



Nutrition Anthropometry & Retrospective Mortality Survey Report

August 2015

Funded by:

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List of Abbreviations & Acronyms

BF	Breast feeding
BSFP	Blanket Supplementary Feeding Program
CFR	Case Fertility Rate
CI	Confidence interval (at 95% throughout report)
CMR	Crude Mortality Rate
CWW	Concern Worldwide
DDG	Digital Data Gathering
EBF	Exclusive Breastfeeding
ENA	Emergency Nutrition Assessments
FGD	Focus Group Discussion
FSL	Food Security and Livelihoods
FSNWG	Food Security Nutrition Working Group
GAM	Global Acute Malnutrition
GFD	General Food Distribution
HFA	Height for Age
HAZ	Height for Age Z scores
HH	Household
IDPs	Internally Displaced Persons
IOM	International Organization for Migration
IPC	Integrated Phase Classification
IYCF	Infant and Young Child Feeding
IYCN	Infant and Young Child Nutrition
MAM	Moderate Acute Malnutrition

MDD	Minimum Dietary Diversity
MOH	Ministry of Health
MUAC	Mid Upper Arm Circumference
OTP	Out-Patient Therapeutic Programme
NCHS	National Centre for Health Statistics
PoC	Protection of Civilians
PPS	Probability Proportional to Size
RUSF	Ready to Use Supplementary Food
RUTF	Ready to Use Therapeutic Food
SAM	Severe Acute Malnutrition
SD	Standard Deviation (measure of spread around the mean)
SFP	Supplementary Feeding Programme
SMART	Standardized Monitoring and Assessment of Relief and Transitions
TFC	Therapeutic Feeding Program
TSFP	Targeted Supplementary Feeding Program
UNICEF	United Nations Children's Fund
U5	Under 5 years
U5MR	Under 5 Mortality Rate
VAS	Vitamin A supplementation
WASH	Water Sanitation and Hygiene
WAZ	Weight for Age Z scores
WFA	Weight for Age
WFP	World Food Program
WFH	Weight for Height
WHZ	Weight for Height Z scores
WHO	World Health Organisation

Executive Summary

A nutrition and mortality SMART Survey was conducted in Bentiu PoC (with a population currently estimated at above 100,000 people) located in Rubkona County, Unity State, South Sudan between 7th and 20th August, 2015. The survey was done by Concern Worldwide (CWW), with support from ECHO-OFDA & UNICEF and validation of the Nutrition Information Working Group (NIWG) of the Nutrition Cluster. The main objective of the survey was to determine the level of acute malnutrition among children aged 6-59 months and crude and under 5 retrospective death rates, as well as to analyse possible factors contributing to malnutrition across the entire Bentiu PoC site. CWW has been running emergency nutrition programmes (OTP, TSFP, and IYCF), Shelter/Non Food Items (NFIs) and Water Hygiene and Sanitations (WASH) interventions in the PoC since May 2014. This SMART survey was the second to be carried out in Bentiu PoCs population since the CARE Nutrition SMART survey conducted in August 2014. The information would help to evaluate the nutrition intervention and to guide further response. This survey was also to be used as baseline and end line information for the CWW Nutrition Programme in Bentiu PoC, which is funded by ECHO-OFDA and UNICEF.

The survey was a cross sectional study using mixed methods where both qualitative and quantitative data was collected. Quantitative data was collected using digital data gathering devices where a two-stage cluster sampling Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology was employed. A sample size of 470 HHs in 47 clusters was planned and 10 teams of 3 enumerators per group were trained and engaged to collect data.

Eventually a total of 632 children aged 6-59 months from 336 households in 47 clusters were examined for anthropometry, immunization, and vitamin A status. Data on mortality, Infant and Young Child Feeding (IYCF) practices among children 0-23 months and food security was also collected concurrently in the 438 households visited during the survey. Qualitative data was collected on paper forms from 10 focus group discussions (FGDs) with 5 people. There were separate FGDS for caregivers (mothers/fathers) and leaders who either had children in or out of the nutrition programme. Further the participants were either new arrivals (i.e less than three months residents) or those living in Bentiu for a longer period. The FGDs together with a review of available secondary data from Bentiu PoC was used to triangulate quantitative data.

The prevalence of Global Acute Malnutrition (GAM) WFH for the Bentiu PoCs was 34.1% (95%CI: 31.1 - 37.2), which according to WHO classification is above emergency threshold of 15% GAM rate. The severe acute malnutrition (SAM) rate (WHZ<-3 or oedema) was equally high at 10.5 % (95%CI: 8.5 - 12.9) but no oedema case was observed according to the survey. Boys and girls were equally malnourished. There was a significant increase in GAM & SAM rate WHZ within the Critical levels compared to the previous SMART survey conducted in Bentiu PoC in August 2014 by CARE international where the results indicated acute malnutrition at 20.8% (95%CI: 16.4% - 25.9%) and 4.9% (95%CI: 3.0% - 7.9%) for GAM and SAM respectively.

The crude mortality rate (CMR) and under five mortality rate (U5MR) of 1.29 (95% CI: 0.75-2.20) and 0.17 (95%CI; 0.02-1.34) were recorded respectively. Both CMR and U5MR rates were well below the WHO emergency threshold (2/10,000 persons/day for crude mortality rate and 4/10,000 U5 children/day for U5MR) for developing countries. Despite the survey findings being similar to those found by CARE in the camp in August 2014, other reports in the camp however suggest that mortality might be higher; and it is possible that this survey did not capture the full extent of mortality due to the new and longer roster format of the mortality questionnaire.

The survey registered an extremely low rate of exclusive breastfeeding of 8.7% (95% CI: 3.3%-18.0%) among children 0-5 months. As a result, this very young age-group is at increased risk of diarrheal infections, acute malnutrition and even death. The main reasons for this low rate cited by mothers in the focus groups were women feeling they didn't have enough milk due to their own poor diet and mothers being away from their infants due to high workloads. Diet diversity among children

remains low, with roughly 50-70% of children under-two (6-23 months) not consuming the minimum diet diversity, which is eating from 4 or more of 7 standard food groups.

Food Security and Livelihood data showed that majority of the households (68.5%) had faced food shortage 7 days prior to the survey. Most of those households ((62.3%) reported that they would borrow from their kins as a coping strategy and this was closely followed by relying on less preferred food at 28.3 %.

The coverage for measles was 81.9% (95% CI: 78.6%-84.8%) and is within the World Health Organization (WHO) & Sphere (2011) recommended coverage of above 80% but that of Vitamin A in the previous 6 months was at 71.8% (95% CI: 68.1%-75.3%) and is below the desired levels of above 80%. Table 0-1 gives a summary of key results of the quantitative survey.

No morbidity data was collected during the survey. However a review of available secondary data from WHO and FSNWG on Bentiu PoC indicated that malnutrition, TB HIV AIDS, acute watery diarrhea, and malaria were the leading cases of morbidity and were the most frequent causes of death. There was also evidence of sub-optimal hygiene and sanitation standards as well as inadequate access to safe drinking water in the camp according to the Knowledge Attitudes and Practice (KAP) survey in Bentiu PoC in May 2015 by CWW.

According to data from the FGDs, there is a problem of rampant misuse of RUTF/RUSF by sharing (for reasons such as "it tastes nice, no other food in the Households, it is the Culture of people to share") and selling (to get money to buy other foods like milk, meat or other necessities in the Households). This trend promotes extended length of stay of children in CMAM programmes, and an increase of non-recovery cases.

Table 0 1: Summary of key findings, Bentiu PoC, Rubkona County, South Sudan, Aug 2015 Survey compared to Aug 2014 Survey.

Characteristic	CWW SMART survey, Aug 2015 % (95% CI)	CARE SMART survey Aug 2014 % (95% CI)
Overall GAM (WFH <-2 Z score or presence of oedema) - WHO 2006	34.1 % (31.1 - 37.2)	20.8% (16.4 - 25.9)
Overall SAM (WFH <-3 Z score or presence of oedema) - WHO 2006	10.5 % (8.5 - 12.9)	4.9% (3.0 - 7.9%)
Overall underweight (WFA <-2 Z score or presence of oedema) - WHO	24.3 % (20.8 - 28.1)	27.5 % (23.8%-31.5%)
Overall Severe underweight (WFA <-3 Z score or presence of oedema)-WHO	7.7 % (5.8 - 10.1)	8.0 % (5.65 - 11.1%)
Overall stunting (HFA <-2 Z score)- WHO	13.0 % (10.4 - 16.1)	28.8% (24.6%- 33.4%)
Overall Severe stunting (Height for age <-3 Z score) –WHO	1.4 % (0.6 - 3.0)	8.6 % (6.6 %- 11.1%)
Overall GAM (MUAC < 125 mm and/or oedema)	11.2 % (8.3 - 15.0)	9.6 % (6.9 - 13.3%)
Overall SAM (MUAC < 115 mm and/or oedema)	1.7 % (0.9 - 3.3)	2.0 % (0.9 - 4.4%)
Vitamin A supplementation coverage children 6-59 months	71.8% (68.1%-75.3%)	-
Measles immunization (card and recall) for children 9-59 months	81.9% (78.6%-84.8%)	-
CMR (deaths/10,000/day)	1.29 (0.75-2.20)	0.70 (0.31-1.58)
U5MR (deaths in children <5/10,000/day)	0.17 (0.02-1.34)	0.47 (0.15-1.50)
Exclusive breastfeeding children 0-5 months	8.7% (3.3%-18.0%)	83.3% (73.6-90.6%)
Minimum dietary diversity (breastfed children 6–23 months):	28.0% (18.7%-39.1%)	12.5% (5.6%-23.2%)
Minimum dietary diversity (non breastfed children 6–23 months)	50.0% (11.8%-88.2%)	16.4% (8.5%-27.5%)
Households with Food shortages in the last seven days at the time of survey	68.5% (63.9%-72.8%)	-

In conclusion, despite the ongoing humanitarian interventions in Bentiu PoCs the nutrition situation has remained in a critical phase from the previous SMART survey according to WHO classification for severity of nutrition situation. Much of this increase is likely due to the worsening violence and humanitarian emergency that has escalated in the surrounding counties over the past year. Crude and under five mortality rates are low and are similarly below the WHO's emergency levels. The nutrition status of the community is associated with many factors that range from poor socio-economic and civil security, food insecurity, poor child care practices and poor access to healthcare, water, sanitation and hygienic infrastructure which lead to poor nutrition status in the PoC.

Specific recommendations are outlined below:

- **Continue delivery of quality services for the management of severe and moderate acute malnutrition for children (6-59 months).** There should be heightened attention to systematically screen new arrivals, refer and follow up any cases to ensure they are immediately admitted.
- **Develop and implement a coordinated PoC-wide behavior change strategy, focusing on IYCF, health seeking and hygiene.** Agencies in the camp must come together to agree on a coordinated set of messages and simple counselling materials. Agencies must also harmonise the work of outreach workers and volunteers; ensuring coverage areas of different community agents within the camp are complementary and messages and support services delivered are the same. Mass media

messaging, group counselling and one-on-one counselling at key contact points and via household visits should be harmonised. WFP is currently expanding its pool of community volunteers – this is an opportunity for harmonization of messaging and coverage.

- **Further investigate the low level (8.7%) of exclusive breastfeeding among children 0-5 month in the camp.**

A Barrier Analysis could be undertaken on this behaviour so that appropriate interventions (e.g. to reduce the time mothers are separated from their young children) can be identified. Increasing this practice is critical to preventing undernutrition and death in the camp context and findings should feed into the coordinated behaviour change strategy recommended above.

- **Further investigate barriers to handwashing with soap, particularly after defecation** (as well as potential enablers). Results of a KAP survey undertaken in Bentiu PoC in May 2015 suggests only 50% of households had soap and further, less than 40% mentioned washing their hands with soap after defecating. Increasing this practice is critical to preventing undernutrition and death in the camp context and findings should feed into the coordinated behaviour change strategy recommended above.

- **Increase access to water, but perhaps more importantly, investigate the quality of water along the water chain** and promote practical messages to improve hygiene of water transport and storage.

- **Better assess coverage of the TSFP and OTP and barriers to accessing both.** This could potentially be done via a systematic mass screening, which is currently being conducted by partners in the camp. However, data collection and recording would need to be strengthened and well supervised if this was to serve as an unbiased and accurate estimate of programme coverage. There should be qualitative investigations to understand barriers and boosters to accessing services of acute malnutrition. This survey estimates that roughly 63% of children with SAM according to MUAC (32% according to WHZ) are being covered currently by the OTP and 30% of children with MAM according to MUAC (19% according to WHZ) are in the SFP. This suggests coverage levels are modest (and generally better for MUAC), but a more appropriate assessment tool is required.

- **Continue the general food distribution in the PoC to bolster the household food security of all displaced families.** Provide particular focus on registering and promptly delivering the ration to new arrivals as they seem most at risk. Review the size and composition of the general food ration as roughly 68% of households say they had experienced food shortages in the last 7 days and the diet diversity of children is low.

- Consider introducing a blanket SFP programme to address the poor diet diversity and acute malnutrition among children. Currently, it appears new arrivals are provided a supplementary ration, but the regularity and duration of this may need to be reviewed.
- Continue to actively vaccinate children for measles and provide vitamin A supplementation – amplify focus on the new arrivals to ensure coverage of both of 85% or more.
- Consider scaling up cash for work programmes to provide more income to households, particularly to purchase foods such as milk to complement the food aid they receive.
- Further investigate under-five mortality data from other sources to triangulate the low levels found in the survey. Ensure more time and piloted training on the longer mortality survey questionnaire or revert to the more concise previous version for difficult survey contexts such as South Sudan

conducted at the end of April 2015 indicates a further deterioration in the number of people facing severe food insecurity across South Sudan from 2.5 million people in January - March 2015 to around 4.6 million people during the lean period of May - July 2015. Compared to most previous years, the onset of the 2015 lean season in May is two months earlier and is due to diminished household food stocks, high food prices and long-term effects of the conflict. So far in 2015, admissions into CWW's outpatient therapeutic and targeted supplementary feeding programmes in Bentiu PoC have been steadily increasing due to the influx of new arrivals. Admissions for May-July 2015 are more than triple what they were during same months in 2014 as shown on Figure 0-1.

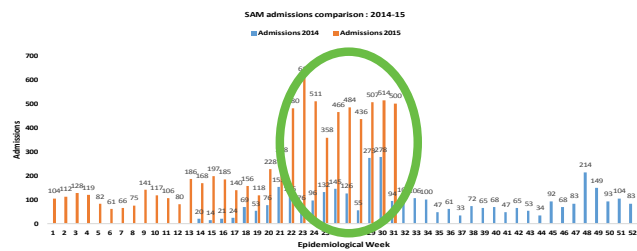


Figure 0-1: SAM admissions comparison: 2014-2015

The previous IPC analysis in December 2014 projected that Guit and Rubkona counties would remain at 'crisis' and 'emergency' levels of food insecurity respectively between January and March 2015. Many of the new arrivals are coming from these counties. Admission trends so far in 2015 for OTP and TSFP are shown below and indicate sharp increases in admissions in April and May 2015 as well as the first week of June (Figure 0-2). The total number of admissions for 2015 was 2431 (OTP) and 3607 (TSFP).

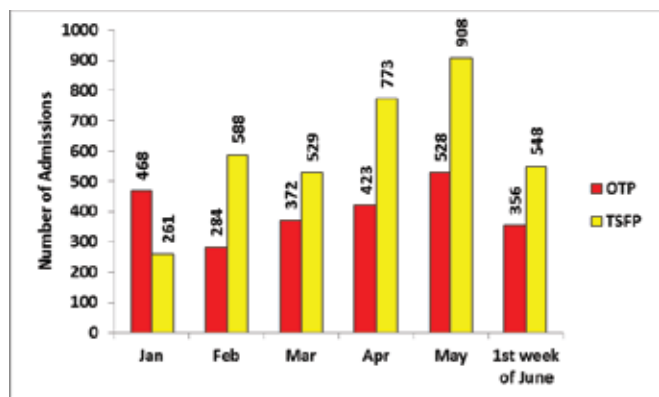


Figure 0 2: Admission trends for first 6 months in 2015 for OTP and TSFP in Bentiu PoC

CARE, the other nutrition actor implementing CMAM in the PoC, carried out a SMART survey in August 2014. The CARE survey showed a GAM prevalence of 20.8% (SAM 4.9%), which is significantly greater than the WHO emergency threshold (>15%). A Mid Upper Arm Circumference (MUAC) assessment conducted by UNICEF in June 2014 showed that 7.72% of the children from 6-59 months screened had a MUAC between 12.5 cm and 11.5cm, and 3.08% of them had a MUAC less than 11.5cm or bilateral oedema. The overall percentage of children with MUAC below 12.5 cm was thus 10.8%.

INTRODUCTION

Background

Concern Worldwide (CWW) first became operational in South Sudan in 1985, when it was still part of Sudan, providing emergency relief to Ethiopian refugees in Upper Nile State. In 1994 CWW started responding to those affected by the civil war with emergency and early recovery interventions, initially in Yei, Eastern Equatoria and then to other areas of the country including counties in Lakes, Northern Bahr el Ghazal (NBeG) and Unity States as well as Nuba Mountains. Currently, CWW operates in Rubkona (Bentiu PoC), Aweil West and Aweil counties of Unity State, north counties of NBeG, and Juba PoCs in Central Equatorial State, with its country office in Juba.

The violence that erupted in South Sudan in mid-December 2013 led to a humanitarian crisis involving massive displacement of 1.5 million people nationwide. On-going conflict has resulted in the displaced seeking refuge in Protection of Civilian (PoC) sites, host communities and neighbouring countries. As of February 2015, over 345,300 people are estimated to be displaced in Unity State alone. The displacement has generated significant need for emergency services. Despite the presence of humanitarian agencies, living conditions in the PoC sites remain substandard. Widespread food insecurity, high acute malnutrition rates, insufficient water and sanitation services and inadequate child feeding practices have led to increased needs for nutrition interventions.

The conflict and associated displacement has had a significant impact on food security and consequently, the prevalence of malnutrition. The most recent Integrated Food Security Phase Classification (IPC) analysis

These findings resulted in a significant scale up by the humanitarian community in terms of providing additional OTP sites, including the establishment of two OTP sites in Sector 3 block 7 and Sector 4 block 11 by CWW in June 2015.

At the time of the CARE survey, the total population in Bentiu PoC was estimated to be 40,500 people. However, CWW survey used a figure of 76,417 individuals, including 16,922 children under five. Figures issued since the survey was conducted indicate that the population in the POC is 111,323 as of August 2015. CWW estimates that roughly 24,491 of these individuals are children under-five. Since December 2014, there has been a sharp increase in new arrivals with roughly 5,000 of them moving into the PoC site each month. The dramatic influx of IDPs can be seen in Figure 0-3 below.

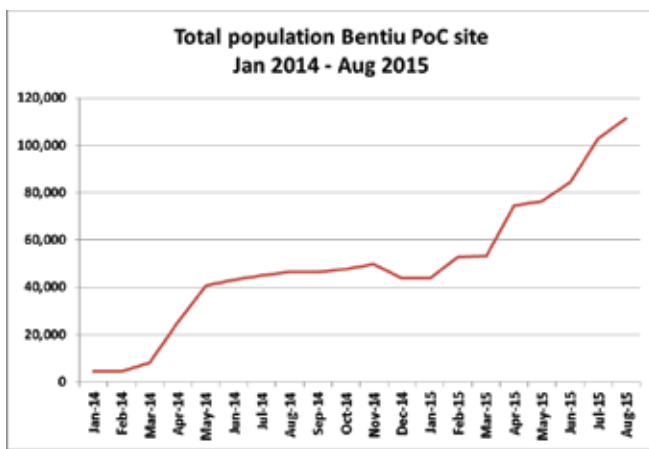


Figure 0 3: Total Population in Bentiu PoC between Jan 2014- Aug 2015

Note at the time of the CARE survey, there was only one camp known as PoC 1-5 and the population was only 45,000. The CWW survey covered both the original PoC and the new site as people were in the process of moving across.

Mass MUAC screening report conducted in June 2015 in Bentiu PoC by UNICEF
 Based on April 2015 IOM biometric registration results
 Based on Cumulative Registration Data June-August 2015 from Camp Coordination & Camp Management Cluster

This assumes 22% of the populations are under-five, based on the April biometric figures and the CARE survey in August 2014. However, CWW's SMART survey found 27% of the population was under-five.

Source Cumulative Registration Data June-August 2015, as above

Survey Justification

This survey is needed to determine the level of acute malnutrition in the area in order to monitor the situation and plan for an appropriate response, particularly given

the large influx of IDPs into the PoC. This survey will also be used as baseline and end line information for the CWW Nutrition Programme in Bentiu PoC, which is funded by ECHO-OFDA and UNICEF.

Objectives Of The Survey

The **main objective** of the survey was to determine the level of acute malnutrition among children aged 6-59 months and crude and under 5 retrospective death rates and to analyse possible factors contributing to malnutrition across the entire Bentiu PoC site.

Specific Objectives

The specific objectives of this nutrition survey were:

1. To determine the prevalence of global and severe acute malnutrition among children aged 6-59 months in Bentiu PoC, Unity State
2. To estimate retrospective under-five and crude mortality rates in the PoCs
3. To estimate the coverage of measles vaccination status among children aged 6-59 months
4. To assess food security and livelihoods related practices
5. To determine the percentage, to compare trends to previous year's SMART survey and track progress of the following Infant and Young Child Feeding indicators:
 - a. -Exclusive breastfeeding rates for infants 0-<5 months
 - b. -Minimum dietary diversity of children 6-<23 months
6. To further analyse the usage of RUTF/RUSF amongst intended beneficiaries and compare new arrivals with children who have been residing at the PoC (through focus group discussions)
- 7 To formulate and provide practical and sustainable recommendations/interventions based on the survey findings to improve the nutrition status of the population.

2. METHODOLOGY

Geographic target area and population group

The integrated SMART Nutrition and retrospective mortality survey was carried out at a time when households within the Protection of Civilians (PoCs) of Bentiu UNMISS base were in the process of relocating from the old to the new site. In order to be representative, the survey was carried out in both the 'old' & 'new' sites. Five sectors (Sector1, Sector2, Sector3, Sector4 and Sector 5) of 'new' site and five PoCs (PoC1, PoC2, PoC3, PoC5 and PoC6) of 'old' site with existing population were included in the sampling frame. Each of the 'new' site's Sector is geographically divided into a number of blocks ranging from 8-16 blocks while the 'old' site's PoCs are divide into sectors, ranging from 4-7 sectors except PoC six with only one sector. Each of the smallest geographical units i.e. Sections and Sectors have their own boundary and specified number of population. Each sector within the 'old' site's PoCs is named as like PoC1A, PoC1B ... PoC2A ...PoC3A...etc (see Appendix 2 for the list of sectors within the PoC). At the time of the survey, there were 18 sectors within the 'old' site and 55 blocks within the 'new' site in Bentiu PoC. In most cases each sector or block is surrounded by ditches (Appendix 6). The survey area is the Bentiu PoC which is located in Rubkona County of Unity State, Republic of South Sudan.

Children aged 6-59 months were targeted for anthropometric measurement; caretakers/mothers of children 0-23 months were targeted for IYCF data; and mortality and FSL data targeted all households selected for the survey.

Study Design

This was a cross-sectional study using mixed methods where both qualitative and quantitative data was collected.

a. Quantitative Data

The Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology was used from planning to report writing. A two-stage cluster sampling with SMART methodology was used. The first stage was the selection of clusters which was done using ENA for SMART software and the second stage was the selection of HHs using systematic random sampling. The sample sizes for indicators of anthropometry and mortality were calculated using ENA for SMART software (July 9th 2015, version) while the IYCF calculator was used in IYCF sample size calculations.

Anthropometric sample size

A prevalence of 20.8% GAM in Bentiu PoC was assumed based on survey data from the Care 2014 SMART Survey which is the most recent similar survey in the area. Precision needed was set at 5%. A Design Effect of 1.3 was used.

ENA July 9th2015 version software was used to calculate the anthropometric sample size. The average household size was taken as 8, and the population assumed to be under 5 years was 22% . A non-response rate of 5% was included in the sample size calculation. The sample size required was 358 children 6-59 months (238 households).

Parameters	for	Value	Assumptions based on context
Anthropometry			
Estimated Prevalence of GAM (%)		20.8 %	CARE SMART 2014
± Desired precision		5 %	SMART guideline
Design Effect		1.3	design is random two stage cluster sampling
Children to be included		358	
Average HH Size		8	
% Children under-5		22 %	IOM population data from April 2015
% Non-response Households		5 %	
Households to be included		238	

Table 2 1: Anthropometry sample size

Mortality Sample Size

In order to calculate the sample size needed for the mortality section of the survey, an estimated death rate of 0.7deaths per 10000/day was assumed based on the results of the 2014 CARE SMART Survey. Precision needed was set at 0.35 so that the estimate would be precise enough in respect to emergency thresholds. An average household size of 8 was assumed. A non-response rate of 5% was included in the sample size calculation. A recall period of 88 days was used based on PoC Verification Date (May 21st). The sample size required is 3340 people (465 households) as shown in Table2-2

Table 2 2: Mortality sample size.

Parameters for Mortality	Value	Assumptions based on context
Estimated Death Rate /10,000/day	0.7	CARE SMART
± Desired precision /10,000/day	0.35	SMART guidelines
Design Effect	1.3	Design is random two stage cluster sampling
Recall Period in days	88	Bentiu PoC Verification Day May 21st 2015
Population to be included	3530	
Average HH Size	8	HH size
% Non-response Households	5 %	
Households to be included	465	

**the total number of 'shelters' (not households) was available for survey planning, thus the agreement to use 8 as 'household' size.*

The most recent population data for the Bentiu POC at the time of survey planning was from the IOM April 2015 biometric registration results as outlined above: 16,922 children under five and a total of 76,417 individuals which equates to 22% children below five years.

Sample size calculations and parameters used for each IYCF Indicators

The sample sizes required for the selected IYCF indicators were determined by the IYCF calculator using the estimated prevalence of the two indicators from the 2014 CARE SMART survey. The estimated percentage of the population in the target age group for each indicator was based on 22% of the population being under-five and assuming an equal distribution across the age bands within 0-59 months and a level of precision that would allow detection of a meaningful change from 2014 CARE survey levels - while still being feasible to collect data given the resources and time allocated to the survey. The design effect was set at 1.3 as shown on Table 2-3.

Table 2-3: IYCF sample size calculation

Sample Size Calculator for IYCF Indicators								
Indicator	Estimated prevalence	± desired precision	Design effect	Sample size in no of children	Average household size	% children under 5	% non-response households	Households to be included
Exclusive breastfeeding	83.3	10	1.3	76	8	22	5	113
Minimum dietary diversity (non-breastfed children)	16.4	10	1.3	75	8	22	5	111
Minimum dietary diversity (breastfed children)	13.8	10	1.3	65	8	22	5	96

The largest number of households required was **465**(mortality). **This was therefore the final sample size for the survey.**

The sampling frame for clusters was drawn from the entire population of the people living within all the locations in **Bentiu PoCs**. This comprised both the 'old' site (PoCs 1,2,3,5 and 6) and the 'new' site (5 sectors divided into blocks). PoC 4, one of the 'old' sites did not exist at the time of the survey since it had been demolished as part of relocation and its occupants moved to other sites mostly in the 'new' site sectors 3, 4 and 5. Using ENA for SMART (July 9th, 2015 version) software, 47 randomly assigned clusters were selected based on probability proportionate to their population sizes (PPS). The decision for 47 clusters (465HH/10 HH) was based on the number of teams (10 teams) as well as their ability to collect data satisfactorily from 10 households per day within a cluster. The teams were expected to take a total of 5 days to collect quantitative data and an additional 1 day to collect qualitative data from FGDs.

Selection of HH:

Based on the final population figures received from the Danish Refugee Council (DRC), selection of 47 clusters was done. Systematic random sampling was used to select 10 HH per cluster to be surveyed. The enumerators would begin by listing all HHs, get a sampling interval (SI), then select 1st HH (choose a number between 1 and SI by simple random sampling) and finally select subsequent HHs using the SI until they achieved 10 HHs for the cluster.

Data Collection:

Quantitative Data collected included: mortality, anthropometry, Infant and Young Child Feeding (IYCF) as well as Food Security and Livelihoods (FSL). Digital Data Gathering Devices (DDGs) were used for data collection and entry.

b. Qualitative Data

Qualitative data was collected through Focus Group Discussions (FGDs). The main objective of the FGDs was to analyse the usage of RUTF/RUSF amongst intended beneficiaries and understand the difference of malnutrition status between new arrivals with children who had been residing at the PoC.

To select participants to Focus Group Discussions, non-probability sampling including purposive sampling was employed to ensure participants were qualified to provide in depth information about their experiences aligned with objectives of the study

One group of 5 persons was gathered for each of the following category with a total of 10 groups being organized:

i. **Group 1a:** Mothers of children under two years old - caretakers of children in programme; new arrivals

ii. **Group 1b:** Mothers of children under two years old - caretakers of children in programme; living in Bentiu PoCs for a longer period

iii. **Group 1c:** Mothers of children under two years old - caretakers of children not in programme; new arrivals

iv. **Group 1d:** Mothers of children under two years old - caretakers of children not in programme; living in Bentiu PoCs for a longer period

v. **Group 2a:** Mothers of children from two to five years old- caretakers of children in programme; new arrivals

vi. **Group 2b:** Mothers of children from two to five years old - caretakers of children in programme; living in Bentiu PoCs for a longer period

vii. **Group 2c:** Mothers of children from two to five years old - caretakers of children not in programme; new arrivals.

viii. **Group 2d:** Mothers of children from two to five years old - caretakers of children not in programme; living in Bentiu PoCs for a longer period

ix. **Group 3a:** Fathers of children under five years old - caretakers of children in programme; mix new arrivals and long-lasting resident

x. **Group 4a:** Community leaders (1)

c. Literature review

Secondary data like the KAP survey conducted in May 2015 by CWW & IOM in Bentiu PoCs, CARE Final Report of Bentiu PoC Nutrition survey conducted in August 2014 as well FSNWG & WHO reports on Bentiu PoC in the course of the year was reviewed

Survey Tools

Data was collected using Digital Data Gathering (DDG) devices instead of paper forms, with the exception of the FGDs which used paper forms. The tool used for mortality and anthropometry was the standard Nutrition Cluster approved one for SMART Survey (Annex 3) with additional questions included by the Concern Worldwide team for donor reporting. Data was uploaded daily and checked by the in-country as well as HQ teams for verification and accuracy. Plausibility checks for the data were done on a daily basis to ensure data quality was fine.

Survey Teams

Ten teams (three enumerators per team) supervised by one Concern worldwide staff and 2 consultants were involved in data collection for a period of six days. The teams were trained for five days from 7th to 12th August 2015. Standardization tests were carried out with 10 children during training and pretesting of the questionnaire using DDG devices was done in Sector 3 block 7.

Data Analysis

Data analysis for anthropometry was done using ENA for SMART software, July 9th 2015 version while mortality data was analyzed using April 21st 2015 version. Anthropometric indices were analyzed using ENA for SMART July 9th 2015 version and results reported with exclusion of SMART flags. Data on IYCF, FSL, Vitamin A supplementation and Measles coverage were analyzed using EPI INFO version 3.5.4.

Organization of the Survey

Data collection in Bentiu PoC began on August 13th and took 6 days with 5 days being for anthropometry, mortality, FSL and IYCF data and one day for FGDs. The survey data collection ended on 20th August, 2015.

Case definitions of the variables used in the survey

Anthropometry: For all eligible children (6-59 months) the following information was collected for the anthropometric survey;

> Age:

The primary source for this information was the child's immunization card, birth certificate or birth notification. In the absence of these documents, a local calendar of events was used to estimate the age.

> Child's Sex:

This was recorded as either 'f' for female or 'm' for male.

> Weight:

A digital weighing scale was used to measure the children's weight. The teams on daily basis calibrated the electronic scale using a standard weight to ensure accuracy. Children were weighed with minimal or no clothing and weight recorded to the nearest 0.1kg.

> Height:

A height board was used to measure children above 2 years of age while length was taken for children less than 2 years of age. While ensuring minimal or no movement of the child and maintaining height readings at eye level, the weight was recorded to the nearest 0.1cm.

> MUAC:

Mid Upper Arm Circumference was measured on the left arm at the middle point between the tip of the elbow and the tip shoulder bone while the arm was at right-angle, then followed MUAC measurements of the arm while it was relaxed and hanging by the body's side. MUAC was measured to the nearest mm. In the event of a disability on the left arm or a left-handed child, the right arm was used.

> Bilateral Oedema:

This was assessed by the application of moderate thumb pressure for at least 3 seconds on both feet. If a depression formed upon pressure application, then presence of bilateral oedema was confirmed.

Mortality:

An 88 days recall period was used to collect mortality data. SMART methodology was employed in data entry and calculations of crude and under five mortality rates. The results are expressed per 10,000 persons per day. It is calculated using the following formula:

$$\text{Crude mortality Rate (CMR)} = 10,000/a * f / (b+f/2-e/2+d/2-c/2)$$

Where:

a= Number of recall days (88)

b= Number of current households resident

c = Number of people who joined household

d= Number of people who left household

e= Number of births during recall

f= Number of deaths during recall period

Thresholds are defined as follows:

Crude mortality Rate (CMR):

Alert level: 1/10,000 persons/day

Emergency level: 2/10,000 persons/day

YCF: Infant and young child feeding practices were assessed based on standard WHO recommendations (WHO, 2010) as follows:

Exclusive breastfeeding under 6 months: proportion of infants 0–5 months of age who are fed exclusively with breast milk: (including milk expressed or from a wet nurse, ORS, drops or syrups (vitamins, breastfeeding minerals, medicines).
 Infants 0–5 months of age who received only breast milk during the previous day
 Infants 0–5 months of age

Minimum dietary diversity 6-23 months (breastfed): Proportion of breastfed children 6–23 months of age who received foods from 4 or more food groups.
 Breastfed Children 6–23 months of age who received foods from 4 or more food groups
 Breastfed Children 6–23 months of age

Minimum dietary diversity 6-23 months (non-breastfed): Proportion of non-breastfed children 6–23 months of age who received foods from 4 or more food groups.
 Non-breastfed Children 6–23 months of age who received foods from 4 or more food groups
 Non-breastfed Children 6–23 months of age

Survey Limitations

- Age estimation was done only by use of calendar of events something that was difficult for the teams.
- Relocation process of camp dwellers was on-going at the time of survey and this affected some clusters
- Lengthy format of the individual mortality questionnaire may have compromised quality of some of the data

3.RESULTS

3.1 Anthropometric results (based on WHO Standards 2006):

Prevalence of acute Malnutrition based on Weight for Height

The prevalence of Global Acute Malnutrition (GAM) defined as Weight-for-height Z scores (WHZ<-2 and/or oedema) rate for Bentiu PoCs was 34.1% (95%CI: 31.1 - 37.2), and the severe acute malnutrition (SAM) defined as (WHZ<-3 and/or oedema) rate was 10.5 % (95%CI: 8.5 - 12.9). No oedema case was observed during the assessment (Table 3-1). The findings indicate a critical nutrition situation according to WHO classification.

Table 3-1: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex.

	All n = 619	Boys n = 327	Girls n = 292
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(211) 34.1 % (31.1 - 37.2 95% C.I.)	(111) 33.9 % (29.4 - 38.8 95% C.I.)	(100) 34.2 % (29.5 - 39.3 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(146) 23.6 % (20.6 - 26.9 95% C.I.)	(68) 20.8 % (16.8 - 25.4 95% C.I.)	(78) 26.7 % (22.1 - 31.9 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(65) 10.5 % (8.5 - 12.9 95% C.I.)	(43) 13.1 % (10.1 - 17.0 95% C.I.)	(22) 7.5 % (5.3 - 10.7 95% C.I.)

The prevalence of oedema is 0.0 %

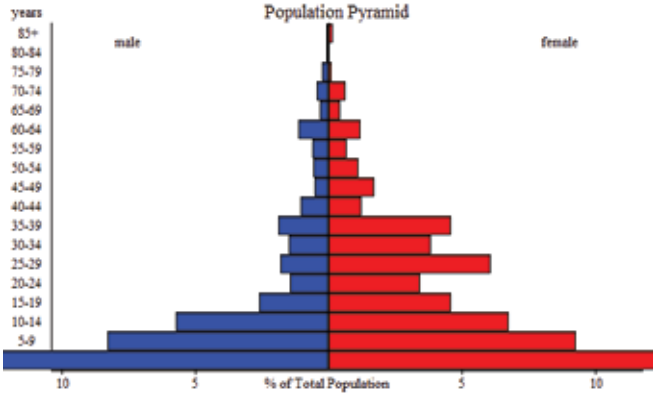


Figure 3 1: Population Pyramid of Bentiu PoC

A higher proportion of the population above 10 years old is female, likely due to higher death and migration rate of men in the household because of the ongoing conflict. The population also appears to be overwhelmingly young, indicating a high dependency ratio (number of unproductive household members: productive household members).

The prevalence of acute malnutrition (WHZ<-2 and/or oedema) by age is presented in Table 3-2 and shows a higher proportion of acutely malnourished among the 6-23 months old children as well as 42-53 and 54-59 months of age categories. The distribution of acute malnutrition is however equal among the younger (6-23 months) and older (24-59 months) age groups (p>0.05).

Table 3-2: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

Age (mo)	Total no.	Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (>= -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	169	19	11.2	36	21.3	114	67.5	0	0.0
24-29	81	4	4.9	12	14.8	65	80.2	0	0.0
30-41	183	16	8.7	40	21.9	127	69.4	0	0.0
42-53	113	14	12.4	33	29.2	66	58.4	0	0.0
54-59	73	12	16.4	25	34.2	36	49.3	0	0.0
Total	619	65	10.5	146	23.6	408	65.9	0	0.0

Table 3-3 shows the distribution of acute malnutrition based on WHZ and oedema. No kwashiorkor case was reported.

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 70 ¹ (11.1 %)	Not malnourished severely No. 562 (88.9 %)



As shown in Table 3-4, the prevalence of global acute malnutrition based on MUAC (<125mm) and/or oedema was 11.2% (95%CI: 8.2-15.0) and of severe acute malnutrition (MUAC<115mm and/or oedema) was 1.7% (95%CI: 0.9-3.3). Table 3-5 shows the distribution of acute malnutrition based on MUAC by age.

Table 3 4: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	All n = 632	Boys n = 334	Girls n = 298
Prevalence of global malnutrition (< 125 mm and/or oedema)	(71) 11.2 % (8.3 - 15.0 95% C.I.)	(32) 9.6 % (6.8 - 13.4 95% C.I.)	(39) 13.1 % (9.1 - 18.4 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(60) 9.5 % (6.8 - 13.1 95% C.I.)	(28) 8.4 % (5.8 - 12.0 95% C.I.)	(32) 10.7 % (7.2 - 15.6 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(11) 1.7 % (0.9 - 3.3 95% C.I.)	(4) 1.2 % (0.4 - 3.2 95% C.I.)	(7) 2.3 % (1.0 - 5.2 95% C.I.)

A higher proportion of the younger children aged 6-23 months were acutely malnourished using MUAC ($p < 0.001$) than the older counterparts (24-59 months) as shown in Table 3-6. This is to be expected as MUAC has a tendency to capture younger children.

Table 3-5: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

Age (mo)	Total no.	Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (>= 125 mm)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	173	5	2.9	40	23.1	128	74.0	0	0.0
24-29	83	0	0.0	5	6.0	78	94.0	0	0.0
30-41	188	5	2.7	9	4.8	174	92.6	0	0.0
42-53	115	1	0.9	5	4.3	109	94.8	0	0.0
54-59	73	0	0.0	1	1.4	72	98.6	0	0.0
Total	632	11	1.7	60	9.5	561	88.8	0	0.0

Prevalence of underweight based on Weight-for-Age Z scores (WAZ)

Underweight prevalence was 24.3 % (20.8 - 28.1 95%) with severe underweight being 7.7 % (5.8 - 10.1 95% C.I.) (Table 3-6). Higher prevalence of underweight was observed among boys (26.4 %) than girls (21.9 %), however, this difference was not statistically significant ($p > 0.05$). A higher proportion of children in the age group (24-59 months) were underweight compared to their older (6-23 months) counterparts even though the difference was not statistically significant ($p > 0.05$). Table 3-7 shows the distribution of underweight by age.

Table 3 6: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 626	Boys n = 329	Girls n = 297
Prevalence of underweight (<-2 z-score)	(152) 24.3 % (20.8 - 28.1 95% C.I.)	(87) 26.4 % (21.4 - 32.2 95% C.I.)	(65) 21.9 % (17.8 - 26.6 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(104) 16.6 % (13.9 - 19.7 95% C.I.)	(59) 17.9 % (13.9 - 22.8 95% C.I.)	(45) 15.2 % (12.3 - 18.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(48) 7.7 % (5.8 - 10.1 95% C.I.)	(28) 8.5 % (6.0 - 12.0 95% C.I.)	(20) 6.7 % (4.2 - 10.7 95% C.I.)

Table 3-7: Prevalence of underweight by age, based on weight-for-age z-scores

Age (mo)	Total no.	Severe underweight (<-3 z-score)		Moderate underweight (>=-3 and <-2 z-score)		Normal (>= -2 z score)		Oedema	
		No.	%	No.	%	No.	%	No.	%
6-23	170	21	12.4	33	19.4	116	68.2	0	0.0
24-29	81	3	3.7	13	16.0	65	80.2	0	0.0
30-41	187	16	8.6	20	10.7	151	80.7	0	0.0
42-53	115	2	1.7	20	17.4	93	80.9	0	0.0
54-59	73	6	8.2	18	24.7	49	67.1	0	0.0
Total	626	48	7.7	104	16.6	474	75.7	0	0.0

Prevalence of Stunting based on Height-for-Age Z scores (HAZ)

Table 3-8: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 586	Boys n = 304	Girls n = 282
Prevalence of stunting (<-2 z-score)	(76) 13.0 % (10.4 - 16.1 95% C.I.)	(38) 12.5 % (9.1 - 16.9 95% C.I.)	(38) 13.5 % (10.0 - 17.9 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(68) 11.6 % (9.1 - 14.7 95% C.I.)	(36) 11.8 % (8.7 - 15.9 95% C.I.)	(32) 11.3 % (8.0 - 15.8 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(8) 1.4 % (0.6 - 3.0 95% C.I.)	(2) 0.7 % (0.2 - 2.7 95% C.I.)	(6) 2.1 % (0.8 - 5.7 95% C.I.)

Prevalence of Stunting based on Height-for-Age Z score (HAZ)

According to Table 3-8 above, overall stunting prevalence of 13.0 % (10.4-16.1) and 1.4% (0.6-3.0) for severe stunting were reported. Slightly higher prevalence was reported among girls (13.5%) than boys (12.5%). However this difference is not statistically significant ($p > 0.05$). While as illustrated in table 3-9 below, significantly high stunting prevalence have been reported in the 6-23 age group (17.9%) compared to the older age groups 9.0 per cent and 7.0 per cent for 42-53 and 54-59 age groups respectively.

Table 3 9: Prevalence of stunting by age based on height-for-age z-scores

Age (mo)	Total no.	Severe stunting (<-3 z-score)		Moderate stunting (>=-3 and <-2 z-score)		Normal (>= -2 z score)	
		No.	%	No.	%	No.	%
6-23	162	1	0.6	28	17.3	133	82.1
24-29	75	1	1.3	10	13.3	64	85.3
30-41	166	3	1.8	18	10.8	145	87.3
42-53	111	2	1.8	8	7.2	101	91.0
54-59	72	1	1.4	4	5.6	67	93.1
Total	586	8	1.4	68	11.6	510	87.0

Mean z-scores, Design Effects and excluded subjects

The design effect for Weight-for-Height (z-score < -2) was at 1.0 as compared to 1.3 for Planning which showed that acute malnutrition prevalence is homogeneous within Bentiu PoC. Number of children excluded from final analysis for Height-for-Age (z-score < -2) according to SMART flags was high compared to Weight-for-Age and Weight-for-Height. This is due to the fact that WHO flag is more inclusive ranging from +6 to -6 z-score as compared to SMART flag ranging from +3 to -3 z-score.

This might be related to challenges in age estimation and the nature of 'long-legged' body types of the Nuer (ethnic group of the surveyed population), Dinka and most pastoralists groups in Eastern Africa. This same effect of body type may also be linked to the large difference prevalence estimates for acute malnutrition by MUAC versus WHZ.

Table 3 10: Mean z-scores, Design Effects and excluded subjects

Indicator	N	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	619	-1.58±1.14	1.00	0	13
Weight-for-Age	626	-1.24±1.13	1.10	0	6
Height-for-Age	586	-0.37±1.36	1.06	0	46

* contains for WHZ and WAZ the children with oedema.

3.2 Mortality results (retrospective over 88 days prior to interview)

The crude mortality rate (CMR) was 1.29 (0.75-2.20) (95% CI) and the under five mortality rate (U5MR) was 0.17 (0.02-1.34) (95% CI). The results were well below the WHO emergency threshold (2/10,000 persons/day for crude mortality rate and 4/10,000 U5 children/day for U5MR) for developing countries.

Table 3 11: Demographic profile of the Respondents for Mortality Data

Demographic variable	Results:
Total number of HHs	438
Total number of HHs with children under five	336
Average household size	5.8
Mid Interval Population Size	2558.5
Number of Clusters	47
Percentage of children under five	27
Birth Rate	0.67
In-migration Rate (Joined)	12.57
Out-migration Rate (Left)	1.6

Most deaths occurred among adults above 65 years rather than among children under five years of age (Table 3-12).

Table 3 12: Mortality rates

		Crude Death Rate (95% CI)	Design Effect
CDR	'Overall	1.29 (0.75-2.20)	2.07
Mortality rate per Gender	'Male	2.56 (1.33-4.89)	2.55
	'Female	0.38 (0.16-0.90)	1
U5MR	'0-4	0.17 (0.02-1.34)	1.03
Mortality rate among other age groups	'5-11	0.76 (0.30-1.92)	1
	'12-17	1.15 (0.35-3.73)	1.02
	'18-49	1.84 (0.72-4.64)	2.81
	'50-64	2.53 (0.55-10.89)	1.68
	'65-120	8.81 (2.61-26.21)	1.74

The location of most deaths was both in and outside current location (34.5%) and commonly arose from violence (41.4%) and as reported by respondents recall (Table 3-13).

Table 3-13: Causes and location of death

Cause of death	n	%	Location of death	n	%
1. Diarrhoea	2	6.9%	1] In current location	10	34.5%
2. Fever	2	6.9%	2] During migration	2	6.9%
3. Measles	0	0	3] In place of last residence	10	34.5%
4. Cough and difficulty in breathing	2	6.9%	4] Other	7	24.1%
5. Malnutrition	0	0			
6. Violence/conflict related	12	41.4%			
7. Other (Please Specify)	11	37.9%			

3.3 Vitamin A supplementation & Measles Coverage

Vitamin A supplementation (VAS) for children 6-59 months was 71.8% while measles coverage stood at 81.9%. The coverage for measles is within the World Health Organization (WHO) recommended coverage of above 80% but that of Vitamin A is below the desired levels of above 80%. VAS was lowest among the children 6-11months compared to children 12-59 months, though the difference is not statistically significant as shown in the Table 3-14.

Table 3 14: VAS & Measles Coverage

Indicator	n	%
Children (9-59 months) immunized against measles, based on card, N=613	352	57.4% (95% CI: 53.4%-61.4%)
Children (9-59 months) immunized against measles, based on recall and card, N=613	502	81.9% (95% CI: 78.6%-84.8%)
Children (6-59 months) who received Vitamin A in the last 6 months, N=632	454	71.8% (95% CI: 68.1%-75.3%)
Children (6-11 months) who received Vitamin A in the last 6 months, N=38	22	57.9% (95% CI: 40.8%-73.7%)
Children (12-59 months) who received Vitamin A in the last 6 months, N=594	432	72.7% (95% CI: 68.9%-76.2%)

Roughly 20% of children in the survey were reportedly enrolled in either the OTP or Targeted Supplementary Feeding Programme as shown in Table 3-15

Table 3 15: Percent of Children Under-Five Reportedly Enrolled in a Feeding Programme

Type of programme	N	Percent
None	498	79%
Supplementary Feeding	77	12%
Outpatient Therapeutic Feeding	56	9%
Stabilisation Centre (inpatient therapeutic)	1	0%
Total	632	100%

3.4 Infant and Young Child Feeding

IYCF indicators were collected in all the 438 Households with children 0-23 months that the survey was conducted. The largest sample size at the planning stage which was the one for mortality at 470 HHs was deemed to be adequate to cover all IYCF indicators at the planning stage.

Exclusive Breastfeeding Practices

According to the survey, the prevalence of exclusive breastfeeding is very low at 8.7% (95% CI: 3.3%-18.0%). It should be noted however, that the sample size for this indicator was very small. As is reflected in the wide confidence interval

there is significant difference between the rates of exclusive breastfeeding reported in this survey and the estimated prevalence of 83.3 % (95% CI: 73.6-90.6) found in the previous CARE SMART survey in August 2014 . The reasons for this difference are difficult to determine. One possible explanation is that the current CWW survey included probing questions regarding what the child 0-5 months ate the previous day, specifically asking if the child had consumed formula, water, sugar water, milk, yogurt, porridge, other liquids. The CARE survey did not ask these additional questions (it did in relation to whether the child was given any of those before being put to the breast just after birth but not in relation to what the child 0-5 months ate yesterday). Of the other foods given to children 0-5 months water, milk and formula were the most common; see Figure 3-2.

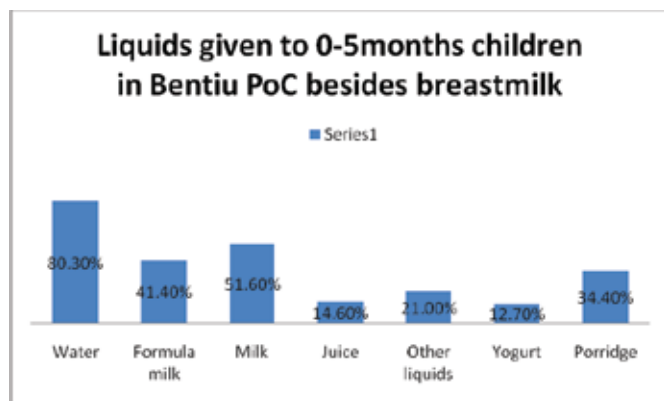


Figure 3 2: Mixed feeding in Children 0-5months in Bentiu PoC

The qualitative data from the focus group discussions showed that an overwhelming majority of the mothers are not able to practice EBF/BF as much as they would want. The reported reasons for this include “mothers don’t eat enough food to produce enough breast milk; they are too busy most of the day time either collecting firewood or doing other activities to get an income or supplement their food supplies from food aid”.

Minimum Dietary Diversity

Minimum dietary diversity indicators have not improved from the findings of the previous survey. There is a slight improvement though the change is not significant as shown in Table 3-16.

Table 3 16: IYCF Indicators Summary

Indicator	Age group	N	Bentiu PoC SMART survey 2015- CWW	Bentiu PoC SMART Survey-2014- CARE	
Minimum dietary diversity	Proportion of breastfeeding children who fed from 4 or more FG (out of 7FG), N=82	6-23 months	23	28.0% (95% CI: 18.7%-39.1%)	13.8% (95% CI: 6.1% - 25.4%)
	Proportion of non-breastfeeding children who fed from 4 or more FG (out of 7FG), N=6	6-23 months	3	50.0% (95% CI: 11.8%-88.2%)	16.4% (95% CI: 8.5%-27.5%)
Exclusive breast feeding	(Proportion of children who received only breast milk), N=69	0-5 months	6	8.7% (95% CI: 3.3%-18.0%)	83.3% (95% CI: 73.6-90.6)

Figure 3 4: Main source of income for the HHs in Bentiu PoC in the last 30 days

Most of the children 0-6months were Mixed fed as early as 0 months of age as shown in the table 3-17.

Table 3 17: Ages at which Mix feeding is done

age category	No. of Mixed fed children	No. of EBF children
0-1month	44	0
1-2months	1	0
2-3month	6	2
3-4months	2	0
4-5months	4	0
5-5.9months	6	4
Total	63	6

From FGDs the respondents mentioned that before the conflict, they were feeding their children with a variety of foods (meat, milk, fish, green vegetables and eggs) which were not easy to come by in the camp settings where majority rely on food aid. The most common food consumed the previous day was grains and tubers, followed by meat/poultry/fish, and dairy products and fruits, vegetables, legumes and nuts to a lesser extent; eggs were consumed the least. See Figure 3-3. Further, 17% of children had reportedly consumed CSB the previous day and 7% had consumed RUTF or RUSF.

Figure 3 3: Types of foods eaten the previous day by 6-23 months

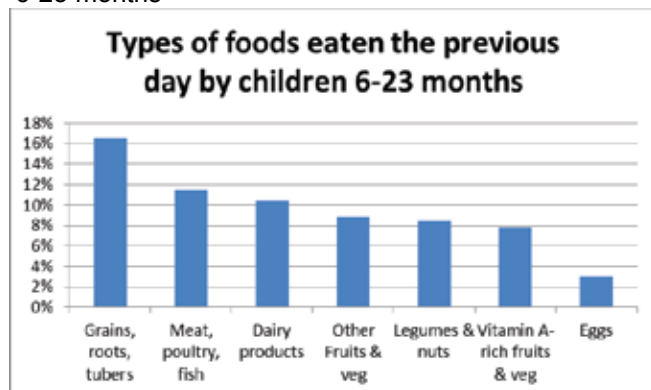


Figure 3 3: Types of foods eaten the previous day by 6-23 months

3.5 Food Security and Livelihoods

Income source for households in Bentiu PoC in the last 30 days

The main source of income for most HHs was either sale of natural resources (firewood, charcoal and grass) - 43.8% or sale of food aid (36.8%) as shown in Figure 3-4

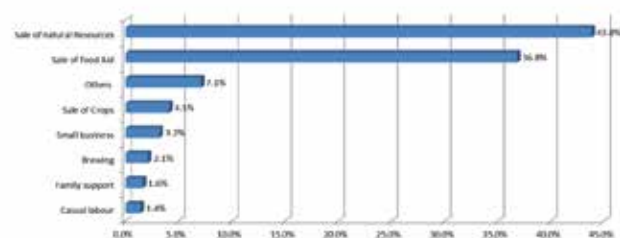


Figure 3 4: Main source of income for the HHs in Bentiu PoC in the last 30 days

Food purchases in the HHs in the last 30days

The most commonly purchased commodity in the last 30 days by majority of the HHs in Bentiu PoC was meat. This was followed by milk, grinding of cereals and rice as shown in the table 3-18. This was an indication of the

type of food commodities available in the market within access to the surveyed population of Bentiu PoC.

Table 3 18: Food purchases in the HHs in last 30days

Food Purchase	N	%	95% CI:
Meat	263	60%	55.3%-64.6%
Rice	116	26.5%	22.5%-30.9%
Milk	205	46.8%	42.1%-51.6%
Grinding of cereals	167	38.1%	33.6%-42.9%
Others (fish, salt, okra e.t.c.)	16	3.7%	2.2%-6.0%

Source of Food for HHs in Bentiu PoC

The main source of food was food aid (57.8%), which was followed by purchases, borrowing and gathering. This was confirmed by the FGDs where most of the respondents reported receiving food ration from WFP.

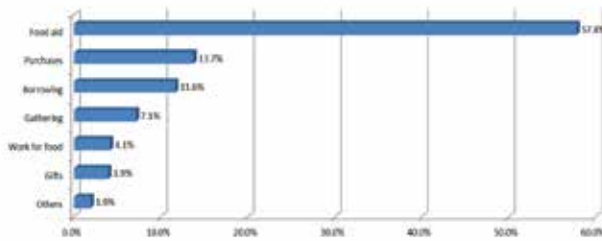


Figure 3 5: Main Source of Food for Bentiu PoC HHs

Food shortage situation and coping strategies in the last seven days

The quantitative SMART survey found that majority of the households at 68.5% (95% CI: 63.9 – 72.8%) had faced a food shortage in the last 7 days (Figure 3- 6). Most of those households reported to borrow from kin (62.3%) when there was shortage and 28.3 % reported relying on less preferred food as shown in Figure 3-7.

From the FGDs, it was reported that food aid from WFP is distributed to the HHs at varied intervals and most often is not enough (supplies usually last less than 15 days for majority of respondents). Consequently, there is inter-household sharing of the ration whenever neighbors /relatives don't have enough. Other coping strategies mentioned were: relying on less preferred food and restricting food to adults in favour of younger members of the household.

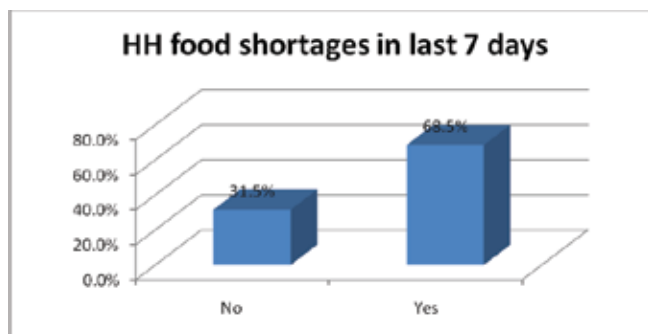


Figure 3 6: HH Food shortages in the last seven days

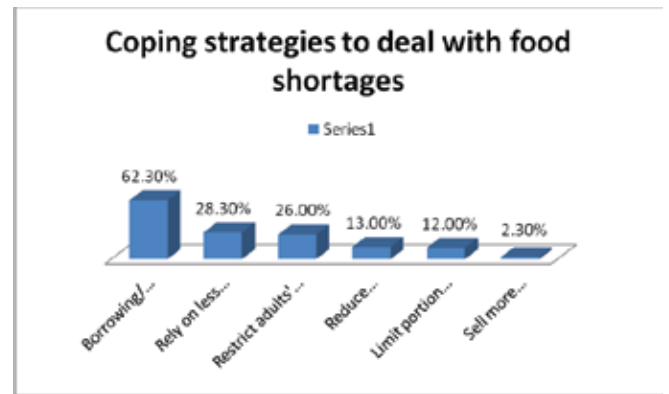


Figure 3 7: Coping strategies to deal with food insecurity in the last 7 days

Food cultivation and ownership of livestock

Only 13% (95% CI: 10.1-16.6%) of the respondents reported having cultivated in the previous season spanning twelve months before the survey (Figure 3-8). In the survey only a mere 3.0% (95% CI: 1.7 – 5.2%) of the respondents reported owning livestock.

Data from the FGDs indicated that before the crisis, most of the camp dwellers were agro-pastoralists who grew crops such as maize, sorghum and millet, besides rearing cattle, sheep, goats and chicken as well as fishing.

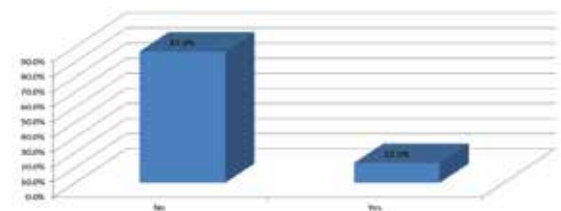


Figure 3 8: Food cultivation

FSL related Shocks Currently Experienced by households in Bentiu PoC

The majority of households reported human sickness (72.1%) and insecurity (70.5) as the main shocks they experienced.

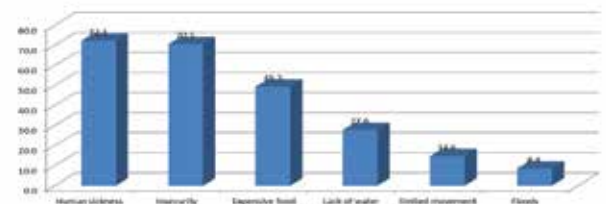


Figure 3 9: FSL related Shocks Experienced by the HHs in Bentiu PoC

3.6 Other findings from Focus Group Discussions

Duration of stay in PoC. The respondents reported that they had moved to the PoC as a result of conflict and were mostly from Rubkona county and other neighboring counties such as Guit, Panyijar, Koch, Leer, among others. They had been staying in the PoC for different periods of time ranging from 0 to 20 months. Their period of residence tallies with quantitative SMART survey data which showed that 22.4% of people in the camp had been residing in PoC for three months or less (Figure 3-10) and can be termed as new arrivals.



Figure 3 10: Number of months of residence in Bentiu PoC from the campers

The prevalence of acute malnutrition according to both MUAC and WHZ is higher by a statistically significant margin in children from households that have been in the camp for three months or less as compared to those who have been in the camp longer. (Table 3-19).

Table 3 19: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by months child's household has lived in the camp

	Children from households residing in the camp for 3 or fewer months n = 144	Children from households residing in the camp for more than 3 months n = 488
Prevalence of global acute malnutrition (<-2 z-score and/or oedema)	(68) 47.2 % (39.4 – 55.1% 95% C.I.)	(143) 29.3 % (25.6 – 33.0% 95% C.I.)
Prevalence of global acute malnutrition according to MUAC	(23) 15.9 % (8.5 – 23.5% 95% C.I.)	(48) 9.8 % (6.7 – 12.9% 95% C.I.)

Use and sharing of RUTF. Most respondents also reported to be receiving “Nyalop” RUSF /RUTF and Soap for malnourished children. Majority also responded they use the ration as follows:

- Share RUSF/RUTF because of culture, lack of enough food, or nice(sweet) taste
- Sell because of need for money (no other source of income, to buy other Foods in HH like milk, meat, etc or meet other needs (buy medicine and clothes)

Separate FGDs of old and new residents with children in the programme showed similar behavior of participants with regard to following prescription of RUTF consumption. They acknowledged it was improving the health of their malnourished children but found it tough to religiously follow the prescription for reasons such as: certain times their children were developing diarrhea when they consumed RUTF; there were other children in the HH and all ration could not be fed only to the malnourished child while ignoring other children; competing needs and limited resources to cater for other needs drove some caretakers to sell part of the RUTF to buy what was not available in the HH.

The sharing and selling had its consequences on performance indicators in form of relapses and non-recovery as some old residents reported that their children had been in and out of CMAM programmes several times since they joined the camp. Although this was not discussed, longer length of stays in the feeding programme may actually be unfavourable as it means a ration is coming into the household for a longer time.

3.7 Review of other literature & further analysis of factors associated with malnutrition

WASH and illness indicators from a Knowledge Attitudes and Practice (KAP) survey in Bentiu in May 2015.

A representative, cross sectional survey conducted in the Bentiu PoC (the ‘old’ site: PoC 1,2,3,4,5 & 6) in May 2015 by CWW and IOM provides background on the broader health and WASH context. The overwhelming majority of households (99%) reported getting their water for household use from the tap stands (boreholes), while roughly half of all households (47%) reported changing to using rainwater collected from the roof as their main source during the wet season, with the bulk of the remainder (47%) continuing to rely on taps during the rainy season. Households reported collecting on average just under 10 litres per day at the time of the survey (which was during the wet season). This is roughly corroborated by the estimated output rate of the six boreholes in the camp at the time of the survey. This is below the Sphere minimum standard of 15 litres per person per day for basic water needs.

The vast majority of households (88%) reported waiting for more than 30 minutes at the tap stands during the dry season - this reduced to 55% of households during the wet season.

Waiting times were cited as a major reason for not accessing sufficient water from the taps. A lack of sufficient transport and storage containers was also cited as a major reason. The majority (60%) of water storage containers were observed to be ‘clean and covered’, but this is obviously a subjective assessment. The provision of water is clearly below minimum standards largely as a result of the continuous and unforeseen influx of IDPs. More could likely also be done to improve hygiene along the water chain.

The overwhelming majority (90%) of respondents in the May 2015 KAP survey reported using communal latrines when defecating and 67% reported they used another latrine nearby when a latrine was full. Roughly 78% of children also reportedly used latrines – either the child latrines or the general communal latrines. The reach of hygiene promotion messaging appears high in the camp – 84% of respondents said they had received hygiene messages in the month prior to the KAP survey. The leading causes of diarrhea mentioned (by 50-60% of respondents) were flies and consuming unsafe water or contaminated food, while only 20% mentioned not washing hands with soap after latrine use. A larger percent (35%) mentioned hand washing as a means of preventing cholera but only 14.6% mentioned washing hands as a means of preventing diarrhea. The practice of handwashing at critical times appears mixed: only 40% mentioned doing so after going to the toilet and only 9.7% reported doing so after handling a child’s faeces; a larger portion reported doing so before eating (68%) and before preparing food (62%). There was a fair level (40-50%) recognition of cholera symptoms (white, rice-water-like stools and vomiting), but mixed awareness on prevention methods. Only 53% of households were observed to have soap on the day of the survey, although 90% said they wash their hands with soap (as opposed to water alone, water and ash, etc.).

Children are very often sick – 71% of children under-two were reportedly sick during the two weeks prior to the survey. The most common illness was diarrhea (45% of children), followed by malaria (33%) and vomiting. The overwhelming majority of the sick children (93%) were taken for treatment and almost all of those were taken to a health centre. Mothers appeared to have good knowledge of the signs of acute malnutrition and 67% said they would take a child with those signs to a nutrition centre (and the remainder would bring them to a health centre). The main reported barrier to accessing care was waiting time at the health facility or nutrition centre.

Women interviewed in the KAP survey showed awareness of some key practices to keep women ‘strong during pregnancy’. Visiting a health centre (60%); eating more food than usual (44%); resting (30%); and taking tablets provided at the clinic (14%) were mentioned. Regarding birth spacing, 92% of women stated they believed women should wait at least two years after having a baby before having another. Their main reason given was to allow the young baby to get enough milk (78%). Finally, 79% of women interviewed said they believed exclusive breastfeeding was important. As seen from the CWW SMART survey, actual practice of exclusive breastfeeding appears to be dramatically lower (8%).

According to reports from WHO and FSNWG on Bentiu PoC, malnutrition, TB HIV AIDS, acute watery diarrhea, and malaria are the most frequent causes of death (Figure 3-11). Bentiu PoC had reported the most death cases (43%) among children less than five years in all IDPS sites in South Sudan as from 1st January to 9th August 2015. Other reports from WHO indicate Hepatitis E Virus (HEV) is also a major public health problem among Bentiu PoC IDPs where there were 115 HEV cases including four deaths (CFR 3.47%). The sustained community transmission of HEV in Bentiu since the beginning of 2015 is attributed to congestion, sub-optimal hygiene and sanitation standards as well as inadequate access to safe drinking water.

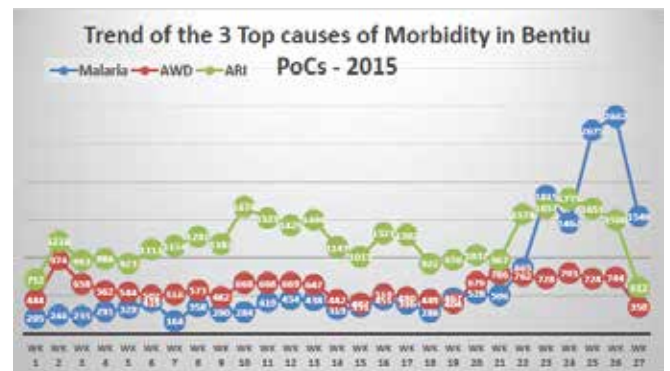


Figure 3 11: Trends of the 3 top causes of morbidity in Bentiu PoC according to FSNWG

4. DISCUSSION

Nutrition Status

The current levels of acute malnutrition according to weight-for-height: Global Acute Malnutrition (GAM) rate of 34.1% (31.1-37.2 95% CI) and of Severe Acute Malnutrition (SAM) rate of 10.5% (8.5-12.9 95% CI) indicate a very critical nutrition situation as per the IPC nutrition classification. This prevalence has also significantly exceeded the 15% threshold for GAM and 4% for SAM as per WHO threshold used to declare a humanitarian emergency. There has been a significant increase in the GAM prevalence since the same time last year when a CARE survey in Bentiu PoC found a GAM prevalence of 20.8% (95% CI: 16.4 – 25.9%). While the increase in SAM from the CARE estimate of 4.9% (95% CI: 3.0 – 7.9%) is statistically significant, it also suggest a very worrying trend. Much of this increase is likely due to the worsening violence and humanitarian emergency that has escalated in the surrounding counties over the past year. This significant deterioration depicts a dire humanitarian situation, and immediate action is needed to prevent and address malnutrition in the PoC.

As illustrated in Fig 4-1 below, there is more than 60% increase in GAM prevalence and doubling of SAM prevalence, further demonstrating the severity of the situation. These estimates indicate that 1 in every 3 children assessed in the PoC site in Bentiu was found to be acutely malnourished and of which 1 in every 10 had severe acute malnutrition and therefore at increased risk of severe morbidity or even death.

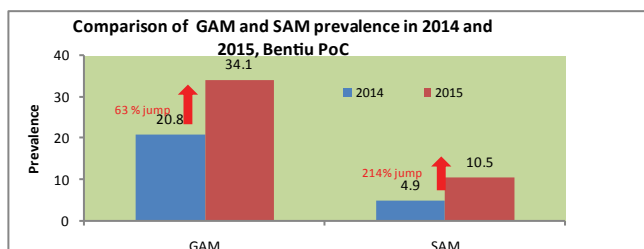


Figure 4 1: Comparison of GAM and SAM prevalence in 2014 and 2015, Bentiu PoC

Mortality rates.

Interestingly, mortality rates were not above WHO emergency thresholds, with a crude death rates of 1.29 (0.75-2.20) and under-five death rate of 0.17 (0.02-1.34). Other reports in the camp however, suggest that mortality is higher, and it is possible that this survey did not capture the full extent of mortality due to the new and longer roster format of the mortality questionnaire. These figures were similar to those found by CARE in the camp in August 2014, but given the deterioration of the situation, other sources of mortality rates including the MSF clinic data should be consulted.

New arrivals most at risk.

Further statistical analysis suggests that new arrivals – defined by this survey as households that have been living in the camp for 3 months or less - are at a higher risk of acute malnutrition by both MUAC and WHZ than those that have been living in the camp for longer. Focus on providing these new arrivals with immediate services and screening should be a priority for all agencies working in Bentiu.

Caring practices.

The survey registered an extremely low rate of exclusive breastfeeding of 8.7%. This suggests that 9 of 10 children under the age of 6 months are not exclusively breastfed, although the sample size was small, so the precision of this estimate is low (95% CI: 3.3%-18.0%). As a result, this very young age-group is at increased risk of diarrheal infections, acute malnutrition and even death. Exclusive breastfeeding remains one of the most cost effective 'interventions' to reduce under-five mortality. The main reasons for this low rate cited by mothers in the focus groups were women feeling they didn't have enough milk due to their own poor diet and mothers being away from their infants due to high workloads. This should be investigated further and a strategy developed to improve this very low rate.

Diet diversity among children remains low, with roughly 50-70% of children under-two (6-23 months) not consuming the minimum diet diversity, which is eating from 4 or more of 7 standard food categories. Some of this may be improved through behavior change communication, but a large part is likely due to lack of household access to a diversity of foods. The general ration should be reviewed against the foods children reportedly consumed to see where it is deficient and how access to e.g. milk or fresh foods could be promoted.

While this survey did not measure other caring practices, the May 2015 KAP survey carried out in Bentiu (see above section) assessed a number of them. Handwashing knowledge and practice, particularly after defecation, appears low. Only 40% of households reported washing hands after defecating and only 12% after handling a child's faeces. Improved messaging on these critical times for handwashing should be prioritized and barriers to this practice (e.g. lack of hand washing stations/soap outside latrines) should also be explored, potentially through a barrier analysis. Despite regular soap distributions taking place, only half of households were observed to have soap during the KAP survey. Latrine use looks quite high but roughly 10% of adults and 22% of children are still defecating in the open. In such a crowded setting, this remains a major public health concern. Improved management of latrines and more intensive messaging regarding the importance of their use, particularly for children, should be undertaken.

A considerable proportion of women stated the importance of visiting a clinic while pregnant and taking additional food and vitamins. The majority also said they believed it was important to wait until a child was two years old before becoming pregnant again. The degree to which mothers are actually able to practice these behaviors, however, should be further investigated

Access to health care and clean water.

While this survey found a good level of coverage for vitamin A supplementation and measles vaccination, the need to enhance and expand coverage for health programmes is paramount given the influx of displaced persons into the camps. Results of the May 2015 KAP suggest a high proportion (71%) of children were sick particularly from diarrhoea and malaria. The vast majority of children were brought for treatment at a health facility, but waiting times were reported to be long. Recognition of the signs of malnutrition were relatively high and most mothers reported they would bring a malnourished child to the nutrition centre or health facility. More investigation of the degree to which this is actually practiced i.e. through a more systematic coverage assessment could be warranted.

Food insecurity

Food insecurity is widespread throughout the camp. Despite a general food ration being distributed, the majority (67%) of households reported not having enough food during the past seven days. The findings show that the otherwise vibrant community of cultivators have been reduced to being food-aid dependent. PoC residents must rely heavily on the sale of natural resources such as firewood, charcoal and grass (43.8%) and sale of food aid (36.8%) to generate income to meet household needs. Only 13 per cent of respondents reported to have cultivated in the previous season. The most common strategy to cope with food stress was borrowing from kin (62.3%).

Gender

Gender does not appear to affect a child's vulnerability to acute malnutrition in Bentiu. However, focus on severe acute malnutrition indicate that the proportion of boys (13.1%) affected by severe acute malnutrition were nearly double that of girls (7.5%). Nevertheless, this does not mean that the intervention should be inclined to target boys more but it is just a statistical note and therefore both genders should be given equal attention when mainstreaming any rehabilitation programmes.

The prevalence of underweight (24.3%) and stunting (13.0%) malnutrition are relatively low among the under-five population in Bentiu PoC compared to other countries in sub-Saharan Africa. These levels are consistent with the trends seen in many parts of South Sudan where acute malnutrition has been showing critical levels of malnutrition alongside much less critical levels of chronic malnutrition. However, due to the debilitating effect stunting can have on the cognitive development of children, a mix of short-term and long-term interventions to prevent undernutrition in all its forms are needed.

5. RECOMMENDATIONS

In addition to taking measures to stop the conflict that is displacing millions of people in South Sudan, the following are recommended for immediate action through discussions with all the relevant actors in Bentiu camp:

- Continue delivery of quality services for the management of severe and moderate acute malnutrition for children (6-59 months). There should be heightened attention to systematically screen new arrivals and refer and follow up any cases to ensure they are immediately admitted.

- Develop and implement a coordinated PoC-wide behavior change strategy, focusing on IYCF, health seeking and hygiene. Agencies in the camp must come together to agree on a coordinated set of messages and simple counselling materials. Agencies must also harmonise the work of outreach workers and volunteers; ensuring coverage areas of different community agents within the camp are complementary and messages and support services delivered are the same. Mass media messaging, group counselling and one-on-one counselling at key contact points and via household visits should be harmonised. WFP is currently expanding its pool of community volunteers – this is an opportunity for harmonization of messaging and coverage.

- Further investigate the low level (8.7%) of exclusive breastfeeding among children 0-5 month in the camp.

A Barrier Analysis could be undertaken on this behaviour so appropriate interventions (e.g. to reduce the time mothers are separated from their young children) can be identified. Increasing this practice is critical to preventing undernutrition and death in the camp context and findings should feed into the coordinated behaviour change strategy recommended above.

• Increase access to water, but perhaps more importantly, investigate the quality of water along the water chain and promote practical messages to improve hygiene of water transport and storage.

• Better assess coverage of the TSFP and OTP and barriers to accessing both. This could potentially be done via a systematic mass screening, which is currently being conducted by partners in the camp. However, data collection and recording would need to be strengthened and well supervised if this was to serve as an unbiased and accurate estimate of programme coverage. There should be qualitative investigations to understand barriers and boosters to accessing services of acute malnutrition. This survey estimates that roughly 63% of children with SAM according to MUAC (32% according to WHZ) are being covered currently by the OTP and 30% of children with MAM according to MUAC (19% according to WHZ) are in the SFP. This suggests coverage levels are modest (and generally better for MUAC), but a more appropriate assessment tool is required.

• Continue the general food distribution in the PoC to bolster the household food security of all displaced families. Provide particular focus on registering and promptly delivering the ration to new arrivals as they seem most at risk. Review the size and composition of the general food ration as roughly 68% of households say they had experienced food shortages in the last 7 days and the diet diversity of children is low.

• Consider introducing a blanket SFP programme to address the poor diet diversity and acute malnutrition among children. Currently, it appears new arrivals are provided a supplementary ration, but the regularity and duration of this may need to be reviewed.

• Continue to actively vaccinate children for measles and provide vitamin A supplementation – amplify focus on the new arrivals to ensure coverage of both of 85% or more.

• Consider scaling up cash for work programmes to provide more income to households, particularly to purchase foods such as milk to complement the food aid they receive.

• Further investigate under-five mortality data from other sources to triangulate the low levels found in the survey. Ensure more time and piloted training on the longer mortality survey questionnaire or revert to the more concise previous version for difficult survey contexts such as South Sudan.

6. APPENDICES

Appendix 1: Plausibility report

Plausibility check for: [BentiuPOC_082015_CWWSSD.bak.as](#)

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

(If it is not mentioned, flagged data is included in the

evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Appendix 2: List of Assigned Clusters for Bentiu PoC

(The numbering of the selected clusters was for 3 digits for the DDG devices: started at 101 and stopped at 147 for the required 47 clusters. This numbering does not influence the results at all and was done for technical reasons).

State	County	Sector/POC	Block/sector	Population size	Assigned Cluster	Recorded clusters Numbers
Unity	Rubkona	SECTOR 1	Block1	1070	1	101
Unity	Rubkona		Block2	1070	2	102
Unity	Rubkona		Block3	520		
Unity	Rubkona		Block5	890	3	103
Unity	Rubkona		Block6	520		
Unity	Rubkona		Block8	1070	4	104
Unity	Rubkona		Block9	520	5	105
Unity	Rubkona	SECTOR 2	Block2	945		
Unity	Rubkona		Block4	945	6	106
Unity	Rubkona	SECTOR 4	Block1	1070	7	107
Unity	Rubkona		Block2	1070	8	108
Unity	Rubkona		Block3	780		
Unity	Rubkona		Block4	1070	9	109
Unity	Rubkona		Block5	1070	10	110
Unity	Rubkona		Block6	505		
Unity	Rubkona		Block7	620	11	111
Unity	Rubkona		Block8	1070		
Unity	Rubkona		Block9	1070	12	112
Unity	Rubkona		Block10	1045	13	113
Unity	Rubkona		Block11	745	14	114
Unity	Rubkona		Block12	1070		
Unity	Rubkona	SECTOR 3	Block1	1070	15	115
Unity	Rubkona		Block2	1070	RC	
Unity	Rubkona		Block3	1070	16	116
Unity	Rubkona		Block4	1070	17	117
Unity	Rubkona		Block5	1070		
Unity	Rubkona		Block6	595	18	118
Unity	Rubkona		Block7	345		
Unity	Rubkona		Block8	1060	19	119
Unity	Rubkona		Block9	1070	20	120
Unity	Rubkona		Block10	955		
Unity	Rubkona		Block11	1070	21	121
Unity	Rubkona		Block12	970	22	122
Unity	Rubkona		Block13	1045	RC	
Unity	Rubkona		Block14	1045	23	123
Unity	Rubkona		Block15	290		
Unity	Rubkona		Block16	1070	24	124
Unity	Rubkona	SECTOR 5	Block1	1070		
Unity	Rubkona		Block2	1070	25	125
Unity	Rubkona		Block3	1070	26	126
Unity	Rubkona		Block4	1070	27	127
Unity	Rubkona		Block5	1070	28	128
Unity	Rubkona		Block6	580		
Unity	Rubkona		Block7	325		
Unity	Rubkona		Block8	955	29	129
Unity	Rubkona		Block9	1310	30	130
Unity	Rubkona		Block10	1235	RC	
Unity	Rubkona		Block11	950	31	131
Unity	Rubkona		Block12	1310	32	132
Unity	Rubkona		Block13	830		
Unity	Rubkona		Block14	410		
Unity	Rubkona		Block 15	1060	33	133
Unity	Rubkona		Block16	780	34	134
Unity	Rubkona	POC 5	Sector A	2928	RC,35	135
Unity	Rubkona		Sector B	1842		136
Unity	Rubkona		Sector C	1844	RC,37	137
Unity	Rubkona		Sector D	750		
Unity	Rubkona		Sector E	220		
Unity	Rubkona	POC 1	Sector A	1704	38,39	138,139
Unity	Rubkona		Sector B	1081	40	140
Unity	Rubkona		Sector C	656		
Unity	Rubkona	POC 2	Sector D	1636	41	141
Unity	Rubkona		Sector A	1005	42	142
Unity	Rubkona		Sector B	926	43	143
Unity	Rubkona		Sector C	454		
Unity	Rubkona	POC 3	Sector D	513		
Unity	Rubkona		Sector A	966	44	144
Unity	Rubkona		Sector B	1421	45	145
Unity	Rubkona		Sector C	1110	46	146
Unity	Rubkona	POC 6	Sector D	1256	47	147
Unity	Rubkona		POC 6	576		

