EMERGENCY NUTRITION ASSESSMENT FINAL REPORT NAYAPARA REGISTERED CAMP AND MAKESHIFT SETTLEMENTS COX'S BAZAR, BANGLADESH

20 October - 8 November 2018

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Coordination team:

- Jogie Abucejo Agbogan, Health and Nutrition Head of Department, Action Against Hunger, Bangladesh
- Md Lalan Miah, Survey Manager, Action Against Hunger, Bangladesh

Technical support:

- The Nutrition Assessment Technical Working Group
- Scott Logue, Assessment Advisor, Tech-RRT
- Brigitte Tonon, Regional Health and Nutrition Advisor Asia, Action Against Hunger, France

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ACRONYMS

ACF	Action Against Hunger - Action Contre la Faim
ANC	Antenatal Care
ARI	Acute Respiratory Infection
ATWG	Assessment Technical Working Group
BIDS	Bangladesh Institute of Development Studies
BRAC	Bangladesh Rural Advancement Committee
BSFP	Blanket Supplementary Feeding Programme
BSU	Basic Sampling Unit
CDC	Centers for Disease Control and Prevention
CDR	Crude Death Rate
DEFF	Design Effect
DFID	Department for International Development
DHS	Demographic and Health Survey
ECHO	European Child Proctection and Humanitarian Aid Operations
ENA	Emergency Nutrition Assessment
EWARS	Early Warning, Alert and Response System
GAM	Global Acute Malnutrition
GFD	General Food Distribution
GMP	Growth Monitoring and Promotion
GPS	Global Positioning System
HAZ	Height-for-Age z-score
HH	Household
ICRC	International Committee of the Red Cross
IFA	Iron-Folic Acid
IFRC	International Federation of Red Cross and Red Crescent
IFPRI	International Food Policy Research Institute
IOM	The International Organization for Migration
IPC	Integrated Food Security Phase Classification
IPHN	Institute of Public Health and Nutrition
IRC	International Rescue Committee
ISCG	Inter Sector Coordination Group
IYCF	Infant and Young Child Feeding
IYCF-E	Infant and Young Child Feeding in Emergencies
MAM	Moderate Acute Malnutrition
MNP	Micronutrient Powder
MoHFW	Ministry of Health and Family Welfare
MR	Measles-Rubella
MS	Makeshift Settlements
MUAC	Mid-Upper Arm Circumference
NCA	Nutrition Causal Analysis
NGO	Non-Governmental Organization
NPM	Needs and Population Monitoring
NPNL	Non-Pregnant Non-Lactating
NYP RC	Nayapara Registered Camp
OPV	Oral Polio Vaccine
OTP	Outpatient Therapeutic Programme
PLW	Pregnant and Lactating Women
PPS	Population Proportional to Size
PSU	Primary Sampling Unit

RC	Registered Camp
REVA	Rohingya Emergency Vulnerability Assessment
RUTF	Ready to Use Therapeutic Food
SAM	Severe Acute Malnutrition
SARPV	Social Assistance and Rehabilitation for the Physically Vulnerable
SC	Stabilization Centre
SD	Standard Deviation
SDC	Swiss Agency for Development and Cooperation
SENS	Standardized Expanded Nutrition Survey
SHED	Society for Health Extension and Development
SIDA	Swedish International Development Cooperation Agency
SMART	Standardized Monitoring and Assessment of Relief and Transition
SRS	Simple Random Sampling
SSU	Secondary Sampling Unit
TAI	Technical Assistance Inc
TDH	Terre des Hommes
Tech RRT	Technical Rapid Response Team
TSFP	Targeted Supplementary Feeding Programme
U5DR	Under 5 Death Rate
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Childrens' Fund
WASH	Water, Sanitation, and Hygiene
WAZ	Weight-for-Age Z-score
WFP	World Food Programme
WHO	World Health Organization
WHZ	Weight-for-Height Z-score
WSB	Wheat Soy Blend

EXECUTIVE SUMMARY

The Emergency Nutrition Assessment Round 3 was composed of two cross sectional and population representative SMART surveys within Cox's Bazar, Bangladesh. The aim of the assessment was to understand the nutrition status of the Rohingya living within the camps of Ukhia and Teknaf Upazilas. Data collection took place from 20th October to 8th November, 2018.

OBJECTIVES

The principal objective was the evaluation of the nutritional status among Rohingya children 6-59 months within the survey areas, as well as to provide salient nutrition and nutrition-sensitive data to inform an effective humanitarian response to the Rohingya Crisis in Cox's Bazar. Additionally, the assessment aimed to:

- Estimate demographic characteristics of the households
- Estimate crude death rate and under five death rate
- Estimate MUAC among women 15-49 years and children 0-59 months
- Determine the prevalence of malnutrition among children 6-59 months
- Determine the prevalence of anaemia among children 6-59 months and non-pregnant, non-lactating women 15-49 years
- Determine the prevalence of morbidity and health seeking behaviour among children 6-59 months
- Determine the proportion of children 6-59 months that received Vitamin A supplementation in the past 6 months
- Determine the proportion of children 6-59 months that received at least 1 sachet of micronutrient powder since the start of the recall period
- Determine the proportion of pregnant women accessing antenatal care services
- Determine the proportion of women of reproductive age (15-49 years) receiving iron –folic acid supplementation tablets.
- Determine the type of food assistance received by surveyed households

METHODOLOGY

The survey of the Makeshift Settlements (Oct 20-31) selected households using a two-stage cluster sampling among Rohingya residing outside of Kutupalong Registered Camp and Nayapara Registered Camp. Sub-block population estimates were derived from The International Organization for Migration (IOM) Needs and Population Monitoring (NPM) estimates. Fifty-three clusters were drawn with a planned 14 households per cluster. The total estimated population of the Makeshift Settlements was 867 687. The survey of Nayapara Registered Camp (Nov 1-7) selected households using simple random sampling among those residing within the camp. Household lists were created from the UNHCR proGres database for registered refugees (n=3 654) as well as household enumerations lists (n=372) created the week prior to data collection. The total estimated population of Nayapara Registered Camp was approximately 22 545. Data collection was planned for, but ultimately cancelled in Kutupalong Registered Camp due to high numbers of systematic refusals linked to fears around relocations and other grievances.

Analysis of the data was conducted using ENA for SMART software (version 9th July 2015) and Epi Info Version 7.2.2.6. The anthropometric data were cleaned following SMART flag recommendations (+/- 3 of the survey's observed median).

RESULTS

The prevalence of GAM among children 6-59 months per WHZ was below the 15% WHO 'Emergency' threshold in both the Makeshift Settlements and Nayapara Registered Camp, as presented in Table 1 below, which are categorized as 'Serious'. Women's low MUAC (<210mm) has decreased significantly from Round 1 to Round 3 in both sites and has been within the 'Acceptable' IPC classification (<6%) since Round 2. Death rates have remained below the Sphere 0.40/10,000/day threshold for South Asia since Round 2. Global chronic malnutrition in both sites has reduced for all 3 Rounds but remains 'Poor' in the Makeshift Settlements and near the >40% 'Emergency' threshold, based on WHO classifications. Anaemia in children 6-59 months has decreased significantly in both sites from Round 1 to Round 3 but also increased significantly from Round 2 to Round 3 and remains near the >40% WHO threshold for Public Health Significance in the Makeshift Settlements and Nayapara RC. Anaemia prevalence for non-pregnant non-lactating women 15-49 years in Round 3 (data not collected Round 1,2) was considered 'Medium' based on WHO classification of Public Health Significance. Two-week recall of diarrhea, acute respiratory infection, and fever indicate a considerable disease burden in children under five, particularly considering the crowded camp environment. Household level support with food assistance by GFD ration card or e-voucher SCOPE card was found to be near universal in both sites. In the Makeshift Settlements, the level of surveyed pregnant women enrolled in an antenatal care programme and/or receiving iron-folic acid tablets was very low compared to Nayapara RC. **The overall findings among the Rohingya population constitute serious levels of malnutrition in need of ongoing nutritional support**. Although the results indicate an overall significant improvement compared to Round 1 (R1 Oct-Nov 2017, R2 April-May 2018) of this assessment, particularly in the Makeshift Settlements, the prevalence of acute malnutrition remains high despite considerable scale-up of nutrition treatment centres, food assistance, WASH facilities, and health services.

Table 1: Summary of Key Indicators, Cox's Bazar, Oct-Nov 2018

Indicator	Sample	Makeshift Settlements		Nayapara RC	
		%	95% CI	%	95% CI
% Children <5 years	Households	20.7%	[19.2-22.2]	12.8%	[11.7-14.1]
Average HH size (SD)		5.4 (2.3)		5.6 [2.3]	
CDR		0.13	[0.06-0.28]	0.21	[0.11-0.39]
U5DR		0.42	[0.16-1.10]	0.56	[0.19-1.64]
GAM (WHZ)	Children 6-59 months	11.0%	[8.4-14.2]	12.1%	[9.1-15.9]
SAM (WHZ)		1.1%	[0.4-2.8]	0.9%	[0.3-2.5]
GAM (MUAC)		3.1%	[1.9-5.0]	3.7%	[2.2-6.2]
MUAC <210mm	Women 15-49 years	3.0%	[2.0-4.6]	1.3%	[0.7-2.4]
MUAC mean (SD)	Infants 0-5 months	118.4mm [17.3]		126.5mm (14.3)	
Stunting (HAZ)	Children 6-59 months	26.9%	[22.4-31.9]	38.3%	[33.4-43.5]
Anaemia (Hb<11.0 g/dL)		39.8%	[34.1-45.4]	38.1%	[33.2-43.3]
Diarrhea		28.4%	[24.5-32.4]	25.2%	[20.0-30.0]

ARI		10.9%	[7.1-14.6]	9.5%	[6.9-13.0]
Fever		38.0%	[33.0-43.0]	33.6%	[28.9-38.7]
Anaemia (Hb<11.0 g/dL)	Non PLW Women 15-49 years	22.6%	[16.7-28.5]	22.8%	[18.0-28.2]

1. BACKGROUND

1.1 CONTEXT

1.1.1 Geography and Demography

Located in the southeast of Bangladesh in the Chittagong Division, Cox's Bazar is one of Bangladesh's sixty-four districts (*zilas)*. Named after the town of Cox's Bazar, it is bordered by Chittagong District to the North, Bandarban District and the Myanmar border to the East, and the Bay of Bengal to the West. Cox's Bazar is known for having one of the world's longest natural sea beaches and for being prone to severe weather events such as cyclones, floods and landslides. Cox's Bazar is in the tropical monsoon region, which is characterized by high temperatures, heavy rainfall, and high humidity. Despite being characterized by the tropical climate "wet" and "dry" seasons, the Bangla calendar is divided into six seasons: summer (*Grime*), rainy (*Barsa*), autumn (*Sarat*), late autumn (*Hemanta*), winter (*Shhit*), and spring (*Basanta*), with an average annual temperature of 32.8 °C (91.0 °F). Earthquakes and related tsunamis are additional natural threats to the region. Cox's Bazar is itself comprised of eight sub-districts (*upazilas*) including Ukhia and Teknaf, which host virtually the entire Rohingya population displaced within Bangladesh.

Officially known as The Republic of the Union of Myanmar, Myanmar (formerly Burma) is a sovereign State and the second largest country by area in the Southeast Asian region. In the 2018 United Nations Development Index Report, Myanmar ranked 148 out of 189 countries and territories[1]. Within Myanmar, the majority of the Rohingya live in the western coastal State of Rakhine (one of the poorest States in Myanmar) which sits across the Naf River from Cox's Bazar, as illustrated in Figure 1 below. According to the World Bank, the poverty rate of Myanmar as a whole is 37.5% while in Rakhine State the poverty rate is 78.0%[2]. Access to education, health services, and adequate nutrition are low in Rakhine State. It also has an insufficient number of trained physicians per capita and some of the lowest immunization rates in the country. A 2015 Standardized Monitoring and Assessment in Relief and Transitions (SMART) Survey conducted by Action Against Hunger following Cyclone Komen in the Maungdaw and Buthidaung Townships of Rakhine State reported emergency levels of acute malnutrition. The previously concerning situation is believed to have deteriorated significantly due to violence against the Rohingya that peaked in August 2017 and subsequent displacement across the border into Bangladesh. In Bangladesh, basic services available prior to the rapid population movements from Myanmar have been severely strained.

[1] UNDP (2018) Human Development Report

[2] World Bank (2014) Ending Poverty and Boosting Shared Prosperity in a Time of Transition

Figure 1: Map of Bangladesh and Burma (Myanmar) with Cox's Bazar in Yellow and Rakhine State in Red, Wikipedia Commons, 2017

1.1.2 Displacement and the Camps

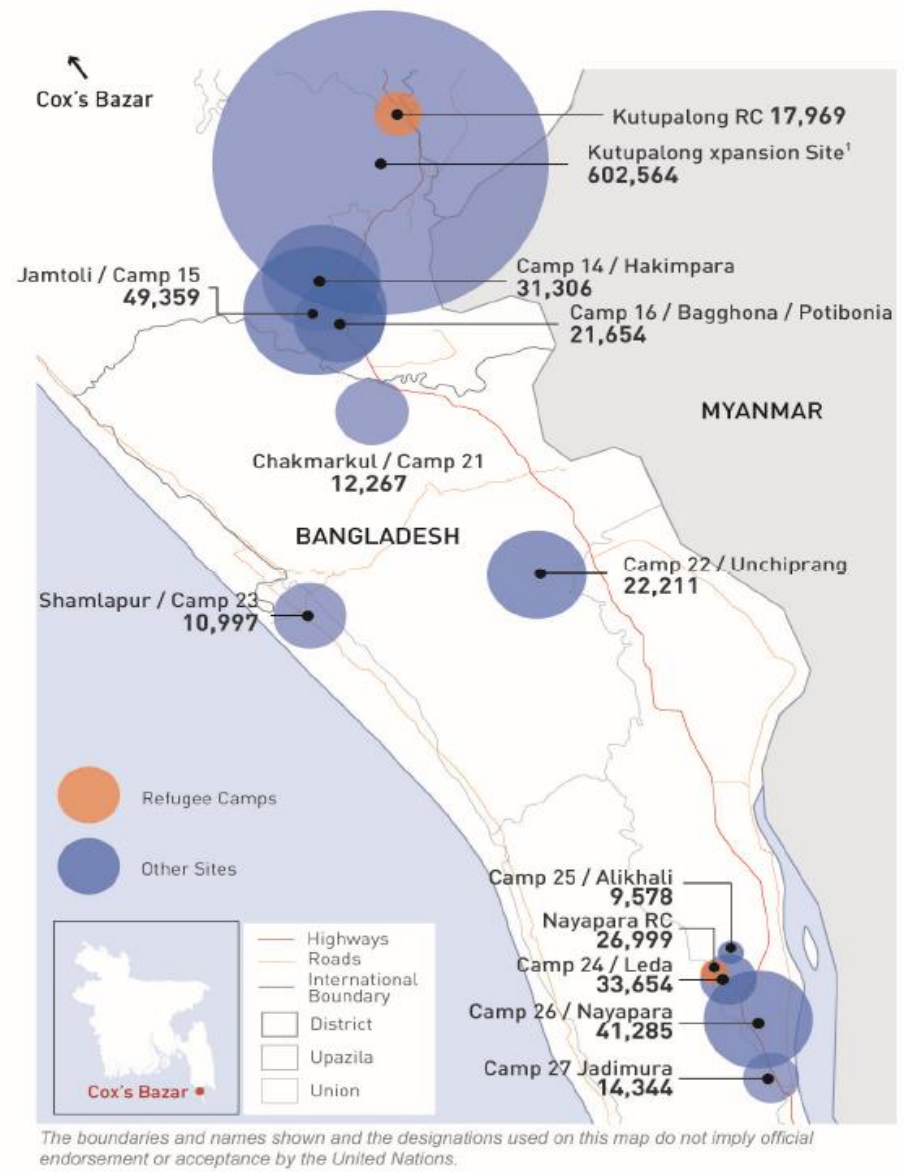
Waves of violence have periodically sent Rohingya over the border into what is now Bangladesh since before it was an independent nation. In 1942, communal riots in Rakhine State pushed an estimated 22 000 Rohingya into what was then pre-partition India[3]. In 1977 and 1978 more than 200 000 Rohingya crossed the border into Bangladesh, fleeing widespread human rights violations and evictions by the Myanmar military[4]. Soon after, repatriation programmes and declining camp conditions in Bangladesh camps forced more than 180 000 Rohingya to return to Myanmar by 1979[5]. Increased Myanmar military violence again prompted an exodus of an estimated 250 000 Rohingya across the border into Bangladesh following elections in 1990[6]. In response to this influx, the two official refugee camps, Kutupalong Registered Camp and Nayapara Registered Camp, were established in 1992 and have been actively managed by UNHCR since. A resurgence of conflict and military activity resulted in an additional 87 000 Rohingya crossing into Bangladesh in October 2016, forming the Balukhali Makeshift Settlement south of Kutupalong Registered Camp[7].

Attacks on police posts and the subsequent backlash in northern Rakhine on 25 August 2017 caused over 700 000 Rohingya refugees to flee from Myanmar to Cox's Bazar, Bangladesh.

[3] Human Rights Watch (2000) Burma; Historical Background
[4] ACAPS (2017) Review; Rohingya Influx Since 1978
[5] MSF (2002) 10 Years for the Rohingya Refugees in Bangladesh; Past, Present, and Future
[6] MSF (2002) 10 Years for the Rohingya Refugees in Bangladesh; Past, Present, and Future
[7] ACAPS (2017) Review; Rohingya Influx Since 1978

These influxes, along with the Rohingya who had arrived in Bangladesh during earlier waves of violence, have resulted in a total population of more than 901 350, including 894 187 in Camps and Settlements and 7 163 living in host communities as of October 15, 2018[8]. The population by camp areas is presented in Figure 2 below. These estimates were based on official data provided to the Inter Sector Coordination Group (ISCG), the main coordination body for humanitarian agencies in Cox's Bazar.

Figure 2: Refugee Sites by Population and Location Type, ISCG, 15 October 2018



[8] ISCG (2018) Situation Report: Rohingya Refugee Crisis 15 Nov 2018

Nayapara Registered Camp (included in current assessment) is a government sponsored Rohinga refugee camp established in 1992. Nayapara Registered Camp (NYP RC) is located in the Teknaf sub-district (*Upazila*) of Cox's Bazar and had an estimated population of 22 545 as of October 20, 2018[9]. Nayapara RC is divided into parts I and II, both of which are surrounded by the Nayapara makeshift settlements.

The Makeshift Settlements (included in the current assessment) include all refugee settlements in Ukhia and Teknaf sub-districts outside of the two official registered refugee camps (Kutupalong RC and Nayapara RC) and exclude Rohingya who have been absorbed into host communities. The three largest makeshift sites were originally Kutupalong Makeshift (which borders Kutupalong RC) Balukhali Makeshift, and Leda Makeshift neighboring Nayapara RC, but the rapid expansion of these sites has blurred borders and created new colloquial distinctions. To accommodate the rapid influx, a 3 000-acre piece of land that stretches from Kutupalong makeshift to Baluchi makeshift settlements was designated for settlements given the rapid influx of Rohingya. Built on previously forested land with stretches of rice paddy, these informal settlements initially lacked basic infrastructure including water points, health facilities, and roads. This expansive area had previously been divided into "zones" ("AA", "BB", "CC", etc.), but has since been divided into camps, numbered from 1-27, with areas such as Hakimpara, Jamtoli, Potibonia, Chakmarkul, Unchiprang, Shamlapur, Leda, Ali Khali, Jadimura Shamlapur, and Nayapara Expansion which have also maintained their colloquial names. The estimated population of all makeshift and settlements was 867 687 as of September 4th, 2018[10].

Although the influx of Rohingya has slowed since the onset of the crisis, refugees continue to arrive in Bangladesh. The total number of new arrivals to Cox's Bazar from January 1 to November 15th, 2018 is 14 922 individuals (approximately, 43 individuals per day)[11].

1.1.3 Health and Morbidity

The large influx of Rohingya in August-November 2017 severely strained all health services in Cox's Bazar. During the early influx, the provision of health services was limited by the lack of space for constructing permanent health facilities. In 2018, however, a number of health facilities were erected in collaboration with the site management sector. As of November, 2018 there were 219 health facilities with 176 (80%) reporting to EWARS[12].

Inadequate vaccination coverage, vector control measures, and water and sanitation conditions contribute to an environment where communicable diseases can easily spread. The monsoon rains which finished late October also add an additional burden to public health problems including increasing the risk of infectious disease outbreaks such as vector-borne diseases like dengue, chikungunya, malaria, Japanese encephalitis; and diarrheal diseases such as typhoid and dysentery. Acute respiratory infections (ARI) continues to be the most common cause of morbidity followed by all forms of diarrhea[13].

Severe overcrowding in the camps has also increased the risk of communicable disease outbreaks, with the population already having experienced outbreaks of measles and diphtheria

[9] UNHCR (2018) Progress database unregistered HH as of Sept 30, 2018 and ACF unregistered HH as of Oct 20, 2018

[10] IOM (2018) Bangladesh, Needs and Population Monitoring (NPM) Site Assessment: Round 12, Aug 9 to Sept 4, 2018

[11] ISCG (2018) Situation Report: Rohingya Refugee Crisis, 29 Nov, 2018

[12] WHO (2018) Situation Report: Rohingya Refugee Crisis, Nov 15 (51)

[13] WHO (2018) EWARS Epidemiological Bulletin-Cox's Bazar, W47 25 Nov 2018

in addition to cases of acute jaundice syndrome (AJS) since the August 2017 influx. A total of 1 557 measles cases have been reported between January-November 2018 but the trend of suspected cases is continuing to decline[14]. Suspected cases of diphtheria have stabilized since the outbreak began in early November 2017 with 11 cases (1 confirmed) reported between November 7-13, 2018 (8 8282 cases for 2018)[15].

1.1.4 Nutrition and Anaemia

Data from the most recent 2015-16 Myanmar Demographic and Health Survey (DHS) pertaining to Rakhine State, where the population fled from, reported that 38% of children less than age five years were chronically malnourished, 14% were acutely malnourished, and 34% were underweight[16].The results of two 2015 SMART Surveys conducted by Action Against Hunger in Maungdaw and Buthidaung Townships of Rakhine State reported GAM prevalence of 19.0% [14.7-24.2] and 15.1% [11.8-19.2], respectively. These prevalences were likely aggravated by Cyclone Komen in 2015. The 2014 SMART Survey conducted by Action Against Hunger in Rathedaung Township of Rakhine State reported a GAM prevalence of 10.5% [6.7-16.0], likely influenced by the widespread poverty and periodic conflict which have contributed to a protracted malnutrition context in Rakhine State.

Results from the Emergency Nutrition Assessment Round 2 in April-May, 2018 indicated a 'high' level of Global Acute Malnutrition (GAM) by weight-for-height z-score (WHZ) for both the Makeshift Settlements, 12% [9.4-15.0], and Nayapara RC, 13.6% [10.1-18.1] based on WHO thresholds. The prevalence of GAM, using MUAC as indicator, for the Makeshift Settlements, 4.3% [3.2-5.9] and Nayapara RC 3.6% [2.0-6.5] were considered 'acceptable (<6%)' based on IPC classification of MUAC. The prevalence of chronic malnutrition (stunting) in the Makeshift Settlements, 37.7% [33.0-42.5], was 'high' with the upper confidence interval, 42.5%, exceeding the WHO 'Emergency' threshold of 40%. The stunting prevalence in Nayapara RC was 'very high' 40.4% [34.7-46.3] indicating an 'Emergency' level of stunting. The prevalence of underweight in the Makeshift settlements, 31.1% [26.5-36] and Nayapara RC, 39.8% [34.2-45.6], were both 'very high' and exceed the WHO emergency threshold of 30%. The prevalence of anaemia among children 6-59 months was considered 'medium [20.0%-39.9%]' in both the Makeshift Settlements, 32.3% [27.8-37.1], and Nayapara RC, 29.4% [24.3-35.0] based on WHO classification of public health significance.

The Round 2 assessment also collected data on low women's MUAC (<210 mm), identifying a prevalence of 2.6% [1.6-4.1] among women 15-49 years and 3.4% [1.5-7.8] for pregnant and lactating women in the Makeshift Settlements. In Nayapara RC the prevalence of low MUAC (<210 mm) of women 15-49 years was 2.4% [1.5-3.9] and 6.5% [2.9-13.9] for pregnant and lactating women (p=0.121).

1.1.5 Nutrition Programmes

A well-rounded interpretation of the malnutrition context is strengthened by an understanding of the humanitarian assistance landscape during the assessment data collection period. The services and programmes most directed at the treatment and prevention of acute malnutrition among children under 5 years include stabilization centres (SCs), outpatient therapeutic

[14] WHO (2018) EWARS Epidemiological Bulletin-Cox's Bazar, W47 25 Nov 2018
[15] WHO (2018) Situation Report: Rohingya Refugee Crisis, Nov 15 (51)
[16] USAID (2015-2016) Myanmar Demographic and Health Survey

programmes (OTPs), targeted supplementary feeding programmes (TSFPs), and blanket supplementary feeding programmes (BSFPs). Stabilization centres function for the treatment of acute malnutrition with medical complications, OTPs for the treatment of severe acute malnutrition without medical complications, TSFPs for the treatment of moderate acute malnutrition, while BSFPs work to prevent acute malnutrition in general. These key programmes are further strengthened by screening and referral mechanisms, Infant and Young Child Feeding in Emergencies (IYCF-E) support, deworming services, immunization campaigns, micronutrient supplementation interventions and iron-folic acid supplementation for adolescent girls and pregnant and lactating women.

Based on Table 2 below, in the Makeshift Settlements, the number of SC's decreased from Round 2 (6) to Round 3 (4) whereas the number of OTP's (R2,52 vs R3,58), TSFP's (R2,18 vs R3,29), and BSFP's (R2,18 vs R3,29) all increased from the Round 2 assessment. In comparison to Round 2, the number of all treatment facilities/programmes, with the exception of SC's, had increased in proportion to the number of children 6-59 months, suggesting better availability and accessibility of services to the population. For example, the number of OTP's in the Makeshift Settlements increased from 52 to 58, the proportion increasing from 1 per 3 166 children 6-59 months to 1 per 2 700 children 6-59 months. Although the number of OTP's, TSFP's, and BSFP's in proportion to the population has increased other factors relevant to programme coverage, such as community sensitization, service delivery, centre capacity, and screening activities must also be considered.

In Round 3 the number of SC's (1), OTP's (1), TSFP's (2), and BSFP's (2) in Nayapara RC stayed the same. The population of children 6-59 months increased from Round 2 to Round 3; therefore, the number of treatment facilities/programmes in proportion to the number of children 6-59 months decreased.

Table 2: Scale-up of Nutrition Treatment Centres in the Makeshift Settlements and Nayapara Refugee Camp, Round 2 and Round 3

	Makeshift Settlements		Nayapara Refugee Camp	
	Round 2 April-May 2018	Round 3 Oct-Nov 2018	Round 2 April-May 2017	Round 3 Oct-Nov 2018
Estimated number of children 6-59 months*	164,647	156,633	3,029	4,908
Number of SCs	6	4	1	1
Number of SCs per child 6-59 months	1/ 27,411	1/ 39,158	1/ 3,029	1/ 4,908
Number of OTPs	52	58	1	1
Number of OTPs per child 6-59 months	1/ 3,166	1/ 2,700	1/ 3,029	1/ 4,908
Number of TSFPs	18	29	2	2
Number of TSFPs per child 6-59 months	1/ 9,147	1/ 5,401	1/ 1,515	1/ 2,454
Number of BSFPs	18	29	2	2
Number of BSFPs per child 6-59 months	1/ 9,147	1/ 5,401	1/ 1,515	1/ 2,454

**Round 2 derived from IOM Needs and Population Monitoring estimates and Round 3 from UNHCR Pop Data used for JRP (Oct 31, 2018)*

1.1.6 Food Assistance

Food assistance and humanitarian support is a necessity for the Rohingya living in the camps as they do not have access to land and most do not have any source of income.

WFP has supported much of the population through general food distribution (GFD) or vouchers (e-voucher SCOPE card or paper voucher) since the August 2017 influx with Save the Children, Mukti, ACF, and SHED being the current implementing partners. The WFP GFD consists of an in-kind donation of food consisting of rice, pulses and vegetable oil and the e-voucher includes a list of 18[17] food items where beneficiaries purchase food from validated WFP-supported vendors. In November 2018, the Food Security Sector reported that 952 714 refugees received regular food assistance, including GFD and e-vouchers[18]. WFP has been scaling up the e-voucher programme with the goal of near universal coverage in the Makeshift camps as is found in Nayapara RC where the e-voucher programme started in 2014. The most significant obstacle to achieving this goal is lack of funding[19].

In addition to the food assistance provided by WFP, ICRC/IFRC in collaboration with the Bangladesh Red Crescent are supporting food assistance to refugees not covered under the WFP program. Complementary food assistance through vouchers to enhance diet diversification (and supplementing GFD) is also being implemented by ACF, Oxfam, ICON, World Vision International and Handicap International.

1.1.7 Health Campaigns

In response to the evolving emergency, mass vaccination and health campaigns have taken place to prevent or counter outbreaks. The most recent health campaigns pertaining to indicators included in Round 3 are listed below:

- Measles Rubella (MR) [20]: Nov 18-Dec 5, 2017 and included 354 982 children
- Vitamin A[21]: July 14-19, 2018 and included 232 249 children
- Penta (including diptheria) [22]: March 10-31, 2018 and included 172 432 children

Additional background information pertaining to humanitarian sectors and indicators not included in the current assessment can be found on the Bangladesh Humanitarian Response website[23].

[17]Rice (3), lentils, iodized salt (2), vegetable oil (2), sugar, dried fish (4), small shrimp, fresh spinach (3), potato (2), onion, garlic (2), chillis, chili powder, turmeric powder, egg, lemon, YSP, pumpkin

[18] ISCG (2018) Situation Report: Rohingya Refugee Crisis, 15 Nov, 2018

[19] ISCG (2018) Situation Report: Rohingya Refugee Crisis, 15 Nov, 2018

[20] Bangladesh MoH&FW (2018). Forcibly Displaced Myanmar National to Bangladesh- Health Situation & Intervention Update.

[21] Unicef (2018). Humanitarian Situation Report No. 37, August 2018.

[22] Bangladesh MoH&FW (2018). Forcibly Displaced Myanmar National to Bangladesh- Health Situation & Intervention Update.

[23] Humanitarian Response (2018). Bangladesh: www.humanitarianresponse.info/en/operations/bangladesh

1.2 Survey Justification

Violence in Rakhine State, Myanmar, which began on 25 August 2017 has driven more than 700 000 Rohingya across the border into Cox's Bazar, Bangladesh. Those fleeing the violence, join an estimated 200 000 people who had fled in earlier waves of displacement. The two pre-existing registered camps, Kutupalong and Nayapara, and Makeshift Settlements have expanded with the new influx. New spontaneous settlements have also formed and are quickly growing. The dense concentration has put immense strain on infrastructure and services.

To estimate the nutritional status of Rohingya in Cox's Bazar, the Emergency Nutrition Assessment Round 2 applying the SMART methodology was conducted in May 2018. The key results from the Emergency Nutrition Assessment Round 2 are presented in Table 3 below.
Reported GAM by WHZ in Makeshift Settlements, 12% [9.4-15.0], and Nayapara RC, 13.6% [10.1-18.1] were both considered 'high' based on WHO thresholds and chronic malnutrition approached the 'emergency' threshold (>40%) in Makeshift Settlements, 37.5% [33.0-42.5], and exceeded the 'emergency' threshold in Nayapara RC, 40.4% [34.7-46.3]. The prevalence of anaemia among children 6-59 months was considered 'medium (20.0%-39.9%)' in both the Makeshift Settlements, 32.3% [27.8-37.1], and Nayapara RC, 29.4% [24.3-35.0] based on WHO classification of public health significance.

Table 3: Key Results from the Emergency Nutrition Assessment Round 2, May 2018

Indicator	Sample	Makeshift Settlements		Nayapara RC	
		%	95% CI	%	95% CI
% Children <5 years	Households	20.2%	[18.9-21.5]	12.4%	[11.2-13.8]
Average HH size (SD)		5.0 (2.3)		5.3 (2.3)	
CDR		0.38	[0.23-0.64]	0.21	[0.11-0.42]
U5DR		0.86	[0.37-1.94]	0.22	[0.04-1.26]
GAM (WHZ)	Children 6-59 months	12.0%	[9.4-15.0]	13.6%	[10.1-18.1]
SAM (WHZ)		2.0%	[1.1-3.6]	1.4%	[0.6-3.6]
GAM (MUAC)		4.3%	[3.2-5.9]	3.6%	[2.0-6.5]
MUAC <210mm	Women 15-49 years	2.6%	[1.6-4.2]	2.4%	[1.5-3.9]
MUAC <110mm	Infants 0-5 months	15.1%	[7.4-28.5]	17.7%	[0.8-35.2]
Stunting (HAZ)	Children 6-59 months	37.7%	[33.0-42.5]	40.4%	[34.7-46.3]
Anaemia (Hb<11.0 g/dL)		32.3%	[27.8-37.1]	29.4%	[24.3-35.0]
Diarrhea		20.9%	[17.4-24.8]	23.9%	[19.3-29.3]
ARI		26.1%	[21.1-32.0]	21.5%	[17.1-26.7]
Fever		40.0%	[34.6-46.0]	40.5%	[34.9-46.3]

Given the serious levels of malnutrition identified in Round 2, there remained a need to monitor the nutritional status of Rohingya as the humanitarian response evolves. The Nutrition Sector agreed to conduct an Emergency Nutrition Assessment Round 3 approximately six months following the Round 2 assessment.

1.3 Survey Objectives

This Emergency Nutrition Assessment Round 3 aims to determine the nutrition status of children under 5 and women of childbearing age, as well as select indicators of morbidity, mortality, access to health services and access to food assistance. Demographic data collected through the survey will also help in planning and targeting humanitarian interventions. The assessment is designed to provide estimates separately for Nayapara Registered Camp, Kutupalong Registered Camp and the Makeshift Settlement outside of the two registered camps. The assessment is not designed to provide separate estimates for each of the new makeshift/informal camps.

This SMART assessment was implemented concurrently with the Refugee Emergency Vulnerability Assessment (REVA) to understand the linkages between food security and nutrition properly to meet programme information. Bangladesh Institute of Development Studies (BIDS) implemented the REVA assessment with technical support from WFP and International Food Policy Research Institute (IFPRI) with financing from WFP. The main purpose of the SMART and REVA integration is to implement a large-scale food security and nutrition survey to assess the severity of malnutrition as well as food insecurity and other basic needs of the displaced Rohingya communities. To materialize this collaboration, the REVA assessment followed the SMART sampling procedure and schedule to enable to conduct the assessment at the same households on the same day. The results of the REVA assessment will be available in a separate report.

The specific objectives of the Emergency Nutrition Assessment were as follows:

Demography and Food Receipts

- To estimate the household demographic composition (age and sex distribution, proportion of pregnant and lactating women) of the assessment population.
- To estimate crude mortality rate and under five death rate disaggregating by cause of death.
- To estimate the proportion of households receiving food assistance through General Food distributions (GFD) and/or E-vouchers in the past month.

Children Under 5 years: Anthropometry and Anaemia

- To estimate mean MUAC of infants <6 months using Mid-Upper Arm Circumference (MUAC)
- To estimate the prevalence of Global Acute Malnutrition (GAM), including MAM and SAM, by Weight for Height Z- Score (WHZ) and MUAC among children aged 6 to 59 months
- To estimate the prevalence of stunting in children aged 6-59 months
- To estimate the prevalence of underweight in children aged 6-59 months
- To estimate the prevalence of total, mild, moderate and severe anaemia in children aged 6-59 months

Children 6–59 months: Morbidity, Vitamin A and MNP supplementation

- To determine the two-week period prevalence of diarrhea among children aged 6-59 months

- To determine the two-week period prevalence of acute respiratory illness among children aged 6-59 months
- To determine the prevalence of diphtheria among children aged 6-59 months since arriving in Bangladesh
- To determine the two-week period prevalence of fever (without respiratory symptoms nor rash) among children aged 6-59 months
- To determine the prevalence of fever with rash (suspected measles) among children aged 6-59 months since arriving in Bangladesh
- To determine health care seeking behaviour amongst caregivers of children 6-59 months who have been ill in the previous 2 weeks.
- To estimate proportion of children 6-59 months that received Vitamin A supplementation in the past 6 months
- To estimate the proportion of children 6-59 months that received at least 1 sachet of micronutrient powder since the start of the recall period.

Women of reproductive age (15-49 years): **Anthropometry, Anaemia and Other:**

- To estimate the nutrition status of women of reproductive age based on low MUAC (<210mm) disaggregated by pregnant and lactating women.
- To estimate the prevalence of total, mild, moderate and severe anaemia in non-pregnant non-lactating women aged 15-49 years.
- To estimate the proportion of pregnant women accessing ANC services
- To estimate the proportion of women of reproductive age 15-49 years receiving iron – folic acid supplementation tablets.

2. METHODOLOGY

2.1 Type of Survey and Target Population

Both surveys were cross-sectional household surveys conducted using the SMART survey design for anthropometric and mortality data.

For the Makeshift Settlements, households were selected using two-stage cluster sampling among refugees residing in Ukhia and Teknaf Upazilas, yet outside of Kutupalong RC, Nayapara RC, and host communities. Camps in the Makeshift Settlements were sub-divided into existing blocks and sub-blocks (local-blocks). The median sub-block size was 109 households (ranging from 12 to 1519 households). The primary sampling unit (PSU) or cluster were sub-blocks, and the basic sampling unit (BSU) was the household. Households were then selected from each cluster using simple random sampling (SRS). Rohingya refugees that were absorbed by the host communities were excluded from the assessment due to difficulties in locating as well as ethical concerns. Total makeshift settlement sampling frame population was derived from IOM Needs and Population Monitoring Round 12 estimates[24]. These estimates concluded the total population of the Makeshift Settlements was 867 687. Enumeration of households in selected clusters took place approximately 10 days prior to the start of data collection on October 20th. In the Makeshift Settlements there were no exclusions due to inaccessibility.

[24] IOM (2018) Bangladesh, Needs and Population Monitoring (NPM) Site Assessment: Round 12, Aug 9 to Sept 4, 2018

For Nayapara RC, households were selected by SRS. The PSU was the household. The sampling frame was updated to include registered refugee households in the UNHCR proGres database as of September 30, 2018 (n=3 654 households) as well as household enumeration lists created to capture unregistered persons (n=372 households). Newly arrived households were enumerated from October 19-20, 2018 approximately 10 days before the start of data collection; therefore, the total number of households included in the sampling frame was 4 026. Using the average household size for the Round 3 assessment, 5.6, the estimated population of Nayapara RC was 22 545. In Nayapara RC there were no exclusions due to inaccessibility.

For both survey areas, all households were listed and eligible for random selection regardless of registration status or date of arrival. While survey teams surveyed every selected household regardless of household demographics, the target population for anthropometric indicators was children 6-59 months (0-5 months included MUAC as well) and women 15-49 years. All age-eligible women and children were included in the sample.

The Refugee Influx Vulnerability Assessment (REVA) was conducted in tandem with the Emergency Nutrition Assessment data collection. The REVA utilized the same sampling frame and selected households for the Makeshift Settlements and Nayapara RC. For the REVA, data was collected at the household level on the same day as the Emergency Nutrition Assessment. The results of the REVA will be available in a separate report.

Important Note: This assessment was originally planned to include a third survey in Kutupalong Registered Camp, for comparability with the Round 1 assessment (due to extenuating circumstances Kutupalong RC was not included in Round 2). However, teams encountered high rates of refusals due to several factors such as fears of loss of benefits, loss of refugee status, relocation or repatriation among other factors which made the households reluctant to share family information. In response to these difficulties a series of timely meetings were held with the Kutupalong RC Camp in Charge, block leaders, community leaders, and community members facilitated by ACF, UNHCR, UNICEF, WFP, and TAI as well as an attempt to utilize local TAI community mobilizers to accompany teams during data collection. Despite efforts to sensitize the Kutupalong RC community on the objectives of the survey, there were no indications that the environment was improving and on the second attempt of data collection there was over 50% household refusal. As a result of these extenuating circumstances, as well as the risk of harming future relations, **it was decided by the Nutrition Sector that Kutupalong RC would not be included in the assessment.**

2.2 Sample Size Calculation

Parameters used to calculate sample size for anthropometry and mortality as supported by survey assumptions and sources of information to inform decision-making were summarized in Table 4 and Table 5 below. All calculations were made using the most recent version of Emergency Nutrition Assessment (ENA) software for SMART (version 9th July 2015). The sample sizes were designed to achieve adequate precision and representativeness of the Rohingya population across the Makeshift Settlements and Nayapara RC.

Table 4: Sample Size Calculation Parameters Anthropometry

Parameter	Makeshift Settlements	Nayapara Registered Camp	Assumptions / Source of Information
Estimated Prevalence of GAM	12%	13.6%	Prevalence of GAM from April – May 2018 SMART survey were as follows: Makeshift 12.0%, and Nayapara 13.6%.[25]
Desired Precision	3.5%	4.0%	Based on SMART guidance to allow for sufficiently precise estimates per survey.
Design Effect	1.4	1.0	SRS method used in NYP RC. Design effect in makeshift during April- May 2018 SMART survey was 1.08[26]. Higher DEFF estimated based on Round 1,2
Children to be Included	**505**	**282**	
Average Household size	4.3	4.7	Demographic information from UNHCR Population Data and Key Demographic Estimates (Updated August 31, 2018[27])
% of Children Under Five	18.8%	12.6%	
Non-Response Rate	6%	8%	Movement has stabilized since November 2017. Non-response estimate based on Round 2 Assessment in April-May, 2018 (Nayapara-7.8% MS-5.6%) but rounded up to account for possible flood or movement. Based on previous high non-responder rate encountered in round 1 (28% NRR due to movement) and round 2 (20% relocation related systematic refusal).
Households to be Included	**738**	**575**	

[25]ACF (2018). Round 2 Emergency Nutrition Assessment Cox's Bazar. April – May 2018 https://www.humanitarianresponse.info/en/operations/bangladesh/assessment/smart-nutrition-assessment
[26] ACF (2018). Round 2 Emergency Nutrition Assessment Cox's Bazar. April – May 2018 https://www.humanitarianresponse.info/en/operations/bangladesh/assessment/smart-nutrition-assessment
[27] UNHCR (2018) Population Data and Key Demographic Estimates https://data2.unhcr.org/en/situations/myanmar_refugees

Table 5: Sample Size Calculation Parameters Mortality

Parameter	Makeshift Settlements	Nayapara Registered Camp	Assumptions / Source of Information
Estimated Death Rate per 10 000/day	0.4	0.5	Estimated death rate derived from the Round 2 Assessment results Makeshift 0.38/10,000/day (0.11-0.42) and NYP RC 0.21/10,000/day (0.23-0.64)[28]
Desired Precision per 10 000/day	0.35	0.35	Based on SMART guidance to allow for sufficiently precise estimates per survey.
Design Effect	1.4	1.0	SRS method used in NYP RC. Design effect in makeshift during April- May 2018 SMART survey was 1.08[29]. Higher DEFF estimated based on Round 1,2.
Recall period in days	132	141	Eid Ul Fitr (June 16, 2018) was used as the beginning of the recall period considering it is the most memorable religious festival for Muslims. The midpoint of data collection was anticipated to be October 26th for the Makeshift Settlements and November 4th for NYP RC.
Population to be Included	**1,448**	**1,112**	
Average Household size	4.3	4.7	Demographic information from UNHCR Population Data and Key Demographic Estimates (Updated Aug 31, 2018[30])
Non-Response Rate	6%	8%	Movement has stabilized since November 2017. Non-response estimate based on Round 2 Assessment in April-May, 2018 (Nayapara-7.8% MS-5.6%) but rounded up to account for possible flood or movement. Based on previous high non-responder rate encountered in round 1 (28% NRR

[28] ACF (2018). Round 2 Emergency Nutrition Assessment Cox's Bazar. April – May 2018 https://www.humanitarianresponse.info/en/operations/bangladesh/assessment/smart-nutrition-assessment
[29] ACF (2018). Round 2 Emergency Nutrition Assessment Cox's Bazar. April – May 2018 https://www.humanitarianresponse.info/en/operations/bangladesh/assessment/smart-nutrition-assessment
[30] UNHCR (2018) Population Data and Key Demographic Estimates https://data2.unhcr.org/en/situations/myanmar_refugees

			due to movement) and round 2 (20% relocation related systematic refusal).
Households to be Included	**358**	**257**	

Sample Size for Additional Indicators

The sample sizes above were calculated to achieve adequate precision for acute malnutrition (GAM by WHZ) and mortality in the Makeshift Settlements and Nayapara RC. SMART methodology recommends calculating sample size for anthropometry and mortality exclusively. For some additional indicators these sample sizes were not specifically calculated to achieve high precision in estimation.

Anaemia was assessed for all 6-59 month children from the randomly selected households (same children anthropometric measurements were taken) in the Makeshift Settlements and Nayapara RC. For non-pregnant non-lactating women 15-49 years, half of the randomly selected households in the Makeshift Settlements and Nayapara RC were selected for testing anaemia based on the SENS guideline for determining household sampling size in surveys with the objective of surveillance of anaemia[31]. The household sample size for testing anaemia in NPNL women 15-49 years in Makeshift camp was 369 households and 129 households in Nayapara RC.

2.3 Sampling

2.3.1 Cluster Selection

Only the Makeshift Settlements Survey applied a cluster sampling strategy. A sample size of 738 households for anthropometry and 358 households for mortality was calculated based on the chosen parameters (see Tables 4,5 above). As per the SMART methodology, the larger sample was selected, which was 738 households. According to the survey planning, it was estimated that teams could visit approximately **14** houses per day. This calculation was based on a work day from 7am to 6pm (660 minutes), assuming approximately 3 hours (180 mins) of transport time (including driving to and from the camps and walking to reach clusters), 1hour (60 mins) of breaks (lunch and rehydration stops), approximately five minutes walking between households and 25 minutes per household for the survey and measurements. An advanced team gathered and updated household listings before the survey team arrived at each cluster.

Therefore, 738 households / 14 households per day = 52.7 clusters

The number of clusters was rounded up to 53 to achieve sufficient sample

The sampling frame included all Rohingya persons within these settlements regardless of registration status or date of arrival. Clusters selected from a complete list of sub-blocks were assigned using population proportional to size (PPS) per ENA software. Reserve clusters were

[31] UNHCR (2013). UNHCR Standardized Expanded Nutrition Survey (SENS) Guidelines for Refugee Populations. Version 2, 2013.

not implemented as more than 80% of the sample size for children was reached. A complete list of selected clusters is available in Annex 2.

2.3.2 Household Selection

A household (HH) was defined as a group of people who live together and share resources. A person was considered a member of the household if they had spent a minimum of the three nights prior with the household. Household members who had both arrived and departed during the recall period starting 16th June, 2018 (not present at the onset of the recall period and not a household member at the time of surveying) were not considered members of the household.

Households were randomly selected from the updated household lists. Abandoned households were replaced by random sampling and absent households were not replaced.

In the Makeshift Settlements, household lists per selected cluster were created in advance of data collection. On the day of data collection after it was confirmed no households had left or joined the camp, 14 households were selected using a random number generator. With 53 clusters and 14 households per cluster, this resulted in a sample of 742 households, in slight excess of the ENA Software calculated sample of 738.

In Nayapara RC, UNHCR randomly selected 522 households from the proGres database. From the enumerated lists, 53 unregistered households were randomly selected. Together this resulted in a total sample of 575 households, with a ratio of registered to unregistered households proportional to the overall camp population. All households were eligible regardless of registration status, date of arrival, or presence of children. Survey teams attempted to survey 16 randomly selected households daily. The rationale for attempting 16 households per day as opposed to 14 as in the Makeshift Settlements was that less driving time was required each day and also because the teams would be more efficient collecting data as Nyapara RC was the second survey. Efforts were made to revisit absent households twice at minimum.

Systematic random sampling was implemented to select the households to conduct anaemia testing for non-pregnant non-lacting women 15-49 years. This resulted in every second household that was randomly selected in the Makeshift Settlements and Nayapara RC.

2.3.3 Selection of Individuals to Survey

All consenting children 6-59 months of age present within selected households were measured for anthropometry (also MUAC for 0-5 months) and tested for anaemia (6-59 months). All consenting women 15-49 years of age present within selected households were measured for MUAC and non-pregnant non-lactating women were also tested for anaemia. Efforts were made to return to households to measure children and women that were absent at the time of the interview.

In certain cases, anthropometric data of age-eligible children were not collected:

- If a child was absent from a household during the visit, could not be located by a family member, and was not found after revisiting the household.
- If a child presented with a handicap or physical malformation which would affect the accuracy of an anthropometric measurement.

In this context, there were generally no problems with weighing the children 6-59 months without clothing. Where there was hesitation, children were weighed in another room with just the

caregiver and a female team member for privacy. The only item that was left on children was a single string tied around the waist called "*tabiz"* which holds religious significance and would require cutting to remove. Despite sometimes including small bells, the tabiz were left on all children, and due to their lightweight (<15 grams) they were not corrected for.

During the survey, children suffering from acute malnutrition based on weight for height using a field weight-for-height z-score table, MUAC <125 mm, and/or presence of oedema, and women with low MUAC (MUAC <210 mm), were referred to the nearest appropriate nutrition programme centre if not already enrolled. The referral form is available in Annex 3.

2.4 Collected Variables

See Annex 14 for thresholds and classifications for indices included in the assessment.

2.4.1 Anthropometry

- **Age** was recorded among children 0-59 months as a date of birth (day/month/year) only if the information was confirmed by supportive documentation such as vaccination or birth registration cards. Where documentation was unavailable, age was estimated using a local calendar of events and recorded in months. Only children 0-59 months were eligible for the nutrition survey. The complete local events calendars for October and November 2018 are available in Annex 4.
- **Weight** was recorded among children 6-59 months in kg to the nearest 0.1kg using an electronic SECA scale with the 2-in-1 (mother/child) weighing function. Children who could easily stand still were weighed on their own. When children could not stand independently the 2-in-1 weighing method was applied with the help of a caregiver. All children were measured without clothes and weight was taken 2-3 times to ensure accuracy. Two team members worked in unison to take the measurements of each child.
- **Height/ Length** was recorded among children 6-59 months in cm to the nearest 0.1cm. A UNICEF height board was used to measure bareheaded and barefoot children. Children less than 2 years were measured lying down (length) and those over 2 years were measured standing up (height). Two team members worked in unison to take the measurements of each child.
- **MUAC** was recorded in children 0-59 months and women 15-49 years to the nearest mm. All subjects were measured on the left arm using standard MUAC tapes. Two team members worked in unison to take the measurements of each child.
- **The presence of oedema** among children 6-59 months was recorded as "yes" or "no". All children were checked for the presence of oedema by applying pressure with thumbs for three continuous seconds on the tops of both feet. Any suspected cases required confirmation by a supervisor or survey manager.

2.4.2 Anaemia, Antenatal care, Iron-Folic Acid

- **Anaemia** was determined among children 6-59 months and non-pregnant non-lactating women 15-49 years according to blood hemoglobin content which was measured utilizing HemoCue (Hb 301) tests. See Annex 14 for Thresholds.
- **Antenatal care** service was assessed by asking pregnant women if they are currently enrolled in an ANC programme.

- **Iron-Folic Acid tablets** was assessed by asking women of reproductive age (15-49 years) if they are currently receiving iron-folic acid tablets.

2.4.3 Morbidity, Vitamin A and MNP Supplementation

- **Diarrhea** was assessed among children 6-59 months by a two-week recall. Diarrhea was defined as the passage of three or more loose or liquid stools in a day.
- **Cough** (with fever) was assessed among children 6-59 months by a two-week recall, defined as cough (with rapid or difficulty breathing) and fever. This indicator was used as a proxy for suspected **ARI** or pneumonia.
- **Fever** (without cough and rash) was assessed among children 6-59 months by a two-week recall, defined as fever in the absence of respiratory symptoms (cough). This indicator was used as a proxy for suspected malaria.
- **Fever** (with a rash) was assessed among children 6-59 months since arriving in Bangladesh. This indicator was used as a proxy for suspected **measles**.
- Suspected **Diphtheria** was assessed among children 6-59 months since arriving in Bangladesh, described as a swelling of the lymph nodes, confirmed by hospital document or household recall.
- **Health Seeking Behaviours** were assessed by asking caregivers of children 6-59 months who reported symptoms of diarrhea, cough, or fever during the two-week recall if they had sought treatment for the child. Categories of response included hospital or clinic, community or traditional healer, no care sought, don't know.
- **Vitamin A** was assessed by asking caregiver if the child received Vitamin A in the past 6 months. Vitamin A capsules were shown to the caregiver.
- **MNP** was assessed by asking caregiver if the child had received at least 1 sachet of micronutrient powder since the start of the recall period.

2.4.4 Receipt of Rations

- **Presence of a GFD ration card** in the households was visually confirmed.
- **Receipt of GFD** use of a ration card to acquire food over the previous month was visually confirmed by notation on ration card.
- **Presence of an e-voucher or SCOPE card** in the households was visually confirmed.
- **Use of an e-voucher or SCOPE card** to purchase food over the previous month was confirmed by household recall.

2.4.5 Retrospective Mortality

Age and sex of all household members present during the recall period were collected. Any household members which were born, joined, left, or died since the beginning of the recall period were recorded. The recall period began June 16, 2018. Eid Ul Fitre is a highly memorable event which supports quality recall data.

- **Household composition** information collected to evaluate average household size, population age categories (0-4 years, 5-10 years, 11-17 years, 18-59 years, and 60+ years), and the proportion of pregnant and lactating women.

- **Crude death rate** (CDR) defined as the number of deaths from all causes per 10 000 people per day. Deaths verified by household recall.
- **Under five death rate** (U5DR) defined as number of deaths among children under five from all causes per 10,000 people per day. Deaths verified by household recall.

2.5 Questionnaire, Training, and Supervision

2.5.1 Questionnaire

The survey questionnaire was developed by ACF Bangladesh in close collaboration with the Nutrition Sector and the ATWG. The paper questionnaire was then translated into xls script by ACF using the Round 2 version created by partners from the CDC as a template. Data was collected on tablets (Lenovo) utilizing the KoboToolbox application. All teams carried a back-up tablet and hard copies of the questionnaire in the event of tablet failure. The questionnaire had been translated from English into Bangla and back-translated to test translation accuracy and cultural appropriateness. A field test was conducted in order to pilot the questionnaire and confirm team comprehension of the methodology. The questionnaires were administered in the local Chittagonian language, however, as the languages are very similar and the Rohingya language is rarely written. The full survey questionnaire is available in Annex 6, the cluster control form in Annex 7, anthropometric form for children 0-59 months in Annex 8, and the anthropometric form for women 15-49 years in Annex 9.

2.5.2 Training

All assessment surveyors and supervisors (32 persons) participated in a 5-day training from 14-18 October 2018. The Round 3 assessment used many of the same surveyors as the Round 1 and 2 Assessment (50%) and nearly all surveyors had implemented multiple recent SMART surveys with ACF Bangladesh.

The training was led by ACF survey manager and included a pre-test, classroom instruction, role-playing, small group work, a standardization test, a field test, and a final post-test. Staff from the REVA also attended relevant training sessions. The pre-test and post-tests were administered to gauge the level of comprehension prior to and upon completion of the training. During the training, survey team members were trained on the survey objectives, the SMART methodology, household selection, gaining proper consent, anthropometric measurements, hemoglobin measurement, questionnaire content, and mobile data collection. The training schedule is included in Annex 10.

The quality of anthropometric measurement was assessed through a standardization test. The standardization test was conducted with ten healthy 6-59 month children and their accompanying caregivers who were not included in the assessment. All children were measured twice by surveyors in order to ensure the accuracy and precision of measurement taking. The standardization test results are included in Annex 11.

The field test was conducted the day following the standardization test in a Kutupalong makeshift site. Team roles were designated based on the standardization test results and team dynamics during the field test. Additional surveyors who completed the training remained on call as reservists in case support was needed or a surveyor fell ill during data collection.

2.5.3 Survey Teams and Supervision

Data collection was conducted from October 20-31, 2018 in the Makeshift Settlements and November 1-8, 2018 in Nayapara RC. In the Makeshift Settlements, each of the six teams surveyed 1 cluster of 14 households and each cluster was finished in one day. In Nayapara each team attempted to survey 16 households per day. Each team was composed of four team members, with the following designated roles:

- **Team leader and measurer:** identified households, took anthropometric measurements of children 0-59 months, coordinated and supported the team
- **Interviewer:** confirmed household listing of family members by measure assistant, conducted verbal interview while entering data into the tablet.
- **HB measurer:** administered finger prick and assessment of hemoglobin status of children 6-59 months and non-pregnant non-lactating women 15-49 years and measured women's MUAC.
- **Measurer assistant:** gained consent and created household listing of family members, assisted in taking anthropometric measurements.

The supervision of the survey teams during the assessment consisted of five supervisors from ACF, UNICEF, UNHCR, Terre Des Hommes, and BRAC. In addition, the ACF Survey Manager was in the field for every day of the Makeshift Settlements survey with the exception of the last day and the Tech-RRT Assessment Advisor accompanied the teams in the field for the last day of the Makeshift Settlements survey and for four days during the Nayapara RC survey data collection. Nutrition Sector partners also conducted ad-hoc monitoring visits throughout data collection.

Survey teams were supervised on a daily basis, with at minimum one supervisor or survey manager per team on a rotating basis in order to ensure consistency in data collection across all teams. All data were uploaded and reviewed daily in order to monitor the quantity and quality of data collected.

During supervision:

- Household selection was observed to assure compliance with the SMART methodology
- Precise measurement taking, proper completion of forms, accurate entry of data into tablets, and quality of interview were regularly monitored by supervisors
- Supervisors were prepared to confirm cases of oedema in case any were identified

Survey managers and supervisors debriefed the Survey Team on a daily basis in order to maintain an open feedback loop from survey teams to supervisors.

2.6 Data Management

Data were collected in two forms: a paper copy with anthropometric data for children 0-59 months and women 15-49 years, and an electronic copy of all collected data entered into tablets. The data were uploaded daily to a secure server, and paper copies were submitted to the survey manager. Daily random checks of entered data were conducted by the survey manager in addition to a daily plausibility check of anthropometric data to assess and assure continued data quality. Supervisors and team leaders played an important role in assuring quality data collection at the field level.

All anthropometric and mortality data were analyzed using the most recent ENA for SMART software (version July 9th, 2015); SMART flags were used for exclusion of z-scores out of range values (+/-3 and +/-3 from the observed survey mean). All other indicators were analyzed using Epi Info version 7.2.2.6. The CDC Statistical Calculator for Two Surveys was used to identify statistical significance of relevant indicators between Rounds 1,2,3 as well as relevant indicators within Round 3. For example, to identify whether there was a significant difference in stunting between boys and girls in Round 3.

2.7 Ethical Considerations

Prior to data collection, the assessment team received approval from the Institute of Public Health followed by the Civil Surgeon and the Rohingya Refugee Repatriation Commissioner's Office and lastly the Camps In-Charge.

All participants were asked to consent verbally after the objectives of the survey were clearly explained and before any data were collected. The households maintained their right to refuse the survey and women had the right to refuse to partake in the interview without a male family member present. All participation was voluntary. Children were always measured in the presence of a parent or older member of the family. All data was securely stored during and after the assessment.

RESULTS

Makeshift Settlements

Round 3, Oct 20th- Oct 31st 2018

3. RESULTS

3.1 Round 3 Makeshift Settlements (MS)

3.1.1 MS Sample

In the Makeshift Settlements (MS), all 742 planned households were visited. Among those, 53 households were absent and 25 households refused to participate. There was a total of 682 eligible children 6-59 months who were considered current members of the 664 surveyed households (1.03 per household). Among those, 42 were absent (33 at relatives, 9 at hospital); therefore, 93.8% (640 children) of eligible children were considered for anthropometry.

Overall, a sufficient number of households and children were surveyed, as demonstrated in Table 6 below. According to the SMART Methodology, a minimum of 90% of clusters and 80% of the child sample size must be achieved to ensure data quality and representativeness. In the Makeshift Settlements, 100.0% of planned clusters and 126.1% of planned children 6-59 months were surveyed, well above the SMART Methodology cut-offs. With 664 households surveyed out of 742 attempted, the nonresponse rate was 10.5% in the Makeshift Settlements.

Table 6: MS Proportion of Clusters, Households, and Children 6-59 Months Surveyed for Round 3

Planned Clusters	Surveyed Clusters	Percentage Surveyed / Planned	Planned Households	Surveyed Households	Percentage Surveyed / Planned	Planned Children 6-59 Months	Measured Children 6-59 Months	Percentage Measured / Planned
53	53	**100.0%**	742	664	**89.5%**	505	640	**126.7%**

3.1.2 MS Demography

The arrival status of Rohingya refugees is presented in Table 7 below. All households surveyed in the Makeshift Settlements were unregistered refugees. Just over 90% of households surveyed had arrived after the violence on the 25th August 2017, consistent with reports of the largest influx in the months following August 2017. Only one household reported having arrived after 1 January 2018.

Table 7: MS Households Arrival Status for Round 3

Arrival Status	Households Surveyed
Prior to October 2016	39 (5.9%)
October 2016 to 24 August 2017	23 (3.5%)
25 August 2017 to 31 December 2017	601 (90.5%)
1 January 2018 to date of survey	1 (0.2%)
Total	**664 (100%)**

In Table 8 below the average household size for the Makeshift Settlements was 5.3 people per household and the proportion of children under 5 years in the surveyed population was 20.7% [19.2-22.2] while a total of 9% of the surveyed population were pregnant and or lactating.

Table 8: MS Demography for Round 3

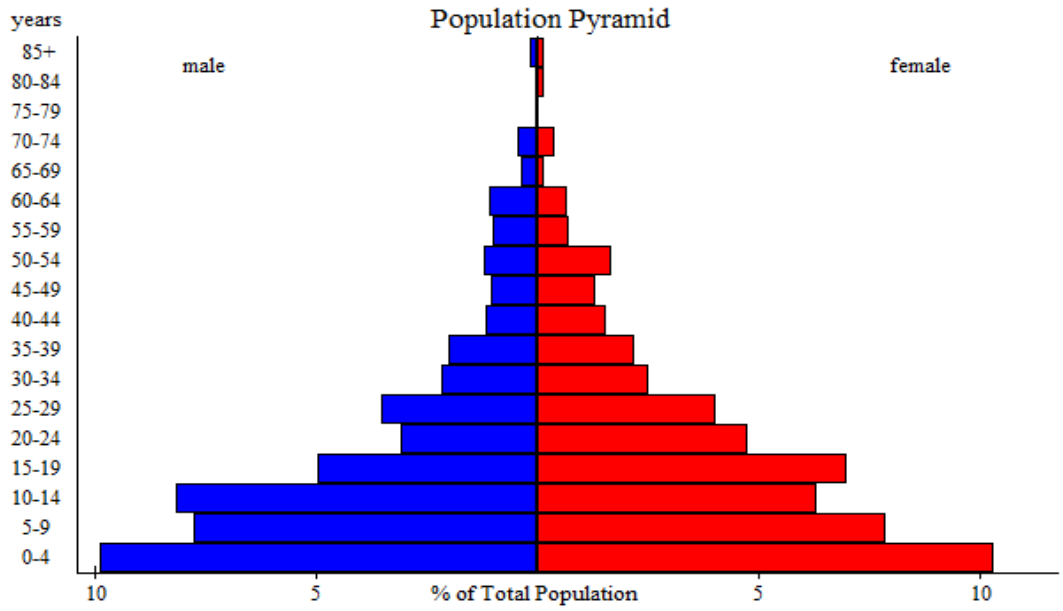
Total Population	Round 3 Oct 2018
All household members*	3573
Average household size	5.3
Population Subset	% [95% CI]
<5 years	20.7% [19.2-22.2]
5-10 years	20.3% [19.1-21.6]
11-17 years	16.2% [14.7-17.6]
18-59 years	39.0% [37.6-40.5]
≥60 years	3.7% [3.1-4.3]
Female	52.0% [50.5-53.5]
Women 15-49 Years	23.2% [22.2-24.1]
Pregnant and lactating women	9.0%
Pregnant women	2.8%
Lactating women	6.3%
Lactating w/child < 6 months	1.6%
Lactating w/child ≥ 6 months	4.7%

**Demographics include all current household members, regardless of presence at the time of interview*

The proportion of male to female for the surveyed population was 48% vs 52%. The overall distribution of the population pyramid presented in Figure 3 below reveals a wide base at 0-4 years and narrowing distribution among older age groups indicating a high growth population[32].

[32] UN Population Division (2015) Regional Workshop on the Production of Population Estimates and Demographic Indicators, Addis Ababa, 5-9 October 2015
www.un.org/en/development/desa/population/events/pdf/other/11/ppt_AgeSexEvaluation.pdf

Figure 3: MS Population Pyramid for Round 3



Among the sample of children 6-59 months by sex and age ratio presented in Table 9 below, the ratio of boys to girls was within 0.1 for each age category with the exception of 6-17 months where the ratio of boys to girls was 1.3. The overall sample consisted of a 1.0 boy: girl ratio.

Table 9: MS Distribution of Age and Sex among Children 6-59 months for Round 3

Age Category (months)	Boys		Girls		Total		Ratio boy : girl
	N	%	N	%	N	%	
6-17	81	56.6	62	43.4	143	22.3	1.3
18-29	90	50.8	87	49.2	177	27.7	1.0
30-41	64	49.6	65	50.4	129	20.2	1.0
42-53	60	47.6	66	52.4	126	19.7	0.9
54-59	30	46.2	35	53.8	65	10.2	0.9
Total	325	50.8	315	49.2	640	100.0	1.0

3.1.3 MS Data Quality

One child was excluded from WHZ analysis per SMART flags[33], resulting in an overall percentage of flagged data of 0.2%, well below the SMART Methodology recommendation of less than 5.0%, and considered of "excellent" quality by the ENA Plausibility Check, as demonstrated in Table 10 below. The overall WHZ analysis included 637 children.

[33] WHZ Smart Flags defined as +/- 3 standard deviations from the observed sample mean

The standard deviation (SD), design effect, missing values, and flagged values are listed for WHZ, HAZ, and WAZ in Table 10 below. The SD of WHZ was 0.86, the SD of HAZ was 0.90, and the SD of WAZ was 1.02, all of which fall within the normal range of 0.8 and 1.2, indicating an adequate distribution of data around the mean and data of good quality.

Table 10: MS Standard Deviation, Design Effect, Missing Values, and Flagged Values for WHZ, HAZ, and WAZ, for Round 3

Index	N	Median z-score ± SD	Design Effect	Unavailable z-scores	Excluded z-scores (SMART flags)	Excluded z-scores % (SMART flags)
WHZ (6-59 months)	637	-0.96±0.86	1.32	2	1	0.2%
HAZ (6-59 months)	638	-1.40±0.90	1.61	0	2	0.3%
WAZ (6-59 months)	632	-1.35±1.02	1.81	2	6	0.9%

The sex ratio between boys and girls 6-59 months was 1.03 boys/girls (expected value between 0.8 and 1.2) (p=0.693) suggesting that boys and girls were equally represented. The overall sex ratio was considered of “excellent” quality by the ENA Plausibility Check.

Among children 6-59 months, only 7% had exact birth dates as confirmed by supportive documentation (birth certificate, vaccination cards, etc.). The age ratio between children 6-29 months and 30-59 months was 1.00 (expected value near 0.85) and the difference was statistically significant (p=0.040) indicating that more than expected children 6-29 months compared to children 30-59 months were included in the survey. The age ratio was considered ‘acceptable’ quality based on the ENA Plausibility Check.

Digit preferences scores for weight (3), height (5), and MUAC (3) all fell below 7 to be considered “excellent” by the ENA Plausibility Check. The overall ENA Plausibility Check score was 9%, which is considered a survey of “excellent” quality. The complete Makeshift Settlements ENA Plausibility Check report is presented in Annex 12.

Table 11: MS Overall Data Quality per ENA Plausibility Check for Round 3

Criteria	SD WHZ	Flagged	Sex-ratio	Age-ratio	Digit Pref. Weight
Observed	**0.86**	**0.2%**	**P=0.693**	**P=0.040**	**3**
Desired	0.8-1.2	< 0.5%	(p>0.05)	(p>0.05)	< 13
Score	Good	Excellent	Excellent	Acceptable	Excellent

Criteria	Digit Pref. Height	Digit Pref. MUAC	Skewness	Kurtosis	Poisson Distr.	Overall Score
Observed	**5**	**3**	**0.03**	**0.11**	**P=0.110**	**9%**
Desired	< 13	< 13	< ± 0.6	< ± 0.6	(p> 0.01)	< 15%
Score	Excellent	Excellent	Excellent	Excellent	Excellent	**Excellent**

3.1.4 MS Prevalence of Acute Malnutrition by WHZ for Round 3

The prevalence of acute malnutrition by WHZ was based on the analysis of 637 children (6-59 months). There were no identified cases of oedema in the Makeshift Settlements.

As seen in Table 12 below, the prevalence of GAM per WHZ among children 6-59 months was 11.0% [8.4-14.2], which is below the WHO emergency cut-off of 15%.

Table 12:MS Prevalence of Acute Malnutrition per WHZ and/or Oedema for Round 3, WHO Reference 2006

Children 6-59 months	Round 3* Oct 2018			
	N	n	%	95% CI
Global Acute Malnutrition	637	70	11%	[8.4-14.2]
Moderate Acute Malnutrition		63	9.9%	[7.7-12.7]
Severe Acute Malnutrition		7	1.1%	[0.4-2.8]

**No cases of oedema identified in Round 3*

As seen in Table 13 below the prevalence of acute malnutrition was higher for boys compared to girls for GAM (13% vs 8.9%), MAM (11.8% vs 7.9%), and SAM (1.2% vs 1.0%) but the differences were not statistically significant. When comparing the prevalence of acute malnutrition in children 6-23 months vs children 24-59 months, children 6-23 months had a higher prevalence of GAM (15.7% vs 8.5%), MAM (13.4% vs 8.1%), SAM (2.3% vs 0.5%) with GAM being a statistically significant difference (p=0.018).

Table 13:MS Prevalence of Acute Malnutrition per WHZ and by Sex and Age for Round 3, WHO Reference 2006

Children 6-59 months	N	Global Acute Malnutrition			Moderate Acute Malnutrition			Severe Acute Malnutrition		
		n	%	95% CI	n	%	95% CI	n	%	95% CI
All	637	70	11%	[8.4-14.2]	63	9.9%	[7.7-12.7]	7	1.1%	[0.4-2.8]
Boys	322	42	13%	[9.5-17.7]	38	11.8%	[8.6-16.0]	4	1.2%	[0.4-4.1]
Girls	315	28	8.9%	[5.6-13.9]	25	7.9%	[5.1-12.2]	3	1.0%	[0.2-4.1]
Children 6-23 months	216	34	15.7%	[11.2-21.7]	29	13.4%	[9.4-18.7]	5	2.3%	[0.8-6.5]
Children 24-59 months	422	36	8.5%	[5.9-12.2]	34	8.1%	[5.6-11.4]	2	0.5%	[0.1-2.0]

When further disaggregated by age group, the prevalence of SAM was highest among the 6-17 months age group (2.8%) with no identified cases among the 30-41 months and 54-59 months age groups, as presented in Table 14 below. The prevalence of MAM was highest among the 6-17 months group (16.2%) and lowest among the 42-53 months age group (5.6%). The age group with the highest percentage of children who were not acutely malnourished was the 42-53 months group (92.9%).

Table 14:MS Prevalence of Acute Malnutrition per WHZ and by Age Group for Round 3, WHO Reference 2006

Children 6-59 months	N	Severe Acute Malnutrition		Moderate Acute Malnutrition		Not Acutely Malnourished	
		n	%	n	%	n	%
6-17 months	142	4	2.8%	23	16.2%	115	81.0%
18-29 months	176	1	0.6%	15	8.5%	160	90.9%
30-41 months	128	0	0.0%	10	7.8%	118	92.2%
42-53 months	126	2	1.6%	7	5.6%	117	92.9%
54-59 months	65	0	0.0%	8	12.3%	57	87.7%
Total	637	7	1.1%	63	9.9%	567	89.0%

3.1.5 MS Prevalence of Acute Malnutrition by MUAC

Using MUAC as an indicator for acute malnutrition, the prevalence of GAM was 3.1% [1.9-5.0] with all 20 cases being identified as MAM as shown in Table 15. This prevalence falls under the IPC Classification category of 'Acceptable'.

Table 15:MS Prevalence of Acute Malnutrition by MUAC for Round 3

Children 6-59 months	Round 3 Oct 2018			
	N	n	%	95% CI
Global Acute Malnutrition	640	20	3.1%	[1.9-5.0]
Moderate Acute Malnutrition		20	3.1%	[1.9-5.0]
Severe Acute Malnutrition		0	0	-

As seen in Table 16 below the prevalence of acute malnutrition by MUAC was higher for girls compared to boys for GAM (4.1% v 2.2%) but the difference was not statistically significant (p=0.222). When comparing GAM by MUAC for children 6-23 months vs children 24-59 months (8.8% vs 0.2%) there was a statistically significant difference (p<0.001).

Table 16:MS Prevalence of Acute Malnutrition per MUAC and by Sex and Age for Round 3

Children 6-59 months	N	Global Acute Malnutrition			Moderate Acute Malnutrition			Severe Acute Malnutrition		
		n	%	95% CI	n	%	95% CI	n	%	95% CI
All	640	20	3.1%	[1.9-5.0]	20	3.1%	[1.9-4.3]	0	0	-
Boys	325	7	2.2%	[1.1-4.3]	7	2.2%	[1.1-4.3]	0	0	-
Girls	315	13	4.1%	[2.1-7.9]	13	4.1%	[2.1-7.9]	0	0	-
Children 6-23 months	217	19	8.8%	[5.3-14.2]	19	8.8%	[5.3-14.2]	0	0	-
Children 24-59 months	423	1	0.2%	[0.0-1.7]	1	0.2%	[0.0-1.7]	0	0	-

The prevalence of acute malnutrition per MUAC as disaggregated by age group as presented in Table 17 below demonstrates that no cases of SAM were found and that the 20 cases of MAM were found in children less than 30 months. A total of 9.8% (14 children) of children 6-17 months and 3.4% (6 children) of children 18-29 months were moderately malnourished.

Table 17:MS Prevalence of Acute Malnutrition per MUAC and by Age Group for Round 3

Children 6-59 months	N	Severe Acute Malnutrition		Moderate Acute Malnutrition		Not Acutely Malnourished	
		n	%	N	%	n	%
6-17 months	143	0	0.0%	14	9.8%	129	90.2%
18-29 months	177	0	0.0%	6	3.4%	171	96.6%
30-41 months	129	0	0.0%	0	0.0%	129	100.0%
42-53 months	126	0	0.0%	0	0.0%	126	100.0%
54-59 months	65	0	0.0%	0	0.0%	65	100.0%
Total	640	0	0.0%	20	3.1%	620	96.9%

3.1.6 MS Infant MUAC

MUAC among infants 0-5 months was assessed for the purpose of this assessment, as presented in Table 18 below. The mean MUAC for children 0-5 months was 118.4 mm.

Table 18: MS Mean MUAC in Infants 0-5 Months for Round 3

Infants 0-5 months	N	Mean (SD)
Infant MUAC	56	118.4 (17.3)

3.1.7 MS Low Women's MUAC

Low MUAC in women was defined as a mid-upper arm circumference below 210 mm for the purpose of this assessment. The prevalence of low women's MUAC in the Makeshift Settlements among all women 15-49 years was 3.0% [2.0-4.6] as presented in Table 19 below. The low MUAC prevalence for women who were pregnant or breastfeeding an infant less than 6 months was 2.8% [1.0-7.3].

Table 19:MS Low MUAC in Women 15-49 Years for Round 3

Women 15-49 years	Round 3 Oct 2018			
	N	n	%	95% CI
Low Women's MUAC	725	22	3.0%	[2.0-4.6]
Low Women's MUAC *Among PLW**	144	4	2.8%	[1.0-7.3]
Women 15-49 years	N			Mean (SD)

Women's MUAC	725	256.4 (31.7)
PLW* Women's MUAC	144	252.0 (30.1)

**Exclusively among women who were pregnant or lactating with an infant <6 months, as this subset was eligible for ongoing humanitarian programmes such as BSFP, IFA supplementation, and IYCF.*

3.1.8 MS Comparison of Prevalence of Acute Malnutrition by WHZ and MUAC

The prevalence of acute malnutrition among children 6-59 months was notably different as identified by WHZ (11.0%) and MUAC (3.1%) in the Makeshift Settlements, meaning nearly four times as many children were identified as GAM by WHZ as MUAC. This disparity was also observed for by MAM (9.9% WHZ vs. 3.1% MUAC) and SAM (1.1% WHZ vs. 0% MUAC). Figure 4 below clearly demonstrates this disparity, as 70 children were identified as GAM by WHZ and 20 children were identified as GAM by MUAC, with just 15 children identified as GAM by both. Overall, of the 70 cases of GAM identified by WHZ, 55 (78.6%) were not identified as GAM by MUAC. In other words, if the assessment had relied exclusively on MUAC measurements, 78.6% of the cases of GAM by WHZ would have been missed.

Figure 4:MS Prevalence of Acute Malnutrition WHZ vs MUAC for Round 3

WHZ GAM 11% (70) **MUAC GAM 3.1% (20)**

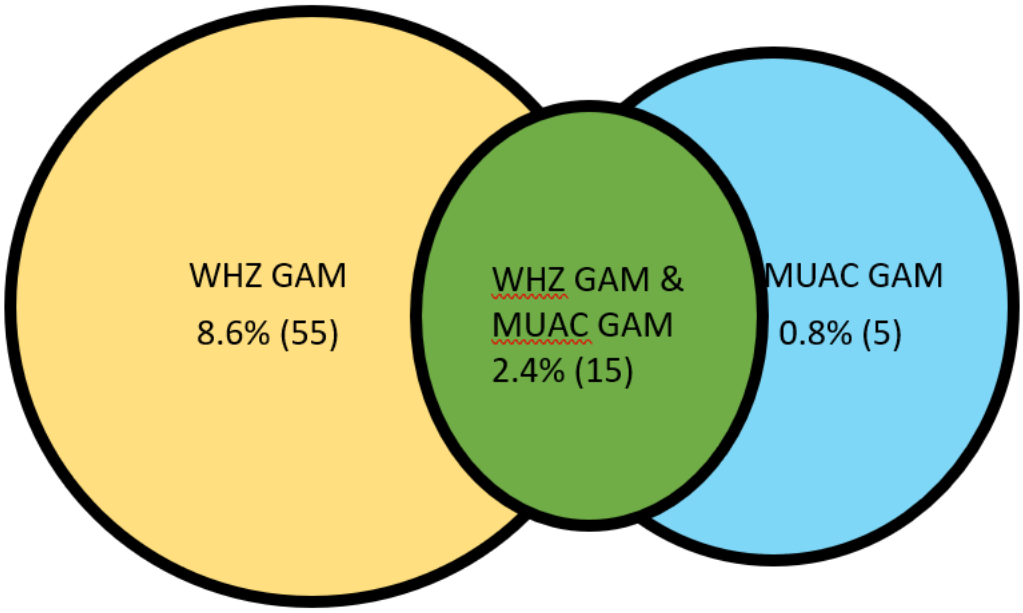


**Figure not to scale. Only children with both WHZ and MUAC values included in the analysis.*

3.1.9 MS Prevalence of Chronic Malnutrition

The prevalence of global chronic malnutrition per HAZ among children 6-59 months was 26.9% [22.4-31.9], as presented in Table 20 below, which is considered 'Poor' based on WHO classification.

Table 20:MS Prevalence of Chronic Malnutrition by HAZ for Round 3, WHO Reference 2006

Children 6-59 months	Round 3 Oct 2018			
	N	n	%	95% CI
Global Chronic Malnutrition	632	170	26.9%	[22.4-31.9]
Moderate Chronic Malnutrition		133	21.0%	[17.3-25.4]
Severe Chronic Malnutrition		37	5.9%	[4.0-8.5]

As seen in Table 21 below the prevalence of chronic malnutrition was higher for boys compared to girls for global (29.8% vs 24.0%), moderate (22.9% vs 19.2%) and severe chronic malnutrition (6.9% vs 4.8%) but the differences were not statistically significant. When comparing chronic malnutrition in children 6-23 months versus children 24-59 months, children 6-23 months had a higher prevalence of global (28.6% vs 26%), moderate (22.1% vs 20.5%), and severe chronic malnutrition (6.6% vs 5.5%) but the differences were not statistically significant.

Table 21:MS Prevalence of Chronic Malnutrition per HAZ by Sex and Age Group for Round 3, WHO Reference 2006

Children 6-59 months	N	Global Chronic Malnutrition			Moderate Chronic Malnutrition			Severe Chronic Malnutrition		
		n	%	95% CI	n	%	95% CI	n	%	95% CI
All	632	170	26.9%	[22.4-31.9]	133	21.0%	17.3-25.4]	37	5.9%	[4.0-8.5]
Boys	319	95	29.8%	[24.0-36.3]	73	22.9%	[18.0-28.6]	22	6.9%	[4.1-11.4]
Girls	313	75	24.0%	[18.2-30.8]	60	19.2%	[14.5-25.0]	15	4.8%	[2.6-8.7]
Children 6-23 months	213	61	28.6%	[21.9-36.4]	47	22.1%	[16.3-29.1]	14	6.6%	[3.6-11.8]
Children 24-59 months	420	109	26%	[21.2-31.4]	86	20.5%	[16.6-25.1]	23	5.5%	[3.4-8.7]

When further disaggregated by age group, the highest prevalence of severe chronic malnutrition was found in the 18-29 month age group, 8.6% (15 children), and the lowest was the 54-59 age group, 1.5% (1 child), as seen in Table 22. The highest prevalence of moderate chronic malnutrition was found in the 42-53 months age group, 26.2% (33 children), and the lowest was the 54-59 age group, 9.2% (6 children).

Table 22: MS Prevalence of Chronic Malnutrition per HAZ and by Age Group for Round 3, WHO Reference 2006

Children 6-59 months	N	Severe Chronic Malnutrition		Moderate Chronic Malnutrition		No Chronic Malnutrition	
		N	%	n	%	n	%
6-17 months	139	9	6.5%	27	19.4%	103	74.1%
18-29 months	175	15	8.6%	42	24.0%	118	67.4%
30-41 months	127	3	2.4%	25	19.7%	99	78.0%
42-53 months	126	9	7.1%	33	26.2%	84	66.7%
54-59 months	65	1	1.5%	6	9.2%	58	89.2%
Total	632	37	5.9%	133	21.0%	462	73.1%

3.1.10 MS Prevalence of Underweight

The prevalence of underweight per WAZ among children 6-59 months was 25.1% [21.0-29.7], as presented in Table 23 below, which is considered 'Serious' based on WHO classification.

Table 23: MS Prevalence of Underweight by WAZ for Round 3, WHO Reference 2006

Children 6-59 months	Round 3 Oct 2018			
	N	n	%	95% CI
Global Underweight	638	160	25.1%	[21.0-29.7]
Moderate Underweight		131	20.5%	[17.2-24.3]
Severe Underweight		29	4.5%	[3.0-6.8]

Underweight per WAZ among children 6-59 months is disaggregated by sex in Table 24 below. The prevalence was higher for boys compared to girls for global underweight (26.9% vs. 23.2%), moderate underweight (20.7% vs. 20.3%) and severe underweight (6.2% vs 2.9%) but there were no statistically significant differences between sexes.

Table 24: MS Prevalence of Underweight per WAZ and by Sex for Round 3, WHO Reference 2006

Children 6-59 months	N	Global Underweight			Moderate Underweight			Severe Underweight		
		n	%	95% CI	N	%	95% CI	n	%	95% CI
All	638	160	25.1%	[21.0-29.7]	131	20.5%	[17.2-24.3]	29	4.5%	[3.0-6.8]
Boys	323	87	26.9%	[21.3-33.4]	67	20.7%	[16.3-26.1]	20	6.2%	[3.7-10.2]
Girls	315	73	23.2%	[17.9-29.5]	64	20.3%	[15.6-26.0]	9	2.9%	[1.4-5.7]

When further disaggregated by age group, the prevalence of severe underweight was highest among children less than 30 months including 7.0% (10 children) of children 6-17 months and 5.7% (10 children) of children18-29 months as seen in Table 25. All of the age groups had a moderate underweight prevalence near or over 20% with the exception of the 30-41month age groups which had a prevalence of 16.3% (21 children).

Table 25:MS Prevalence of Underweight per WAZ and by Age Group for Round 3, WHO Reference 2006

Children 6-59 months	N	Severe Underweight		Moderate Underweight		Not Underweight	
		n	%	n	%	n	%
6-17 months	142	10	7.0%	31	21.8%	101	71.1%
18-29 months	176	10	5.7%	35	19.9%	131	74.4%
30-41 months	129	4	3.1%	21	16.3%	104	80.6%
42-53 months	126	5	4.0%	31	24.6%	90	71.4%
54-59 months	65	0	0.0%	13	20.0%	52	80.0%
Total	638	29	4.5%	131	20.5%	478	74.9%

3.1.11 MS Prevalence of Anaemia

The overall prevalence of anaemia (Hb<11.0 g/dL) among children 6-59 months was 39.8% [34.1-45.4] which is nearly at the WHO cut-off of 40% for significant public health concern as presented in Table 26 below. When comparing anaemia in children 6-23 months vs children 24-59 months, children 6-23 months had a higher prevalence of anaemia (53.2% vs 32.9%) and the difference was statistically significant (p<0.001).

Table 26:MS Prevalence of Anaemia Among Children 6-59 months by Age Category for Round 3, WHO Reference

Children 6-59 months	Round 3 Oct 2018			
	N	n	%	95% CI
Any Anaemia (Hb<11.0 g/dL)	636	253	39.8%	[34.1-45.4]
Mild Anaemia (Hb 10.0 to <11.0 g/dL)		137	21.5%	[18.4-24.7]
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)		115	18.1%	[13.5-22.6]
Severe Anaemia (Hb <7.0 g/dL)		1	0.2%	[0-0.5]
Children 6-23 months	N	n	%	95% CI
Any Anaemia (Hb<11.0 g/dL)	216	115	53.2%	[44.7-61.7]
Mild Anaemia (Hb 10.0 to <11.0 g/dL)		57	26.4%	[21.3-31.4]
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)		57	26.4%	[18.8-33.4}
Severe Anaemia (Hb <7.0 g/dL)		1	0.4%	[0-1.4]
Children 24-59 months	N	n	%	95% CI
Any Anaemia (Hb<11.0 g/dL)	420	138	32.9%	[26.6-39.1]
Mild Anaemia (Hb 10.0 to <11.0 g/dL)		80	19.1%	[15.1-23.0]
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)		58	13.8%	[9.1-18.5}
Severe Anaemia (Hb <7.0 g/dL)		0	-	-

When disaggregated by sex as presented in Table 27 below, the prevalence of anaemia was found to be slightly higher among male children 6-59 months than female children 6-59 months (40.6% vs. 38.9%) but is not statistically significant.

Table 27: MS Prevalence of Anaemia Among Children 6-59 months by Sex for Round 3, WHO Reference

Children 6-59 months	Male Children 6-59 months				Female Children 6-59 months			
	N	n	%	95% CI	N	n	%	95% CI
Any Anaemia (Hb<11.0 g/dL)	325	132	40.6%	[33.5-47.7]	311	121	38.9%	[32.4-45.4]
Mild Anaemia (Hb 10.0 to <11.0 g/dL)		70	21.5%	[17.5-25.6]		67	21.5%	[16.6-26.5]
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)		61	18.8%	[13.3-24.2]		54	17.4%	[11.5-23.2]
Severe Anaemia (Hb <7.0 g/dL)		1	0.3%	[0.0-0.9]		0	0	-

3.1.12 MS Prevalence of Anaemia among Non-Pregnant Non-Lactating Women

As seen in Table 28 below, the overall prevalence of anaemia (Hb<12.0 g/dL) among non-pregnant non-lactating women 15-49 years was 22.6% [16.7-28.5] which is considered 'Medium' based on the WHO classification of public health concern.

Table 28: MS Prevalence of Anaemia among Non-Pregnant Non-Lactating Women (15-49 years) for Round 3, WHO Reference

Women 15-49 years (non-pregnant, non lactating)	Round 3 Oct 2018			
	N	n	%	95% CI
Any Anaemia (Hb<12.0 g/dL)	217	49	22.6%	[16.7-28.5]
Mild Anaemia (Hb 11.0 to <11.9 g/dL)		28	12.9%	[8.8-17.0]
Moderate Anaemia (Hb 8.0 to <10.9 g/dL)		20	9.2%	[5.3-13.1]
Severe Anaemia (Hb <8.0 g/dL)		1	0.5%	[0-1.4]

3.1.13 MS Prevalence of Morbidity

The prevalence of diarrhea, ARI, and fever among children 6-59 months as per two-week recall period were 28.4% [24.5-32.4], 10.9% [7.1-14.6], and 38.0% [33.0-43.0] respectively as presented in Table 29 below.

Table 29: MS Two-Week Prevalence of Diarrhea, Cough, and Fever among Children 6-59 Months for Round 3

Indicator	Round 3 Oct 2018			
	N	n	%	95% CI
Two-week prevalence of diarrhea*	682	194	28.4%	[24.5-32.4]
Two-Week Prevalence of Acute Respiratory Infection**	682	74	10.9%	[7.1-14.6]
Two-Week Prevalence of Fever	682	259	38.0%	[33.0-43.0]

**Diarrhea defined as the passage of three or more loose or liquid stools in a day. **ARI defined as cough with rapid or difficulty breathing AND a fever. Fever defined as mother checking childs' forehead and is warm accompanied my general malaise.*

The prevalence of suspected measles and diphtheria as presented in Table 30 below including all suspected cases. Household recall included: "yes, caregiver reports that the child was diagnosed at a clinic", "yes, caregiver reports that the child was diagnosed by a local healer", "yes, caregiver reports that child had disease, but did not seek diagnosis".

The prevalence of suspected measles among children 6-59 months was 12.8% [9.8-15.7]. The majority of cases were confirmed by recall (n=84) with only 3 confirmed by health document.

The prevalence of suspected diphtheria among children 6-59 months was 2.6% [1.1-4.1]. The majority of cases were confirmed by recall (n=17) with only 1 confirmed by a health document.

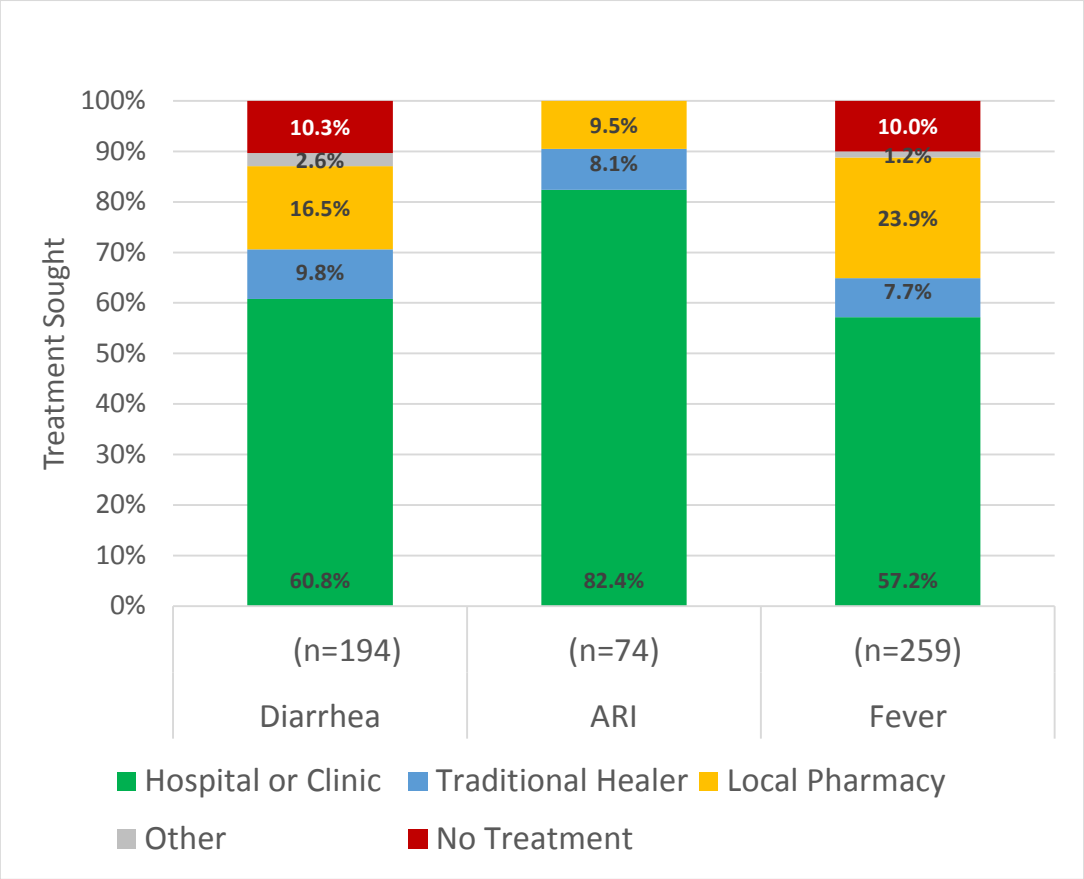
Table 30: MS Prevalence of Suspected Measles and Diphtheria among Children 6-59 Months for Round 3

Prevalence of Fever with Rash (Suspected Measles)*	Children 6-59 months			
	N	n	%	95% CI
All Reported	682	87	12.8%	[9.8-15.7]
Confirmed by Health Document		3	0.5%	[0-1.1]
Confirmed by Household Recall		84	12.3%	[9.3-15.3]
Prevalence of Suspected Diphtheria*	N	n	%	95% CI
All Reported	682	18	2.6%	[1.1-4.1]
Confirmed by Health Document		1	0.1%	[0-0.4]
Confirmed by Household Recall		17	2.5%	[0.7-4.0]

**Measles and diphtheria recall period since 25 August 2017. All cases by household level self-report. Cases include children reportedly diagnosed by hospital or clinic but confirmed by caregiver recall*

Health seeking behaviors at the household level among children 6-59 months with reported symptoms of diarrhea, ARI, and fever are illustrated in Figure 5 below. The hospital or clinic was the most prominent treatment option for diarrhea (60.8%), ARI (82.4%), and Fever (57.2%), followed by Local Pharmacy and Traditional Healer.

Figure 5: MS Health Seeking Behaviors for Symptoms of Diarrhea, ARI, and Fever in Children 6-59 months for Round 3



3.1.14 MS Additional Supplementation and ANC Programme

The proportion of 6-59 month children that received at least 1 sachet of MNP since June 16th, 2018 was 58.7% [49.1-68.2] and 92.1% [88.9-95.3] received Vitamin A in the past 6 months prior to the survey as presented in Table 31 below.

Table 31: MS Proportion of children 6-59 months that received Vitamin A, MNP since specified period of time for Round 3

Indicator	Round 3 Oct 2018			
	N	n	%	95% CI
Proportion of children that received at least 1 sachet of MNP since June 16,2018*	682	400	58.7%	[49.1-68.2]
Proportion of children that received Vitamin A in past 6 months	682	628	92.1%	[88.9-95.3]

*Recall period between June 16th, 2018 and day of interview

Just over half of the pregnant women 53.9% [42.2-65.6] were currently enrolled in an antenatal care (ANC) programme as seen below in Table 32. From the pregnant women enrolled in an ANC programme, 68.8% [51.4-86.1] were currently receiving IFA tablets.

Table 32: MS Proportion of Pregnant Women Enrolled in an ANC Programme and/or Receiving IFA Tablets for Round 3

Indicator	Round 3 Oct 2018			
	N	n	%	95% CI
Proportion of pregnant women enrolled in ANC programme	89	48*	53.9%	[42.2-65.6]
Proportion of pregnant women currently receiving IFA tablets	89	42	47.1%	[34.8-59.6]
Proportion of pregnant women enrolled in ANC programme currently receiving IFA tablets	48	33	68.8%	[51.4-86.1]

*39 pregnant women enrolled in ANC programme verified by card

3.1.15 MS Food Assistance

Different indicators to assess food assistance are included in Table 33 below. Nearly 95% of households received food assistance via a General Food Distribution, 77.3% [66.5-88.0] or e-voucher, 18.5% [8.7-28.3]. A total of 34 households did not know if they have a GFD ration card or SCOPE card. All households receiving GFD food rations had received food within the past month and only one household reported that they did not purchase SCOPE card food items in the previous month.

Table 33: MS Receipt of Food Assistance for Round 3

Indicator	Round 3 Oct 2018	
	Sample HH	% [95% CI]
Proportion of households with a general food distribution (GFD) ration card and/or e-voucher (SCOPE) card	Households 630*/664	94.9% [89.8-100]
Proportion of households with a GFD ration card	Households 513/664	77.3% [66.5-88.0]
With documented receipt of food rations September 2018	513/513	100%
Proportion of households with a SCOPE card for food rations	Households 123/664	18.5% [8.7-28.3]
With reported purchase of food items in September 2018	122/123	99.2% [97.4-100]

* 6 households reported that they have a GFD ration card and e-voucher SCOPE card

3.1.16 MS Retrospective Mortality

In the Makeshift Settlements, the Crude Death Rate was 0.13 [0.06-0.28] and the Under 5 Death Rate was 0.42 [0.16-1.10] as presented in Table 34. Both the CDR and Under 5 DR are below emergency thresholds as per the South Asian Sphere Standards.

Household level questions were asked to determine the cause of each death, under the broad categories of illness or injury/trauma. Five deaths were reported due to illness and 1 unknown cause.

Table 34: MS Retrospective Mortality and Cause of Death for Round 3

Indicator	Round 3 Oct 2018	
	Sample	Rate [95% CI]
Crude death rate* Deaths/10,000/day	Mid-interval population** (n=3, 549.5)	0.13 [0.06-0.28]
Under 5 death rate Deaths/10,000/day	Mid-interval population** (n=717)	0.42 [0.16-1.10]
Cause of death	**Sample**	**Rate**
Illness	Household member deaths (n=6)	83.3%
Don't Know		16.7%

**For Round 3, Eid Ul Fitre (June 16, 2018) was used as the beginning of the mortality recall period. **All households members present during recall period adjusted for in and out-migration*

RESULTS

Nayapara Registered Camp

Round 3, Nov 1 – Nov 8 2018

3.2 Nayapara Registered Camp

3.2.1 NYP RC Sample

In Nayapara Registered Camp (NYP RC), all 575 planned households were visited. It was determined that two randomly selected households were the same household; therefore, the total number of households visited was 574. Among those, 19 households were absent and 1 household refused to participate. There was a total of 357 eligible children 6-59 months who were considered current members of the 554 surveyed households (0.64 per household). Among those, 6 were absent (at relatives); therefore, 98.3% (351 children) of eligible children were considered for anthropometry.

Overall, a sufficient number of households and children were surveyed, as demonstrated in Table 35 below. According to the SMART Methodology, a minimum of 90% of clusters and 80% of the child sample size must be achieved to ensure data quality and representativeness. In NYP RC, 122.7% of planned children 6-59 months were surveyed, well above the SMART Methodology cut-offs. With 554 households surveyed of 574 attempted, the nonresponse rate in NYP RC was 3.5%.

Table 35: NYP RC Proportion of Households and Children 6-59 Months Surveyed

Planned Households	Surveyed Households	Percentage Surveyed / Planned	Planned Children 6-59 Months	Measured Children 6-59 Months	Percentage Measured / Planned
574	554	**96.5%**	**282**	346	**122.7%**

3.2.2 NYP RC Demography

Households surveyed are disaggregated by arrival status in Table 36 below. Approximately 92% of households surveyed in NYP RC were registered refugees. The remaining 8% of households were unregistered refugees and no households had arrived after January 1, 2018.

Table 36: NYP RC Households Arrival Status for Round 3

Arrival Status	Households Surveyed
Registered	510 (92.1%)
Prior to October 2016	17 (3.1%)
October 2016 to 24 August 2017	6 (1.1%)
25 August 2017 to 31 December 2017	21 (3.7%)
Total	**554 (100%)**

In Table 37 below the average household size for NYP RC was 5.6 people per household and the proportion of children under 5 years in the surveyed population was 12.8% [11.7-14.1]. A total of 6.7% of the surveyed population was pregnant or lactating.

Table 37: NYP RC Demography for Round 3

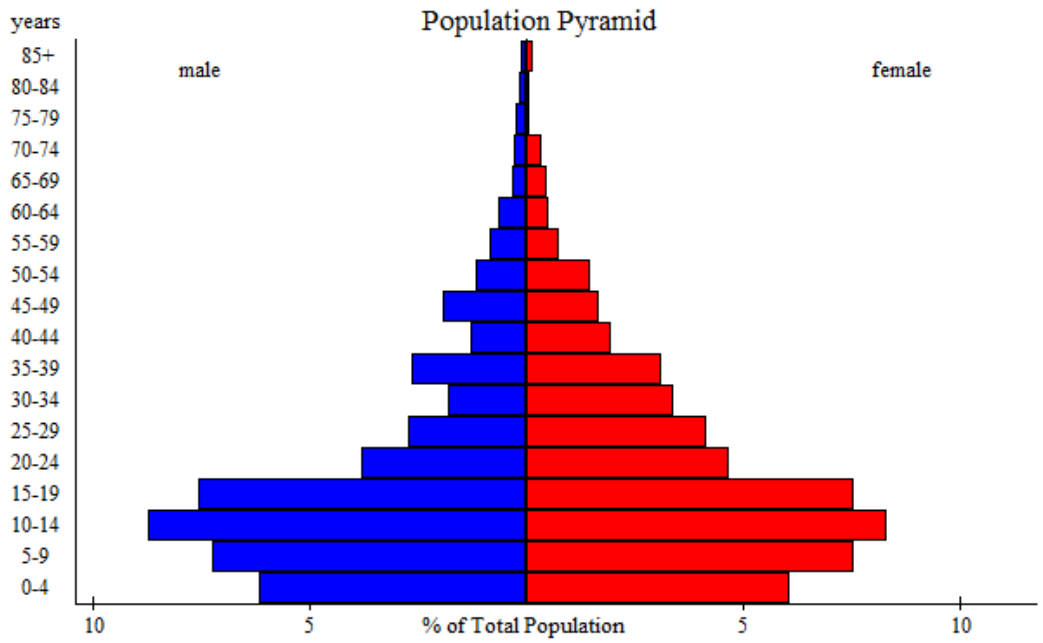
Total Population	Round 3 Nov 2018
All household members*	3, 093
Average household size	5.6
Population Subset	% [95% CI]
<5 years	12.8% [11.7-14.1]
5-10 years	18.7% [17.4-20.1]
11-17 years	21.3% [20.0-22.8]
18-59 years	43.8% [42.1-45.6]
≥60 years	3.4% [2.8-4.1]
Female	52.5% [50.7-54.3]
Women 15-49 Years	26.5% [25.0-28.1]
Pregnant and lactating women	6.7%
Pregnant women	2.1%
Lactating women	4.6%
Lactating w/child < 6 months	1.3%
Lactating w/child ≥ 6 months	3.3%

**Demographics include all current household members, regardless of presence at the time of interview*

The proportion of male to female for the surveyed population was 47.5% vs 52.5%. The overall distribution of the population pyramid presented in Figure 6 below shows a greater width at 10-19 years and a narrower base at 0-4 years indicating a reduction in birthrates among what was previously a high growth population[34].

[34] UN Population Division (2015) Regional Workshop on the Production of Population Estimates and Demographic Indicators, Addis Ababa, 5-9 October 2015
www.un.org/en/development/desa/population/events/pdf/other/11/ppt_AgeSexEvaluation.pdf

Figure 6: NYP RC Population Pyramid for Round 3



Among the sample of children 6-59 months by sex and age ratio presented in Table 38 below, the ratio of boys to girls was within 0.2 for each age category with the exception of 6-17 months where the ratio of boys to girls was 1.3. The overall sample consisted of a 1.1 boy: girl ratio.

Table 38: NYP RC Distribution of Age and Sex among Children 6-59 months for Round 3

Age Category (months)	Boys		Girls		Total		Ratio boy : girl
	N	%	N	%	N	%	
6-17	45	57.0	34	43.0	79	22.5	1.3
18-29	43	46.7	49	53.3	92	26.2	0.9
30-41	35	50.0	35	50.0	70	19.9	1.0
42-53	41	54.7	34	45.3	75	21.4	1.2
54-59	18	51.4	17	48.6	35	10.0	1.1
Total	182	51.9	169	48.1	351	100.0	1.1

3.2.3 NYP RC Data Quality

Two children were excluded from WHZ analysis per SMART flags[35], contributing to the overall percentage of flagged data of 0.6%, well below the SMART Methodology recommendation of less than 5.0%, and was considered of "excellent" quality by the ENA Plausibility Check, as demonstrated in Table 39 and 40 below. The overall WHZ analysis included 348 children.

The SD, design effect, missing values, and flagged values are listed for WHZ, HAZ, and WAZ in Table 39 below. The SD of WHZ was 0.85, the SD of HAZ was 0.87, and the SD of WAZ was 0.95, all of which fall within the normal range of 0.8 and 1.2, indicating an adequate distribution of data around the mean and data of good quality. The design effect was 1.00, as expected for a survey utilizing SRS.

Table 39: NYP RC Standard Deviation, Design Effect, Missing Values, and Flagged Values for WHZ, HAZ, and WAZ, for Round 3

Index	N	Median z-score ± SD	Design Effect	Unavailable z-scores	Excluded z-scores (SMART flags)	Excluded z-scores % (SMART flags)
WHZ (6-59 months)	348	-1.00±0.85	1.00	1	2	0.6%
HAZ (6-59 months)	349	-1.66±0.87	1.00	1	1	0.3%
WAZ (6-59 months)	347	-1.70±0.95	1.00	1	3	0.9%

The sex ratio between boys and girls 6-59 months was 1.08 boys/girls (expected value between 0.8 and 1.2) (p=0.488) suggesting that boys and girls were equally represented. The overall sex ratio was considered of "excellent" quality by the ENA Plausibility Check.

Among children 6-59 months 83% had exact birth dates as confirmed by supportive documentation (birth certificate, vaccination cards, etc.). The age ratio between children 6-29 months and 30-59 months was 0.95 (expected value near 0.85) and the difference was not statistically significant (p=0.297). The age ratio was considered of "excellent" quality by the ENA Plausibility Check.

Digit preferences scores for weight (7), height (6), and MUAC (5) all fell at or below 7 to be considered "excellent" by the ENA Plausibility Check. The overall ENA Plausibility Check score was 7%, which is considered a survey of "Excellent" quality. The complete Nayapara RC ENA Plausibility Check report is presented in Annex 13

Table 40: NYP RC Overall Data Quality per ENA Plausibility Check for Round 3

Criteria	SD WHZ	Flagged	Sex-ratio	Age-ratio	Digit Pref. Weight
Observed	**0.85**	**0.6%**	**P=0.488**	**P=0.297**	**7**
Desired	0.8-1.2	< 0.5%	(p>0.05)	(p>0.05)	< 13
Score	Good	Excellent	Excellent	Excellent	Excellent

[35] WHZ Smart Flags defined as +/- 3 standard deviations from the observed sample mean

Criteria	Digit Pref. Height	Digit Pref. MUAC	Skewness	Kurtosis	Overall Score
Observed	**6**	**5**	**0.32**	**0.26**	**7%**
Desired	< 13	< 13	< ± 0.6	< ± 0.6	< 15%
Score	Excellent	Excellent	Good	Good	**Excellent**

3.2.4 NYP RC Prevalence of Acute Malnutrition by WHZ

The prevalence of acute malnutrition by WHZ was based on the analysis of 348 children. There were no identified cases of oedema in Nayapara RC.

As seen in Table 41 below, the prevalence of GAM per WHZ among children 6-59 months was 12.1% [9.1-15.9] below the WHO emergency cut-off of 15%, with an upper confidence interval, 15.9%, exceed the threshold.

Table 41: NYP RC Prevalence of Acute Malnutrition per WHZ and/or Oedema for Round 3, WHO Reference 2006

Children 6-59 months	Round 3* Nov 2018			
	N	n	%	95% CI
Global Acute Malnutrition	348	42	12.1%	[9.1-15.9]
Moderate Acute Malnutrition		39	11.2%	[8.3-15.0]
Severe Acute Malnutrition		3	0.9%	[0.3-2.5]

**No cases of oedema identified in Round 3*

As seen in Table 42 below the prevalence of acute malnutrition was higher for boys compared to girls for GAM (12.2% vs 11.9%) and SAM (1.1% vs 0.6%) and lower for MAM (11.1% vs 11.3%) but the differences were not statistically significant. When comparing the prevalence of acute malnutrition in children 6-23 months vs children 24-59 months, children 6-23 months had a lower GAM (11.7% vs 12.2%) and MAM (10.2% vs 11.8%) and a higher SAM (1.6% vs 0.5%) but the differences were not statistically significant.

Table 42: NYP RC Prevalence of Acute Malnutrition per WHZ and by Sex and Age for Round 3, WHO Reference 2006

Children 6-59 months	N	Global Acute Malnutrition			Moderate Acute Malnutrition			Severe Acute Malnutrition		
		n	%	95% CI	n	%	95% CI	n	%	95% CI
All	348	42	12.1%	[9.1-15.9]	39	11.2%	[8.3-15.0]	3	0.9%	[0.3-2.5]
Boys	180	22	12.2%	[8.2-17.8]	20	11.1%	[7.3-16.5]	2	1.1%	[0.3-4.0]
Girls	168	20	11.9%	[7.8-17.7]	19	11.3%	[7.4-17.0]	1	0.6%	[0.1-3.3]
Children 6-23 months	128	15	11.7%	[7.2-18.4]	13	10.2%	[6.0-16.6]	2	1.6%	[0.4-5.5]
Children 24-59 months	220	27	12.3%	[8.6-17.3]	26	11.8%	[8.2-16.8]	1	0.5%	[0.1-2.5]

When further disaggregated by age group, the prevalence of SAM was highest in the 6-17 months age group (2.6%) and the 42-53 months age group (1.4%) while no identified cases were found in the other age groups, as presented in Table 43 below. The prevalence of MAM was highest among the 54-59 months group (14.3%) and lowest in the 18-29 months age group (6.6%). The age group with the highest percentage of children who were not acutely malnourished was the 18-29 age group (93.4%).

Table 43: NYP RC Prevalence of Acute Malnutrition per WHZ and by Age Group for Round 3, WHO Reference 2006

Children 6-59 months	N	Severe Acute Malnutrition		Moderate Acute Malnutrition		Not Acutely Malnourished	
		n	%	n	%	n	%
6-17 months	78	2	2.6%	9	11.5%	67	85.9%
18-29 months	91	0	0.0%	6	6.6%	85	93.4%
30-41 months	70	0	0.0%	9	12.9%	61	87.1%
42-53 months	74	1	1.4%	10	13.5%	63	85.1%
54-59 months	35	0	0.0%	5	14.3%	30	85.7%
Total	348	3	0.9%	39	11.2%	306	87.9%

3.2.5 NYP RC Prevalence of Acute Malnutrition by MUAC

Using MUAC as an indicator for acute malnutrition, the prevalence of GAM was 3.7% [2.2-6.2], including MAM 3.4% [2.0-5.9] MAM and SAM 0.3% [0.1-1.6], as seen in Table 44 below. This prevalence of GAM falls under the IPC Classification category of 'Acceptable'.

Table 44: NYP RC Prevalence of Acute Malnutrition by MUAC for Round 3

Children 6-59 months	Round 3 Nov 2018			
	N	n	%	95% CI
Global Acute Malnutrition	351	13	3.7%	[2.2-6.2]
Moderate Acute Malnutrition		12	3.4%	[2.0-5.9]
Severe Acute Malnutrition		1	0.3%	[0.1-1.6]

When disaggregated by sex as presented in Table 45, GAM was higher in girls than in boys (6.5% vs 1.1%) and was statistically significant (p=0.008). When comparing GAM by MUAC for children 6-23 months vs children 24-59 months (10.1% vs 0%) there was a statistically significant difference (p<0.001).

Table 45: NYP RC Prevalence of Acute Malnutrition per MUAC and by Sex and Age for Round 3

Children 6-59 months	N	Global Acute Malnutrition			Moderate Acute Malnutrition			Severe Acute Malnutrition		
		n	%	95% CI	n	%	95% CI	n	%	95% CI
All	351	13	3.7%	[2.2-6.2]	12	3.4%	[2.0-5.9]	1	0.3%	[0.1-1.6]
Boys	182	2	1.1%	[0.3-3.9]	2	1.1%	[0.3-3.9]	0	0	-
Girls	169	11	6.5%	[3.7-11.3]	10	5.9%	[3.2-10.5]	1	0.6%	[0.1-3.3]
Children 6-23 months	129	13	10.1%	[6.0-16.5]	12	9.3%	[5.4-15.6]	1	0.8%	[0.1-4.3]
Children 24-59 months	222	0	0	-	0	0	-	0	0	-

The prevalence of acute malnutrition per MUAC as disaggregated by age group as presented in Table 46 below demonstrates that 1 case of SAM was found in the 18-29 age group and that the 12 cases of MAM were found in children less than 30 months. A total of 12.7% (10 children) of children 6-17 months and 2.2% (2 children) of children 18-29 months were moderately malnourished.

Table 46: NYP RC Prevalence of Acute Malnutrition per MUAC and by Age Group for Round 3

Children 6-59 months	N	Severe Acute Malnutrition		Moderate Acute Malnutrition		Not Acutely Malnourished	
		n	%	n	%	n	%
6-17 months	79	0	0.0%	10	12.7%	69	87.3%
18-29 months	92	1	1.1%	2	2.2%	89	96.7%
30-41 months	70	0	0.0%	0	0.0%	70	100.0%
42-53 months	75	0	0.0%	0	0.0%	75	100.0%
54-59 months	35	0	0.0%	0	0.0%	35	100.0%
Total	351	1	0.3%	12	3.4%	338	96.3%

3.2.6 NYP RC Infant MUAC

MUAC among infants 0-5 months was assessed for the purpose of this assessment, as presented in Table 47 below. The mean MUAC for children 0-5 months was 126.5 mm.

Table 47: NYP RC Mean MUAC in Infants 0-5 Months for Round 3

Infants 0-5 months	N	Mean (SD)
Infant MUAC	39	126.5 (17.3)

3.2.7 NYP RC Low Women's MUAC

Low MUAC in women was defined as a mid-upper arm circumference below 210 mm for the purpose of this assessment. The prevalence of low women's MUAC among all women 15-49 years was 1.3% [0.7-2.4] as presented in Table 48 below. The low MUAC prevalence for women who were pregnant or breastfeeding an infant less than 6 months was 1.9% [0.5-6.7].

Table 48: NYP RC Low MUAC in Women 15-49 Years for Round 3

Women 15-49 years	Round 3 Nov 2018			
	N	n	%	95% CI
Low Women's MUAC	777	10	1.3%	[0.7-2.4]
Low Women's MUAC *Among PLW**	105	2	1.9%	[0.5-6.7]

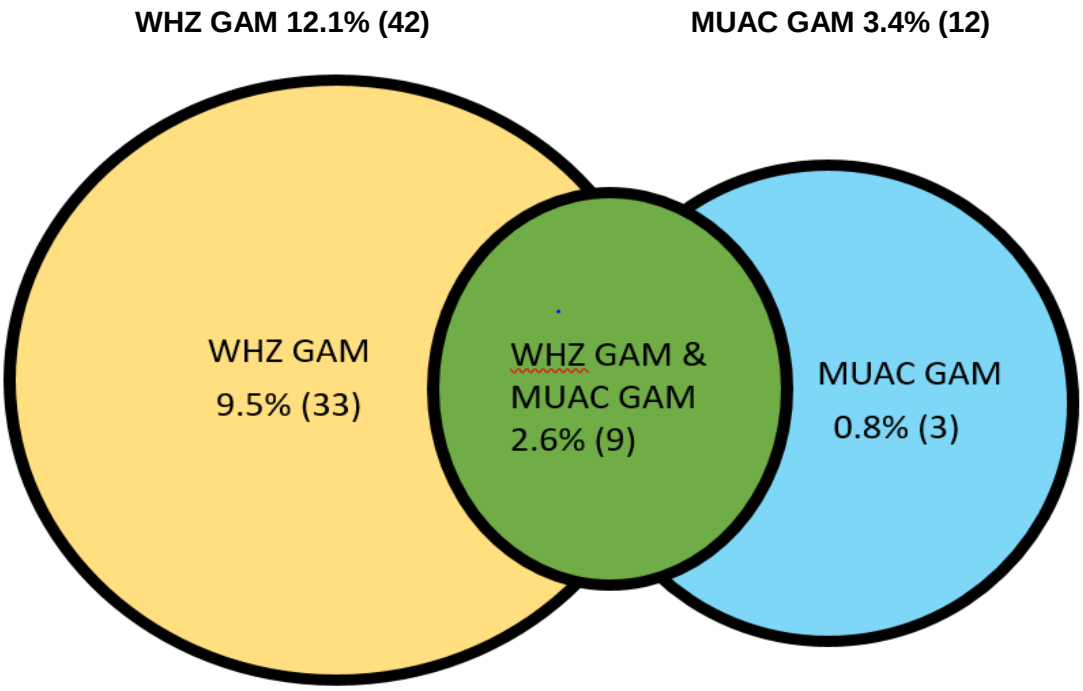
Women 15-49 years	N	Mean (SD)
Women's MUAC	777	270.6 (35.3)
PLW* Women's MUAC	105	257.3 (29.4)

**Exclusively among women who were pregnant or lactating with an infant <6 months, as this subset was eligible for ongoing humanitarian programmes such as BSFP, IFA supplementation and IYCF.*

3.2.8 NYP RC Prevalence of Acute Malnutrition WHZ vs MUAC for Round 3

The prevalence of acute malnutrition among children 6-59 months was notably different as identified by WHZ (12.1%) and MUAC (3.4%) in Nayapara RC, meaning nearly four times as many children were identified as GAM by WHZ as MUAC. This disparity was also observed for MAM (11.2% WHZ vs. 3.4% MUAC) and SAM (0.9% WHZ vs. 0.3% MUAC). Figure 7 below clearly demonstrates this disparity, as 42 children were identified as GAM by WHZ and 12 children were identified as GAM by MUAC, with just 9 children identified as GAM by both. Overall, of the 42 cases of GAM identified by WHZ, 33 (78.6%) were not identified as GAM by MUAC. In other words, if the assessment had relied exclusively on MUAC measurements, 78.6% of the cases of GAM by WHZ would have been missed.

Figure 7:NYP RC Prevalence of Acute Malnutrition WHZ vs MUAC for Round 3



**Only children with both WHZ and MUAC values included in the analysis. Notably, the prevalence of GAM per MUAC is 3.4% in this diagram as opposed to 3.7% in the results as generated by ENA for SMART.*

3.2.9 NYP RC Prevalence of Chronic Malnutrition

The prevalence of global chronic malnutrition per HAZ among children 6-59 months was 38.3% [33.4-43.5], as presented in Table 49 below, which is considered 'Serious' based on WHO classification. However, the upper confidence, 43.5%, exceeds the 'Emergency' threshold based on WHO classification.

Table 49: NYP RC Prevalence of Chronic Malnutrition per HAZ for Round 3, WHO Reference 2006

Children 6-59 months	Round 3 Nov 2018			
	N	n	%	95% CI
Global Chronic Malnutrition	347	133	38.3%	[33.4-43.5]
Moderate Chronic Malnutrition		105	30.3%	[25.7-35.3]
Severe Chronic Malnutrition		28	8.1%	[5.6-11.4]

As seen in Table 50 below the prevalence of chronic malnutrition was higher for boys compared to girls for global (41.9% vs 34.5%), moderate (33.0% vs 27.4%) and severe (8.9% vs 7.1%) chronic malnutrition but the differences were not statistically significant. When comparing chronic malnutrition in children 6-23 months versus children 24-59 months, children 24-59 months had a higher prevalence of global (26.6% vs 45.0%), moderate (21.9% vs 35.0%), and severe (4.7% vs 10.0%) chronic malnutrition and the differences were statistically significant for global ($p<0.001$), moderate ($p=0.008$), and nearly statistically significant for severe ($p=0.055$).

Table 50: NYP RC Prevalence of Chronic Malnutrition per HAZ by Sex and Age Group for Round 3, WHO Reference 2006

Children 6-59 months	N	Global Chronic Malnutrition			Moderate Chronic Malnutrition			Severe Chronic Malnutrition		
		n	%	95% CI	n	%	95% CI	n	%	95% CI
All	347	133	38.3%	[33.4-43.5]	105	30.3%	[25.7-35.3]	28	8.1%	[5.6-11.4]
Boys	179	75	41.9%	[34.9-49.2]	59	33.0%	[26.5-40.1]	16	8.9%	[5.6-14.0]
Girls	168	58	34.5%	[27.8-42.0]	46	27.4%	[21.2-34.6]	12	7.1%	[4.1-12.1]
Children 6-23 months	128	34	26.6%	[19.7-34.8]	28	21.9%	[15.6-29.8]	6	4.7%	[2.2-9.8]
Children 24-59 months	220	99	45.0%	[38.6-51.6]	77	35.0%	[29.0-41.5]	22	10.0%	[6.7-14.7]

When further disaggregated by age group, all of the age groups had a severe chronic malnutrition prevalence over 8.0% with the exception of the 6-17 month age group which had a prevalence of 3.8% (3 children), as seen in Table 51. The prevalence of moderate chronic malnutrition was

over 29.9% in all age groups with the exception of the 6-17 month age group which had a prevalence of 13.9% (11 children).

Table 51: NYP RC Prevalence of Chronic Malnutrition per HAZ and by Age Group for Round 3, WHO Reference 2006

Children 6-59 months	N	Severe Chronic Malnutrition		Moderate Chronic Malnutrition		No Chronic Malnutrition	
		n	%	n	%	n	%
6-17 months	79	3	3.8%	11	13.9%	65	82.3%
18-29 months	90	8	8.9%	30	33.3%	52	57.8%
30-41 months	70	7	10.0%	21	30.0%	42	60.0%
42-53 months	73	7	9.6%	29	39.7%	37	50.7%
54-59 months	35	3	8.6%	14	40.0%	18	51.4%
Total	347	28	8.1%	105	30.3%	214	61.7%

3.2.10 NYP RC Prevalence of Underweight

The prevalence of underweight per WAZ among children 6-59 months was 35.0% [30.1-40.1], as presented in Table 52 below, which exceeds the 'Emergency' threshold based on WHO classification.

Table 52: NYP RC Prevalence of Underweight per WAZ for Round 3, WHO Reference 2006

Children 6-59 months	Round 3 Nov 2018			
	N	n	%	95% CI
Global Underweight	349	122	35.0%	[30.1-40.1]
Moderate Underweight		102	29.2%	[24.7-34.2]
Severe Underweight		20	5.7%	[3.7-8.7]

Underweight per WAZ among children 6-59 months is disaggregated by sex in Table 53 below. The prevalence was higher for girls compared to boys for global underweight (35.7% vs. 34.3%) and moderate underweight (30.4% vs. 28.2%). The prevalence of severe underweight was slightly higher for boys compared to girls (6.1% vs. 5.4%), however, there was no statistical significance between sex and underweight.

Table 53: NYP RC Prevalence of Underweight per WAZ by Sex for Round 3, WHO Reference 2006

Children 6-59 months	N	Global Underweight			Moderate Underweight			Severe Underweight		
		n	%	95% CI	n	%	95% CI	n	%	95% CI
All	349	122	35.0%	[30.1-40.1]	102	29.2%	[24.7-34.2]	20	5.7%	[3.7-8.7]
Boys	181	62	34.3%	[27.7-41.4]	51	28.2%	[22.1-35.1]	11	6.1%	[3.4-10.6]
Girls	168	60	35.7%	[28.9-43.2]	51	30.4%	[23.9-37.7]	9	5.4%	[2.8-9.9]

When further disaggregated by age group in Table 54, the prevalence of severe underweight was highest among children 6-17 months, 9.0% (7 children). All other age groups had a severe underweight prevalence ranging from 4.3%-5.7%. All of the age groups had a moderate underweight prevalence over 26% with the exception of the 6-17 month age group that had a moderate underweight prevalence of 16.7% (13 children).

Table 54: NYP RC Prevalence of Underweight per WAZ and by Age Group for Round 3, WHO Reference 2006

Children 6-59 months	N	Severe Underweight		Moderate Underweight		Not Underweight	
		n	%	n	%	n	%
6-17 months	78	7	9.0%	13	16.7%	58	74.4%
18-29 months	92	4	4.3%	26	28.3%	62	67.4%
30-41 months	70	3	4.3%	19	27.1%	48	68.6%
42-53 months	74	4	5.4%	30	40.5%	40	54.1%
54-59 months	35	2	5.7%	14	40.0%	19	54.3%
Total	349	20	5.7%	102	29.2%	227	65.0%

3.2.11 NYP RC Prevalence of Anaemia

The overall prevalence of anaemia (Hb<11.0 g/dL) among children 6-59 months was 38.1% [33.2-43.3] which is nearly at the WHO cut-off of 40% for significant public health concern as presented in Table 55 below. When comparing anaemia in children 6-23 months vs children 24-59 months, children 6-23 months had a higher prevalence of anaemia (59.4% vs 25.8%) and the difference was statistically significant (p<0.001).

Table 55: NYP RC Prevalence of Anaemia Among Children 6-59 months by Age Category, WHO Reference

Children 6-59 months	Round 3 Nov 2018			
	N	n	%	95% CI
Any Anaemia (Hb<11.0 g/dL)	349	133	38.1%	[33.2-43.3]
Mild Anaemia (Hb 10.0 to <11.0 g/dL)		68	19.5%	[15.7-24.0]
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)		63	18.0%	[14.4-22.4]
Severe Anaemia (Hb <7.0 g/dL)		2	0.6%	[0.2-2.1]
Children 6-23 months	N			
Any Anaemia (Hb<11.0 g/dL)	128	76	59.4%	[50.3-68.0]
Mild Anaemia (Hb 10.0 to <11.0 g/dL)		36	28.1%	[20.5-36.8]
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)		39	30.5%	[22.7-39.2]
Severe Anaemia (Hb <7.0 g/dL)		1	0.8%	[0.0-4.3]
Children 24-59 months	N			
Any Anaemia (Hb<11.0 g/dL)	221	57	25.8%	[20.2-32.1]
Mild Anaemia (Hb 10.0 to <11.0 g/dL)		32	14.5%	[10.1-19.8]
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)		24	10.9%	[7.1-15.7]
Severe Anaemia (Hb <7.0 g/dL)		1	0.4%	[0.0-2.5]

When disaggregated by sex as presented in Table 56 below, the prevalence of anaemia was found to be slightly higher among male children 6-59 months compared to female children 6-59 months (39.8% vs. 36.3%) but was not statistically significant.

Table 56: NYP RC Prevalence of Anaemia Among Children 6-59 months by Sex for Round 3, WHO Reference

Children 6-59 months	Male Children 6-59 months				Female Children 6-59 months			
	N	n	%	95% CI	N	n	%	95% CI
Any Anaemia (Hb<11.0 g/dL)	181	72	39.8%	[32.6-47.3]	168	61	36.3%	[29.0-44.1]
Mild Anaemia (Hb 10.0 to <11.0 g/dL)		37	20.4%	[14.8-27.1]		31	18.4%	[12.9-25.2]
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)		34	18.8%	[13.4-25.3]		29	17.3%	[11.9-23.8]
Severe Anaemia (Hb <7.0 g/dL)		1	0.6%	[0.0-3.0]		1	0.6%	[0.0-3.3]

3.2.12 NYP RC Prevalence of Anaemia among Non-Pregnant Non-Lactating Women

As seen in Table 57 below, the overall prevalence of anaemia (Hb<12.0 g/dL) among non-pregnant non-lactating women 15-49 years was 22.8% [18.0-28.2] which is considered 'Medium' based on the WHO classification of public health concern. No cases of severe anaemia were identified.

Table 57: NYP RC Prevalence of Anaemia Among Non-Pregnant Non-Lactating Women (15-49 years) for Round 3, WHO Reference

Women 15-49 years (non-pregnant, non lactating)	Round 3 Nov 2018			
	N	n	%	95% CI
Any Anaemia (Hb<12.0 g/dL)	276	63	22.8%	[18.0-28.2]
Mild Anaemia (Hb 11.0 to <11.9 g/dL)		38	13.8%	[9.9-18.4]
Moderate Anaemia (Hb 8.0 to <10.9 g/dL)		25	9.0%	[6.0-13.1]
Severe Anaemia (Hb <8.0 g/dL)		-	-	-

3.2.13 NYP RC Prevalence of Morbidity

The prevalence of diarrhea, ARI, and fever among children 6-59 months as per two-week recall period were 25.2% [21.0-30.0], 9.5% [6.9-13.0], and 33.6% [28.9-38.7] respectively, as presented in Table 58 below.

Table 58: NYP RC Two-Week Prevalence of Diarrhea, Cough, and Fever Among Children 6-59 Months for Round 3

Indicator	Round 3 Nov 2018			
	N	n	%	95% CI
Two-week prevalence of diarrhea*	357	90	25.2%	[21.0-30.0]
Two-Week Prevalence of Acute Respiratory Infection**	357	34	9.5%	[6.9-13.0]
Two-Week Prevalence of Fever	357	120	33.6%	[28.9-38.7]

**Diarrhea defined as the passage of three or more loose or liquid stools in a day. **ARI defined as cough with rapid or difficulty breathing AND a fever. Fever defined as mother checking childs' forehead and is warm accompanied my general malaise.*

The prevalence of suspected measles and diphtheria as presented in Table 59 below including all suspected cases. Household recall included: “yes, caregiver reports that the child was diagnosed at a clinic”, “yes, caregiver reports that the child was diagnosed by a local healer”, “yes, caregiver reports that child had disease, but did not seek diagnosis”.

The prevalence of suspected measles among children 6-59 months was 10.9% [8.1-14.6]. The majority of cases were confirmed by recall (n=36) with only 3 confirmed by health document.

There were no suspected cases of diphtheria reported among children 6-59 months in Round 3 in Nayapara RC.

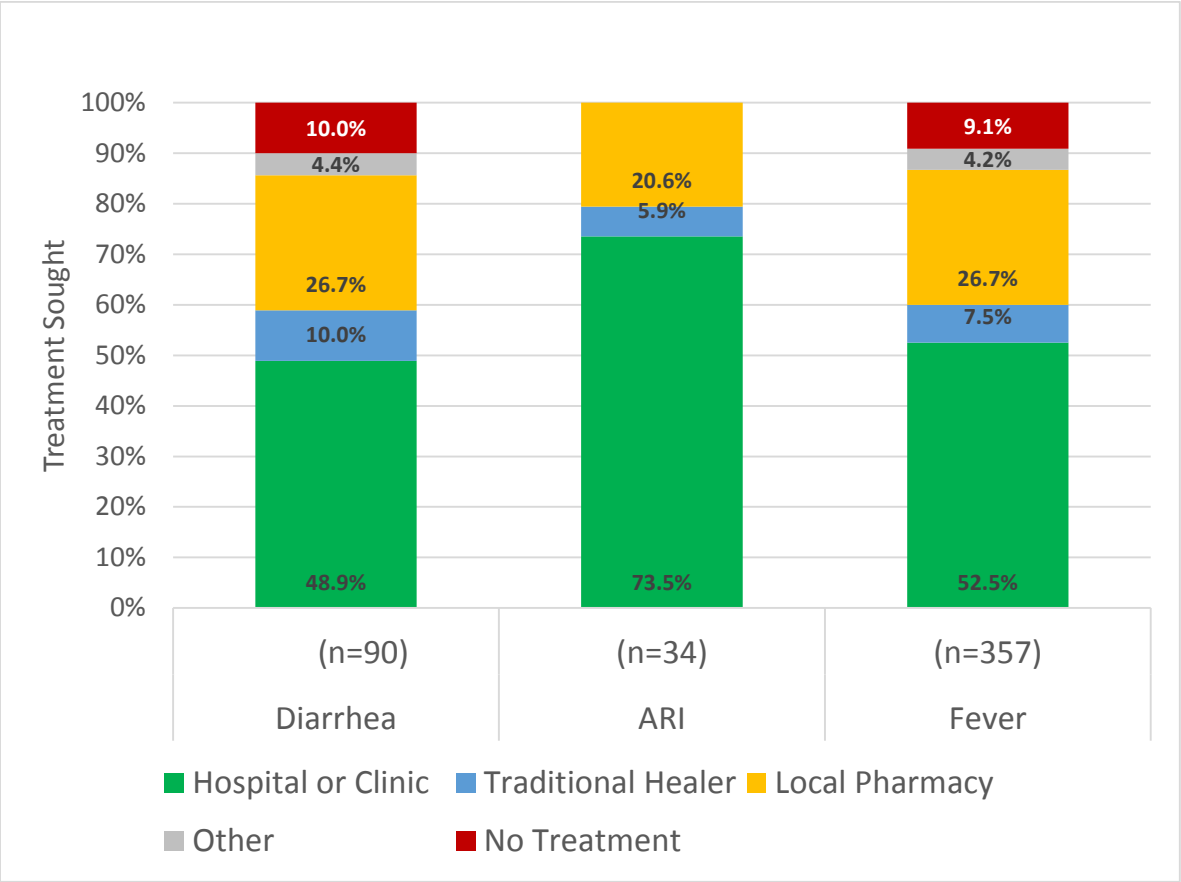
Table 59: NYP RC Prevalence of Suspected Measles and Diphtheria among Children 6-59 Months for Round 3

Prevalence of Fever with Rash (Suspected Measles)*	Children 6-59 months			
	N	n	%	95% CI
All Reported	357	39	10.9%	[8.1-14.6]
Confirmed by Health Document		3	0.8%	[0.3-2.4]
Confirmed by Household Recall		36	10.1%	[7.4-13.6]
Prevalence of Suspected Diphtheria*	N	n	%	95% CI
All Reported	357	0	-	-

**Measles and diphtheria recall period since 25 August 2017. All cases by household level self-report. Cases include children reportedly diagnosed by hospital or clinic but confirmed by caregiver recall*

Health seeking behaviors at the household level among children 6-59 months with reported symptoms of diarrhea, ARI, and fever are illustrated in Figure 8 below. The hospital or clinic was the most prominent treatment option for diarrhea (48.9%), ARI (73.5%), and Fever (52.5%), followed by Local Pharmacy and Traditional Healer.

Figure 8: NYP RC Health Seeking Behaviours for Symptoms of Diarrhea, ARI, and Fever in Children 6-59 months for Round 3



3.2.14 NYP RC Additional Supplementation and ANC Programme

The proportion of 6-59 month children that received at least 1 sachet of MNP since June 16th, 2018 was 83.8% [79.6-87.2] and 93.6% [90.5-95.7] received Vitamin A in the past 6 months prior to the survey as present in Table 60 below.

Table 60: NYP RC Proportion of Children 6-59 Months That Received Vitamin A, MNP Since Specified Period of Time for Round 3

Indicator	Round 3 Nov 2018			
	N	n	%	95% CI
Proportion of children that received at least 1 sachet of MNP since June 16,2018*	357**	299	83.8%	[79.6-87.2]
Proportion of children that received Vitamin A in past 6 months	357	334	93.6%	[90.5-95.7]

*Recall period between June 16th, 2018 and day of interview

As seen in Table 61 below, 80% [68.2-88.9] of pregnant women were enrolled in an antenatal care (ANC) programme. From the pregnant women enrolled in an ANC programme, 92.3% [81.5-97.9] were currently receiving IFA tablets.

Table 61: NYP RC Proportion of Pregnant Women Enrolled in an ANC Programme and/or Receiving IFA Tablets for Round 3

Indicator	Round 3 Nov 2018			
	N	n	%	95% CI
Proportion of pregnant women enrolled in ANC programme	65*	52	80.0%	[68.2-88.9]
Proportion of pregnant women currently receiving IFA tablets	65	50	76.9%	[64.8-86.5]
Proportion of pregnant women enrolled in ANC programme currently receiving IFA tablets	52	48	92.3%	[81.5-97.9]

*All 52 pregnant women enrolled in ANC programme verified by card

3.2.15 NYP RC Food Assistance

Different indicators to assess food assistance are included in Table 62 below. Nearly all households received food assistance, 98.2%, via e-voucher (SCOPE) card, 96.8% [94.9-97.9] and 1.4% [0.7-2.8] by GFD ration card. A total of 99.6% [98.7-99.9] purchased food using their SCOPE card within the past month and all households collecting GFD food rations had received them within the past month.

Table 62: NYP RC Receipt of Food Assistance for Round 3

Indicator	Round 3 Nov 2018	
	Sample HH	% [95% CI]
Proportion of households with a general food distribution (GFD) ration card and/or e-voucher (SCOPE) card	Households 544/554	98.2% [96.7-99.0]
Proportion of households with a GFD ration card	Households 8/554	1.4% [0.7-2.8]
With documented receipt of food rations September 2018	8/8	100%
Proportion of households with a SCOPE card for food rations	Households 536/554	96.8% [94.9-97.9]
With reported purchase of food items in September 2018	534/536	99.6% [98.7-99.9]

3.2.16 NYP RC Retrospective Mortality

In Nayapara RC, the CDR was 0.21 [0.11-0.39] and the Under 5 DR was 0.56 [0.19-1.64] as presented in Table 63. Both the CDR and Under 5 DR are below emergency thresholds as per the South Asian Sphere Standards.

Household level questions were asked to determine the cause of each death, under the broad categories of illness or injury/trauma. Seven of the 9 deaths were reported due to illness and the cause was not known for the remaining 2 deaths.

Table 63: NYP RC Retrospective Mortality and Cause of Death for Round 3

Indicator	Round 3 Nov 2018	
	Sample	Rate [95% CI]
Crude death rate* Deaths/10,000/day	Mid-interval population** (n=3,090)	0.21[0.11-0.39]
Under 5 death rate Deaths/10,000/day	Mid-interval population** (n=378)	0.56 [0.19-1.64]
Cause of death	**Sample**	**Rate**
Illness	Household member deaths (n=9)	77.8%
Don't Know		22.2%

**For Round 3, Eid Ul Fitre (June 16, 2018) was used as the beginning of the mortality recall period. **All households members present during recall period adjusted for in and out-migration*

4. DISCUSSION

4.1 Makeshift Settlements and Nayapara RC Comparison of Rounds 1,2,3

Round 1 of the assessment took place in October/November 2017, Round 2 in April/May 2018, and Round 3 in October/November 2018. The results of all indicators (including confidence intervals) in Rounds 1,2,3 and the p-values comparing Round 1 to Round 3 and Round 2 to Round 3 can be found in Annex 15.

4.2 Demography

Based on the indicators included in the assessment questionnaire, the findings from the two cross-sectional population representative SMART surveys presented in this Round 3 report along with results from the previous two Rounds discussed in the following section aim to illustrate the trends which have taken place over the one-year period between Round 1 and Round 3. The aim is also to provide some insight into the nutrtion context for the Rohingya population residing in refugee camps and settlements of Ukhia and Teknaf Upazilas of Cox's Bazar, Bangladesh.

Throughout this comparative discussion, it should be noted that the population size of the Makeshift Settlements (867 687) was approximately 38 times larger than Nayapara RC (22 545). Given the disparity in sample sizes and the difference in sampling methodology, the data speaks uniquely to each designated survey area and cannot be averaged without threatening an accurate representation of the populations.

Demographic shifts between the three Rounds of this assessment should be considered when interpreting the comparative results. Data collection for Round 1 was conducted just after the peak influx yet during an active population flow from Myanmar. This has lessened but continues until present day with 14 922 (43 individuals per day) Rohingya arriving in Cox's Bazar from January 1 to November 15th, 2018[36]. At the start of data collection for Round 1, the estimated Rohingya population in the Makeshift Settlements was 720 903. This increased to 904 657 in Round 2 and then decreased to 867 687 in Round 3. In Nayapara RC, the population decreased in each Round of the assessment from 38 997 in Round 1, 24 430 in Round 2, and 22 545 in Round 3. It should be noted that in Nayapara RC the population figures are estimated by converting total number of households, based on combining the UNHCR proGress registered household database figures and the ACF pre-data collection unregistered household enumeration figures, and converting to population using average household size; therefore, some error has likely occurred. Despite this, it is clear that the population in Nayapara RC has decreased significantly from Round 1 to Round 3.

The number of Rohingya refugees arriving in Cox's Bazar decreased significantly from Round 2 to Round 3 and it is unknown if households arriving later differed from households that arrived earlier during the emergency; therefore, the effect of the continued influx on the rates of malnutrition is difficult to generalise.

4.3 Data Quality

The anthropometry data quality for both the Makeshift Settlements and Nayapara RC was 'Excellent' based on the ENA for SMART plausibility check. In both camps the weight-for-height Standard Deviation (SD) was 'Good' as opposed to 'Excellent' because the SD was just outside of the range of 0.9-1.1 (MS 0.86, NYP RC 0.85). This also occurred in a few of the previous rounds of the assessment. Standard deviation takes into account the small measurement mistakes (weight, height, MUAC, age) which occur during data collection. Typically, low SD (below 0.9) is associated with over cleaning the data such as deleting WHO or SMART flags before analysis. This did not occur with this assessment. There are several reasons why the weight-for-height SD was lower than the majority of SMART surveys as seen below:

- The measurers had a lot of prior experience taking anthropometric measurements during SMART surveys and a significant time was spent practicing measurements during training before the standardization test.
- Each team had a supervisor that monitored all measurements
- The teams weighed each child two times on a SECA digital scale and if there was a difference a child was measured a third time
- Every child that was malnourished or close to malnourished based on a WHZ field tool had their weight and height and age double checked
- High quality UNICEF height boards, SECA digital scales, and an up to date local events calendar were used during data collection

As a result, when interpreting the data quality of the assessment, the ENA for SMART plausibility check score (5 points) for weight-for-height SD can be disregarded.

[36] ISCG (2018) Situation Report: Rohingya Refugee Crisis, 29 Nov, 2018

In the Makeshift Settlements there were significantly more 6-29 month children than expected compared to 30-59 month children (p=0.040). As a result, the age ratio (6-29 vs 30-59) criteria was considered 'Acceptable' based on the ENA for SMART plausibility check.

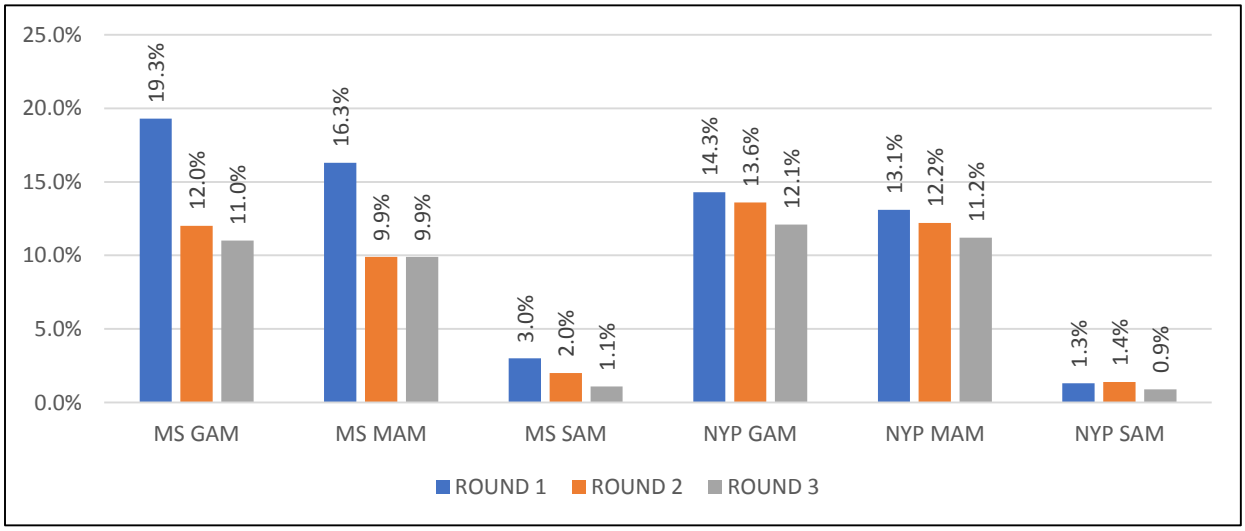
4.4 Acute Malnutrition

4.4.1 Makeshift Setlements and Nayapara RC (WHZ)

Acute malnutrition figures based on WHZ in Rounds 1,2,3 are presented in Figure 9 below. The prevalence of GAM in Round 3 in the Makeshift Settlements and Nayapara RC is categorized as 'Serious' based on WHO classification. GAM decreased significantly in the Makeshift Settlements from Round 1 to Round 3 (19.3% vs 11.0%, p<0.001) while the decrease in Nayapara RC (14.3% vs 12.1%) was not significant. From Round 1 to Round 3 in the Makeshift Settlements MAM (16.3% vs 9.9%, p<0.001) and SAM (3.0% vs 1.1%, p=0.01) decreased significantly. In Nayapara RC, MAM (13.1% vs 11.2%) and SAM (1.3% vs 0.9%) decreased but the difference was not significant. Comparing Rounds 2 and 3 in the Makeshift Settlements, the prevalence of GAM (12.0% vs 11.0%), MAM (9.9% vs 9.9%), and SAM (2.0% vs 1.1%) decreased slightly. In Nayapara RC, GAM (13.6% vs 12.1%), MAM (12.2% vs 11.2%), and SAM (1.4% vs 0.9%) decreased but not significantly.

The significant reduction of the prevalence of GAM from the one-year period between Round 1 to Round 3 in the Makeshift Settlements is to be as expected as nutrition interventions were rolled out to cope with the influx of Rohingya refugees fleeing Myanmar in 2017. The most notable reduction took place during the six-month period between Rounds 1 and 2. In Nyapara RC, which has been in existence since 1992, saw a modest decrease in the prevalence of GAM from Round 1 to Round 3. The greatest gains in reducing the prevalence of acute malnutrition (WHZ) were among MAM cases, suggesting that increased efforts to prevent and treat MAM can significantly contribute to an overall reduction of acute malnutrition.

Figure 9*:* MS and NYP RC Prevalence of Acute Malnutrition per WHZ and/or Oedema in Round 1,2,3 WHO Reference 2006



4.4.2 Makeshift Settlements: Sex and Age (WHZ)

When disaggregated by sex and age, as seen in Figure 10, in the Makeshift Settlements in Round 3, the prevalence of GAM was higher in boys compared to girls (13.0% vs 8.9%) but the difference was not significant. However, the prevalence of GAM was significantly higher in children 6-23 months compared to 24-59 months in Round 3 (15.7% vs 8.5%, p=0.018). When comparing Round 1 to Round 3, GAM decreased significantly in boys (20.2% vs 13.0%, p=0.009) and girls (18.3% vs 8.9%, p=0.001). GAM also decreased significantly in children 6-23 months from Round 1 to Round 3 (29.8% vs 15.7%, p=0.000) and children 24-59 months (14.2% vs 8.5%, p=0.008). Comparing Rounds 2 and 3 in the Makeshift Settlements, the prevalence of GAM in boys (13.1% vs 13.0%), girls (10.7% vs 8.9%) and children 6-23 months (19.5% vs 15.7%) decreased but not significantly and children 24-59 months (8.3% vs 8.5%) slightly increased.

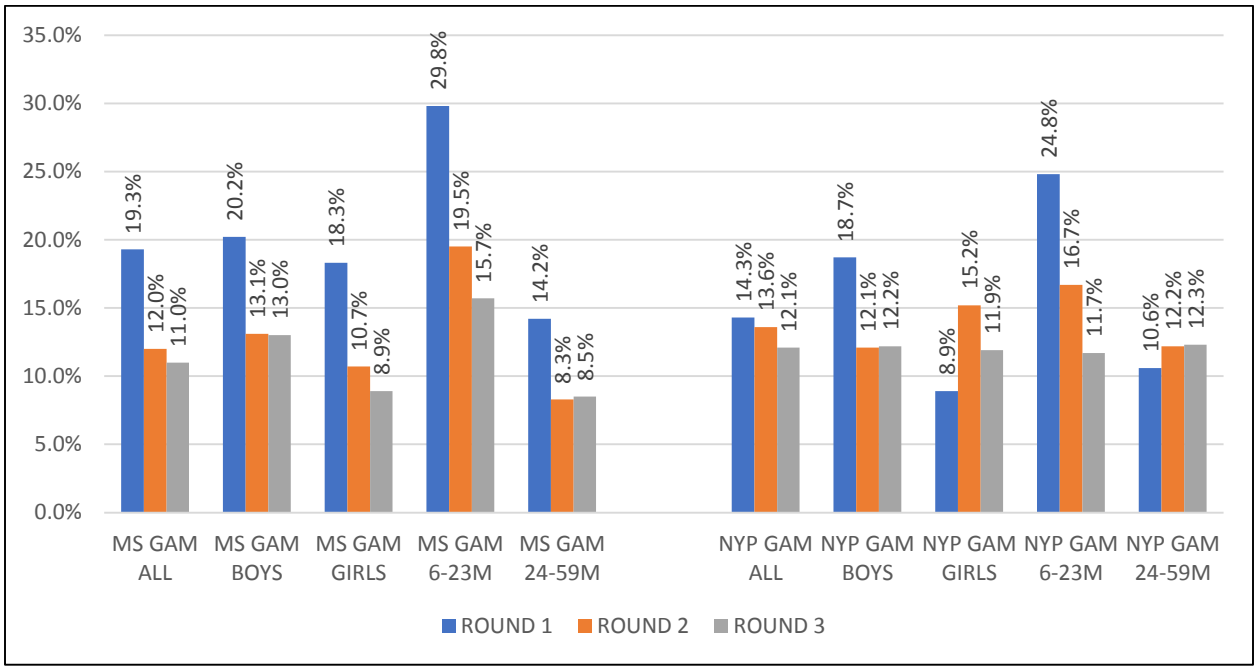
All categories in Figure 10 (GAM, GAM boys, GAM girls, GAM children 6-23 month, GAM children 24-59 months) have decreased significantly from Round 1 to Round 3 with the most notable reductions taking place from Round 1 to Round 2. Round 3 results suggest that children 6-23 months are more vulnerable to acute malnutrition; therefore, additional efforts should be made to target this age group.

4.4.3 Nayapara RC: Sex and Age (WHZ)

In Nayapara RC in Round 3, as seen in Figure 10, the prevalence of GAM in boys and girls was similar (12.2% vs 11.9%) as well as the prevalence of GAM in children 6-23 months and 24-59 months (11.7% vs 12.3%). When comparing Round 1 to Round 3, GAM decreased in boys (18.7% vs 12.2%) and increased in girls (8.9% vs 11.9%) but the differences were not significant. GAM decreased significantly in children 6-23 months from Round 1 to Round 3 (24.8% vs 11.7%, p=0.008) and increased in children 24-59 months (10.6% vs 12.3%) but the difference was not significant. Comparing Rounds 2 and 3, the prevalence of GAM in boys (12.1% vs 12.2%) and children 23-59 months (12.2% vs 12.3%) slightly increased and the prevalence of GAM in girls (15.2% vs 11.9%) and children 6-23 months (16.7% vs 11.7%) decreased but was not significant.

No significant changes occurred in all the categories in Figure 10 from Round 1 to Round 3 with the exception of children 6-23 months, in which the prevalence of GAM was reduced by half. The prevelance of GAM for all categories in Round 3 were around 12%. Additional nutritional support is required to reduce acute malnutrition in Nayapara RC but the results indicate that the focus should be placed equally on all categories.

Figure 10: MS and NYP RC Prevalence of Acute Malnutrition per WHZ and/or Oedema by Sex and Age in Round 1,2,3 WHO Reference 2006

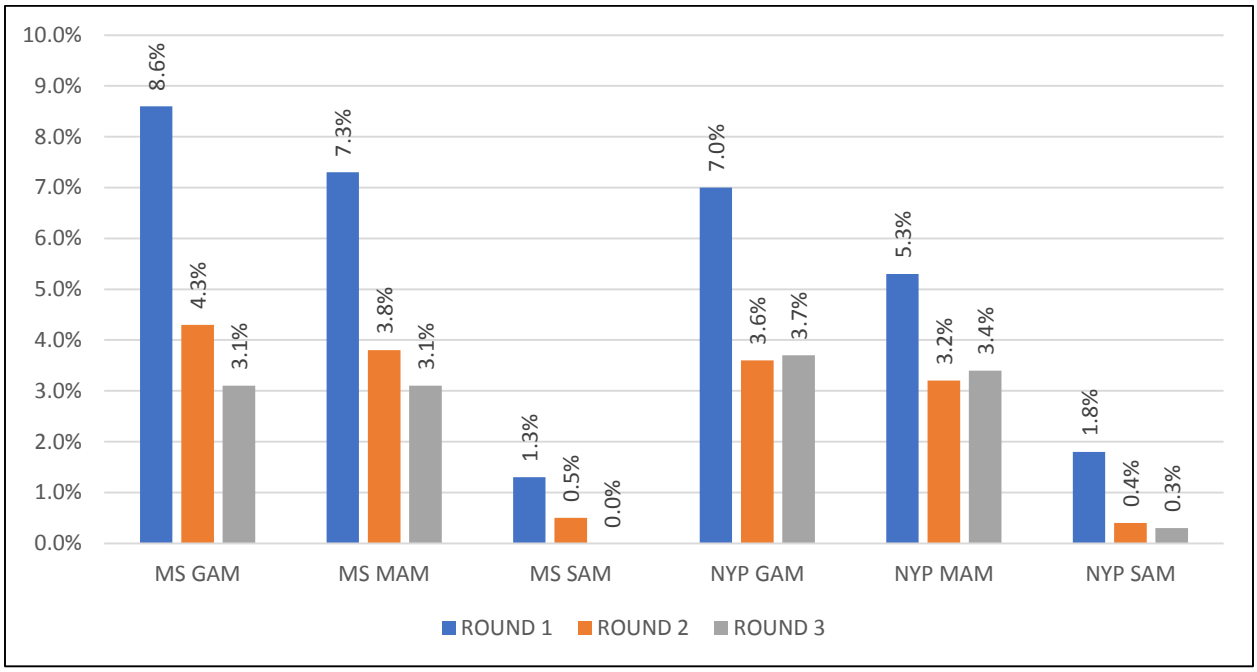


4.4.4 Makeshift Settlements and Nayapara RC (MUAC)

Acute malnutrition based on MUAC in Rounds 1,2,3 are presented in Figure 11 below. The prevalence of GAM in Round 3 in the Makeshift Settlements and Nayapara RC is categorized as 'Acceptable <6%' based on IPC classification. GAM decreased significantly from Round 1 to Round 3 in the Makeshift Settlements (8.6% vs 3.1%, p<0.001) and Nayapara RC (7.0% vs 3.7%, p=0.043). In the Makeshift Settlements MAM (7.3% vs 3.1%, p<0.001) and SAM (1.3% vs 0%, p<0.001) decreased significantly from Round 1 to Round 3. In Nayapara RC, MAM (5.3% vs 3.4%) and SAM (1.8% vs 0.3%) decreased from Round 1 to Round 3 but the difference was not significant. Comparing Rounds 2 and 3 in the Makeshift Settlements, the prevalence of GAM (4.3% vs 3.1%), MAM (3.8% vs 3.1%), and SAM (0.5% vs 0%, p=0.31) decreased with SAM being significant. In Nayapara RC, GAM (3.6% vs 3.7%), MAM (3.2% vs 3.4%), and SAM (0.4% vs 0.3%) remained almost the same in Rounds 2 and 3.

In the Makeshift Settlements, from Round 1 to Round 3, GAM by MUAC followed a similar trend as GAM by WHZ and decreased significantly with the most notable reduction taking place between Round 1 and Round 2. In Nayapara RC, GAM by MUAC decreased significantly from Round 1 to Round 3 in contrast to GAM by WHZ which decreased only a modest amount.

Figure 11: MS and NYP RC Prevalence of Acute Malnutrition by MUAC in Round 1, 2,3



4.4.5 Makeshift Settlements: Sex and Age (MUAC)

When disaggregated by sex and age, as seen in Figure 12 below, in the Makeshift Settlements in Round 3, the prevalence of GAM was higher in girls compared to boys (4.1% vs 2.2%) but the difference was not significant. However, the prevalence of GAM was significantly higher in children 6-23 months compared to 24-59 months in Round 3 (8.8% vs 0.2%, p<0.001). When comparing Round 1 to Round 3, GAM decreased significantly in boys (6.9%% vs 2.2%, p=0.001) and girls (10.4% vs 4.1%, p=0.002). GAM also decreased in children 6-23 months from Round 1 to Round 3 (22.3% vs 8.8%, p<0.001) and children 24-59 months (2.0% vs 0.2%) with children 6-23 months being significant. Comparing Rounds 2 and 3 in the Makeshift Settlements, the prevalence of GAM in boys (2.5% vs 2.2%), girls (6.3% vs 4.1%), children 6-23 months (11.2% vs 8.8%) and children 24-59 months (1.0% vs 0.2%) decreased but not significantly.

All categories in Figure 12 (GAM, GAM boys, GAM girls, GAM children 6-23 month) have decreased significantly from Round 1 to Round 3 with the exception of children 24-59 months which has had a GAM prevalence less than 2% since Round 1. The most notable reductions occurred between Round 1 and Round 2. In all 3 rounds children 6-23 months have had a significantly higher prevalence of GAM compared to children 24-59 months. The higher numbers of GAM cases among younger children and girls (although not signicantly different than boys) is consistent with MUAC's known bias towards identifying acute malnutrition in younger and small children[37].

4.4.6 Nayapara RC: Sex and Age (MUAC)

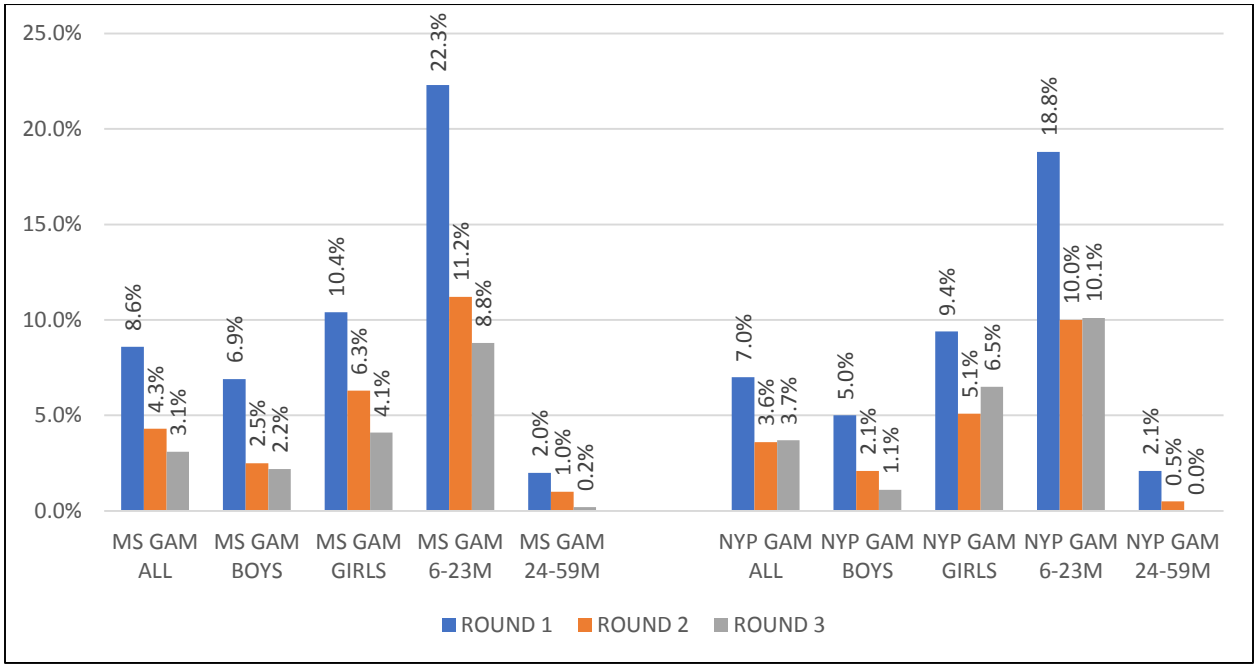
In Nayapara RC in Round 3, as seen in Figure 12, the prevalence of GAM was significantly higher in girls compared to boys (6.5% vs 1.1%, p=0.008) and children 6-23 months compared to 24-59

[37]Briend A, Golden MH, Grellety Y, Prudhon C, Hailey P. (1995) Use of mid-upper-arm circumference for nutritional screening of refugees

months (10.1% vs 0%, p<0.001). When comparing Round 1 to Round 3, GAM decreased in boys (5.0% vs 1.1%, p=0.019) and girls (9.4% vs 6.5%) with boys being significant. GAM also decreased in children 6-23 months from Round 1 to Round 3 (18.8% vs 10.1%, p=0.053) and children 24-59 months (2.1% vs 0%, p=0.014) with children 24-59 months being significant. Comparing Rounds 2 and 3, the prevalence of GAM in boys (2.1% vs 1.1%), girls (5.1% vs 6.5%), children 6-23 months (10.0% vs 10.1%) and children 24-59 (0.5% vs 0%) remained similar and there were no significant changes.

Similar to the results in the Makeshift Camps, the most urgent areas of concern pertaining to GAM by MUAC in Nayapara RC is the higher prevalence of GAM in girls and children 6-23 months.

Figure 12: MS AND NYP RC Prevalence of Acute Malnutrition by MUAC by Sex and Age in Round 1,2,3, WHO reference 2006



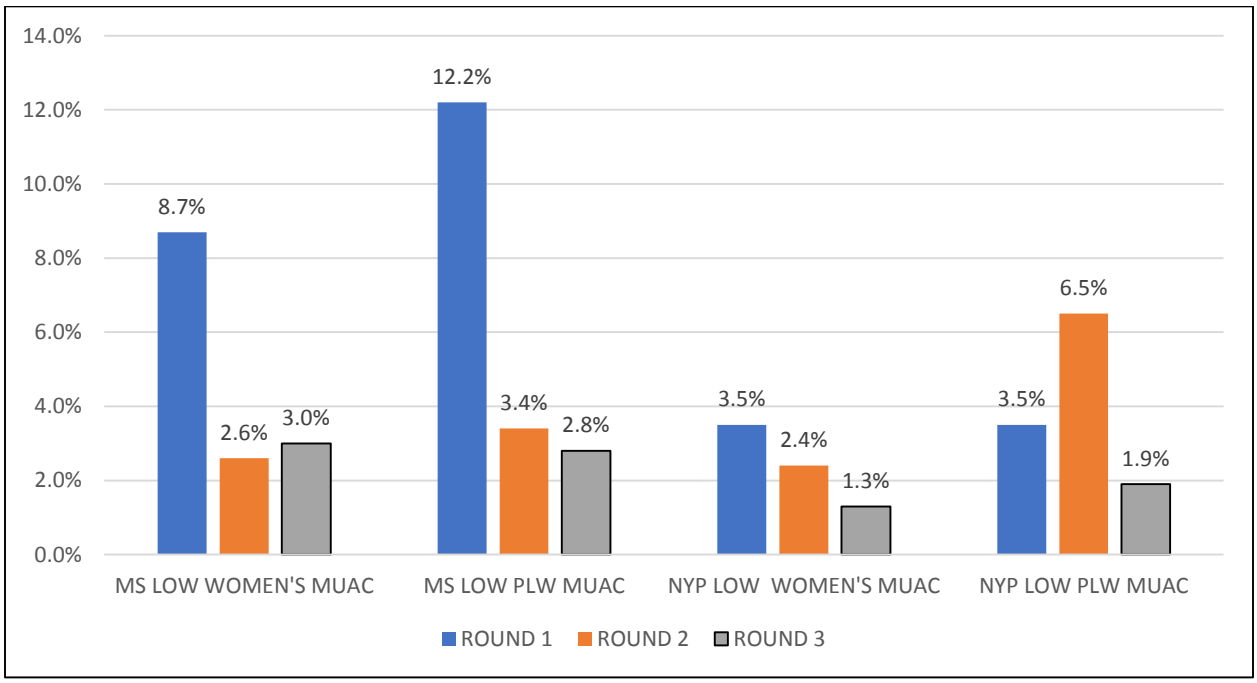
4.4.7 Acute Malnutrition Low Women's MUAC

Acute malnutrition based on low MUAC <210mm for women 15-49 years in Rounds 1,2,3 are presented in Figure 13 below. The prevalence of low women's MUAC in Round 3 in the Makeshift Settlements was 3.0% and 1.3% in Nayapara RC. Low women's MUAC decreased significantly from Round 1 to Round 3 in the Makeshift Settlements (8.7% vs 3.0%, p<0.001) and Nayapara RC (3.5% vs 1.3%, p=0.007). Comparing Round 2 and Round 3 low women's MUAC increased in the Makeshift Settlements (2.6% vs 3.0%) and decreased in Nayapara RC (2.4% vs 1.3%) but the changes were not significant.

The prevalence of low women's MUAC for pregnant or lactating women in Round 3 in the Makeshift Settlements was 2.8% and 1.9% in Nayapara RC. Low women's MUAC decreased from Round 1 to Round 3 in the Makeshift Settlements (12.2% vs 2.8%, p<0.001) and Nayapara RC (3.5% vs 1.9%) with the improvement being significant in the Makeshift Settlements. Comparing Round 2 and Round 3 low women's MUAC decreased in the Makeshift Settlements (3.4% vs 2.8%) and Nayapara RC (6.5% vs 1.9%) but not significantly.

The results indicate in the Makeshift Settlements that low women's MUAC for women 15-49 and pregnant or lactating women decreased significantly from Round 1 to 3 with the most notable reduction taking place from Round 1 to Round 2. The prevalence has remained 'Acceptable' since Round 2. In Nayapara RC, the prevalence of low women's MUAC for women 15-49 and pregnant or lactating women has consistently remained 'Acceptable' for all 3 Rounds with the exception of Round 2 that indicated an increase in low women's MUAC for pregnant or lactating women. However, this result has a wide confidence interval, 6.5% (2.9-13.9) so this must be taken into consideration. Nutritional support must be continued in order to maintain or improve the nutrition status of women 15-49 and pregnant or lactating women.

Figure 13: MS and NYP RC Low MUAC in Women 15-49 Years in Round 1,2,3



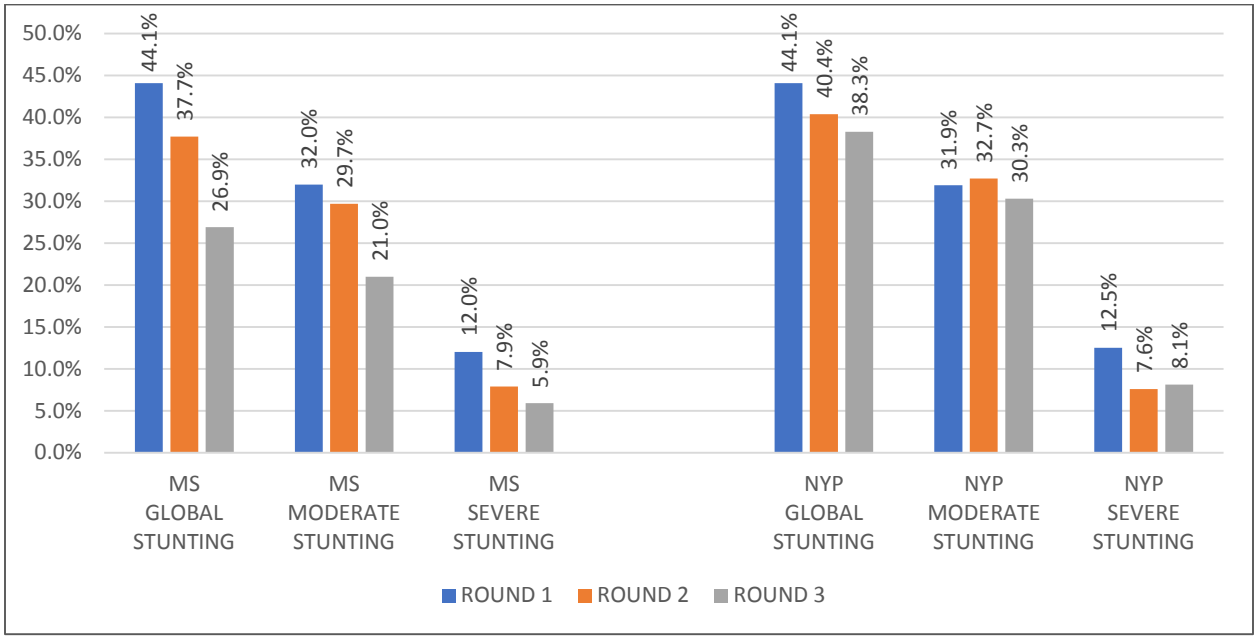
4.5 Chronic Malnutrition

4.5.1 Makeshift Camps and Nayapara RC (HAZ)

Chronic malnutrition (stunted) in Rounds 1,2,3 are presented in Figure 14 below. The prevalence of global chronic malnutrition in Round 3 in the Makeshift Settlements is categorized as 'Poor' and in Nayapara RC 'Serious' but approaching the >40% emergency threshold, based on WHO classification. Global chronic malnutrition decreased from Round 1 to Round 3 in the Makeshift Settlements (44.1% vs 26.9%, p<0.001) and Nayapara RC (44.4% vs 38.3%), with the Makeshift Settlements being significant. In the Makeshift Settlements, moderate chronic malnutrition (32.0% vs 21.0%, p<0.001) and severe (12.0% vs 5.9%, p<0.001) decreased significantly and in Nayapara RC moderate (31.9% vs 30.3%) and severe (12.5% vs 8.1%, p=0.048) also decreased with severe being significant. Comparing Round 2 and Round 3 in the Makeshift Settlements, the prevalence of global chronic malnutrition (37.7% vs 26.9%, p=0.002), moderate (29.7% vs 21.0%, p=0.004), and severe chronic malnutrition (7.9% vs 5.9%) decreased with global and severe being significant. In Nayapara RC, global chronic malnutrition (40.4% vs 38.3%) and moderate (32.7% vs 30.3%) decreased and severe (7.6% vs 8.1%) increased but none of these changes were significant.

The significant decreasing trend of global chronic malnutrition from Round 1 to Round 3 in the Makeshift Settlements is positive but surprising. Recent research has found that the mean recovery time from chronic malnutrition is 41 months[38]. This in part may be explained by nutritional differences in the households which arrived since Round 1, for example, less vulnerable households stayed in Myanmar longer. In Nayapara RC, there was a modest decrease in the prevalence of global chronic malnutrition from Round 1 to Round 3 but not as prevelant as the Makeshift Settlements likely due to the fact that the population demographics and humanitarian support in Nayapara RC has not significantly changed over the past year.

Figure 14: MS and NYP RC Prevalence of Chronic Malnutrition by HAZ in Round 1,2,3, WHO Reference 2006



4.5.2 Makeshift Settlements: Sex and Age (HAZ)

When disaggregated by sex and age, as seen in Figure 15 below, in the Makeshift Settlements in Round 3, the prevalence of global chronic malnutrition was higher in boys compared to girls (29.8% vs 24.0%) and in children 6-23 months compared to children 24-59 months (28.6% vs 26.0%) but the differences were not significant. When comparing Round 2 to Round 3, global chronic malnutrition decreased in boys (37.5% vs 29.8%), girls (37.5% vs 24.0%, p=0.005), children 6-23 months (29.6% vs 28.6%) and children 24-59 months (41.4% vs 26.0%, p<0.001) with girls and children 24-59 months being significant.

The results indicate that additional programmatic support is needed to further reduce the level of global chronic malnutrition in boys and girls. No significant differences were noted in Round 3 between boys vs girls and 6-23 month children vs 24-59 month children; therefore, the focus should be prioritized equally for each of these categories.

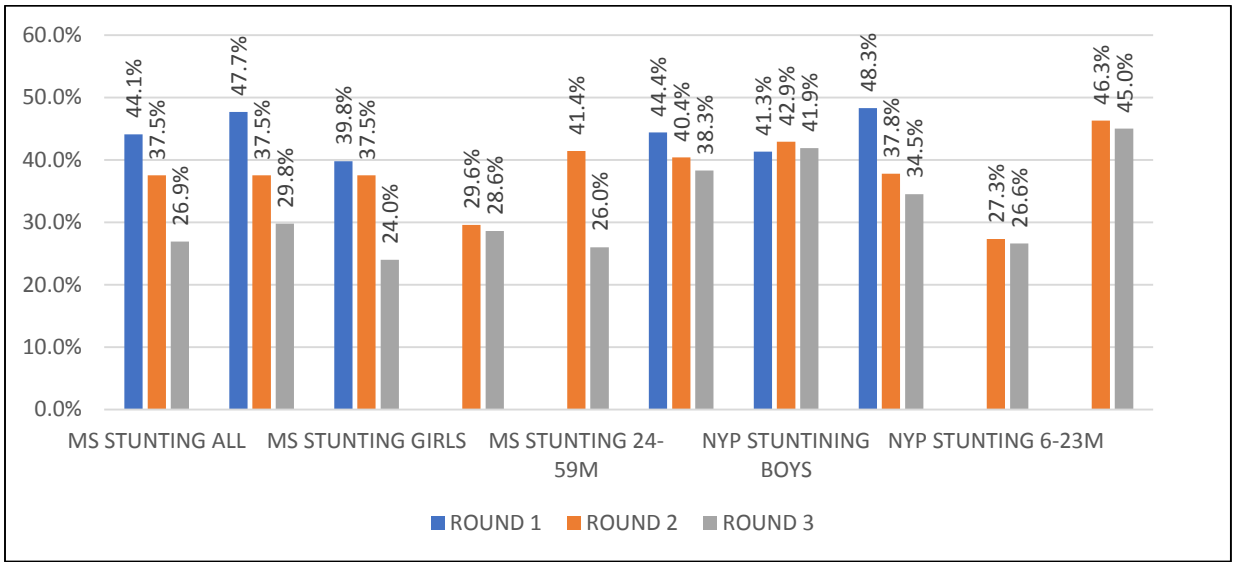
4.5.3 Nayapara RC: Sex and Age (HAZ)

[38] Bueno et al. (2018) Effectiveness of a Stunting Recovery Program for Children Treated in a Specialized Center

As seen in Figure 15, in Nayapara RC in Round 3, the prevalence of global chronic malnutrition was higher in boys compared to girls (41.9% vs 34.5%) and in children 24-59 months compared to children 6-23 months (45.0% vs 26.6%, p<0.001) with children 24-59 months compared to children 6-23 months being significant. When comparing Round 2 to Round 3, global chronic malnutrition decreased in boys (42.9% vs 41.9%), girls (37.8% vs 34.5%), children 6-23 months (27.3% vs 26.6%) and children 24-59 months (46.3% vs 45.0%) but not significantly.

The prevalence of global chronic malnutrition has been consistently near or above the WHO >40% emergency threshold for each of the three rounds of assessments and children 24-59 have had the highest prevalence. Additional support for activities that focus on reducing global chronic malnutrition must be prioritized.

Figure 15: MS and NYP RC Prevalence of Chronic Malnutrition by HAZ by Sex and Age Group, WHO Reference 2006



4.6 Anaemia

4.6.1 Anaemia: Children 6-59 months

Anaemia based on Hb<11.0g/dL for children 6-59 months are presented in Figure 16 below. The prevalence of anaemia in children 6-59 months in Round 3 in the Makeshift Settlements and Nayapara RC is approaching the 'High >40.0%' threshold, based on the WHO classification of public health concern. Anaemia decreased significantly from Round 1 to Round 3 in the Makeshift Settlements (47.9% vs 39.8%, p=0.019) and Nayapara RC (46.6% vs 38.1%, p=0.019) but increased significantly from Round 2 to Round 3 in the Makeshift Settlements (32.3% vs 39.8%, p=0.043) and Nayapara RC (29.4% vs 38.1%, p=0.021).

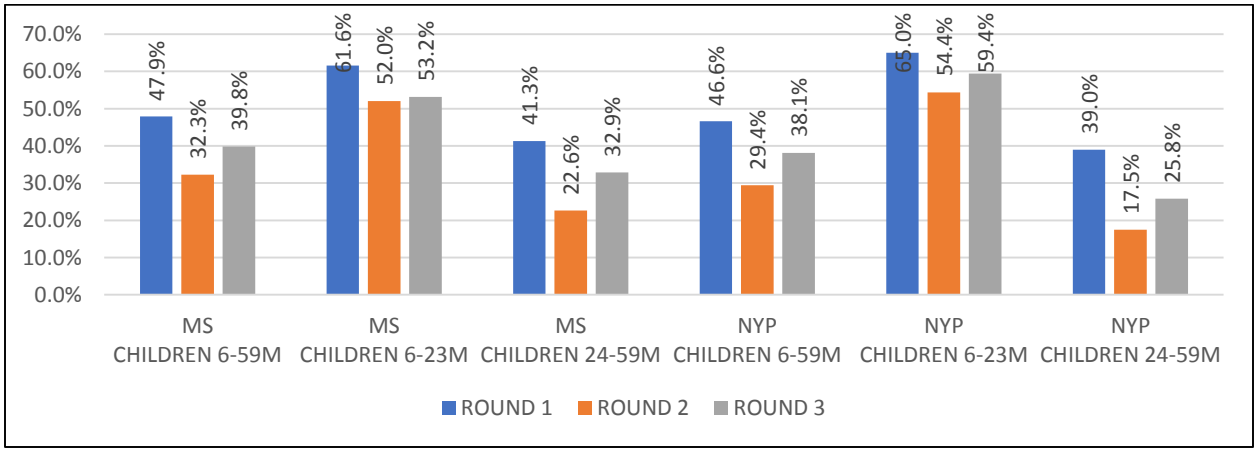
The prevalence of anaemia in both the Makeshift Settlements and Nayapara RC decreased from Round 1 to Round 3 but is still close to the WHO '>40%' threshold. There was a significant decrease of anaemia in both camps from Round 1 to Round 2 but then significantly increased again from Round 2 to Round 3. The cause of the increase from Round 2 to Round 3 should be explored and activities implemented to reduce the prevalence of anaemia in both camps.

4.6.2 Anaemia: Age

As seen in Figure 16 below, when disaggregated by age, in Round 3 anaemia prevalence was significantly higher in children 6-23 month compared to children 24-59 months in the Makeshift Settlements (53.2% vs 32.9%, p<0.001) and Nayapara RC (59.4% vs 25.8%, p<0.001). When comparing Round 1 to Round 3, anaemia decreased in children 6-23 months in the Makeshift Settlements (61.6% vs 53.2%) and Nayapara RC (65.0% vs 59.4%) but not significantly. Anaemia in children 24-59 months decreased significantly in the Makeshift Settlements (41.3% vs 32.9%, p=0.024) and Nayapara RC (39.0% vs 25.8%, p=0.002). Comparing Round 2 to Round 3, anaemia increased in children 6-23 months in the Makeshift Settlements (52.0% vs 53.2%) and Nayapara RC (54.4% vs 59.4%) but not significantly. Anaemia in children 24-59 months increased significantly in the Makeshift Settlements (22.6% vs 32.9%, p=0.012) and Nayapara RC (17.5% vs 25.8%, p=0.040).

The results indicate that the prevalence of anaemia in the Makeshift Settlements and Nayapara RC is disproportionally affecting children 6-23 months. In all three Rounds the prevalence of anaemia in children 24-59 months has been over 50% in both camps. The lack of significant change in the prevalence of anaemia among children 6-23 months between the three Rounds coupled with evidence of low dietary diversity raises questions pertaining to the potenital causes of the high prevalence of anaemia found such as the appropriateness of complementary feeding practices. Particularly the adequacy and delivery of complementary fortified blended foods, as the introduction of complementary feeding is a crucial time to introduce iron-rich foods given that breastmilk has a low concentration of iron[39]. The delivery and content of iron in foods and supplements may not entirely explain this disparity; therefore, in order to optimise anaemia reduction strategies, other causes of anaemia aside from nutritional iron-deficiency such as parasitic infections, malaria, reduced iron absorption, and the presence of other micronutrient deficiencies should be considered. In addition, previous studies in Bangladesh have indicated high iron content in groundwater and high prevalence of thalassemia, a hereditary blood condition which reduces hemoglobin levels in carriers[40]; both factors which could influence the overall prevalence of anaemia.

Figure 16: MS and NYP RC Prevalence of Anaemia Among Children 6-59 Months by Age Category in Round 1,2,3, WHO Reference



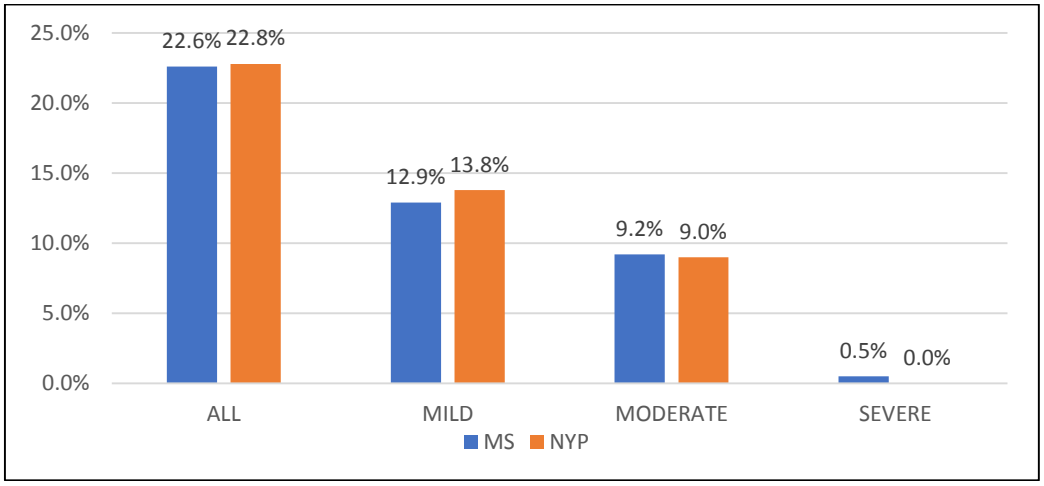
[39] WHO (2003) Guiding Principles for Complementary Feeding of the Breastfed Child

[40] Merrill RD, Shamim AA, Ali H, et al. (2012) High prevalence of anemia with lack of iron deficiency among women in rural Bangladesh: a role for thalassemia and iron in groundwater. Asia Pac J Clin Nutr. 21(3):416-24.

4.6.3 Anaemia: Women 15-49 years

Anaemia based on Hb<12.0g/dL for non-pregnant non-lactating women 15-49 years are presented in Figure 17 below. Anaemia status of non-pregnant non-lactating women was not included in the first two Rounds. The prevalence of anaemia in Round 3 in the Makeshift Settlements and Nayapara RC is categorized as 'Medium' based on WHO classification of public health significance. Nearly all cases of anaemia in the Makeshift Settlements and Nayapara RC were mild or moderate.

Figure 17: MS AND NYP RC Prevalence of Anaemia Among Non-Pregnant Non-Lactating women (15-49 years) for Round 3, WHO Reference



4.7 Morbidity

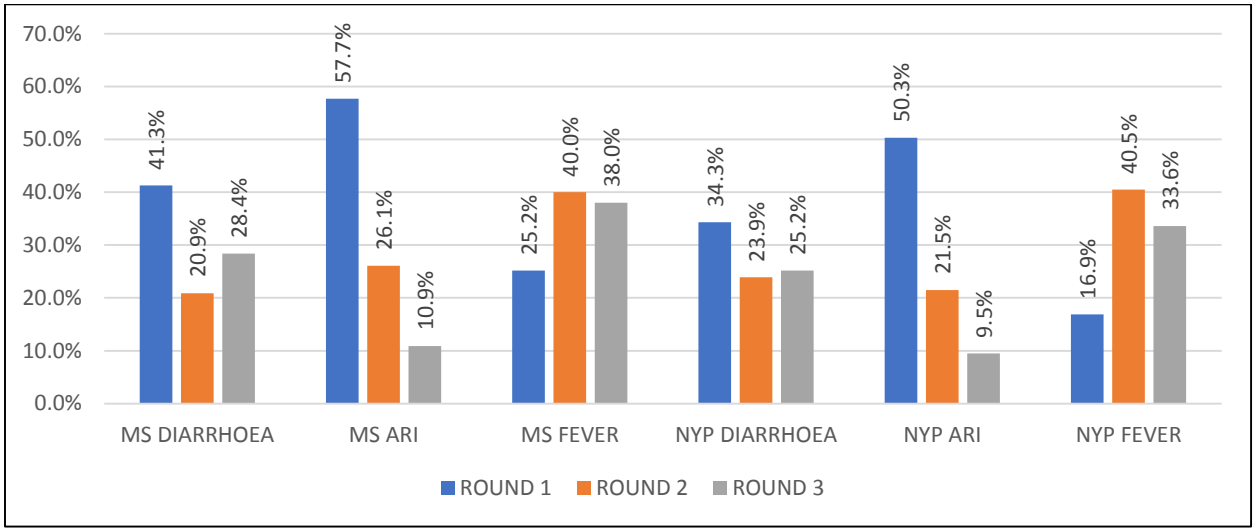
Morbidity indicators based on a two-week recall are presented in Figure 18 below. In Round 3 the prevalence of morbidity indicators in the Makeshift Settlements were diarrhea 28.4%, ARI 10.9%, fever 38.0% and in Nayapara RC they were diarrhea 25.2%, ARI 9.5%, fever 33.6%. The prevalence of diarrhea decreased significantly from Round 1 to Round 3 in the Makeshift Settlements (41.3% vs 28.4%, p<0.001) and in Nayapara RC (34.3% vs 25.2%, p=0.006) and when comparing Round 2 to Round 3 the prevalence of diarrhea increased in the Makeshift Settlements (20.9% vs 28.4%, p=0.007) and Nayapara RC (23.9% vs 25.2%) with the Makeshift Settlements being significant. The prevalence of ARI decreased significantly from Round 1 to Round 3 in the Makeshift Settlements (57.7% vs 10.9%, p<0.001) and in Nayapara RC (50.3% vs 9.5% p<0.001) and when comparing Round 2 to Round 3 the prevalence of ARI also decreased significantly in the Makeshift Settlements (26.1% vs 10.9%, p<0.001) and Nayapara RC (21.5% vs 9.5%, p<0.001). The prevalence of fever increased from Round 1 to Round 3 in the Makeshift Settlements (25.2% vs 38.0%) and in Nayapara RC (16.9% vs 33.6%, p<0.001) with Nayapara RC being significant and when comparing Round 2 to Round 3 the prevalence of fever decreased in the Makeshift Settlements (40.0% vs 38.0%) and Nayapara RC (40.5% vs 33.6%) but not significantly.

The prevalence of diarrhea, ARI, and fever followed the same pattern in each of the three Rounds in the Makeshift Settlements and Nayapara RC. Diarrhea decreased from Round 1 to Round 2 and increased from Round 2 to Round 3 with the Makeshift Camps being significant. ARI decreased significantly from Round 1 to Round 2 as well as Round 2 to Round 3. Fever increased

significantly from Round 1 to Round 2 and decreased from Round 2 to Round 3 with Nayapara RC being significant. When comparing Round 1 to Round 3, fever has become the most prevalent morbidity as opposed to diarrhea which was most prevalent in Round 1. For each Round of the assessment over 45% of participants sought treatment for diarrhea and/or ARI and/or fever at a hospital or clinic. The second most common health seeking behaviour was a local pharmacy.

The rapid influx of refugees into Bangladesh severely strained existing health services and overcrowding in the camps likely contributed to disease outbreaks among the most vulnerable. In response, health services were scaled up and immunisation campaigns conducted in an effort to mitigate a heightened communicable disease burden. This may have contributed to the significant decrease in reported ARI symptoms since Round 1. Additional efforts should be made to reduce the prevalence of diarrhea and fever.

Figure 18: MS and NYP RC Two-Week Prevalence of Diarrhoea, Cough, and Fever Among Children 6-59 Months Round 1, 2, 3



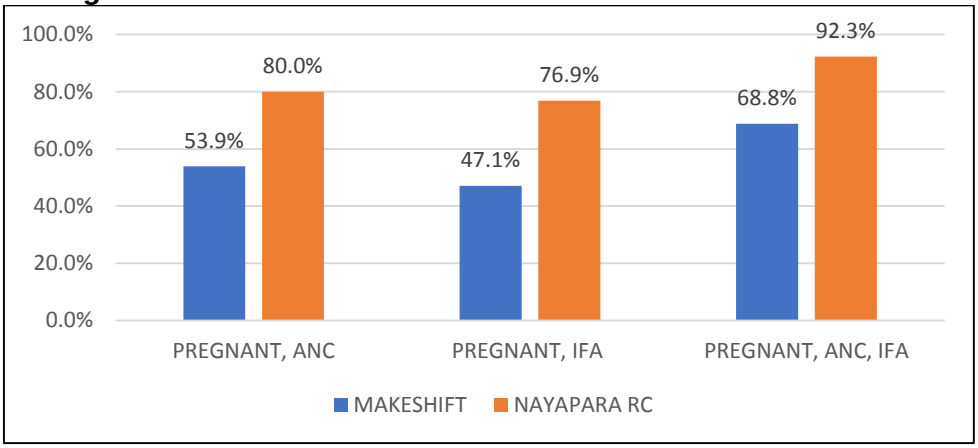
4.8 Additional Supplementation and ANC Programme

4.8.1 Antenatal Care Program and Iron-folic acid Supplementation

The proportion of pregnant women enrolled in an antenatal care (ANC) program and/or receiving iron-folic acid (IFA) tablets is presented in Figure 19 below. This information was not included in the first two round of the ENA. In the Makeshift Settlements 53.9% of pregnant women surveyed were enrolled in an ANC program and 68.8% of these women were receiving IFA tablets. A total of 47.1% of pregnant women surveyed were receiving IFA tablets, including pregnant women enrolled and not enrolled in an ANC program. In Nayapara RC 80% of pregnant women surveyed were enrolled in an ANC program and 92.3% of these women were receiving IFA tablets. A total of 76.9% of pregnant women surveyed were receiving IFA tablets, including pregnant women enrolled and not enrolled in an ANC program.

The results indicate that activities to increase enrollment into ANC programs in the Makeshift Settlements is needed. In addition, when pregnant women are enrolled in an ANC program emphasis must be made to ensure that they are receiving IFA tablets. In both camps, activities to increase awareness of the benefits of IFA tablets and where to access them should also be considered.

Figure 19: MS and NYP RC Proportion of Pregnant Women Enrolled in an ANC Programme and/or Receiving IFA Tablets for Round 3



4.8.2 Micronutrient Powder and Vitamin A Supplementation

In the Makeshift Camps the proportion of 6-59 month children that received at least one sachet of MNP in approximately the four months prior (date of start of mortality recall period) to the survey increased significantly with each Round (10.3% R1, 29.9% R2, 58.7% R3). The same trend occurred in Nayapara RC (10.5% R1, 58.5% R2, 83.8% R3). The frequency of receiving MNP was not included in the questionnaire; therefore, it is not possible to determine the effects of MNP on the health status of children 6-59 months in the camps.

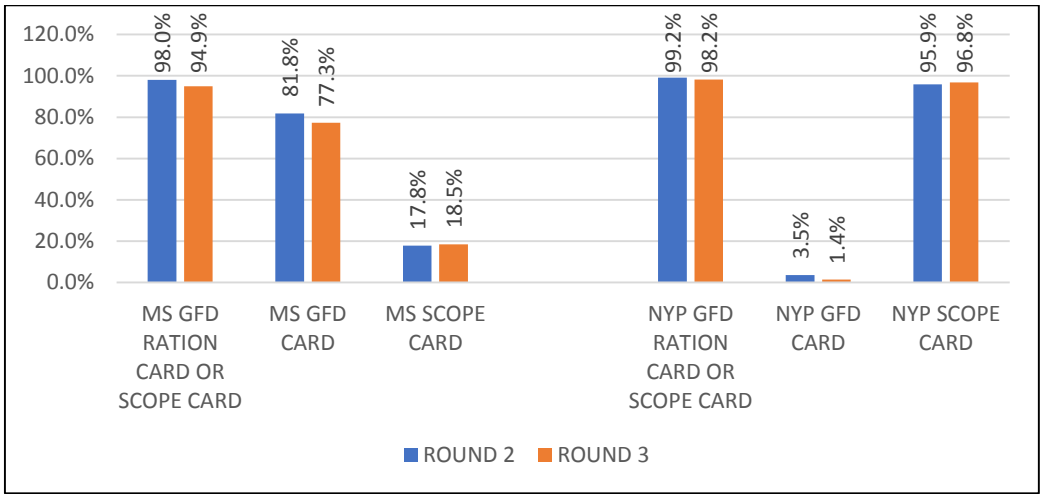
Vitamin A supplementation for children 6-59 months was not included in the first two Rounds of the assessment. In Round 3, the proportion of 6-59 month children that received vitamin A in the past 6 months in the Makeshift Settlements was 92.1% and 93.6% in Nayapara RC. The most recent vitamin A campaign took place between July 14-19, 2018.

4.9 Food Assistance

Information pertaining to type of food assistance received in Rounds 2 and 3 is presented in Figure 20 below. Households receiving food assistance via a General Food Distribution (GFD) food ration or e-voucher SCOPE card has been nearly universal since Round 2 in the Makeshift Settlements and Nayapara RC. In the Makeshift Settlements in Round 3, 77.3% of households had a GFD card and 18.5% had a SCOPE card and in Nayapara RC, 1.4% of households had a GFD card and 96.8% had a SCOPE card. Comparing Rounds 2 and 3, the proportion of households with a GFD card decreased in the Makeshift Settlements (81.8% vs 77.3%) and Nayapara RC (3.5% vs 1.4%, p=0.031) with Nayapara RC being significant. The proportion of households with a SCOPE card increased in the Makeshift Settlements (17.8% vs 18.5%) and Nayapara RC (95.9% vs 96.8%) but not significantly.

The e-voucher SCOPE card program should be expanded over time in the Makeshift Settlements. It is the preferred method of food assistance because it includes more variety of foods compared to the GFD. Although using the e-voucher SCOPE card can increase dietary diversity it is important to promote the importance of dietary diversity, otherwise families may still choose to select only a few staple food items.

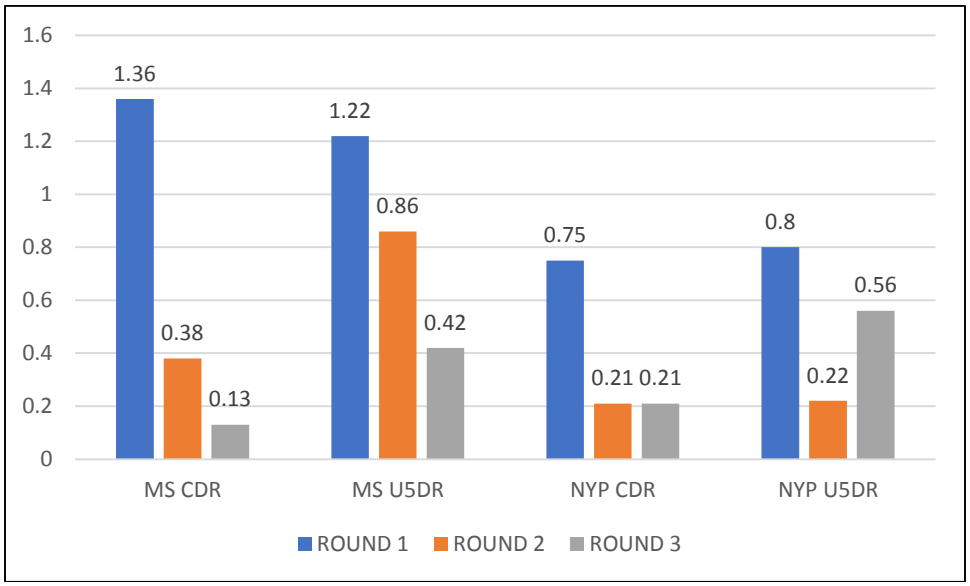
Figure 20: MS and NYP RC Receipt for Food Assistance for Round 2,3



4.10 Mortality

As seen in Figure 21 below, the Crude Death rate (CDR) and Under 5 Death Rate (U5DR) in the Makeshift Settlements have decreased with each Round of the assessment and in Round 3 they were below the WHO, and SPHERE for South Asia, thresholds for emergencies. In Nayapara RC the CDR decreased from Round 1 to Round 2 and remained the same in Round 3. The U5DR decreased from Round 1 to Round 3 but increased in Round 3. However, both the CDR and U5DR are below the WHO, and SPHERE for South Asia, thresholds for emergencies in Round 3.

Figure 21: MS and NYP RC Retrospective Mortality for Round 1,2,3



4.11 Limitations of the Assessment

The SMART methodology used for the Assessment provides a snap shot of the prevalence of malnutrition and other indicators collected during the data collection period. However, the prevalence of malnutrition cannot be entirely understood without an in-depth analysis of the underlying causes of malnutrition, including the socio-economic context, child care practices, food security and livelihoods environment, WASH assessment, market analyses etc as typically found in a 6-month Nutrition Causal Analysis (NCA). This report provides a general overview and analysis of the context in Cox's Bazar during the period from 30 October to 8 November 2018.

The planning phase of the assessment took place in August and September 2018. The population figures used during planning were from the end of August 2018 for the Makeshift Settlements and the end of September 2018 for Nayapara RC; therefore, the population estimates relied on during planning may have increased or decreased by the time teams arrived for data collection. As a result, there may exist a slight overrepresentation or underrepresentation of certain sites within the sampling frame. In addition, Kutupalong Registered Camp was also planned to be included in the assessment but was eventually excluded due to extenuating circumstances pertaining to high rates of refusal.

5. Conclusion and Recommendations

The Emergency Nutrition Assessment Round 3 was conducted in Cox's Bazar, Bangladesh from 30 October to 8 November 2018 with the aim of determining the nutrition status among Rohingya living in the Makeshift Settlements and Nayapara Registered Camp. The Round 1 ENA was conducted in October-November 2017 and Round 2 took place April-May 2018. The findings indicate in the Makeshift Settlements that the prevalence of GAM among children 6-59 months using WHZ has decreased significantly from Round 1 to Round 3 (19.3% R1,12.0% R2,11.0% R3) falling below the 15% WHO emergency threshold. In Nayapara RC there has also been a declining trend from Round 1 to Round 3 (14.3% R1, 13.6% R2, 12.1% R3) but is not statistically significant. Women's low MUAC (<210mm) has decreased significantly from Round 1 to Round 3 in both sites and has been within the 'Acceptable' IPC classification (<6%) since Round 2.

Further, the crude mortality rate has reduced significantly in both the Makeshift Settlements and Nayapara RC from Round 1 to Round 3 and has been below the WHO emergency threshold of 1/10,000 persons/day and the Sphere 0.40/10,000/day threshold for South Asia since Round 2.

In the Makeshift Settlements, chronic malnutrition among children 6-59 months has declined significantly from Round 1 to Round 3 with a notable reduction taking place from Round 2 to Round 3 (44.1% R1, 37.3% R2, and 26.9% R3). The Round 3 chronic malnutrition prevalence, 26.9%, is considered 'Poor' based on WHO classification. In Nayapara RC, chronic malnutrition has steadily decreased from Round 1 to Round 3 (44.3% R1, 40.4% R2, and 38.3% R3) but is not statistically significant and remains near the 40% WHO 'Emergency' threshold.

The overall prevalence of anaemia among children 6-59 months decreased significantly from Round 1 to Round 3 in both the Makeshift Settlements and Nayapara RC. However, in both sites anaemia increased significantly from Round 2 to Round 3 and remains near the >40% WHO

threshold for Public Health Significance in the Makeshift Settlements (38.1% R3) and Nayapara RC (39.8% R3). The prevalence of anaemia for children 6-23 months has consistently been over 50% for all three Rounds in both sites. Anaemia prevalence for non-pregnant non-lactating women 15-49 years in Round 3 (data not collected Round 1,2) was approximately 22.0% in both the Makeshift Settlements and Nayapara RC, which is considered 'Medium' based on WHO classification of Public Health Significance.

Data from the two-week recall among children 6-59 months indicated a significant decrease of acute respiratory infection when comparing Round 1 to Round 3 as well as Round 2 Round 3 in both the Makeshift Settlements and Nayapara RC. Prevalence of diarrhea reduced significantly from Round 1 to Round 3 in both sites but increased significantly from Round 2 to Round 3 in the Makeshift Settlements. Prevalence of fever increased from Round 1 to Round 3 in both sites. When comparing Round 2 to Round 3, the prevalence of fever decreased in both sites but was not statistically significant. Also, a minimum of nearly 50% of caregivers of children 6-59 months with symptoms of ARI and/or diarrhea and/or fever at both sites sought treatment at a hospital or clinic. Due to the continuing crowded camp conditions in both sites the disease burden remains a concern.

Household level support with food assistance by GFD ration card or e-voucher SCOPE card was found to be near universal in both sites. In Nayapara RC in Round 3, 96.8% of households surveyed used a SCOPE card which was nearly the same as Round 2. For Round 3 in the Makeshift Settlements, 77.3% of households surveyed used a GFD ration card and 18.5% of households used a SCOPE card which was similar to Round 2 results.

The Round 3 Assessment also included information pertaining to pregnant women attending an antenatal care program and taking iron-folic acid tablets. In the Makeshift Settlements, 47.1% of pregnant women surveyed were taking IFA tablets. 53.9% of pregnant women were enrolled in an ANC program and 68.3% of these women were also taking IFA tablets. In Nayapara RC, 76.9% of pregnant women surveyed were taking IFA tablets. A total of 80% of pregnant women were enrolled in an ANC program and 92.3% of these women were also taking IFA tablets.

Compared to established WHO malnutrition cut-offs, **the malnutrition status of the Rohingya during Round 3 of this assessment constitute serious levels of malnutrition in need of ongoing nutritional support**. Although the results indicate significant improvement since Round 1, particularly in the Makeshift Settlements, the prevalence of acute malnutrition remains high despite considerable scale-up of nutrition treatment centres, food distributions, WASH facilities, and health services. In addition, the high prevalence of anaemia and concerning disease burden, suggest an ongoing need to strengthen nutrition treatment and prevention programmes as supported by health and nutrition services, IYCF support, food diversification, access to safe and adequate water and sanitation, appropriate shelter and education, and the provision of psychosocial support in order to better serve the Rohingya refugee population of Cox's Bazar.

The recommendations drawn from the findings of this assessment are the following:

- To increase the number of identified GAM cases, introduce or strengthen WHZ/MUAC screening at TSFP/BSFP sites. As TSFP/BSFP services are provided at regular visits, are conducted at fixed sites, and target all children <5 years, this may be easier to scale up than house-to-house screening. This may require hiring additional staff for allotted measurement days and standardized training. This will require a sustained long-term effort evidenced by strong reporting and record keeping.

- Continued advocacy at the national level for the use of WHZ as admission criteria into acute malnutrition treatment programmes.

- Assess the feasibility of introducing and/or scaling up growth monitoring and promotion (GMP) for all children under five years. GMP requires clinicians to have the time and training to conduct proper counseling as well as measurements. The use of GMP should capitalize on the provision of advice and engagement with the caregiver, to counsel on health and nutrition practices catered for the individual child. Partners should discuss whether GMP could be successfully supported in select primary and secondary health facilities with at least one clinician and proper support—initially as a pilot to test feasibility. Consider opportunities to strengthen GMP in the host community as well as camps.

- Initiate the screening of anaemia among all malnourished children in OTP/TSFP/SC facilities and refer those with physical symptoms for further screening and treatment to the appropriate health facilities.

- Conduct a short survey to review the adherence of the BSFP programme and any scheduled MNP programme with the goal of determining how the adherence to these programmes affects levels of anaemia.

- Increase community awareness in the Makeshift Settlements to increase enrollment of pregnant women in ANC programs. A secondary objective is to increase the number of pregnant women in an ANC program receiving IFA tablets and to ensure that the tablets are being consumed.

- If additional data supports the present survey results of low enrollment of pregnant women in ANC programs and taking IFA tablets, conduct a short barrier analysis to determine what are the contributing factors stopping pregnant women from enrolling in ANC programs and taking IFA tablets.

- Continue the near universal usage of the e-voucher SCOPE card in NYP RC and scale up the use of the e-voucher SCOPE card in MS in order to increase dietary diversity. This will also include WFP supporting vendors in providing iron-rich foods that can be easily prepared as complementary foods. Cash programs can also be explored or expanded.

- Review e-voucher SCOPE card data to determine whether or not individuals are purchasing a variety of food items as opposed to commonly choosing 3 or 4 stable items. If it is determined that individuals are not purchasing a variety of foods conduct a short barrier analysis to determine the factors that are inhibiting individuals from selecting a variety of foods.

- Support more action oriented and collaborative efforts among the Health, WASH, Food Security and Nutrition sectors in strengthening prevention and control programmes.

- Conduct an Emergency Nutrition Assessment Round 4 in the fourth quarter of 2019 to monitor the evolution of the nutrition and health status of children 6-59 months and women 15-49 years, as well as household-level receipt of services.

Annex 1: Bangladesh Nutrition Sector Nutrition Programming Admission and Discharge Criteria

Bangladesh Nutrition Sector
https://www.humanitarianresponse.info/en/operations/bangladesh

Admission and Discharge Criteria of Community based Management of Acute Malnutrition (CMAM) Programme

[BSFP, TSFP, OTP and SC]

Admission and Discharge criteria for SC

Target Group	Admission Criteria	Discharge Criteria
6-59 months	Bilateral edema: +++ *or*	No bilateral edema *and*
	Bilateral edema + / ++ **or** WFH< -3 Z score *and/or* MUAC <11.5 cm *and* no appetite *and* presence of medical complications as per National CMAM/IMCI Protocol	Medical complication treated or resolved *and* presence of appetite *and* Immunization completed *or* planned
< 6 months or ≥6 months and <3 kg with prospect of breastfeeding	***Any one or more of the following:*** • WFL <-3 Z Score *with/without* medical complication • Too weak or feeble to suckle effectively • Infant not gaining weight at home after serial measurements (3 times; weekly basis) • Visibly wasted (If length is <45 cm then calculation of WLZ is not possible)	The child is gaining weight on breastmilk alone after the supplemented suckling technique has been used *and* achieve a minimum of 5 g/kg/day weight gain due to breastfeeding alone over a period of 3 consecutive days before discharge[1] *and* there is no medical complication *and* the mother has been enrolled/ referred to BSFP/TSFP to ensure supplementation with vitamins and minerals to restore vitamin and nutrient stores
< 6 months or ≥6 months and <3 kg with no prospect of breastfeeding		WFL ≥ -1.5 Z Score *and weight >3.5kg and* gaining weight at 5g/kg/day at least for 3 successive days before discharge[2] *and* there is no medical complication

Notes:

- All children stabilized from SC to be referred to OTP.

Admission and Discharge criteria for OTP

Situation	Admission Criteria	Discharge Criteria
OTP *with established TSFP referral system*	Bilateral edema: + / ++ *or*	No bilateral edema *and*
	WFH< -3 Z score *and/or* MUAC <11.5 cm *and* presence of appetite *and* absence of medical complications as per National CMAM/IMCI Protocol	WFH ≥ -3 Z score *and* MUAC ≥ 11.5 cm for 2 consecutive visits *and* presence of appetite *and* absence of medical complications as per National CMAM/IMCI Protocol
OTP *without established TSFP referral system*	Bilateral edema: + / ++ *or*	No bilateral edema *and*
	WFH< -3 Z score *and/or* MUAC <11.5 cm *and* presence of appetite and absence of medical complications as per National CMAM/IMCI Protocol	WFH ≥ -2 Z score *and* MUAC ≥ 12.5 cm for 2 consecutive visits *and* presence of appetite *and* absence of medical complications as per National CMAM/IMCI Protocol

Notes:

- Volunteers should provide 2 times follow up visit in the home of the child in 2 weeks.
- All children cured from OTP to be referred to TSFP

Admission and Discharge criteria for TSFP

Beneficiaries	Admission criteria	Discharge criteria	Verification
Children	Aged 6-59 months and WFH < -2SD to ≥-3SD *and/or* MUAC: 11.5 cm-12.4cm *and* without medical complications, as per national Integrated Management of Childhood Illness (IMCI) protocol and absence bilateral edema	WFH ≥ -2SD *and* MUAC ≥ 12.5 cm for two consecutive visits *and* no other severe disease (classification according to IMCI protocol)	Birth certificate, Health card or EPI card or height cut-off *
	Discharged from OTP	Meets MAM discharge criteria *and* has stayed in the programme for at least 2 months	
PLW	Upon confirmation of pregnancy *and /or* giving birth, Lactating child less than 6 months *and* MUAC less than 21cm	MUAC ≥ 21cm	ANC card

Notes:

- * In case there is no documentation to verify the child's age, height (minimum: 61 cm and maximum 110 cm) can be used as a cut off point for children under 5 or the Childs's age in months can be determined using a seasonal calendar

Admission and Discharge criteria for BSFP

Beneficiaries	Admission criteria	Discharge criteria	Verification
Children	Aged 6-59 months*	≥ 60 months of age	**Birth certificate, Health card or EPI card or height cut-off
Pregnant women and girls	Upon the confirmation of pregnancy	Upon delivery *and* admit as lactating woman	ANC card
Lactating women and girls***	Immediately after giving birth *or* a lactating woman/girl with an infant below 6 months	When the child reaches 6 months of age	Birth certificate or EPI card or height cut-off for the infant
Chronically ill patients *(TB, HIV, Cancer etc.)* ****	Diagnosed with TB and enrolled in TB treatment	Completed Treatment	Patient card

Notes:

*Children aged 6-59 months who are enrolled in SAM/MAM treatment programme will not be included in the BSFP. However, they will be enrolled once they are discharged from the SAM/MAM treatment programme. Once a child is admitted in the programme, s/he will remain in the programme for the duration of this project or until they turn 60 months.

** In case there is no documentation to verify the child's age, height (minimum: 61 cm and maximum :110 cm) can be used as a cut off point for children under 5 or the Childs's age in months can be determined using a seasonal calendar.

***Wet nurses can also be admitted into the programme using same parameters as Lactating women

**** Case by case for few protection cases such as isolated elderly cases living on their own

Annex 2: Makeshift Settlements Cluster Determination

Site Name	Location SSID	Cluster Number(s)
Camp 01E	CXB-201	1, RC
Camp 01W	CXB-202	2, 3, RC
Camp 02E	CXB-203	4, RC
Camp 02W	CXB-204	5, 6
Camp 03	CXB-205	7, 8, 9
Camp 04	CXB-206	10, 11
Camp 05	CXB-209	12, 13
Camp 06	CXB-208	14
Camp 07	CXB-207	15, 16, 17
Camp 08E	CXB-210	18, RC
Camp 08W	CXB-211	19, 20, 21
Camp 09	CXB-213	22, 23
Camp 10	CXB-214	24, 25
Camp 11	CXB-217	26, 27, 28
Camp 12	CXB-218	29
Camp 13	CXB-220	30, 31, 32
Camp 14 (Hakimpara)	CXB-222	33, 34
Camp 15 (Jamtoli)	CXB-223	35, 36, 37
Camp 16 (Potibonia)	CXB-224	38, 39
Camp 17	CXB-212	RC
Camp 18	CXB-215	40, 41
Camp 19	CXB-219	42
Camp 20	CXB-216	43
Camp 21 (Chakmarkul)	CXB-108	RC
Camp 22 (Unchiprang)	CXB-085	44, 45
Camp 23 (Shamlapur)	CXB-032	46
Camp 24 (Leda)	CXB-233	47, 48
Camp 25 (Ali Khali)	CXB-017	49
Camp 26 (Nayapara)	CXB-025	50, 51, 52
Camp 27 (Jadimura)	CXB-037	53

Annex 3: Referral Form

Emergency Health and Nutrition Survey

Referral Form

Date of Referral: _____ Team #: _____ Cluster #: _____

Camp:_____ Block: _____ BlockLeader:_____

Beneficiary Name: _____ Referral Center: _____

Child		Woman
Caregiver name: _____	Age:_____ (months)	☐ Pregnant ☐ Lactating with child < 6m ☐ Non pregnant Non Lactating
Sex: ☐ Male ☐ Female	Weight: _____kg	Age: _____ (years)
Height:_____ cm	MUAC: _____ mm	MUAC:_____ mm
Hemoglobin:_____ g/dL	Zscore ☐ <-2SD ☐ -<3SD ☐ Edema: ☐ Yes ☐ No	Hemoglobin:..... g/dL

Team Leader Name and Signature:

Emergency Health and Nutrition Survey

Referral Form

Date of Referral:_____ Team #:_____ Cluster #:_____

Camp: _____ Block:_____ Block Leader:_____

Name of Patient: _____ Referral Center: _____

Child		Woman
Caregiver name: _____	Age: _____ (months)	☐ Pregnant ☐ Lactating with child < 6m ☐ Non pregnant Non Lactating
Sex: ☐ Male ☐ Female	Weight:_____ kg	Age: _____ (years)
Height:_____ cm	MUAC_____ mm	MUAC:_____ mm
Hemoglobin:_____ g/dL	Zscore ☐ <-2SD ☐ -<3SD ☐ Edema: ☐ Yes ☐ No	Hemoglobin:..... g/dL

Team Leader Name and Signature:

Annex 4: Event Calendar

Emergency Health and Nutrition Survey-Rd-3_2018

Calendar of Local Events constructed end of *OCTOBER*-2018

Month	2013		2014		2015		2016		2017		2018	
January (Poush-Magh)			Winter session, Eid-E-miladunnobi, National Election (Conflict in Du Chee Yar Tan)	57	Winter session, Eid-E-miladunnobi (Family Photo, school vaccine campaign)	45	Winter session, Eid-E-miladunnobi,	33	Winter session, English New Year's Day	21	Winter session, English New Year's Day	9
February (Magh-Falgun)			End of Winter Mother Language Day	56	End of Winter Mother Language Day (Family Photo, school vaccine campaign)	44	End of Winter Mother Language Day	32	End of Winter Mother Language Day	20	End of Winter Mother Language Day	8
March (Falgun-Chaitra)			Hervesting time work brick field, Local Upazila election	55	Hervesting time work brick field, (Ended Family photo Matric Exam and (returning card on March 31)	43	Hervesting time work brick field,	31	Hervesting time work brick field, Birth day of Bangabandu Independence Day	19	Hervesting time work brick field, Birth day of Bangabandu Independence Day	7
April (Chaitra-Baishakh)			Harvesting time, Bangla New year day (Pohela Boishak).	54	Harvesting time, Bangla New year day (Pohela Boishak)	42	Harvesting time, Bangla New year day (PohelaBoishak).	30	Harvesting time, Bangla New year day (Pohela Boishak).	18	Harvesting time, Bangla New year day (PohelaBoishak)	6
May (Baishakh-Jaishtha)			Summer, Buddho purnima	53	Summer, Buddho purnima	41	Summer, Buddho purnima	29	Summer, Buddho purnima Shab-e-Barat	17	Summer, Buddho purnima Shab-e-Barat	5
June (Jaishtha-Ashar)			Start of long rainy session, Shab-e-Barat	52	Start of long rainy session, Shab-e-Barat	40	Start of long rainy session, Shab-e-Barat	28	Shobe-e Qadar & Jummatul bida/ Eid-ul Fitr	16	Shobe-e Qadar & Jummatul bida/ Eid-ul Fitr	4
July (Ashar-Shrabon)			Eid-ul fitor, Rainy session	51	Eid-ul fitor, Rainy session	39	Eid-ul fitor, Rainy session	27	Rainy session	15	Rainy session , 2nd Nutrition Action Week, 14-19 July.	3
August (Shrabon-Bhadro)			Rainy Session, Janmashtami	50	Rainy Session, Janmashtami	38	Rainy Session, Janmashtami	26	Rainy Session, Janmashtami (2nd Recent Conflict in Myanmar)	14	Rainy Session, Eid Ul Adha	2
September (Bhadro-Ashwin)			End of the long rainy session	49	End of the long rainy session/ Eid-ul Azha,	37	End of the long rainy session/ Eid-ul Azha,	25	Eid Ul Adha, Durgapuja (Dashami) End of the long rainy session	13	Moharram Ashura, Janmashtami End of the long rainy session	1
October (Ashwin-Kartik)	Go brickfield up to march.	60	Eid-ul Azha, Durga Puja, Go brickfield up to march.	48	Durga Puja, Moharram Ashura	36	Durga Puja, (Bijaya Dashami) Moharram Ashura(1st recent Conflict in Myanmar)	24	Durga Puja, (Bijaya Dashami) Moharram Ashura	12	Durga Puja, (Bijaya Dashami)	0
November (Kartik-Agrahayan)	Start working in salt field,	59	Start working in salt field, Moharram Ashura	47	Harvesting time, Start working in salt field,	35	Harvesting time, Start working in salt field,	23	Harvesting time, Start working in salt field, 1st	11		

	Moharram Ashura								Nutrition Action Week, 17-22 Nov.				
December (Agrahayon-Poush)	Christmas, Starting Winter	58	Christmas, Starting Winter	46	Christmas, Starting Winter	34	Christmas, Starting Winter	22	Christmas, Starting Winter	10			

Emergency Health and Nutrition Survey-Rd-3_2018
Calendar of Local Events constructed end of *NOVEMBER*-2018

Month	2013		2014		2015		2016		2017		2018	
January (Poush-Magh)			Winter session, Eid-E-miladunnobi,National Election (Conflict in Du Chee YaTan)	58	Winter session, Eid-E-miladunnobi(Family Photo, school vaccine campaign)	46	Winter session, Eid-E-miladunnobi,	34	Winter session, English New Year's Day	22	Winter session, English New Year's Day	10
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December (Agrahayon-Poush)	Christmas, Starting Winter	59	Christmas, Starting Winter	47	Christmas, Starting Winter	35	Christmas, Starting Winter	23	Christmas, Starting Winter	11		

Annex 5: Supervision Checklist for Supervisor

Emergency Health and Nutrition Survey Round 3 (Oct Nov 2018)

Supervision Checklist

Name of Survey Area: Camp Name Block Name: Date:

Cluster No: Team No: Name of Team Leader: Name of Supervisor:

	Thinks to Look at	Follow Instruction Properly (Yes/NO)	Follow the instruction but Need to Improve (Yes/No	Don't follow the Instruction (Yes/No	Did supervisor explain and take initiative to correct the enumerators? (Yes/No)	Overall Comments
A	**General**					
A 1	Are the teams respectful? Do they say hello? Introduce their team members?					
A 2	Do the teams explain clearly, what is involved in the survey (taking of height, weight, haemoglobin, dbs)?					
A 3	Is the first person to arrive at the household asking for consent from every household?					
A 4	Are teams correctly filling one pager UNIQUE identifier & demographic information for REVA team?					
B	**Household**					
B 1	Are teams clearly explaining the household definition to each household?					
B 3	Are the teams clearly stating Eid Ul Fitre (End of Ramadan, June 16 2018) as the beginning of the recall period for arrived/joined/births/deaths?					

B 4	Are the teams asking every household about deaths?					
B 5	Are the teams asking about both the WFP and SCOPE card?					
B 6	Are the teams asking if women are married when asking about pregnancies? (they should not)					
B 7	Are the teams showing examples of RUTF, WSB, MNP?					
B 8	Do the teams say good-bye and thank you to each household?					

Thinks to Look at		**Follow Instruction Properly (Yes/NO)**	**Follow the instruction but Need to Improve (Yes/No**	**Don't follow the Instruction (Yes/No**	**Did supervisor explain and take initiative to correct the enumerators? (Yes/No)**	**Overall Comments**
C	**Age determination**					
C 1	Are the teams writing exact date of birth when documentation is shown?					
C 2	Are teams using the event calendar when there is no documentation available?					
C 3	Are the teams asking more clarifying questions about children aged 5 years to confirm they are not less than 5 years?					
C 4	Are teams verifying age in months of the UNHCR MRC cards show a birthday of January 1?					
C 5	October 1: Have teams replaced the October calendar of events with the November calendar?					
D	**Weight Measurement**					
D 1	Is the weight scale placed on a flat surface?					
D 2	Are all children weighed without clothing?					

D 3	Are children/parents who refuse for the child to be weighed naked given the option of being weighed in a more private place?					
D 4	Are weight measure always taken at least twice? (3 times if choosing between two close measurements)					
D 5	Is the child in the center of the scale, arms at side, looking straight ahead while being weighed?					
D 6	When taking a 2-in-1 (parent/child) measurement is the woman standing still and is the child handed to her so she does not need to move/reach out to be handed her child.					

Thinks to Look at		**Follow Instruction Properly (Yes/NO)**	**Follow the instruction but Need to Improve (Yes/No**	**Don't follow the Instruction (Yes/No**	**Did supervisor explain and take initiative to correct the enumerators? (Yes/No)**	**Overall Comments**
E	**Height measurement**					
E 1	Is the height board clipped together tightly (rear)					
E 2	Are children <87 cm measured lying down and children ≥87 cm measured standing?					
E 3	Is the child perfectly centered on the height board (ankles->hips->shoulders->head)?					
E 4	Is there space between the top of the head and the height board cursor? (there should <u>not</u> be)					
F	**MUAC/edema**					
F1	Is the midpoint of the arm marked?					
F2	Do they surveyors talk to the women, explain what they are doing (when taking the MUAC), allow them to feel comfortable and covered aside from their left arm/shoulder?					
F3	Is edema checked for every child?					
G	**Materials**					

G 1	Are teams keeping measurement materials out of direct sunlight and protected from the rain?					
G 2	Are teams replacing MUAC tapes as soon as they become bent?					

Thinks to Look at		Follow Instruction Properly (Yes/NO)	Follow the instruction but Need to Improve (Yes/No	Don't follow the Instruction (Yes/No	Did supervisor explain and take initiative to correct the enumerators? (Yes/No)	Overall Comments
H	**Morbidity**					
H 1	When asking about diarrhea/fever/ARI, is the two-week recall period clearly stated?					
H 2	When asking where taken for medical treatment, do the surveys list options? (they should <u>not</u>, they should listen to the response and silently select the appropriate response on the tablet)					
H 3	When asking about measles/diphtheria, is the recall period since the large influx/end of August/Eid clearly stated?					
I	**Team dynamics**					
I1	Are team members supportive and encouraging towards one another?					
I2	Is there a smooth transition and transfer of information between the SMART team and the REVA team?					
I3	Does the team lead stay in the household until the end of the interview?					

Name of Supervisor:

Signature of Supervisor:

Date:

Annex 6: Round 3 Assessment Questionnaire

Emergency Health and Nutrition Survey Round 3 (October – November 2018)

Questionnaire

Household Level Questionnaire (খানার তথ্য)		
1.0	Name of Enumerator (তথ্য সংগ্রহকারীর নাম)	
1.1	Date (তারিখ):	
1.2	Team (টিম): (Valid answers: Numbers between 1 and 6)	
1.3	Survey Area (জরিপ এলাকা)	1= Kutupalong Refugee Camp/কুতুপালং শরণার্থী ক্যাম্প 2 = Nayapara Refugee Camp/ নয়াপাড়া শরণার্থী ক্যাম্প 3 = Outside of Refugee Camp ক্যাম্পের বাইরে
1.4	Cluster No (ক্লাস্টার) (Relevant if 1.3 is 3 (outside of camp); Valid answers: Numbers between 1 and 100)	
1.5	Camp Name(ক্যাম্পের নাম)	
1.6	Block Name (ব্লকের নাম)	
1.7	Household Serial Number (খানার সিরিয়াল নাম্বর)	
1.8	Household UNIQUE ID (খানার ইউনিক আইডি)	
1.9	GPS Coordinate *(Note: Push the 'Record Location' button when the accuracy of the GPS measure is less than 25 m.)*	
1.10	Hello, My name is_____ and my colleague's are_____, We are from Action Against Hunger, a humanitarian organization. We are here to gather information related to nutrition and health of the Rohingya people in Cox's Bazar. If there are any women (aged 15-49 years) or children under five years old in the household we would like to take some measurements to assess their nutritional status. Besides, we also measure haemoglobin to detect anemia and referrer those who are severe anaemic. All personal information will be kept confidential. Please note that it is not currently known what actions if any will be taken after the results of the survey are finalized. This information will be used to improve the standard living of Rohinga people. The questions will take about 20-25 minutes. Do you have any questions? May I begin? Avwg bvg ------ Avgvi mv‡_ ------ ------- ------- Av‡Qb| Avgiv GwmGd bv‡g GKUv AvšÍR©vwZK gvbweK সাহায্য ms¯'v †_‡K G‡mwQ| Avgiv K·evRv‡i Aew¯'Z †ivwn½v kiYv_©x‡`i স্বাস্থ্য I cywó m¤úwK©Z GKUv Rwic KvR cwiPvjbv KiwQ| Avcbvi cwieviwU GB Rwic Kv‡Ri জন্য GKwU wbe©vwPZ cwievi| Avcbv‡`i cwiev‡i 5 eQ‡ii Kg eqmx wkï Ges 15-49 eQi eqmx gwnjv _vK‡j Avgiv Zv‡`i cywó Ae¯'v মূল্যায়ন Kivi জন্য IRb, D"PZv Ges nv‡Zi GKUv gvc wb‡q †`L‡ev †m Acywó‡Z f~M‡Q wKbv| cvkvcvwk তারা অ্যানিমিয়া বা রক্তাল্পতায় ভূগছে কিনা তা cixÿv K‡i †`L‡ev| ‡Kn hw` Acywó‡Z ev	1 = Consent (সম্মতি) 2 = Refuse (end survey)/ অস্বীকার (জরিপ শেষে) 3 = Absent (end survey) /অনুপস্থিতি(জরিপ শেষে)

	রক্তাল্পতায় ভুগে _v‡K, Avgiv Zv‡K cywó †K‡›`ª †idvi Ki‡ev| Avgiv Avcbv‡`i †_‡K †h me তথ্য¨ wb‡ev Zv অন্য KvD‡K Rvbv‡bv n‡e bv| Bnv ïaygvÎ M‡elYvi Kv‡R ব্যjenvi Kiv n‡e| GB Rwic KvR Ki‡Z wM‡q Avgiv Avcbv‡K wKQz w`‡ev bv| wKš‘ msM„wnZ তথ্য mKj †ivwn½v kiYv_©x‡`i Rxeb gvb Dbœq‡bi Kv‡R ব্যবহার Kiv n‡e| GB Rwic KvR Ki‡Z Avgv‡`i 25-30 wgwbU mgq jvM‡e| Avcwb hw` mgq w`‡Z ivRx _v‡Kb, Avgiv Avcbvi mv‡_ K_v ej‡ev| *Note: A household will only be marked absent after at least two re-visits to the household have been made.*(কোন খানাতে পর পর দুইবার পরিদর্শনের পরও খানা সদস্য পাওয়া না গেলে বাড়িটি জরীপে অনুপস্থিতি বলে বিবেচিত হবে।)	
1.11	When did the household arrive in Bangladesh? (Note: Select the best answer. If household members did not all arrive at the same time, select the option that is most accurate for a majority of the household members) **খানাটি কখন বাংলাদেশে আসে?** **(নোট: সেরা উত্তর নির্বাচন করুন। যদি পরিবারের সদস্য সকল একই সময়ে আসেন না, তাহলে বাড়ির সদস্যদের সংখ্যাগরিষ্ঠের জন্য সবচেয়ে উপযুক্ত বিকল্পটি নির্বাচন করুন)**	1 = Registered refugees(নিবন্ধিত শরণার্থী) 2 = Unregistered – Prior to October 2016(অ নিবন্ধিত - অক্টোবর 2016 এর আগে) 3 = Unregistered – October 2016 to August 25, 2017(অ নিবন্ধিত - অক্টোবর 2016 থেকে ২5 আগস্ট, 2017) 4 = Unregistered – August 25 2017 to present(অ নিবন্ধিত -25 আগস্ট 2017 থেকে বর্তমান)
1.12	Does the household have a WFP food card or SCOPE card? (পরিবারটিতে WFP এর রেশন কার্ড বা স্কোপ কার্ড আছে কি?) *(Note: Show WFP ration card and SCOPE card examples)*(নোট: রেশন কার্ড বা স্কোপ কার্ডটি)	1 = Yes, observed food ration card (রেশন কার্ড পর্যবেক্ষণ করেছি) 2 = Yes observed SCOPE card (স্কোপ কার্ড পর্যবেক্ষণ করেছি) 3 = Yes observed both (উভয়টাই পর্যবেক্ষণ করেছি) 4 = No (না) (skip to 1.15) 8 = Don't Know (জানি না)
1.13	Is the card marked indicating that the household received at least one food distribution during the last month (September/October)? গত মাসে (সেপ্টেম্বর/অক্টোবর) পরিবারটি কি কমপক্ষে একবার খাদ্য সহায়তা জা কার্ডটিতে চিহ্নিত করা আছে?) (Relevant if 1.12 is 1 or 2 or 3)	1 = Yes (হ্যাঁ) 2 = No (না)
1.14	Did the household use the e-voucher to purchase food successfully during last month (September/October)? গত মাসে (সেপ্টেম্বর/অক্টোবর) পরিবারটি ই-ভাউচার ব্যবহার করে সফলভাবে খাদ্য কিনতে সক্ষম হয়েছে কি? (Relevant if 1.12 is 2 or 3)	1 = Yes (হ্যাঁ) 2 = No (না)
1.15	For what reason does the household not have a WFP food card? (কি কারণে পরিবারটিতে WFP এর কোন রেশন কার্ড নেই?) *(Note: do not read answer choices. Select the most relevant answer.)* নোট: উত্তরগুলি পড়ে শোনাবেন না। সবচেয়ে প্রাসঙ্গিক উত্তর নির্বাচন করুন।) (Relevant if 1.12 = 4)	1= Not given one at registration even if eligible (যোগ্য হওয়া সত্ত্বেও কার্ড দেয়া হয় না) 2= Lost card (কার্ড হারিয়ে ফেলছে) 3= Traded/sold card (কার্ড বিক্রি করেছে/কার্ড চুরি হয়েছে) 4= Not registered (তালিকাভুক্ত নয়) 5= Registered but determined not eligible (তালিকাভুক্ত কিন্তু তালিকাভুক্ত হউয়ার যোগ্য নয়) 6= Other (অন্যান্য) 8= Don't know (জানিনা) 8

	List all of the household members that are currently living in this household. (বর্তমানে এই পরিবার এ বসবাসকারী সকল সদস্যদের তালিকা করুন) **(Programmed on tablet as a repeat group)**	
2.1	First name of the household member (পরিবারের সদস্যের প্রথম নাম) Note: *First name only. Name will not be retained in the final data set. Name is only collected to aid in recall during data collection.* (নোট: শুধুমাত্র প্রথম নাম । নাম চূড়ান্ত তথ্য সেট রাখা হবে না। ডেটা সংগ্রহের সময় স্মরণ করার জন্য কেবল নাম সংগ্রহ করা হবে)	
2.2	Sex (লিঙ্গ)	1 = Male (পুরুষ) 2 = Female (মহিলা)
2.3	Age in years (বয়স-**বছর**) *Note: Children aged 0-11 months should be recorded as '0' years* নোট: 0-11 মাস বয়সী শিশুদের '0' বছর হিসাবে রেকর্ড করুন।	
2.4	Did [Name] join the household since **Eid Ul Fitre (June-16, 2018)?** [নাম] কি রোযার ঈদের (১৬ ই জুন ২০১৮) পর থেকে পরিবারের সাথে যোগ হয়েছে?	1 = Yes (হ্যাঁ) 2 = No (না)
2.5	Was [Name] born since **Eid Ul Fitre (June-16, 2018)?** [নাম] কি রোযার ঈদের (১৬ ই জুন ২০১৮) পর জন্ম গ্রহন করেছে? (Relevant: Age in years = 0)	1 = Yes (হ্যাঁ) 2 = No (না)
2.6	Is [Name] currently pregnant or lactating? *Note: If a women is pregnant and lactating, select pregnant* [নাম] কি বর্তমানে গর্ভবতী বা দুগ্ধদানকারী? দ্রষ্টব্য: যদি একটি মহিলা একই সাথে গর্ভবতী এবং দুগ্ধদানকারী হয়, তবে গর্ভবতী মহিলাটি নির্বাচন করুন (Relevant: Women between the ages of 15-49 years)	1= Pregnant/ (গর্ভবতী) 2= Lactating (with child less than 6 months) (দুগ্ধদানকারী, 6 মাসের কম বয়সী শিশু) 3 = Lactating (with child 6 months or older) (দুগ্ধদানকারী, 6 মাস বা তার বেশী বয়সী শিশু) 4= Neither pregnant nor lactating (গর্ভবতীও না বা দুগ্ধদানকারীও না) 8 = Don't Know (জানি না)
	List all of the household members that <u>left</u> this household since Eid Ul Fitre (June-16, 2018)? রোযার ঈদের (১৬ ই জুন ২০১৮) পর থেকে পরিবার থেকে যারা চলে গিয়েছে তাদের তালিকা করুন। *(Programmed on tablet as a repeat group)*	
3.1	First name of the household member (পরিবারের সদস্যের প্রথম নাম) Note: *First name only. Name will not be retained in the final data set. Name is only collected to aid in recall during data collection.* (নোট: শুধুমাত্র প্রথম নাম । নাম চূড়ান্ত তথ্য সেট রাখা হবে না। ডেটা সংগ্রহের সময় স্মরণ করার জন্য কেবল নাম সংগ্রহ করা হবে)	
3.2	Sex (লিঙ্গ)	1 = Male (পুরুষ) 2 = Female) মহিলা
3.3	Age in years (বয়স-**বছর**) *Note: Children aged 0-11 months should be recorded as '0' years* নোট: 0-11 মাস বয়সী শিশুদের '0' বছর হিসাবে রেকর্ড করুন।	
3.4	Did [Name] join the household since **Eid Ul Fitre (June-16, 2018)?** [নাম] কি রোযার ঈদের (১৬ ই জুন ২০১৮) পর থেকে পরিবারের সাথে যোগ হয়েছে?	1 = Yes (হ্যাঁ) 2 = No (না)
3.5	Was [Name] born since **Eid Ul Fitre (June-16, 2018)?** [নাম] কি রোযার ঈদের (১৬ ই জুন ২০১৮) এর পর জন্ম গ্রহন করেছে? (Relevant: Age in years = 0)	1 = Yes (হ্যাঁ) 2 = No (না)
	List all of the household members that <u>died</u> since Eid Ul Fitre (June-16, 2018)? রোযার ঈদের (১৬ ই জুন ২০১৮) পর পরিবার এর যারা মারা গিয়েছে তাদের তালিকা করুন। ***(Programmed on tablet as a repeat group)***	

4.1	First name of the household member (পরিবারের সদস্যের প্রথম নাম) Note: *First name only. Name will not be retained in the final data set. Name is only collected to aid in recall during data collection.* (নোট: শুধুমাত্র প্রথম নাম । নাম চূড়ান্ত তথ্য সেট রাখা হবে না। ডেটা সংগ্রহের সময় স্মরণ করার জন্য কেবল নাম সংগ্রহ করা হবে)	
4.2	Sex (লিঙ্গ)	1 = Male (পুরুষ) 2 = Female) মহিলা
4.3	Age in years (বয়স-**বছর**) *Note: Children aged 0-11 months should be recorded as '0' years* নোট: 0-11 মাস বয়সী শিশুদের '0' বছর হিসাবে রেকর্ড করুন।	
4.4	Did [Name] join the household **Eid Ul Fitre (June-16, 2018)?** [নাম] কি রোযার ঈদের (১৬ ই জুন ২০১৮) পর থেকে পরিবারের সাথে যোগ হয়েছে?	1 = Yes (হ্যাঁ) 2 = No (না)
4.5	Was [Name] born since **Eid Ul Fitre (June-16, 2018)?** [নাম] কি রোযার ঈদের (১৬ ই জুন ২০১৮) পর জন্ম গ্রহন করেছে? (Relevant: Age in years = 0)	1 = Yes (হ্যাঁ) 2 = No (না)
4.6	What was the cause of death?(মৃত্যুর কারণ কি ছিল?)	1 = Injury – Trauma / conflict related (জুরি - ট্রমা বা সংঘর্ষ সম্পর্কিত) (Skip to 5.1) 2 = Injury – Other(ইজুরি – অন্যান্য)(Skip to 5.1) 3 = Illness (অসুস্থতা) 8 = Don't Know (জানি না) (Skip to 5.1)
4.7	During the days before death, did [Name] have any of the following symptoms? (মৃত্যুর আগের দিনগুলোতে, [নিম্নলিখিত কি কি লক্ষণ ছিল?) *Note: Select all that apply.*	1 = Diarrhea (ডায়রিয়া) 2 = Fever (জ্বর) 3 = Cough (কাশি) 4 = Rash (রাশ) 5 = None of the above (উপরের কোনটিই নয়) 8 = Don't know (জানি না)

Women Level Questionnaire

	Anthropometry of women of reproductive age (15-49 Yrs) ১৫ -49 বছর বয়সী মহিলাদের শরীর বৃত্তীয় পরিমাপ(*Note: Complete the following module for all women in the household between 15 and 49 years of age* ১৫ থেকে ৪৯ বছরের মধ্যে পরিবারের সব নারীদের জন্য নিম্নোক্ত মডিউলটি সম্পন্ন করুন *(Programmed on tablet as a repeat group)*	
5.1	**Is this household selected for Haemoglobin measurement from women of reproductive age (15-49 Years)** এই পরিবারটি কি **15-49** বছর বয়সী মহিলাদের থেকে হিমোগ্লোবিনের পরিমাপের জন্য নির্বাচিত	1 = Yes (হ্যাঁ) 2 = No (না)
5.2	Age (Years) (বয়স-বছর) (Valid responses: 15 to 49)	
5.3	MUAC (mm) (মুয়াক-মিমি)	
5.4	Are you currently pregnant or lactating? (আপনি কি বর্তমানে গর্ভবতী বা দুগ্ধদানকারী?) *Note: If a women is pregnant and lactating, select pregnant* দ্রষ্টব্য: যদি একটি মহিলা গর্ভবতী হয় এবং গর্ভবতী হয়, তবে গর্ভবতী মহিলাটি নির্বাচন করুন	1= Pregnant/ (গর্ভবতী) 2= Lactating (with child less than 6 months) (দুগ্ধদানকারী, 6 মাসের কম বয়সী শিশু) 3 = Lactating (with child 6 months or older) (দুগ্ধদানকারী, 6 মাস বা তার বেশী বয়সী শিশু) 4= Neither pregnant nor lactating (গর্ভবতীও না বা দুগ্ধদানকারীও না) 8 = Don't Know (জানি না)

5.5	Are you currently enrolled in any antenatal care (ANC) program for this pregnancy? **আপনি বর্তমানে এই গর্ভাবস্থার জন্য কোন প্রসবকালীন যত্ন (এএনসি) প্রোগ্রাম** এ fwZ© Av‡Qn ? Relevant for 5.4 response is pregnant (1)	1 = Yes, verified by card (হ্যাঁ, কার্ড আছে) 2 = Yes, but No card (না কার্ড নাই) 3=No (না) 8 = Don't Know (জানি না)
5.6	Are you currently receiving Iron Folic Acid (IFA) tablets? **আপনি বর্তমানে কি আয়রন ফলিক এসিড (আইএফএ) ট্যাবলেট গ্রহণ করছেন**?	1 = Yes (হ্যাঁ) 2 = No (না) 8 = Don't Know (জানি না)
5.6	Does the women consent to having [Name]'s haemoglobin measured? (হিমোগ্লোবিন মাপার অনুমতি দেওয়া হয়েছে?) (Relevant for 5.1 response is yes (1) & 5.4 response is Neither pregnant nor lactating (4))	1 = Yes (হ্যাঁ) 2 = No (না)
5.7	Hemoglobin measurement (g/dL) (হিমোগ্লোবিন পরিমাপ – গ্রাম/ডিএল) (Relevant for 5.3 response is Neither pregnant nor lactating (4); valid responses between 1 and 23)	

Child Level Questionnaire

	Anthropometry and Anemia ০৫৯- মাস বয়সী শিশুদের শরীর বৃত্তীয় পরিমাপ এবং রক্তাল্পতা *Note: Complete the following module for all children in the household between 0-59 months* *(Programmed on tablet as a repeat group)*	
6.1	[Name]'s sex (শিশুর (নাম) লিঙ্গ)	1 = Male (পুরুষ) 2 = Female) মহিলা(
6.2	Do you know [Name]'s day, month and year of birth? (আপনি কি (নাম)শিশুর জন্ম দিন, মাস এবং জন্ম সন জানেন?)	1 = Yes (হাঁ) 2 = No (না) (skip to 6.4)
6.3	[Name]'s date of birth **(শিশুর জন্ম তারিখ)-** (Age on months calculated on tablet from survey date and DOB)	(Day/Month/Year)/ (দিন/ মাস/বছর)
6.4	[Name]'s age in months / (শিশুর বয়স মাসে) *Note: Estimate using event calendar.* (ঘটনাপণজ্জির মাধ্যমে বয়স বের করুন)	
6.5	Weight (Kg) ±0.1kg (ওজন ±0.1 কেজি) *Note: The child must be weighed naked. Remove diapers, necklaces and other items that could increase the weight before measuring. REMINDER: Always record weight with one digit after the decimal point.* (Relevant for age between 6 and 59 months; valid responses between 0.1 and 54)	
6.6	Height or Length[41](cm) ±0.1 cm **(উচ্চতা বা** দৈর্ঘ্য + 0.1 সেমি **)** *Note: Height measurement standing when child is ≥24 months (height proxy ≥87 cm) and lying down when child is < 24 months (< 87 cm)* (Relevant for age between 6 and 59 months; valid responses between 30 and 155)	
6.7	Record measurement taken: length or height **(** দৈর্ঘ্য বা উচ্চতা)	1 = Length (দৈর্ঘ্য) 2= Height (উচ্চতা)
6.8	MUAC (mm) **(**মুয়াক-মিমি) (If MUAC<115, prompt a note: "Please complete the referral form. This child has severe acute malnutrition.") (যদি MUAC <115, নোট করুন: "অনুগ্রহ করে রেফারেল ফর্মটি পূরণ করুন। এই শিশুটির গুরুতর অপুষ্টি আছে।")	
6.9	Does [Name] have bilateral oedema that is swelling with pitting oedema in both feet? **(**উভয় পায়ের পাতায় ইডিমা আছে)	1 = Yes (হ্যাঁ) 2 = No (না)

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	(If yes, prompt a note: "Notify your supervisor and have him/her confirm whether or not the child has oedema. Children with oedema should be referred for treatment")	
6.10	WFH Z-score (WFH Z- **স্কোর**) (Use Z-score Toolbox to identify WHZ)	1= < -3 (SAM) 2= -3 to -2 (MAM) 3= >-2 (Well nourished)
6.11	Malnutrition Status of child (**শিশুটির প্রকৃত অপুষ্টি অবস্থা**)	1= Child is SAM (**শিশুটি স্যাম**) 2= Child is MAM (**শিশুটি ম্যাম**) 3= Child is well nourished (**শিশুটি সুস্থ**)
6.12	Is your child [Name] currently enrolled in any nutrition-feeding program? Verify by card? Avcbvi wkïwU ‡Kvb cywó wPwKrmv †mevq fwZ© Av‡Q wK? wkïi KvW© †`‡L wbwðZ †nvb: (If the child is malnourished but did not enrolled in any nutrition program, please complete the referral form and refer to nearest nutrition centre.") (যদি শিশুটি **অপুষ্টিতে** আক্রান্ত হয় এবং কোন পুষ্টি প্রোগ্রামে ভর্তি না হয় তবে দয়া করে রেফারেল ফর্ম পূরণ করুন এবং নিকটস্থ পুষ্টি কেন্দ্র পড়ুন	1 = Yes, SC (**এসসি**) 2 = Yes, OTP (IwUwc) 3= Yes, TSFP (**টি**GmGdwc) 4= Yes, BSFP (**বি**GmGdwc 4 = No (না) 8= Don't Know (জানি না)
6.13	Name of referral centre (**রেফারেল সেন্টার এর নাম**) (Relevant if 6.11 response is SAM (1) & MAM(2) and 6.12 response is NO(4)	
6.14	Since Eid ul-Fiter (June, 2018) has [Name] received any micronutrient powders? রোযার ঈদের (১৬ ই জুন ২০১৮) পর থেকে শিশুটি [নাম] কি কোন মাইক্রোনিউট্রিয়েন্ট গুঁড়ো (পুস্টিকনা) খেয়েছে?) *(Note: Show package of MNP)* (নোট: MNP বা পুস্টিকনার প্যাকেট দেখান) (Relevant for age between 6 and 59 months)	1 = Yes (হ্যাঁ) 2 = No (না) 8 = Don't Know (জানি না)
6.15	Did the child [Name] receive Vitamin A in last six months? (MZ Qq gv‡m wkïwU wK wfUvwgb G ‡L‡qwQj?) Note: please verify the response showing Vitamin A sample/ showing card Vitamin A campaign through Nutrition Action Weeks during 14-19 July 2018.	1 = Yes (হ্যাঁ) 2 = No (না) 8 = Don't Know (জানি না)
6.16	Does the caregiver consent to having [Name]'s haemoglobin measured? (হিমোগ্লোবিন মাপার অনুমতি দেওয়া হয়েছে?)	1 = Yes (হ্যাঁ) 2 = No (না)
6.17	Hemoglobin measurement (g/dL) (হিমোগ্লোবিন পরিমাপ – গ্রাম/ডিএল) (Relevant for age between 6 and 59 months AND 6.16 response is Yes (1); valid responses between 1 and 23)	

	Child Morbidity	
7.1	In the past two weeks, has [Name] had diarrhoea? (গত দুই সপ্তাহে শিশুটির (নাম) কি ডায়রিয়া হয়েছিল? *Note: Diarrhoea is defined as the passage of three or more loose or liquid stools in a day* (ডায়রিয়া -দিনে তিন বা এর অধিক পাতলা বা পানি যুক্ত পায়খানা) (Relevant for age between 6 and 59 months)	1 = Yes (হ্যাঁ) 2 = No (না) Skip to 7.3) 8 = Don't Know (জানি না) (Skip to 7.3)
7.2	Was [Name] taken for treatment / medical care since the time the diarrhoea started? শিশুটির (নাম) কি ডায়রিয়ার জন্য কোন চিকিৎসা নিয়েছিল?) *Note: Do not read answer choices allowed.* (উত্তর পড়ে শুনানো যাবেনা)	1 = Yes – at a clinic/hospital (হ্যাঁ -ক্লিনিক বা হাসপাতাল) 2 = Yes –community / traditional healer (গ্রামের ডাক্তার বা কবিরাজ) 3 = No (না) 8 = Don't Know (জানি না)
7.3	In the past two weeks, has [Name] had cough with rapid or difficulty breathing AND a fever? (গত দুই সপ্তাহে শিশুটির (নাম) কি একই সাথে জর, দ্রত কাশি বা শ্বাস কষ্ট হয়েছিল? (Relevant for age between 6 and 59 months)	1 = Yes (হ্যাঁ) 2 = No (না) (Skip to 7.5) 8 = Don't Know (জানি না) (Skip to 7.5)

7.4	Was [Name] taken for treatment / medical care since the time the cough started? (শিশুটির (নাম) কি জর, দ্রত কাশি বা শ্বাস কষ্টর জন্য কোন চিকিৎসা নিয়েছিল?) *Note: Do not read answer choices allowed.* (উত্তর পড়ে শুনানো যাবেনা)	1 = Yes – at a clinic/hospital (হ্যাঁ -ক্লিনিক বা হাসপাতাল) 2 = Yes –community / traditional healer (গ্রামের ডাক্তার বা কবিরাজ) 3 = No (না) 8 = Don't Know (জানি না)
7.5	In the past two weeks, has [Name] had a fever BUT NO cough and NO rash? (গত দুই সপ্তাহে শিশুটির (নাম) কি শুধু জর হয়েছিল (কাশি ছাড়া)?) (Relevant for age between 6 and 59 months)	1 = Yes (হ্যাঁ) 2 = No (না) (Skip to 7.7) 8 = Don't Know (জানি না) (Skip to 7.7)
7.6	Was [Name] taken for treatment / medical care since the time the fever started? শিশুটির (নাম) কি জর এর জন্য কোন চিকিৎসা নিয়েছিল?) *Note: Do not read answer choices allowed.*(উত্তর পড়ে শুনানো যাবেনা)	1 = Yes – at a clinic/hospital (হ্যাঁ -ক্লিনিক বা হাসপাতাল) 2 = Yes –community / traditional healer (গ্রামের ডাক্তার বা কবিরাজ) 3 = No (না) 8 = Don't Know (জানি না)
7.7	Since arriving in Bangladesh, has [Name] had measles? (বাংলাদেশে আগমনের পর শিশুটির (নাম) কি হাম (লুতি)হয়েছিল?) *(Note: Use the local term for measles. Remind them that measles usually presents with fever and a rash)* নোট: হামের জন্য স্থানীয় শব্দটি ব্যবহার করুন। তাদের স্মরণ করিয়ে দিন যে-হামের সময় সাধারণত শিশুর ফুসকুড়ি সহ জ্বর হয়। (Relevant for age between 6 and 59 months)	1 = Yes, confirmed by health facility document **(হ্যাঁ, স্বাস্থ্য কেন্দ্রের নথি দেখে নিশ্চিত হয়েছি।** 2 = Yes, caregiver reports that the child was diagnosed at a clinic **(হ্যাঁ, পরিচরযাকারী রিপোর্ট করেছে যে শিশুটিকে একটি ক্লিনিক এ রোগ নির্ণয় করা হয়েছিল)** 3= Yes, caregiver reports that the child was diagnosed bv a local healer **(হ্যাঁ, পরিচরযাকারী রিপোর্ট করেছেন যে গ্রামের ডাক্তার শিশুটির রোগ সনাক্ত করেছিল)** 4= Yes, caregiver reports that child had disease, but did not seek diagnosis **(হ্যাঁ, পরিচরযাকারী রিপোর্ট করেন যে শিশুটি কি রোগে ভূগেছে কিন্তু তা নির্ণয় করা হয়নি)** 5 = No **(না)** 8 = Don't know**(জানিনা)**
7.8	Since arriving in Bangladesh, has [Name] had diphtheria?(বাংলাদেশে আগমনের পর শিশুটির (নাম) কি ডিপথেরিয়া হয়েছিল?) (Relevant for age between 6 and 59 months)	1 = Yes, confirmed by health facility document **(হ্যাঁ, স্বাস্থ্য কেন্দ্রের নথি দেখে নিশ্চিত হয়েছি।** 2 = Yes, caregiver reports that the child was diagnosed at a clinic **(হ্যাঁ, পরিচর্যাকারী রিপোর্ট করেছে যে শিশুটিকে একটি ক্লিনিক এ রোগ নির্ণয় করা হয়েছিল)** 3= Yes, caregiver reports that the child was diagnosed bv a local healer **(হ্যাঁ, পরিচরযাকারী রিপোর্ট করেছেন যে গ্রামের ডাক্তার শিশুটির রোগ সনাক্ত করেছিল)** 4= Yes, caregiver reports that child had disease, but did not seek diagnosis **(হ্যাঁ, পরিচর্যাকারী রিপোর্ট করেন যে শিশুটি কি রোগে ভূগেছে কিন্তু তা নির্ণয় করা হয়নি)** 5 = No **(না)** 8 = Don't know**(জানিনা)**

Annex 7: Cluster Control Form

Emergency Health and Nutrition Survey Round 3 -2018

Action Against Hunger I Action Contre La Faim

KTP RRC ☐ NYP RRC ☐ MS Site ☐

Cluster Control Form

Upazila Name :_____ Camp Name:_____ Block Name_____ Cluster No: _____ Team No:_____

Supervisor Name:_____Team Leader Name: _____Mobile:_____ Date:----------

Annex 8: Anthropometric Measurement Form Child

Emergency Health and Nutrition Survey Round 3 -2018

Action Against Hunger I Action Contre La Faim

HH UNIQUE ID	HH serial	Head of HH name	Visit Result 1 = Consent 2 = Refuse (end survey) 3 = Absent (end survey)	HH Selected for Women Hb Test? (Yes/No)	Number of eligible WOMEN 15-49 yrs (Non pregnant Non lactating)	Number of eligible children (0-5m)	Number of eligible children (6-59m)	Number of eligible children Measured (0-59m)	Household needs to be revisited YES/NO	Household revisited YES/NO	Remarks/ Reason for not Measured
	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
	16										

KTP RC ☐ NYP RC ☐ MS Site ☐

Child Anthropometric Summary Sheet

Upazila Name :_____ Camp Name:_____ Block Name_____ Cluster No: _____ Team No:_____

Supervisor Name:_____Team Leader Name: _____Mobile:_____ Date:----------

HH UNIQUE ID	HH Serial	Child MID	Name of child	Sex (M/F)	Date of Birth (dd-mm-yyyy)	Age (month)	Weight (kg)	Height (cm)	Oedema (Y/N)	MUAC (mm)	HB (g/dl)	Comments/ Reason for not Measured

Annex 9: Anthropometric Measurement Form Woman

Emergency Health and Nutrition Survey Round 3 -2018

Action Against Hunger I Action Contre La Faim

KTP RC ☐ NYP RC ☐ MS Site ☐

Women Anthropometric Measurement Form (15-49 Yrs Women)

Upazila Name :_____ Camp Name:_____Block Name_____Cluster No: ____Team No:_____Supervisor Name:_____Team Leader Name: _____Mobile:_____Date:_____

HH UNIQUE ID	Household Serial No	HH Selected for Women Hb Test? (Yes/No)	Women MID	Age (Year)	Women Status *(See Below Code)*	Hemoglobin g/dL *(If women status is 4 and HH selected for HB)*	MUAC (mm)	Comments/ Reason for not Measured

**‡KvWt 1= Pregnant (গর্ভবতী), 2= Lactating (with child less than 6 months) স্তন্যদানকারী (6 মাসের কম বয়সী শিশু), 3 = Lactating (with child 6 months or older) স্তন্যদানকারী(6 মাস বা তার বেশী বয়স্ক শিশু), 4= Neither pregnant nor lactating (গর্ভবতী বা স্তন্যদানকারী না),

8 = Don't Know (জানি না), ***Note: If a women is pregnant and lactating, select pregnant*** দ্রষ্টব্য: যদি একটি মহিলা গর্ভবতী এবং স্তন্যদানকারী DfqB হয়, তবে গর্ভবতী মহিলা হিসাবে নির্বাচন করুন।

Annex 10: Surveyor Training Schedule

Emergency Health and Nutrition Survey Training

Agenda (Round 3)

October 14-18, 2018

Venue: Hotel Beach Way

Day 1: Sunday, October 14

Time	Topic	Details	Lead Facilitator
9:00- 10:00	Introduction	- Introduction by participants - Introduction of nutrition sector partners, CS/UHFPOs - Registration	Nutrition Assessment Working Group Partners / Health Sector
10:00-10:30	Survey training objectives	- Expectations, ground rules	ACF
10:30-11:00	Pre-test		
11:00- 11:30	Refreshment Break		
11:30-1:00	Sampling and selection of households	- Overview of survey areas (MS, Kutupalong, Nayapara) - First stage sampling: Navigating to selected clusters (MS) or block (RC) - Second stage sampling: Household selection - Household selection technique for Anemia of reproductive age (NPNL)	ACF
1:00-2:00	Lunch		
2:00-3:00	Review of Cluster Control Form	- Proper form completion (lecture and exercise)	ACF
3:00-3:15	Refreshment		
3:15-3:45	Review of informed consent	-Practice	ACF
3:45-5:00	Review of household definition	- Lecture and exercise	ACF

Day 2: Monday, October 15

Time	Topic	Details	Lead Facilitator
9:00-9:30	Review and Summarize Day 1		
9:30-10:30	Review household enumeration/ demography module	- Determining date of arrival Review definitions of joined/left	ACF
10:30-10:45	Refreshment Break		
10:45-12:00	Child Morbidity and Women Module	- Definition of Diarrhea, ARI, measles MNP & Vitamin A supplementation Care seeking behaviour	ACF
		Questionnaire module on women section on IFA supplementation and ANC care - Review commodities (RUTF, vouchers, food cards, etc)	
12:00-1:00	Age Estimation	Review of age (review of documentation cards, practice with local events calendar)	ACF
1:00-2:00	Lunch		
2:00-3:30	Anthropometry and child nutrition module	- Review measurement (weight, height, MUAC, oedema) - Anthropometric measurement form - Daily calibration	ACF
3:30:3:45		Refreshment Break	
3:45-5:00	Anthropometry and child nutrition module	Use of Z score tools box - Referral procedures - Referral forms / sector maps for referral (OTP, BSFP/TSFP)	ACF

Day 3: Tuesday, October 16

Time	Topic	Details	Lead Facilitator
9:00-9:30	Review and summarize Day 2		
9:30-10:45	- Hemoglobin for Children and Women	Measurement technique	ACF
10:45-11:00	Refreshment Break		
11:00-12:00 **(Combine)**	-Two surveys but one "family" **(SMART Group 1 +REVA Group - 1)**	- Objectives of both surveys - Survey methodology-Shortly - Order of activities. - Roles and responsibilities of supervisors. - Discussion on One pager Common identifier and Demographic module.	ACF+ WFP+BIDS
	- Hemoglobin Measurement and role play **(SMART group 2+ REVA Group 2)**	- Practice session and role play	
12:00-1:00 **(Combine)**	**(Switching the group)**		
1:00-2:00	Lunch		
2:00-3:00	Roles and responsibilities of team members	- Supervision checklist	ACF

3:00-3:45	- Roll playing interview with tablets (nutrition)	- Switch groups	ACF
3:45-4:00	Refreshment		
4:00-5:00	Roll playing interview with tablets (nutrition)	- Switch groups	ACF

Day 4: Wednesday, October 17

Time	Topic	Details	Lead Facilitator
9:00-9:30	Recap of Day 3		
9:30-1:00	Concurrent session: Standardization test – Part 1	First round of measurements (10 children)	ACF
1:00-2:00	Lunch and prayer		
2:00-4:00	Concurrent session: Standardization test – Part 2	Second round of measurements (10 children)	ACF
4:00-4:15	Refreshment Break		
4:15-5:00	Daily field work completion	- Supervisor checklists - Supply checklists	ACF
	Financial and Security Brief	- Financial & Security brief, documentation, salaries	ACF Finance & Logistics
	Review of standardization test		ACF

Day 5: Tuesday, October 18

Time	Topic	Details	Lead Facilitator
7:30-09:00	Travel to Kutupalong MS		
09:00-01:00	Field test	SMART+REVA	All Supervisors
01:00-02:00	Travel to Cox's Bazar		
02:00-02:30	Lunch		
02:30-03:00	Post-test		
03:00-04:30	Feedback on field test	SMART+REVA	All Supervisors
04:30-05:00	Team composition, Administrative brief and preparation for the next day		Lalon and Amir

Standardization test results					Precision				Accuracy		OUTCOME		
Weight		subjects	mean	SD	max	Technical error	TEM/mean	Coef of reliability	Bias from superv	Bias from median	result		
		#	kg	kg	kg	TEM (kg)	TEM (%)	R (%)	Bias (kg)	Bias (kg)			
	Supervisor	10	13.2	2.8	0.5	0.2	1.5	99.5	-	0.56	TEM poor	R value good	Bias reject
	Enumerator 1	10	13.2	2.8	0.4	0.17	1.3	99.6	0.01	0.57	TEM poor	R value good	Bias reject
	Enumerator 2	10	13.2	2.8	0.5	0.22	1.7	99.3	0.03	0.59	TEM reject	R value good	Bias reject
	Enumerator 3	10	13.2	2.8	0.5	0.22	1.7	99.3	0.02	0.58	TEM reject	R value good	Bias reject
	Enumerator 4	10	13.2	2.8	0.4	0.17	1.3	99.6	0.01	0.57	TEM poor	R value good	Bias reject
	Enumerator 5	10	13.2	2.8	0.4	0.16	1.2	99.7	0	0.56	TEM poor	R value good	Bias reject
	Enumerator 6	10	13.2	2.8	0.6	0.22	1.7	99.3	0.03	0.59	TEM reject	R value good	Bias reject
	Enumerator 7	10	13.2	2.8	0.4	0.14	1.1	99.7	0.01	0.57	TEM poor	R value good	Bias reject
	Enumerator 8	10	13.2	2.8	0.4	0.19	1.4	99.5	0.01	0.57	TEM poor	R value good	Bias reject
	Enumerator 9	10	13.1	2.8	0.5	0.23	1.7	99.3	-0.01	0.55	TEM reject	R value good	Bias reject
	Enumerator 10	10	13.2	2.8	0.6	0.24	1.8	99.3	0.03	0.59	TEM reject	R value good	Bias reject
	Enumerator 11	10	13.1	2.7	0.4	0.16	1.2	99.6	-0.03	0.52	TEM poor	R value good	Bias reject
	enum inter 1st	11x10	13.1	2.7	-	0.08	0.6	99.9	-	-	TEM good	R value good	
	enum inter 2nd	11x10	13.3	2.7	-	0.1	0.7	99.9	-	-	TEM good	R value good	
	inter enum + sup	12x10	13.2	2.7	-	0.08	0.6	99.9	-	-	TEM good	R value good	
	TOTAL intra+inter	11x10	-	-	-	0.21	1.6	99.4	0.01	0.57	TEM poor	R value good	Bias reject
	TOTAL+ sup	12x10	-	-	-	0.21	1.6	99.4	-	-	TEM poor	R value good	

Annex 11: Surveyor Standardization test

Height		subjects	mean	SD	max	Technical error	TEM/mean	Coef of reliability	Bias from superv	Bias from median	result		
		#	cm	cm	cm	TEM (cm)	TEM (%)	R (%)	Bias (cm)	Bias (cm)			
	Supervisor	10	96.7	12	1.1	0.44	0.5	99.9	-	1.26	TEM acceptable	R value good	Bias poor
	Enumerator 1	10	95.9	12	4.7	1.09	1.1	99.2	-0.74	0.52	TEM reject	R value good	Bias acceptab
	Enumerator 2	10	96.6	12	3.5	0.86	0.9	99.5	-0.1	1.16	TEM poor	R value good	Bias poor
	Enumerator 3	10	96.7	12	1	0.3	0.3	99.9	0.01	1.27	TEM good	R value good	Bias poor
	Enumerator 4	10	96.5	12	1.1	0.35	0.4	99.9	-0.19	1.07	TEM good	R value good	Bias poor
	Enumerator 5	10	96.4	12	1.2	0.49	0.5	99.8	-0.27	0.99	TEM acceptable	R value good	Bias poor
	Enumerator 6	10	96.3	12	0.9	0.32	0.3	99.9	-0.41	0.85	TEM good	R value good	Bias poor
	Enumerator 7	10	96.3	12	1.5	0.44	0.5	99.9	-0.35	0.92	TEM acceptable	R value good	Bias poor
	Enumerator 8	10	96.4	12	1.4	0.39	0.4	99.9	-0.24	1.02	TEM good	R value good	Bias poor
	Enumerator 9	10	96.7	12	0.9	0.27	0.3	100	0.05	1.32	TEM good	R value good	Bias poor
	Enumerator 10	10	96.7	12	0.7	0.29	0.3	99.9	-0.01	1.25	TEM good	R value good	Bias poor
	Enumerator 11	10	96.2	12	1.1	0.35	0.4	99.9	-0.45	0.81	TEM good	R value good	Bias poor
	enum inter 1st	11x10	96.5	12	-	0.56	0.6	99.8	-	-	TEM acceptable	R value good	
	enum inter 2nd	11x10	96.3	12	-	0.56	0.6	99.8	-	-	TEM acceptable	R value good	
	inter enum + sup	12x10	96.4	12	-	0.55	0.6	99.8	-	-	TEM acceptable	R value good	

	TOTAL intra+inter	11x10	-	-	-	0.77	0.8	99.6	-0.25	1.04	TEM acceptable	R value good	Bias poor
	TOTAL+ sup	12x10	-	-	-	0.76	0.8	99.6	-	-	TEM acceptable	R value good	

MUAC		subjects	mean	SD	max	Technical error	TEM/mean	Coef of reliability	Bias from superv	Bias from median	result		
		#	mm	mm	mm	TEM (mm)	TEM (%)	R (%)	Bias (mm)	Bias (mm)			
	Supervisor	10	145.4	7.9	8	2.83	1.9	87.2	-	-1.6	TEM poor	R value reject	Bias good
	Enumerator 1	10	150.6	7.5	5	2.04	1.4	92.7	5.15	3.55	TEM acceptable	R value poor	Bias reject
	Enumerator 2	10	144.7	7.2	3	1.05	0.7	97.9	-0.7	-2.3	TEM good	R value acceptable	Bias good
	Enumerator 3	10	147.1	7.4	10	2.97	2	83.9	1.75	0.15	TEM poor	R value reject	Bias good
	Enumerator 4	10	145.9	8.2	4	1.6	1.1	96.2	0.45	-1.15	TEM good	R value acceptable	Bias good
	Enumerator 5	10	145.6	7.7	5	1.69	1.2	95.2	0.15	-1.45	TEM good	R value acceptable	Bias good
	Enumerator 6	10	144.6	9.1	15	5.03	3.5	69.4	-0.85	-2.45	TEM reject	R value reject	Bias good
	Enumerator 7	10	143.9	7.8	10	3.42	2.4	80.6	-1.5	-3.1	TEM reject	R value reject	Bias good
	Enumerator 8	10	147.6	8	5	2.01	1.4	93.6	2.15	0.55	TEM acceptable	R value poor	Bias good
	Enumerator 9	10	144.3	7.4	4	1.69	1.2	94.8	-1.15	-2.75	TEM good	R value poor	Bias good
	Enumerator 10	10	147.1	7.5	6	2.18	1.5	91.5	1.65	0.05	TEM acceptable	R value poor	Bias good
	Enumerator 11	10	145.9	7.6	7	2.9	2	85.5	0.5	-1.1	TEM poor	R value reject	Bias good
	enum inter 1st	11x10	146.4	8	-	3.09	2.1	85.1	-	-	TEM poor	R value reject	
	enum inter 2nd	11x10	145.8	7.7	-	3.05	2.1	84.2	-	-	TEM poor	R value reject	
	inter enum + sup	12x10	146	7.8	-	3.04	2.1	84.9	-	-	TEM poor	R value reject	
	TOTAL intra+inter	11x10	-	-	-	4.05	2.8	73.3	0.69	-0.97	TEM reject	R value reject	Bias good
	TOTAL+ sup	12x10	-	-	-	4.04	2.8	73.3	-	-	TEM reject	R value reject	

Suggested cut-off points for acceptability of measurements				
Parameter		MUAC mm	Weight Kg	Height cm
individual	Good	<2.0	<0.04	<0.4
TEM	Acceptable	<2.7	<0.10	<0.6
(intra)	Poor	<3.3	<0.21	<1.0
	Reject	>3.3	>0.21	>1.0
Team TEM	Good	<2.0	<0.10	<0.5
(intra+inter)	Acceptable	<2.7	<0.21	<1.0
and Total	Poor	<3.3	<0.24	<1.5
	Reject	>3.3	>0.24	>1.5
R value	Good	>99	>99	>99
	Acceptable	>95	>95	>95
	Poor	>90	>90	>90
	Reject	<90	<90	<90
Bias	Good	<1	<0.04	<0.4
From sup if good	Acceptable	<2	<0.10	<0.6
outcome, otherwise	Poor	<3	<0.21	<1.4
from median	Reject	>3	>0.21	>1.4

Annex 12: Round 3 ENA for SMART Plausibility Check for Makeshift Settlements

Plausibility check for: Final_Makeshift_R3_BD_ACF_OCT NOV 18.as

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

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**0** (0.2 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.693)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**4** (p=0.040)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (3)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (5)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (3)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.			and	and	and	or	
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	**5** (0.86)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (0.03)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (0.11)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**0** (p=0.110)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**9** %

The overall score of this survey is 9 %, this is excellent.

There were no duplicate entries detected.

Missing or wrong data:

HEIGHT: Line=19/ID=42, Line=117/ID=148

Percentage of children with no exact birthday: 93 %

Anthropometric Indices likely to be in error (-3 to 3 for WHZ, -3 to 3 for HAZ, -3 to 3 for WAZ, from observed mean - chosen in Options panel - these values will be flagged and should be excluded from analysis for a nutrition survey in emergencies. For other surveys this might not be the best procedure e.g. when the percentage of overweight children has to be calculated):

Line=2/ID=3: HAZ (2.269), Age may be incorrect
Line=96/ID=137: HAZ (-4.357), Age may be incorrect
Line=100/ID=131: HAZ (-7.175), WAZ (-5.340), Age may be incorrect
Line=102/ID=141: HAZ (2.562), Age may be incorrect
Line=158/ID=193: HAZ (4.639), WAZ (1.637), Age may be incorrect
Line=466/ID=526: **WHZ (2.054)**, Weight may be incorrect
Line=598/ID=677: HAZ (1.676), Age may be incorrect

Percentage of values flagged with SMART flags:WHZ: 0.2 %, HAZ: 0.9 %, WAZ: 0.3 %

Age distribution:

Month 6 : ##########
Month 7 : ###############
Month 8 : ##########
Month 9 : ##########
Month 10 : ##########
Month 11 : #########
Month 12 : ##############
Month 13 : ####################
Month 14 : #########
Month 15 : #############
Month 16 : ##########
Month 17 : #########
Month 18 : ################
Month 19 : ###############
Month 20 : ##########
Month 21 : #####
Month 22 : ################

Month 23 : ###########
Month 24 : ##################
Month 25 : ###############
Month 26 : #################
Month 27 : ###############
Month 28 : ###############
Month 29 : ##################
Month 30 : ##################
Month 31 : ######
Month 32 : ####
Month 33 : ##
Month 34 : ###########
Month 35 : ###
Month 36 : ##########
Month 37 : ###########
Month 38 : ##################
Month 39 : #################
Month 40 : ############
Month 41 : ###############
Month 42 : ###############
Month 43 : ####
Month 44 : #######
Month 45 : ############
Month 46 : ##########
Month 47 : #####
Month 48 : ################
Month 49 : ########
Month 50 : ###########
Month 51 : ###########
Month 52 : ################
Month 53 : ############
Month 54 : ###############
Month 55 : ############
Month 56 : #########
Month 57 : #########
Month 58 : ##############
Month 59 : #######

Age ratio of 6-29 months to 30-59 months: 1.00 (The value should be around 0.85).: p-value = 0.040 (significant difference)

Statistical evaluation of sex and age ratios (using Chi squared statistic):

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	81/75.4 (1.1)	62/73.1 (0.8)	143/148.5 (1.0)	1.31
18 to 29	12	90/73.5 (1.2)	87/71.3 (1.2)	177/144.8 (1.2)	1.03
30 to 41	12	64/71.3 (0.9)	65/69.1 (0.9)	129/140.3 (0.9)	0.98
42 to 53	12	60/70.1 (0.9)	66/68.0 (1.0)	126/138.1 (0.9)	0.91
54 to 59	6	30/34.7 (0.9)	35/33.6 (1.0)	65/68.3 (1.0)	0.86
6 to 59	54	325/320.0 (1.0)	315/320.0 (1.0)		1.03

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.693 (boys and girls equally represented)
Overall age distribution: p-value = 0.050 (significant difference)
Overall age distribution for boys: p-value = 0.139 (as expected)
Overall age distribution for girls: p-value = 0.239 (as expected)
Overall sex/age distribution: p-value = 0.013 (significant difference)

Digit preference Weight:

Digit .0 : ##################################
Digit .1 : ############################
Digit .2 : ##############################
Digit .3 : ##################################
Digit .4 : ############################
Digit .5 : ##############################
Digit .6 : ##############################
Digit .7 : ##############################
Digit .8 : ############################
Digit .9 : ##################################

Digit preference score: **3** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.699

Digit preference Height:

Digit .0 : ########################
Digit .1 : ##############################
Digit .2 : ################################
Digit .3 : ##############################
Digit .4 : ######################################
Digit .5 : ##############################
Digit .6 : ################################
Digit .7 : ################################
Digit .8 : ######################################
Digit .9 : ########################

Digit preference score: **5** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.171

Digit preference MUAC:

Digit .0 : ##############################
Digit .1 : ################################
Digit .2 : ################################
Digit .3 : ##############################
Digit .4 : ############################

Digit .5 : ############################
Digit .6 : ##################################
Digit .7 : ####################################
Digit .8 : ############################
Digit .9 : ##################################

Digit preference score: **3** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.792

Evaluation of Standard deviation, Normal distribution, Skewness and Kurtosis using the 3 exclusion (Flag) procedures

.	no exclusion	exclusion from reference mean (WHO flags)	exclusion from observed mean (SMART flags)
WHZ			
Standard Deviation SD:	0.87	0.87	0.86
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:			
calculated with current SD:			
calculated with a SD of 1:			
HAZ			
Standard Deviation SD:	1.11	1.08	1.02
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	27.0%	26.8%	26.9%
calculated with current SD:	27.5%	26.8%	26.3%
calculated with a SD of 1:	25.4%	25.1%	25.8%
WAZ			
Standard Deviation SD:	0.92	0.92	0.90
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:			
calculated with current SD:			
calculated with a SD of 1:			

Results for Shapiro-Wilk test for normally (Gaussian) distributed data:

WHZ	p= 0.183	p= 0.183	p= 0.425
HAZ	p= 0.000	p= 0.000	p= 0.798
WAZ	p= 0.032	p= 0.032	p= 0.092

(If p < 0.05 then the data are not normally distributed. If p > 0.05 you can consider the data normally distributed)

Skewness

WHZ	0.08	0.08	0.03
HAZ	0.10	0.33	-0.01
WAZ	-0.16	-0.16	-0.11

If the value is:
-below minus 0.4 there is a relative excess of wasted/stunted/underweight subjects in the sample
-between minus 0.4 and minus 0.2, there may be a relative excess of wasted/stunted/underweight subjects in the sample.
-between minus 0.2 and plus 0.2, the distribution can be considered as symmetrical.
-between 0.2 and 0.4, there may be an excess of obese/tall/overweight subjects in the sample.
-above 0.4, there is an excess of obese/tall/overweight subjects in the sample

Kurtosis

WHZ	0.23	0.23	0.11
HAZ	2.24	1.36	-0.19
WAZ	0.48	0.48	0.03

Kurtosis characterizes the relative size of the body versus the tails of the distribution. Positive kurtosis indicates relatively large tails and small body. Negative kurtosis indicates relatively large body and small tails.
If the absolute value is:
-above 0.4 it indicates a problem. There might have been a problem with data collection or

```
sampling.
-between 0.2 and 0.4, the data may be affected with a problem.
-less than an absolute value of 0.2 the distribution can be considered as normal.
```

Test if cases are randomly distributed or aggregated over the clusters by calculation of the Index of Dispersion (ID) and comparison with the Poisson distribution for:

```
WHZ < -2: ID=1.25 (p=0.110)
WHZ < -3: ID=1.47 (p=0.016)
GAM:      ID=1.25 (p=0.110)
SAM:      ID=1.47 (p=0.016)
HAZ < -2: ID=1.58 (p=0.005)
HAZ < -3: ID=1.35 (p=0.045)
WAZ < -2: ID=1.42 (p=0.025)
WAZ < -3: ID=1.16 (p=0.195)
```

Subjects with SMART flags are excluded from this analysis.

The Index of Dispersion (ID) indicates the degree to which the cases are aggregated into certain clusters (the degree to which there are "pockets"). If the ID is less than 1 and p > 0.95 it indicates that the cases are UNIFORMLY distributed among the clusters. If the p value is between 0.05 and 0.95 the cases appear to be randomly distributed among the clusters, if ID is higher than 1 and p is less than 0.05 the cases are aggregated into certain cluster (there appear to be pockets of cases). If this is the case for Oedema but not for WHZ then aggregation of GAM and SAM cases is likely due to inclusion of oedematous cases in GAM and SAM estimates.

Are the data of the same quality at the beginning and the end of the clusters?
Evaluation of the SD for WHZ depending upon the order the cases are measured within each cluster (if one cluster per day is measured then this will be related to the time of the day the measurement is made).

```
Time                                          SD for WHZ
point                 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.87 (n=53, f=0)  ###
02: 0.85 (n=53, f=0)  ##
03: 0.87 (n=52, f=0)  ###
04: 0.87 (n=52, f=0)  ###
05: 0.90 (n=52, f=0)  ####
06: 0.91 (n=51, f=1)  ####
07: 0.96 (n=46, f=0)  #######
08: 0.71 (n=45, f=0)
09: 0.96 (n=42, f=0)  #######
10: 0.97 (n=40, f=0)  #######
11: 0.72 (n=36, f=0)
12: 0.73 (n=33, f=0)
13: 1.01 (n=25, f=0)  #########
14: 0.85 (n=20, f=0)  OO
15: 0.98 (n=09, f=0)  ~~~~~~~~
16: 0.52 (n=09, f=0)
17: 0.87 (n=06, f=0)  ~~~
18: 0.78 (n=05, f=0)
19: 0.21 (n=03, f=0)
20: 0.30 (n=02, f=0)

(when n is much less than the average number of subjects per cluster different symbols are
used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags
found in the different time points)
```

Analysis by Team

Team		**1**	**2**	**3**	**4**	**5**	**6**
n =	99	120	111	99	82	129	
Percentage of values flagged with SMART flags:							
WHZ:		0.0	0.8	0.9	0.0	1.2	0.0
HAZ:		0.0	1.7	2.7	1.0	2.5	0.0
WAZ:		0.0	0.0	0.9	1.0	0.0	0.0
Age ratio of 6-29 months to 30-59 months:							
	1.25	0.97	0.98	0.98	0.86	0.98	
Sex ratio (male/female):							
	1.02	1.00	1.27	1.02	0.86	1.02	
Digit preference Weight (%):							
.0 :	12	11	6	16	15	11	
.1 :	9	10	9	11	7	6	
.2 :	7	11	9	15	9	9	
.3 :	12	12	13	7	6	15	
.4 :	5	9	14	8	11	6	
.5 :	11	12	12	11	9	10	
.6 :	10	12	9	9	9	9	
.7 :	11	10	7	8	9	12	
.8 :	12	6	8	4	13	10	
.9 :	10	8	14	10	13	11	
DPS:		7	6	8	12	9	8
Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)							
Digit preference Height (%):							
.0 :	9	8	11	5	6	9	
.1 :	11	13	12	13	7	4	
.2 :	5	13	8	14	10	12	
.3 :	10	3	8	7	21	12	
.4 :	20	11	12	9	10	12	
.5 :	7	12	8	11	14	5	
.6 :	11	11	10	12	10	11	
.7 :	10	10	13	9	9	12	
.8 :	10	11	11	11	5	19	
.9 :	6	8	8	8	9	5	
DPS:		13	9	6	9	14	14
Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)							
Digit preference MUAC (%):							
.0 :	12	8	14	7	10	9	
.1 :	5	11	10	14	11	12	
.2 :	7	10	9	10	21	11	
.3 :	5	14	10	11	7	11	
.4 :	9	6	11	11	6	8	
.5 :	13	6	5	7	7	13	
.6 :	10	13	13	11	9	9	
.7 :	14	13	11	9	9	12	
.8 :	13	10	10	8	7	6	
.9 :	11	10	8	11	13	9	
DPS:		11	9	7	7	14	7

Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

Standard deviation of WHZ:

SD	0.89	0.85	0.98	0.88	0.88	0.72

Prevalence (< -2) observed:

%

Prevalence (< -2) calculated with current SD:

%

Prevalence (< -2) calculated with a SD of 1:

%

Standard deviation of HAZ:

SD	1.02	0.98	1.23	1.32	1.07	0.96

observed:

%	26.3	40.5	29.3	30.9

calculated with current SD:

%	31.5	37.8	26.2	25.4

calculated with a SD of 1:

%	31.1	35.1	20.0	24.0

Statistical evaluation of sex and age ratios (using Chi squared statistic) for:

Team 1:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	15/11.6 (1.3)	5/11.4 (0.4)	20/23.0 (0.9)	3.00
18 to 29	12	11/11.3 (1.0)	24/11.1 (2.2)	35/22.4 (1.6)	0.46
30 to 41	12	7/11.0 (0.6)	9/10.7 (0.8)	16/21.7 (0.7)	0.78
42 to 53	12	12/10.8 (1.1)	8/10.6 (0.8)	20/21.4 (0.9)	1.50
54 to 59	6	5/5.3 (0.9)	3/5.2 (0.6)	8/10.6 (0.8)	1.67
6 to 59	54	50/49.5 (1.0)	49/49.5 (1.0)		1.02

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.920 (boys and girls equally represented)
Overall age distribution: p-value = 0.046 (significant difference)
Overall age distribution for boys: p-value = 0.628 (as expected)
Overall age distribution for girls: p-value = 0.000 (significant difference)
Overall sex/age distribution: p-value = 0.000 (significant difference)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	15/13.9 (1.1)	13/13.9 (0.9)	28/27.8 (1.0)	1.15
18 to 29	12	19/13.6 (1.4)	12/13.6 (0.9)	31/27.1 (1.1)	1.58
30 to 41	12	13/13.2 (1.0)	12/13.2 (0.9)	25/26.3 (1.0)	1.08
42 to 53	12	9/12.9 (0.7)	15/12.9 (1.2)	24/25.9 (0.9)	0.60
54 to 59	6	4/6.4 (0.6)	8/6.4 (1.2)	12/12.8 (0.9)	0.50
6 to 59	54	60/60.0 (1.0)	60/60.0 (1.0)		1.00

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 1.000 (boys and girls equally represented)
Overall age distribution: p-value = 0.938 (as expected)
Overall age distribution for boys: p-value = 0.359 (as expected)
Overall age distribution for girls: p-value = 0.899 (as expected)
Overall sex/age distribution: p-value = 0.246 (as expected)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	16/14.4 (1.1)	7/11.4 (0.6)	23/25.8 (0.9)	2.29
18 to 29	12	18/14.0 (1.3)	14/11.1 (1.3)	32/25.1 (1.3)	1.29
30 to 41	12	12/13.6 (0.9)	15/10.7 (1.4)	27/24.3 (1.1)	0.80
42 to 53	12	11/13.4 (0.8)	7/10.6 (0.7)	18/24.0 (0.8)	1.57
54 to 59	6	5/6.6 (0.8)	6/5.2 (1.1)	11/11.8 (0.9)	0.83
6 to 59	54	62/55.5 (1.1)	49/55.5 (0.9)		1.27

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.217 (boys and girls equally represented)
Overall age distribution: p-value = 0.404 (as expected)
Overall age distribution for boys: p-value = 0.679 (as expected)
Overall age distribution for girls: p-value = 0.244 (as expected)
Overall sex/age distribution: p-value = 0.063 (as expected)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	11/11.6 (0.9)	12/11.4 (1.1)	23/23.0 (1.0)	0.92
18 to 29	12	14/11.3 (1.2)	12/11.1 (1.1)	26/22.4 (1.2)	1.17
30 to 41	12	12/11.0 (1.1)	10/10.7 (0.9)	22/21.7 (1.0)	1.20
42 to 53	12	9/10.8 (0.8)	10/10.6 (0.9)	19/21.4 (0.9)	0.90
54 to 59	6	4/5.3 (0.7)	5/5.2 (1.0)	9/10.6 (0.9)	0.80
6 to 59	54	50/49.5 (1.0)	49/49.5 (1.0)		1.02

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.920 (boys and girls equally represented)
Overall age distribution: p-value = 0.898 (as expected)
Overall age distribution for boys: p-value = 0.844 (as expected)
Overall age distribution for girls: p-value = 0.995 (as expected)
Overall sex/age distribution: p-value = 0.804 (as expected)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	7/8.8 (0.8)	13/10.2 (1.3)	20/19.0 (1.1)	0.54
18 to 29	12	12/8.6 (1.4)	6/10.0 (0.6)	18/18.5 (1.0)	2.00
30 to 41	12	9/8.3 (1.1)	6/9.6 (0.6)	15/18.0 (0.8)	1.50
42 to 53	12	7/8.2 (0.9)	15/9.5 (1.6)	22/17.7 (1.2)	0.47
54 to 59	6	3/4.1 (0.7)	4/4.7 (0.9)	7/8.8 (0.8)	0.75
6 to 59	54	38/41.0 (0.9)	44/41.0 (1.1)		0.86

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.508 (boys and girls equally represented)
Overall age distribution: p-value = 0.743 (as expected)
Overall age distribution for boys: p-value = 0.694 (as expected)
Overall age distribution for girls: p-value = 0.135 (as expected)
Overall sex/age distribution: p-value = 0.040 (significant difference)

Team 6:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	17/15.1 (1.1)	12/14.8 (0.8)	29/29.9 (1.0)	1.42
18 to 29	12	16/14.7 (1.1)	19/14.5 (1.3)	35/29.2 (1.2)	0.84
30 to 41	12	11/14.3 (0.8)	13/14.0 (0.9)	24/28.3 (0.8)	0.85
42 to 53	12	12/14.0 (0.9)	11/13.8 (0.8)	23/27.8 (0.8)	1.09
54 to 59	6	9/6.9 (1.3)	9/6.8 (1.3)	18/13.8 (1.3)	1.00
6 to 59	54	65/64.5 (1.0)	64/64.5 (1.0)		1.02

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.930 (boys and girls equally represented)
Overall age distribution: p-value = 0.409 (as expected)
Overall age distribution for boys: p-value = 0.735 (as expected)
Overall age distribution for girls: p-value = 0.510 (as expected)
Overall sex/age distribution: p-value = 0.258 (as expected)

Evaluation of the SD for WHZ depending upon the order the cases are measured within each cluster (if one cluster per day is measured then this will be related to the time of the day the measurement is made).

Team: 1

```
Time                                                SD for WHZ
point                  0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.86 (n=08, f=0)   ###
02: 1.03 (n=08, f=0)   ##########
03: 0.99 (n=08, f=0)   ########
04: 0.79 (n=08, f=0)
05: 0.79 (n=08, f=0)
06: 1.06 (n=08, f=0)   ###########
07: 0.57 (n=08, f=0)
08: 0.89 (n=08, f=0)   ####
09: 0.99 (n=07, f=0)   ########
10: 1.05 (n=07, f=0)   ###########
11: 0.44 (n=05, f=0)
12: 0.81 (n=04, f=0)
13: 0.93 (n=03, f=0)   OOOOO
14: 1.17 (n=03, f=0)   OOOOOOOOOOOOOOO
```

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Team: 2

```
Time                                                SD for WHZ
point                  0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
```

```
01: 0.83 (n=09, f=0)  #
02: 0.75 (n=09, f=0)
03: 1.13 (n=09, f=0)  ###############
04: 1.06 (n=09, f=0)  ############
05: 0.97 (n=09, f=0)  #######
06: 0.62 (n=09, f=0)
07: 0.56 (n=09, f=0)
08: 0.78 (n=09, f=0)
09: 1.03 (n=09, f=0)  ##########
10: 0.63 (n=09, f=0)
11: 0.81 (n=09, f=0)
12: 0.82 (n=08, f=0)  #
13: 1.15 (n=06, f=0)  ################
14: 1.50 (n=04, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOO

(when n is much less than the average number of subjects per cluster different symbols are
used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags
found in the different time points)
```

Team: 3

```
Time                                              SD for WHZ
point                 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.17 (n=09, f=0)  #################
02: 0.83 (n=09, f=0)  #
03: 0.61 (n=09, f=0)
04: 0.97 (n=09, f=0)  #######
05: 0.75 (n=09, f=0)
06: 1.10 (n=08, f=0)  #############
07: 0.80 (n=07, f=0)
08: 0.56 (n=07, f=0)
09: 1.35 (n=07, f=0)  ########################
10: 1.51 (n=07, f=0)  ##############################
11: 0.62 (n=07, f=0)
12: 1.08 (n=06, f=0)  ############
13: 1.19 (n=04, f=0)  ##################
14: 0.70 (n=03, f=0)

(when n is much less than the average number of subjects per cluster different symbols are
used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags
found in the different time points)
```

Team: 4

```
Time                                              SD for WHZ
point                 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.34 (n=09, f=0)
02: 0.80 (n=09, f=0)
03: 0.84 (n=09, f=0)  ##
04: 0.68 (n=09, f=0)
05: 1.07 (n=09, f=0)  ###########
06: 0.69 (n=09, f=0)
07: 1.08 (n=08, f=0)  #############
08: 0.55 (n=07, f=0)
09: 1.06 (n=06, f=0)  ###########
10: 0.80 (n=05, f=0)
11: 1.18 (n=04, f=0)  OOOOOOOOOOOOOOO
12: 0.66 (n=04, f=0)
13: 0.65 (n=03, f=0)
14: 0.00 (n=02, f=0)
15: 0.76 (n=02, f=0)
16: 0.28 (n=02, f=0)

(when n is much less than the average number of subjects per cluster different symbols are
used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags
found in the different time points)
```

Team: 5

```
Time                                              SD for WHZ
point                 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
```

```
01: 0.72 (n=09, f=0)
02: 1.03 (n=09, f=0)  ##########
03: 0.66 (n=08, f=0)
04: 1.17 (n=08, f=0)  ################
05: 0.66 (n=08, f=0)
06: 0.89 (n=08, f=0)  ####
07: 1.29 (n=06, f=0)  ####################
08: 1.06 (n=06, f=0)  ###########
09: 0.97 (n=05, f=0)  #######
10: 0.40 (n=04, f=0)
11: 0.77 (n=03, f=0)
12: 0.29 (n=03, f=0)

(when n is much less than the average number of subjects per cluster different symbols are
used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags
found in the different time points)
```

Team: 6

```
Time                                                SD for WHZ
point               0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.74 (n=09, f=0)
02: 0.74 (n=09, f=0)
03: 0.99 (n=09, f=0)  ########
04: 0.73 (n=09, f=0)
05: 1.03 (n=09, f=0)  ##########
06: 0.57 (n=09, f=0)
07: 0.47 (n=08, f=0)
08: 0.49 (n=08, f=0)
09: 0.42 (n=08, f=0)
10: 0.65 (n=08, f=0)
11: 0.42 (n=08, f=0)
12: 0.52 (n=08, f=0)
13: 0.72 (n=08, f=0)
14: 0.55 (n=07, f=0)
15: 1.19 (n=03, f=0)  OOOOOOOOOOOOOOOO
16: 0.81 (n=03, f=0)  O
17: 0.87 (n=03, f=0)  OOO
18: 0.22 (n=02, f=0)

(when n is much less than the average number of subjects per cluster different symbols are
used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags
found in the different time points)
```

(for better comparison it ca

Annex 13: Round 3 ENA for SMART Plausibility Check for Nayapara RC

Plausibility check for: Final_NYP_R3_BD_ACF_OCT_NOV 18.as

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

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	**0** (0.6 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0.488)
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=0.297)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (7)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (6)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (5)
Standard Dev WHZ . .	Excl Excl	SD SD	<1.1 and >0.9 0	<1.15 and >0.85 5	<1.20 and >0.80 10	>=1.20 or <=0.80 20	**5** (0.85)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**1** (0.32)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**1** (0.26)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	**0** (p=)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**7** %

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

There were no duplicate entries detected.

Missing or wrong data:

WEIGHT: Line=32/ID=273
HEIGHT: Line=32/ID=273

Percentage of children with no exact birthday: 17 %

Anthropometric Indices likely to be in error (-3 to 3 for WHZ, -3 to 3 for HAZ, -3 to 3 for WAZ, from observed mean - chosen in Options panel - these values will be flagged and should be excluded from analysis for a nutrition survey in emergencies. For other surveys this might not be the best procedure e.g. when the percentage of overweight children has to be calculated):

Line=8/ID=67: HAZ (-6.016), Age may be incorrect

Line=93/ID=231: WAZ (1.661), Weight may be incorrect
Line=212/ID=244: HAZ (-5.568), Age may be incorrect
Line=240/ID=278: HAZ (1.373), Age may be incorrect
Line=275/ID=439: **WHZ (2.578)**, Weight may be incorrect
Line=308/ID=245: **WHZ (-5.074)**, Height may be incorrect

Percentage of values flagged with SMART flags:WHZ: 0.6 %, HAZ: 0.9 %, WAZ: 0.3 %

Age distribution:

Month 6 : #####
Month 7 : ##########
Month 8 : #####
Month 9 : ########
Month 10 : #########
Month 11 : ####
Month 12 : #####
Month 13 : ##########
Month 14 : #####
Month 15 : ######
Month 16 : ##
Month 17 : #####
Month 18 : ###########
Month 19 : #########
Month 20 : ###
Month 21 : #######
Month 22 : #########
Month 23 : ############
Month 24 : ####
Month 25 : ############
Month 26 : #####
Month 27 : #########
Month 28 : ######
Month 29 : ######
Month 30 : ####
Month 31 :
Month 32 : ####
Month 33 : #
Month 34 : #####
Month 35 : ##########
Month 36 : ######
Month 37 : #########
Month 38 : ########
Month 39 : ##
Month 40 : #########
Month 41 : ########
Month 42 : ######
Month 43 : ########

Month 44 : #####
Month 45 : ######
Month 46 : ########
Month 47 : #####
Month 48 : #########
Month 49 : ######
Month 50 : ########
Month 51 : ##
Month 52 : #####
Month 53 : #####
Month 54 : ##########
Month 55 : ##
Month 56 : ###
Month 57 : ####
Month 58 : ######
Month 59 : ##########
Month 60 : ######

Age ratio of 6-29 months to 30-59 months: 0.95 (The value should be around 0.85).:
p-value = 0.297 (as expected)

Statistical evaluation of sex and age ratios (using Chi squared statistic):

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	45/42.2 (1.1)	34/39.2 (0.9)	79/81.4 (1.0)	1.32
18 to 29	12	43/41.2 (1.0)	49/38.2 (1.3)	92/79.4 (1.2)	0.88
30 to 41	12	35/39.9 (0.9)	35/37.1 (0.9)	70/77.0 (0.9)	1.00
42 to 53	12	41/39.3 (1.0)	34/36.5 (0.9)	75/75.7 (1.0)	1.21
54 to 59	6	18/19.4 (0.9)	17/18.0 (0.9)	35/37.5 (0.9)	1.06
6 to 59	54	182/175.5 (1.0)	169/175.5 (1.0)		1.08

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.488 (boys and girls equally represented)
Overall age distribution: p-value = 0.580 (as expected)
Overall age distribution for boys: p-value = 0.903 (as expected)
Overall age distribution for girls: p-value = 0.397 (as expected)
Overall sex/age distribution: p-value = 0.241 (as expected)

Digit preference Weight:

Digit .0 : ##################################
Digit .1 : ################################
Digit .2 : ##
Digit .3 : ##########################
Digit .4 : ##
Digit .5 : ############################
Digit .6 : ###################
Digit .7 : ####################################
Digit .8 : ##
Digit .9 : ################################

Digit preference score: **7** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.069

Digit preference Height:

Digit .0 : ####################
Digit .1 : ####################################
Digit .2 : ####################################
Digit .3 : ##################################
Digit .4 : ##
Digit .5 : ##################################
Digit .6 : ############################
Digit .7 : ######################################
Digit .8 : ######################################
Digit .9 : ##############################

Digit preference score: **6** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.258

Digit preference MUAC:

Digit .0 : ##################################
Digit .1 : ##################################
Digit .2 : ######################################
Digit .3 : ##################################
Digit .4 : ##############################
Digit .5 : ########################
Digit .6 : ######################################
Digit .7 : ######################################
Digit .8 : ##
Digit .9 : ##############################

Digit preference score: **5** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.699

Evaluation of Standard deviation, Normal distribution, Skewness and Kurtosis using the 3 exclusion (Flag) procedures

.	no exclusion	exclusion from reference mean (WHO flags)	exclusion from observed mean (SMART flags)
WHZ			
Standard Deviation SD:	0.90	0.87	0.85
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:			
calculated with current SD:			
calculated with a SD of 1:			
HAZ			
Standard Deviation SD:	1.01	0.99	0.95
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	38.6%		
calculated with current SD:	38.8%		

calculated with a SD of 1: 38.6%

WAZ

Standard Deviation SD: 0.89 0.89 0.87
(The SD should be between 0.8 and 1.2)
Prevalence (< -2)
observed:
calculated with current SD:
calculated with a SD of 1:

Results for Shapiro-Wilk test for normally (Gaussian) distributed data:

WHZ p= 0.000 p= 0.002 p= 0.059
HAZ p= 0.008 p= 0.299 p= 0.557
WAZ p= 0.586 p= 0.586 p= 0.923
(If p < 0.05 then the data are not normally distributed. If p > 0.05 you can consider the data normally distributed)

Skewness

WHZ 0.19 0.46 0.32
HAZ -0.24 -0.06 0.02
WAZ 0.18 0.18 0.07
If the value is:
-below minus 0.4 there is a relative excess of wasted/stunted/underweight subjects in the sample
-between minus 0.4 and minus 0.2, there may be a relative excess of wasted/stunted/underweight subjects in the sample.
-between minus 0.2 and plus 0.2, the distribution can be considered as symmetrical.
-between 0.2 and 0.4, there may be an excess of obese/tall/overweight subjects in the sample.
-above 0.4, there is an excess of obese/tall/overweight subjects in the sample

Kurtosis

WHZ 1.62 0.77 0.26
HAZ 0.96 0.34 -0.25
WAZ 0.30 0.30 -0.04
Kurtosis characterizes the relative size of the body versus the tails of the distribution. Positive kurtosis indicates relatively large tails and small body. Negative kurtosis indicates relatively large body and small tails.
If the absolute value is:
-above 0.4 it indicates a problem. There might have been a problem with data collection or sampling.
-between 0.2 and 0.4, the data may be affected with a problem.
-less than an absolute value of 0.2 the distribution can be considered as normal.

Are the data of the same quality at the beginning and the end of the clusters?

Evaluation of the SD for WHZ depending upon the order the cases are measured within each cluster (if one cluster per day is measured then this will be related to the time of the day the measurement is made).

Time SD for WHZ
point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Analysis by Team

Team	**1**	**2**	**3**	**4**	**5**	**6**
n =	60	49	45	68	63	66
Percentage of values flagged with SMART flags:						
WHZ:	0.0	0.0	0.0	3.0	1.6	0.0
HAZ:	1.7	0.0	2.2	3.0	0.0	0.0
WAZ:	0.0	0.0	2.2	1.5	0.0	0.0
Age ratio of 6-29 months to 30-59 months:						
	1.40	0.75	0.88	0.84	0.85	1.06
Sex ratio (male/female):						
	1.07	0.81	0.88	1.52	1.10	1.06

Digit preference Weight (%):

.0 :	7	12	7	13	14	9
.1 :	12	4	16	6	16	6
.2 :	10	16	27	9	8	9
.3 :	10	4	13	6	3	12
.4 :	12	18	9	16	13	9
.5 :	10	4	13	7	6	9
.6 :	12	2	2	4	6	6
.7 :	10	18	0	10	16	9
.8 :	12	12	9	13	11	15
.9 :	7	8	4	13	6	15
DPS:	6	20	24	13	14	10

Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

Digit preference Height (%):

.0 :	5	8	7	6	5	8
.1 :	12	6	16	9	16	8
.2 :	5	16	4	12	11	15
.3 :	10	6	11	12	8	11
.4 :	12	10	13	13	16	12
.5 :	12	18	7	9	8	8
.6 :	8	6	7	6	11	9
.7 :	17	10	11	9	11	9
.8 :	12	10	13	15	8	11
.9 :	8	8	11	9	6	11
DPS:	11	13	12	9	12	8

Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

Digit preference MUAC (%):

.0 :	18	16	4	9	6	8
.1 :	5	10	16	10	11	11
.2 :	12	14	13	9	10	11
.3 :	10	4	13	12	8	12
.4 :	5	16	7	7	8	12
.5 :	8	6	0	7	10	8
.6 :	12	4	9	12	17	9
.7 :	13	10	9	13	11	9
.8 :	8	12	18	10	11	12
.9 :	8	6	11	10	8	9
DPS:	13	15	17	6	10	6

Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

Standard deviation of WHZ:

SD	0.84	0.78	0.93	0.96	1.04	0.76

Prevalence (< -2) observed:

%	14.3

Prevalence (< -2) calculated with current SD:

%	14.9

Prevalence (< -2) calculated with a SD of 1:

%	13.9

Standard deviation of HAZ:

SD	1.06	1.09	1.09	1.13	0.85	0.84

observed:
% 40.0 44.9 48.9 34.3
calculated with current SD:
% 42.2 38.3 48.0 33.0
calculated with a SD of 1:
% 41.8 37.2 47.9 30.9

Statistical evaluation of sex and age ratios (using Chi squared statistic) for:

Team 1:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	9/7.2 (1.3)	7/6.7 (1.0)	16/13.9 (1.1)	1.29
18 to 29	12	11/7.0 (1.6)	8/6.6 (1.2)	19/13.6 (1.4)	1.38
30 to 41	12	3/6.8 (0.4)	5/6.4 (0.8)	8/13.2 (0.6)	0.60
42 to 53	12	6/6.7 (0.9)	7/6.3 (1.1)	13/12.9 (1.0)	0.86
54 to 59	6	2/3.3 (0.6)	2/3.1 (0.6)	4/6.4 (0.6)	1.00
6 to 59	54	31/30.0 (1.0)	29/30.0 (1.0)		1.07

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.796 (boys and girls equally represented)
Overall age distribution: p-value = 0.248 (as expected)
Overall age distribution for boys: p-value = 0.246 (as expected)
Overall age distribution for girls: p-value = 0.895 (as expected)
Overall sex/age distribution: p-value = 0.151 (as expected)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	4/5.1 (0.8)	7/6.3 (1.1)	11/11.4 (1.0)	0.57
18 to 29	12	3/5.0 (0.6)	7/6.1 (1.1)	10/11.1 (0.9)	0.43
30 to 41	12	6/4.8 (1.2)	4/5.9 (0.7)	10/10.7 (0.9)	1.50
42 to 53	12	5/4.7 (1.1)	5/5.8 (0.9)	10/10.6 (0.9)	1.00
54 to 59	6	4/2.3 (1.7)	4/2.9 (1.4)	8/5.2 (1.5)	1.00
6 to 59	54	22/24.5 (0.9)	27/24.5 (1.1)		0.81

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.475 (boys and girls equally represented)
Overall age distribution: p-value = 0.796 (as expected)
Overall age distribution for boys: p-value = 0.647 (as expected)
Overall age distribution for girls: p-value = 0.846 (as expected)
Overall sex/age distribution: p-value = 0.370 (as expected)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	6/4.9 (1.2)	4/5.6 (0.7)	10/10.4 (1.0)	1.50
18 to 29	12	5/4.8 (1.1)	6/5.4 (1.1)	11/10.2 (1.1)	0.83
30 to 41	12	2/4.6 (0.4)	8/5.3 (1.5)	10/9.9 (1.0)	0.25

42 to 53	12	5/4.5 (1.1)	4/5.2 (0.8)	9/9.7 (0.9)	1.25
54 to 59	6	3/2.2 (1.3)	2/2.6 (0.8)	5/4.8 (1.0)	1.50
6 to 59	54	21/22.5 (0.9)	24/22.5 (1.1)		0.88

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.655 (boys and girls equally represented)
Overall age distribution: p-value = 0.997 (as expected)
Overall age distribution for boys: p-value = 0.726 (as expected)
Overall age distribution for girls: p-value = 0.678 (as expected)
Overall sex/age distribution: p-value = 0.332 (as expected)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	9/9.5 (0.9)	6/6.3 (1.0)	15/15.8 (1.0)	1.50
18 to 29	12	10/9.3 (1.1)	6/6.1 (1.0)	16/15.4 (1.0)	1.67
30 to 41	12	14/9.0 (1.6)	9/5.9 (1.5)	23/14.9 (1.5)	1.56
42 to 53	12	6/8.8 (0.7)	3/5.8 (0.5)	9/14.7 (0.6)	2.00
54 to 59	6	2/4.4 (0.5)	3/2.9 (1.0)	5/7.3 (0.7)	0.67
6 to 59	54	41/34.0 (1.2)	27/34.0 (0.8)		1.52

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.090 (boys and girls equally represented)
Overall age distribution: p-value = 0.119 (as expected)
Overall age distribution for boys: p-value = 0.279 (as expected)
Overall age distribution for girls: p-value = 0.559 (as expected)
Overall sex/age distribution: p-value = 0.023 (significant difference)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	10/7.7 (1.3)	4/7.0 (0.6)	14/14.6 (1.0)	2.50
18 to 29	12	6/7.5 (0.8)	9/6.8 (1.3)	15/14.3 (1.1)	0.67
30 to 41	12	6/7.2 (0.8)	5/6.6 (0.8)	11/13.8 (0.8)	1.20
42 to 53	12	8/7.1 (1.1)	8/6.5 (1.2)	16/13.6 (1.2)	1.00
54 to 59	6	3/3.5 (0.9)	4/3.2 (1.2)	7/6.7 (1.0)	0.75
6 to 59	54	33/31.5 (1.0)	30/31.5 (1.0)		1.10

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.705 (boys and girls equally represented)
Overall age distribution: p-value = 0.898 (as expected)
Overall age distribution for boys: p-value = 0.844 (as expected)
Overall age distribution for girls: p-value = 0.572 (as expected)
Overall sex/age distribution: p-value = 0.356 (as expected)

Team 6:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	7/7.9 (0.9)	6/7.4 (0.8)	13/15.3 (0.8)	1.17
18 to 29	12	8/7.7 (1.0)	13/7.2 (1.8)	21/14.9 (1.4)	0.62
30 to 41	12	4/7.5 (0.5)	4/7.0 (0.6)	8/14.5 (0.6)	1.00
42 to 53	12	11/7.3 (1.5)	7/6.9 (1.0)	18/14.2 (1.3)	1.57
54 to 59	6	4/3.6 (1.1)	2/3.4 (0.6)	6/7.0 (0.9)	2.00
6 to 59	54	34/33.0 (1.0)	32/33.0 (1.0)		1.06

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.806 (boys and girls equally represented)
Overall age distribution: p-value = 0.144 (as expected)
Overall age distribution for boys: p-value = 0.466 (as expected)
Overall age distribution for girls: p-value = 0.150 (as expected)
Overall sex/age distribution: p-value = 0.036 (significant difference)

Evaluation of the SD for WHZ depending upon the order the cases are measured within each cluster (if one cluster per day is measured then this will be related to the time of the day the measurement is made).

Team: 1

Time point	SD for WHZ 0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Team: 2

Time point	SD for WHZ 0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Team: 3

Time point	SD for WHZ 0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Team: 4

Time point	SD for WHZ 0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Team: 5

```
Time                                          SD for WHZ
point              0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n
< 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different
time points)
```

Team: 6

```
Time                                          SD for WHZ
point              0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n
< 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different
time points)
```

Annex 14: Thresholds and Classifications for Indices Included in Round 3 Assessment

Indicators and Cut-offs
Anthropometric Indices
See Annex for thresholds and classifications for indices included in the assessment.

Acute malnutrition is the physical manifestation of a sudden disruption of an individual's ability to consume or absorb nutrients. In children 6-59 months of age, acute malnutrition is estimated using Weight-for-Height z-score (WHZ) and/or MUAC combined with the presence of oedema. WHZ is calculated using ENA Software by comparing the observed weight of a selected child to the mean weight of children from the reference population for a given height. When using WHZ, the distribution of the sample is compared against the 2006 WHO reference population. The WHZ cut-offs are displayed in Table A14-1 below. Global acute malnutrition (GAM) is the sum of moderate acute malnutrition (MAM) and severe acute malnutrition (SAM).

Chronic malnutrition is the physical manifestation of longer-term malnutrition which retards growth. In children 6-59 months of age, chronic malnutrition is estimated using Height-for-Age z-score (HAZ). HAZ is calculated using ENA Software by comparing the observed height of a selected child to the mean height of children from the reference population for a given age. When using HAZ, the distribution of the sample is compared against the 2006 WHO reference population. The HAZ cut-offs are displayed in A14-1 below. Global chronic malnutrition is the sum of moderate and severe chronic malnutrition.

Underweight is the physical manifestation of both acute malnutrition and chronic malnutrition. In children 6-59 months of age, underweight is estimated using Weight-for-Age z-score (WAZ). WAZ is calculated using ENA Software by comparing the observed weight of a selected child to the mean weight of children from the reference population for a given age. When using WAZ, the distribution of the sample is compared against the 2006 WHO reference population. The WAZ cut-offs are displayed in Table A14-1 below. Global underweight is the sum of moderate and severe underweight.

Table A14-1: Cut-offs for the Indices for Weight-for-Height z-score (WHZ), Height-for-Age z-score (HAZ), and Weight-for-Age z-score (WAZ) according to WHO reference 2006

	ACUTE MALNUTRITION (WHZ)	CHRONIC MALNUTRITION (HAZ)	UNDERWEIGHT (WAZ)
GLOBAL	<-2 z-score and/or oedema	<-2 z-score	<-2 z-score
MODERATE	<-2 z-score and ≥ -3 z-score	<-2 z-score and ≥ -3 z-score	<-2 z-score and ≥ -3 z-score
SEVERE	<-3 z-score and/or oedema	<-3 z-score	<-3 z-score

Malnutrition as identified by WHZ, HAZ and WAZ have been classified by the WHO in terms of public health significance. These are presented in A14-2 below.

Table A14-2: WHO Classification for Severity of Malnutrition by Prevalence among Children Under Five[42]

Severity	GLOBAL ACUTE MALNUTRITION (WHZ)	GLOBAL CHRONIC MALNUTRITION (HAZ)	GLOBAL UNDERWEIGHT (WAZ)	Interpretation
Very High	≥ 15%	≥ 40%	≥ 30%	**Critical / Emergency**
High	≥ 10% - <15%	≥ 30% - < 40%	≥ 20% - < 30%	**Serious**
Medium	≥ 5% - < 10%	≥ 20% - < 30%	≥ 10% - < 20%	**Poor**
Low	< 5%	< 20%	< 10%	**Acceptable**

The second anthropometric measure used to assess acute malnutrition is MUAC. In children 6-59 months of age, MUAC is measured using a MUAC tape and children are categorised as moderate or severe based on the WHO established cut-offs displayed in Table A14-3 below.

Table A14-3: WHO Cut-off Values for Anthropometric Measurements Using MUAC and or Oedema to Assess Moderate and Severe Acute Malnutrition

Severity	MUAC (mm)
GLOBAL	<125
MODERATE	≥ 115 and < 125
SEVERE	<115

The rate of GAM within a population as identified by MUAC has been classified in terms of severity by the Integrated Food Security Phase Classification (IPC). These are presented in Table A14-4 below.

[42] WHO Cut-off Points and Summary Statistics www.who.int/nutgrowthdb/about/introduction/en/index5.html

Table A14-4: IPC Classification of Severity of Acute Malnutrition by MUAC[43]

Severity	GAM by MUAC (< 125mm)
Extreme critical	≥17%
Critical	11.0-16.9%
Alert-Serious	6-10.9%
Acceptable	<6%

[43] IPC (2016) Acute Malnutrition Addendum

Anaemia

Anaemia is a condition where the number of red blood cells and their oxygen-carrying capacity are insufficient to meet the body's physiological needs. Although anaemia can be influenced by many factors, including but not limited to age, gender, and elevation above sea level, as well as nutritional deficiencies (including folate, vitamin B, and vitamin A) it remains an important indicator of iron status. For this assessment, the haemoglobin content of finger prick whole blood samples from children 6-59 months were measured and evaluated per WHO recommendations (see Tables A14-5 and A-14-6 below).

Table A14-5: WHO Cut-off Values for Prevalence of Anaemia based on Haemoglobin Measurement

Non-pregnant, non lactating women 15-49 years (Hb g/dL)	Children 6-59 Months Hb (g/dL)	Severity
<8 g/dL	**< 7.0 g/dL**	Severe
≥ 8.0 - <10.9 g/dL	**≥ 7.0 - <10.0 g/dL**	Moderate
≥ 11.0 - <11.9 g/dL	**≥ 10.0 - <11.0 g/dL**	Mild
≥ 12.0 g/dL	**≥ 11.0 g/dL**	No Anaemia

Table A14-6: WHO Classification of Public Health Significance of Anaemia and Iron Deficiency in Populations based on Haemoglobin Measurement[44]

Prevalence of Anaemia	Category of Public Health Significance
≥ 40%	High
20.0 - 39.9%	Medium
5.0 - 19.9%	Low

Mortality

One of the primary goals of humanitarian response to a humanitarian crisis is the prevention and reduction of mortality[45]. The CDR is a metric frequently used to gauge the severity of a humanitarian crisis. It is defined as the number of deaths from all causes per 10,000 people per day over a specified period of time. It is calculated from the following formula:

CDR = Number of deaths / (mid-interval population / 10,000) x time interval

= deaths / 10,000 / day

[44] WHO (2000) The Management of Nutrition in Major Emergencies

[45] The Sphere Project (2011) Humanitarian Charter and Minimum Standards in Humanitarian Response

U5DR is defined as the number of deaths among children under five from all causes per 10,000 people per day over a specific period of time. It is calculated from the following formula:

U5DR = Number of under 5 deaths / (mid-interval population / 10,000) x time interval

= under 5 deaths / 10,000 / day

The most broadly referenced CDR emergency threshold is >1 death/10,000/day among the entire population and >2 deaths/10,000/day among children under five years. Sphere standards recommend the interpretation of CDR and U5DR by regional cut-offs, as shown in A14-7 below. Bangladesh is situated in South Asia, and therefore results from this assessment will be compared with this region.

Table A14-7: Sphere Standards CDR and U5DR Emergency Threshold Cut-offs by Region[46]

Region	CDR Baseline	CDR Emergency Threshold	U5DR Baseline	U5DR Emergency Threshold
South Asia	0.22	0.40	0.46	0.90
East Asia and Pacific	0.19	0.40	0.15	0.30
Industrialised Countries	0.25	0.50	0.03	0.10
Developing Countries	0.22	0.40	0.44	0.90
Least developed countries	0.33	0.70	0.82	1.70
World	0.25	0.50	0.40	0.80

[46] The Sphere Project (2011) Humanitarian Charter and Minimum Standards in Humanitarian Response

Annex 15: Comparison of Indicators for Makeshift Settlements and Nayapara RC for Round 1,2,3

Makeshift Settlements

Table A15-1: MS Demography for Round 1,2,3

Population Subset	Round 1 Oct-Nov 2017		Round 2 April-May 2018		Round 3 Oct-Nov 2018	
All Household members	6,146		3,404		3,573	
Average HH Size	4.7		5.0		5.3	
Population Subset	**Round 1 Oct-Nov 2017**		**Round 2 April-May 2018**		**Round 3 Oct-Nov 2018**	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
<5 years	20.3%	[19.3-21.4]	20.2%	[18.9-21.5]	20.7%	[19.2-22.2]
5-10 years	18.7%	[17.8-19.6]	19.5%	[17.9-21.1]	20.3%	[19.1-21.6]
11-17 years	15.9%	[14.9-16.9]	16.3%	[14.9-17.8]	16.2%	[14.7-17.6]
18-59 years	40.8%	[40.0-41.8]	39.8%	[38.5-41.2]	39.0%	[37.6-40.5]
≥60 years	4.3%	[3.8-4.9]	4.2%	[3.6-4.9]	3.7%	[3.1-4.3]
Female	51.4%	[50.2-52.5]	50.1%	[49.4-52.7]	52.0%	[50.5-53.5]
Women 15-49 years	23.7%	[23.0-24.5]	23.9%	[22.8-25.0]	23.2%	[22.2-24.1]
Pregnant and lactating women	9.8%	[9.1-10.6]	9.3%	[8.5-10.2]	9.0%	
Pregnant Women	3.1%	[2.7-3.6]	3.0%	[2.4-3.6]	2.8%	
Lactating Women	6.7%	[6.2-7.2]	6.4%	[5.6-7.1]	6.3%	
w/infant >6 months	2.2%	[1.8-2.6]	1.7%	[1.4-2.2]	1.6%	
w/infant ≥ 6 months	4.5%	[4.0-5.0]	4.6%	[4.1-5.2]	4.7%	

Table A15-2: MS Prevalence of Acute Malnutrition per WHZ and/or Oedema in Round 1,2,3 WHO Reference 2006

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3	R1 vs R3
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI	P-value	P-value
Global Acute Malnutrition	1086	210	19.3%	[16.7-22.2]	594	71	12.0%	[9.4-15.0]	637	70	11%	[8.4-14.2]	0.626	**0.000**
Moderate Acute Malnutrition	1086	177	16.3%	[13.9-19.0]	594	59	9.9%	[7.7-12.8]	637	63	9.9%	[7.7-12.7]	1.000	**0.000**
Severe Acute malnutrition	1086	33	3.0%	[2.2-4.2]	594	12	2.0%	[1.1-3.6]	637	7	1.1%	[0.4-2.8]	0.269	**0.010**

Table A15-3: MS Prevalence of Acute Malnutrition per WHZ and/or Oedema by Sex and Age in Round 1,2,3 , WHO Reference 2006

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3	R1 vs R3
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI	P-value	P-value
Global Acute Malnutrition All	1086	210	19.3%	[16.7-22.2]	594	71	12.0%	[9.4-15.0]	637	70	11%	[8.4-14.2]	0.626	**0.000**
GAM Boys	579	117	20.2%	[16.8-24.1]	313	41	13.1%	[10.0-16.9]	322	42	13%	[9.5-17.7]	0.970	**0.009**
GAM Girls	507	93	18.3%	[14.9-22.3]	281	30	10.7%	[7.2-15.5]	315	28	8.9%	[5.6-13.9]	0.535	**0.001**
GAM Children 6-23 months	349	104	29.8%	[24.6-35.6]	195	38	19.5%	[14.1-26.3]	216	34	15.7%	[11.2-21.7]	0.343	**0.000**
GAM Children 24-49 month	734	104	14.2%	[11.5-17.3]	399	33	8.3%	[6.3-10.8]	422	36	8.5%	[5.9-12.2]	0.916	**0.008**

Table A15-4: MS Prevalence of Acute Malnutrition by MUAC in Round 1, 2,3

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3	R1 vs R3
	N	**n**	**%**	**95% CI**	**N**	**N**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**	**P-value**	**P-value**
Global Acute Malnutrition	1087	93	8.6%	[6.8-10.7]	600	26	4.3%	[3.2-5.9]	640	20	3.1	1.9-5.0	0.224	**0.000**
Moderate Acute Malnutrition	1087	79	7.3%	[5.6-9.4]	600	23	3.8%	[2.7-5.4]	640	20	3.1	1.9-5.0	0.481	**0.001**
Severe Acute malnutrition	1087	14	1.3%	[0.8-2.1]	600	3	0.5%	[0.2-1.6]	640	0	0	-	**0.031**	**0.000**

Table A15-5: MS Prevalence of Acute Malnutrition by MUAC by Sex and Age in Round 1,2,3, WHO Reference 2006

Children 6-59 months MUAC	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI		
Global Acute Malnutrition MUAC All	1,087	93	8.6%	[6.8-10.7]	600	26	4.3%	[3.2-5.9]	640	20	3.1%	[1.9-5.0]	0.224	**0.000**
GAM Boys	579	40	6.9%	[4.9-9.7]	316	8	2.5%	[1.3-4.9]	325	7	2.2%	[1.1-4.3]	0.787	**0.001**
GAM Girls	508	53	10.4%	[7.9-13.6]	284	18	6.3%	[4.3-9.2]	315	13	4.1%	[2.1-7.9]	0.224	**0.002**
GAM Children 6-23 months	350	78	22.3%	[17.4-28.0]	197	22	11.2%	[8.0-15.4]	217	19	8.8%	[5.3-14.2]	0.402	**0.000**
GAM Children 24-59 month	737	153	2.0%	[1.2-3.3]	403	4	1.0%	[0.4-2.6]	423	1	0.2%	[0.0-1.7]	0.367	0.051

Table A15-6: MS Low MUAC in Women 15-49 Years in Round 1,2,3

Women 15-49 years	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	**n**	**%**	**95% CI**	**N**	**N**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**		
Low Women's MUAC	1,385	120	8.7%	[6.7-11.1]	734	19	2.6%	[1.6-4.1]	725	22	3.0%	[2.0-4.6]	0.646	**0.000**
Low Women's MUAC Among PLW's	311	38	12.2%	[8.6-17.1]	147	5	3.4%	[1.5-7.8]	144	4	2.8%	[1.0-7.3]	0.762	**0.000**
Women 15-49 years	**N**	**Mean**	**SD**		**N**	**Mean**	**SD**		**N**	**Mean**	**SD**			
Women's MUAC	1,385	247	31.8		734	254	29.1		725	256.4	31.7			
PLW Women's MUAC	311	241	28.0		147	246	25.5		144	252.0	30.1			

Table A15-7: MS Prevalence of Chronic Malnutrition by HAZ in Round 1,2,3, WHO Reference 2006

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**		
Global Chronic Malnutrition	1071	472	44.1%	[40.7-47.5]	592	223	37.7%	[33.0-42.5]	632	170	26.9%	[22.4-31.9]	**0.002**	**0.000**
Moderate Chronic Malnutrition	1071	343	32.0%	[29.2-35.0]	592	176	29.7%	[25.6-34.2]	632	133	21.0%	[17.3-25.4]	**0.004**	**0.000**
Severe Chronic malnutrition	1071	129	12.0%	[10.1-14.3]	592	47	7.9%	[5.8-10.8]	632	37	5.9%	[4.0-8.5]	0.228	**0.000**

Table A15-8: MS Prevalence of Chronic Malnutrition by HAZ by Sex and Age Group, WHO Reference 2006

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3	R1 vs R3
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI	P-value	P-value
Chronic Malnutrition All	1,071	472	44.1%	[40.7-47.5]	592	222	37.5%	[32.9-42.3]	632	170	26.9%	[22.4-31.9]	**0.002**	**0.000**
Total stunting Boys	574	274	47.7%	[42.9-52.6]	312	117	37.5%	[31.7-43.7]	319	95	29.8%	[24.0-36.3]	0.076	**0.000**
Total stunting Girls	497	198	39.8%	[35.1-44.8]	280	105	37.5%	[30.9-44.6]	313	75	24.0%	[18.2-30.8]	**0.005**	**0.000**
Stunting Children 6-23 months					196	58	29.6%	[23.1-37.1]	213	61	28.6%	[21.9-36.4]	0.843	
Stunting Children 24-59 months					396	164	41.4%	[36.4-46.6]	420	109	26.0%	[21.2-31.4]	**0.000**	

Table A15-9: MS Prevalence of Underweight by WAZ in Round 1,2,3, WHO Reference 2006

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3	R1 vs R3
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI	P-value	P-value
Global underweight	1083	447	41.3%	[37.5-45.1]	599	186	31.1%	[26.5-36.0]	638	160	25.1%	[21.0-29.7]	0.067	**0.000**
Moderate underweight	1083	326	30.1%	[26.9-33.5]	599	146	24.4%	[20.4-28.9]	638	131	20.5%	[17.2-24.3]	0.160	**0.000**
Severe underweight	1083	121	11.2%	[9.0-13.8]	599	40	6.7%	[4.6-9.6]	638	29	4.5%	[3.0-6.8]	0.155	**0.000**

Table A15-10: MS Prevalence of Underweight per WAZ by Sex and Age Group, WHO Reference 2006

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3	R1 vs R3
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI	P-value	P-value
Global Underweight All	1,083	447	41.3%	[37.5-45.1]	599	186	31.1%	[26.5-36.0]	638	160	25.1%	[21.0-29.7]	0.067	**0.000**
Global Underweight Boys	577	250	43.3%	[38.6-48.2]	316	105	33.2%	[28.0-38.9]	323	87	26.9%	[21.3-33.4]	0.123	**0.000**
Global Underweight Girls	506	197	38.9%	[34.2-43.9]	283	81	28.6%	[22.2-36.1]	315	73	23.2%	[17.9-29.5]	0.234	**0.000**

Table A15-11: MS Prevalence of Anaemia Among Children 6-59 months by Age Category in Round 1,2,3, WHO Reference

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI		
Any Anaemia (Hb<11.0g/dL)	1082	518	47.9%	[44.1-51.7]	598	193	32.3%	[27.8-37.1]	636	253	39.8%	[34.1-45.4]	**0.043**	**0.019**
Mild Anaemia (Hb 10.0 to <11.0 g/dL)	1082	333	30.8%	[27.7-34.0]	598	117	19.6%	[16.7-22.8]	636	137	21.5%	[18.4-24.7]	0.389	**0.000**
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)	1082	183	16.9%	[14.5-19.7]	598	75	12.5%	[9.8-15.9]	636	115	18.1%	[13.5-22.6]	**0.042**	0.646
Severe Anaemia (Hb<7.0g/dL)	1082	2	0.2%	[0.1-0.7]	598	1	0.2%	[0.1-1.2]	636	1	0.2%	[0-0.5]	1.0	1.0
Children 6-23 months	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**		
Any Anaemia (Hb<11.0g/dL)	349	215	61.6%	[55.8-67.1]	196	102	52.0%	[44.0-60.0]	216	115	53.2%	[44.7-61.7]	0.837	0.102
Mild Anaemia (Hb 10.0 to <11.0 g/dL)	349	112	32.1%	[27.5-37.1]	196	59	30.1%	[23.8-37.3]	216	57	26.4%	[21.3-31.4]	0.381	0.105
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)	349	102	29.2%	[24.5-34.5]	196	42	21.4%	[16.0-28.1]	216	57	26.4%	[18.8-33.4]	0.338	0.570
Severe Anaemia (Hb<7.0g/dL)	349	1	0.3%	[0.1-2.0]	196	1	0.5%	[0.1-3.6]	216	1	0.4%	[0-1.4]	0.953	0.952
Children 24-59 months	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**		
Any Anaemia (Hb<11.0g/dL)	733	303	41.3%	[37.5-45.3]	402	91	22.6%	[17.9-28.2]	420	138	32.9%	[26.6-39.1]	**0.012**	**0.024**
Mild Anaemia (Hb 10.0 to <11.0 g/dL)	733	221	30.2%	[26.5-34.1]	402	58	14.4%	[11.2-18.4]	420	80	19.1%	[15.1-23.0]	0.079	**0.000**
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)	733	81	11.1%	[8.8-13.8]	402	33	8.2%	[5.7-11.6]	420	58	13.8%	[9.1-18.5]	**0.045**	0.314
Severe Anaemia (Hb<7.0g/dL)	733	1	0.1%	[0.1-1.0]	402	0	0.0%	-	420	0	-	-		

Table A15-12: MS Two-Week Prevalence of Diarrhoea, Cough, and Fever among Children 6-59 Months in Round 1, 2, 3

Indicator	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI		
Two Week Prevalence of Diarrhoea	1,110	458	41.3%	[36.5-46.2]	628	131	20.9%	[17.4-24.8]	682	194	28.4%	[24.5-32.4]	**0.007**	**0.000**
Two-Week Prevalence of Acute Respiratory Infection**	1,110	640	57.7%	[52.8-62.4]	628	164	26.1%	[21.1-31.9]	682	74	10.9%	[7.1-14.6]	**0.000**	**0.000**
Two-Week Prevalence of Fever***	1,110	280	25.2%	[20.6-30.5]	628	251	40.0%	[34.6-45.6]	682	259	38.0%	[33.0-43.0]	0.591	0.097

Table A15-13: MS Prevalence of Suspected Measles and Diphtheria among Children 6-59 Months in Round 2,3

Prevalence of Fever with rash (suspected measles) *	Round 2 April-May 2018 Children 6-59 months				Round 3 Oct-Nov 2018 Children 6-59 months				R2 vs R3 P-value
	N	n	%	95% CI	N	n	%	95% CI	
All reported	628	87	13.9%	[10.7-17.7]	682	87	12.8%	[9.8-15.7]	0.635
Confirmed by Health Document	628	13	2.1%	[0.7-5.9]	682	3	0.5%	[0-1.1]	0.176
Confirmed by Household Recall	628	74	11.8%	[9.0-15.4]	682	84	12.3%	[9.3-15.3]	0.818
Prevalence of Suspected Diphtheria*	N	n	%	95% CI	N	n	%	95% CI	
All Reported	628	39	6.2%	[3.7-10.3]	682	18	2.6%	[1.1-4.1]	**0.041**
Confirmed by Health Document	628	12	1.9%	[0.5-7.2]	682	1	0.1%	[0-0.4]	0.155
Confirmed by Household Recall	628	27	4.3%	[2.7-6.9]	682	17	2.5%	[0.7-4.0]	0.334

**Measles and diphtheria recall period since 25 August 2017. Suspected measles and diphtheria were not included in Round 1*

Table A15-14: MS Receipt for Food Assistance for Round 2,3

Indicator	Round 2 April-May 2018		Round 3 Oct-Nov 2018		R2 vs R3 P-value
	Sample HH	% [95% CI]	Sample HH	% [95% CI	
Proportion of HH with a GFD ration card or e-voucher (SCOPE) card	662/675	98.1% [96.0-99.1]	630*/664	94.9% [89.8-100]	0.228
Proportion of HH with a GFD card	552/675	81.8% [71.1-89.1]	513/664	77.3% [66.5-88.0]	0.521
With documented receipt of food rations within last month	542/552	98.2% [95.4-99.3]	513/513	100%	
Proportion of HH with a SCOPE card	120/675	17.8% [10.3-29.0]	123/664	18.5% [8.7-28.3]	0.917
With reported purchase of food items last month	119/120	99.2% [93.3-99.9]	122/123	99.2% [97.4-100]	1.0

*6 households reported that they have a GFD ration card and e-voucher SCOPE card

Table A15-15: MS Retrospective Mortality for Round 1,2,3

Indicator	Round 1 Oct-Nov 2017		Round 2 April-May 2018		Round 3 Oct-Nov 2018	
	Rate	95% CI	Rate	95% CI	Rate	95% CI
Crude death rate Deaths/10000/day	1.36	[1.07-1.73]	0.38	[0.23-0.64]	0.13	[0.06-0.28]
Under 5 death rate Deaths/10 000/day	1.22	[0.70-2.13]	0.86	[0.37-1.94]	0.42	[0.16-1.10]

Nayapara RC

Table A15-16: NYP RC Demography for Round 1,2,3

Population Subset	Round 1 Oct-Nov 2017		Round 2 April-May 2018		Round 3 Oct-Nov 2018	
All Household members	3,093		2,562		3,093	
Average HH Size	5.3		5.3		5.6	
Population Subset	**Round 1 Oct-Nov 2017**		**Round 2 April-May 2018**		**Round 3 Oct-Nov 2018**	
	%	**95% CI**	**%**	**95% CI**	**%**	**95% CI**
<5 years	15.0%	[13.8-16.3]	12.4%	[11.2-13.8]	12.8%	[11.7-14.1]
5-10 years	19.8%	[18.5-21.3]	18.9%	[17.5-20.5]	18.7%	[17.4-20.1]
11-17 years	21.2%	[19.8-22.7]	22.3%	[20.7-23.9]	21.3%	[20.0-22.8]
18-59 years	40.9%	[39.2-42.6]	42.9%	[41.0-44.9]	43.8%	[42.1-45.6]
≥60 years	3.1%	[2.6-3.8]	3.5%	[2.8-4.3]	3.4%	[2.8-4.1]
Female	51.1%	[49.3-52.8]	50.6%	[48.7-52.6]	52.5%	[50.7-54.3]
Women 15-49 years	24.4%	[22.9-25.9]	25.1%	[23.5-26.9]	26.5%	[25.0-28.1]
Pregnant and lactating women	7.0%	[6.2-8.0]	7.1%	[6.1-8.1]	6.7%	
Pregnant Women	2.2%	[1.7-2.7]	2.3%	[1.8-3.0]	2.1%	
Lactating Women	4.9%	[4.2-5.7]	4.8%	[4.0-5.7]	4.6%	
w/infant >6 months	1.7%	[1.3-2.2]	1.3%	[0.9-1.8]	1.3%	
w/infant ≥ 6 months	3.2%	[2.6-3.9]	3.5%	[2.8-4.3]	3.3%	

Table A15-17: NYP RC Prevalence of Acute Malnutrition per WHZ and/or Oedema in Round 1,2,3 WHO Reference 2006

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	n	%	95% CI	N	N	%	95% CI	N	n	%	95% CI		
Global Acute Malnutrition	398	57	14.3%	[11.2-18.1]	279	38	13.6%	[10.1-18.1]	348	42	12.1%	[9.1-15.9]	0.578	0.375
Moderate Acute Malnutrition	398	52	13.1%	[10.1-16.7]	279	34	12.2%	[8.9-16.5]	348	39	11.2%	[8.3-15.0]	0.699	0.472
Severe Acute malnutrition	398	5	1.3%	[0.5-2.9]	279	4	1.4%	[0.6-3.6]	348	3	0.9%	[0.3-2.5]	0.564	0.599

Table A15-18: NYP RC Prevalence of Acute Malnutrition per WHZ and/or Oedema by Sex and Age in Round 1,2,3 , WHO Reference 2006

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	n	%	95% CI	N	N	%	95% CI	N	n	%	95% CI		
Global Acute Malnutrition All	398	57	14.3%	[11.2-18.1]	279	38	13.6%	[10.1-18.1]	348	42	12.1%	[9.1-15.9]	0.578	0.375
GAM Boys	219	41	18.7%	[14.1-24.4]	141	17	12.1%	[7.7-18.5]	180	22	12.2%	[8.2-17.8]	0.978	0.071
GAM Girls	179	16	8.9%	[5.6-14.0]	138	21	15.2%	[10.2-22.1]	168	20	11.9%	[7.8-17.7]	0.404	0.361
GAM Children 6-23 months	117	29	24.8%	[17.8-33.3]	90	15	16.7%	[10.2-26.0]	128	15	11.7%	7.2-18.4]	0.304	**0.008**
GAM Children 24-59 month	283	30	10.6%	[7.5-14.7]	189	23	12.2%	[8.2-17.7]	220	27	12.3%	[8.6-17.3]	0.976	0.554

Table A15-19: NYP RC Prevalence of Acute Malnutrition by MUAC in Round 1, 2,3

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI		
Global Acute Malnutrition	400	28	7.0%	[4.9-9.9]	279	10	3.6%	[2.0-6.5]	351	13	3.7%	[2.2-6.2]	0.947	**0.043**
Moderate Acute Malnutrition	400	21	5.3%	[3.5-7.9]	279	9	3.2%	[1.7-6.0]	351	12	3.4%	[2.0-5.9]	0.889	0.200
Severe Acute malnutrition	400	7	1.8%	[0.9-3.6]	279	1	0.4%	[0.1-2.0]	351	1	0.3%	[0.1-1.6]	0.834	0.061

Table A15-20: NYP RC Prevalence of Acute Malnutrition by MUAC by Sex and Age in Round 1,2,3, WHO Reference 2006

Children 6-59 months MUAC	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI		
Global Acute Malnutrition MUAC All	400	28	7.0%	[4.9-9.9]	279	10	3.6%	[2.0-6.5]	351	13	3.7%	[2.2-6.2]	0.947	**0.043**
GAM Boys	220	11	5.0%	[2.8-8.7]	141	3	2.1%	[0.7-6.1]	182	2	1.1%	[0.3-3.9]	0.486	**0.019**
GAM Girls	180	17	9.4%	[6.0-14.6]	138	7	5.1%	[2.5-10.1]	169	11	6.5%	[3.7-11.3]	0.600	0.316

GAM Children 6-23 months	117	22	18.8%	[12.8-26.8]	90	9	10.0%	[5.2-18.3]	129	13	10.1%	[6.0-16.5]	0.981	0.053
GAM Children 24-59 month	283	6	2.1%	[1.0-4.5]	189	1	0.5%	[0.1-3.7]	222	0	0	-	0.330	**0.014**

Table A15-21: NYP RC Low MUAC in Women 15-49 Years in Round 1,2,3

Women 15-49 years	**Round 1 Oct-Nov 2017**				**Round 2 April-May 2018**				**Round 3 Oct-Nov 2018**				**R2 vs R3 P-value**	**R1 vs R3 P-value**
	N	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**		
Low Women's MUAC	693	24	3.5%	[2.3-5.1]	625	15	2.4%	[1.5-3.9]	777	10	1.3%	[0.7-2.4]	0.135	**0.007**
Low Women's MUAC Among PLW's	116	4	3.5%	[1.3-8.9]	92	6	6.5%	[2.9-13.9]	105	2	1.9%	[0.5-6.7]	0.114	0.461
Women 15-49 years	**N**	**Mean**	**SD**		**N**	**Mean**	**SD**		**N**	**Mean**	**SD**			
Women's MUAC	693	257	34.6		625	271	38.2		777	270.6	35.3			
PLW Women's MUAC	116	246	29.6		92	259	35.2		105	257.3	29.4			

Table A15-22: NYP RC Prevalence of Chronic Malnutrition by HAZ in Round 1,2,3, WHO Reference 2006

Children 6-59 months	**Round 1 Oct-Nov 2017**				**Round 2 April-May 2018**				**Round 3 Oct-Nov 2018**				**R2 vs R3 P-value**	**R1 vs R3 P-value**
	N	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**		
Global Chronic Malnutrition	392	174	44.4%	[39.5-49.3]	275	111	40.4%	[34.7-46.3]	347	133	38.3%	[33.4-43.5	0.595	0.092
Moderate Chronic Malnutrition	392	125	31.9%	[27.5-36.7]	275	90	32.7%	[27.5-38.5]	347	105	30.3%	[25.7-35.3]	0.523	0.639
Severe Chronic malnutrition	392	49	12.5%	[9.6-16.1]	275	21	7.6%	[5.0-11.4%]	347	28	8.1%	[5.6-11.4]	0.818	**0.048**

Table A15-23: NYP RC Prevalence of Chronic Malnutrition by HAZ by Sex and Age Group, WHO Reference 2006

Children 6-59 months	**Round 1 Oct-Nov 2017**				**Round 2 April-May 2018**				**Round 3 Oct-Nov 2018**				**R2 vs R3 P-value**	**R1 vs R3 P-value**
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI		
Chronic Malnutrition All	392	174	44.4%	[39.5-49.3]	275	111	40.4%	[34.7-46.3]	347	133	38.3%	[33.4-43.5]	0.595	0.092
Total stunting Boys	218	90	41.3%	[35.0-47.9]	140	60	42.9%	[35.0-51.1]	179	75	41.9%	[34.9-49.2]	0.858	0.904
Total stunting Girls	174	84	48.3%	[41.0-55.7]	135	51	37.8%	[30.0-46.2]	168	58	34.5%	[27.8-42.0]	0.553	**0.009**
Stunting Children 6-23 months					88	24	27.3%	[18.9-37.7]	128	34	26.6%	[19.7-34.8]	0.910	

Stunting Children 24-59 months					188	87	46.3%	[39.2-53.5]	220	99	45.0%	[38.6-51.6]	0.793	

Table A15-24: NYP RC Prevalence of Underweight by WAZ in Round 1,2,3, WHO Reference 2006

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI		
Global underweight	400	163	40.8%	[36.0-45.6]	279	111	39.8%	[34.2-45.6]	349	122	35.0%	[30.1-40.1]	0.217	0.102
Moderate underweight	400	129	32.3%	[27.9-37.0]	279	91	32.6%	[27.4-38.3]	349	102	29.2%	[24.7-34.2]	0.360	0.359
Severe underweight	400	34	8.5%	[6.1-11.6]	279	20	7.2%	[4.7-10.8]	349	20	5.7%	[3.7-8.7]	0.450	0.134

Table A15-25: NYP RC Prevalence of Underweight per WAZ by Sex and Age Group, WHO Reference 2006

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI		
Global Underweight All	400	163	40.8%	[36.0-45.6]	279	111	39.8%	[34.2-45.6]	349	122	35.0%	[30.1-40.1]	0.217	0.102
Global Underweight Boys	220	91	41.4%	[35.1-48.0]	141	62	44.0%	[36.0-52.2]	181	62	34.3%	[27.7-41.4]	0.077	0.144
Global Underweight Girls	180	72	40.0%	[33.1-47.3]	138	49	35.5%	[28.0-43.8]	168	60	35.7%	[28.9-43.2]	0.971	0.409

Table A15-26: NYP RC Prevalence of Anaemia Among Children 6-59 months by Age Category in Round 1,2,3, WHO Reference

Children 6-59 months	Round 1 Oct-Nov 2017				Round 2 April-May 2018				Round 3 Oct-Nov 2018				R2 vs R3 P-value	R1 vs R3 P-value
	N	n	%	95% CI	N	n	%	95% CI	N	n	%	95% CI		
Any Anaemia (Hb<11.0g/dL)	399	186	46.6%	[41.8-51.5]	279	82	29.4%	[24.3-35.0]	349	133	38.1%	[33.2-43.3]	**0.021**	**0.019**
Mild Anaemia (Hb 10.0 to <11.0 g/dL)	399	124	31.1%	[26.7-35.8]	279	52	18.6%	[14.5-23.7]	349	68	19.5%	[15.7-24.0]	0.775	**0.000**
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)	399	62	15.5%	[12.3-19.4]	279	29	10.4%	[7.3-14.6]	349	63	18.0%	[14.4-22.4]	**0.006**	0.362
Severe Anaemia (Hb<7.0g/dL)	399	0	-	-	279	1	0.4%	[0.1-2.5]	349	2	0.6%	[0.2-2.1]	0.721	0.147
Children 6-23 months	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**		
Any Anaemia (Hb<11.0g/dL)	117	76	65.0%	[55.8-73.1]	90	49	54.4%	[44.0-64.5]	128	76	59.4%	[50.3-68.0]	0.464	0.366
Mild Anaemia	117	47	40.2%	[31.6-49.4]	90	30	33.3%	[24.3-43.8]	128	36	28.1%	[20.5-36.8]	0.415	**0.046**

(Hb 10.0 to <11.0 g/dL)														
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)	117	29	24.8%	[17.8-33.5]	90	19	21.1%	[13.8-30.8]	128	39	30.5%	[22.7-39.2]	0.114	0.318
Severe Anaemia (Hb<7.0g/dL)	117	0	-	-	90	0	-	-	128	1	0.8%	[0.0-4.3]	0.311	0.311
Children 24-59 months	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**		
Any Anaemia (Hb<11.0g/dL)	282	110	39.0%	[33.5-44.9]	189	33	17.5%	[12.7-23.6]	221	57	25.8%	[20.2-32.1]	**0.040**	**0.002**
Mild Anaemia (Hb 10.0 to <11.0 g/dL)	282	77	27.3%	[22.4-32.8]	189	22	11.6%	[7.8-17.1]	221	32	14.5%	[10.1-19.8]	0.383	**0.000**
Moderate Anaemia (Hb 7.0 to <10.0 g/dL)	282	33	11.7%	[8.4-16.0]	189	10	5.3%	[2.9-9.6]	221	24	10.9%	[7.1-15.7]	**0.036**	0.778
Severe Anaemia (Hb<7.0g/dL)	282	0	-	-	189	1	0.2%	[0.1-1.5]	221	1	0.4%	[0.0-2.5]	0.709	0.347

Table A15-27: NYP RC Two-Week Prevalence of Diarrhoea, Cough, and Fever among Children 6-59 Months in Round 1, 2, 3

Indicator	**Round 1 Oct-Nov 2017**				**Round 2 April-May 2018**				**Round 3 Oct-Nov 2018**				**R2 vs R3 P-value**	**R1 vs R3 P-value**
	N	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**		
Two Week Prevalence of Diarrhoea	408	140	34.3%	[29.9-39.1]	284	68	23.9%	[19.3-29.3]	357	90	25.2%	[21.0-30.0]	0.704	**0.006**
Two-Week Prevalence of Acute Respiratory Infection**	408	205	50.3%	[45.4-55.1]	284	61	21.5%	[17.1-26.7]	357	34	9.5%	[6.9-13.0]	**0.000**	**0.000**
Two-Week Prevalence of Fever***	408	69	16.9%	[13.6-20.9]	284	115	40.5%	[34.9-46.3]	357	120	33.6%	[28.9-38.7]	0.073	**0.000**

Table A15-28: NYP RC Prevalence of Suspected Measles and Diphtheria among Children 6-59 Months in Round 2,3

Prevalence of Fever with rash (suspected measles) *	**Round 2 April-May 2018 Children 6-59 months**				**Round 3 Oct-Nov 2018 Children 6-59 months**				**R2 vs R3 P-value**
	N	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**	
All reported	284	33	11.6%	[8.4-15.9]	357	39	10.9%	[8.1-14.6]	0.781

Confirmed by Health Document	284	0	0	-	357	3	0.8%	[0.3-2.4]	0.090
Confirmed by Household Recall	284	33	11.6%	[8.4-15.9]	357	36	10.1%	[7.4-13.6]	0.546
Prevalence of Suspected Diphtheria*	**N**	**n**	**%**	**95% CI**	**N**	**n**	**%**	**95% CI**	
All Reported	284	1	0.4%	[0.1-2.5]	357	0	0	-	0.286
Confirmed by Health Document	284	0	0	-	-	-	-	-	-
Confirmed by Household Recall	284	1	0.4%	[0.1-2.5]	-	-	-	-	-

**Measles and diphtheria recall period since 25 August 2017. Suspected measles and diphtheria were not included in Round 1*

Table A15-29: NYP RC Receipt for Food Assistance for Round 1,2

Indicator	Round 2 April-May 2018		Round 3 Oct-Nov 2018		R2 vs R3 P-value
	Sample HH	% [95% CI]	Sample HH	% [95% CI	
Proportion of HH with a GFD ration card or e-voucher (SCOPE) card	479/483	99.2% [97.8-99.7]	544/554	98.2% [96.7-99.0]	0.151
Proportion of HH with a GFD card	17/483	3.5% [2.2-5.6]	8/554	1.4% [0.7-2.8]	**0.031**
With documented receipt of food rations within last month	16/17	94.1% [62.7-99.4]	8/8	100%	0.313
Proportion of HH with a SCOPE card	463/483	95.9% [93.7-97.3]	536/554	96.8% [94.9-97.9]	0.443
With reported purchase of food items last month	462/463	99.8% [98.5-99.9]	534/536	99.6% [98.7-99.9]	0.560

*6 households reported that they have a GFD ration card and e-voucher SCOPE card

Table A15-30: NYP RC Retrospective Mortality for Round 1,2,3

Indicator	Round 1 Oct-Nov 2017		Round 2 April-May 2018		Round 3 Oct-Nov 2018	
	Rate	95% CI	Rate	95% CI	Rate	95% CI
Crude death rate Deaths/10000/day	0.75	[0.56-1.01]	0.21	[0.11-0.42]	0.21	[0.11-0.39]

Under 5 death rate Deaths/10 000/day	0.80	[0.37-1.73]	0.22	[0.04-1.26]	0.56	[0.19-1.64]