 3.5.3. SMART flags (+/- 3 SD from the observed mean) were applied for exclusion of outliers from the final analysis.

3 Results: Dagahaley camp

The demographics of the study populationa are shown in Table 2. A total of 3,236 people were surveyed in 601 households, giving an average household size of 5.4.

Table 2 Demographic Characteristics of the study population, Dagahaley camp, Kenya, 20178

Total HHs surveyed	*601*
Total population surveyed	*3,236*
Total U5 surveyed	*697*
Average HH size	*5.4*
% of U5	*21.5%*

3.1 Children 6-59 months

Sample size and clusters

A total of 697 children between 6-59 months were interviewed compared to a target of 533, representing 120% (Table 3).

Table 3 Target and actual number captured, Dagahaley, Dagahaley Camp, Kenya, 2018

	Target (No.)	Total surveyed (No.)	% of the target covered
Children 6-59 months	533	518	97
Clusters	30	30	100

The distribution of age and sex (Table 4) shows that there was no bias with respect to selection of different ages as well as boys girls.

Table 4 Distribution of age and sex of sample, Dagahaley camp, Kenya, 2018

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy : girl**
6-17	66	58.4	47	41.6	113	21.8	1.4
18-29	58	43.6	75	56.4	133	25.7	0.8
30-41	61	48.8	64	51.2	125	24.1	1.0
42-53	59	53.2	52	46.8	111	21.4	1.1
54-59	18	50.0	18	50.0	36	6.9	1.0
Total	262	50.6	256	49.4	518	100.0	1.0

Anthropometric results (based on WHO Growth Standards 2006)

The prevalence of global acute malnutrition (GAM) was 8.5% (6.4-11.3, 95%CI), with a higher prevalence of GAM among girls (8.7%) than boys (8.4%). The prevalence of severe acute malnutrition (SAM) was 1.6% (0.7-3.7, 95% CI). There were no cases of oedema (Table 5). The difference between the 2017 and 2018 GAM prevalence was not statistically significant *(p=0.878)*.

Table 5 Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex, Dagahaley camp, Kenya, 2018

	All n = 503	**Boys** n = 251	**Girls** n = 252
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(43) 8.5 % (6.4 – 11.3 95% C.I.)	(21) 8.4 % (5.3 – 12.9 95% C.I.)	(22) 8.7 % (5.4 – 13.7 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(35) 7.0 % (5.3 – 9.1 95% C.I.)	(18) 7.2 % (4.6 - 11.1 95% C.I.)	(17) 6.7 % (4.1 – 10.8 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(8) 1.6 % (0.7 – 3.7 95% C.I.)	(3) 1.2 % (0.3 – 5.3 95% C.I.)	(5) 2.0 % (0.9 - 4.2 95% C.I.)

The prevalence of oedema is 0.0 %

According to the trend analysis (Figure 1), the prevalence of GAM and SAM increased in 2018 after having decreased in 2017.

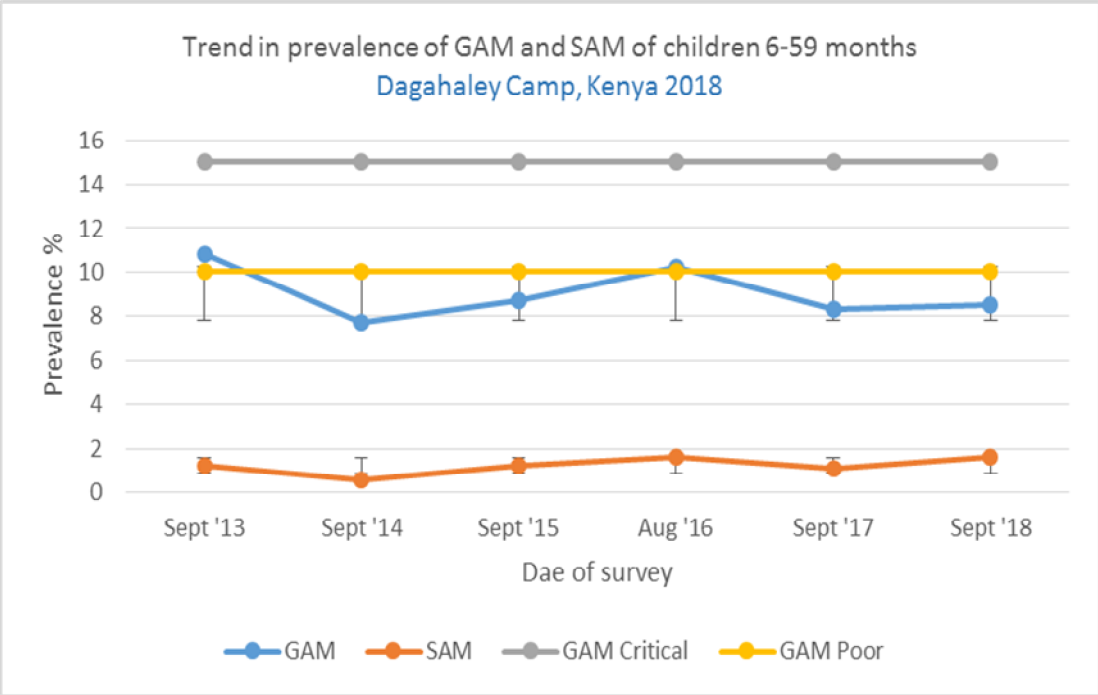


Figure 1 Trend in prevalence of GAM and SAM, Dagahaley camp, Kenya, 2018

Table 6 Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema, Dagahaley camp, Kenya, 2018

		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	104	3	2.9	6	5.8	95	91.3	0	0.0
18-29	132	0	0.0	9	6.8	123	93.2	0	0.0
30-41	124	3	2.4	11	8.9	110	88.7	0	0.0
42-53	107	2	1.9	4	3.7	101	94.4	0	0.0
54-59	36	0	0.0	5	13.9	31	86.1	0	0.0
Total	503	8	1.6	35	7.0	460	91.7	0	0.0

The prevalence of moderate wasting was highest in the 54-59 age group while the prevalence of severe wasting was highest in the 42-53 age group (Table 6 and Figure 2).

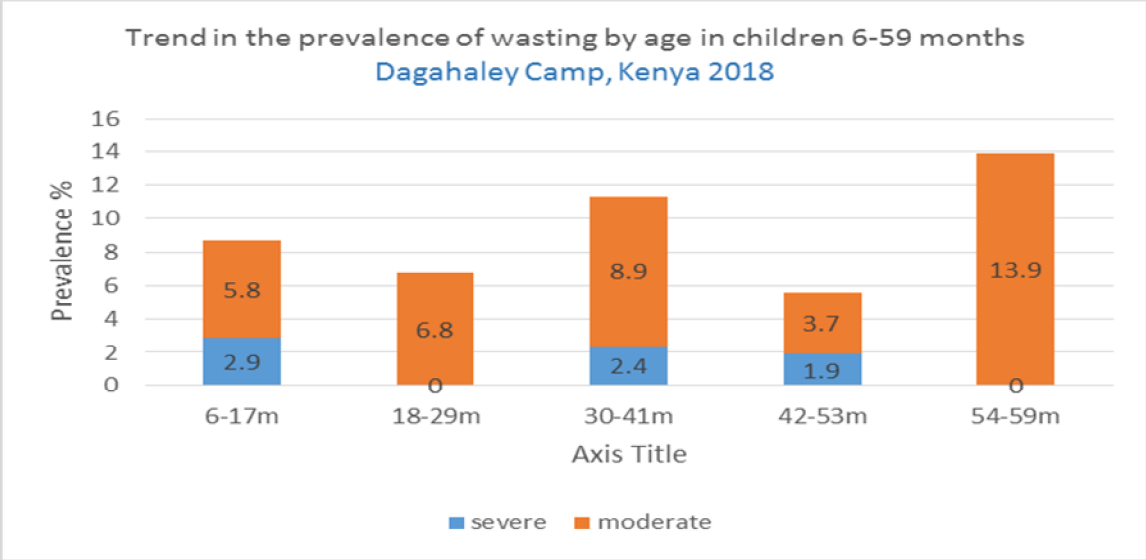


Figure 2 Trend in prevalence of wasting by age, Dagahaley camp, Kenya, 2018

As shown in Table 7, all cases of severe acute malnutrition were due to marasmus.

Table 7 Distribution of acute malnutrition and oedema based on weight-for-height z-scores, Dagahaley camp, Kenya, 2018

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 13 (2.5 %)	Not severely malnourished No. 499 (97.5 %)

NB: Flagged records are included

Figure 3 shows the weight-for-height z-scores distribution. The graph closely resembles the standard WHO curve.

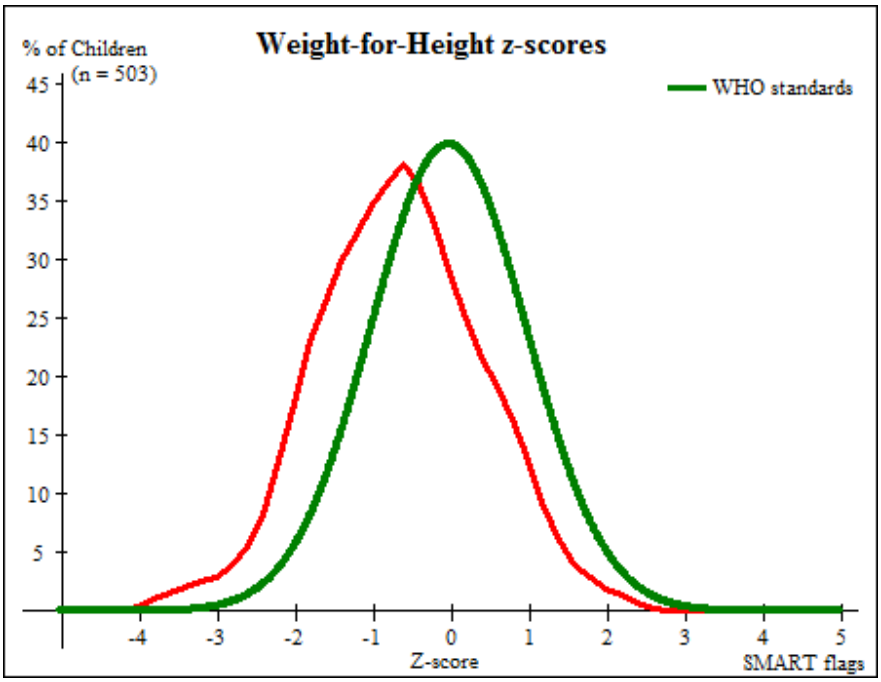


Figure 3 Distribution of weight-for-height z-scores, Dagahaley camp, Kenya, 2018

Table 8 Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex, Dagahaley camp, Kenya, 2018

	All n = 512	**Boys** n = 257	**Girls** n = 255
Prevalence of global malnutrition (< 125 mm and/or oedema)	(19) 3.7 % (2.5 – 5.5 95% C.I.)	(8) 3.1 % (1.6 - 5.9 95% C.I.)	(11) 4.3 % (2.5 - 7.3 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(14) 2.7 % (1.7 - 4.4 95% C.I.)	(6) 2.3 % (1.0 - 5.4 95% C.I.)	(8) 3.1 % (1.6 – 6.2 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(5) 1.0 % (0.5 – 2.0 95% C.I.)	(2) 0.8 % (0.2 – 3.0 95% C.I.)	(3) 1.2 % (0.4 – 3.3 95% C.I.)

Table 9 Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema, Dagahaley camp, Kenya, 2018

		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	107	4	3.7	8	7.5	95	88.8	0	0.0
18-29	133	0	0.0	5	3.8	128	96.2	0	0.0
30-41	125	0	0.0	1	0.8	124	99.2	0	0.0
42-53	111	1	0.9	1	0.0	110	99.1	0	0.0
54-59	36	0	0.0	0	0.0	36	100.0	0	0.0
Total	512	5	1.0	14	2.7	493	96.3	0	0.0

The prevalence of underweight was 20.9% (15.9-26.9), with 6.2% (3.7-10.1) classified as severely underweight (Table 10).

Table 10 Prevalence of underweight based on weight-for-age z-scores by sex, Dagahaley camp, Kenya, 2018

	All n = 503	**Boys** n **=** 254	**Girls** n **=** 249
Prevalence of underweight (<-2 z-score)	(105) 20.9 % (15.9 – 26.9 95% C.I.)	(62) 24.4 % (17.1 - 33.6 95% C.I.)	(43) 17.3 % (12.6 – 23.2 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(74) 14.7% (11.6 – 18.4 95% C.I.)	(44) 17.3 % (12.2 – 23.9 95% C.I.)	(30) 12.0 % (8.6 – 16.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(31) 6.2 % (3.7 – 10.1 95% C.I.)	(18) 7.1 % (4.0 – 12.3 95% C.I.)	(13) 5.2 % (2.7 – 10.0 95% C.I.)

The prevalence of stunting in Dagahaley was 27.3% (21.5-34.0), with a severe stunting prevalence of 10.9% (7.5-15.6) as shown in Table 11.

Table 11 Prevalence of stunting based on height-for-age z-scores and by sex, Dagahaley camp, Kenya, 2018

	All n = 476	**Boys** n **=** 237	**Girls** n **=** 239
Prevalence of stunting (<-2 z-score)	(130) 27.3 % (21.5 – 34.0 95% C.I.)	(76) 32.1 % (24.3 – 40.9 95% C.I.)	(54) 22.6 % (16.3 – 30.5 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(78) 16.4 % (12.8 – 20.7 95% C.I.)	(41) 17.3 % (12.8 – 22.9 95% C.I.)	(37) 15.5 % (10.4 – 22.5 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(52) 10.9 % (7.5 – 15.6 95% C.I.)	(35) 14.8 % (9.7 – 21.8 95% C.I.)	(17) 7.1 % (4.0 – 12.3 95% C.I.)

The analysis of the trend from 2013 to 2017 shows that stunting increased from 2013 to 2015, decreased from 2016 to 2017 but increased again in 2018 (Figure 4). The difference between the 2017 and 2018 prevalence was statistically significant *(p=0.024)*.

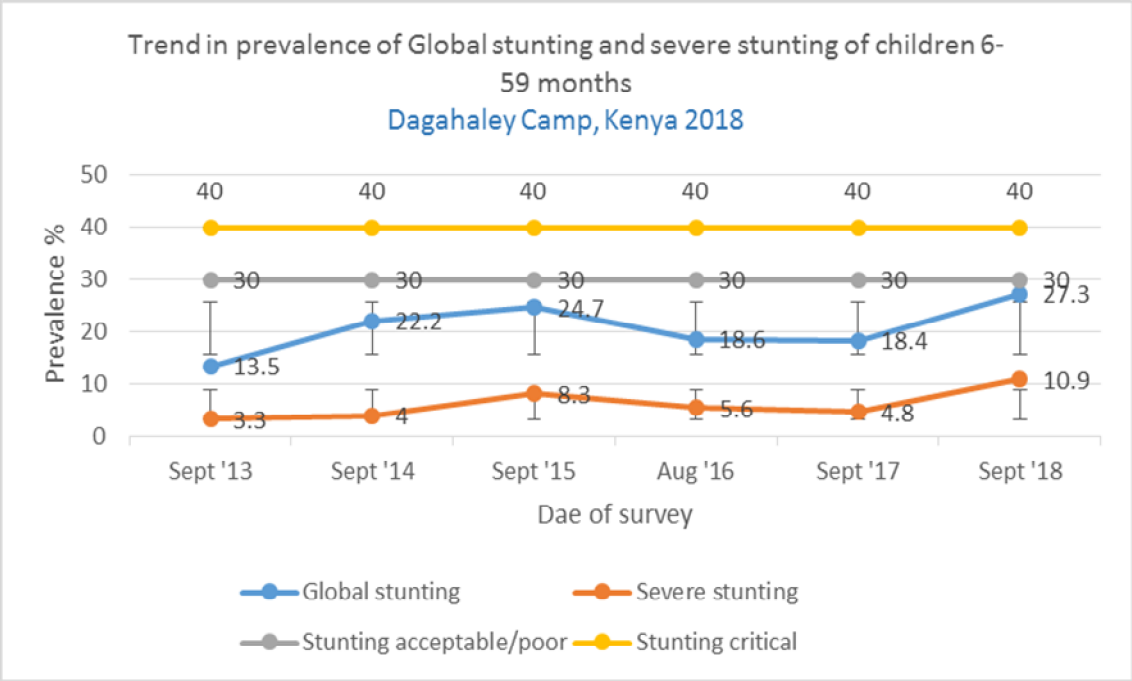


Figure 4 Trend in prevalence of global and severe stunting, Dagahaley camp, 2018

The analysis of stunting by age reveals that stunting was highest in the 18-29 age group, after which it decreased (Table 12 and Figure 5).

Table 12 Prevalence of stunting by age based on height-for-age z-scores, Dagahaley camp, Kenya, 2018

		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	96	10	10.4	18	18.8	68	70.8
18-29	122	19	15.6	21	17.2	82	67.2
30-41	116	14	12.1	25	21.6	77	66.4
42-53	107	5	4.7	11	10.3	91	85.0
54-59	35	4	11.4	3	8.6	28	80.0
Total	476	52	10.9	78	16.4	346	72.7

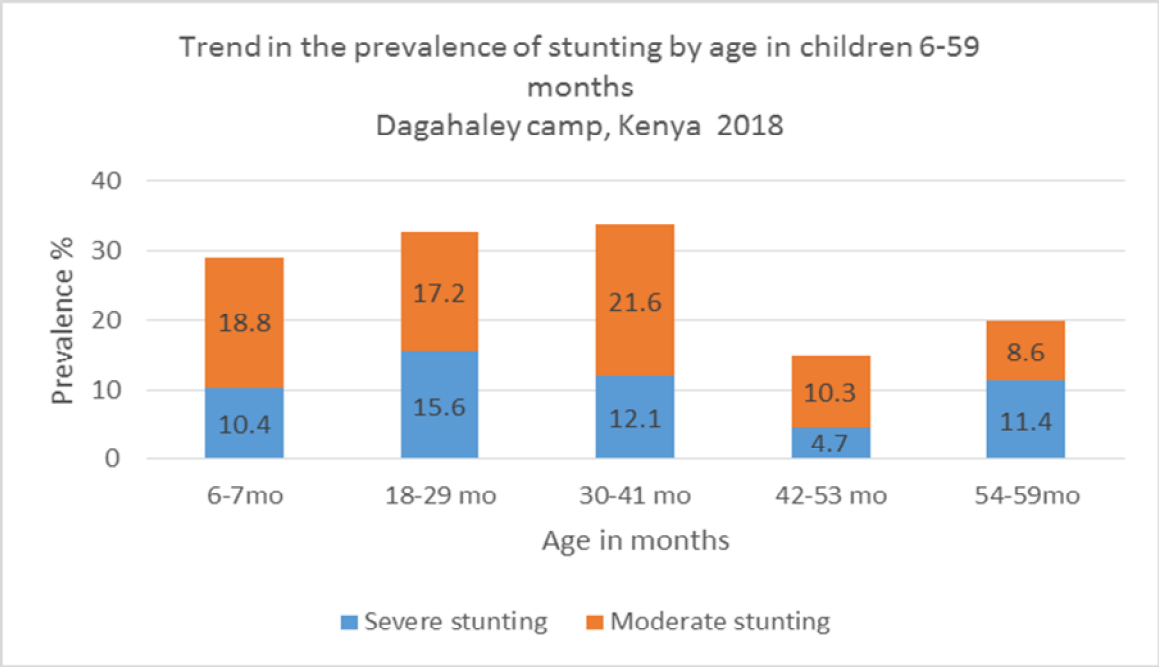


Figure 5 Trend in prevalence of stunting by age, Dagahaley camp, Kenya, 2018

The height-for-age z-scores distribution is compared to the WHO curve in Figure 6. The curve was flatter than the WHO graph.

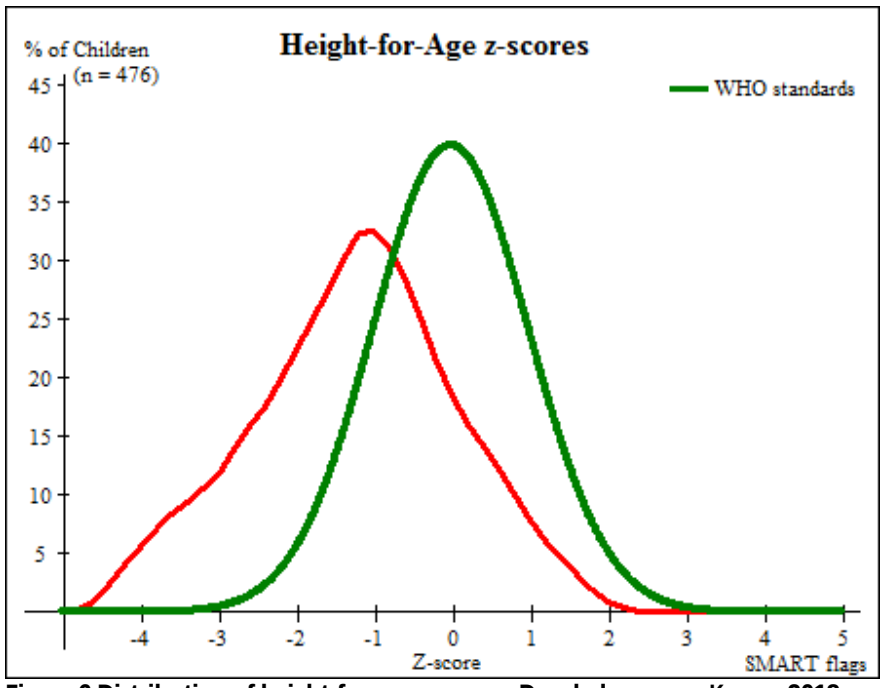


Figure 6 Distribution of height-for-age z-scores, Dagahaley camp, Kenya, 2018

The mean z-scores and design effect for the three indicators is displayed in Table 13.

Table 13 Mean z-scores, Design Effects and excluded subjects, Dagahaley camp, Kenya, 2018

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	503	-0.65±1.05	1.00	6	9
Weight-for-Age	503	-1.16±1.12	2.16	6	9
Height-for-Age	476	-1.25±1.28	2.22	6	36

* contains for WHZ and WAZ the children with edema.

Measles vaccination coverage results

The coverage of both measles vaccination and Vitamin A supplementation were very high based on recall or confirmation from the mother (Table 14 and 15).

Table 14 Measles vaccination coverage for children aged 9-59 months (n=489), Dagahaley camp, Kenya, 2018

	Measles (with card) n=366	**Measles (with card or confirmation from mother) n=486**
YES	75% (61.5-88.5, 95% C.I)	99.6% (99.0-100.0, 95% C.I)

Vitamin A coverage results

Table 15 Vitamin A supplementation for children aged 6-59 months within past 6 months (n=488), Dagahaley camp, Kenya, 2018

	Vitamin A capsule (with card) n=347	**Vitamin A capsule (with card or confirmation from mother) n=442**
YES	67.8% (54.2-81.4, 95% C.I)	86.3% (77.1-95.5, 95% C.I)

An analysis of the trend revealed that the coverage of measles has remained within acceptable levels, however Vitamin A has reduced in comparison with the standard (Figure 7).

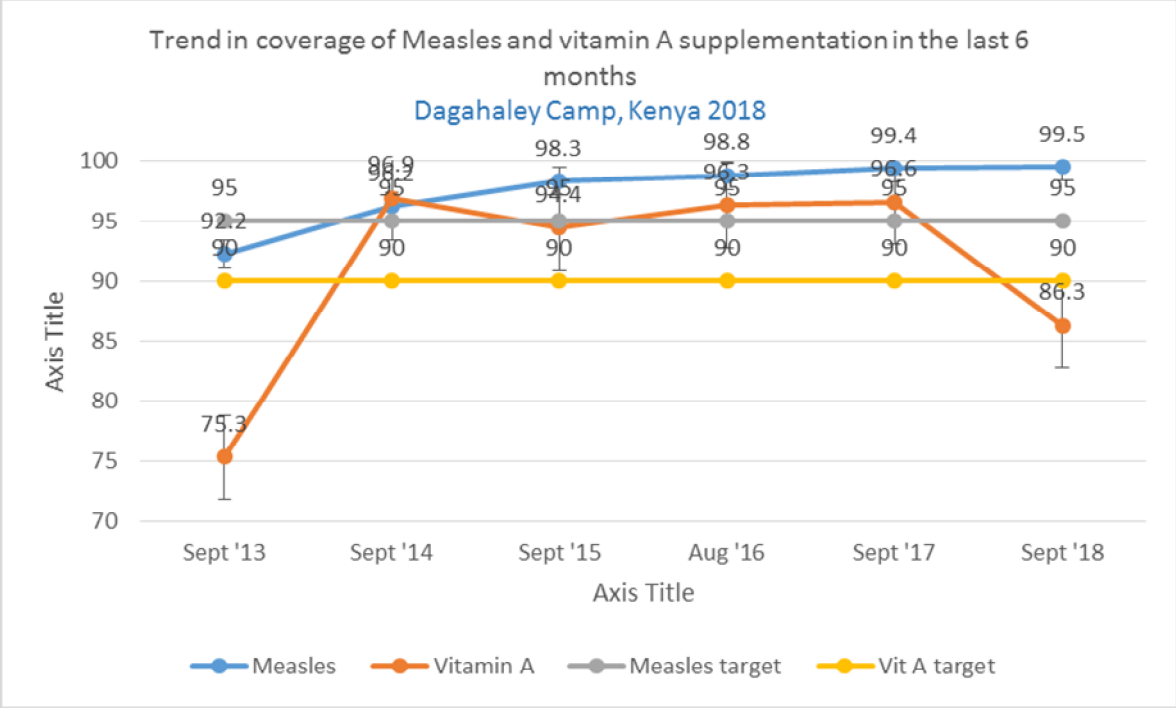


Figure 7 Trend in coverage of measles vaccination and Vitamin A supplementation, Dagahaley camp, Kenya, 2018

Deworming

The coverage of deworming was also very high for the 24-59 months age group (Table 16). The high coverage of Vitamin A, measles and deworming shows the impact of the bi-annual malezi bhora exercise in addition to routine supplementation and vaccination.

Table 16 Deworming for children aged 24-59 months within past 6 months (n=330), Dagahaley camp, Kenya, 2018

	Deworming (with card or confirmation from mother) n=276
YES	83.6% (75.5-91.7, 95% C.I)

Diarrhoea results

6.7% (3.2-10.1) of children had experienced diarrhoea in the previous two weeks (Table 17).

Table 17 Period prevalence of diarrhoea, Dagahaley camp, Kenya, 2018

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	34/512	6.7 (3.2-10.1)

Anaemia results

Among children 6-59 months, 60.7% (55.9-65.4) were classified as anaemic (Table 18), with a mean Hb level of 10.5. The decrease in anaemia in 2018 compared to 2017 was not statistically significant *(p=0.510)*.

Table 18 Prevalence of anaemia in children 6-59 months, Dagahaley camp, Kenya, 2018

Anaemia in Children 6-59 months	All n = 697
Total Anaemia (Hb<11.0 g/dL)	(633) 60.7% (55.9-65.4, 95% C.I)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(189) 29.9% (26.0-33.7, 95% C.I)
Moderate Anaemia (7.0-9.9 g/dL)	(192) 30.3% (25.3-35.4, 95% C.I)
Severe Anaemia (<7.0 g/dL)	(3) 0.5% (0.0-1.0, 95% C.I)
Mean Hb (g/dL) (confidence interval)	10.5 (10.3-10.7)

Figure 8 shows that anaemia has been increasing since 2014. There was a decrease in the prevalence of amaemia from 2017 to 2018, which was not statistically significant *(p=0.962).*

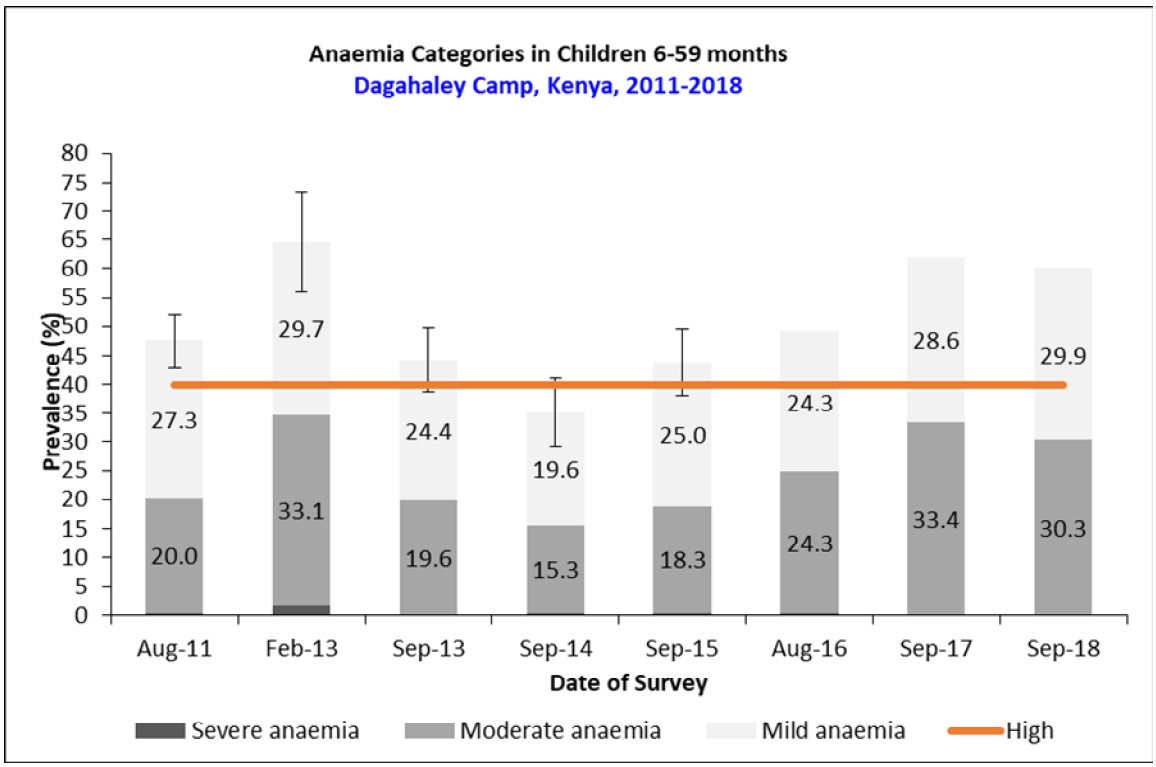


Figure 8 Anaemia categories, Dagahaley camp, Kenya, 2018

The mean haemoglobin concentration in 2018 remained the same as in 2017 (Figure 9).

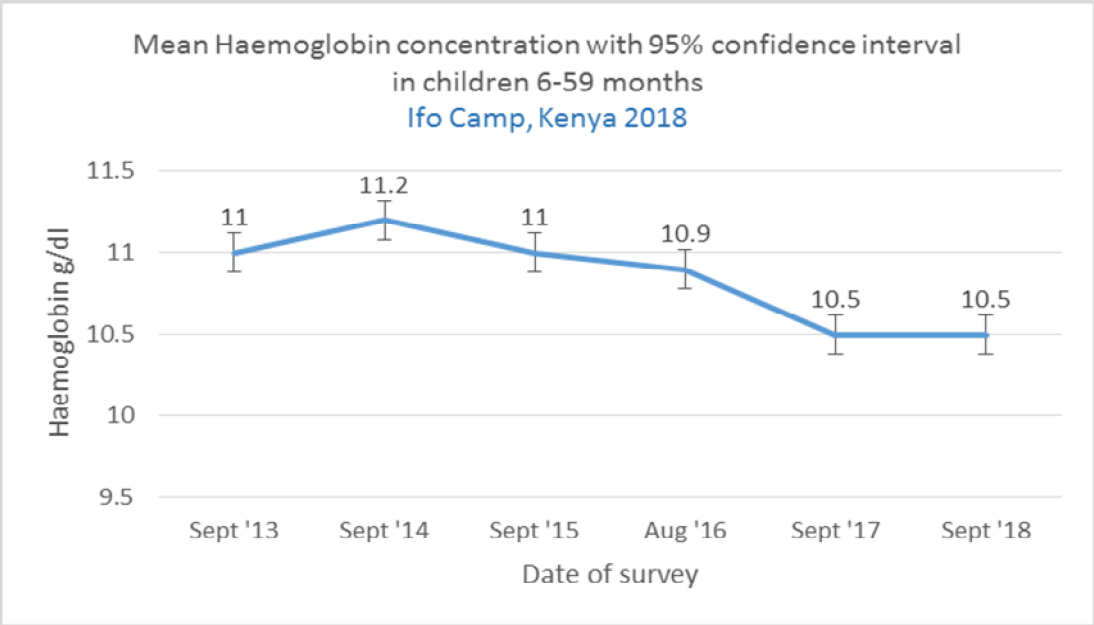


Figure 9 Mean haemoglobin concentration, Dagahaley camp, Kenya, 2018

The prevalence of moderate and severe anaemia by age is analysed in Table 19.

Table 19 Prevalence of moderate and severe anaemia in children 6-59 months by age, Dagahaley camp, Kenya, 2018

	6-23 months n=181	**24-35 months n=132**	**36-59 months n=205**	**Total n=633**
Moderate and Severe Anaemia (Hb < 10g/dl)	(80) 45.7% (37.6-53.9, 95% C.I)	(46) 34.8% 25.7-44.0 95% C.I)	(29) 14.1% (9.7-18.6, 95% C.I)	(195) 30.8% (25.7-36.0, 95% C.I)

Anaemia was highest in the 6-23 age group, where more than three quarters were anaemic (78.3%, 71.7-84.8). In the 24-35 age group, more than two thirds (68.2%, 58.8-77.6) were anaemic. In the 36-59 age group, less than half (42.0%, 35.8-58.0) were anaemic (Table 20).

Table 20 Prevalence of anaemia by age, Dagahaley camp, Kenya, 2018

		Severe Anaemia (<7.0 g/dL)		Moderate Anaemia (7.0-9.9 g/dL)		Mild Anaemia (Hb 10.0-10.9 g/dL)		Total Anaemia (Hb<11.0 g/dL)		Normal (Hb≥11.0 g/dL)	
Age (mths)	**Total no.**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**
6-23	181	2	1.1 (0.0-2.8)	78	44.6 (36.3-52.8)	57	32.6 (24.7-40.4)	175	78.3 (71.8-84.8)	38	21.7 (15.2-8.2)
24-35	132	1	0.8 (0.0-2.2)	45	34.1 (24.5-43.7)	44	33.3 (24.6-42.0)	90	68.2 (58.8-77.6)	42	31.8 (22.4-41.2)
36-59	205	0	0.0 (0.0-0.0)	29	14.1 (9.7-18.6)	57	27.8 (21.9-33.7)	86	42.0 (35.9-48.0)	119	58.0 (52.0-64.1)
Total	**633**	**3**	**0.5 (0.0-1.0)**	**192**	**30.3 (25.3-35.4)**	**189**	**29.8 (26.0-33.7)**	**384**	**60.7 (55.8-65.4)**	**249**	**39.3 (34.6-44.1)**

3.2 Children 0-23 months

Infant and Young Child Feeding (IYCF) indicators results are presented in Table 21 and Figure 10. Timely initiation of breastfeeding (initiation of breastfeeding within an hour of birth) was reported by more than two thirds (79.1%, 65.2-92.9) of the sample. Over half (62.5%, 45.4-79.5) of children below 6 months were exclusively breastfed. Only 18.1% (5.7-30.7**)** of children between 6 and 8 months had been introduced to solid food.

Table 21 Prevalence of Infant and Young Child Feeding Practices Indicators, Dagahaley camp, Kenya, 2017

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	140/177	79.1	65.2-93.0
Exclusive breastfeeding under 6 months	0-5 months	35/56	62.5	45.5-79.5
Continued breastfeeding at 1 year	12-15 months	18/28	64.3	40.5-88.1
Continued breastfeeding at 2 years	20-23 months	4/15	26.7	3.8-49.6
Introduction of solid, semi-solid or soft foods	6-8 months	6/33	18.2	5.7-30.7
Consumption of iron-rich or iron-fortified foods	6-23 months	50/181	27.6	15.0-40.2
Bottle feeding	0-23 months	47/225	20.9	7.9-33.8

The analysis of trends revealed that timely initiation of breastfeeding and exclusive breastfeeding have improved in 2018.

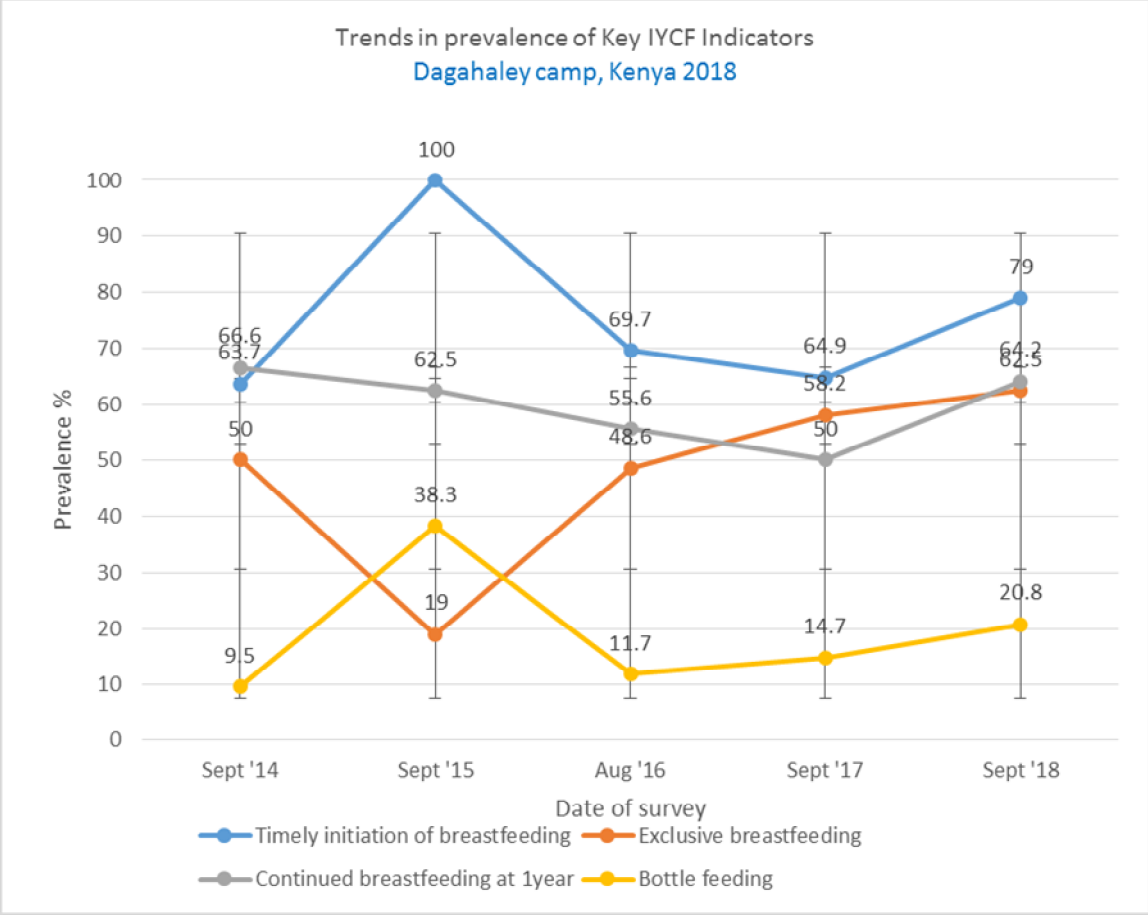


Figure 10 Trends in prevalence of key IYCF indicators, Dagahaley camp, Kenya, 2018

Prevalence of intake

Infant formula

More than a fifth (23.3%, 10.2-36.4) had consumed infant formula (Table 22).

Table 22 Infant formula intake in children aged 0-23 months, Dagahaley camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who consumed infant formula (fortified or non-fortified)	52/223	23.3 (10.2-36.4)

3.3 Women 15-49 years

Of the sample of women of reproductive age, 13.5% were pregnant. The mean age was 27.7, with a minimum of 15 and a maximum of 49 (Table 23).

Table 23 Women's physiological status and age, Dagahaley camp, Kenya, 2018

Physiological status	Number/total	% of sample
Pregnant	44/327	13.5
Non-pregnant	283/327	86.5
Mean age (range)	27.7 (15-49)	

The prevalence of anaemia among non-pregnant women was 53.0% (46.9-59.1), with a severe

anaemia prevalence of 0.4% (0.0-1.0). The mean haemoglobin was 11.8 (Table 24). There was an increase in 2018 compared to 2017, although the increase was not statistically significant *(p=0.134)*.

Table 24 Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years), Dagahaley camp, Kenya, 2018

Anaemia in non-pregnant women of reproductive age (15-49 years)	**All** n = 283
Total Anaemia (<12.0 g/dL)	(150) 53.0% (46.9-59.1, 95% C.I)
Mild Anaemia (11.0-11.9 g/dL)	(84) 29.7% (24.8-34.5, 95% C.I)
Moderate Anaemia (8.0-10.9 g/dL)	(65) 23.0% (18.2-27.7, 95% C.I)
Severe Anaemia (<8.0 g/dL)	(1) 0.4% (0.0-1.1, 95% C.I)
Mean Hb (g/dL) **(confidence interval)**	11.8 (11.6-12.0)

Figure 11 and 12 show the increase in both mild and moderate anaemia in 2018 compared to 2017.

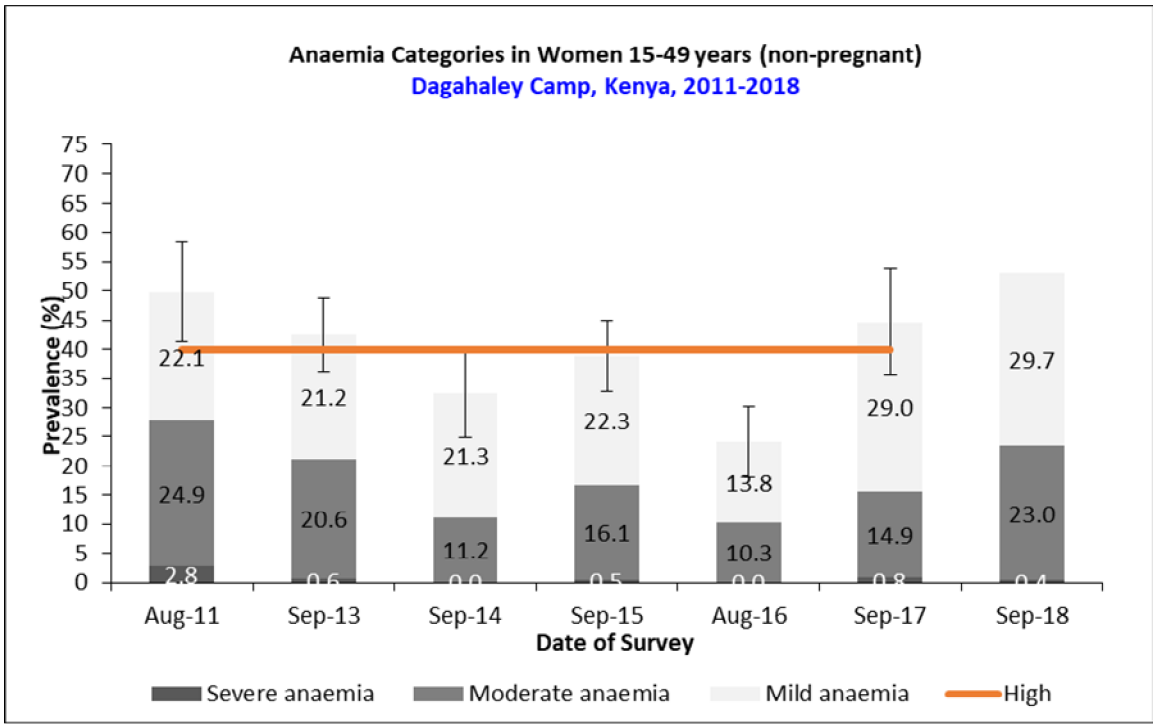


Figure 11 Anaemia categories in women 15-49 years, Dagahaley camp, Kenya, 2018

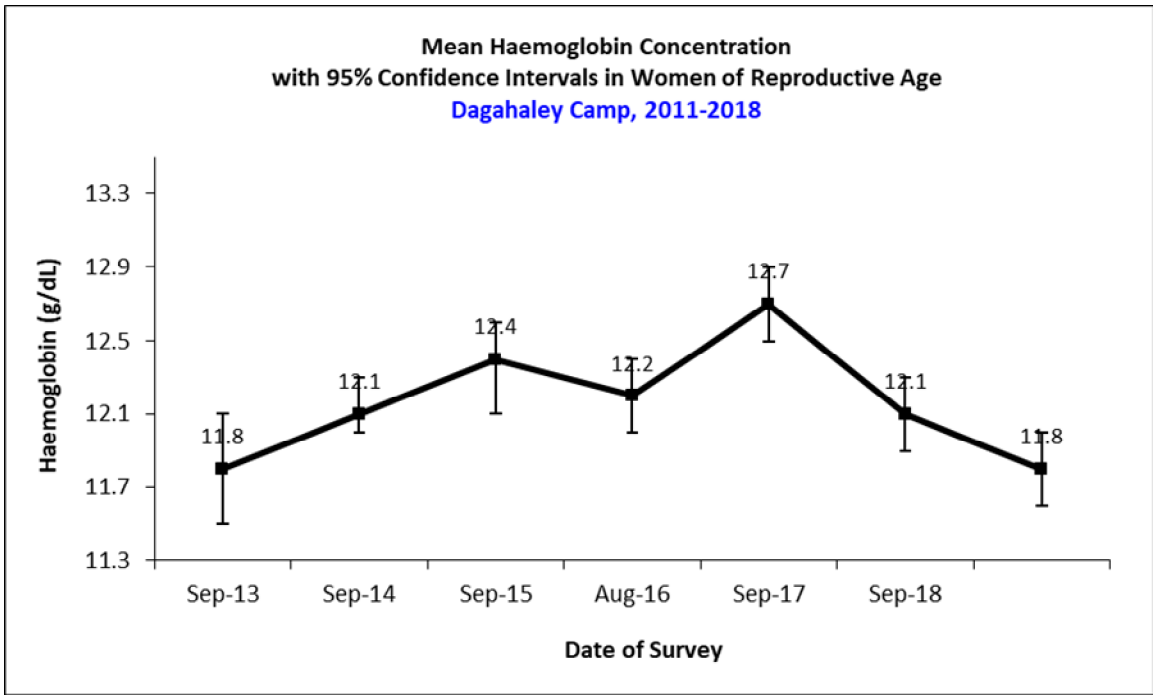


Figure 12 Mean haemoglobin concentration, Dagahaley camp, Kenya, 2018

Nearly all pregnant women were enrolled in antenatal care and were receiving iron-flic acid tablets (Table 25).

Table 25 ANC enrollment and iron-folic acid pills coverage among pregnant women (15-49 years), Dagahaley camp, Kenya, 2018

	Number /total	% (95% CI)
Currently enrolled in ANC programme	42/44	95.5(88.4-100.0)
Currently receiving iron-folic acid pills	41/44	93.2 (84.6-100.0)

3.4 Food security

A total of 300 households were interviewed for the food security module against a planned 246. (Table 26).

Table 26 Food security information, Dagahaley camp, Kenya, 2017

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	246	300	122%

Food distribution results

The average duration of the food ration was reported as 14.9 against the theoretical duration of 31, which is 48% of the expeted duration (Table 27).

Table 27 Reported duration of general food ration, Dagahaley camp, Kenya, 2018

Average number of days the food ration lasts (Standard deviation or 95% CI)	Average duration (%) in relation to the theoretical duration of the ration
14.9 (13.8-16.0)	48.0%

Negative coping strategies results

The main household coping mechanism was borrowing (16.5%), followed by requesting increased remittances (13.0%).

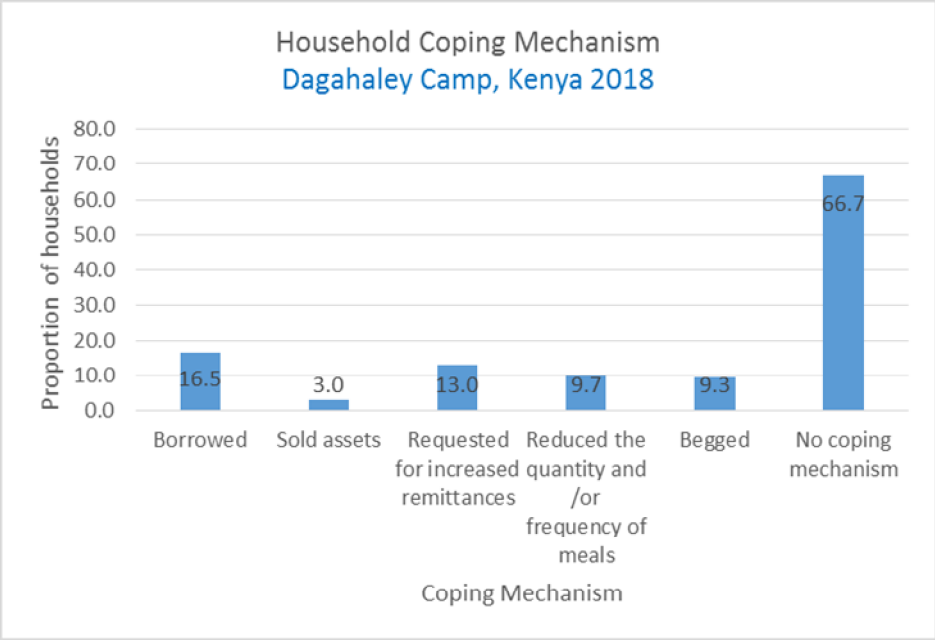


Figure 13 Household coping mechanisms, Dagahaley camp, Kenya, 2018

Household dietary diversity results

The average household dietary diversity score (HDDS) was 6.5 for Dagahaley (Table 28).

Table 28 Average HDDS, Dagahaley camp, Kenya, 2018

Average HDDS	95% CI
6.5	5.3-7.8

The proportion of households consuming different food groups is displayed in Figure 14. Consumption of cereals was very high, followed by vegetables, pulses, and spices. Consumption of fruits, milk and eggs was low.

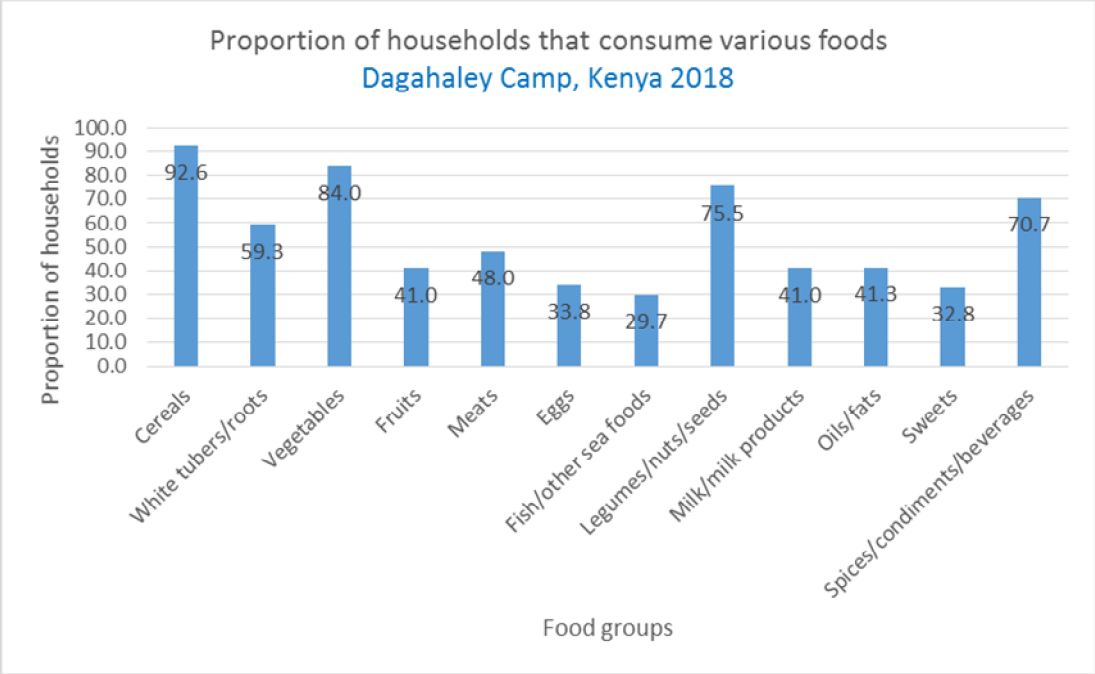


Figure 14 Proportion of households consuming various food groups, Dagahaley camp, Kenya, 2018

About a tenth (10.7%, 4.0-17.3) of households had not consumed any vegetables, fruits, meat, eggs, fish/seafood and milk/milk products. About three quarters (77.3%, 65.4-89.2) had consumed either a plant or animal source of Vitamin A. About half (49.7%, 35.3-64.0) had consumed food sources of haem iron (Table 29).

Table 29 Consumption of food aid commodities and micronutrient rich foods by households, Dagahaley camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	32/300	10.7 (4.0-17.3)
Proportion of households consuming either a plant or animal source of vitamin A	232/300	77.3 (65.4-89.2)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	149/300	49.7 (35.3-64.0)

3.5 WASH

298 households were interviewed compared to a planned 492. The reasons for the higher than planned number were explained in section 3.3.

Table 30 WASH information, Dagahaley camp, Kenya, 2017

Household data	Planned	Actual	% of target
Total households surveyed for WASH	492	601	122%

Nearly all households had access to an improved drinking water source (Table 31). The proportion of households with covered or narrow necked containers was 52.7% (41.1-64.3).

Table 31 Water Quality, Dagahaley camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of households using an improved drinking water source	599/601	99.7 (99.2-100.0)
Proportion of households that use a covered or narrow necked container for storing their drinking water	317/601	52.7% (41.2-64.3)

Huseholds were using an average of 32.5 litres (26.5-38.5) per person per day, with 63.2% (49.4-77.0) using at least the standard 20 litres per person per day (Table 32).

Table 32 Water Quantity: Amount of litres of water used per person per day, Dagahaley camp, Kenya, 2018

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	380/601	63.2 (49.5-77.0)
15 – <20 lpppd	89/601	14.8 (9.4-20.2)
<15 lpppd	132/601	22.0 (11.8-32.1)
Mean (95% CI)	32.5 (26.5-38.5)	

A high proportion of households were satisfied with the water supply (Table 33).

Table 33 Satisfaction with water supply, Dagahaley camp. Kenya, 2018

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	491/601	81.7 (71.4-92.0)

The main reason for lack of satisfaction was ‘not enough’ (81.6%) as shown in Figure 15.

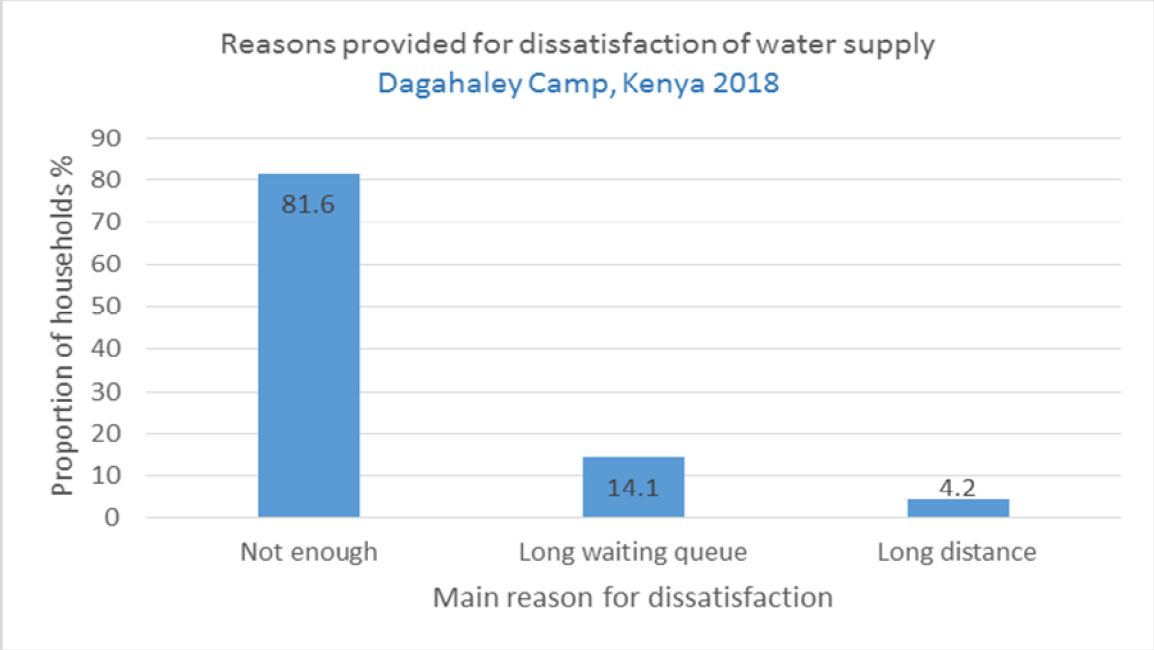


Figure 15 Reasons provided for dissatisfaction of water supply, Dagahaley camp, Kenya, 2018

Less then half (42,6%, 31.5-53.6) of households were using an improved excreta disposal facility. About a fifth (26.1%, 11.7-40.5) were using an unimproved toilet. Just about all households reported safe disposal of child faeces (Table 34).

Table 34 Safe Excreta disposal, Dagahaley camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of households using an improved excreta disposal facility (improved toilet facility, not shared)	256/601	42.6 (31.5-53.6)
Proportion of households using a shared family toilet	149/601	24.8 (16.1-33.5)
Proportion of households using a communal toilet	39/601	6.5 (2.8-10.2)
Proportion of households using an unimproved toilet	157/601	26.1 (11.7-40.5)
The proportion of households with children under three years old that dispose of faeces safely.	341/342	99.7 (99.1-100.0)

4 Results: Hagadera camp

A total population of 3,604 was surveyed in 604 households, to give an average household size of 6.0. The proportion of children below 5 years in the sample was 18.8% (Table 35).

Table 35 Demographic Characteristics of the study population, Hagadera camp, Kenya, 2018

Total HHs surveyed	*604*
Total population surveyed	*3,604*
Total U5 surveyed	*677*
Average HH size	*6.0*
% of U5	*18.8*

4.1 Children 6-59 months

Sample size and clusters

584 children aged 6-59 months were interviewed, which was 118% of the target of 497. (Table 37).

Table 37 Target and actual number captured, Hagadera Camp, Kenya, 2018

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	497	584	118
Clusters	30	30	100

The distribution of children within different ages was as expected, and the sex ratio of 0.9 was acceptable (Table 38).

Table 38 Distribution of age and sex of sample, Hagadera camp, Kenya, 2018

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy:girl**
6-17	59	47.6	65	52.4	124	21.2	0.9
18-29	81	54.7	67	45.3	148	25.3	1.2
30-41	62	45.6	74	54.4	136	23.3	0.8
42-53	65	47.8	71	55.2	136	23.3	0.9
54-59	16	40.0	24	60.0	40	6.8	0.7
Total	283	48.5	301	51.5	584	100.0	0.9

Anthropometric results (based on WHO Growth Standards 2006)

The prevalence of global acute malnutrition (GAM) was 5.6% (3.5-8.9), with a severe acute malnutrition (SAM) prevalence of 0.5% (0.2-1.6). There were no cases of oedema (Table 39).

Table 39 Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex, Hagadera camp, Kenya, 2018

	All n = 574	**Boys** n = 278	**Girls** n = 296
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(32) 5.6 % (3.5 - 8.9 95% C.I.)	(21) 7.6 % (4.7 – 11.9 95% C.I.)	(11) 3.7 % (1.8 – 7.6 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(29) 5.1 % (3.1- 8.1 95% C.I.)	(18) 6.5 % (3.8 – 10.8 95% C.I.)	(11) 3.7 % (1.8 – 7.6 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(3) 0.5% (0.2 – 1.6 95% C.I.)	(3) 1.1 % (0.4 – 3.2 95% C.I.)	(0) 0 % (0.0 – 0.0 95% C.I.)

The prevalence of oedema is 0.0 %

The trend analysis (Figure 16) reveals that there was a decline in GAM from 2017 to 2018. The decrease was, however, not statistically significant *(p=0.066)*.

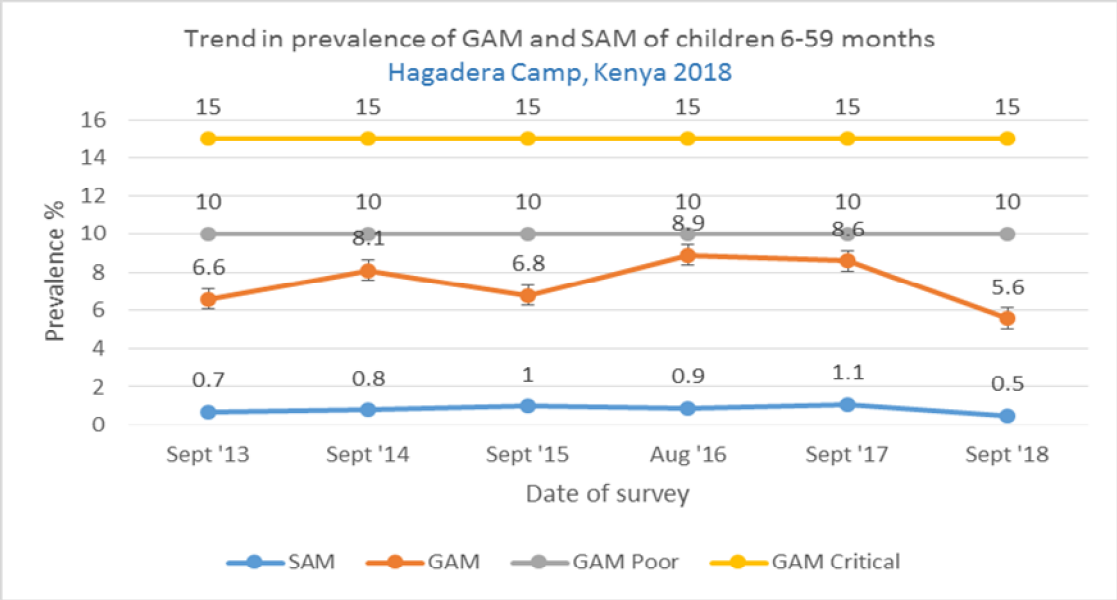


Figure 16 Trend in prevalence of GAM and SAM, Hagadera camp, Kenya, 2018

Table 40 Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema, Hagadera camp, Kenya, 2018

		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	122	0	0.0	3	2.5	119	97.5	0	0.0
18-29	144	2	1.4	8	5.6	134	93.1	0	0.0
30-41	133	1	0.8	4	3.0	128	96.2	0	0.0
42-53	136	0	0.0	6	4.4	130	95.6	0	0.0
54-59	39	0	0.0	8	20.5	31	79.5	0	0.0
Total	574	3	0.5	29	5.1	542	94.4	0	0.0

Acute malnutrition was highest in the 18-29 and 54-59 age groups (Table 40 and Figure 17).

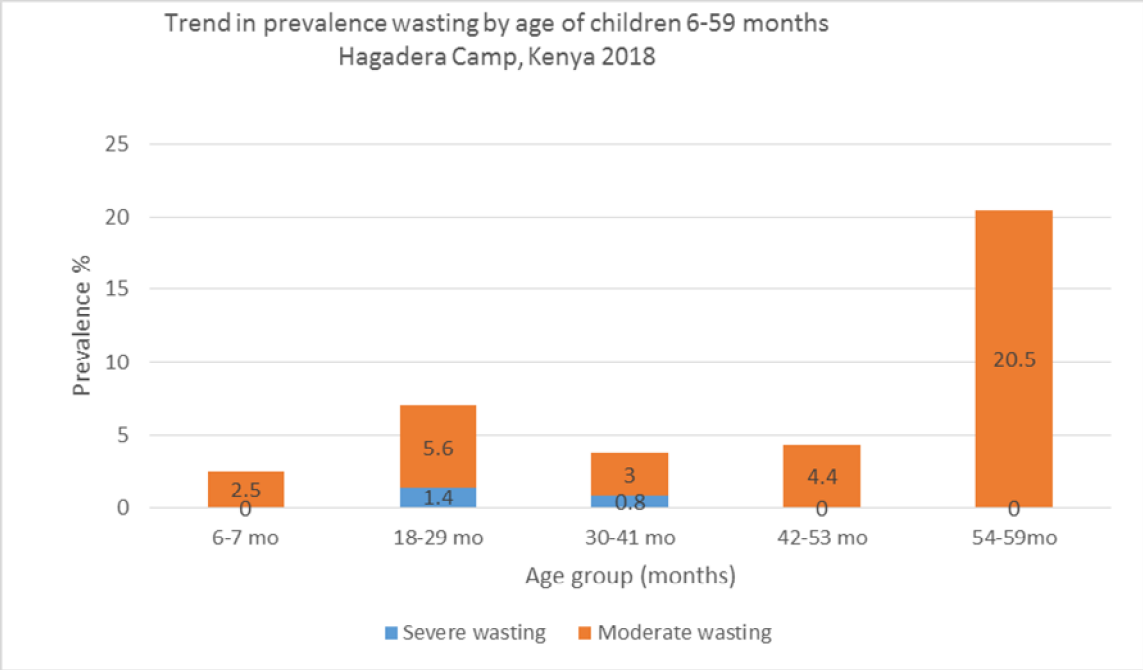


Figure 17 Trend in prevalence of wasting by age, Hagadera camp, Kenya, 2018

All cases of severe malnutrition were due to marasmus (Table 41).

Table 41 Distribution of acute malnutrition and oedema based on weight-for-height z-scores, Hagadera camp, Kenya, 2018

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 9 (1.5 %)	Not severely malnourished No. 574 (98.5 %)

NB: flagged records are included

Figure 18 is a comparison of the weight-for-height z-scores distribution with the WHO standard. The distribution followed a normal distribution and closely resembled the WHO curve.

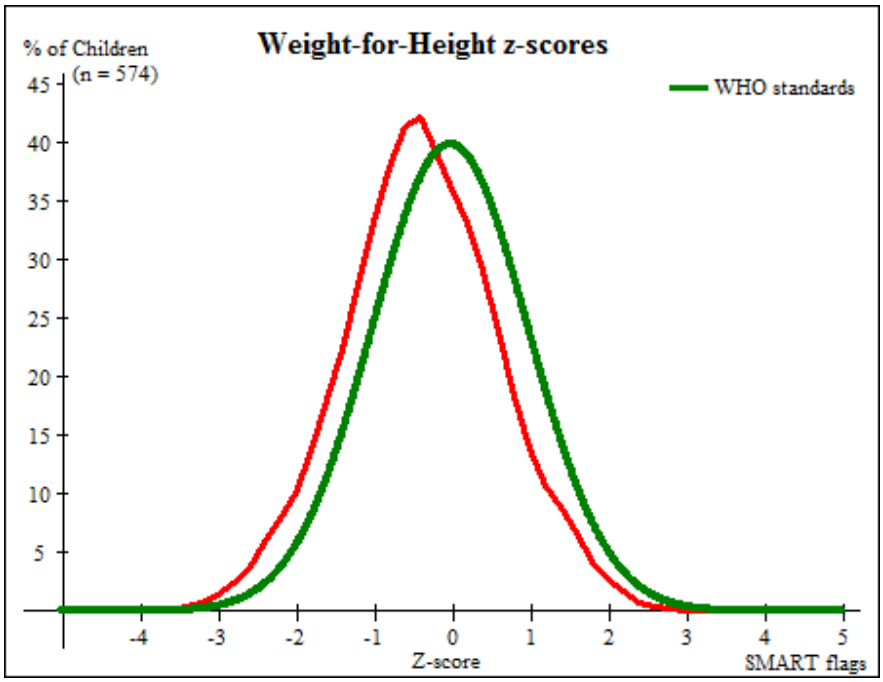


Figure 18 Distribution of weight-for-height z-scores, Hagadera camp, Kenya, 2018

The prevalence of global malnutrition based on MUAC was 3.1% (1.9-5.0). The prevalence was much higher based on MUAC than weight-for-height due which is consistent for the surveyed population (Table 42).

Table 42 Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex, Hagadera camp, Kenya, 2018

	All n = 584	**Boys** n = 283	**Girls** n = 301
Prevalence of global malnutrition (< 125 mm and/or oedema)	(18) 3.1 % (1.9 – 5.0 95% C.I.)	(2) 0.7 % (0.2 – 2.9 95% C.I.)	(16) 5.3 % (3.3 – 8.4 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(13) 2.2 % (1.2 - 4.1 95% C.I.)	(1) 0.4 % (0.0 – 2.7 95% C.I.)	(12) 4.0 % (2.2 – 7.2 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(5) 0.9 % (0.4 – 2.0 95% C.I.)	(1) 0.4 % (0.0 - 2.7 95% C.I.)	(4) 1.3 % (0.5 – 3.4 95% C.I.)

Table 43 Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema, Hagadera camp, Kenya, 2018.

		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	124	5	4.0	13	10.5	106	85.5	0	0.0
18-29	148	0	0.0	0	1.3	148	100.0	0	0.0
30-41	136	0	0.0	0	1.3	136	100.0	0	0.0
42-53	136	0	0.0	0	0.0	136	100.0	0	0.0
54-59	40	0	0.0	0	0.0	40	100.0	0	0.0
Total	584	5	0.9	13	2.2	566	96.9	0	0.0

11.1% (8.6-14.1) of children were underweight, with 2.4% (1.3-4.5) severely underweight (Table 44).

Table 44 Prevalence of underweight based on weight-for-age z-scores by sex, Hagadera camp, Kenya, 2018

	All n = 578	**Boys** n **=** 278	**Girls** n **=** 300
Prevalence of underweight (<-2 z-score)	(64) 11.1 % (8.6 – 14.1 95% C.I.)	(35) 12.6 % (9.5 – 16.4 95% C.I.)	(29) 9.7 % (6.7 – 13.8 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(50) 8.7% (6.8 – 11.0 95% C.I.)	(26) 9.4 % (7.0 – 12.5 95% C.I.)	(24) 8.0 % (5.3 – 11.9 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(14) 2.4 % (1.3 - 4.5 95% C.I.)	(9) 3.2 % (1.6 - 6.5 95% C.I.)	(5) 1.7 % (0.7- 3.8 95% C.I.)

18.6% (13.6-24.8) of children in the sample were classified as stunted, with 4.0% (2.5-6.4) severely stunded (Table 45).

Table 45 Prevalence of stunting based on height-for-age z-scores and by sex, Hagadera camp, Kenya, 2018

	All n = 571	**Boys** n **=** 274	**Girls** n **=** 297
Prevalence of stunting (<-2 z-score)	(106) 18.6 % (13.6 – 24.8 95% C.I.)	(54) 19.7 % (13.6 - 27.7 95% C.I.)	(52) 17.5 % (11.6 – 25.5 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(83) 14.5 % (10.7 - 19.4 95% C.I.)	(40) 14.6 % (10.0 - 20.8 95% C.I.)	(43) 14.5% (9.4 – 21.6 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(23) 4.0% (2.5 – 6.4 95% C.I.)	(14) 5.1 % (3.0 – 8.5 95% C.I.)	(9) 3.0 % (1.6 – 5.6 95% C.I.)

As shown in Figure 19, stunting has been on a decreasing trend since 2014. However, there was a slight increase in 2018 compared to 2017.The increase in stunting from 2017 to 2018 was, however, not statistically significant *(p=0.964)*.

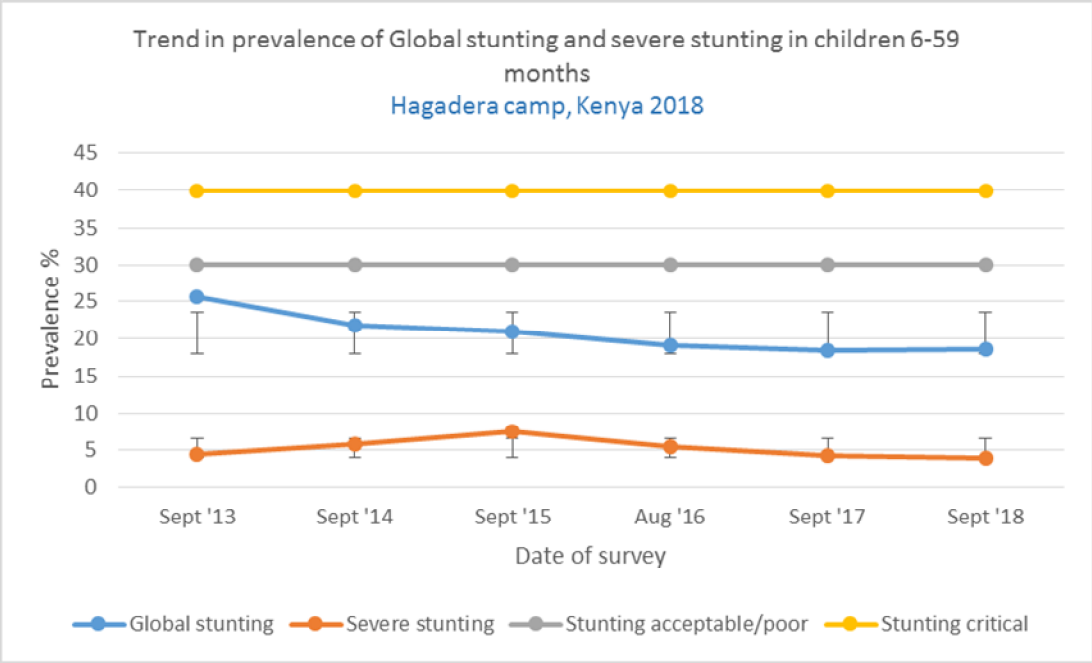


Figure 19 Trend in prevalence of global and severe stunting, Hagadera camp, 2018

Table 46 Prevalence of stunting by age based on height-for-age z-scores, Hagadera camp, Kenya, 2018

		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	119	5	4.2	12	10.1	102	85.7
18-29	143	7	4.9	29	20.3	107	74.8
30-41	134	4	3.0	23	17.2	107	79.9
42-53	135	5	3.7	13	9.6	117	86.7
54-59	40	2	5.0	6	15.0	32	80.0
Total	571	23	4.0	83	14.5	465	81.4

Stunting was highest in the 18-29 age group (Figure 20).

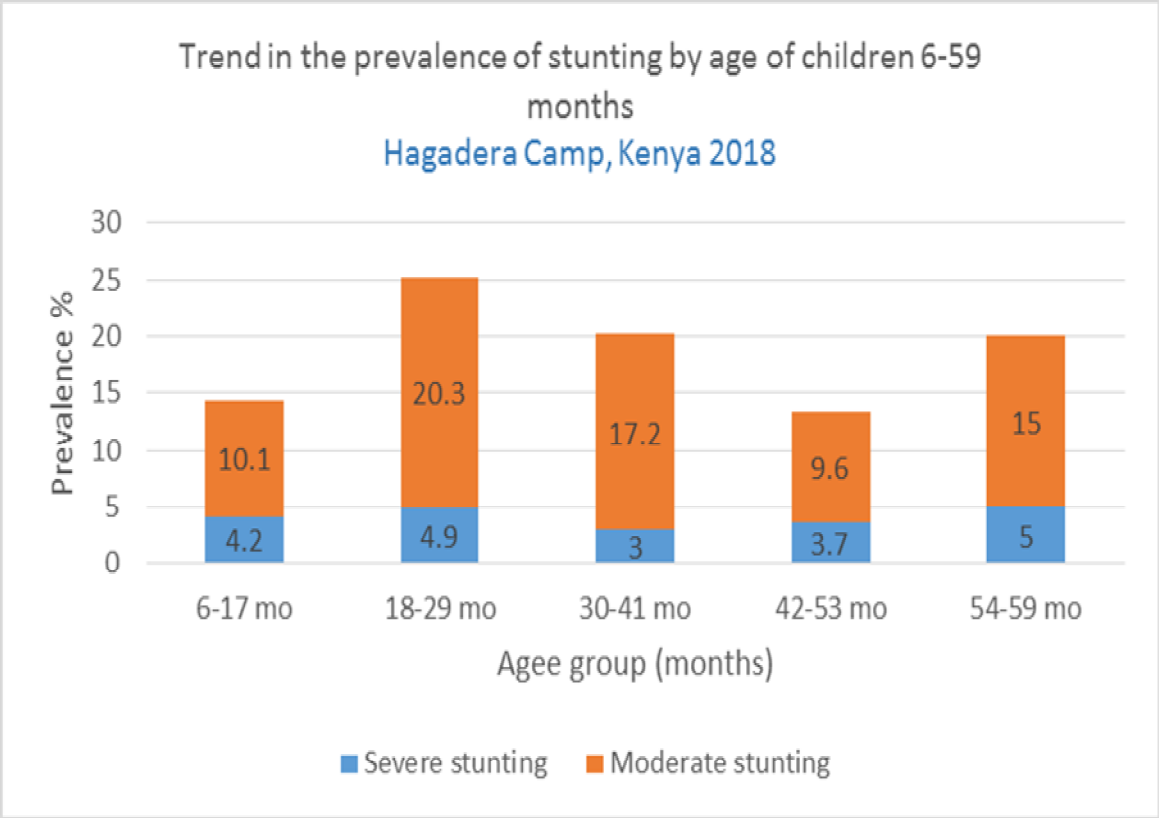


Figure 20 Trend in prevalence of stunting by age, Hagadera camp, Kenya, 2018

A comparison of the survey and WHO distribution is shown in Figure 21.

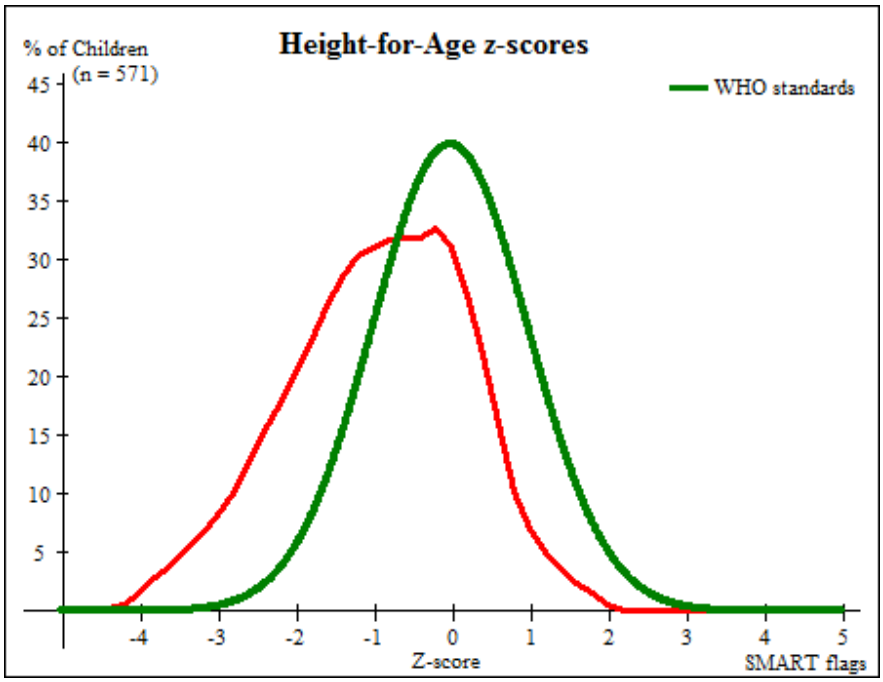


Figure 21 Distribution of height-for-age z-scores, Hagadera camp, Kenya, 2018

The mean z-scores, design effects and excluded subjects are shown in Table 47.

Table 47 Mean z-scores, Design Effects and excluded subjects, Hagadera camp, Kenya, 2018

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	574	-0.38±0.97	1.82	1	9
Weight-for-Age	578	-0.79±0.98	1.06	0	6
Height-for-Age	671	-0.94±1.13	2.80	1	12

* contains for WHZ and WAZ the children with edema.

Measles vaccination coverage results

The coverage of both Vitamin A and measles were very high, which is expected given that there is both routine and periodic supplementation and vaccination in the context (Table 48 and 49).

Table 48 Measles vaccination coverage for children aged 9-59 months (n=554), Hagadera camp, Kenya, 2018

	Measles (with card) n=500	**Measles (with card or confirmation from mother) n=631**
YES	90.3% (86.3-94.2, 95% C.I)	99.5% (98.6-100.0, 95% C.I)

Vitamin A coverage results

Table 49 Vitamin A supplementation for children aged 6-59 months (n=583) within past 6 months, Hagadera camp, Kenya, 2018

	Vitamin A capsule (with card) n=470	**Vitamin A capsule (with card or confirmation from mother) n=576**
YES	80.6% (72.4-88.8, 95% C.I)	98.8% (97.2-100.0, 95% CI)

The coverage of both has been increasing since 2014 (Figure 22).

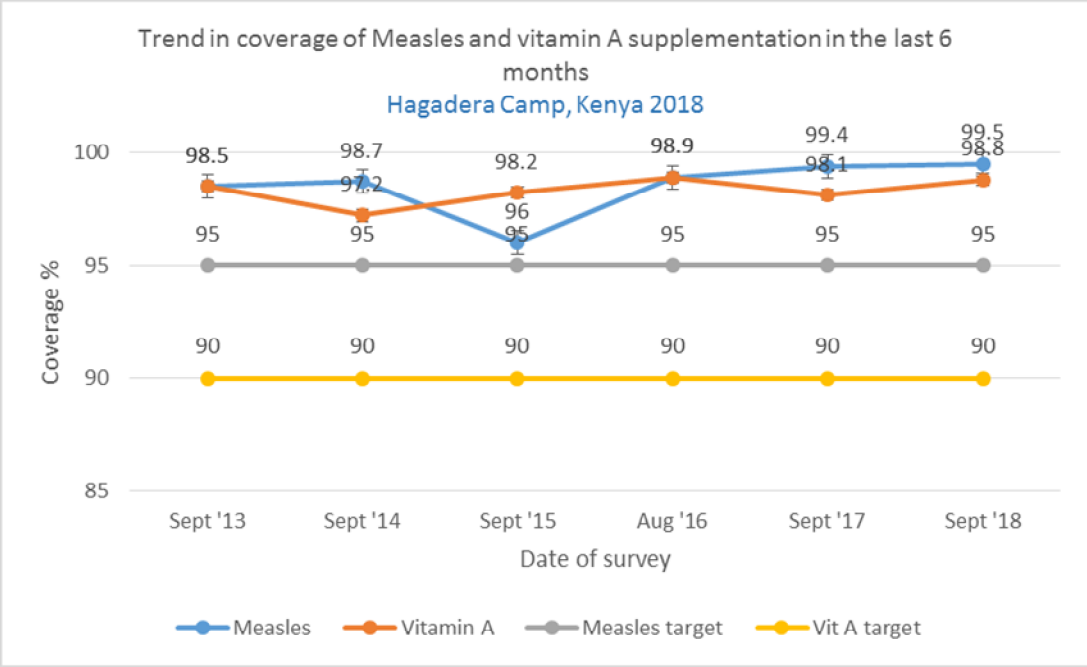


Figure 22 Trend in coverage of measles vaccination and Vitamin A supplementation, Hagadera camp, Kenya, 2018

Deworming

The coverage of deworming for children 24 to 59 months was also very high (Tabe 50).

Table 50 Deworming for children aged 24-59 months (n=386) within past 6 months, Hagadera camp, Kenya, 2018

	Deworming (with card or confirmation from mother) n=351
YES	90.9% (86.5-95.4, 95% C.I)

Diarrhoea results

Of the children 6-59 months in the sample, 8.6% (5.5-11.6) had experienced diarrhoea in the previous two weeks (Table 51).

Table 51 Period prevalence of diarrhoea, Hagadera camp, Kenya, 2018

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	50/583	8.6 (5.6-11.6)

Anaemia results

A total of 54.0% (48.6-59.3) of children 6-59 months in the sample were anaemic, with a mean haemoglobin level of 10.8 (10.6-11.0). The prevalence was well above the critical threshold of 40%.

Table 52 Prevalence of anaemia in children 6-59 months, Hagadera camp, Kenya, 2018

Anaemia in Children 6-59 months	All n = 677
Total Anaemia (Hb<11.0 g/dL)	(325) 54.0% (48.6-59.3, 95% C.I)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(172) 28.6% (24.9-32.2, 95% C.I)
Moderate Anaemia (7.0-9.9 g/dL)	(153) 25.4% (20.7-30.2, 95% C.I)
Severe Anaemia (<7.0 g/dL)	(0) 0.0% (0.0-0.0, 95% C.I)
Mean Hb (g/dL) (confidence interval)	10.8 (10.6-11.0)

Figure 23 further reveals that anaemia decreased in 2018 after having increased in both 2016 and 2017. The decrease in anaemia from 2017 to 2018 was statistically significant *(p<0.05*).

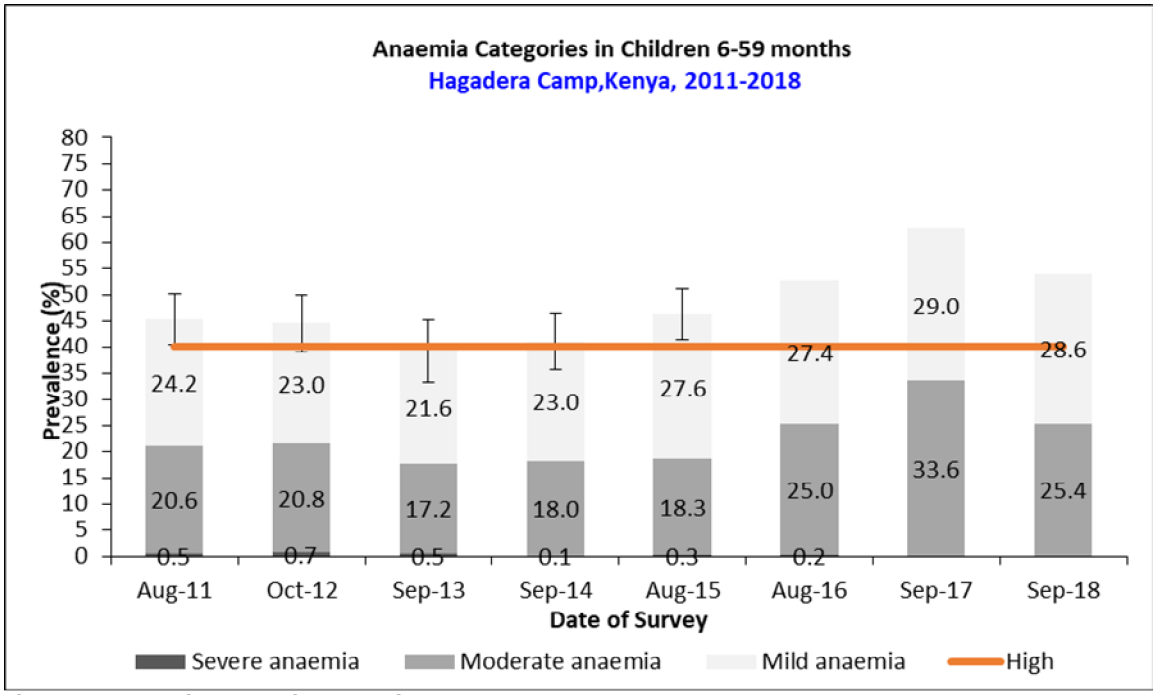


Figure 23 Anaemia categories, Hagadera camp, Kenya, 2018

Mean haemoglobin concentration has also been on a decreasing trend due to the increase in anaemia. However, the mean haemoglobin concentration increased in 2018 (Figure 24).

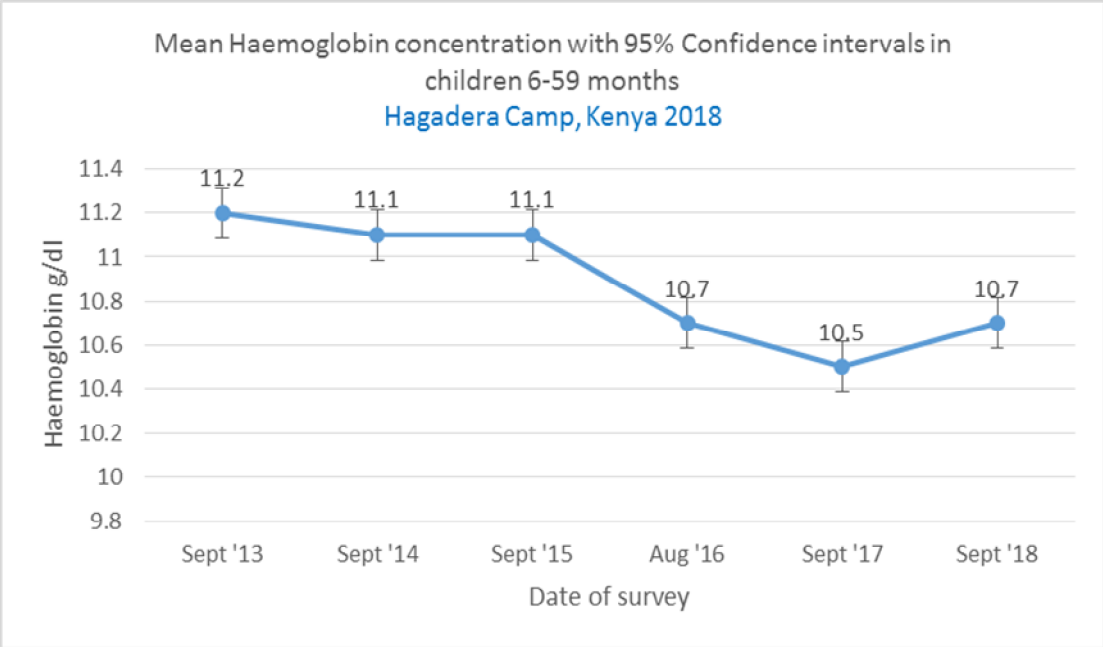


Figure 24 Mean haemoglobin concentration, Hagadera camp, Kenya, 2018

The analysis of moderate and severe anaemia by age group is displayed in Table 53.

Table 53 Prevalence of moderate and severe anaemia in children 6-59 months by age, Hagadera camp, Kenya, 2018

	6-23 months n=198	**24-35 months n=140**	**36-59 months n=246**	**Total n=602**
Moderate and Severe Anaemia (Hb < 10g/dl)	(67) 33.8% (26.0-41.6, 95% C.I)	(41) 29.3% (21.6-37.0, 95% C.I)	(37) 15.0% (9.8-20.3%, 95% C.I)	(153) 25.4% (20.7-30.2, 95% C.I)

An analysis of anaemia by age group revealed that anaemia was highest in the 6-23 months age group and decreased but was also very high in the 24-35 month age group (Table 54).

Table 54 Prevalence of anaemia by age, Hagadera camp, Kenya, 2018

		Severe Anaemia (<7.0 g/dL)		Moderate Anaemia (7.0-9.9 g/dL)		Mild Anaemia (Hb 10.0-10.9 g/dL)		Total Anaemia (Hb<11.0 g/dL)		Normal (Hb≥11.0 g/dL)	
Age (mths)	**Total no.**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**
6-23	198	0	0.0	67	33.8 (26.0-41.6)	66	33.3 (26.9-39.8)	133	67.2 (60.1-74.3)	65	32.8 (25.7-39.9)
24-35	140	0	0.0 (0.0-0.0)	41	29.3 (21.6-37.0)	40	28.6 (20.1-37.0)	81	57.8 (47.8-67.9)	59	42.1 (32.0-52)
36-59	246	0	0.0	37	15.0 (9.8-20.3)	61	24.8 (19.1-30.5)	98	39.8 (32.3-47.4)	148	60.1 (52.5-67.7)
Total	**602**	**0**	**0.0(0.0-0.0)**	**153**	**25.4 (20.6-30.1)**	**172**	**28.5 (24.9-32.2)**	**325**	**53.9 (48.6-59.3)**	**277**	**46.0 (40.6-51.3)**

4.2 Children 0-23 months

IYCF results for children between 0-23 months are summarised in Table 55. Timely initiation of breastfeeding was very pleasing, while exclusive breastfeeding was reported by more than two thirds of children below 6 months. Continued breastfeeding at 2 years was particularly low.

Table 55 Prevalence of Infant and Young Child Feeding Practices Indicators, Hagadera camp, Kenya, 2018

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	210/246	85.4	78.3-92.4
Exclusive breastfeeding under 6 months	0-5 months	50/75	66.7	53.5-79.8
Continued breastfeeding at 1 year	12-15 month	26/36	72.2	55.4-89.1
Continued breastfeeding at 2 years	20-23 month	10/26	38.5	18.5-58.5
Introduction of solid, semi-solid or soft foods	6-8 months	20/30	66.7	46.6-86.7
Consumption of iron-rich or iron-fortified foods	6-23 months	56/198	28.3	18.2-38.4
Bottle feeding	0-23 months	38/273	13.9	9.3-18.5

Exclusive breastfeeding and continued breastfeeding to 1 year improved from 2017 to 2018, while timely initiation of breastfeeding was lower in 2018 than in 2017. (Figure 25).

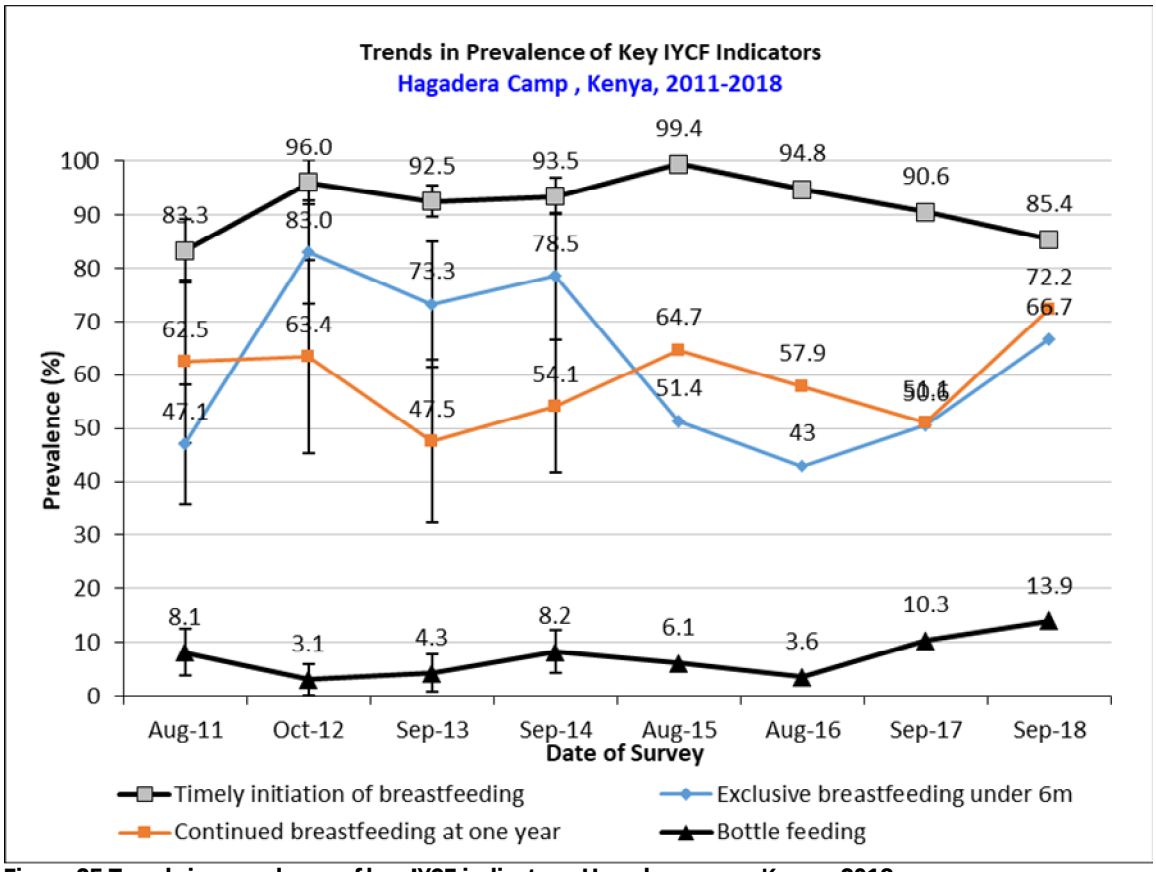


Figure 25 Trends in prevalence of key IYCF indicators, Hagadera camp, Kenya, 2018

Prevalence of intake

12.5% (7.8-17.1) of children had consumed infant formula (Table 56).

Infant formula

Table 56 Infant formula intake in children aged 0-23 months, Hagadera camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who consumed infant formula (fortified or non-fortified)	34/273	12.5 (7.8-17.1)

4.3 Women 15-49 years

16.7% of sampled women of reproductive age were pregnant, with a mean age of 27.5 (Table 57).

Table 57 Women's physiological status and age, Hagadera camp, Kenya, 2018

Physiological status	Number/total	% of sample
Pregnant	66/396	16.7
Non-pregnant	330/396	83.3
Mean age (range)	27.5 (15-49)	

47.9% (40.3-55.5) of non-pregnant women were anaemic in the sample (Table 58). The prevalence exceeded the 40% critical threshold.

Table 58 Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years), Hagadera camp, Kenya, 2018

Anaemia in non-pregnant women of reproductive age (15-49 years)	**All** n = 330
Total Anaemia (<12.0 g/dL)	(158) 47.9% (40.3-55.5, 95% C.I)
Mild Anaemia (11.0-11.9 g/dL)	(79) 23.9% (18.6-29.3, 95% C.I)
Moderate Anaemia (8.0-10.9 g/dL)	(77) 23.3% (18.7-28.0, 95% C.I)
Severe Anaemia (<8.0 g/dL)	(2) 0.6% (0.0-1.8, 95% C.I)
Mean Hb (g/dL) **(confidence interval)**	11.9 (11.7-12.2)

Figure 26 and 27 show that anaemia has been on an increasing trend since 2015. The increase in anaemia in 2018 compared to 2017 was, however, not statistically significant *(p=0.309)*.

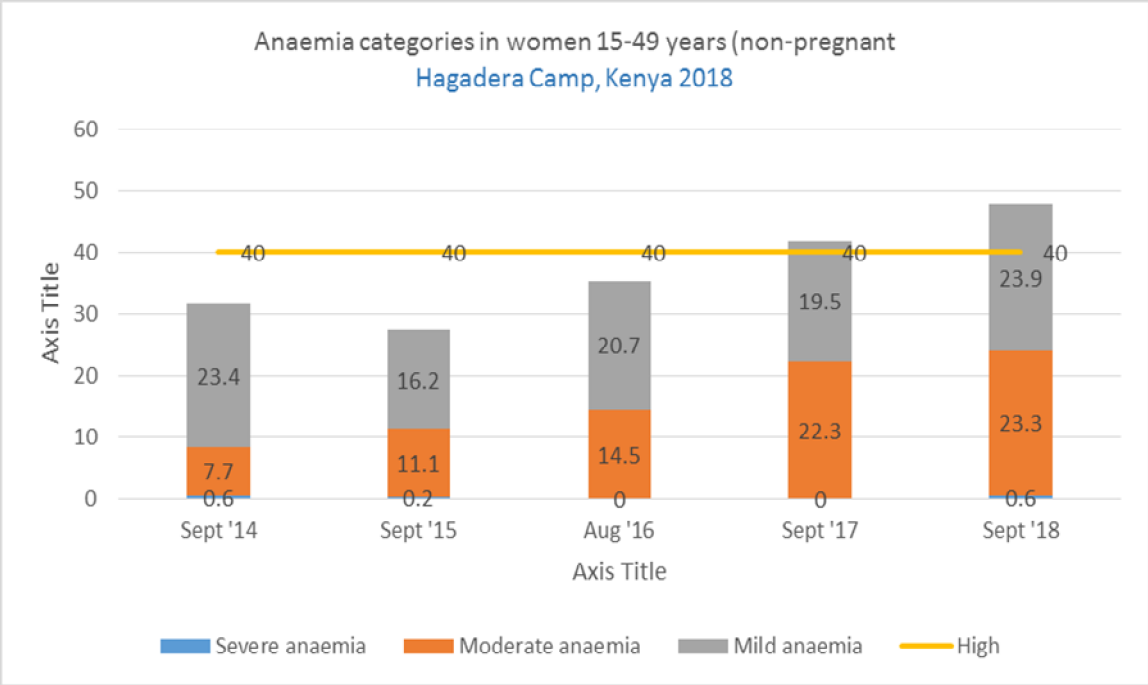


Figure 26 Anaemia categories in women 15-49 years, Hagadera camp, Kenya, 2018

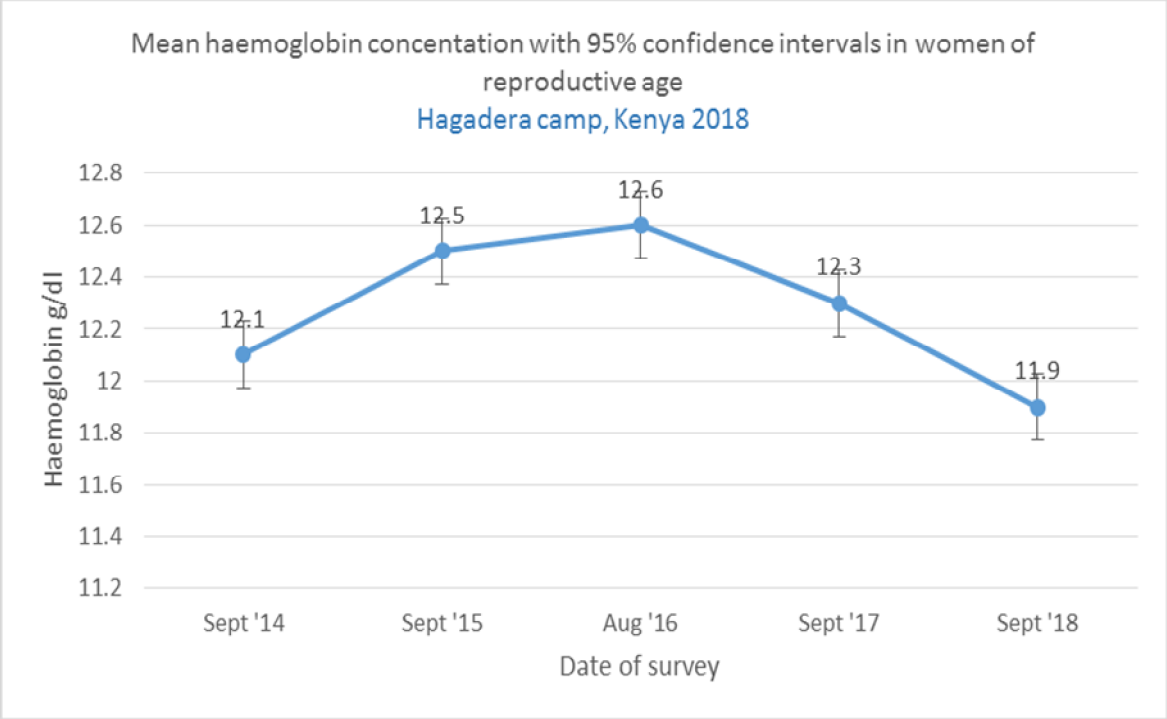


Figure 27 Mean haemoglobin concentration, Hagadera camp, Kenya, 2018

Over 80% of women were enrolled in the ANC programme and receiving iron-folic acid pills (Table 59).

Table 59 ANC enrollment and iron-folic acid pills coverage among pregnant women (15-49 years), Hagadera camp, Kenya, 2018

	Number /total	% (95% CI)
Currently enrolled in ANC programme	57/66	86.4 (77.8-94.9)
Currently receiving iron-folic acid pills	57/66	86.4 (77.8-94.9)

4.4 Food security

302 households were surveyed, whih was 131% of the target (Table 60).

Table 60 Food security information, Hagadera camp, Kenya, 2017

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	230	*302*	*131*

Food distribution results

The reported mean duration of the general food ration was 19.1, which is 61.6% of the theoretical duration (Table 61).

Table 61 Reported duration of general food ration, Hagadera camp, Kenya, 2018

Average number of days the food ration lasts (Standard deviation or 95% CI)	Average duration (%) in relation to the theoretical duration of the ration
19.1 (17.5-20.7)	61.6%

Negative coping strategies results

The main household coping mechanism was reducing meals (50.5%) followed by borrowing (25.7%) and requesting increased remittances (24.4%). 28.8% of households did not use any coping mechanism (Figure28).

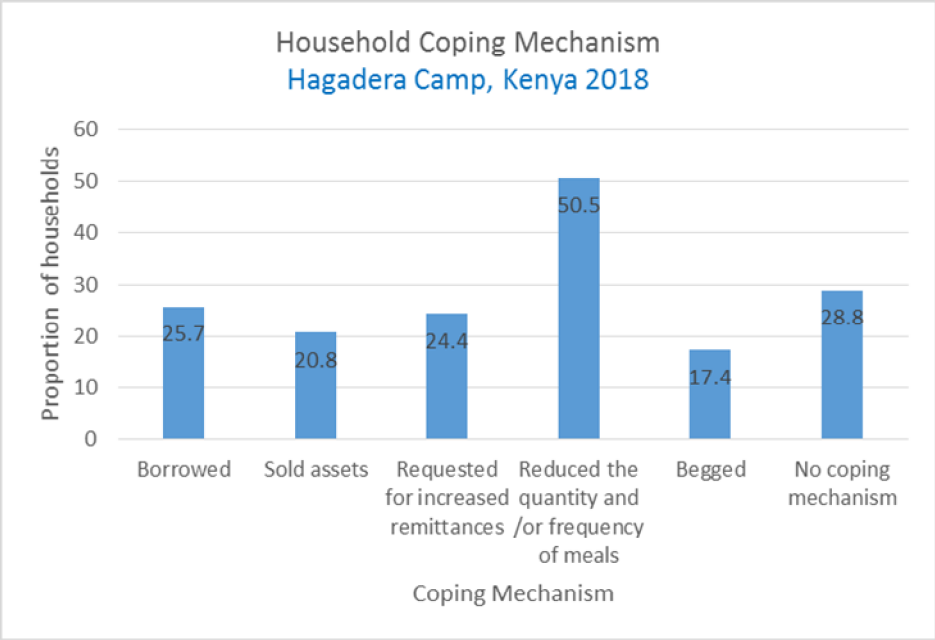


Figure 28 Household coping mechanisms, Hagadera camp, Kenya, 2018

Household dietary diversity results

The average household dietary diversity score was 8.0 (Table 62).

Table 62 Average HDDS, Hagadera camp, Kenya, 2018

Average HDDS	95% CI
8.0	7.1-8.9

The main food categories consumed were cereals (96.3%), vegetables (89.7%), legumes (82.6%) and oils (79.9%). Consumption of fruits, eggs and fish was relatively low (Figure 29).

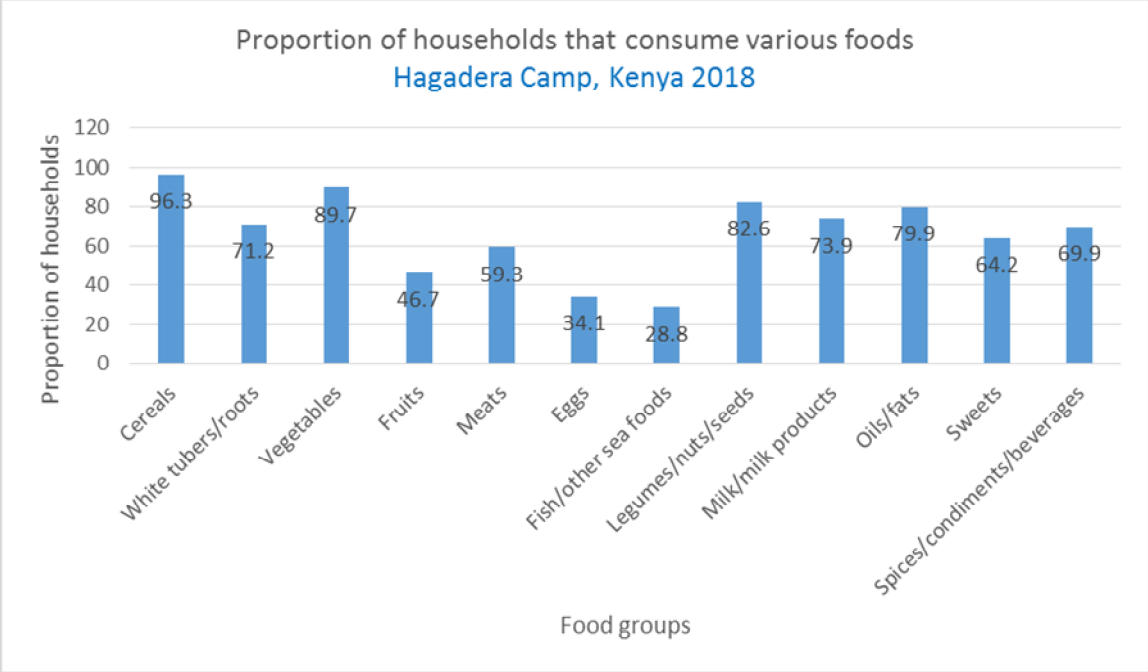


Figure 29 Proportion of households consuming various food groups, Hagadera camp, Kenya, 2018

Only 3.6% (0.5-6.8) had not consumed any vegetables, fruits, meat, eggs, fish/seafood and milk/milk products. Nearly all households (89.7%, 83.1-96.4) had consumed an animal or plant source of Vitamin A. More than half thehouseholds had consumed food sources of haem iron (Table 63).

Table 63 Consumption of food aid commodities and micronutrient rich foods by households, Hagadera camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	11/302	3.6 (0.5-6.8)
Proportion of households consuming either a plant or animal source of vitamin A	271/302	89.7 (83.1-96.4)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	186/302	61.6 (50.2-73.0)

4.5 WASH

604 households were interviewed for WASH, compared to a target of 460 (Table 64).

Table 64 WASH information, Hagadera camp, Kenya, 2017

Household data	Planned	Actual	% of target
Total households surveyed for WASH	460	*604*	*131*

Just about all households in the sample reported having access to an improved drinking water source and 60.8% (54.8-66.9) of containers were narrow necked or covered (Table 65).

Table 65 Water Quality, Hagadera camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of households using an improved drinking water source	599/600	99.8 (99.5-100.0)
Proportion of households that use a covered or narrow necked container for storing their drinking water	365/600	60.8 (54.8-66.9)

Nearly two thirds 60.0 (51.0-68.9)) of households used at least 20 litres per person per day (Table 66). The mean was 23.8 (20.8-26.7).

Table 66 Water Quantity: Amount of litres of water used per person per day, Hagadera camp, Kenya, 2018

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	360/600	60.0 (51.0-68.9)
15 – <20 lpppd	108/600	18.0 (14.2-21.8)
<15 lpppd	132/600	22.0 (14.9-29.1)
Mean (95% CI)	23.8 (20.8-26.8)	

73.8% (64.4-83.3) of households were satisfied with the water supply (Table 67). Of those who were not satisfied (Figure 30), the main reason was "not enough".

Table 67 Satisfaction with water supply, Hagadera camp. Kenya, 2018

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	443/600	73.8% (64.4-83.3)

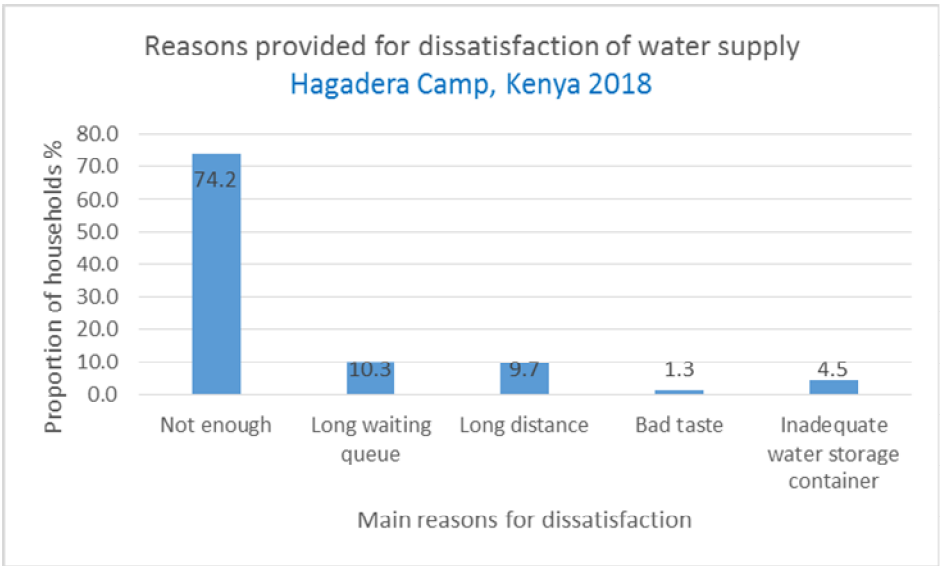


Figure 30 Reasons provided for dissatisfaction of water supply, Hagadera camp, Kenya, 2018

Slightly over half of households were using an improved excreta disposal facility (Table 68).

Table 68 Safe Excreta disposal, Hagadera camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of households using an improved excreta disposal facility (improved toilet facility, not shared)	335/600	55.8 (49.2-62.4)
Proportion of households using a shared family toilet	121/600	20.2 (16.5-23.8)
Proportion of households using a communal toilet	72/600	12.0 (7.6-16.4)
Proportion of households using an unimproved toilet	72/600	12.0 (7.2-16.8)
The proportion of households with children under three years old that dispose of faeces safely.	301/320	94.1 (90.3-97.8)

5 Results: Ifo camp

3,461 individuals were surveyed in 628 households of Ifo camp people were surveyed, with an average household size of 5.5. 599 children below 5 years were surveyed, which constitutes 17.3% of the sample (Table 74).

Table 74 Demographic Characteristics of the study population, Ifo camp, Kenya, 2018

Total HHs surveyed	*628*
Total population surveyed	*3,461*
Total U5 surveyed	*599*
Average HH size	*5.5*
% of U5	*17.3*

5.1 Children 6-59 months

Sample size and clusters

548 children 6-59 months were interviewed, which was 99% of the initial target of 551 (Table 75).

Table 75 Target and actual number captured, Ifo camp, Kenya, 2018

	Target (No.)	Total surveyed (No.)	% of the target
Children 6-59 months	551	548	99%
Clusters	30	30	100

Boys and girls, as well as age groups, were distributed fairly in the sample (Table 76).

Table 76 Distribution of age and sex of sample, Ifo camp, Kenya, 2018

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy:girl**
6-17	75	55.1	61	44.9	136	24.8	1.2
18-29	69	50.7	67	49.3	136	24.8	1.0
30-41	67	53.2	59	46.8	126	23.0	1.1
42-53	64	53.3	56	46.7	120	21.9	1.1
54-59	13	43.3	17	56.7	30	5.5	0.8
Total	288	52.6	260	47.4	548	100.0	1.1

Anthropometric results (based on WHO Growth Standards 2006)

The prevalence of GAM was 10.0% (7.4-13.5), with a SAM prevalence of 1.3% (0.7-2.3). There were no cases of oedema (Table 77).

Table 77 Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex, Ifo camp, Kenya, 2018

	All n = 548	**Boys** n = 288	**Girls** n = 260
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(55) 10.0 % (7.4 – 13.5 95% C.I.)	(31) 10.8 % (8.0 – 14.3 95% C.I.)	(24) 9.2 % (5.5 – 15.2 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(48) 8.8 % (6.1 – 12.4 95% C.I.)	(27) 9.4 % (6.6 – 13.1 95% C.I.)	(21) 8.1 % (4.5 – 14.0 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(7) 1.3 % (0.7 – 2.3 95% C.I.)	(4) 1.4 % (0.6 – 3.2 95% C.I.)	(3) 1.2 % (0.4 - 3.5 95% C.I.)

The prevalence of oedema is 0.0 %

Figure 31 clearly shows that GAM has been increasing from 2015 to 2017. However, there was a decrease in 2018 compared to 2017. The increase was not statistically significant. *(p=0.278)*.

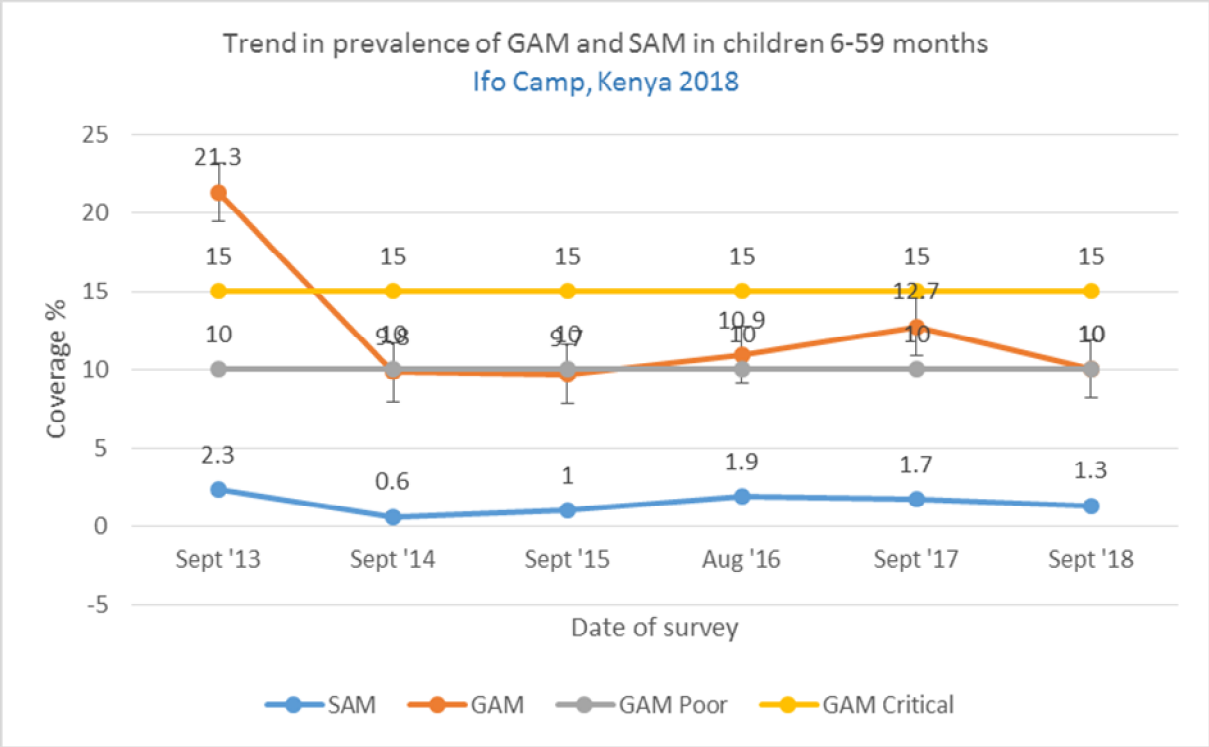


Figure 31 Trend in prevalence of GAM and SAM, Ifo camp, Kenya, 2018

Table 78 Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema, Ifo camp, Kenya, 2018

		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	136	3	2.2	12	8.8	121	89.0	0	0.0
18-29	136	2	1.5	6	4.4	128	94.1	0	0.0
30-41	126	2	1.6	11	8.7	113	89.7	0	0.0
42-53	120	0	0.0	13	10.8	107	89.2	0	0.0
54-59	30	0	0.0	6	20.0	24	80.0	0	0.0
Total	548	7	1.3	48	8.8	493	90.0	0	0.0

The prevalence of wasting was not very different between the 6-17, 30-41 and 42-53 age groups (Figure 32).

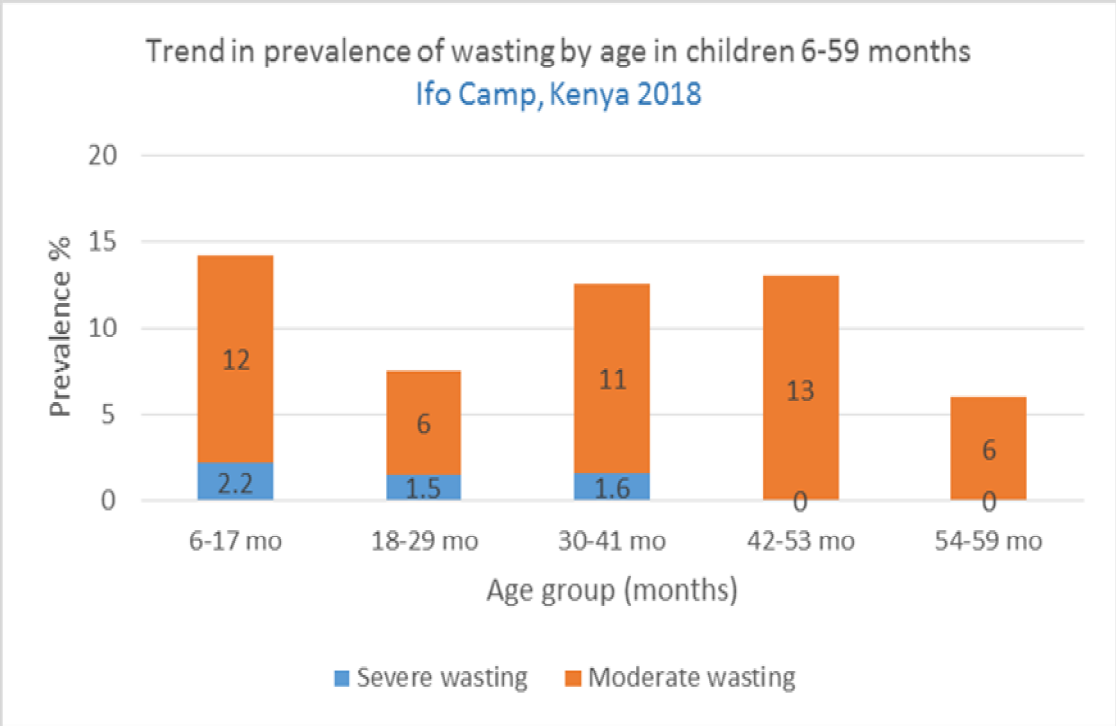


Figure 32 Trend in prevalence of wasting by age, Ifo camp, Kenya, 2018

Table 79 Distribution of acute malnutrition and oedema based on weight-for-height z-scores, Ifo camp, Kenya, 2018

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 7 (1.3 %)	Not severely malnourished No. 541 (98.7%)

NB: flagged records are included

The weight-for-height distribution followed a similar shape to the WHO normal distribution (Figure 33).

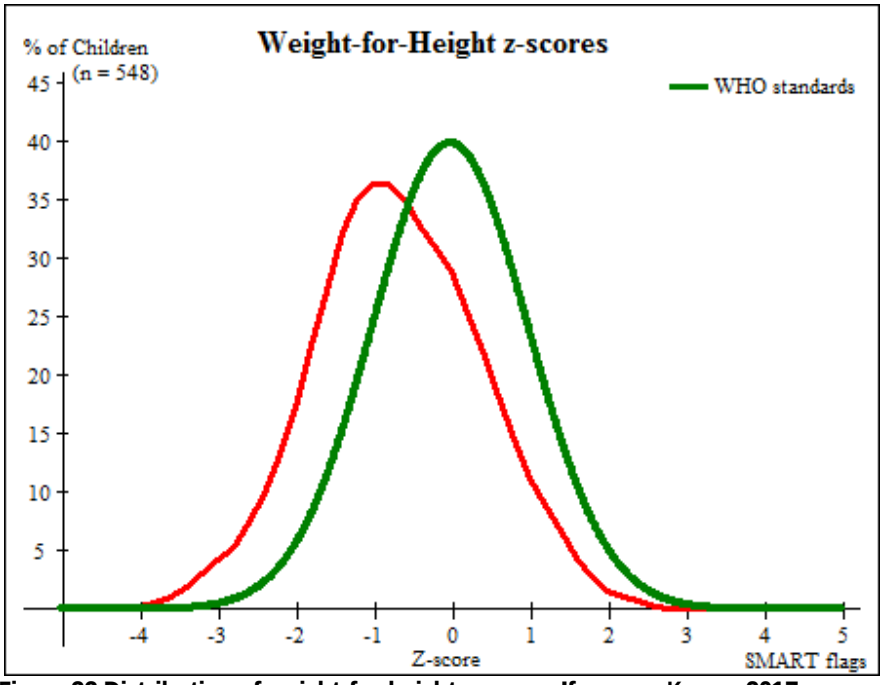


Figure 33 Distribution of weight-for-height z-scores, Ifo camp, Kenya, 2017

The prevalence of global malnutrition by MUAC was 9.3% (7.0-12.3), which is lower than the GAM prevalence using weight-for-height (Table 80).

Table 80 Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex, Ifo camp, Kenya, 2018

	All n = 548	**Boys** n = 288	**Girls** n = 260
Prevalence of global malnutrition (< 125 mm and/or oedema)	(58) 9.3 % (7.0 - 12.3 95% C.I.)	(25) 8.7 % (5.5 – 13.4 95% C.I.)	(26) 10.0 % (6.4 – 15.2 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(45) 8.2% (5.9 – 11.3 95% C.I.)	(23) 8.0 % (4.9 – 12.8 95% C.I.)	(22) 8.5 % (5.1 – 13.8 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(6) 1.1 % (0.3- 3.4 95% C.I.)	(2) 0.7 % (0.2 – 2.9 95% C.I.)	(4) 1.5 % (0.3 - 7.3 95% C.I.)

As expected, the prevalence of wasting based on MUAC was highest in the 6-17 age group followed by the 18-29 age group. MUAC is known to identify a higher proportion of younger children (Table 81).

Table 81 Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema, Ifo camp, Kenya, 2018

		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	136	4	2.9	28	20.6	104	76.5	0	0.0
18-29	136	1	0.7	8	5.9	127	93.4	0	0.0
30-41	126	0	0.0	6	4.8	120	95.2	0	0.0
42-53	120	1	0.8	2	1.7	117	97.5	0	0.0
54-59	30	0	0.0	1	3.3	29	96.7	0	0.0
Total	548	6	1.1	45	8.2	497	90.7	0	0.0

The proportion of children who were underweight was 17.3% (11.8-24.7) based on weight-for-age z-scores (Table 82).

Table 82 Prevalence of underweight based on weight-for-age z-scores by sex, Ifo camp, Kenya, 2018

	All n = 531	**Boys** n **=** 281	**Girls** n **=** 250
Prevalence of underweight (<-2 z-score)	(92) 17.3 % (11.8 – 24.7 95% C.I.)	(53) 18.9 % (12.1 – 28.1 95% C.I.)	(39) 15.6 % (10.0 – 23.6 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(88) 16.6 % (11.2 - 23.9 95% C.I.)	(51) 18.1 % (11.5 – 27.5 95% C.I.)	(37) 14.8 % (9.4 - 22.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(4) 0.8 % (0.3 – 1.9 95% C.I.)	(2) 0.7 % (0.2 – 2.8 95% C.I.)	(2) 0.8 % (0.2 – 3.3 95% C.I.)

19.8% (14.4-26.6) of sampled children were stunted (Table 83).

Table 83 Prevalence of stunting based on height-for-age z-scores and by sex, Ifo camp, Kenya, 2018

	All n = 531	**Boys** n **=** 281	**Girls** n **=** 250
Prevalence of stunting (<-2 z-score)	(105) 19.8 % (14.4 – 26.6 95% C.I.)	(72) 25.6 % (19.9 – 32.3 95% C.I.)	(33) 13.2 % (7.5 – 22.1 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(94) 17.7 % (13.2 – 23.3 95% C.I.)	(64) 22.8 % (18.2 – 28.1 95% C.I.)	(30) 12.0% (6.5 – 21.1 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(11) 2.1% (1.0 – 4.3 95% C.I.)	(8) 2.8 % (1.1 – 7.0 95% C.I.)	(3) 1.2 % (0.3 – 5.2 95% C.I.)

Stunting was higher in 2018 compared to 2017 (Figure 34). However, the difference was not statistically significant (*p=0.785*).

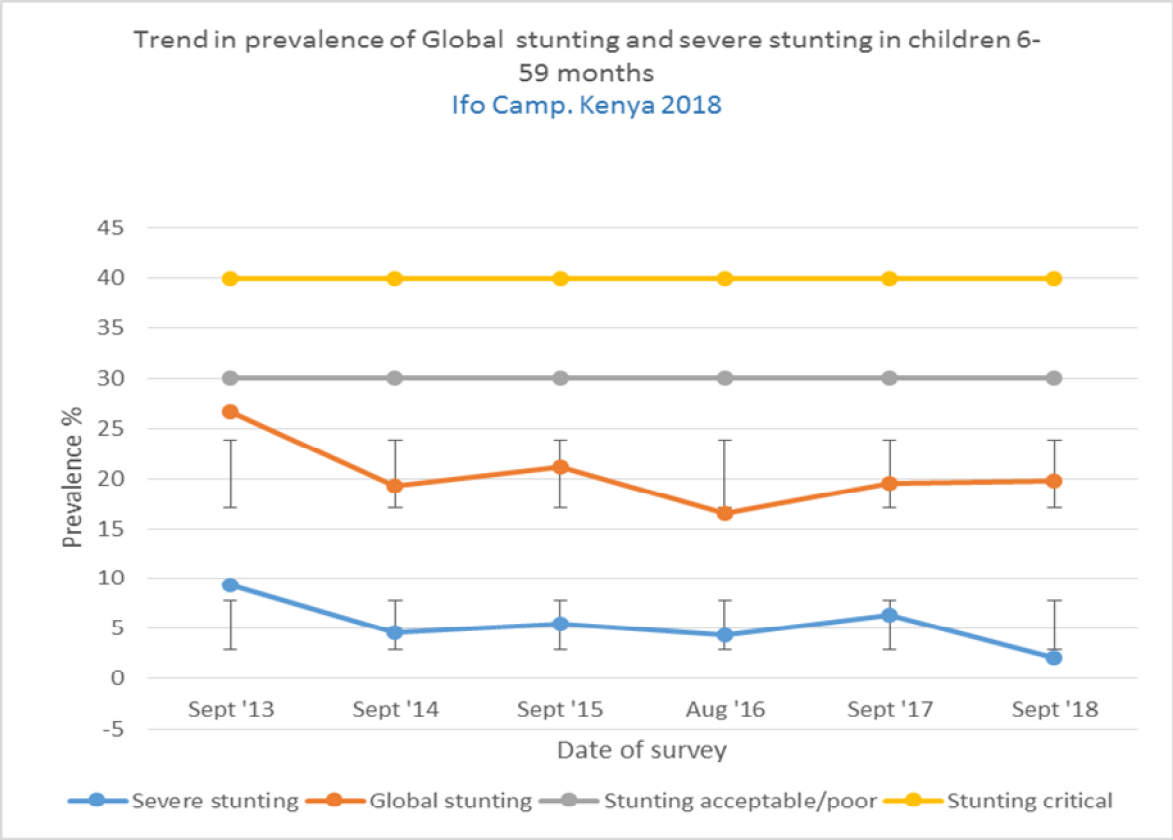


Figure 34 Trend in prevalence of global and severe stunting, Ifo camp, 2018

Table 84 Prevalence of stunting by age based on height-for-age z-scores, Ifo camp, Kenya, 2018

		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	130	0	0.0	12	9.2	118	90.8
18-29	132	4	3.0	43	32.6	85	64.4
30-41	124	3	2.4	23	18.5	98	79.0
42-53	115	3	2.6	14	12.2	98	85.2
54-59	30	1	3.3	2	6.7	27	90.0
Total	531	11	2.1	94	17.7	426	80.2

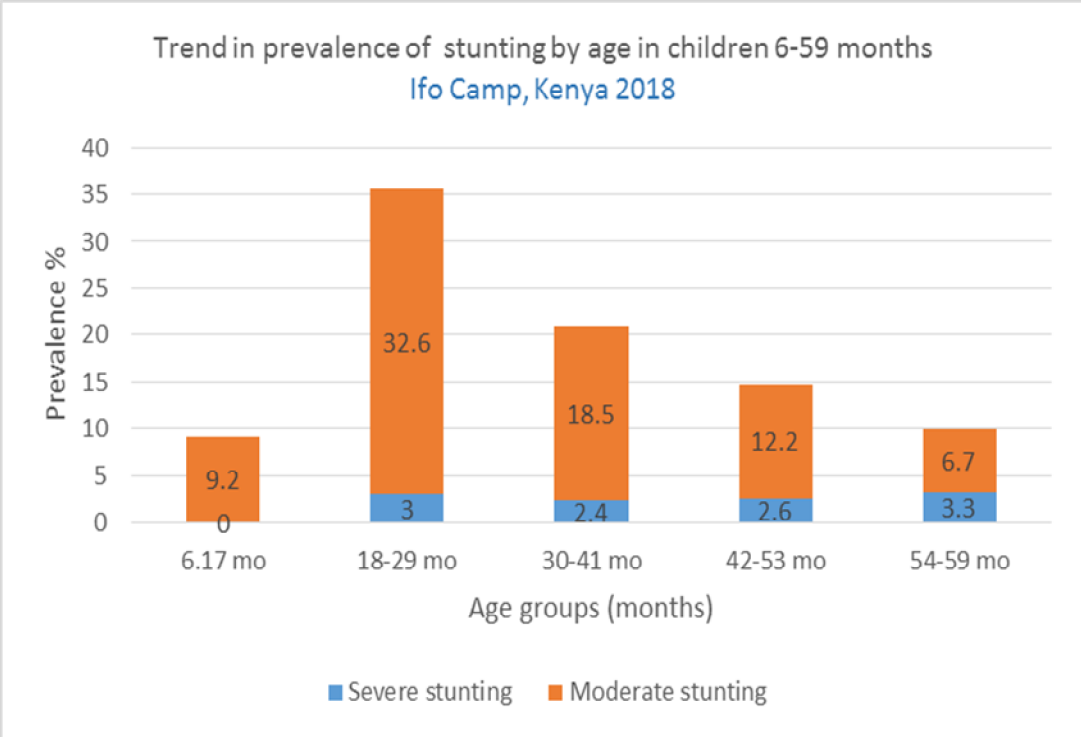


Figure 35 Trend in prevalence of stunting by age, Ifo camp, Kenya, 2018

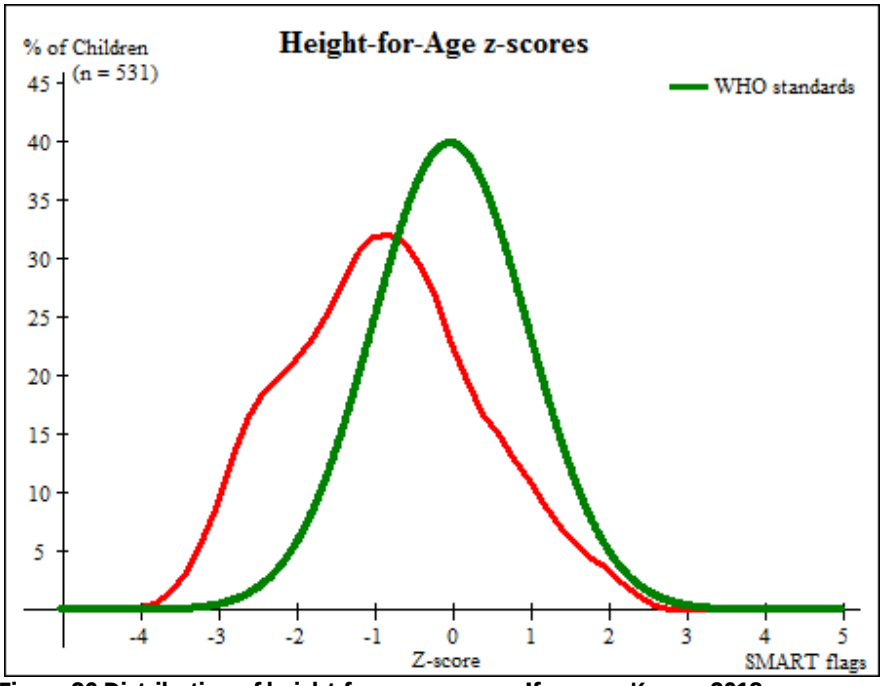


Figure 36 Distribution of height-for-age z-scores, Ifo camp, Kenya, 2018

Table 85 Mean z-scores, Design Effects and excluded subjects, Ifo camp, Kenya, 2018

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	548	-0.69±1.05	1.33	0	0
Weight-for-Age	531	-0.96±1.04	3.62	17	0
Height-for-Age	431	-0.87±1.20	2.95	17	0

* contains for WHZ and WAZ the children with edema.

Measles vaccination coverage results

All sampled children had received measles vaccination, and nearly all had received Vitamin A supplementation (Table 86 and 87).

Table 86 Measles vaccination coverage for children aged 9-59 months (n=504) Ifo camp, Kenya, 2018

	Measles (with card) n=486	Measles (with card or confirmation from mother) n=503
YES	96.4% (93.9-99.0, 95% C.I)	99.8% (99.4-100.0, 95%)

Vitamin A coverage results

Table 87 Vitamin A supplementation for children aged 6-59 months (n=504) within past 6 months, Ifo camp, Kenya, 2018

	Vitamin A capsule (with card) n=469	Vitamin A capsule (with card or confirmation from mother) n=486
YES	95.4% (92.1-98.6, 95% C.I)	100%

The coverage of both Vitamin A supplementation and measles vaccination have been improving (Figure 37).

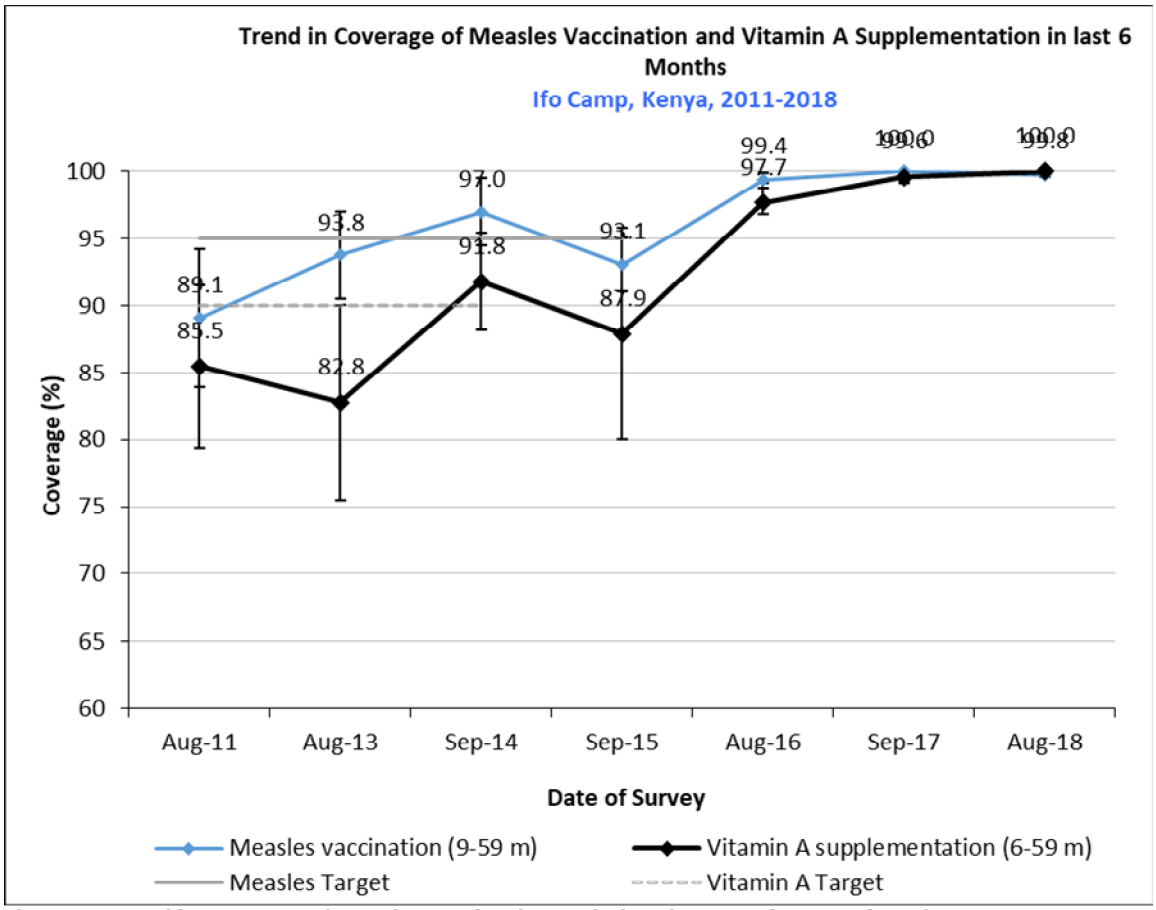


Figure 37 Trend in coverage of measles vaccination and Vitamin A supplementation, Ifo camp, Kenya, 2018

Deworming

The coverage of deworming was also very high for children 24-59 months (Table 88).

Table 88 Deworming for children aged 24-59 months within past 6 months (n=346), Ifo camp, Kenya, 2018

	Deworming (with card or confirmation from mother) n=332
YES	96.0% (92.4-99.5, 95% C.I)

Diarrhoea results

Nearly a fifth of children reported having experienced diarrhoea in the previous 2 weeks, which is quite high (Table 89).

Table 89 Period prevalence of diarrhoea, Ifo camp, Kenya, 2018

	Number/total	% (95% CI)
Diarrhoea in the last two weeks	97/538	18.0 (6.5-29.6)

Anaemia results

51.9% (45.3-58.5) of children 6-59 months were classified as anaemic (Table 90), with a mean haemoglobin concentration of 10.8 (10.6-11.0).

Table 90 Prevalence of anaemia in children 6-59 months, Ifo camp, Kenya, 2018

Anaemia in Children 6-59 months	**All** n = 599
Total Anaemia (Hb<11.0 g/dL)	(282) 51.9% (45.4-58.5, 95% C.I)
Mild Anaemia (Hb 10.0-10.9 g/dL)	(132) 24.3% (19.7-29.0, 95% C.I)
Moderate Anaemia (7.0-9.9 g/dL)	(145) 26.7% (21.4-32.0, 95% C.I)
Severe Anaemia (<7.0 g/dL)	(5) 0.9% (0.0-1.9, 95% C.I)
Mean Hb (g/dL) **(confidence interval)**	10.8 (10.6-11.0)

Figure 38 and 39 clearly indicate that anaemia decreased in 2018 compared to 2017. The decrease in anaemia from 2017 to 2018 was not statisticaly significant (*p<0.962).*

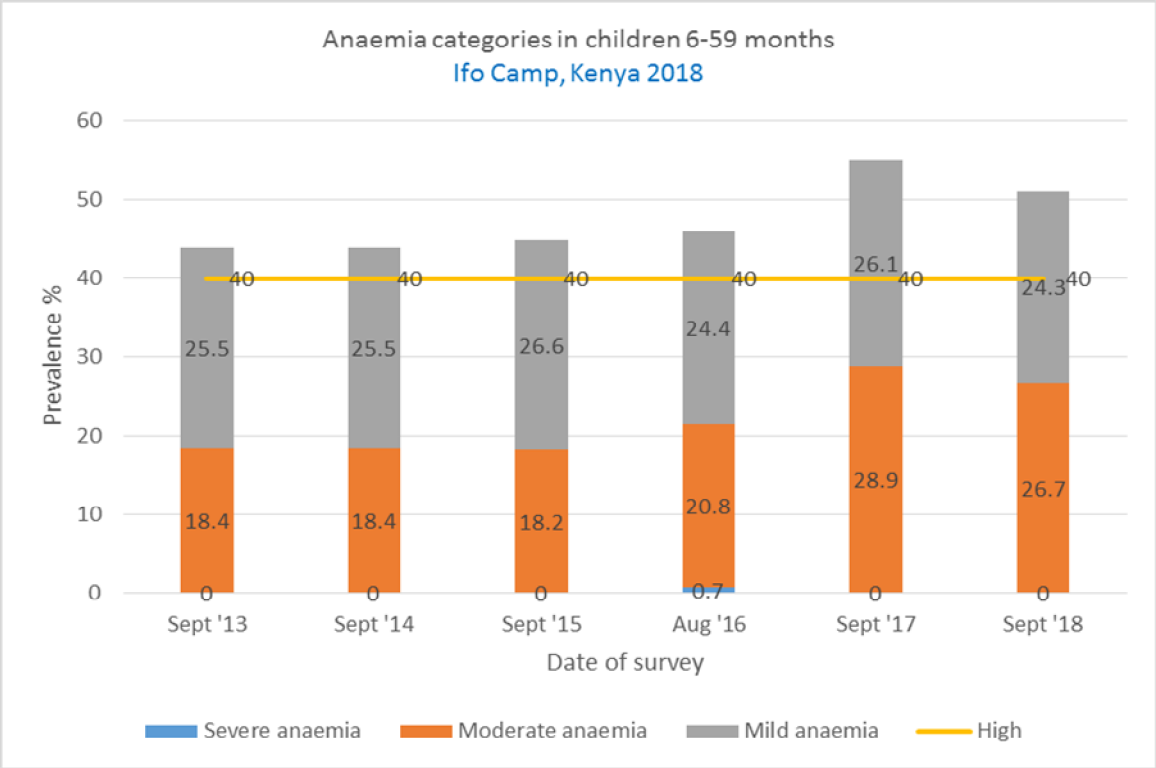


Figure 38 Anaemia categories, Ifo camp, Kenya, 2018

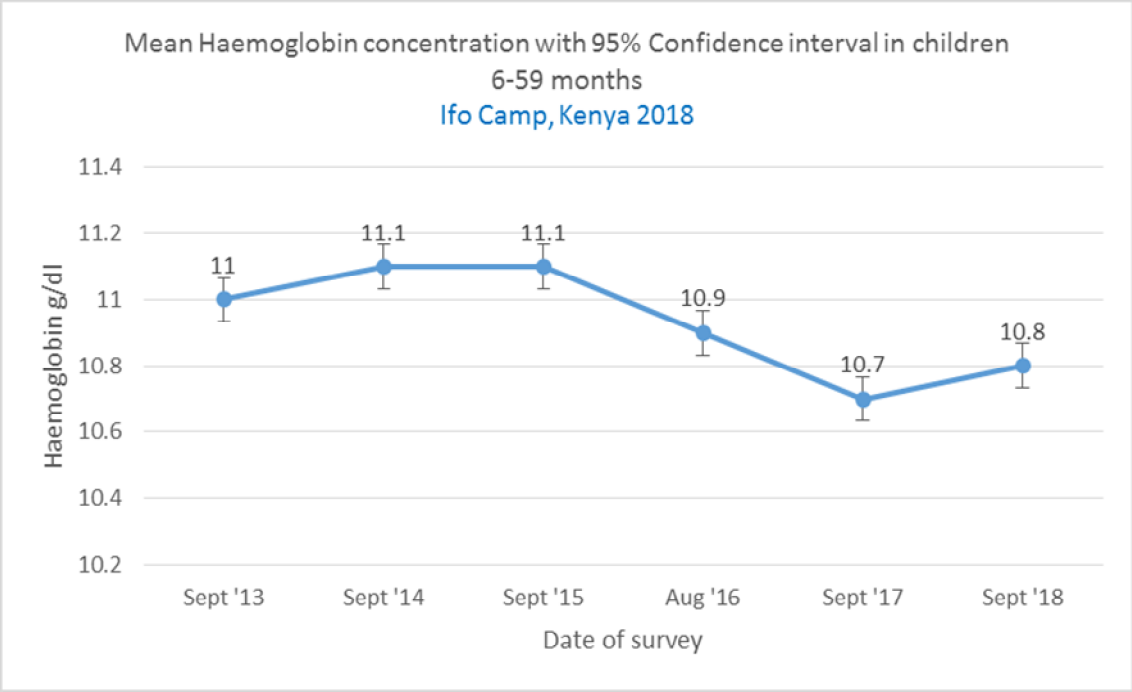


Figure 39 Mean haemoglobin concentration, Ifo camp, Kenya, 2018

An analysis of the prevalence of moderate and severe malnutrition is shown by Table 91.

Table 91 Prevalence of moderate and severe anaemia in children 6-59 months by age, Ifo camp, Kenya, 2018

	6-23 months n=192	24-35 months n=127	36-59 months n=220	Total n=543
Moderate and Severe Anaemia (Hb < 10g/dl)	(77) 40.1% (31.1-49.1, 95% C.I)	(42) 33.1% (23.2-42.9, 95% C.I)	(31) 14.2% (8.1-20.2, 95% C.I)	(150) 27.6% (22.4-32.8, 95% C.I)

Anaemia was highest in the 6-23 age group, although it was also very high in the 24-35 age group (Table 92).

Table 92 Prevalence of anaemia by age, Ifo camp, Kenya, 2018

		Severe Anaemia (<7.0 g/dL)		Moderate Anaemia (7.0-9.9 g/dL)		Mild Anaemia (Hb 10.0-10.9 g/dL)		Total Anaemia (Hb<11.0 g/dL)		Normal (Hb≥11.0 g/dL)	
Age (mths)	**Total no.**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**	**No.**	**% (95% CI)**
6-23	192	3	1.6 (0.0-3.3)	74	38.5 (29.4-47.6)	53	27.6 (22.2-33.0)	130	67.7 (59.3-76.1)	62	32.2 (23.8-40.7)
24-35	127	2	1.6 (0.0-4.7)	40	31.5 (21.9-41.1)	31	24.4 (17.3-31.5)	73	57.5 (48.6-66.4)	54	42.5(33.5-51.4)
36-59	220	0	0.0 (0.0-0.0)	31	14.2 (8.1-20.2)	48	21.9 (14.8-29.0)	79	36.1 (27.9-44.2)	140	63.9 (55.8-72.1)
Total	**599**	**5**	**0.9 (-0.0-1.8)**	**145**	**26.7 (21.4-31.9)**	**132**	**24.3 (19.6-28.9)**	**282**	**51.9 (45.3-58.4)**	**261**	**48.0 (41.5-54.6)**

5.2 Children 0-23 months

IYCF indicators are shown in Table 93. Timely initiation of breastfeeding and exclusive breastfeeding were very high. Continued breastfeeding at 1 and 2 years were also pleasing, although introduction of solid foods at 6 months would have been expected to be higher.

Table 93 Prevalence of Infant and Young Child Feeding Practices Indicators, Ifo camp, Kenya, 2018

Indicator	Age range	Number/ total	Prevalence (%)	95% CI
Timely initiation of breastfeeding	0-23 months	196/219	89.4	80.1-98.8
Exclusive breastfeeding under 6 months	0-5 months	37/42	88.1	79.4-96.8
Continued breastfeeding at 1 year	12-15 months	13/17	76.5	54.7-98.3
Continued breastfeeding at 2 years	20-23 months	12/16	75.0	57.9-92.1
Introduction of solid, semi-solid or soft foods	6-8 months	6/10	60.0	21.9-98.1
Consumption of iron-rich or iron-fortified foods	6-23 months	1/192	0.5	0.0-1.6
Bottle feeding	0-23 months	8/234	3.4	0.9-5.9

Of the main indicators displayed in Figure 40, only exclusive breastfeeding improved in 2018 compaed to 2017.

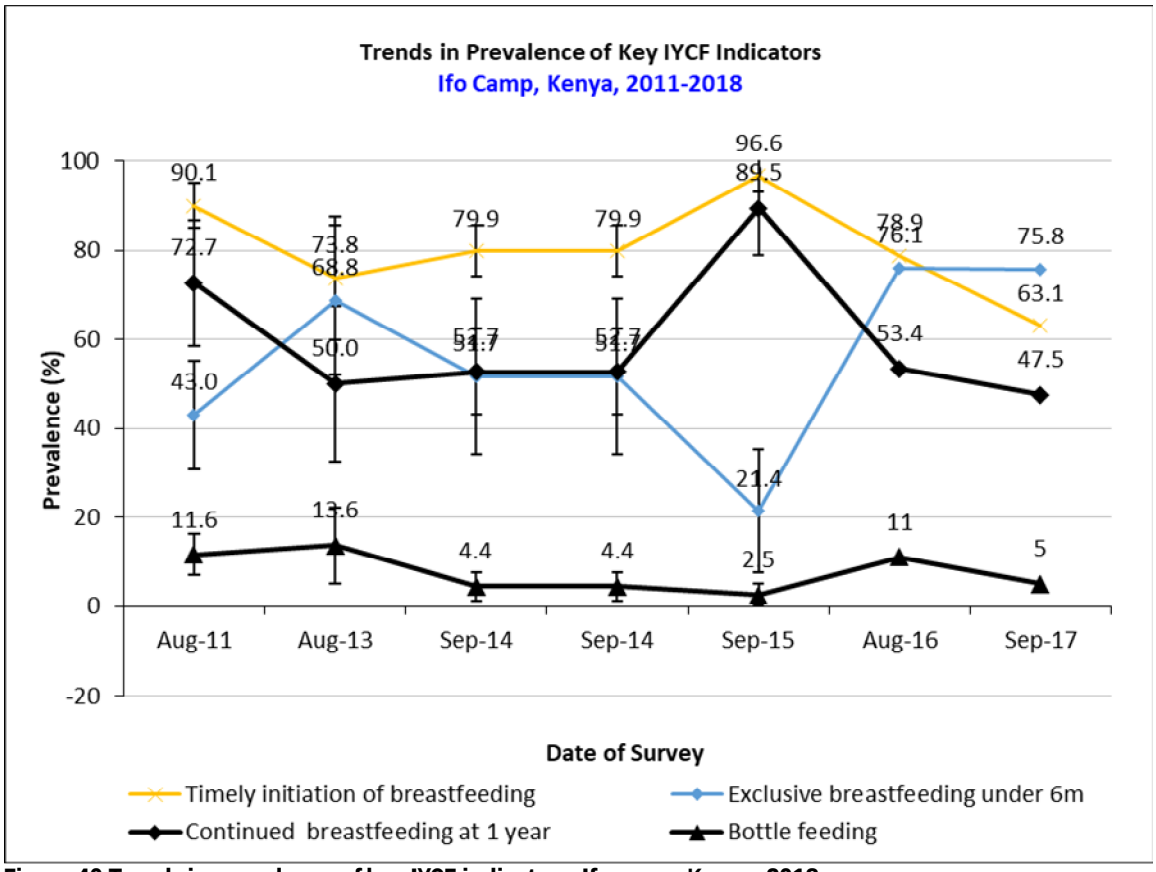


Figure 40 Trends in prevalence of key IYCF indicators, Ifo camp, Kenya, 2018

Prevalence of intake

Infant formula

The proportion who consumed infant formula was low (1.2%, -0.1-2.7) for children 0-23 months (Table 94).

Table 94 Infant formula intake in children aged 0-23 months, Ifo camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of children aged 0-23 months who consumed infant formula (fortified or non-fortified)	3/234	1.2% (0.0-2.7)

5.3 Women 15-49 years

Of the sample of pregnant and lactating women, 13.3% were pregnant. The mean age was 27.6, with a minimum of 15 and a maximum of 48 (Table 96).

Table 96 Women's physiological status and age, Ifo camp, Kenya, 2018

Physiological status	Number/total	% of sample
Pregnant	49/367	13.4
Non-pregnant	318/367	86.6
Mean age (range)	27.6 (15-48)	

45.7% (40.1-51.3) of non-pregnant women of reproductive age were anaemic (Table 97).

Table 97 Prevalence of anaemia and haemoglobin concentration in non-pregnant women of reproductive age (15-49 years), Ifo camp, Kenya, 2018

Anaemia in non-pregnant women of reproductive age (15-49 years)	**All** n = 317
Total Anaemia (<12.0 g/dL)	(145) 45.7% (40.2-51.3 95% C.I)
Mild Anaemia (11.0-11.9 g/dL)	(86) 27.1% (21.4-32.8, 95% C.I)
Moderate Anaemia (8.0-10.9 g/dL)	(57) 18.0% (13.6-22.4, 95% C.I)
Severe Anaemia (<8.0 g/dL)	(2) 0.6% (0.0-1.5), 95% C.I)
Mean Hb (g/dL) **(confidence interval)**	12.0 (11.8-12.2)

Anaemia has been increasing from 2014 to 2017. However, there was a slight decrease in 2018 compared to 2017 (Figure 41 and 42), although it was not statistically significant (*p=0.910).*

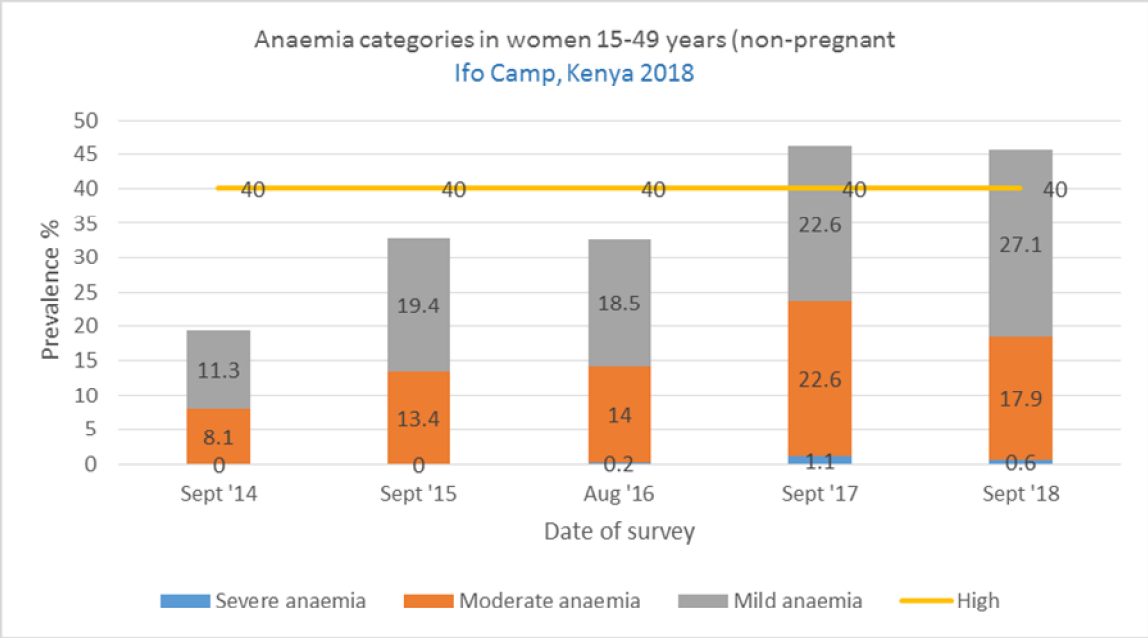


Figure 41 Anaemia categories in women 15-49 years, Ifo camp, Kenya, 2018

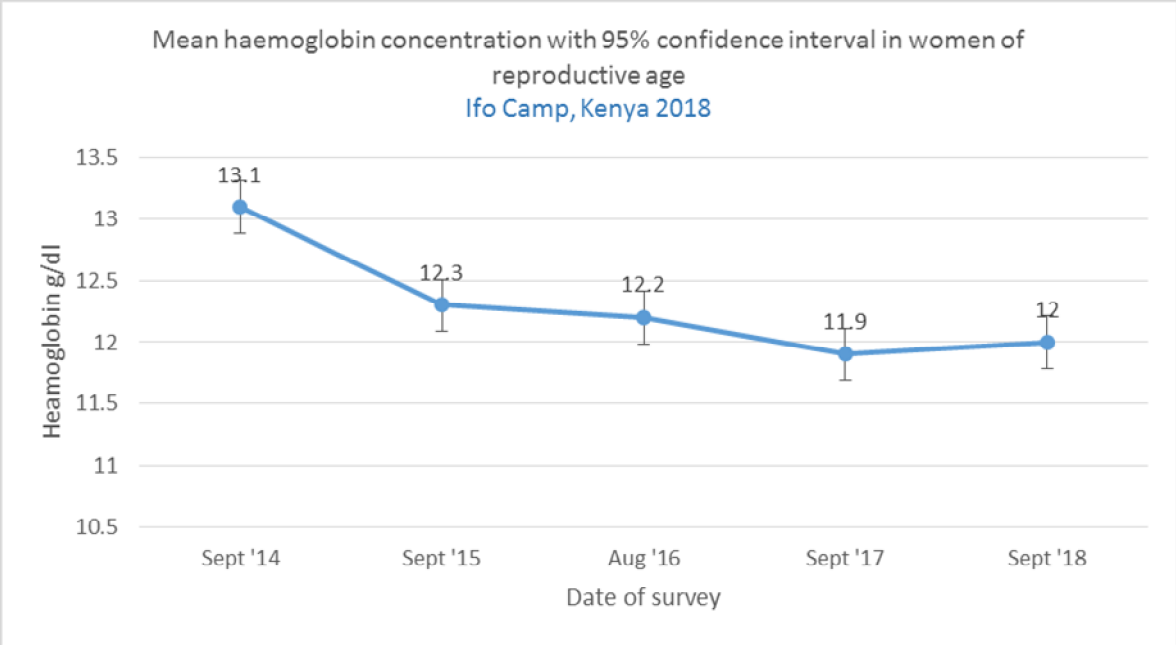


Figure 42 Mean haemoglobin concentration, Ifo camp, Kenya, 2018

ANC enrollment and iron-folic acid tablets coverage were very high (Table 98).

Table 98 ANC enrollment and iron-folic acid pills coverage among pregnant women (15-49 years), Ifo camp, Kenya, 2018

	Number /total	% (95% CI)
Currently enrolled in ANC programme	48/49	98.0 (93.6-100.0)
Currently receiving iron-folic acid pills	47/49	95.9 (90.0-100.0)

5.4 Food security

329 households were surveyed, being 109% of the target (Table 101).

Table 101 Food security information, Ifo camp, Kenya, 2018

Household data	Planned	Actual	% of target
Total households surveyed for Food Security	302	*329*	*109%*

Food distribution results

The average duration of the food ration was 19.7 days, which is 63.5% of the theoretical duration (Table 102).

Table 102 Reported duration of general food ration, Ifo camp, Kenya, 2018

Average number of days the food ration lasts (Standard deviation or 95% CI)	Average duration (%) in relation to the theoretical duration of the ration
19.7 (18.9-20.6)	63.5%

Negative coping strategies results

Borrowing (24.9%), reducing meals (20.1%) and requesting increased remittances (19.8%) were the main coping mechanisms (Figure 43).

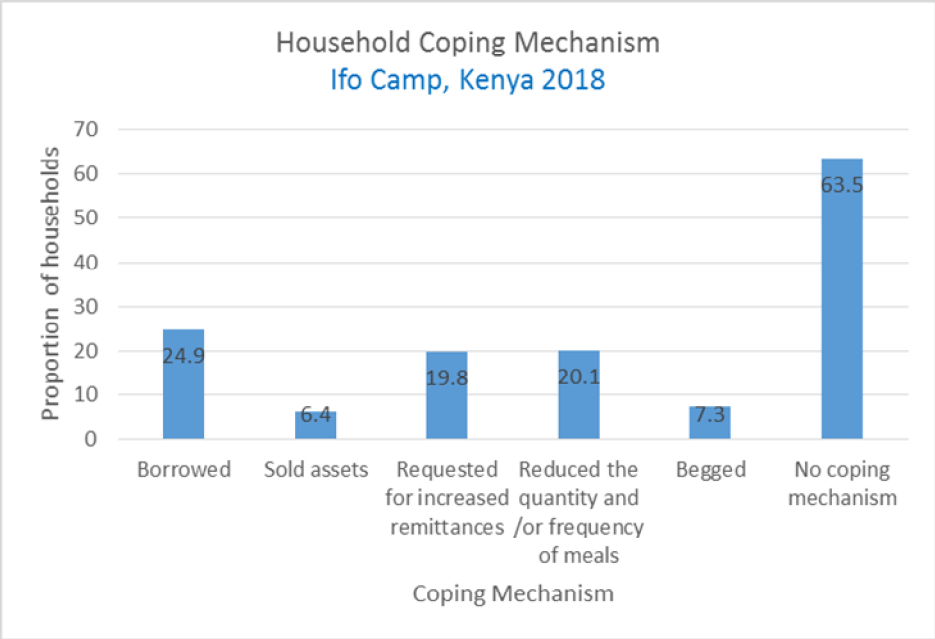


Figure 43 Household coping mechanisms, Ifo camp, Kenya, 2018

Household dietary diversity results

The average household dietary diversity score of 7.2 (Table 103).

Table 103 Average HDDS, Ifo camp, Kenya, 2018

Average HDDS	95% CI
7.2	6.6-7.9

The consumption of cereals (98.1%), vegetables (91.4%), cereals (86.9%) and spices, condiments and beverages (86.9%) was very high (Figure 44).

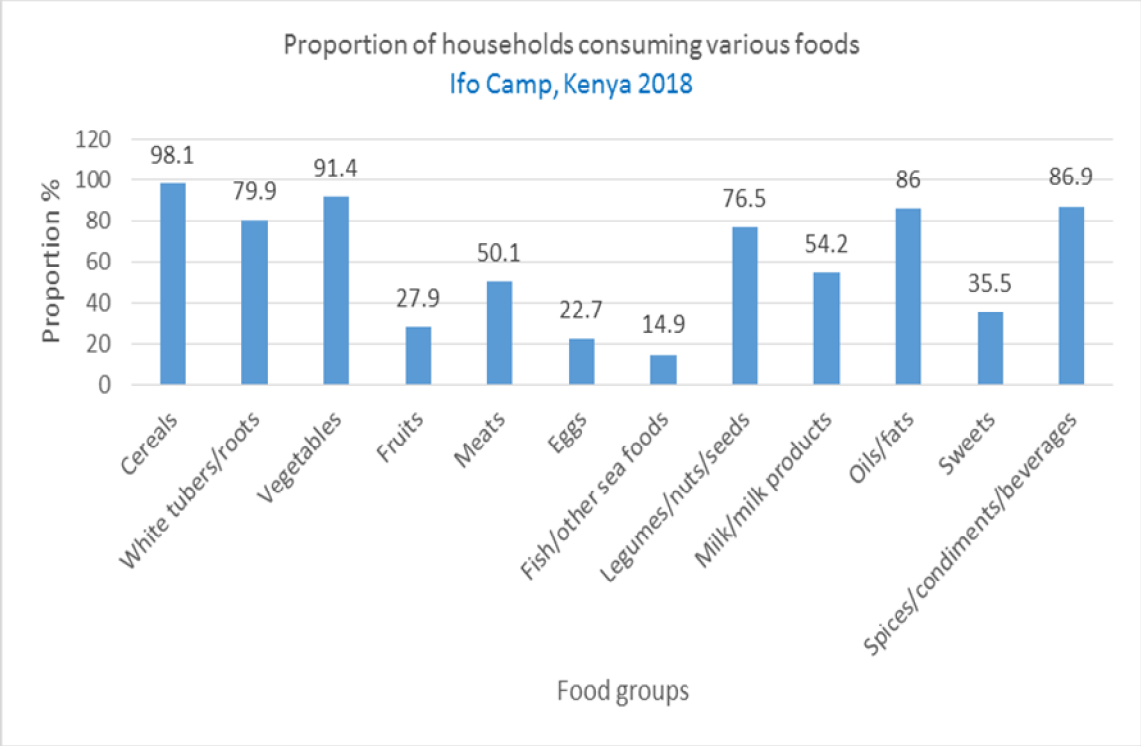


Figure 44 Proportion of households consuming various food groups, Ifo camp, Kenya, 2018

5.7% (1.0-10.5) of households did not consume any vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products. A high proportion (85.7%, 76.8-94.5) consumed either a plant or animal source of Vitamin A. 50.7% (34.3-67.1) consumed food sources of haem iron (Table 104).

Table 104 Consumption of food aid commodities and micronutrient rich foods by households, Ifo camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of households *not consuming any* vegetables, fruits, meat, eggs, fish/seafood, and milk/milk products	19/329	5.8 (1.0-10.5)
Proportion of households consuming either a plant or animal source of vitamin A	282/329	85.7 (76.9-94.5)
Proportion of households consuming organ meat/flesh meat, or fish/seafood (food sources of haem iron)	167/329	50.8 (34.3-67.2)

5.5 WASH

628 households were interviewed for the WASH module, 96% of the target 603 (Table 105).

Table 105 WASH information, Ifo camp, Kenya, 2018

Household data	Planned	Actual	% of target
Total households surveyed for WASH	603	*628*	*104%*

All households reported having access to an improved drinking water source (Table 106).

Table 106 Water Quality, Ifo camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of households using an improved drinking water source	628/628	100.0

Proportion of households that use a covered or narrow necked container for storing their drinking water	132/628	21.0 (12.5-29.5)

61.4% (52.8-70.0) of sampled households used at least 20 litres per person per day (Table 107). The mean was 26.0 (22.8-29.7) litres per person per day.

Table 107 Water Quantity: Amount of litres of water used per person per day, Ifo camp, Kenya, 2018

Proportion of households that use:	Number/total	% (95% CI)
≥ 20 lpppd	386/628	61.5 (52.9-70.1)
15 – <20 lpppd	119/628	18.9 (14.1-23.8)
<15 lpppd	123/628	19.6 (12.8-26.4)
Mean (95% CI)	26.3 (22.8-29.8)	

More than half (65.2%, 54.7-75.7) of the households were satisfied with their drinking water source (Table 108).

Table 108 Satisfaction with water supply, Ifo camp. Kenya, 2018

	Number/total	% (95% CI)
Proportion of households that say they are satisfied with the drinking water supply	410/628	65.3 (54.8-75.8)

For those who were not satisfied, the main reason was "not enough" (61.4%), followed by "long waiting queue" (22.7%).

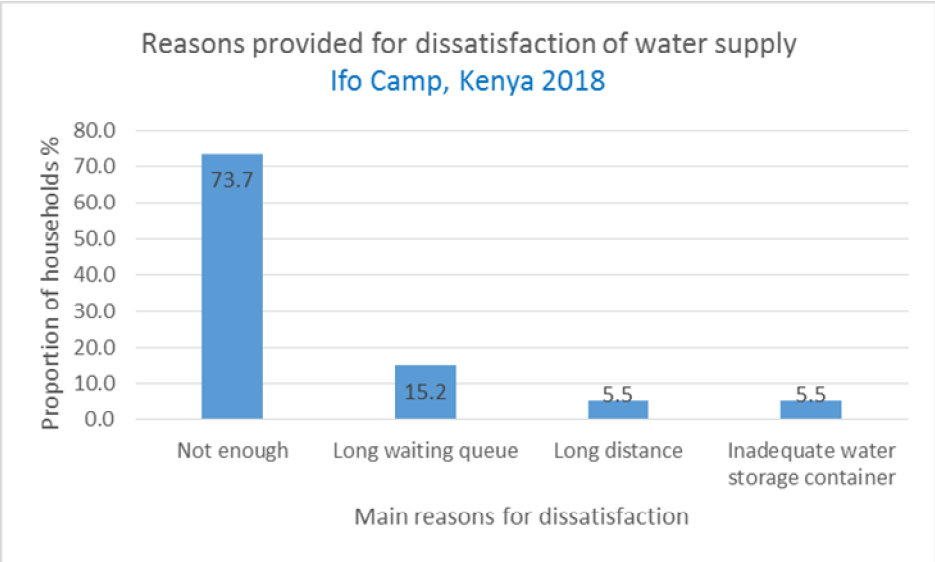


Figure 45 Reasons provided for dissatisfaction of water supply, Ifo camp, Kenya, 2018

62.0% (43.7-80.3) of households used an improved excreta disposal facility and nearly all households disposed of children's faeces safely (Table 109).

Table 109 Safe Excreta disposal, Ifo camp, Kenya, 2018

	Number/total	% (95% CI)
Proportion of households using an improved excreta disposal facility (improved toilet facility, not shared)	392/626	62.6 (49.0-76.2)
Proportion of households using a shared family toilet	89/626	14.2 (7.2-21.3)
Proportion of households using a communal toilet	8/626	1.3 (0.2-2.3)
Proportion of households using an unimproved toilet	137/626	21.9 (7.0-36.8)
The proportion of households with children under three years old that dispose of faeces safely.	319/320	99.7 (99.0-100.0)

6 Discussion

The weighted prevalence of global acute malnutrition (GAM) decreased to 8.0% from 9.7% in 2017. GAM prevalence decreased in Hagadera and Ifo but slightly increased in Dagahaley. It is important to note that the severe acute malnutrition (SAM) prevalence in Dagahaley increased from 1.1% in 2017 to 2.6% in 2018. The changes were not statistically significant. There was an increase in the prevalence of stunting across the camps, with a weighted prevalence of 21.9%, an increase from 19.6% in 2017. The increases in the prevalence per camp were not statistically significant except in Dagahaley which increased from 18.4% to 27.3% (p=0.024). The prevalence of anaemia among children aged 6-59 months showed a decrease from a weighted prevalence of 60.7% in 2017 to 55.6% in 2018. Further analysis by camp showed that the decrease was only statistically significant in Hagadera, where it decreased from 62.8% to 54.0% (p=0.02). For non-pregnant women aged 15-49 years, however, there was an overall increase from 43.6% in 2017 to 48.9% in 2018 and the increase was across all camps, although not statistically significant. Timely initiation of breastfeeding was generally high, although lower in Dagahaley. Exclusive breastfeeding was quite satisfactory compared to previous assessments. Introduction of solid foods was also very low in Dagahaley, while consumption of ironrich foods was quite low, but unacceptable low in Ifo camp. However, the interpretation must be made with caution given the low sample size. The average number of days which the food ration lasted ranged from 14.9 in Dagahaley to 19.7 in Ifo, which is between 2 to 3 weeks of the theoretical duration. The average household dietary diversity score ranged from 6.5 in Dagahaley to 8.0 in Hagadera. As previous surveys have observed, nearly all households have access to a safe drinking water source, while much fewer have access to an improved excreta disposal facility, mainly due to sharing for some households. In all camps, well over half of households used at least 20 litres per person per day and the average in each camp was well over the accepted standard.

7 Conclusions

The weighted prevalence of global acutemalnutrition, the most important indicator, was 8.0% overall, falling within the POOR category (5-9%). However, there was a marked improvement from 9.7% in 2017. Only Ifo camp was within the SERIOUS category (10-14%). The high prevalence of anaemia remains a major concern, as shown by the anaemia prevalence among children which remained above the 40% critical threshold, despite having decreased. Anaemia prevalence among non-pregnant women jumped to 48.9% overall, from 43.6% in 2017 and was above the 40% threshold for all camps. Some improvement was recorded in terms of infant and young chid feeding indicators, although there is still room for improvement. The access to safe drinking water also continued to be satisfactory, while gaps were still observed in terms of sanitation. The duration of the food ration and dietary diversity basically reflect what has been observed in recent surveys.

8 Recommendations and priorities

- Sensitize the mothers /caregivers on timely optimal complimentary feeding and dietary diversity focusing on children aged 6 to 23 months.
- Sensitize and educate the mothers on the importance of balanced diets and supplementation with Iron, Folic acid during adolescence, pregnancy and beyond.
- Mentor MTMSG with livelihood options to supplement what they have e.g. Kitchen gardening, selling of surplus produce to compliment the dietary household needs.
- Introduce SBCC activities sensitive to the community to adress myths and misconceptions on MIYCN through local radio spots e.g. Star Fm, Gargaar Fm and Dadaab Fm.
- Educate the community on how to purchase foods that are well diversified based on the food nutritive values using the Bamba Chakula money they receive on a monthly basis from WFP
- Adapt key messages on MIYCN through provision of IEC materials on EBF, Optimal complimentary feeding, dietary diversity, cooking demonstrations on food preparation, food consumption visavi nutrient absorption.
- Train MIYCN counselors, Mentor Mothers and MTMSG on MIYCN curriculum to strengthen the linkage and support given to mothers at antenatal and postpartum care.
- Scale up provision of food items to ensure that they meet 100% food basket requirements, at least 8 food groups and more .Other than sorghum, maize, oil, beans from the food vouchers they receive on a monthly basis.
- Educate and sensitize the gate keepers (block leaders, religious leaders) and the household heads on empowering their women and children prioritizing their nutritional needs.

9 List of individuals involved in the survey

MSF-DAGAHALEY

NAME	TITLE
Mohamed Ismail	COORDINATOR
Muhlar Ismail Abdi	SUPERVISOR
Yussuf Adan Dugow	SUPERVISOR
Hassan Abdikadir Abdille	TEAM LEADER
Issack Noor Hajji	ENUMERATOR
Mohamed Hassan Gama	ENUMERATOR
Hindio Mohamed Abdi	ENUMERATOR
Adey Abdi Duul	ENUMERATOR
Abdullahi Jire Dahir	COMMUNITY
Mohamed Issack Ali	TEAM LEADER
Ismail Mohamed Hussein	ENUMERATOR
Ahmed Hussein Adan	ENUMERATOR
Ahmed Hassan Gedi	ENUMERATOR
Abdirizack Hiraabey Bulle	ENUMERATOR
Omar Hassan Aden	COMMUNITY
Abdiyow Adan Korane	TEAM LEADER
Bashi Mohamud Abdi	ENUMERATOR
Mohamed Abdullahi Ahmed	ENUMERATOR
Abdi Hassan Abdullahi	ENUMERATOR
Noor Osman Yakub	ENUMERATOR
Ikro Abdullahi Mayow	COMMUNITY
Daud Sahal Haji	TEAM LEADER
Abdikani Mohamed Iman	ENUMERATOR
Dekow Nadhir Mohamud	ENUMERATOR
Sadia Dakane Sambul	ENUMERATOR
Hussein Dubat Abdi	ENUMERATOR
Yussuf Abdikadir Osman	COMMUNITY
Mohamed M. Bishar	TEAM LEADER
Hamdi Mohamed Ali	ENUMERATOR
Borrow Abdi Hassan	ENUMERATOR
Ibrahim Amphile Kassim	ENUMERATOR
Khadro Mohamed Bare	ENUMERATOR
Mahat Abdi Guhad	COMMUNITY
Ali Yussuf Ali	WASTE DISPOSER

IRC-HAGADERA CAMP

NAME	TITLE
ANZAL MOHAMED ALI	COORDINATOR
JAMAL ABDI FATAH	COORDINATOR
ROBINSON KIRORE MATEMO	COORDINATOR
SARAH HUSSEIN ABDULLAHI	COORDINATOR
HARET IBRAHIM ABDI	COORDINATOR
ADEN ADEN ADOW	TEAM LEADER
HASSAN AB ABDULLAHI	ENUMERATOR
HUSSEIN SHAMSO KHALIF	ENUMERATOR
DIIS YUSUF FARAH	ENUMERATOR
HASSAN ALI ADEN	ENUMERATOR
ABDI HUSSEIN ABDULLAHI	COMMUNITY MOBILIZER
HALIMA MAHAD ALI	TEAM LEADER
ADEN YUSSUF HUSSEIN	ENUMERATOR
FARDOWSA ABDI ADEN	ENUMERATOR
HUSSEIN ABDIFATAH MOHAMED	ENUMERATOR
LOHOW ABDULLAHI IBRAHIM	ENUMERATOR
BILAY MOHAMED JAMA	COMMUNITY MOBILIZER
SAADIO YAROW SAMO	TEAM LEADER
AHMED ISSACK HUSSEIN	ENUMERATOR
DEK MOHAMED GUDLE	ENUMERATOR
MOHAMUD ABDIWAHAB RONOW	ENUMERATOR
ALI IBRAHIM OMAR	ENUMERATOR
FARHIYA HASSAN OMAR	COMMUNITY MOBILIZER
SAID ABDIKADIR MOHAMED	TEAM LEADER
ABDIKADIR JAMA AHMED	ENUMERATOR
HASSAN WELI HUSSEIN	ENUMERATOR
FATUMA OMAR ALI	ENUMERATOR
ABDI ABDULLAHI ADEN	ENUMERATOR
ISSE ABDULLAHI MOHAMED	COMMUNITY MOBILIZER
FARAH MOHAMED ALI	TEAM LEADER
MOHAMED IBRAHIM MOHAMED	ENUMERATOR
KHALIF JAHABAT DINI	ENUMERATOR
WELI HUSSEIN SAHAL	ENUMERATOR
NIMO ADEN OMAR	ENUMERATOR
KHALIF HABIBO NOOR	COMMUNITY MOBILIZER
HABIBO MOHAMED HUSSEIN	WASTE DISPOSER

KRCS-IFO CAMP

NAME	TITLE
Zarah Abdi Salat	Suvey coordinator
Mohamed Abdi Hassan	Team leader
Abdiaziz Ali Ahmed	Team leader
Kheyrow Ali Hassan	Team leader
Abdirizak Bare Santur	Team leader
Mohamed Sheikh Ibrahim	Team leader
Christine Wairimu	Team leader
Hassan Abdi Ahmed	Team leader
Farah Abdi Dis	Enumerator
Mohamed Abdullahi Muse	Enumerator
Adenkadar Abdi Yusuf	Enumerator
Ali Ibrahim Mudey	Enumerator
Osman Dahir Digale	Enumerator
Ismael Ibrahim Farah	Enumerator
Hassan Shimoi Hussein	Enumerator
Abdi Ali Hud	Enumerator
Ahmed Hassan Bare	Enumerator
Kerow Adan Afi	Enumerator
Hussein Hassan Kusow	Enumerator
Mohamed Abdullahi Abdi	Enumerator
Shukri Khalif Mire	Enumerator
Mohamed Hassan Dahir	Enumerator
Mohamed Mursal Idris	Enumerator
Alemayehu Nordofa Sheri	Enumerator
Abdullahi Mohamed Hassan	Enumerator
Aden Hassan Abdi	Enumerator
Sowdo Abdi Afi	Enumerator
Halima Mohamed Gedi	Enumerator
Ahmed Wacdi Weli	Enumerator
Mohamed Hassan Sulub	Enumerator
Habibo Digale Sofe	Enumerator
Yusuf Abdirahman Abdille	Enumerator
Ahmed Gelle Ibrahim	Enumerator
Aden Dekow Areys	Enumerator
Amina Hussein Hassan	Enumerator

9. Appendices

Appendix 1 SMART Plausibility Check Report
Plausibility check for Dagahaley camp

Standard/Reference used for z-score calculation: WHO standards 2006
(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**0** (1.8 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.792)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.481)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (4)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**4** (17)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (6)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.			and	and	and	or	
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	**0** (1.05)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.02)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.03)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**0** (p=0.093)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**4** %

The overall score of this survey is 4 %, this is excellent.

Plausibility check for Hagadera camp

Standard/Reference used for z-score calculation: WHO standards 2006
(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	**0** (1.5 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0.456)
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=0.760)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (3)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (9)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (5)
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** (0.03)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (-0.01)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	**3** (p=0.002)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**5** %

The overall score of this survey is 5 %, this is excellent.

Plausibility check for Ifo camp

Standard/Reference used for z-score calculation: WHO standards 2006
(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**0** (0.0 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.232)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**2** (p=0.083)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (5)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**4** (19)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**2** (8)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.			and	and	and	or	
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	**0** (1.05)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (0.03)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.17)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**3** (p=0.009)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**11** %

The overall score of this survey is 11 %, this is good.

Appendix 2 Assignment of clusters

Dagahaley

Geographical unit	Population size	Cluster
C5	92	1
A11-1	119	
B5	106	
A11-2	110	2
C6	99	
A11-3	102	
A11-4	100	
A11-5	120	3
C4	110	
A5	130	
A11-6	115	RC
A11-7	187	
A6		
C7	105	4
B4	83	
B6	100	
A4	70	
G4	118	RC
H6	112	
H2	63	
G5	104	5
H8	120	
G2	113	
G1	135	6
H3	152	
G7	110	
G8	88	7
G9	80	
G10	42	
H10	95	
H1	120	8
G3	130	
H7	119	
H4	69	9
H5	82	
H9	101	
BH5	250	10
A1	121	
AC	96	
AB	100	11

AA	97	
A0	100	
B1	95	12
BC	71	
A9	100	
A8	102	
B0	223	13
BA	98	
DB	122	RC
A10	110	
D2	74	
C1	77	14
BB	98	
B7	69	
C10	71	
A7	66	
EA	109	15
CO	104	
EB	91	
DC	201	16
D1	83	
D0	24	
DA	111	17
B8	63	
B9	71	
A2	83	
A3	84	
B3	80	18
BH2	160	
B2	111	
C2	105	19
B10	79	
C3	63	
E9	69	
C9	96	20
E4	60	
E5	111	
E6	70	
E7	71	21
E0	126	
D7	99	
D4	110	22
C8	110	
D9	80	

E1	105	
D3	105	23
E10	85	
D5		
D8	65	
E3	79	
E8	70	24
D6		
D10	110	
CL6	110	
F8	94	
CL5	113	25
CL3	112	
cl4	102	
cl2	103	26
F3	90	
F4	127	
F5	65	27
F6	89	
F7	63	
F10	71	
F9	91	RC
CL1	102	
F2	75	
FA	100	
FB	127	28
F0	79	
K1	116	
K2	71	
K3	38	29
K4	82	
K5	69	
K6	168	30
K7	101	
K8		
K9		
K10		
K11		
K12	75	
K13	85	

Hagadera

Geographical unit	Population size	Cluster
A1	199	
A2	164	1
A3	135	
A4	110	
A5	135	
A7	120	RC
A8	130	
A9	168	
A10	95	
A11	30	
B1	242	2
B2	178	
B3	125	
B4	110	3
B5	193	
B7	130	
B8	122	
B9	85	4
B10	109	
B11	50	
C1	285	
C2	183	5
C3	169	
C4	176	
C5	131	6
C6	120	
C7	95	
C8	121	
C9	129	7
C10	40	
D1	280	
D2	284	8
D3	185	
D4	180	
D5	197	9
D6	131	
D7	108	
D8	132	
D9	158	10
E1	297	

E2	271	11
E3	191	
E4	151	RC
E5	180	
E6	190	
E7	139	
E8	140	12
E9	183	
E10	45	
F1	115	
F2	268	13
F3	175	
F4	165	14
F5	147	
F6	154	
F7	171	
F8	164	15
F9	150	
F10	138	
F11	8	
G1	190	16
G2	180	
G3	167	
G4	114	RC
G5	130	
G6	120	
G7	140	
G8	120	
G9	127	17
G10	90	
H1	207	
H2	205	18
H3	209	
H4	135	
H5	129	19
H7	112	
H8	109	
H9	66	
H11	90	
I1	130	
I2	170	20
I3	90	
I4	80	
I5	90	

I7	120	21
I8	120	
I9	102	
I11	70	
J0/1	233	22
J2	132	
J3	100	
J4	92	
J5/6	97	
J7/8	158	23
J9	112	
J10	149	
K1	73	
K2	74	
K3	187	24
K4	153	
K5	150	
K7	127	25
K8	153	
K9	115	
L1/2	126	
L3	98	
L4/5	258	26
L7	109	
L8/9	193	RC
L10/11	222	
M1/2	216	
M3/4	274	27
M5	120	
M7	115	
M7/8	158	28
N1	102	
N2	114	
N3	109	
N4	146	
N5	96	29
N6	142	
KO1	45	
KO2	123	
KO3	104	
KO4	79	30
KO5	30	
KO7	79	
KO8	40	

KO9	25	
KO10	31	

Ifo

Geographical unit	Population size	Cluster
A1	250	1
A2	190	RC
A3	299	2
A4	306	RC
A5	380	3
A6	152	
B1	89	4
B2	84	
B3	66	
B4	74	
B5	82	
B6	67	5
B7	86	
B8	77	
B9	63	
B10	70	6
B11	79	
B12	97	
B13	69	
B14	50	
B15	74	RC
B16	87	
B17	90	
B18	113	7
B19	97	
B20	145	
B21	60	8
B22	60	
C1	140	
C2	140	9
C3	105	
C4	135	
C5	78	10
C6	119	
C7	100	
C8	185	11
C9	100	
C10	102	
C11	100	12
C12	100	
C13	107	

C14	100	13
C15	120	
C16	195	14
C17	83	
C18	129	
C19	134	15
C20	126	
C21	100	
C22	95	16
C23	60	
C24	60	
C25	80	
C26	120	17
C27	53	
D1	87	
D2	184	18
D3 P1	141	
D3 P2	93	
D4 P1	152	19
D4 P2	126	
D5	379	20
D6 P1	270	21
D7 P1	108	
D7 P2	79	22
D8	171	
E1	80	
E2	103	23
F1	150	
F2 P1, P2	250	24
F3 P1, P2	314	25
F4	110	
G1 P1, P2	39	
G2	53	26
G3	83	
G4	8	
G5	165	
N0	14	
N1	31	
N2	32	RC
N3	18	
N4	31	
N5	97	
N6	103	
N7	54	

N8	87	27
N9	120	
N10	89	
N11	94	28
N12	79	
N13	60	
N14	77	
N15	59	
N16	60	29
N17	54	
N18	60	
N20	80	
N21	6	
N24	58	
N26	9	
N27	40	30
N28	38	
N29	66	
N30	56	
N31	40	
N32	46	
S2	12	
S3	29	
S4	12	

Appendix 3 Survey Questionnaires

UNHCR Standardized Expanded Nutrition Survey (SENS) Questionnaire
Dadaab Nutrition Survey, August/September 2018

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, 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.

FOOD SECURITY QUESTIONNAIRE

Date of interview (dd/mm/yyyy)	Cluster Number	Team Number
|___|___|/|___|___|/ 2018	|___|___|	|___|
Block code/Number	1=DAG, 2= HAG, 3=IFO HH No	
|___||___||___|	**Camp** |___|	|___|

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 *Bamba Chakula* sim card?	Yes..... 1 No..... 2	|___| If 1 go to FS5 If 2, go to FS4
FS4	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	
FS5	How many days did your food ration last from the August distribution cycle (general ration and *Bamba Chakula*)?		|___|
FS6	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	
FS7	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 Firewood .....12 Shoes/clothing .....13 Mobile phone airtime .....14 School materials/ fees .....15 Bus fare/transport .....16 Detergent/soap.....17 Cooking utensils.....18 Miraa/khat.....19 Cosmetics/make-up.....20	
FS8	Which other items did you buy using *Bamba Chakula*?		
FS9	In the last month, have you or anyone in your household borrowed cash, food or other items?	Yes..... 1 No.....2	|___|
FS10	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	|___|
FS11	In the last month, have you or anyone in your household requested increased remittances or gifts as compared to normal?	Yes..... 1 No.....2	|___|
FS12	In the last month, have you or anyone in your household reduced the quantity and/or frequency of meals?	Yes..... 1 No.....2	|___|
FS13	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.

FS15	**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,Iyo 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	4B.....|___|

	(ananas, tufax, afkadho, moos, liin- iwm)	
	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

WASH QUESTIONNAIRE

Date of interview (dd/mm/yyyy)	Cluster Number	Team Number
|___|___|/|___|___|/|___|___||___|___|	|___|___|	|___|
Block code/Number	1= DAG, 2= HAG, 3=IFO HH No	
|___||___||___|	|___|	|___|

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	|___ **IF ANSWER IS 2 GO TO WS4**|
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	|___|___| **IF ANSWER IS 04 GO TO WS7**
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) **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	|___|___| Households

<table>
<tr><td>WS7</td><td>Do you have children under three years old?</td><td colspan="3">Yes.....1
No .....2</td><td>|___|
IF ANSWER IS 2 GO TO WS9</td></tr>
<tr><td>WS8</td><td>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</td><td colspan="3">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</td><td>|___|___|</td></tr>
<tr><td rowspan="8">WS9</td><td rowspan="8">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)</td><td>Please show me the containers you used yesterday for collecting water

ASSIGN A NUMBER TO EACH CONTAINER</td><td>Capacity in litres</td><td>Number of journeys made with each container</td><td>Total litres

SUPERVISOR TO COMPLETE HAND CALCULATION</td></tr>
<tr><td>1 E.g. jerry can</td><td>25 L</td><td>1 x</td><td>25</td></tr>
<tr><td>2 E.g. jerry can</td><td>10 L</td><td>2 x</td><td>20</td></tr>
<tr><td>3 E.g. jerry can</td><td>5 L</td><td>2 x</td><td>10</td></tr>
<tr><td>4 E.g Jerry can</td><td>5 L</td><td>1 x</td><td>5</td></tr>
<tr><td>5 E.g. bucket</td><td>50 L</td><td>1 x</td><td>50</td></tr>
<tr><td colspan="3">Total litres used by household</td><td>110</td></tr>
<tr><td>WS10</td><td>Please show me where you store your drinking water.
(ARE THE DRINKING WATER CONTAINERS COVERED OR NARROW NECKED?)</td><td colspan="3">All are.....1
Some are 2
None are.....3</td><td>|___|___|</td></tr>
</table>

WOMEN QUESTONNAIRE

Date (dd/mm): |_____|_____||_____|_____| 2018		
Block Code / Number: |_____|_____|_____|		

WM1	**WM2**	**WM3**	**WM4**	**WM5**	**WM6**	**WM7**	**WM8**
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 <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/dL) Question will be asked for WM5=No or DK
01							
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							

…							

CHILD QUESTIONNAIRE

		Cluster Number: |_____|_____|	**Team Number:** |_____|
		Camp/Survey Number: 1= DAG, 2=HAG, 3=IFO |_____|	

C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**
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 PROGRAMME ?** 1 = OTP; 2 = SFP; 3 = None 8=Don't know
	1										
	2										
	3										
	4										
	5										
	6										
	9										
	10										

		C13	**C14**	**C15**	**C16**	**C17**	**C20**

		Measles Vaccination 9-59m 1=Yes with card 2=Yes by recall 3=No or don't know	**Vit. A in past 6 months 6-59m** (SHOW CAPSULE) 1=Yes card 2=Yes recall 3=No or don't know	**Dewormed in past 6 months** (SHOW PILL) 1=Yes recall 2=No or don't know	**Diarrhoea in last 2 weeks (more than 3 loose, watery stools/24hrs)** 1 = yes 2 = no 99 = don't know	**When [name] had diarrhoea did you feed [name]:** 1=less 2= the same 3=more 4=no food	**Hb** (g/dL)
1							
2							
3							
4							
5							
6							

Team Number: |_____|								
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	**Was [name] breastfed yesterday during the day or at night?** 1 = yes 2 = no 99 = don't know
1								
2								
3								
4								
5								

Now I would like to ask you about liquids that you may have had. I'm interested in whether your child had the item even if it was combined with other foods. Yesterday during the day and night, has your child received:

IF10	**IF11**	**1F12**	**IF13**	**IF14**	**IF15**	**IF16**	**IF17**	**IF18** **I**

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	**Sour milk or yoghurt** 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 water-based liquids (sodas, other sweet drinks, sweetened water, herbal infusion, gripe, clear tea with no milk, black coffee, ritual 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**	**IF3**	**IF24**	**IF25**		
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	**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, choice, anchor, S26 (*caano, boodhe, sahha*)?** 1 = yes 2 = no 99 = don't know	**Iron fortified solid, semi-solid or soft foods designed specifically for infants and young children Eg.Weetabix, Serifam Cerelac** 1 = yes 2 = no 99 = don't know		

Appendix 4 Local events calendar

Dadaab Nutrition survey Events calendar: August 2018					
Season	**Local Event (in camp of surrounding areas)**	**Somali Calendar**	**Religious holidays**	**Month / year**	**Age (m)**
Mid Xagaa	World Breastfeeding week 1-7 August	Bisha Sideedaad		Aug-18	0
Beginning of Xagaa	Somalia Independence 1 July	Bisha Todobaad		Jul-18	1
End of Gu'	Madaraka Day 1 June World Refugee Day 20 June	Bisha Luuly		Jun-18	2
Mid of Gu'		Bisha Shanaad		May-18	3
Beginning of Gu'		Abriil	Easter holidays	Apr-18	4
End of Jiilal	Women's Day 8 March	Maarso		Mar-18	5
Mid of Jiilal	Valentines' Day 14 February	Febrayo		Feb-18	6
Beginning of Jililal		Janaayo	New years' holiday 1 January	Jan-18	7
End of Deyr	Jamhuri Day 12 December	Bisha diseenbar		Dec-17	8
Mid of Deyr		Bisha kow iyo Tobnad		Nov-17	9
Beginning of Deyr		Bisha Tob		Oct-17	10
End of Xagaa		Bisha Sagaalad		Sep-17	11

Mid Xagaa	World Breastfeeding week 1-7 August	Bisha Sideedaad		Aug-17	12
Beginning of Xagaa	Somalia Independence 1 July	Bisha Todobaad	End of Ramadhan (Eid Al Fatir)	Jul-17	13
End of Gu'	Madaraka Day 1 June World Refugee Day 20 June	Bisha Luuly	Start of Ramadhan	Jun-17	14
Mid of Gu'		Bisha Shanaad		May-17	15
Beginning of Gu'		Abriil	Easter holidays	Apr-17	16
End of Jiilal	Women's Day 8 March	Maarso		Mar-17	17
Mid of Jiilal	Valentines' Day 14 February	Febrayo		Feb-17	18
Beginning of Jililal		Janaayo	New years' holiday 1 January	Jan-17	19
End of Deyr	Jamhuri Day 12 December	Bisha diseenbar		Dec-16	20
Mid of Deyr		Bisha kow iyo Tobnad		Nov-16	21
Beginning of Deyr		Bisha Tob		Oct-16	22
End of Xagaa		Bisha Sagaalad		Sep-16	23
Mid Xagaa	World breastfeeding week	Bisha		Aug-16	24

		Sideedaad			
Beginning of Xagaa	Somalia Independence 1 July	Bisha Todobaad	End of Ramadhan 7 July (Eid Al Fatir) 7 July	Jul-16	25
End of Gu'	Madaraka Day 1 June World Refugee Day 20 June	Bisha Luuly	Start of Ramadhan 6 June	Jun-16	26
Mid of Gu'	Government decision to close Dadaab 6 May Visit of President of Somalia 10 May Measles campaign 16 May	Bisha Shanaad		May-16	27
Beginning of Gu'		Abriil	Easter holidays	Apr-16	28
End of Jiilal	Women's Day 8 March	Maarso		Mar-16	29
Mid of Jiilal	Valentines' Day 14 February	Febrayo		Feb-16	30
Beginning of Jililal		Janaayo	New years' holiday 1 January	Jan-16	31
End of Deyr	Jamhuri Day 12 December	Bisha diseenbar		Dec-15	32
Mid of Deyr	Kambioos maternity opened 17 November	Bisha kow iyo Tobnad		Nov-15	33
Beginning of Deyr	Cholera outbreak in Hagadera 13 October	Bisha Tob		Oct-15	34
End of Xagaa		Bisha Sagaalad		Sep-15	35
Mid Xagaa	World breastfeeding week	Bisha Sideedaad		Aug-15	36
Beginning of Xagaa		Bisha Todobaad	Eid Al Fatir 18 July	Jul-15	37
End of Gu'	World Refugee Day	Bisha Luuly	Beginning of Ramadan 18 June	Jun-15	38
Mid of Gu'	Yumbis attack/fire at albushra	Bisha Shanaad		May-15	39
Beginning of Gu'	Hagadera windle trust Incident	Abriil		Apr-15	40

End of Jiilal		Maarso		Mar-15	41
Mid of Jiilal	Attempted hijacking of UNHCR car	Febrayo		Feb-15	42
Beginning of Jililal		Janaayo	Mawlid al-Nabi 3 January	Jan-15	43
End of Deyr		Bisha diseenbar		Dec-14	44
Mid of Deyr		Bisha kow iyo Tobnad		Nov-14	45
Beginning of Deyr		Bisha Tob	Muharram 25 October/ Eid adha oct 4	Oct-14	46
End of Xagaa		Bisha Sagaalad		Sep-14	47
Mid Xagaa	World Breastfeeding Week.	Bisha Sideedaad		Aug-14	48
Beginning of Xagaa		Bisha Todobaad	Eid Al Fatir 28 July	Jul-14	49
End of Gu'	World Refugee Day	Bisha Luuly	Beginning of Ramadan 28 June 28/06 بدايـــة شهر رمضان/	Jun-14	50
Mid of Gu'		Bisha Shanaad		May-14	51
Beginning of Gu'		Abriil		Apr-14	52
End of Jiilal		Maarso		Mar-14	53
Mid of Jiilal		Febrayo		Feb-14	54
Beginning of Jililal		Janaayo	Mawlid al-Nabi 13 January	Jan-14	55
End of Deyr		Bisha diseenbar		Dec-13	56
Mid of Deyr		Bisha kow iyo Tobnad	Muharram 5 November	Nov-13	57
Beginning of Deyr		Bisha Tob	Eid al adha Oct 15th	Oct-13	58
End of Xagaa	Refugee elections	Bisha Sagaalad		Sep-13	59