Report of Nutrition and Mortality SMART survey in Bor PoC of South Sudan during October 10th to 14th, 2016

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Funded by:

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Acronyms

ACTED:	Agency for Technical Corporation and Development
CBD:	Community Based Distributers
CDR:	Crude Death Rate
CHD:	County Health Department
CI:	Confidence Interval
CMAM:	Community Management of Acute Malnutrition
EES:	Eastern Equatoria State
ENA:	Emergency Nutrition Assessment
EPI:	Expanded Programme on Immunization
GAM:	Global Acute Malnutrition
HH:	Household
ID:	Index of Dispersion
IDP:	Internally Displaced Person
LLITN:	Long Lasting Insecticide Treated Net
IYCF:	Infant and Young Child Feeding
MAD:	Minimum Acceptable Diet
MDD:	Minimum Dietary Diversity
MoH:	Ministry of Health
MMF:	Minimum Meal Frequency
MUAC:	Mid-Upper Arm Circumference
OTP:	Outpatient Therapeutic Programme
PHCC:	Primary Health Care Centre
PHCU:	Primary Health Care Unit
PoC:	Protection of Civilians
PPS:	Probability Proportionate to Size
SAM:	Severe Acute Malnutrition
SC:	Stabilization Centre
SCI:	Save the Children International
SD:	Standard Deviation
SMART:	Standardized Monitoring and Assessment of Relief and Transitions
SMoH:	State Ministry of Health
SPLM:	Sudan People's Liberation Movement
ST:	Standardization Test
UNICEF:	United Nations Children Education Fund
UNMISS:	United Nations Mission in South Sudan
U5MR:	Under 5 Mortality Rate
WASH:	Water Sanitation and Hygiene
WHO:	World Health Organization
WHZ:	Weight for Height z-score

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Executive Summary

Bor county is one of the 11 counties that make up Jonglei State in the Republic of South Sudan and it has an estimated population of 221,106[1] (Population projection of 281,210)[2], estimated area of 122,479Km^2, and it is subdivided into six payams namely; Anyidi, Baidit, Bor Town, Jalle, Kolnyang and Makuach.

Bor PoC site was established in December 2013 following the outbreaks of violance which forced people (IDPs) into the UNMISS base for refuge. The PoC site was then relocated to Bor new site in September 2014. With reference to the recent exhaustive SMART survey conducted by SCI, 804 households (2,489.5 ≈ 2,490 individuals)[3] were assessed in the PoC.

Currently, SCI is supporting 1 SC and 1 OTP site in Bor PoC. The resent Post-Harvest survey conducted by SCI in December 2015 in Bor POC showed that prevalence of GAM was 8.0%and SAM was 1.1%which is considered poor according to WHO standards[4].

The main objective of this survey was to determine the nutrition status of population in Bor POC.

Between October 10th and 14th, 2016, a total of 544 HHs in Bor PoC were assessed. This preliminary report contains analysis of all indicators assessed in the survey (see 1.1 Survey Objectives) nutrition anthropometric indicators assessed among children 6-59 months.

[1] South Sudan National Bureau of Statistics/United Nations (web), 2008

[2] Between 2008 and 2014, the population of South Sudan increased by the immigration of about 1.95 million returnees. In addition, the 2014 population includes about 343,800 refugees.

[3] Bor PoC Post-Harvest SMART survey, December 2015 by SCI

[4] WHO cutoff points for wasting (<-2 z-scores in populations: <5% acceptable/normal, 5-9% poor/medium, 10-14% serious/high and ≥15% critical/very high)

Summary of key anthropometric and mortality findings:

Anthropometry

- 325 children were assessed
- GAM was 14.4% and SAM 1.3% based on Weight-for-Height and the presence of bilateral oedema.
- No cases of oedema were identified.
- Stunting was 9.8% based on calculated SD of 1
- Total underweight was 10.8 % and severe underweight was 1.5%

Mortality

- Crude death rate 0.54
- Under 5 death rate was 1.10

Summary findings have excluded extreme values (SMART Flags— +/- 3SD from the observed mean).

The GAM prevalence in Bor PoC of 14.4% was below the emergency threshold of 15%. Whereas SAM prevalence was 1.3%. The nutrition situation of the PoC was therefore classified as “Serious” with the presence of high under five morbidity rates and low deworming rate.

Recommendations

- Continue with the nutrition intervention in Bor PoC with close monitoring of the nutrition activities as the situation might deteriorate
- SCI should consider immediate initiation of TSFP to prevent relapse. The TSFP be linked with OTP to follow up severely malnourished children discharged from the OTP for treatment
- Morbidity rate in children aged 6-59 months is high with fever being the highly suffered illness. Thus there is need to improve on WASH with much emphasis on application of detergents into the water logged trenches that tend to be the breeding places for mosquitoes.
- Deworming coverage needs to be improved.

1.0 Introduction

Bor county is one of the 11 counties that make up Jonglei State in the Republic of South Sudan and it has an estimated population of 221,106[5] (Population projection of 281,210)[6], estimated area of 122,479Km^2, and it is subdivided into six payams namely; Anyidi, Baidit, Bor Town, Jalle, Kolnyang and Makuach. Bor county borders EES to the South East, CE to the South, LS to the West, Twich County to North and Pibor County to the East. Because of the low-lying nature and heavy clay soil, the county is prone to flooding during the rainy season.

Bor County is predominantly inhabited by the Nilotic group of the Dinka tribe who pratice pastoralism. The mix of available resources has been exploited through main livelihood activities of farming (crop production, livestock rearing), fishing especially in Bor Town, and natural resources extraction.

Bor PoC site was established in December 2013 following the outbreaks of violance which forced people (IDPs) into the UNMISS base for refuge. The PoC site was then relocated to Bor new site in September 2014. With reference to recent exhaustive SMART survey conducted by SCI, 804 households (2,489.5 ≈ 2,490 individuals)[7] were assessed in the PoC.

Currently, SCI is supporting 1 SC and 1 OTP sites in Bor PoC. The resent Post-Harvest survey conducted by SCI in December 2015 in Bor POC showed that prevalence of GAM was 8.0% and SAM was 1.1% which is considered poor according to WHO standards[8].

[5] South Sudan National Bureau of Statistics/United Nations (web), 2008
[6] Between 2008 and 2014, the population of South Sudan increased by the immigration of about 1.95 million returnees. In addition, the 2014 population includes about 343,800 refugees.
[7] Bor PoC Post-Harvest SMART survey December 2015 by SCI
[8] WHO cutoff points for wasting (<-2 z-scores in populations: <5% acceptable/normal, 5-9% poor/medium, 10-14% serious/high and ≥15% critical/very high)

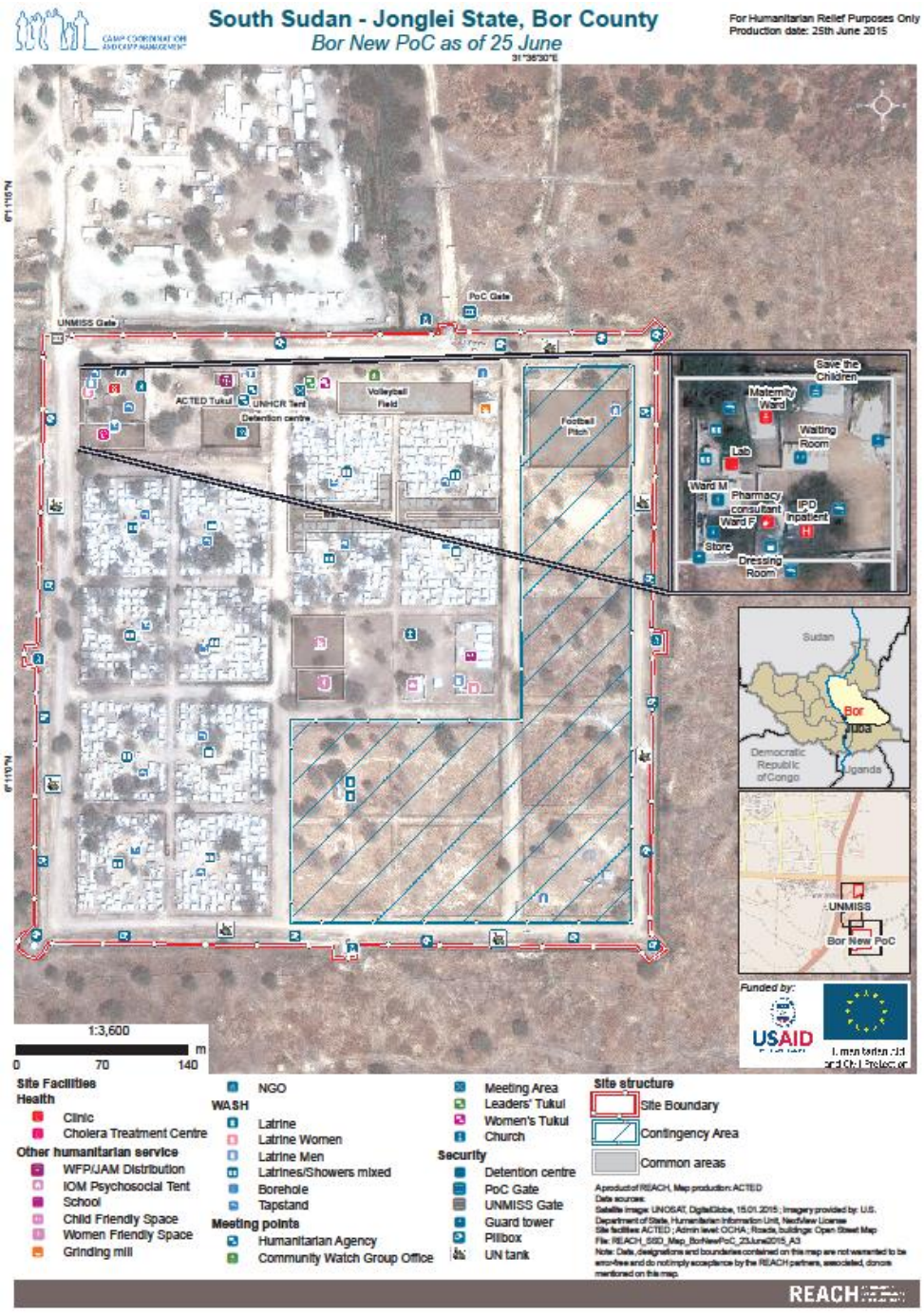

Figure 1 Map of Bor PoC

2.0 Survey Objectives

2.1 General objective

The main objective of this survey was to determine the nutrition status of population in Bor POC.

2.2 Specific Objectives

- To assess the prevalence of malnutrition in children aged 6-59 months
- To estimate the mortality rates through a retrospective survey in the PoC.
- To determine the morbidity and health seeking behaviors' in the PoC.
- To estimate the coverage of measles vaccination (9-59 months), deworming (12-59 months), LLITN utilization (6-59 months) and Vitamin A supplementation rates (6-59 months).
- To assess IYCF practices in the PoC.
- To give recommendations based on findings.

3.0 Methodology

The Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology was used for this survey. This methodology provides a basic integrated method for assessing nutritional status and mortality rate.

3.1 Sample size for Anthropometry and Mortality

The survey was an exhaustive one in that, every household in the PoC was assessed. The anthropometric measurements and bilateral oedema of all eligible children in the households were conducted. Each team had to assess one Block for two days to enhance quality of the data.

3.2 Household selection

Upon arrival to the respective blocks, each team leader introduced his team and their objectives to the Block leader. The teams then start data collection on the first HH to their right in one of the corners of the Block and labeling the HH using a marker pen as SCI-1 for the first HH and SCI-2 for the second HH and so on for the first day of data collection in the block. They then continued with the remaining HHs in the following day of data collection in that block.

3.2.1 Household definition

Based on the context, a household was defined as a group of people living under the same roof and sharing food from the same cooking pot. In home with multiple wives, those living and eating in different houses were considered as separate HHs. Wives living in different houses and eating from the same pot were considered as one HH.

3.3 Empty households

For empty HHs, teams tried to ask for the where about of the HH members from the neighbors and they revisited those HHs later in the day. No replacements were made for empty HHs and they were labeled as SCI-ABD.

3.4 Household with absent children

In households with absent children, demography and mortality information was collected during the absence of the eligible children and an appointment for revisit to take the anthropometric measurements with the eligible children was made with the head of the HH when the children come back in the later hours of the day.

3.5 Households with no eligible children

For HHs with no eligible children, mortality and demography questionnaire was administered to capture other HH information like in and out-migrants during the recall period.

3.6 Survey teams

The survey was conducted using 6 teams; each team comprising of 3 members (1 team leader/interviewer and 2 enumerators). Two supervisors from SCI were involved in the supervision and since the Blocks are close to each other, movement by the supervisors from one Block to the other was easier.

3.7 Training

The survey team was trained for three days inclusive of standardization test were ten children were measured weight, height and MUAC twice by each measurer in the team.

3.8 Field Supervision

Team leaders were responsible for the overall quality of activities and teams performance. Additionally, two supervisors from SCI closely supervised the teams throughout the survey. Each questionnaire and data sheet was checked each night prior to the data entry. The data was entered on daily basis and missing or flag data identified. Based on the results supervisors gave feedback to team members every morning.

3.9 Data entry and analysis

Data was entered in ENA for SMART software (July 9th, 2015 version) in the field by experienced data encoder. A random check on a certain percentage of entered records was done every day by the survey officers. Six outliers in anthropometry data were excluded from the analysis. The boundaries for exclusion were defined as +/- 3 SD of WHZ from the observed WHZ mean.

Anthropometric data was automatically analysed by ENA for SMART software (July 9th, 2015) whereas IYCF and the additional variables were analysed using EPI Info version 3.5.4.

4.0 Survey results

4.1 Anthropometry

A total of 325 children were assessed. However, GAM was analysed using 319 children. Six children were out of range (Exclusion of z-scores from Observed mean SMART flags: WHZ -3 to 3; HAZ -3 to 3; WAZ -3 to 3)

Survey 1

Total Sample Size		Prevalence	Design Effect	Number of Clusters	Estimated Variance	
n1		p1	Deff1	C1	$s1^2$	se
448		8.00%	1.00	13	0.000164	0.012817

Survey 2

Total Sample Size		Prevalence	Design Effect	Number of Clusters	Estimated Variance	
n2		p2	Deff2	C2	$s2^2$	se
325		14.40%	1.65	14	0.000626	0.025016

p1-p2	Pooled Variance	t	p	DF	2 sided	1 sided
-6.40%	2.81%	-2.28	0.0316	25	96.8%	98.4%

Figure 2: CDC two survey calculator comparing GAM results of December 2015 and October 2016.

As seen from the above figure, the p value for comparing the two surveys is 0.0316 which is less than 0.05 thus; the two surveys have statistical significant difference indicating that the nutritional situation has deteriorated in the PoC.

Table 1: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy:girl**
6-17	40	55.6	32	44.4	72	22.2	1.3
18-29	32	42.7	43	57.3	75	23.1	0.7
30-41	51	58.6	36	41.4	87	26.8	1.4
42-53	28	47.5	31	52.5	59	18.2	0.9
54-59	18	56.3	14	43.8	32	9.8	1.3
Total	169	52.0	156	48.0	325	100.0	1.1

The overall sex ratio showed P=0.471[9] which means boys and girls were equally represented in the survey.

[9] Plausibility check for: SS_201610_SCI_BORPOC.as

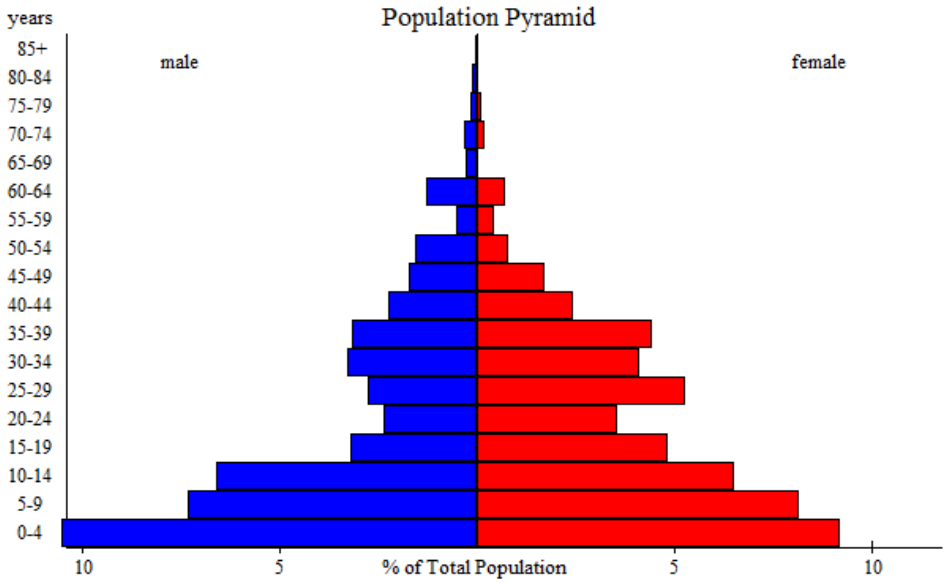

Figure 3: Population pyramid

As seen from the above population pyramid, the age group of 0-4 years is almost equal for male and female.

Table 2: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex, Bor PoC October 2016.

	All n = 319	**Boys n = 166**	**Girls n = 153**
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(46) 14.4 %	(21) 12.7 %	(25) 16.3 %
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(42) 13.2 %	(19) 11.4 %	(23) 15.0 %
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(4) 1.3 %	(2) 1.2 %	(2) 1.3 %

The prevalence of oedema is 0.0 %

Last year's survey was conducted in December 2015 whereas the current survey was conducted in October 2016. The two surveys are therefore comparable as there is no seasonality difference. The current GAM rate is 14.4% which is considered serious according to WHO standards and is significantly high as compared to last year's GAM rate of 8.0%. The high GAM rate could be attributed to the high morbidity rate as a casual factor to malnutrition, with fever being the most prevailing illness.

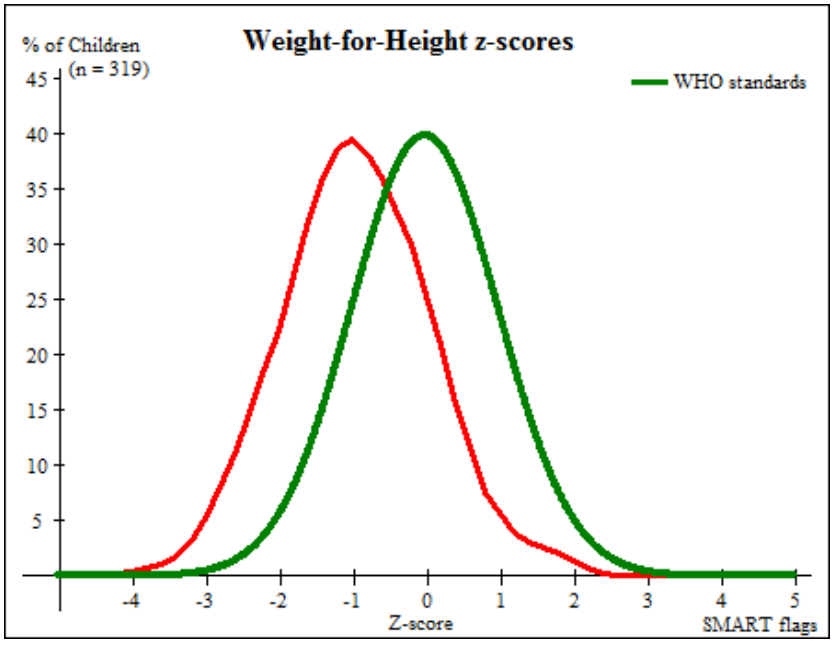

Figure 4: Gaussian curve for Weight-for Height z-scores

Anthropometric measurement was taken from 325 children. However, analysis was made with 319 children.

Table 3: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 7 (2.2 %)	Not severely malnourished No. 318 (97.8 %)

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

	All n = 325	**Boys** n = 169	**Girls** n = 156
Prevalence of global malnutrition (< 125 mm and/or oedema)	(27) 8.3 %	(15) 8.9 %	(12) 7.7 %
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(22) 6.8 %	(11) 6.5 %	(11) 7.1 %
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(5) 1.5 %	(4) 2.4 %	(1) 0.6 %

Table 5: Prevalence of underweight based on weight-for-age z-scores by sex

		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (months)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	72	1	1.4	13	18.1	58	80.6	0	0.0
18-29	73	1	1.4	9	12.3	63	86.3	0	0.0
30-41	87	2	2.3	3	3.4	82	94.3	0	0.0
42-53	59	1	1.7	4	6.8	54	91.5	0	0.0
54-59	32	0	0.0	1	3.1	31	96.9	0	0.0
Total	323	5	1.5	30	9.3	288	89.2	0	0.0

Table 6: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 305	**Boys** n = 155	**Girls** n = 150
Prevalence of stunting (<-2 z-score)	(30) 9.8 %	(16) 10.3 %	(14) 9.3 %
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(24) 7.9 %	(13) 8.4 %	(11) 7.3 %
Prevalence of severe stunting (<-3 z-score)	(6) 2.0 %	(3) 1.9 %	(3) 2.0 %

Table 7: 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	319	-0.94±0.99	1.65	0	6
Weight-for-Age	323	-0.80±0.95	1.14	0	2
Height-for-Age	305	-0.42±1.25	1.00	0	20

4.2 Mortality

Mortality data was collected using the mortality individual questionnaire, summary of results are summarized (Table 8) below.

Table 8: Mortality rates, Bor PoC, October 10th-14th, 2016

Parameters for Mortality	Results
CMR (Deaths per 10,000/day)	0.54
U5MR (Deaths in children <5/10,000/day)	1.10
Persons recorded within recall period	1,897
Current residents <5 years old	325
Mean household size	3.5
Total deaths during the recall period	10.0
Total deaths during the recall period for <5 years	4
Recall period (Days)	97
Causes of death	
Illness	80.0%
Injury/traumatic	20.0%
Location of death	
In current location	100.0%

4.3 Additional variables

Table 9: Measles, Vitamin A supplementation, LLITN utilization and deworming coverage

Parameters	N	n	%
Vitamin A (6-59 months)	325	171	52.6
Measles with EPI card (9-59 months)	307	164	53.4
Measles recall (9-59 months)	307	54	17.6
Dewormed (12-59 months)	293	105	35.8
LLITN (6-59 months)	325	294	90.5

Looking at the above table, the survey found out that 52.6% (n=171) out of 325 children aged 6-59 months received vitamin A supplementation, 53.4% (n=164) out of 307 children aged 9-59 month had measles vaccination with EPI card and 17.6% (n=54) of the children aged 9-59 months had measles vaccination according to the caregivers recall. 35.8% (n=105) of the children aged 12-59 months were dewormed in the past six month and 90.5% (n=294) of the children aged 6-59 months slept under mosquito net.

4.3.1 Child morbidity

Reported Morbidity cases two weeks prior to survey

Table 10: Point prevalence of morbidity of children 6-59 months in the two weeks prior to the survey

Parameters	N	n	%
Prevalence of Illness	325	243	74.8

Two weeks prior to the survey, the morbidity level in Bor PoC was found to be 74.8% (n=243) which is high. The most prevalent illness during this period was fever at 58.4% (n=142) followed by cough at 19.8% (n=48), diarrhoea at 14.8% (n=36) and other illnesses contributed to 7.0% (n=17) *see table 11 below*. The high prevalence of Fever would be as a result of mosquito bites especially in the evening before going to sleep as the River Nile and some water logged trenches near the PoC could be breeding places

for mosquitoes. Thus despite of the high LLITN utilization in the PoC, still children get mosquito bites outside the beds before going to sleep.

Table 11: Prevalence of reported illness two weeks prior to the survey

Type of Illness	N	N	%
Fever	243	142	58.4%
Cough	243	48	19.8%
Diarrhoea	243	36	14.8%
Others (99)	243	17	7.0%

Table 12: Treatment sought

Type of treatment sought	N	N	%
None	243	11	4.5
PHCC/U	243	208	85.6
Hospital	243	17	7.0
Private clinic	243	6	2.5
Traditional healer	243	1	0.4

As reported by the mothers/caregivers, out of 243 children who fell sick 14 days prior to the start of the survey, 85.6% (n=208) of children received treatment from the PHCC, followed by 7.0% (n=17) children who received treatment from the hospital.

4.4 Infant and Young Child Feeding

Table 13: IYCF indicators

Indicator	Age range	N	n	Prevalence (%)
Exclusive Breast Feeding (EBF) under 6 months	0-<6 Months	46	43	93.5
Early Initiation of Breast Feeding (EIBF)	0-23 Months	139	112	80.6
Continued Breastfeeding at 1 year	12-15 Months	26	23	88.5
Continued Breastfeeding at 2 years	20-23 Months	7	6	85.7
Introduction of solid, semi-solid or soft foods	6-8 Months	15	13	86.7
Minimum Dietary Diversity (MDD)	6-23 Months	93	4	4.3
Minimum Acceptable Diet (MAD)	6-23 Months	93	3	3.2

Exclusive Breast Feeding

This indicator only looks at only breast feeding to children 0->6 months right from the first hour after birth. As per the report, 93.5% of the children aged 0->6 months were exclusively breastfed. However, improvement is still needed as feeding of infants on only breast to the age of five months is very important for the immunity of the child.

Early Initiation of Breast Feeding

In this assessment, 80.6% of the mothers initiated breast feeding within the first hour after birth compared to last year's 79.2% mothers who initiated breast feeding within one hour after birth. This has shown a slight improvement in EIBF in Bor PoC.

Continued breast feeding at one year

88.5% of the children aged 12-15 months were breast fed at least to one year in this assessment. But in comparison to last year's survey, all children were breast fed to at least one year. The current survey therefore portrait a decline in continued breast feeding at one year.

Introduction of complementary foods

In addition to breast milk, the timely introduction of Semi-solid foods to infants at the age of 6 months is very important. As per the assessment, 86.7% of the children aged 6-8 months were introduced to complementary foods.

Minimum Dietary Diversity

4.3% of the children aged 6-23 months received food from four or more food groups during the previous day. In comparison to last year's survey, no child in the PoC got diversified food from four or more food groups. This therefore shows that there is a slight improvement in dietary diversity.

Minimum Acceptable Diet

Only 3.2% of the children aged 6-23 months received a Minimum Acceptable Diet apart from breast milk.

5.0 Discussion

5.1 Anthropometry

In comparison of the current 2016 GAM rate with that of 2015 in Bor PoC, the results showed an increase in GAM from 8.0% in 2015 to 14.4% in the current survey which is considered serious according to WHO standards. The high GAM rate could be as a result of the high morbidity with fever being the most prevailing illness. However, in SAM, there is no significant difference that is; in 2015, SAM was 1.1% whereas in 2016, SAM is at 1.3% with p value of 0.8342 (see the figure below)

Survey 1

Total Sample Size		Prevalence	Design Effect	Number of Clusters	Estimated Variance	
n1		p1	Deff1	C1	$s1^2$	se
448		1.10%	1.00	13	2.43E-05	0.004928

Survey 2

Total Sample Size		Prevalence	Design Effect	Number of Clusters	Estimated Variance	
n2		p2	Deff2	C2	$s2^2$	se
325		1.30%	1.65	14	6.51E-05	0.008071

p1-p2	Pooled Variance	t	p	DF	2 sided	1 sided
-0.20%	0.95%	-0.21	0.8342	25	16.6%	58.3%

Figure 5: CDC two surveys calculator comparing SAM for December 2015 and October 2016

5.2 Mortality

In comparison of mortality results, there has been an increase in death cases thus CDR and U5MR for December 2015 survey was 0.08 and 0.21 whereas in October 2016 survey, the CDR and U5MR increased to 0.54 and 1.10 respectively. The main cause of death for October 2016 was illness that contributed 80% of the deaths during the recall period whereas 20% of the deaths were caused by injury/traumatic.

6.0 Conclusions

In conclusion, the GAM rate in the PoC was 14.4% and therefore, the overall nutrition situation in Bor PoC is classified as serious according to WHO classification of malnutrition. The survey also found out that, there were high morbidity cases in the PoC two weeks prior to the start of the survey with fever being the most prevailing illness contributing to 58.4% of the reported cases. However, although the morbidity rate was found to be high in Bor PoC, the health seeking behaviour was quite encouraging with majority of the people preferring the hospital and PHCC for treatment.

The survey also found out that, there was high LLITN utilization in the PoC with 90.5% of the children slept under mosquito net which is very good. Also vitamin A supplementation among the children aged between 6 and 59 months and the measles vaccination rate among the children aged between 9 and 59 months were also found to be high and commendable. However, deworming coverage looked low and there the coverage of deworming needs to be strengthened.

6.1. Recommendation

- Continue with the nutrition intervention in Bor PoC with close monitoring of the nutrition activities as the situation might deteriorate
- SCI should consider immediate initiation of TSFP to prevent relapse. The TSFP be linked with OTP to follow up severely malnourished children discharged from the OTP for treatment
- Morbidity rate in children aged 6-59 months is high with fever being the highly suffered illness. Thus there is need to improve on WASH with much emphasis on application of detergents into the water logged trenches that tend to be the breeding places for mosquitoes.
- Deworming coverage needs to be improved.

Annexes

Annex i: Plausibility Report

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** (1.8 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0.471)
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=0.796)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (4)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (7)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (6)
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** (0.99)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (0.13)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (0.06)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	**3** (p=0.010)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**3** %

The overall score of this survey is 3 %, this is excellent.

Annex ii: Demography and mortality questionnaire

DEMOGRAPHY & MORTALITY QUESTIONNAIRE

DATE OF INTERVIEW: [ ][ ]/[ ][ ]/ [ ][ ]

COUNTY:	**PAYAM:**	**BOMA:**
VILLAGE:		**INTERVIEWER:**
CLUSTER NO. [ ][ ]	**TEAM NO. [ ][ ]**	**HOUSEHOLD[10] NO. [ ][ ]**

01	02	03	04	05	06	07	08	09	10
No.	Name	Sex (M/F)	Age (years)	Joined on or after:	Left on or after:	Born on or after:	Died on or after:	Cause of death 1=Illness 2=Injury/ traumatic 3=Unknown 4=Violence/ conflict 5=Food shortage	Location of death 1=Current location 2=During migration 3=In place of last residence 4=Other
				(Start date of the recall period - ex. Jan. 1, 1900)					
				WRITE 'Y' for YES. Leave BLANK if NO.					
a) List all the people that slept in this household last night.									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
18									
b) List all the people that slept in this household on the **first night of the recall period (INCLUDE DATE)** but did **NOT sleep** in the household **Last night**									
1					Y				
2					Y				
3					Y				
4					Y				
5					Y				
c) List all the people that slept in this household on the **first night of the recall period but have since died** (probe clearly to determine case)									
1							Y		
2							Y		
3							Y		
4							Y		
5							Y		

Was/is anyone in the household pregnant at the **start** of the recall period? No [ ] Yes [ ] If yes, how many? _____

[10] HH definition: Group of people living under same roof & sharing food from the same pot. In home with multiple wives, those living and eating in different houses are considered as separate HHs. Wives living in different houses and eating from same pot are considered as one HH.

Annex iii: Anthropometry and health questionnaire

ANTHROPOMETRIC & HEALTH QUESTIONNAIRE

(To be conducted in EVERY SELECTED HH with children 6-59 months)

Date (DD/MM/YY): …/……/……. Cluster No:……. Team No……. State:…….. County…….. Payam:…….. Boma……..

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Child No.	HHNO	Child Name	Sex **m** = Male **f** = Female	Date of Birth (DD/MMYY)	Age in months	Weght in Kg (eg 12.4)	Height in cm (eg 78.1)	Oedema **n** = No **y** =Yes	MUAC in cm (eg 11.3)	Vit. A in last 6 months --------- **0** = No **1** =Yes	Measles Vaccine ---- **0** = No **1** =Yes with EPI card **2** =Yes recall **3** = Child <9m	Illness in past 14 days? **0** = No **1** =Yes If no, go to 16	Type of Illness **1** = Fever **2** = Cough **3** = Diarrhoea 99 = Other (specify)	Treatment Sought: **0** = None **1** =Hospital **2** =PHCC/U **3** = Mobile /outreach clinic **4**=CBD **5**=Private clinic **6**=Traditional practitioner **7**=Pharmacy/chemist **99**=Other (Specify)	Did the child sleep under a mosquito net(LLITN) last night? --------- 0= No 1= Yes	Dewormed in last 6 months (12-59 months) ------- **0** = No **1** =Yes 88 =DK
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
20																
21																

Annex iv: Local events calendar

Local events calendar for Bor PoC SMART Survey Oct 2016												
	2011		2012		2013		2014		2015		2016	
Jan	New Year's day CPA celebrations Hunting begins Tour of governor in all payams		New Year's day CPA celebrations Hunting begins Tour of governor in all payams	**57**	New Year's day CPA celebrations Hunting begins Tour of governor in all payams	**45**	New Year's day CPA celebrations Hunting begins Tour of governor in all payams	**33**	New Year's day CPA celebrations Hunting begins Tour of governor in all payams	**21**	New Year's day CPA celebrations Hunting begins Tour of governor in all payams	**9**
Feb	Cutting of grass for building		Cutting of grass for building Fighting Murle and Bor	**56**	Cutting of grass for building	**44**	Cutting of grass for building	**32**	Cutting of grass for building	**20**	Cutting of grass for building	**8**
Mar	Too much heat		Too much heat	**55**	Too much heat	**43**	Too much heat	**31**	Too much heat	**19**	Too much heat	**7**
April	Easter holidays		Easter holidays Land Clarence begins	**54**	Easter holidays Land Clarence begins	**42**	Easter holidays Land Clarence begins	**30**	Easter holidays Land Clarence begins	**18**	Easter holidays Land Clarence begins	**6**
May	Labour day SPLM/A day		Labour day SPLM/A day Cultivation begins	**53**	Labour day SPLM/A day Cultivation begins	**41**	Labour day SPLM/A day Cultivation begins	**29**	Labour day SPLM/A day Cultivation begins	**17**	Labour day SPLM/A day Cultivation begins	**5**
June	Weeding begins		Weeding begins	**52**	Weeding begins	**40**	Weeding begins	**28**	Weeding begins	**16**	Weeding begins	**4**
July	Independence day Martyrs day		Independence day Martyrs day	**51**	Independence day Martyrs day	**39**	Independence day Martyrs day	**27**	Independence day Martyrs day	**15**	Independence day Martyrs day	**3**
Aug	Harvesting begins		Harvesting begins	**50**	Harvesting begins	**38**	Harvesting begins	**26**	Harvesting begins	**14**	Harvesting begins	**2**
Sept	Harvesting ends		Harvesting ends	**49**	Harvesting ends	**37**	Harvesting ends	**25**	Harvesting ends	**13**	Harvesting ends	**1**
Oct	Adiong (Period when cattle are allowed into the gardens to feed on sorghum stems after harvest)		Adiong (Period when cattle are allowed into the gardens to feed on sorghum stems after harvest)	**48**	Adiong (Period when cattle are allowed into the gardens to feed on sorghum stems after harvest)	**36**	Adiong(Period when cattle are allowed into the gardens to feed on sorghum stems after harvest)	**24**	Adiong(Period when cattle are allowed into the gardens to feed on sorghum stems after harvest)	**12**	Adiong (Period when cattle are allowed into the gardens to feed on sorghum stems after harvest)	**0**
Nov	Start of coldness	**59**	Start of coldness	**47**	Start of coldness	**35**	Start of coldness	**23**	Start of coldness	**11**	Start of coldness	
Dec	Christmas Movement of cattle to swamps begins	**58**	Christmas Movement of cattle to swamps begins Christmas	**46**	Christmas Movement of cattle to swamps begins Christmas Beginning of crisis	**34**	Christmas Movement of cattle to swamps begins Christmas	**22**	Christmas Movement of cattle to swamps begins Christmas	**10**	Christmas Movement of cattle to swamps begins Christmas	

Annex v: IYCF questionnaire

INFANT AND YOUNG CHILD FEEDING QUESTIONNAIRE

(To be conducted in every HH with children 0-24 months)

1 2

Date (D/M/Y): ……/……./…..... Cluster No:……. Team No…..... Block no……..

1	2	3	4	5	6	7	8	9	10	11
Child No.	HH NO	**Age** (in months)	Has this child ever been **breastfed**? --------- 0 = No 1 = Yes **If no go to 11**	**How long** after birth did you first put the child to the breast? --------- **1** = Immediately in 1st hour **2** = In first day **3** = After first day	Did you feed your child with **colostrum** (local language = thiith) --------- 0 = No 1 = Yes	Is this child **still** breastfeeding now? --------- 0 = No 1 = Yes	**Exclusive** breast feeding: What other foods did you give the child before the age of 6 months (other than breast milk)_____ 0 =None other than breast milk 1 = Powder/animal milk/yogurt 2 = Cereals based diet 3 = Plain water 4 = Fruit Juice 5 = Sugar water 6 = Vegetables	What foods were given to the child **yesterday** during the day and night? --------- 1 =Grains/cereal s/tubers 2 = Meat/Fish/Poultry/O rgan meats 3 = Legumes/ Nuts 4 = Dairy products 5 = Fruits/vegetables 6= Vitamin A rich fruits & Vegetables 7 = Eggs 8 = Others (specify___)	Since this time yesterday, how many times have you given the child **food** other than liquid? (put number)	How do you feed the child when having **diarrhea**, do you feed him --------- **0** = Nothing at all **1** = Less than usual or fluids only **2** = Same as usual **3** = More than usual **4** = Never had diarrhea